PERPETUAL

TROUBLE SHOOTER'S MANUAL

Reg. U.S. Pat. Off.

VOLUME X

by

JOHN F. RIDER

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Publisher

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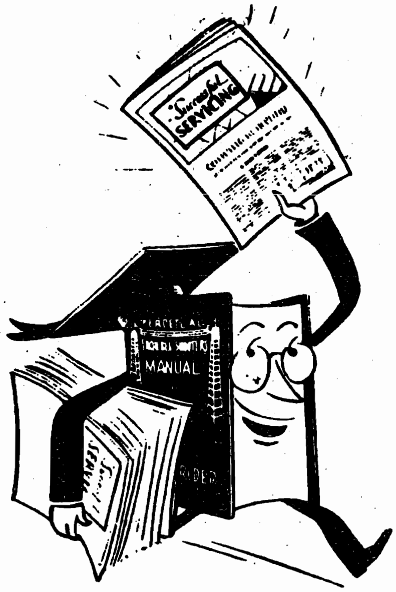

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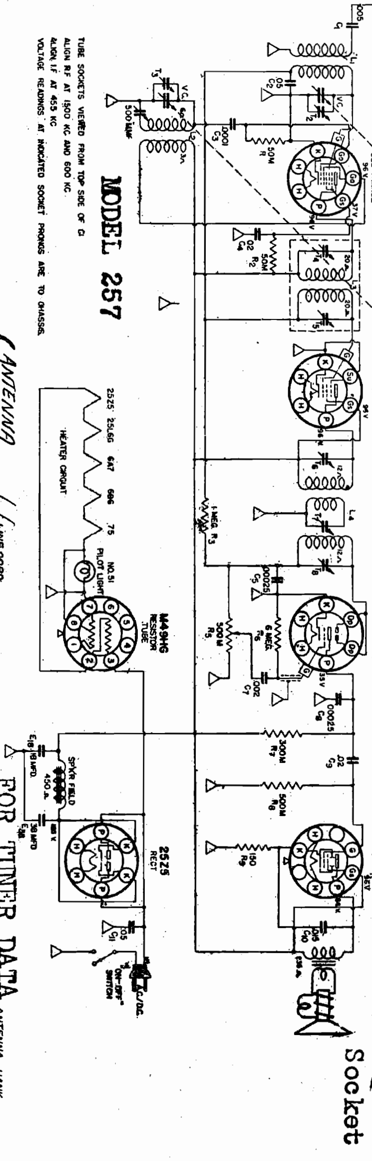
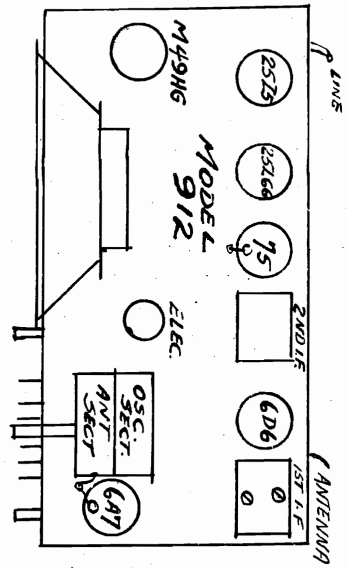
MODEL 912 Schematic, Socket, Trimmers Tuner Data, Alignment

AIR KING PRODUCTS CORP.

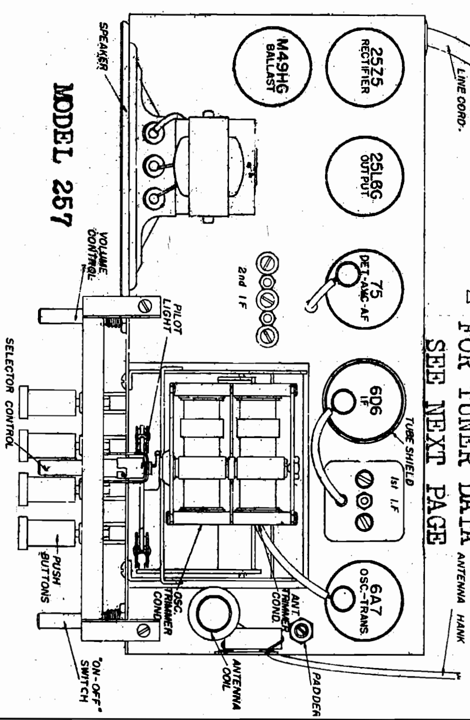
MODEL 257 Schematic, Voltage, Trimmers, Alignment Socket



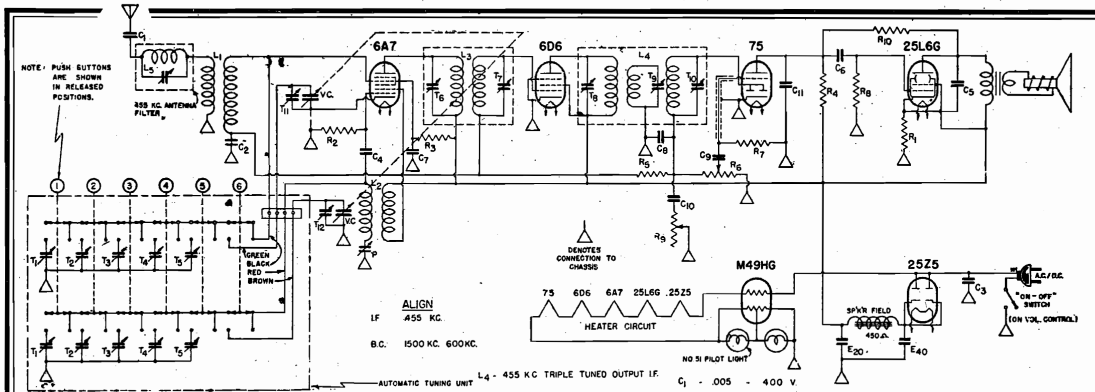
TUBE SOCKETS VIEWED FROM TOP SIDE OF CH
ALIGN R.F. AT 1500 KC AND 600 KC
ALIGN I.F. AT 455 KC
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS



FOR TUNER DATA SEE NEXT PAGE



MODEL 257



R_1 -	150	OHM	1/4	WATT
R_2 -	50,000	"	"	"
R_3 -	50,000	"	"	"
R_4 -	300,000	"	"	"
R_5 -	1,000,000	"	"	"
R_6 -	500,000	"	VOL. CONTROL	

R_7 -	6,000,000	"	1/4 WATT
R_8 -	500,000	"	1/4
R_9 -	500,000	"	TONE CONTROL
R_{10} -	3,000,000	"	1/4 WATT
L_1 -	ANTENNA COIL		
L_2 -	OSCILLATOR COIL		
L_3 -	455 K.C. INPUT I.F.		

L_4 - 455 KC TRIPLE TUNED OUTPUT I.F.
P 500 MMF MAX. PADDER
E_{20} - 20 MFD. 150 V.W.
E_{40} 40 " " "
VC - 410 MMF MAX VARIABLE COND

C_1 -	.005 -	400 V.
C_2 -	.05 -	400 V.
C_3 -	.05 -	400 V.
C_4 -	.0001 -	MICA
C_5 -	.015 -	400 V.
C_6 -	.02 -	"
C_7 -	.02 -	"
C_8 -	.00025 -	MICA
C_9 -	.002 -	200 V.
C_{10} -	.005 -	400 V.
C_{11} -	.00025 -	MICA

MODEL 912

MODEL 912 AUTOMATIC TUNING CONTROL

Decide on station you wish to receive.

Refer to the diagram underneath cabinet and see, which set of adjustment screws will have a tuning range that includes the frequency of the station desired. This is the pair of screws to be adjusted for this particular station. The ranges of the adjustment screws are divided into two groups, one group covering from 530-1100 kc, the other covering from 625-1600 kc.

From the same diagram, after finding where the proper pair of adjustment screws are located, trace dotted line connecting these screws to one of the push buttons. This is the button which, after the adjustments are completed, will tune in the station.

Push button located "IN."

Turn volume control knob on full (to the extreme right) and adjust screw marked "O" until desired station is heard. (In this case until WJZ is heard.) If when making this adjustment, a number of stations can be brought in as the screw is turned and it is doubtful which station is the correct one, press button No. 6 (Manual Tuning) "IN" and move dial pointer by turning station selector knob, to the number on the dial that corresponds to the frequency of the station. (Turn pointer to 76 on the dial. This corresponds to WJZ's frequency 760 kc. The number on the dial must be multiplied by ten to give the frequency in kilocycles.) Listening to the program being broadcast will identify the station when adjusting screw "O."

Adjust screw marked "A" for maximum volume, retarding the volume control and readjusting if necessary. This completes the adjustments for this particular station.

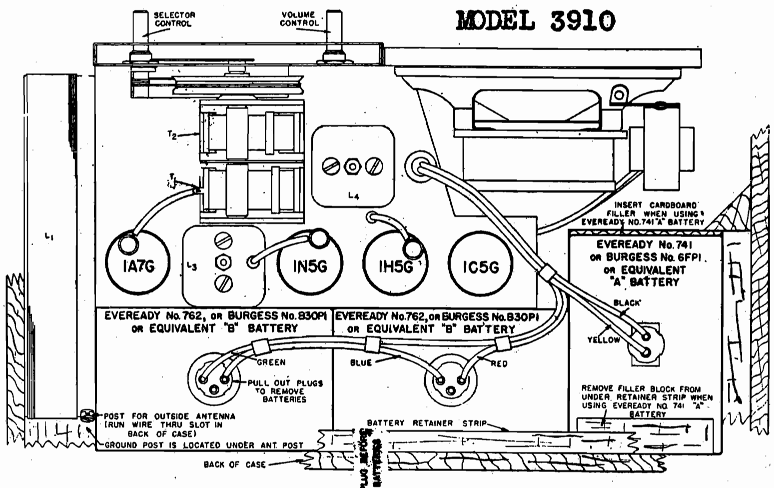
Cut out name of station from list supplied and insert in button.
Insert celluloid disc.

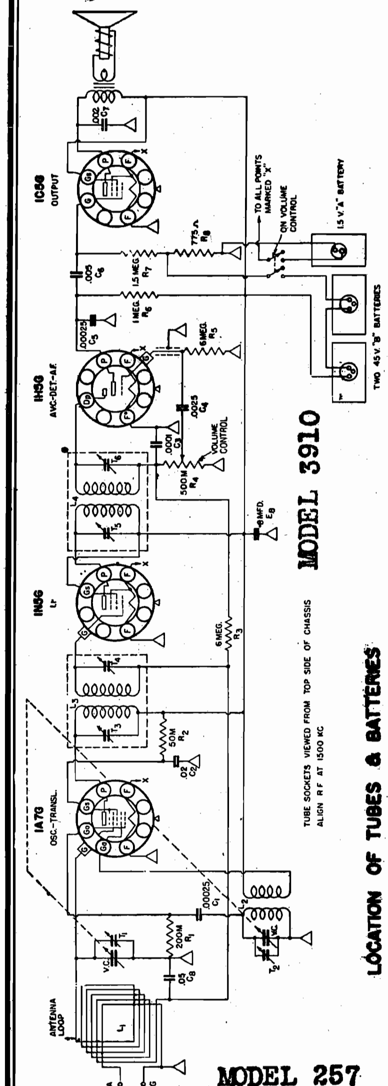
In a like manner, select a station for each of the other buttons (four other buttons) and make necessary adjustments for each station.

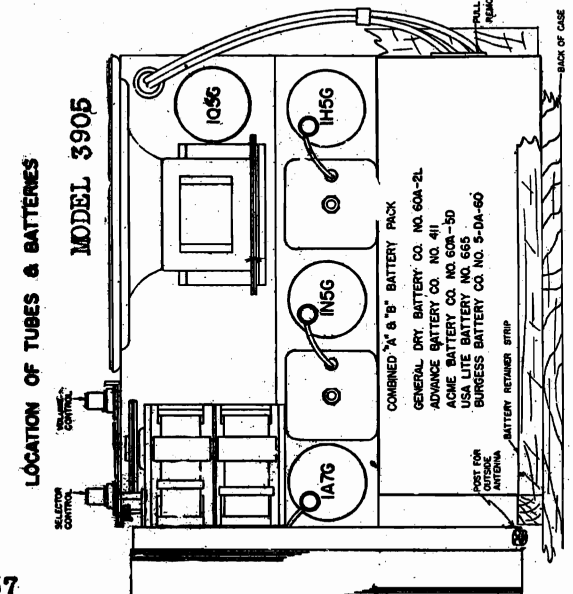
MODEL 257
Tuner Data
MODEL 3905
Schematic, Voltage
Alignment, Socket

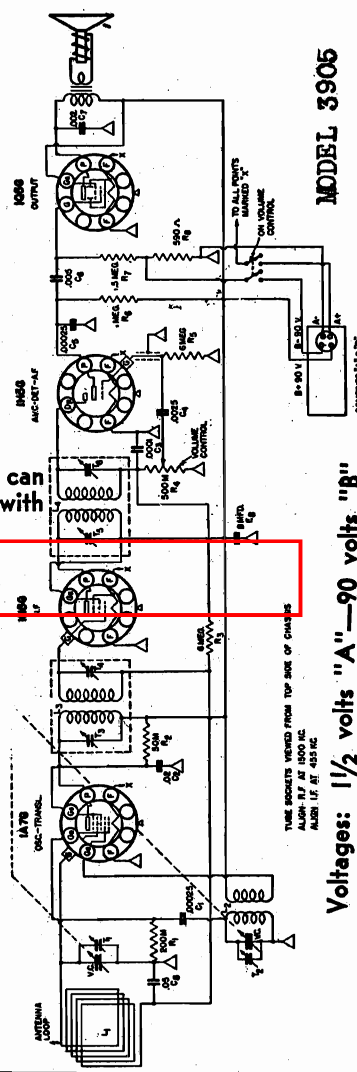
AIR KING PRODUCTS CORP.

MODEL 3910
Schematic, Socket









MODEL 257

AUTOMATIC TUNING: There are four push buttons on the front panel which can be set so that by simply pushing the button marked with a station's call letters, any of four different stations may be received.

Allow the receiver to warm up for 20 minutes before making the station adjustments.

Decide on the station you wish to receive.

Tune to this station as accurately as possible with the selector knob.

Next, push in this button as far as possible, being careful not to disturb the station setting on the dial.

Turn this push button knob about one turn to the left, or until it starts to unscrew easily.

Holding the button at the "IN" position, screw the push button knob to the right until it is tight.

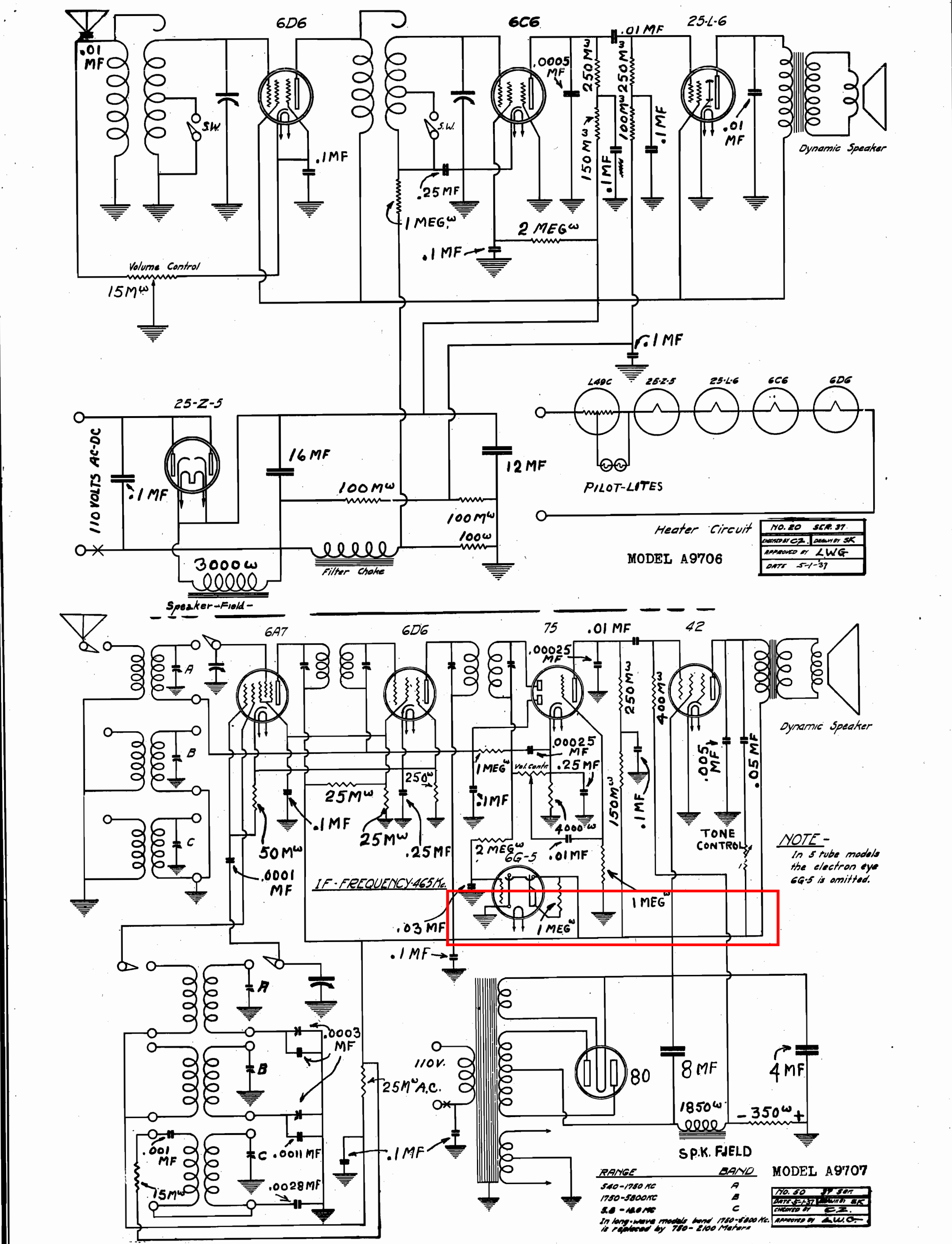
Cut out name of station from list supplied and insert in face of button.

Insert celluloid disk.

This completes the adjustments for one station. The three other buttons may be set in a similar manner.

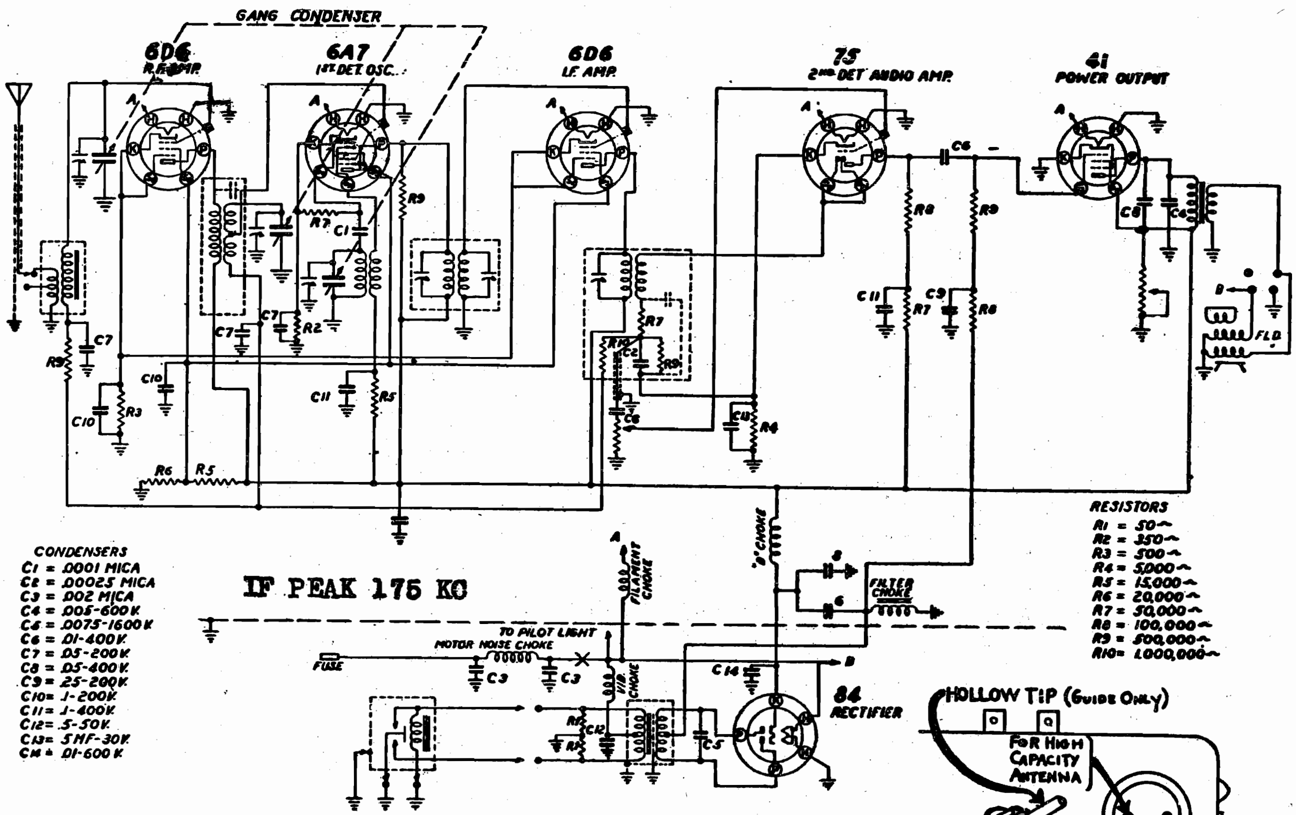
ALLIED RADIO CORP.

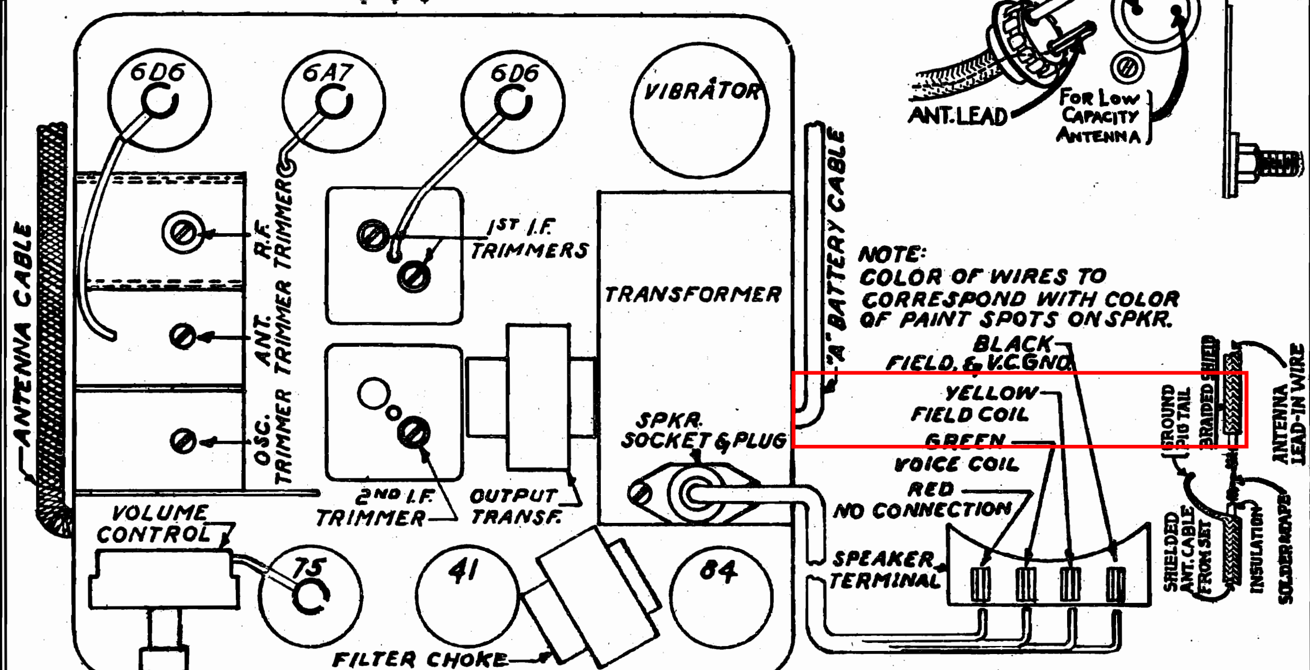
MODEL A-9706
MODEL A-9707
Schematics



MODELS A-9780, A-9781
Chassis B-6
Schematic, Socket, Alignment
Trimmers

ALLIED RADIO CORP.





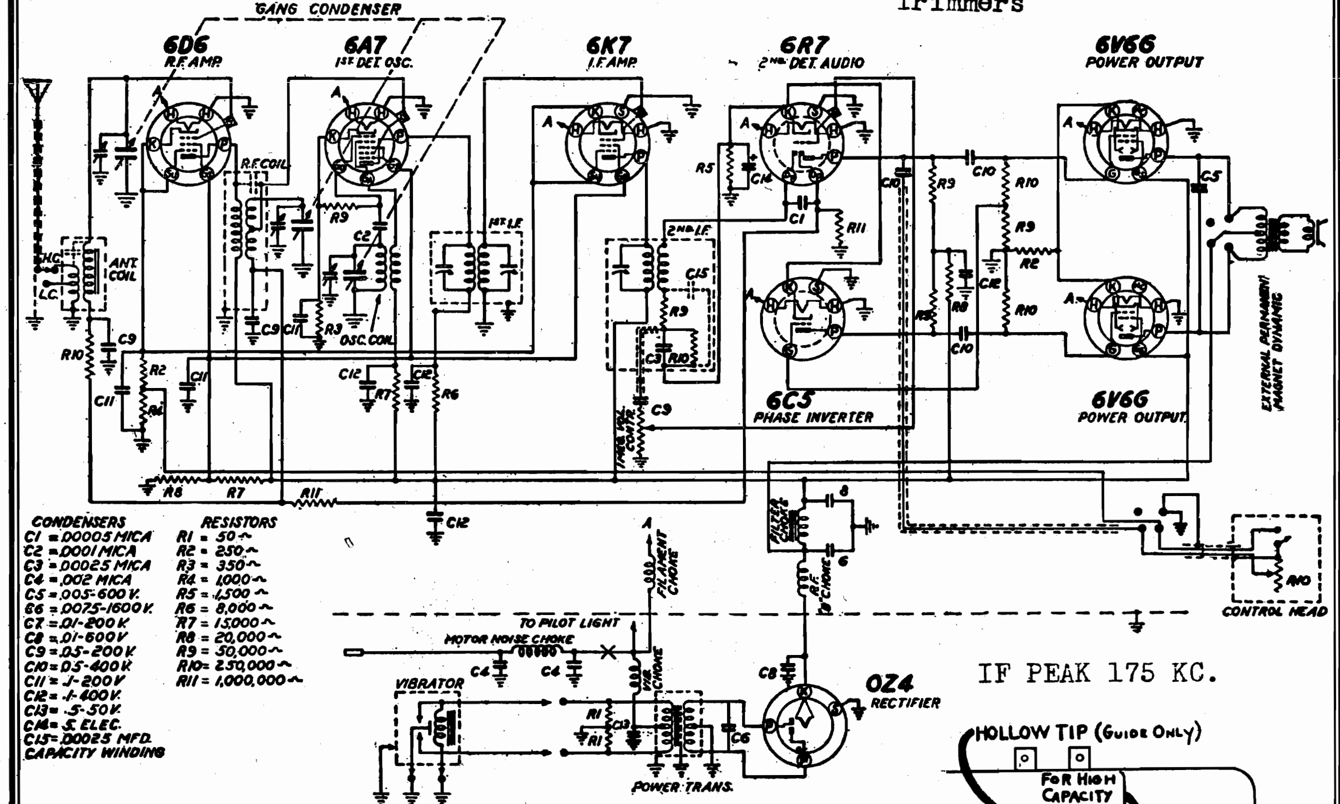
IF ALIGNMENT - Adjust Generator to 175 KC, connect output to grid of 6A7, the omission of series cond and resistor to block out AVC action. Generator grounded to chassis. Align trimmers of IF trnasformers (three).

OSCILLATOR - Adjust Generator to 1400 KC, connect through 100 MMFD cond. to the antenna of receiver. Adjust 1st section of gang condenser trimmer to max. peak.

RF ALIGNMENT - Adjust the Antenna and RF trimmers on gang condenser to maximum peak at 1400 KC. Repeat all adjustments for maximum performance.

ALLIED RADIO CORP.

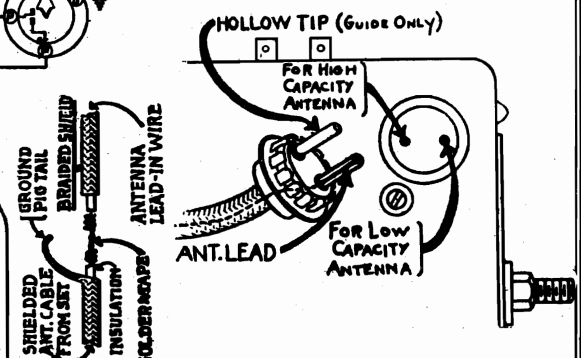
MODEL A-9784
Chassis B-8
Schematic, Socket, Alignment Trimmers

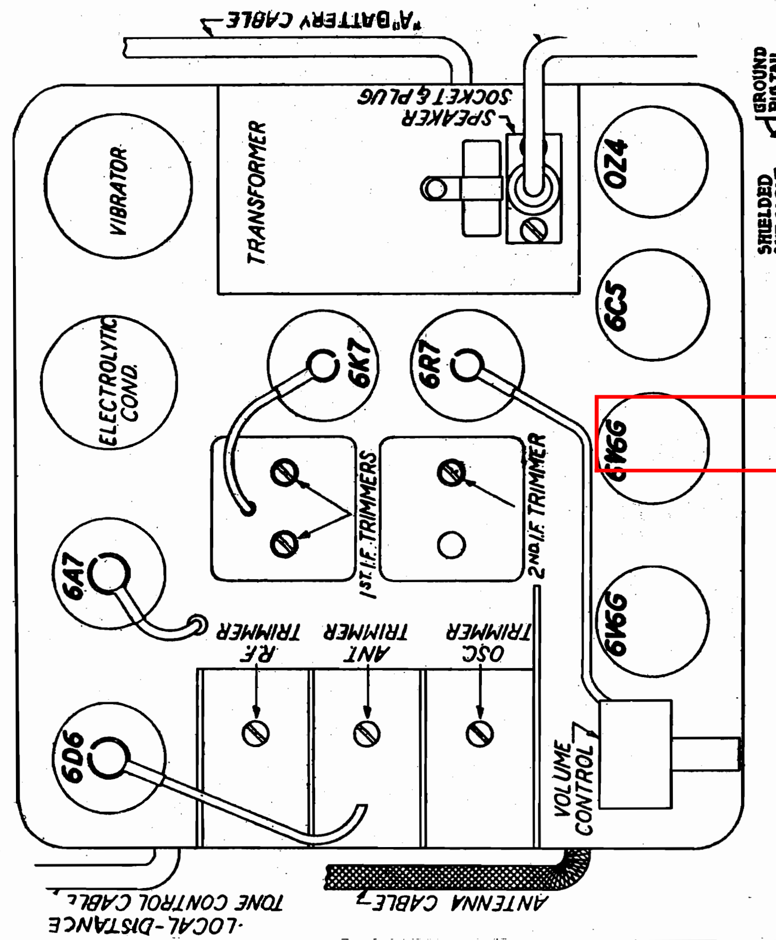


CONDENSERS
C1 = .00005 MICA
C2 = .0001 MICA
C3 = .00025 MICA
C4 = .002 MICA
C5 = .005-600 V.
C6 = .0075-1600 V.
C7 = .01-200 V.
C8 = .01-600 V
C9 = .05-200 V.
C10 = .05-400 V.
C11 = .1-200 V
C12 = .1-400 V.
C13 = .5-50 V.
C14 = .5 ELEC.
C15 = .00025 MFD. CAPACITY WINDING

RESISTORS
R1 = 50 ~
R2 = 250 ~
R3 = 350 ~
R4 = 1,000 ~
R5 = 1,500 ~
R6 = 8,000 ~
R7 = 15,000 ~
R8 = 20,000 ~
R9 = 50,000 ~
R10 = 250,000 ~
R11 = 1,000,000 ~

IF PEAK 175 KC.





ALIGNMENT

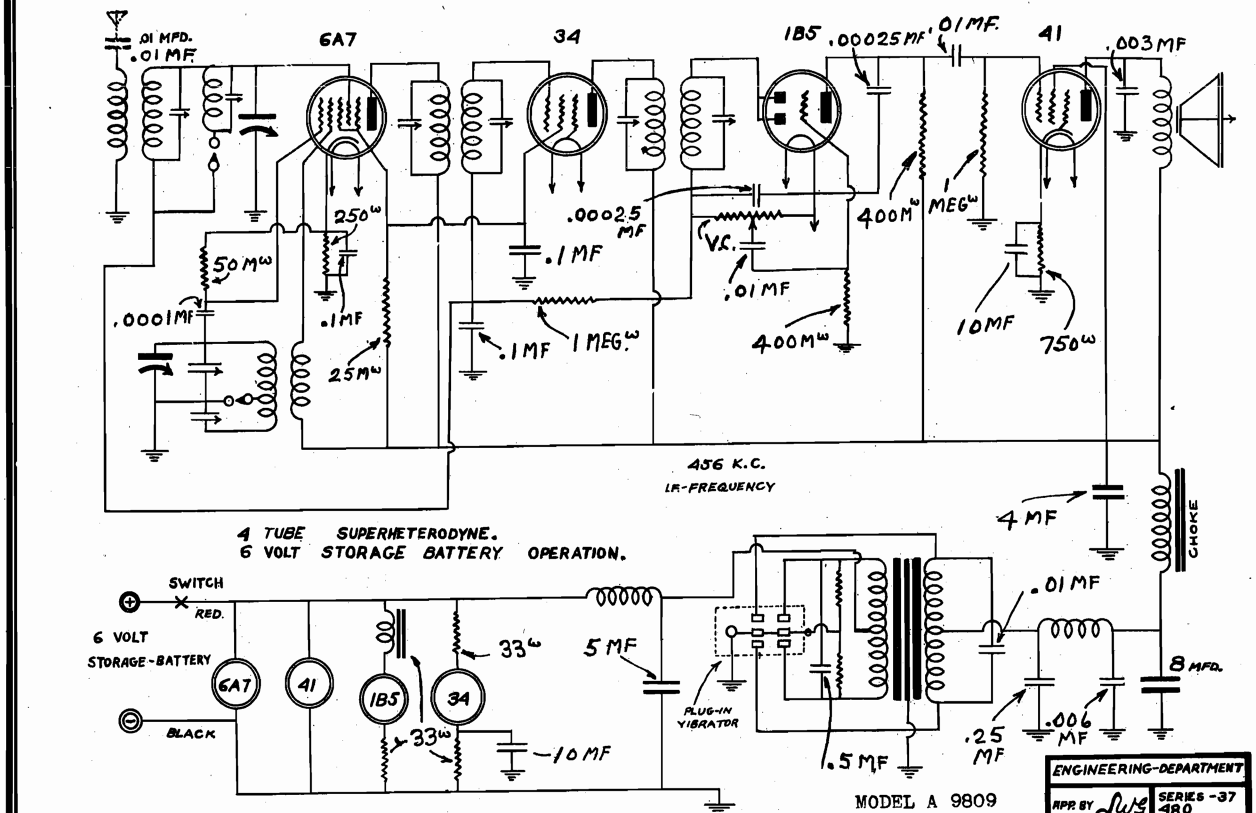
I.F. ALIGNMENT. Adjust the test oscillator to 175 K.C. and connect the output directly to the grid of the first detector tube (6A7), without the use of any series condenser or resistor; the omission of series condenser and resistor to block out the AVC action. The ground on the test oscillator can be connected to the chassis ground. Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

OSCILLATOR ALIGNMENT. Adjust the test oscillator to 1400 K.C. and connect the output to the antenna through a .0001 mfd. mica condenser to give the equivalent of a low capacity type average auto antenna. Set the dial pointer to 1400 K.C. and adjust the oscillator trimmer to peak. (Front section of gang condenser.)

R.F. ALIGNMENT. The next step is to adjust the center and rear trimmers of the gang condenser to peak. The center section of the gang condenser tunes the antenna amplifier stage (6D6 tube), and the rear condenser section tunes the detector grid coil of the 6A7 tube.

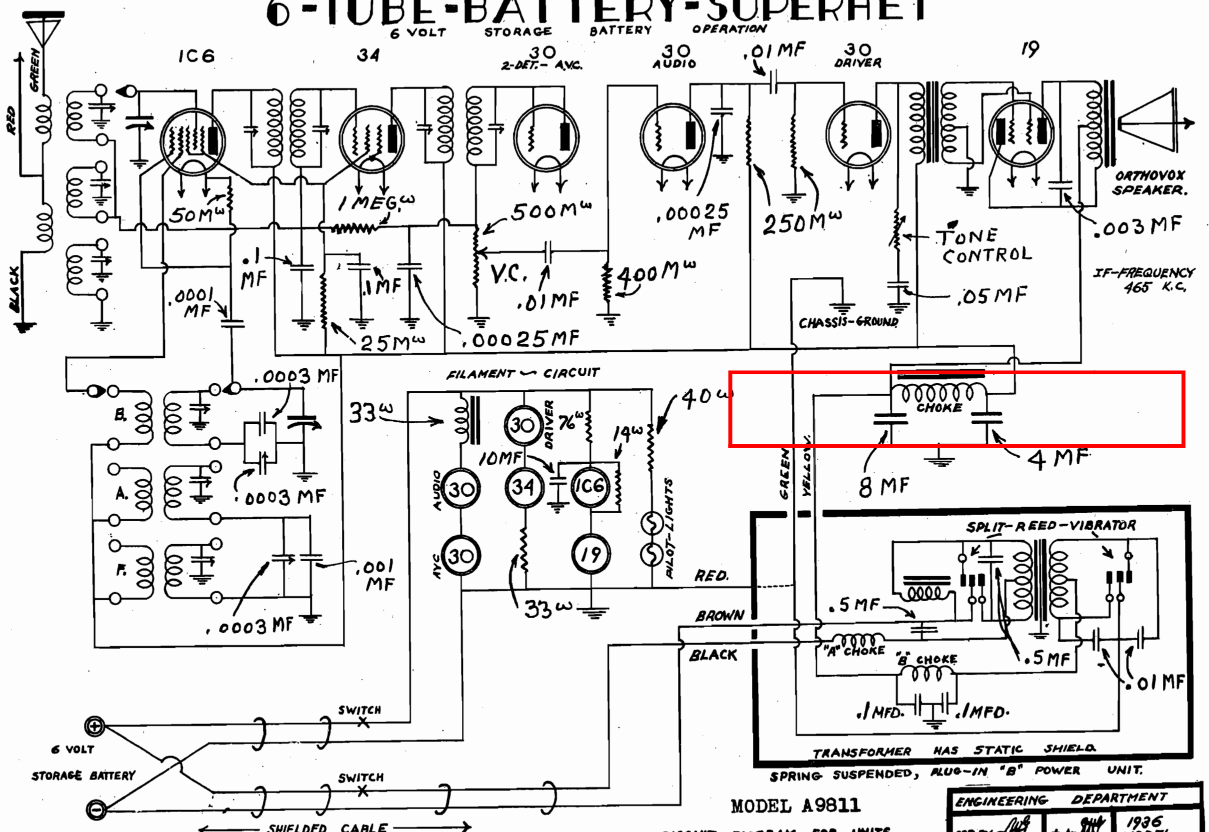
MODEL A-9809
MODEL A-9811
Schematics

ALLIED RADIO CORP.



6-TUBE-BATTERY-SUPERHET

6 VOLT STORAGE BATTERY OPERATION



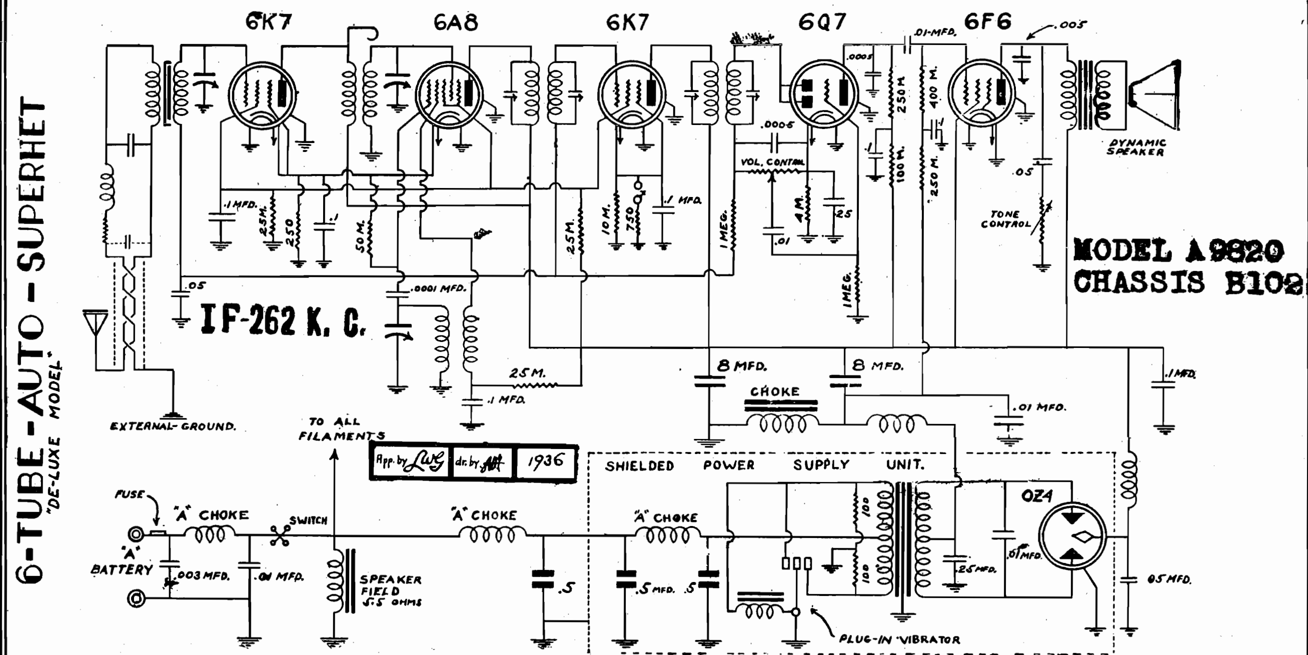
MODEL A9811

CIRCUIT DIAGRAM FOR UNITS STARTING FROM SERIAL NUMBER — 10703

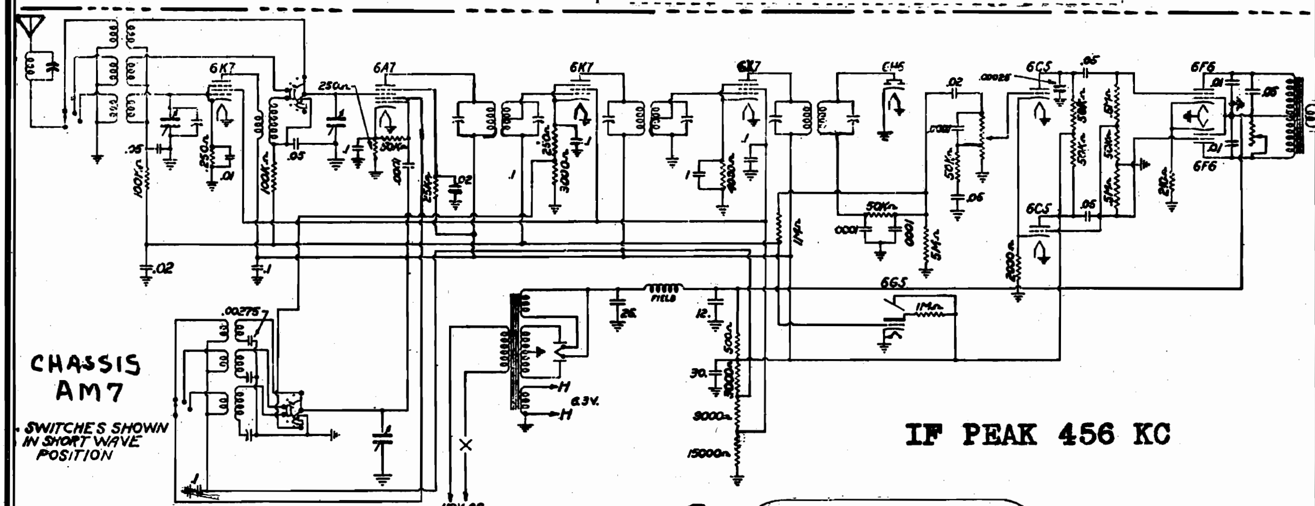
MODELS A-9852, A-9854
Chassis AM-7
Schematic, Socket
Trimmers, Alignment

ALLIED RADIO CORP.

MODEL A-9820
Chassis B-102
Schematic



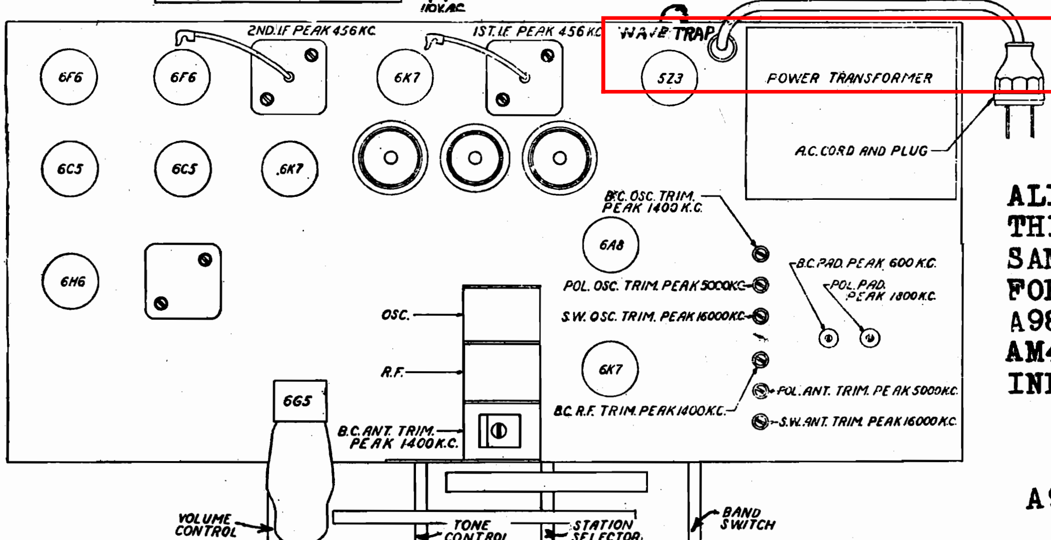
MODEL A9820
CHASSIS B102



CHASSIS AM7

SWITCHES SHOWN IN SHORT WAVE POSITION

IF PEAK 456 KC

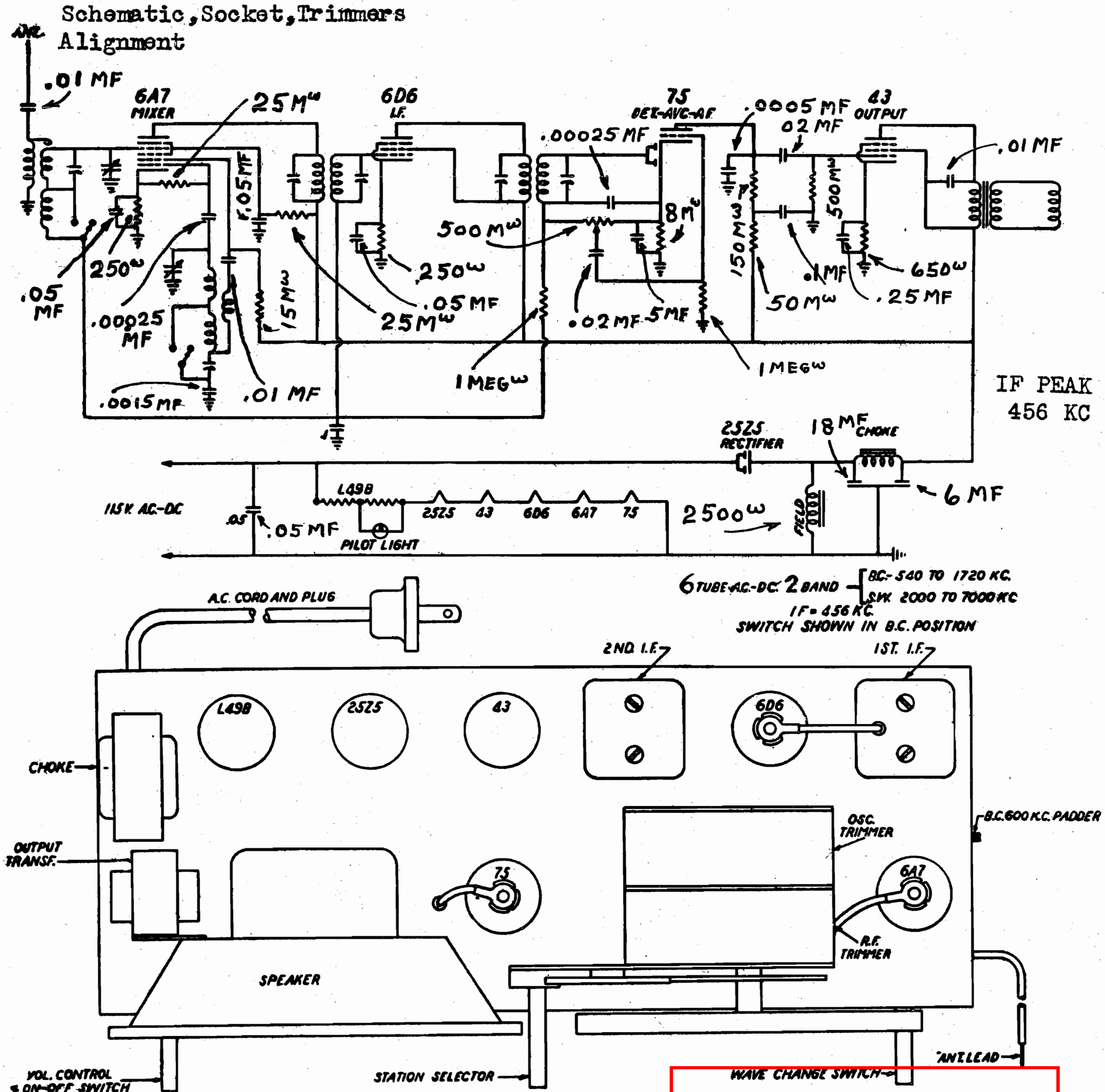


ALIGNMENT FOR THIS MODEL IS SAME AS GIVEN FOR THE MODEL A9890-CHASSIS AM4. (SEE THE INDEX)

MODELS
A9852, A9854

MODEL A-9851
Chassis B-2
Schematic, Socket, Trimmers
Alignment

ALLIED RADIO CORP.



IF PEAK
456 KC

ALIGNMENT DATA

INTERMEDIATE FREQUENCY - Connect the Signal Generator to Grid of 6A7 tube through a .05 MFD. condenser. Ground Generator to Ground of Chassis. Set Generator at 456 KC and adjust Trimmers on IF Transformers for maximum peak.

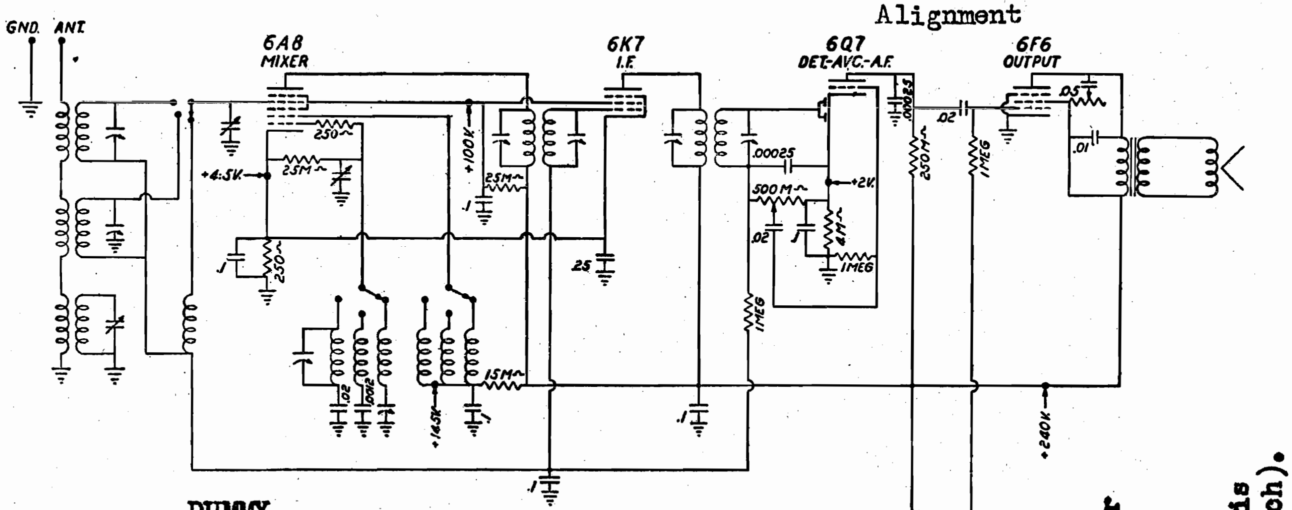
BROADCAST BAND - Connect the Generator to the Antenna of receiver through a .0001 MFD condenser. Ground Generator to Ground of Chassis. Range switch in Broadcast Position. Set Generator to 1400 KC and adjust Oscillator and RF Trimmers to Maximum peak. Dial of Receiver set on 1400 KC.

Pad the Broadcast Band at 600 KC, rocking the variable condenser during the adjustment.

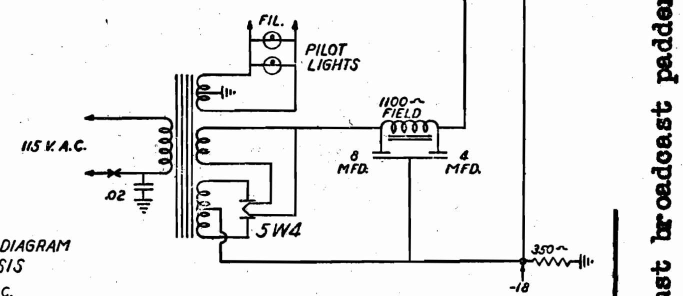
SHORTWAVE BAND - Set Receiver and Generator to 6000 KC. Range switch in SW Position. Adjust SW Antenna Trimmer for maximum peak. No Oscillator adjustment is needed on this range.

ALLIED RADIO CORP.

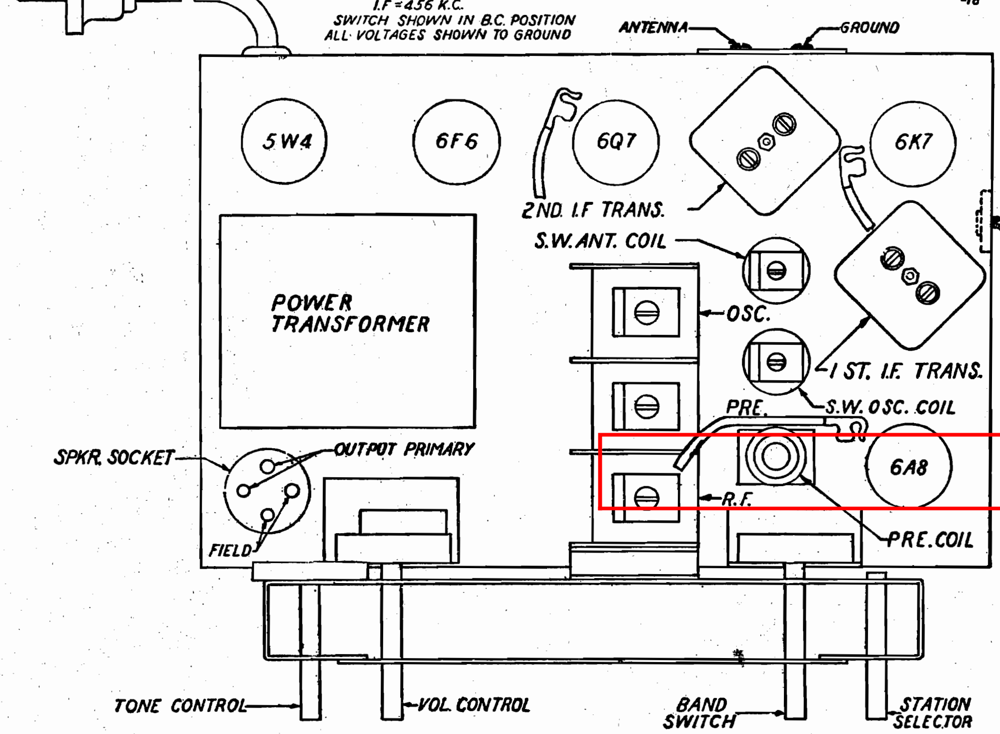
MODELS A-9857, A-9857E
Chassis A-1
Schematic, Socket, Trimmers
Alignment



DUMMY ANTENNAS
IF: .05 mfd. cond. to 6A8 grid. OSC. gnd., to chassis.
B.C: .0001 mfd. to ant. post "A".



SCHEMATIC DIAGRAM
A1 CHASSIS
I.F. = 456 K.C.
SWITCH SHOWN IN B.C. POSITION
ALL VOLTAGES SHOWN TO GROUND



CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOL. VIII.
IF: Peak all four IF trimmers at 456 kc.
BROADCAST BAND: Adjust oscillator trimmer at 1400kc. Adjust broadcast padder at 600kc. Then repeat adjustment at 1400kc.
FOREIGN BAND: Adjust s.w. oscillator and s.w. antenna coil trimmers for 14000kc peak. (Start with osc. trimmer loose, ant. trimmer tightened).
POLICE BAND: Adjust antenna coil trimmer to resonance at 4000 kc. (Trimmer is located on top of the chassis, right front corner alongside wave band switch).

Five Tube AC Superheterodyne

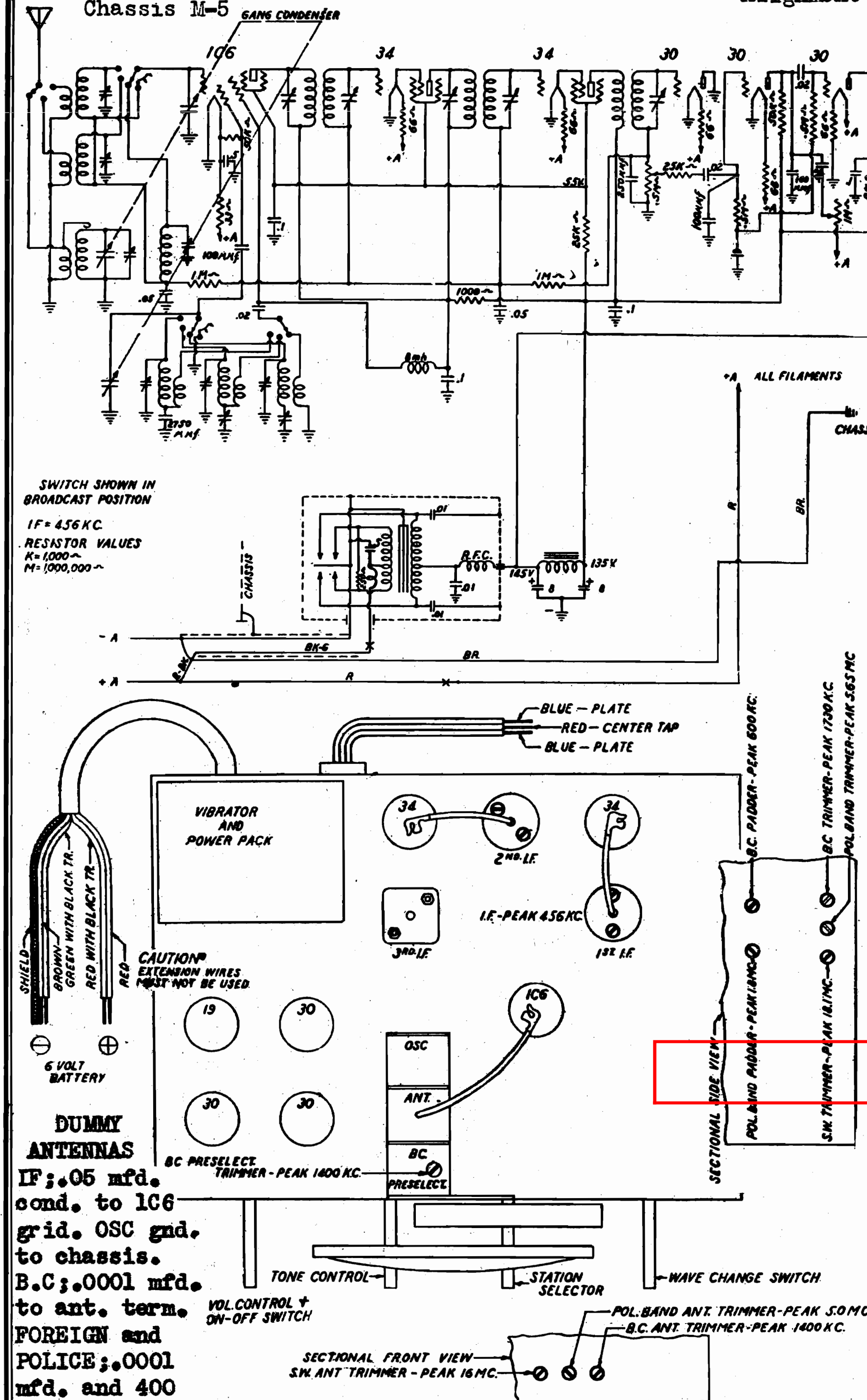
A1 Chassis

This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (AC). Never plug into a DC outlet.

MODELS A-9861, A-9862, A-9863
A-9864, A-9865, A-9866
Chassis M-5

ALLIED RADIO CORP.

Schematic, Socket, Trimmers
Alignment



DUMMY ANTENNAS

IF; .05 mfd. cond. to 1C6 grid. OSC gnd. to chassis.
B.C; .0001 mfd. to ant. term.
FOREIGN and POLICE; .0001 mfd. and 400 ohm carbon resistor in series, to ant. term.

6 Volt Battery Superheterodyne M5 Chassis

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOL. VIII.

IF: Align all five if trimmers at 456 kc.

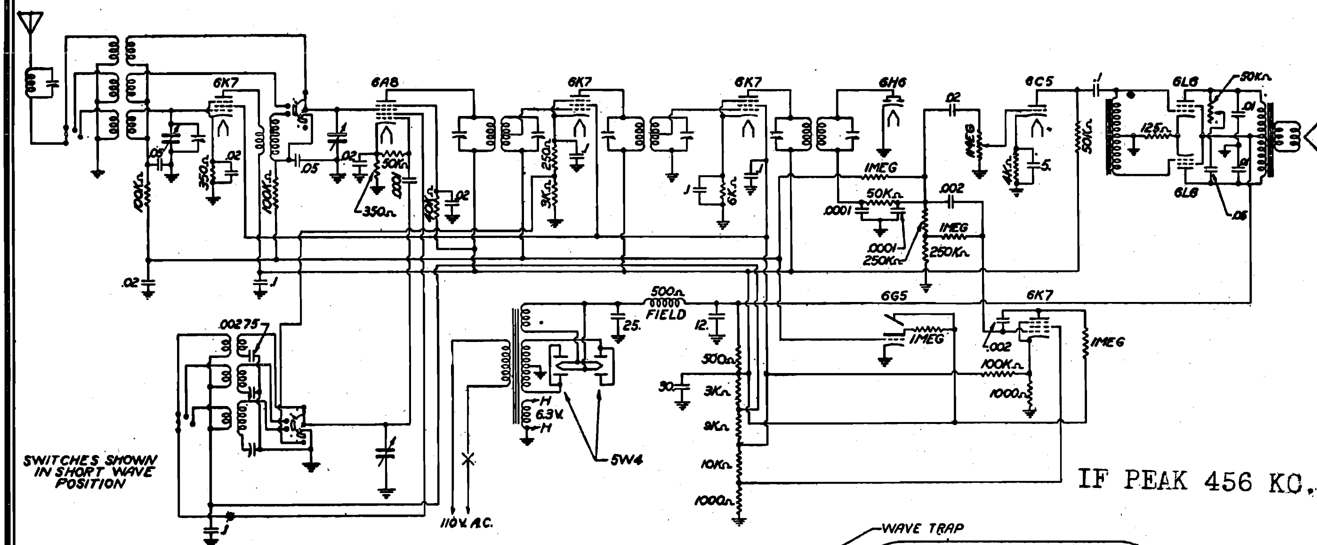
BROADCAST BAND: Peak b.c. preselect. trimmer at 1400 kc. Then b.c. RF trimmer at 1400 kc. Adjust b.c. osc. padder at 600 kc. for peak. Repeat all b.c. adjustments.

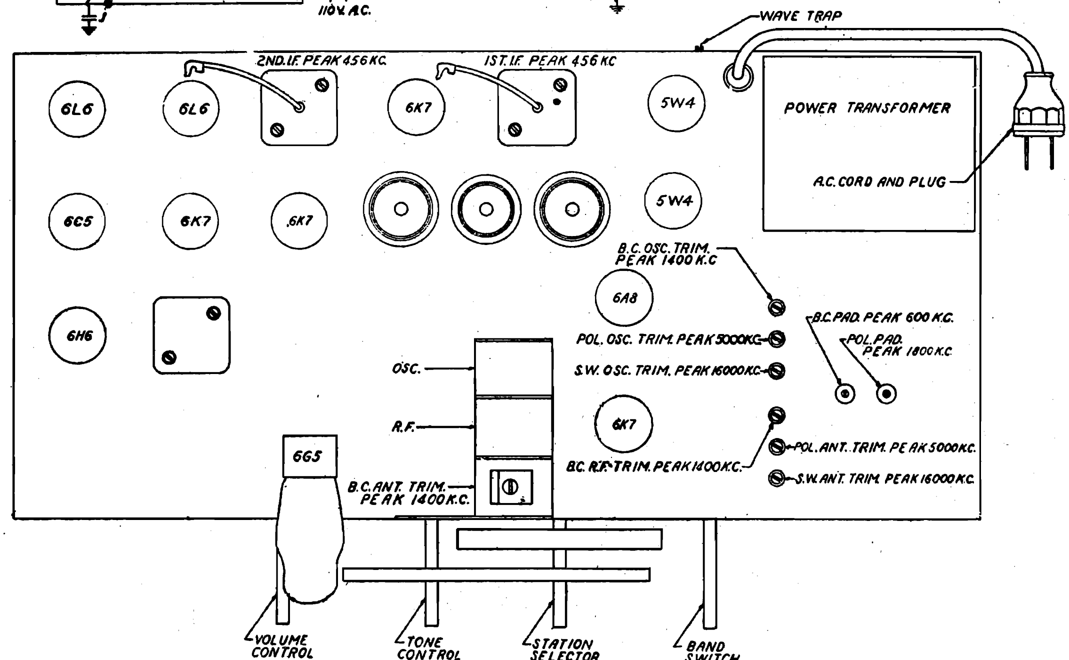
FOREIGN BAND: Peak SW osc. and SW trimmer at 14000 kc. (adjust osc. trimmer first).

POLICE BAND: Peak pol. band osc. trimmer at 4000 kc. Then adjust pol. band ant. trimmer to peak. Adjust pol. band padder at 1800 kc. Check all adjustments of this band. These three adjustments are all required on this band.

MODEL A-9891
Chassis AM-4
Schematic, Socket, Trimmers
Alignment

ALLIED RADIO CORP.





ALIGNMENT DATA

IF ALIGNMENT - Wave change switch on BC position. Generator connected to grid of 6A8 thru a .05 MFD condenser, and align six IF trimmers to peak.

BROADCAST - Connect Generator to ANT lead thru 1000 MMFD condenser. Receiver, Generator set to 1400 KC, adjust Oscillator trimmer to peak, then RF trimmers. Pad the Oscillator circuit at 600 KC while rocking variable condenser.

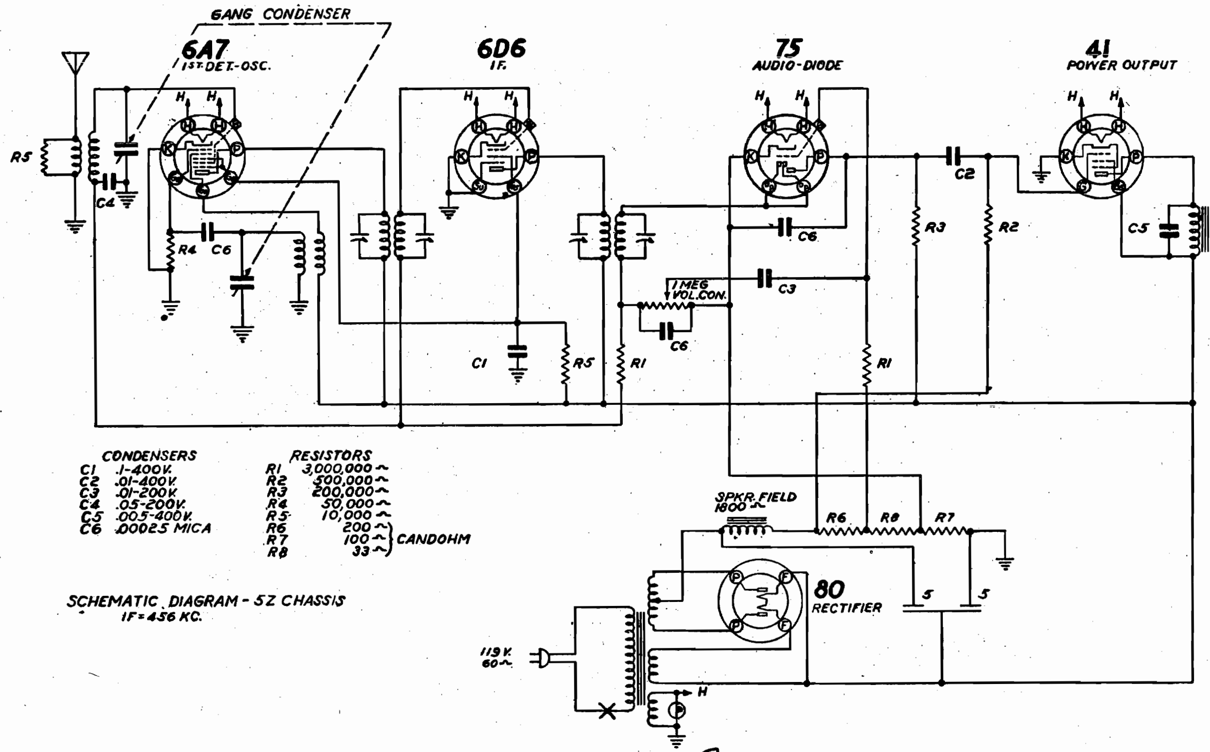
POLICE - Replace 1000 MMFD condenser with 400 ohm resistor in series with 100 MMFD condenser and connect Generator to ANT lead. Generator and receiver set to 4000 KC, adjust Oscillator and ANT Police trimmers to maximum peak. Reset the Generator and receiver to 1800 KC, rock variable condenser while padding OSC.

FOREIGN - Set Generator and Receiver to 14000 KC, adjust Oscillator trimmer, and the Foreign ANT trimmer to peak. Readjust receiver to 13100 KC, generator still at 14000 KC and check for image response which should be weaker. Adjustments should be started with oscillator trimmer loose and ANT trimmer tight. Repeat all adjustments for maximum performance of the receiver.

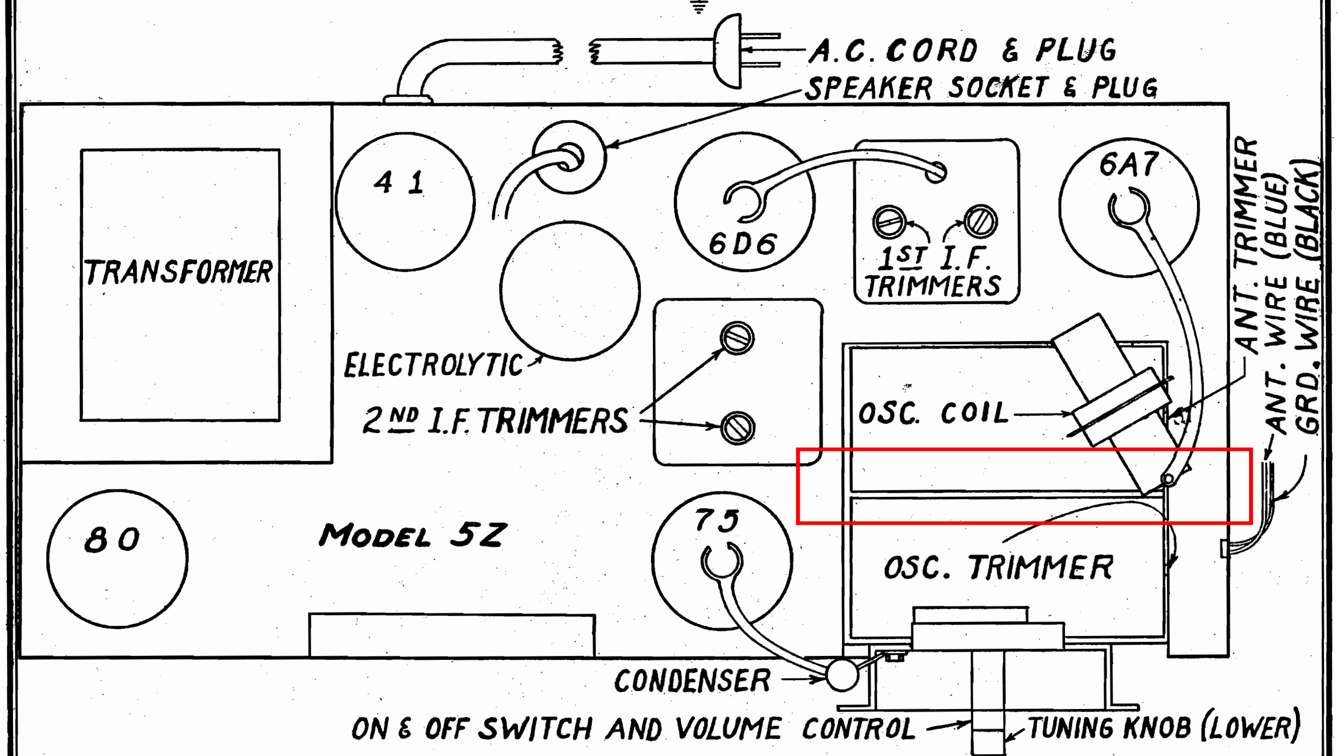
WAVE TRAP - Used only in event of code interference, adjusted to 456 KC.

MODELS A-10500, A-10501
Chassis 5Z
Schematic, Socket, Trimmers
Alignment

ALLIED RADIO CORP.



SCHEMATIC DIAGRAM - 5Z CHASSIS
IF = 456 KC.



ALIGNMENT DATA

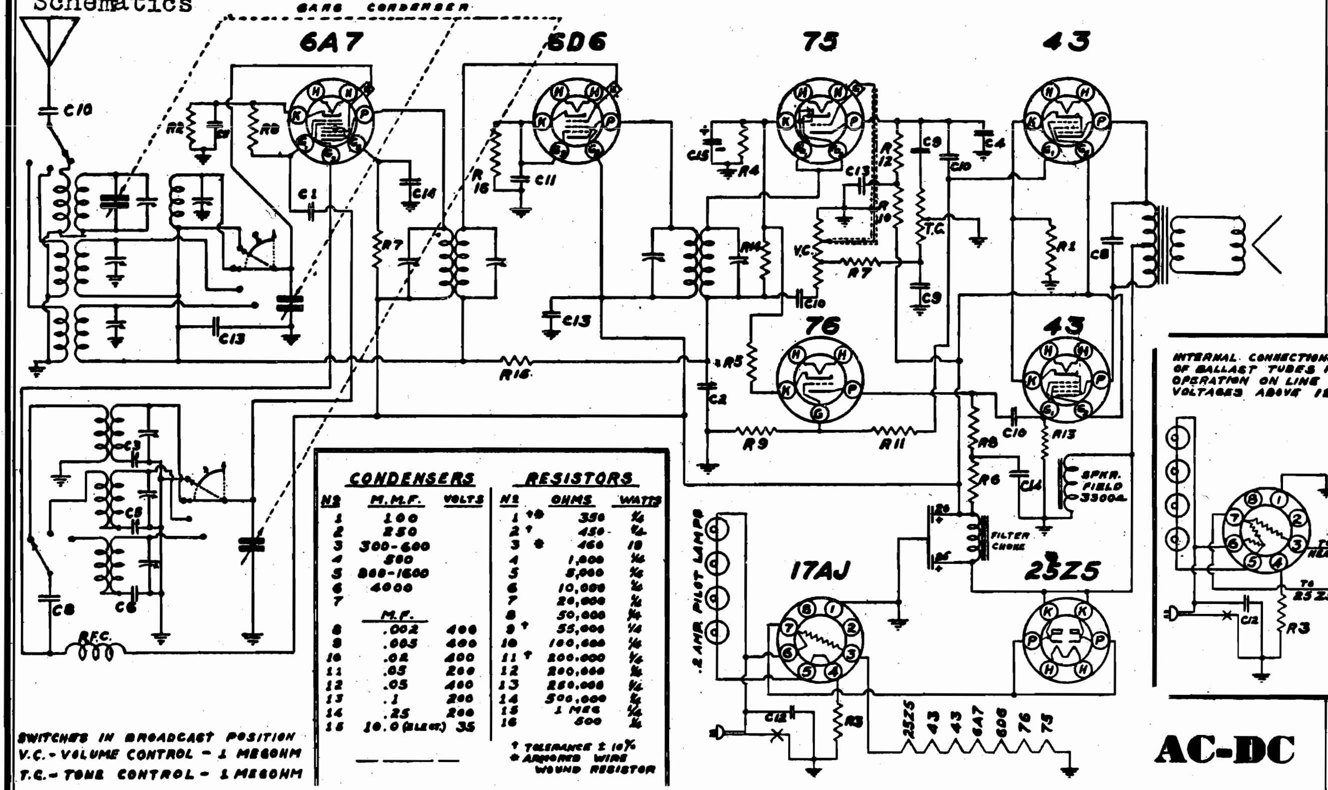
IF ALIGNMENT - Wave switch on B.C. position. Generator connected to grid of 6A7 tube through a .05 MFD Cond. Align four trimmers.

BROADCAST - Connect generator to ANT. lead (blue) through a 200 MMFD cond. Gang condenser at minimum, generator set at 1730 KC, adj. OSC. trimmer to peak. Set generator to 1400 KC and adjust ANT. trimmer to peak. Generator and receiver set to 600 KC. Rock

MODELS A-10515 to A-10518 incl. Chassis 8-T Schematics

ALLIED RADIO CORP.

MODELS A-10510 to A-10513 incl. Chassis 8-K



CONDENSERS

No	M.M.F.	VOLTS
1	100	
2	250	
3	300-600	
4	500	
5	800-1500	
6	4000	
7		
	M.F.	
8	.002	400
9	.005	400
10	.02	400
11	.05	200
12	.05	400
13	.1	200
14	.25	200
15	10.0 (ELECT.)	35

RESISTORS

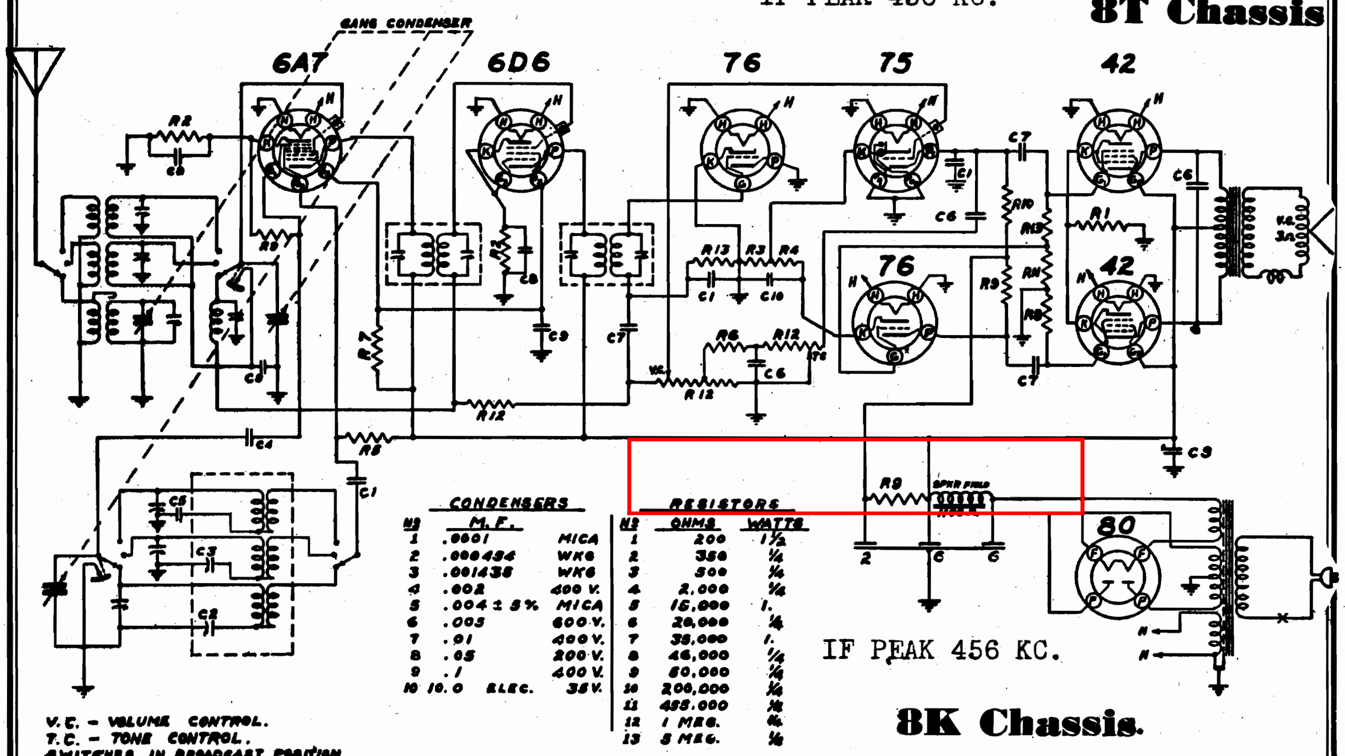
No	OHMS	WATTS
1 †*	350	¼
2 †	450	¼
3 *	460	10
4	1,000	¼
5	5,000	¼
6	10,000	¼
7	20,000	¼
8	50,000	¼
9 †	55,000	¼
10	100,000	¼
11 †	200,000	¼
12	200,000	¼
13	250,000	¼
14	500,000	¼
15	1 MEG	¼
16	500	¼

† TOLERANCE ± 10%
* ARMORED WIRE WOUND RESISTOR

IF PEAK 456 KC.

AC-DC

8T Chassis



CONDENSERS

No	M.F.	
1	.0001	MICA
2	.000434	WKG
3	.001435	WKG
4	.002	400 V.
5	.004 ± 5%	MICA
6	.005	600 V.
7	.01	400 V.
8	.05	200 V.
9	.1	400 V.
10	10.0 ELEC.	35 V.

RESISTORS

No	OHMS	WATTS
1	200	1½
2	350	¼
3	500	¼
4	2,000	¼
5	15,000	1.
6	20,000	¼
7	35,000	1.
8	46,000	¼
9	60,000	¼
10	200,000	¼
11	455,000	½
12	1 MEG.	¼
13	5 MEG.	¼

IF PEAK 456 KC.

8K Chassis.

8K and 8T are designed to operate over three tuning ranges with a pointer swing of 340°; the broadcast range which extends from 535 to 1730 Kilocycles (KC) (173 to 560 meters), Police and Aviation Band which extends from 1.7 to 5.6 Megacycles (MC) (53 to 176 Meters) and the International Short Wave Band which extends from 5.6 to 18.1 Megacycles (MC) (16.5 to 53 Meters). This latter range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.

MODELS A-10510 to A-10513 incl.
Chassis 8-K
MODELS A-10515 to A-10518 incl.
Chassis 8-T

ALLIED RADIO CORP.

Alignment, Socket Trimmers, Tuner

HOW TO TUNE IN STATIONS ON THE TELEPHONE DIAL

Press in the button of the station desired tuned and rotate the dial slowly until a click is heard and the dial will not turn in either direction until the button is released. The station is now tuned in and can be adjusted to the volume desired by means of the volume control. The proper direction of rotation of the dial can be determined by turning the dial in the direction which will not allow the wide space adjacent to the pointer to converge into the space at the bottom of the dial. See Fig. (1).

PROCEDURE FOR ADJUSTING THE TELEPHONE DIAL BUTTONS

(1) Choose one of the stations out of the list of stations selected and by means of the station selector very carefully tune in this station, noting at the same time the exact pointer location on the dial.

(2) Now select the proper button for the first station chosen by referring to Fig. 1 and noting the button into whose range the station falls. For example, station WGN with a frequency of 720 KC comes under the button whose frequency ranges from 670 to 755 KC. Usually the button nearest the tuning point or the bottom of the dial will be the proper button.

(3) Loosen the button by unscrewing it (not the dial) ½ turn to the left. Now press the button in all the way and rock the dial back and forth a trifle until a click is heard. Do not release the button now but set the pointer to its former location and with the dial in this position, being careful not to move it, proceed to tighten the button by turning it in the opposite direction (to the right). Make sure the button is very securely tightened as it may get out of adjustment.

(4) From the station call sheet supplied remove the proper station disc and insert into the push button so that the wording is horizontal when the button is at the bottom, and then insert a clear celluloid insert. Follow this same procedure for the remaining buttons.

Shown in Fig. 1 is the approximate frequency range that each button will cover. **Note:** If 2 stations happen to fall within the range of one button, one station will necessarily have to be tuned in with the selector knob.

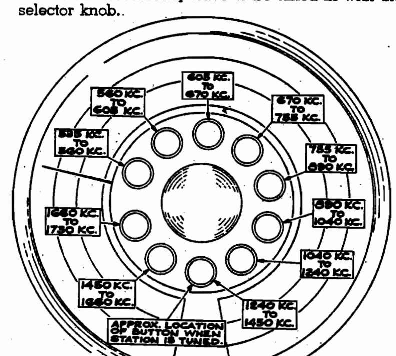


Figure 1

ALIGNMENT DATA, 8K. 8T.

GENERAL DATA The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1730, 1800, 4000, 5600, 6000, 16,000 and 18,100 KC and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should always be the next procedure; after which, either or both of the Short Wave Bands may be aligned.

I.F. ALIGNMENT

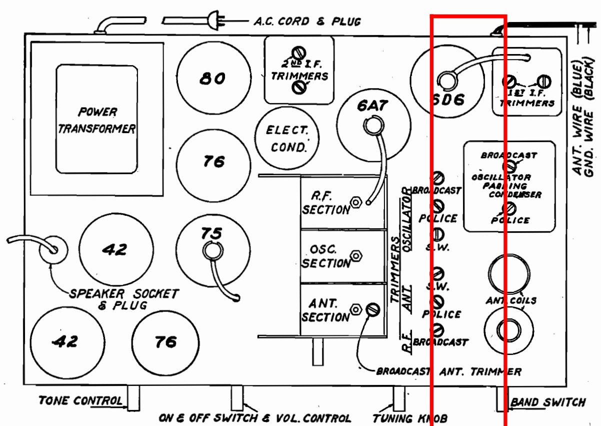
With the wave switch in the Broadcast Band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground if the test oscillator is not grounded to one side of the power line. In case one side is connected to ground, connect a large condenser from ground on the test oscillator to ground of the chassis. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "preselector" and "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the preselector of the R.F. section. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

POLICE BAND ALIGNMENT The police band is adjusted by first replacing the .0002 dummy with a 400-ohm resistor and setting the generator to 5600 KC. With the gang set at minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to give maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit of this frequency as described in the instructions for padding the broadcast circuits.

SHORT WAVE BAND ALIGNMENT The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

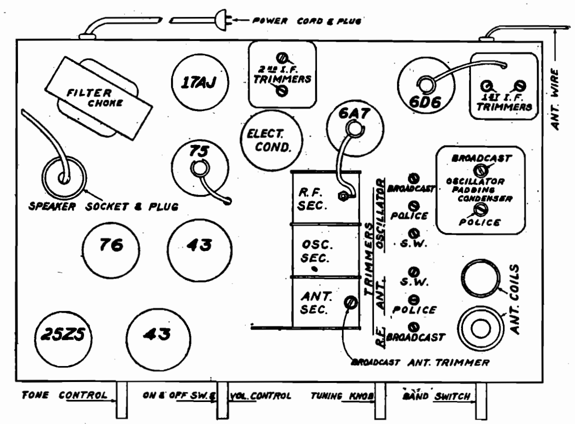
MODELS A10510, A10511, A10512, A10513 Chassis 8K.



Eight Tube AC Telephone Dial All Wave Superheterodyne

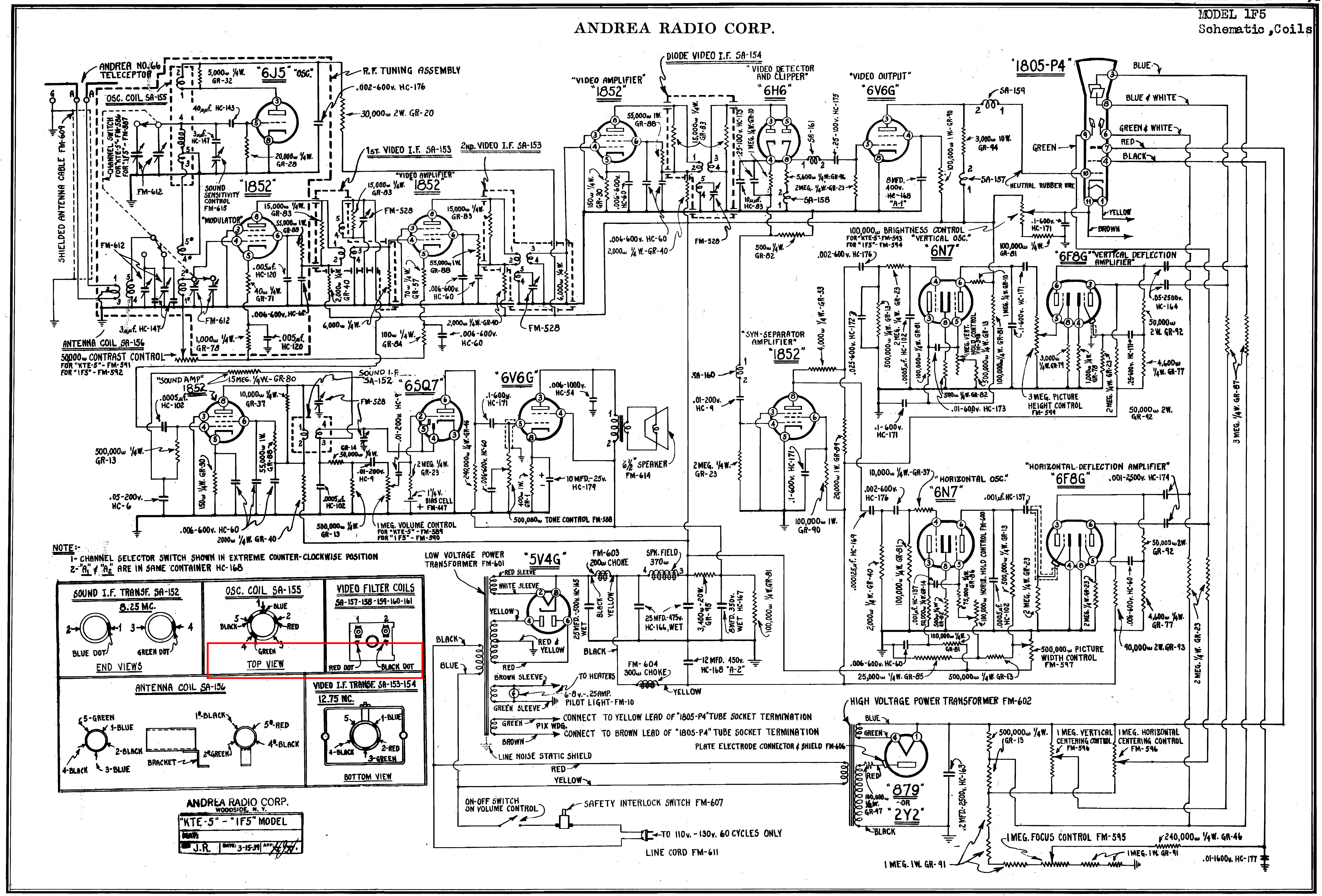
This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (AC). Never plug into a DC outlet.

MODELS A10515, A10516, A10517, A10518 Chassis 8T.



BALLAST TUBES This receiver is designed to operate from any 60 cycle AC (alternating current) or DC (direct current) power supply main of 110 to 120 volts. However by the use of the proper tube (listed below) any one of the following line voltages can be employed: 115, 130, 150, 230.

Type Tube	Line Voltage
17AJ	115 Volts — 60 Cycle
33AJ	130 Volts — 60 Cycle
M50E3J	150 Volts — 60 Cycle
M130E3J	230 Volts — 60 Cycle


ANDREA RADIO CORP.
R.F. TUNING ASSEMBLY
ANDREA NO. 66 TELECEPTOR
SHIELDED ANTENNA CABLE FM-609
OSC. COIL SA-155
"6J5" "OSC."
"1852" "MODULATOR"
1st. VIDEO I.F. SA-153
2nd. VIDEO I.F. SA-153
"VIDEO AMPLIFIER" "1852"
DIODE VIDEO I.F. SA-154
"VIDEO DETECTOR AND CLIPPER" "6H6"
"VIDEO OUTPUT" "6V6G"
"1805-P4"
100,000Ω BRIGHTNESS CONTROL
"VERTICAL OSC." "6N7"
"6F8G" "VERTICAL DEFLECTION AMPLIFIER"
"SYN-SEPARATOR AMPLIFIER" "1852"
"HORIZONTAL OSC." "6N7"
"HORIZONTAL-DEFLECTION AMPLIFIER" "6F8G"
ANTENNA COIL SA-156
50000Ω CONTRAST CONTROL
"SOUND AMP" 1852
SOUND I.F. SA-152
"6SQ7" "6V6G"
6½" SPEAKER FM-614
1 MEG. VOLUME CONTROL
500,000Ω TONE CONTROL FM-588
LOW VOLTAGE POWER TRANSFORMER FM-601
"5V4G"
FM-603 200Ω CHOKE
SPK. FIELD 370Ω
FM-604 300Ω CHOKE
TO HEATERS
6-8v.-.25AMP. PILOT LIGHT-FM-10
CONNECT TO YELLOW LEAD OF "1805-P4" TUBE SOCKET TERMINATION
CONNECT TO BROWN LEAD OF "1805-P4" TUBE SOCKET TERMINATION
LINE NOISE STATIC SHIELD
HIGH VOLTAGE POWER TRANSFORMER FM-602
PLATE ELECTRODE CONNECTOR & SHIELD FM-606
"879" -OR "2Y2"
500,000Ω PICTURE WIDTH CONTROL FM-597
3 MEG. PICTURE HEIGHT CONTROL FM-594
1 MEG. VERTICAL CENTERING CONTROL FM-596
1 MEG. HORIZONTAL CENTERING CONTROL FM-596
1 MEG. FOCUS CONTROL FM-595
ON-OFF SWITCH ON VOLUME CONTROL
SAFETY INTERLOCK SWITCH FM-607
TO 110v.-130v. 60 CYCLES ONLY
LINE CORD FM-611
NOTE:-
1- CHANNEL SELECTOR SWITCH SHOWN IN EXTREME COUNTER-CLOCKWISE POSITION
2- "A1" & "A2" ARE IN SAME CONTAINER HC-168
SOUND I.F. TRANSF. SA-152
8.25 MC.
BLUE DOT
GREEN DOT
END VIEWS
OSC. COIL SA-155
TOP VIEW
VIDEO FILTER COILS
SA-157-158-159-160-161
RED DOT
BLACK DOT
ANTENNA COIL SA-156
BRACKET
VIDEO I.F. TRANSF. SA-153-154
12.75 MC.
BOTTOM VIEW
ANDREA RADIO CORP.
WOODSIDE, N. Y.
"KTE-5" - "1F5" MODEL
J.R.
3-15-39

ANDREA RADIO CORP.

MODEL 1F5
Service Chart

CHART INDICATING TUBE FAILURES

Tube and Function	*Picture* *Raster, no picture*	*Sound*	*Sync*	*Miscellaneous*
1852 Modulator	Picture			Tube is microphonic, gray bars appear when cabinet is tapped, or when loud audio signals are heard.
6J5 Oscillator	Distorted picture			
	No picture	No sound		
1852 1st Video I.F.	No picture	Sound O.K.		
1852 2nd Video I.F.	No picture	Sound O.K.		
6H6 Video Detector and Clipper	No picture	Sound O.K.		
	Picture		Slipping	
6V6G Video Output	No picture	Sound O.K.		
1852 Snyc Separator	Picture	Sound O.K.	Slipping	
6N7 Vertical Oscillator	Insufficient height			
	Out of frame			Picture syncs slightly down from top or up from bottom.
6F8G Vertical Deflection Amp.	Insufficient height			Picture may appear as merely a horizontal line.
6N7 Horizontal Oscillator	Insufficient width			Picture may appear as a vertical line.
6F8G Horizontal Deflection Amp.	Insufficient width			Picture may appear as a vertical line.
879 or 2Y2 High Voltage Rectifier	No picture	Sound O. K.		Centering controls have no effect.
5V4G Low Voltage Rectifier	No picture	No sound		
1805—P4 Picture Tube	Momentary			Momentary picture, screen blooms, picture disappears.
	Spot			Yellow spot: burn, due to operation at excessive brightness.
	Dull			Dull picture due to long use of picture tube
	Odd Size			Note: If faulty picture size can not be corrected by size or hold controls, look for open connection from cable to picture tube socket.

Checking Tube Failures: If you have determined that the fault lies in the set and not in the antenna, the first source of trouble to examine is the tubes. Consequently, a set of tested tubes must be at hand for television service work. Different tubes display quite definite symptoms of failure. With the Chart provided here, it is easy to locate the defective tube quickly.

1852 Sound I.F.	Picture O.K.	No sound		
6SQ7 Detector and 1st Audio	Picture O.K.	Microphonic howl		
	Picture O.K.	No sound		
	Picture O.K.	Distortion		
	Picture O.K.	Noise in speaker		
6V6G Audio Output	Picture O.K.	No sound		
	Picture O.K.	Weak, distorted		

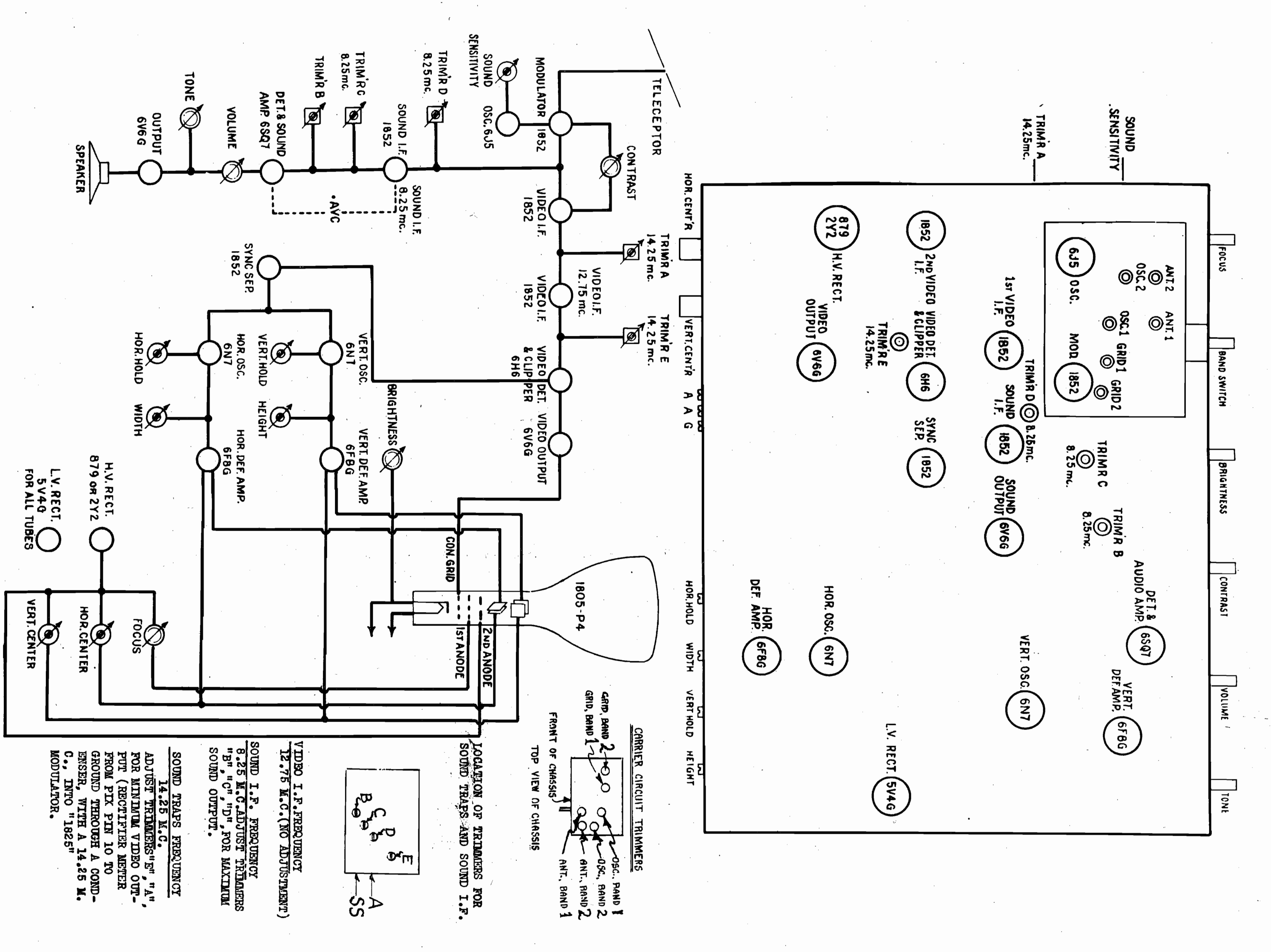
Other Failures: If, after checking the tubes, reception of pictures or sound is not satisfactory, go through the Sight and Sound Chart.

SIGHT AND SOUND CHART

SYMPTOM	REMEDY
Picture will not hold vertical sync	Adjust vertical hold control. Do this with contrast control as low as possible.
	Insufficient Signal: Antenna must be oriented, moved to more favorable location, or raised in height. Ratio of signal to noise may be too low. Increase height of antenna. If lead is over 100 ft. long, coaxial cable may be required. Note: May be due to losses introduced by antenna leads to other television receivers. Remove such leads.
	Interference: Ratio of signal to noise may be too low. See Insufficient Signal notes above.
Picture tears	Adjust horizontal hold control.
	Interference: Ignition interference may cause tearing in all or part of the picture area. See Insufficient Signal notes above.
Picture shows horizontal distortion	Adjust horizontal hold control.
	Interference: See Insufficient Signal notes above.
Picture is broken by angular pattern	Interference: See Insufficient Signal notes above.
Picture has white retrace lines	Brightness control too high, contrast control too low.
	Insufficient signal: If contrast control is at maximum see Insufficient Signal notes above.
	Transmitter adjustment is not correct.
Picture is distorted by sound	Adjust trimmers A and E for minimum signal at 14.25 mc.
Pictures without sound	Adjust trimmers B, C, and D for maximum audio output at 8.25 mc., and check adjustment of Sound Sensitivity trimmer at the side of the chassis.
Pictures and sound weak	As a last resort, after you have checked everything else, realign R.F. plunger condensers.

MODEL 1F5
Socket, Alignment
Video Block Diagram

ANDREA RADIO CORP.



Trimmers, Socket

BELMONT RADIO CORP.

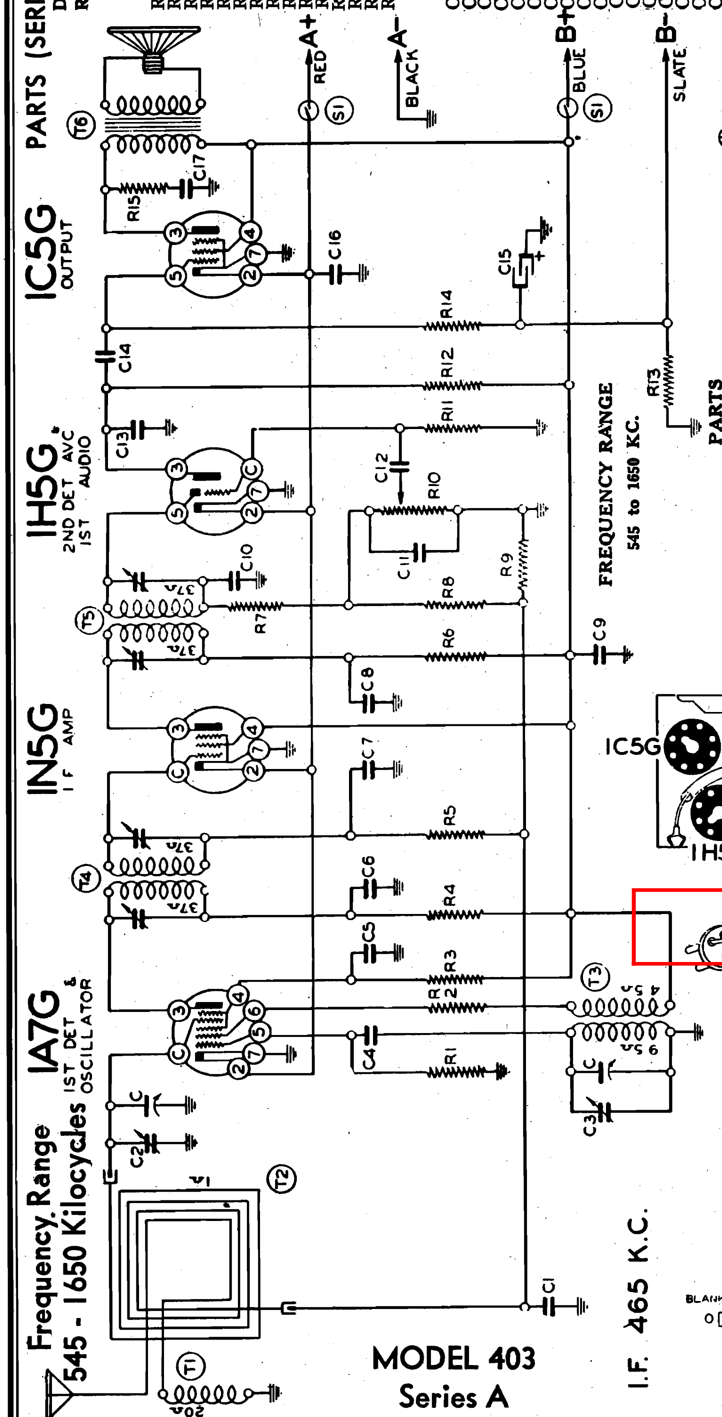
MODEL 403, Series A
Schematic, Voltage

Power Output.................200 Milliwatts Undistorted, 300 Milliwatts Maximum

Slight adjustments to the oscillator and antenna circuits can be made without removing the chassis from the cabinet through two holes on the front of the radio cabinet under the nameplate (see Fig. 4).

PARTS (SERIAL No. 9C617100 and UP)

Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	1309	200M ohm—1/3 w.
R2	13071	4M ohm—1/3 w.
R3	130208	40M ohm—1/3 w.
R4	13026	1000 ohm—1/3 w.
R5	13020	100M ohm—1/3 w.
R6	13026	1000 ohm—1/3 w.
R7	13040	19M ohm—1/3 w.
R8	13038	2 megohm—1/3 w.
R9	13038	2 megohm—1/3 w.
R10	101163	1 megohm volume control
R11	13019	1 megohm—1/3 w.
R12	1303	500M ohm—1/3 w.
R13	130283	750 ohm—1/3 w.
R14	13038	2 megohm—1/3 w.
R15	130218	5M ohm—1/3 w.
		CONDENSERS
C	102103	2 gang variable condenser
C1	10022	.05 x 200 v.
C2		Loop ant. trimmer on gang
C3		Oscillator trimmer on gang
C4	12912	.00025 mica
C5	10022	.05 x 200 v.
C6	10078	.01 x 200 v.
C7	10078	.01 x 200 v.
C8	10078	.01 x 200 v.
C9	10064	.25 x 200 v.
C10	1295	.0001 mica
C11	1295	.0001 mica
C12	10078	.01 x 200 v.
C13	12912	.00025 mica
C14	10078	.01 x 200 v.
C15	11935	.25 mfd. 25 w. v. lytic
C16	10056	.5 x 200 v.
C17	10012	.003 x 600 v.
T1	1236	Antenna load coil (on loop)
T2	120257	Loop antenna coil (complete)
T3	110110	Oscillator coil
T4	108142	Input I.F. coil
T5	108143	Output I.F. coil
T6	114158	5" P.M. Speaker
S1		Off-on switch D.P.S.T. on vol. control



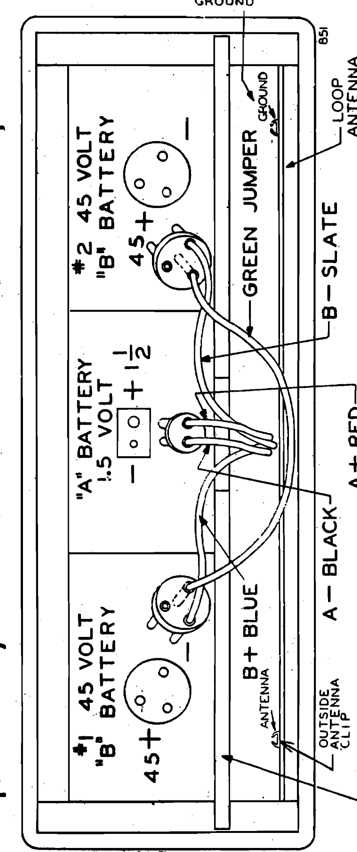
Frequency Range 545 - 1650 Kilocycles

MODEL 403
Series A

I.F. 465 K.C.

Broadcast Band 1½-Volt Battery Operated Superheterodyne Receiver with Self-Contained Loop Antenna

FIG. 1



The approximate current consumption is as follows: "A"—200ma., "B"—12.5ma.

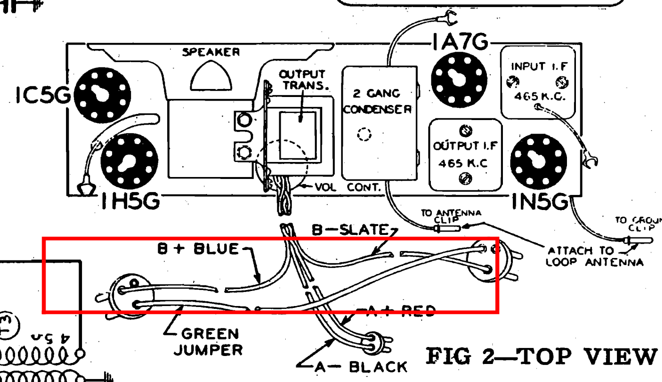
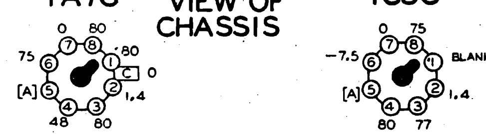


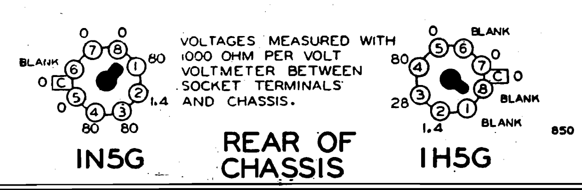
FIG 2—TOP VIEW

BOTTOM VIEW OF CHASSIS



[A] CANNOT BE READ WITH VOLTMETER.

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.



REAR OF CHASSIS

A ground is essential when an outside antenna is employed.

MODEL 403, Series A
Alignment
MODEL 418, Series A
Alignment, Voltage
Tuner Data

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

MODEL 418 SERIES A

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1N5G I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1735 Kc.	200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output

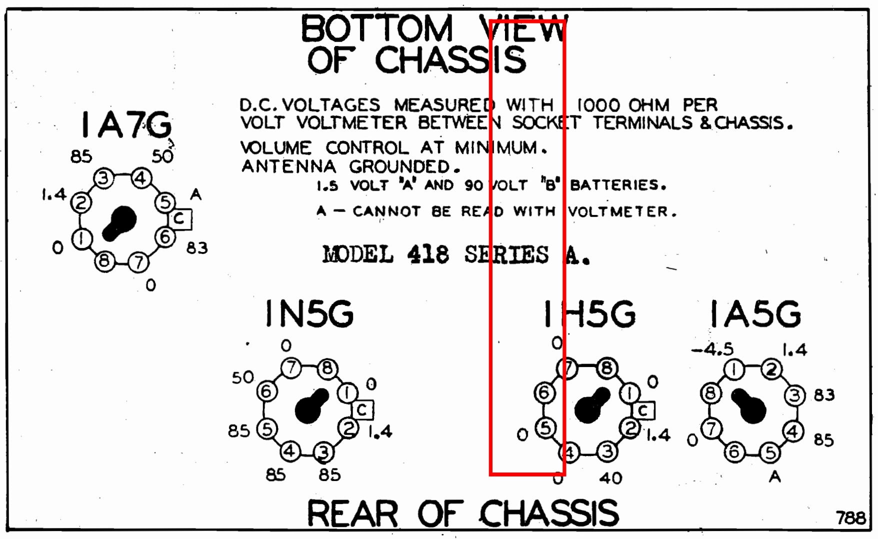
MODEL 403 Series A

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1A7G Tube	Rotor full open (Plates out of mesh)	Four trimmers on top (See Fig. 1)	Output and input I. F.	(See Note "A") Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	200 mmf.	Grid of 1A7G Tube	Rotor full open (Plates out of mesh)	Trimmer (C3) front section of gang (See Fig. 4)	Oscillator	(See Note "A") Adjust to maximum output
	1400 Kc.		See Note "C"	Set dial at 1400 Kc.	Trimmer (C2) rear section of gang (See Fig. 4)	Antenna	(See Note "B") Adjust to maximum output

NOTE "A" — A 1 megohm resistor must be connected between the two loop antenna leads from the chassis when aligning the I. F. transformers and setting the oscillator trimmer, (C3). The loop antenna must be disconnected from the chassis.

NOTE "B" — Remove the 1 megohm resistor from the loop antenna leads; mount the chassis and the loop antenna in the cabinet, connect the loop antenna to the chassis. Adjust trimmer (C2). (See note "C.")

NOTE "C" — Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.



PROCEDURE FOR SETTING THE AUTOMATIC LEVERS: MODEL 418 SERIES A.

There are six levers on the front of the radio by means of which six stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the cabinet is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in the cabinet above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

MODEL 403 SERIES A.

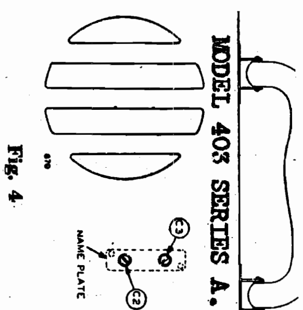


Fig. 4

BELMONT RADIO CORP.

MODEL 418, Series A
Schematic, Socket
Trimmers

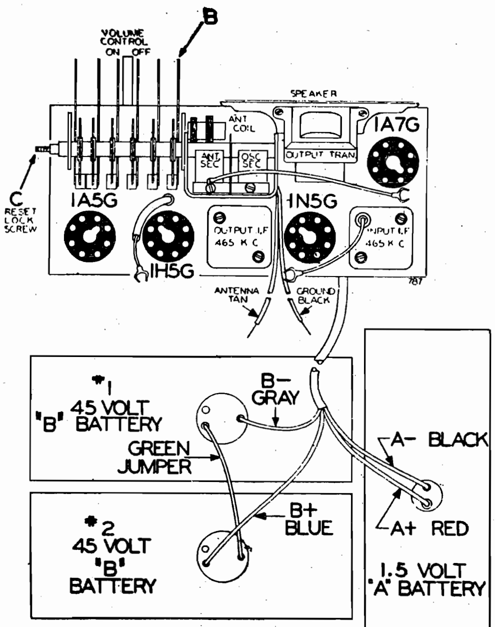


FIG 1—TOP VIEW

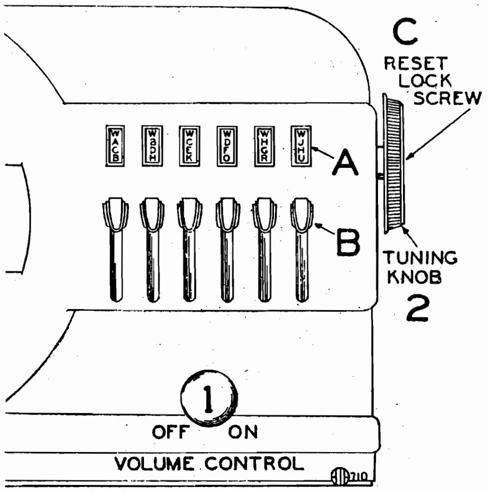
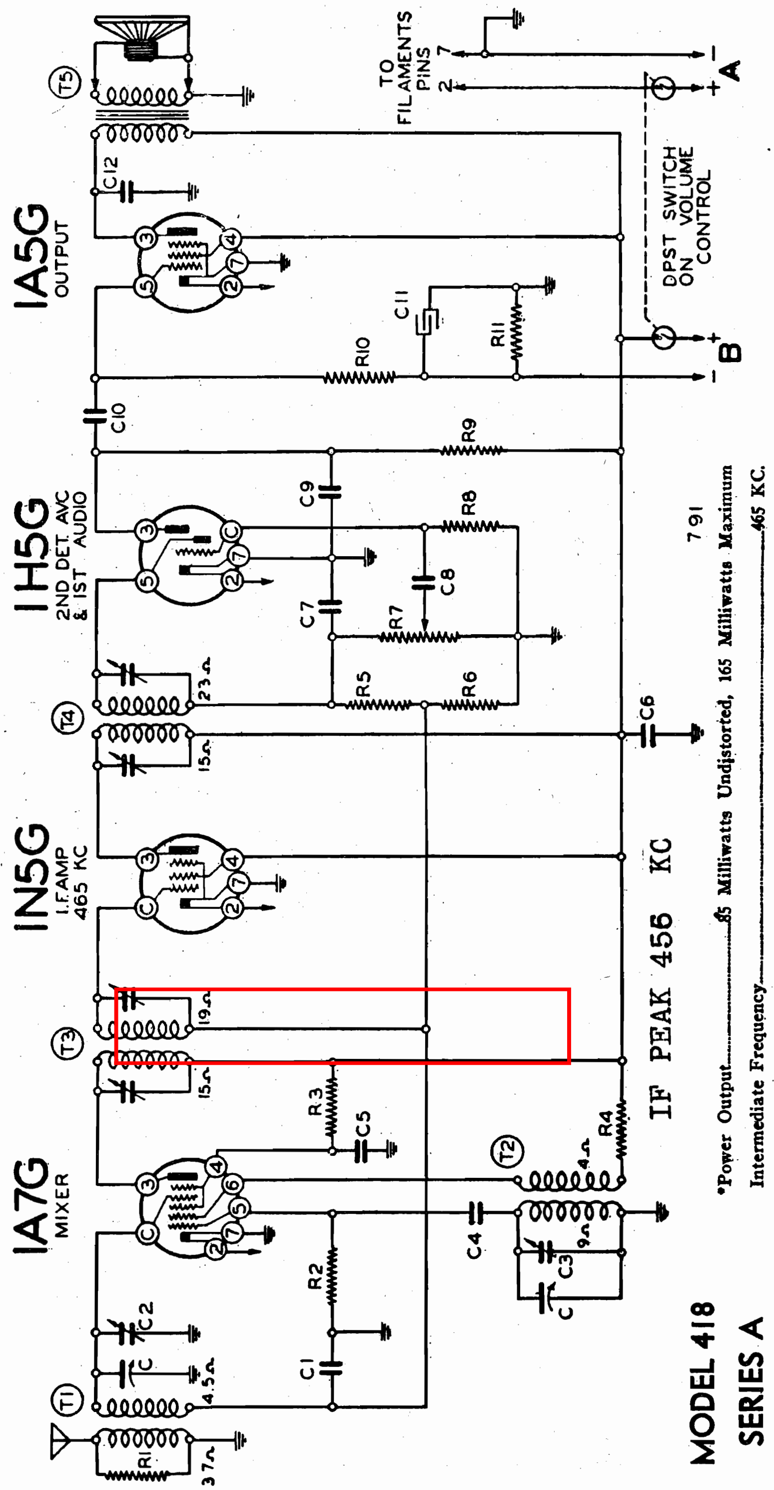


FIG. 2—FRONT VIEW

Broadcast Band 1½-Volt Battery Operated Superheterodyne Receiver

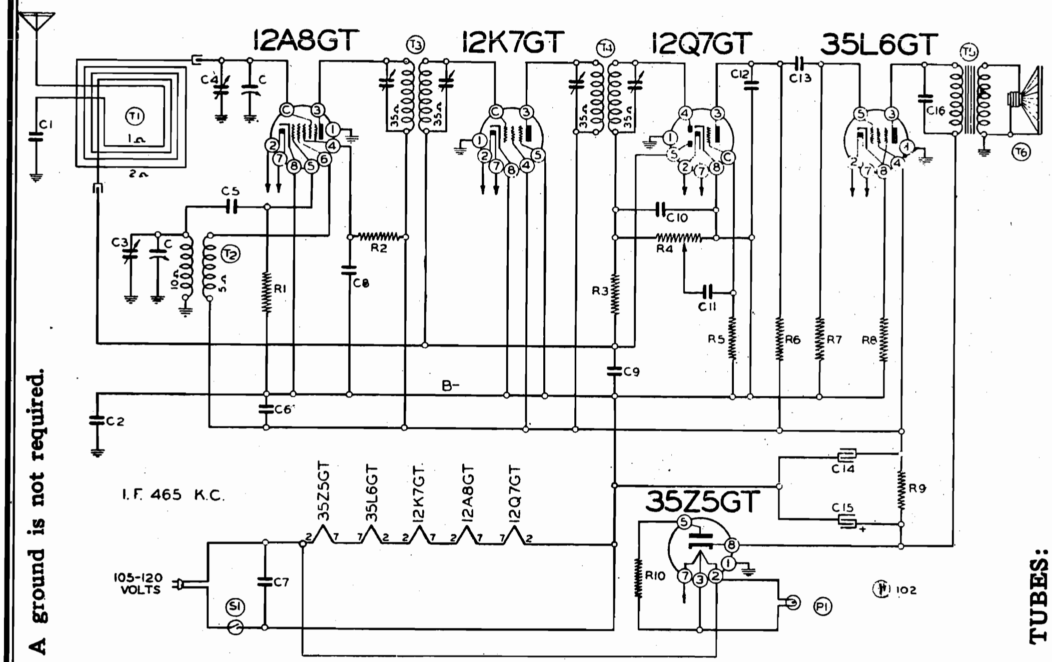
Frequency Range—530 - 1735 Kilocycles



Circuit Reference	Part No.	Description
		RESISTORS
R1	13021	20M ohm—⅓ w.
R2	1309	200M ohm—⅓ w.
R3	130208	40M ohm—⅓ w.
R4	13031	1500 ohm—⅓ w.
R5	13038	2 megohm—⅓ w.
R6	13038	2 megohm—⅓ w.
R7	101155	1 megohm volume control
R8	13019	1 megohm—⅓ w
R9	130268	350M ohm—⅓ w
R10	13019	1 megohm—⅓ w.
R11	130267	550 ohm—⅓ w.
		CONDENSERS
C	10287B	2 gang variable condenser
C1	1009	.05 x 200 v.
C2		Antenna Trimmer
C3		Oscillator Trimmer
C4	12912	.00025 mica
C5	10064	.25 x 200 v.
C6	10064	.25 x 200 v
C7	1295	.0001 mica
C8	10011	.01 x 400 v.
C9	1295	.0001 mica
C10	10011	.01 x 400 v.
C11	11952	25 mfd. x 25 w. v.
C12	10037	.003 x 600 v.

MODEL 519
Schematic, Voltage
Alignment

BELMONT RADIO CORP.



TUBES:

DESCRIPTION:
The tube complement of this chassis consists of the following octal base glass tubes.
The type and function of each tube is as follows:
1—Type 12A8GT Mixer, First Detector-oscillator.
1—Type 12K7GT I. F. Amplifier.
1—Type 12Q7GT Second Detector, A.V.C. and First Audio.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

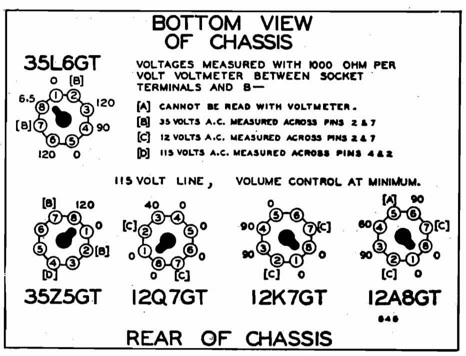


FIG. 3

PARTS (Serial No. 620,000 and up)

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13012	50M ohm—1/3 w.
R2	130149	15M ohm—1/3 w.
R3	1304	3 megohm—1/3 w.
R4	101164	1 megohm—volume control
R5	130225	15 megohm—1/3 w.
R6	13011	250M ohm—1/3 w.
R7	1303	500M ohm—1/3 w.
R8	130166	150 ohm—1/3 w.
R9	130282	2M ohm—1 watt
R10	130215	25 ohm—1/2 w.
		CONDENSERS
C	102102	2 gang variable condenser
C1	1292	.0005 mica
C2	10091	.15 x 400 v.
C3		Oscillator Trimmer on Gang
C4		Antenna Trimmer on Gang
C5	12912	.00025 Mica
C6	1009	.05 x 200 v.
C7	1001	.1 x 400 v.
C8	10022	.05 x 200 v.
C9	10022	.05 x 200 v.
C10	1295	.0001 Mica
C11	10071	.004 x 600 v.
C12	12912	.00025—Mica
C13	10011	.01 x 400 v.
C14	11982	30 mfd. lytic
C15	11982	30 mfd. lytic
C16	10095	.035 x 400 v.
		C14 and C15 in same unit
		PARTS
T1	120255	Loop Antenna
T2	110112	Oscillator Coil
T3	108140	Input I. F.—465 kc.
T4	108141	Output I. F.—465 kc.
T5	10587	Output Transformer
T6	114157	4" P.M. Speaker
P1	10794	Pilot Light T44
S1		Off-on switch on volume control

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of singal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:
- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12A8GT	Rotor full open (Plates out of mesh)	Four Trimmers on Top (See Fig. 1)	Output and Input I.F.	Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	.1 MFD.	Grid of 12A8GT	Rotor full open (Plates out of mesh)	Trimmer bottom of rear section of gang. (See bottom of radio)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer bottom of front section of gang. (See bottom of radio)	Broadcast Antenna	Adjust to maximum output

NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

FREQUENCY RANGE
540 to 1650 K.C.

Power Consumption.......40 Watts
Power Output.......1.3 Watts Undistorted, 2.5 Watts Maximum
Intermediate Frequency.......465 K.C.

BELMONT RADIO CORP.

MODEL 519
Socket, Trimmers, Tuner
MODEL 520, Series A
Alignment

MODEL 519

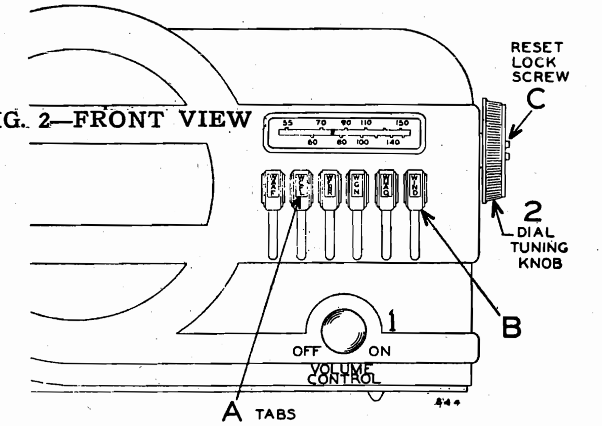


FIG. 2—FRONT VIEW

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are six levers on the front of the radio by means of which six stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner button an opening is provided for inserting the call letter tabs. (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 2).

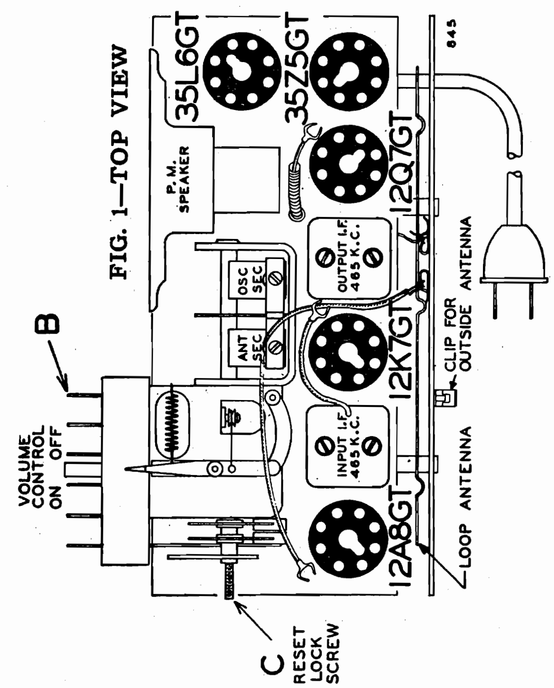
It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob No. 2 securely and with a coin loosen the locking screw "C" one or two turns; select the new station as explained. **Be sure to retighten the locking screw,** otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and—your favorite station is selected.

FIG. 1—TOP VIEW



MODEL 520 SERIES A.
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 100 mmf.

FREQUENCY RANGE
530 to 1720 K.C.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6A8	Rotor full open (Plates out of mesh)	Two trimmers (See Fig. 3)	I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	100 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	100 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Broadcast Antenna	Adjust to maximum output

MODEL 520, Series A
Schematic, Socket
Trimmers,
Voltage

BELMONT RADIO CORP.

Broadcast Band A. C.-D. C. Superheterodyne Receiver

Frequency Range 530-1720 Kilocycles

For setting Automatic Levers see Model 418.

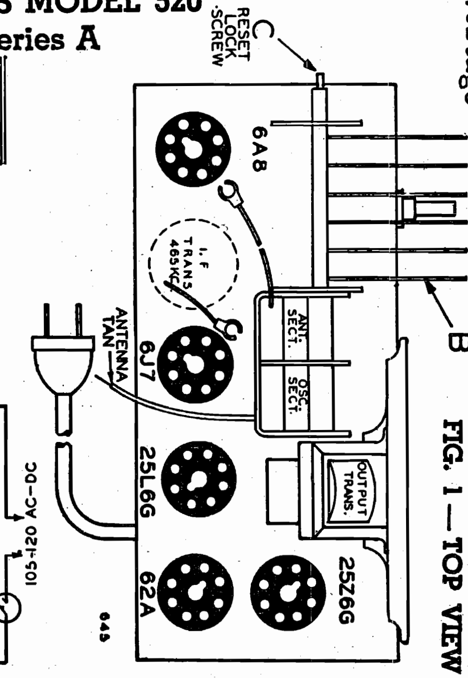
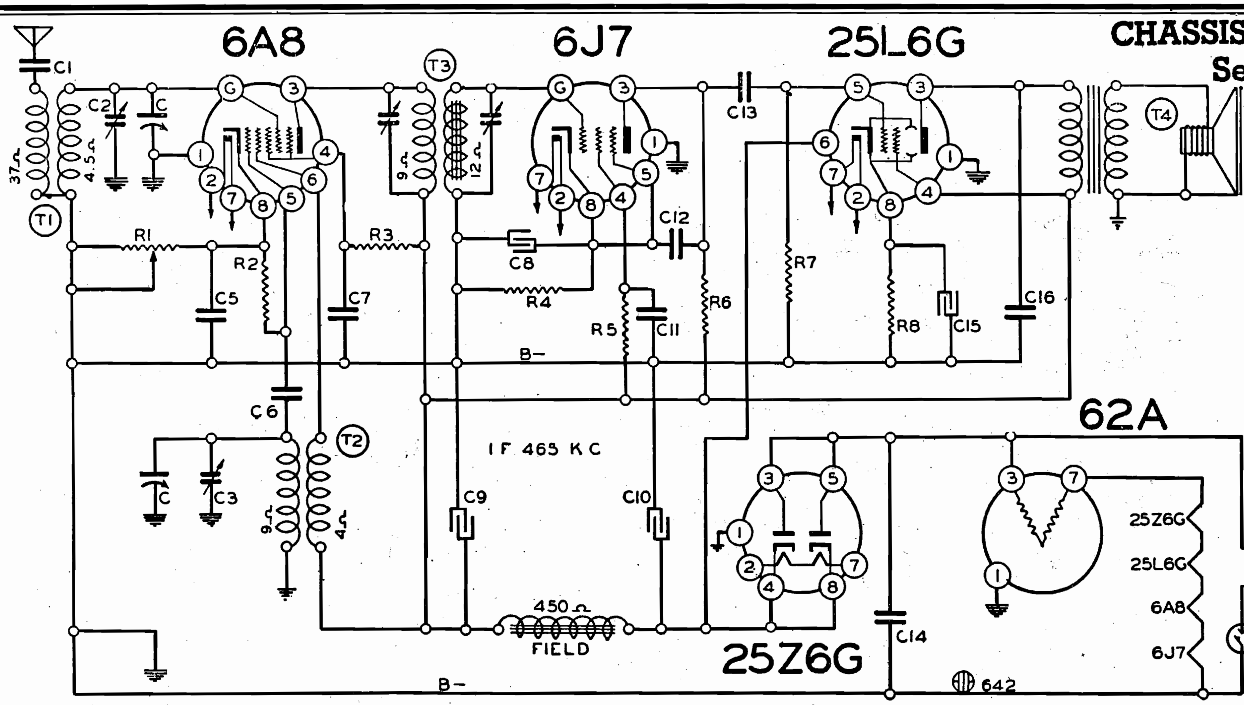


FIG. 1 — TOP VIEW



Power Consumption........45 Watts
Power Output........800 Milliwatts Undistorted, 1300 Milliwatts Maximum

I. F. Frequency 465 K. C.

Code No.	Part No.	Description
		RESISTORS
R1	101138	20M ohm volume control
R2	13012	50M ohm—1/3 w.
R3	130194	35M ohm—1/3 w.
R4	13082	10M ohm—1/3 w.
R5	13038	2 megohm—1/3 w.
R6	13045	250M ohm—1/3 w.
R7	1303	500M ohm—1/3 w.
R8	130251	160 ohm—1/3 w.
		CONDENSERS
C	10287	2 gang variable condenser
C1	1292	.0005 mica
C2		Antenna Trimmer
C3		Oscillator Trimmer
C5	1009	.05 x 200 v.
C6	12912	.00025 mica

Code No.	Part No.	Description
C7	1009	.05 x 200 v.
C8	11971	5 mfd. x 25 v. lytic
C9	11970	30 mfd. x 150 v. lytic
C10	11970	30 mfd. x 150 v. lytic
C11	10020	.1 x 200 v.
C12	1292	.0005 mica
C13	10026	.02 x 400 v.
C14	1001	.1 x 400 v.
C15	11970	40 mfd. x 25 w. v. lytic
C16	10095	.035 x 400 v.

C9, C10 and C15 in one unit, part no. 11970

Code No.	Part No.	Description
		PARTS
T1	111110	Antenna Coil
T2	11095	Oscillator Coil
T3	108123	I. F. Transformer—465 kc.
T4	114130	5 inch Dynamic Speaker

BOTTOM VIEW OF CHASSIS

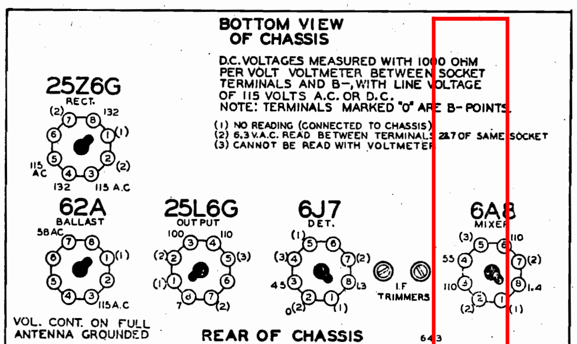


FIG. 3

TUBES:

DESCRIPTION:

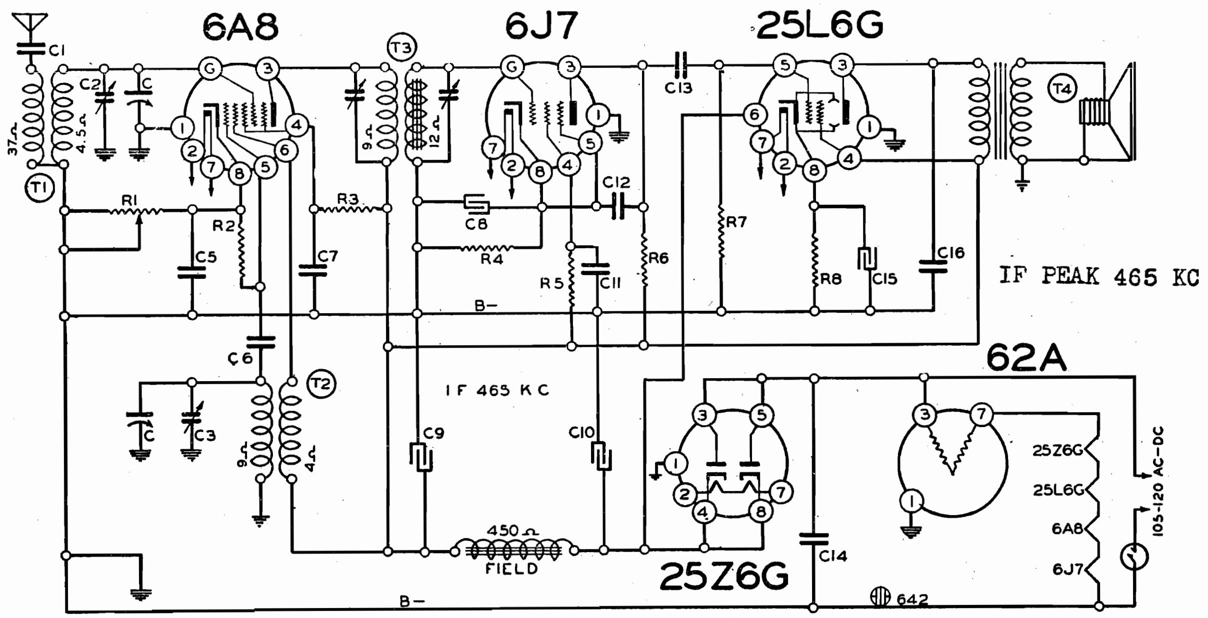
The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows:

1—Type 6A8 Pentagrid Mixer, First Detector-oscillator.
1—Type 6J7 Second Detector.
1—Type 25L6G Beam Output Amplifier.
1—Type 25Z6G High Vacuum Rectifier.
1—Type 62A Ballast Tube.

MODEL 521, Series A
Schematic

BELMONT RADIO CORP.



CHASSIS MODEL 521
Series A

When ordering parts always mention complete factory model number, series and issue.

LIST OF REPAIR PARTS (Serial No. 286700 and up)

Use Only Genuine Factory Replacement Parts

Part No.	Circuit Diagram Reference	Description	No. Used in Set	List Price Each
		CONDENSERS		
1001	C14	.1 x 400 Volt Tubular Condenser	1	$ .25
1009	C5, C7	.05 x 200 Volt Tubular Condenser	2	.25
10020	C11	.1 x 200 Volt Tubular Condenser	1	.25
10026	C13	.02 x 400 Volt Tubular Condenser	1	.25
10095	C16	.035 x 400 Volt Tubular Condenser	1	.25
11971	C8	5 MFD x 25 Volt Electrolytic Condenser	1	.50
11970	C9, C10, C15	30 MFD x 150 V; 30 MFD x 150 V; 40 MFD x 25 V. Electrolytic Condenser (for 60 cycle)	1	1.50
11972	C9, C10, C15	60 MFD x 150 V; 60 MFD x 150 V; 40 MFD x 25 V. Electrolytic Condenser (for 25 cycle)	1	
1292	C1, C12	.0005 Mica Type Condenser—20%	2	.25
12912	C6	.00025 Mica Type Condenser—20%	1	.25
		RESISTORS		
1303	R7	500M Ohm—1/3 Watt Resistor—20%	1	.20
13012	R2	50M Ohm—1/3 Watt Resistor—20%	1	.20
13038	R5	2 Megohm—1/3 Watt Resistor—20%	1	.20
13045	R6	250M Ohm—1/3 Watt Resistor—20%	1	.20
130194	R3	35M Ohm—1/3 Watt Resistor—10%	1	20
130251	R8	160 Ohm—1/3 Watt Resistor—10%	1	20
130252	R4	6M Ohm—1/3 Watt Resistor—20%	1	20
		COILS		
108123	T3	I. F. Transformer Coil Assembly, Less Cardboard Cover	1	1.25
11095	T2	Oscillator Coil Assembly Complete	1	.50
111110	T1	Antenna Coil Assembly Complete	1	.75
		SOCKETS		
12193		Eight Prong Octal Socket	3	.15
12194		Seven Prong Octal Socket	2	.15
		SPEAKER		
114130	T4	Five Inch Dynamic (Field Resis. 450 Ohms)	1	3.50
		MISCELLANEOUS		
101138	R1	Volume Control & On-Off Switch (20M Ohm)	1	1.00
10287	C, C2, C3	Two Gang Variable Condenser	1	2.50
10798		Line Cord and Plug	1	.50
115241		Cover Shield for 108123 I. F. Coil	1	.10
128178BR		Brown Bakelite Cabinet Complete	1	2.50
128178W		Ivory Finish Bakelite Cabinet Complete	1	3.00
128202		Back for Cabinet (Specify Color)	1	.10
128203BR		Brown Bakelite Knob (Volume)	1	.10
128203W		Ivory Bakelite Knob (Volume)	1	.15
128190BR		Brown Bakelite Knob (Tuning)	1	.15
128190W		Ivory Bakelite Knob (Tuning)	1	.20
128173BR		Brown Buttons for Tuner Levers	6	.10
128173W		Ivory Buttons for Tuner Levers	6	.10
62A		Ballast Resistor (in Tube, Shell and Base)	1	.75

Part No.	Diagram Circuit Reference	Description	Used No. in Set	Price List Each
		DIAL PARTS LIST		
115251		Support Bracket for Automatic Tuning Mechanism (Mounts to Variable Condenser)	1	.10
115251B		Support End Bracket for Automatic Tuning Mechanism	1	.10
115146		Tuner Cam	6	.05
115143		Key Washers (Used on Each Side of Tuner Cams)	13	.02
115252		Lever Complete with 117309 Roller	6	.15
117418		Shaft for Tuner Levers	1	.10
117416		Spacer	4	.03
117419		Spacer	2	.03
117417		Locking Collar (for Right End of Cam Shaft)	1	.10
117390		Locking Screw (Lock Tuner Cams; Inserted Through Center of Tuning Knob)	1	.10
131181		Compression Spring Washer (Used Between Locking Collar and First Tuner Cam on Right End of Cam Shaft)	1	.02
120204		Hair Pin Spring for Tuner Levers	6	.03
128173BR		Brown Spring for Tuner Levers	6	.10
128173W		Ivory Spring for Tuner Levers	6	.10
112445		Set of 2 Sheets of Station Call Letters	1	.15
112336		Clear Pyralin Tabs for Station Call Letter Tabs	6 doz.	.10

Tubes are coded and guaranteed by the tube manufacturer.

Prompter service can be rendered on adjustments if defective tubes are returned direct to the tube manufacturer rather than through our factory.

All resistors are RMA color coded—specify value and/or resistor number (per schematic diagram) and model number.

When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

All prices quoted are list and are subject to the usual trade discounts. Shipments are F.O.B. our Factory. When remitting in advance, please include postage.

WE CANNOT SUPPLY SPEAKER, CONES OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $1.00 NET, IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

BRC—CHGO Form 5996 7M 9-38

MODEL 521, Series A
Socket, Trimmers, Voltage
Alignment, Tuner

BELMONT RADIO CORP.

POWER SUPPLY:

Caution:—This radio, unless otherwise marked, must be operated from 105-125 volts, A.C. or D.C. supply only. If you are in doubt as to the voltage rating of the power supply, consult your local power company before inserting plug. Do not insert plug unless all tubes are in their proper sockets.

Receivers of this model which are to be used on voltages other than 105-125 volts, 50/60 cycle, are so marked. The power consumption of this receiver is 45 watts.

HOW TO REMOVE CABINET:

CAUTION:—Always disconnect the line cord from the house current before removing the chassis from the cabinet.

To remove chassis from the cabinet unscrew the locking screw in the center of the tuning knob and pull tuning knob and volume knob off their shafts. Remove the back of the cabinet and the two screws that hold the chassis to the cabinet. Pull off the six buttons on the Automatic levers. Move the chassis toward back of cabinet so that control shafts and tuner assembly clear holes in cabinet, then chassis can be slipped out.

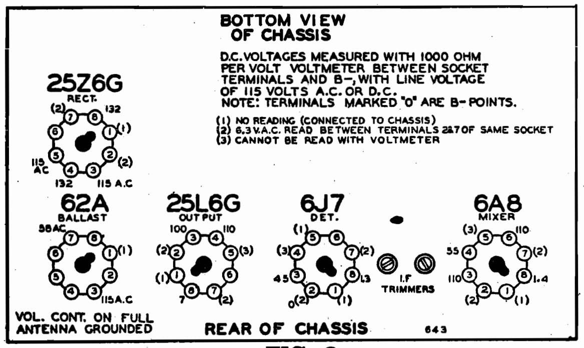


FIG. 3

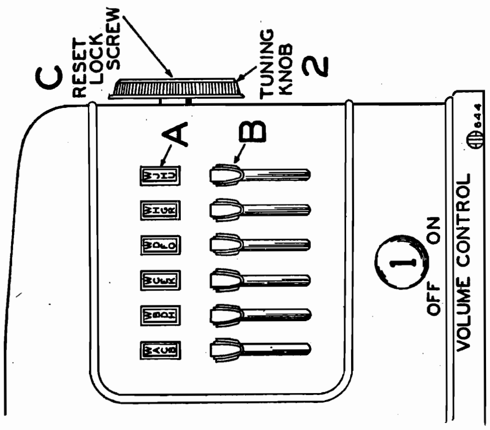


FIG. 2—FRONT VIEW

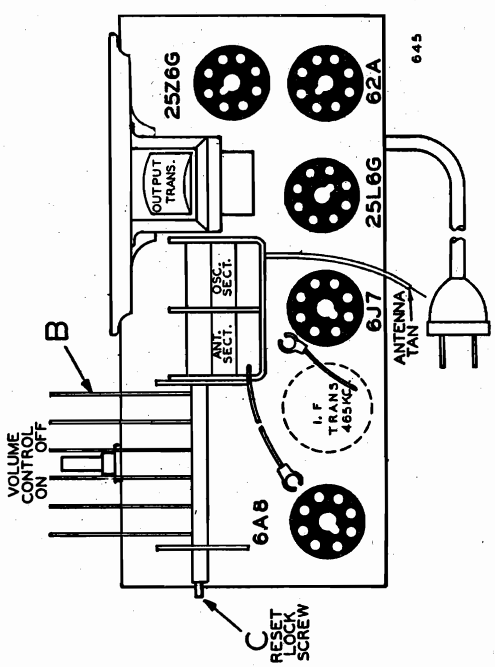


FIG. 1—TOP VIEW

The procedure for setting the Automatic Tuning Levers in this receiver is the same as that for Model 633 with the exception that this receiver has six levers instead of five.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 100 mmf.

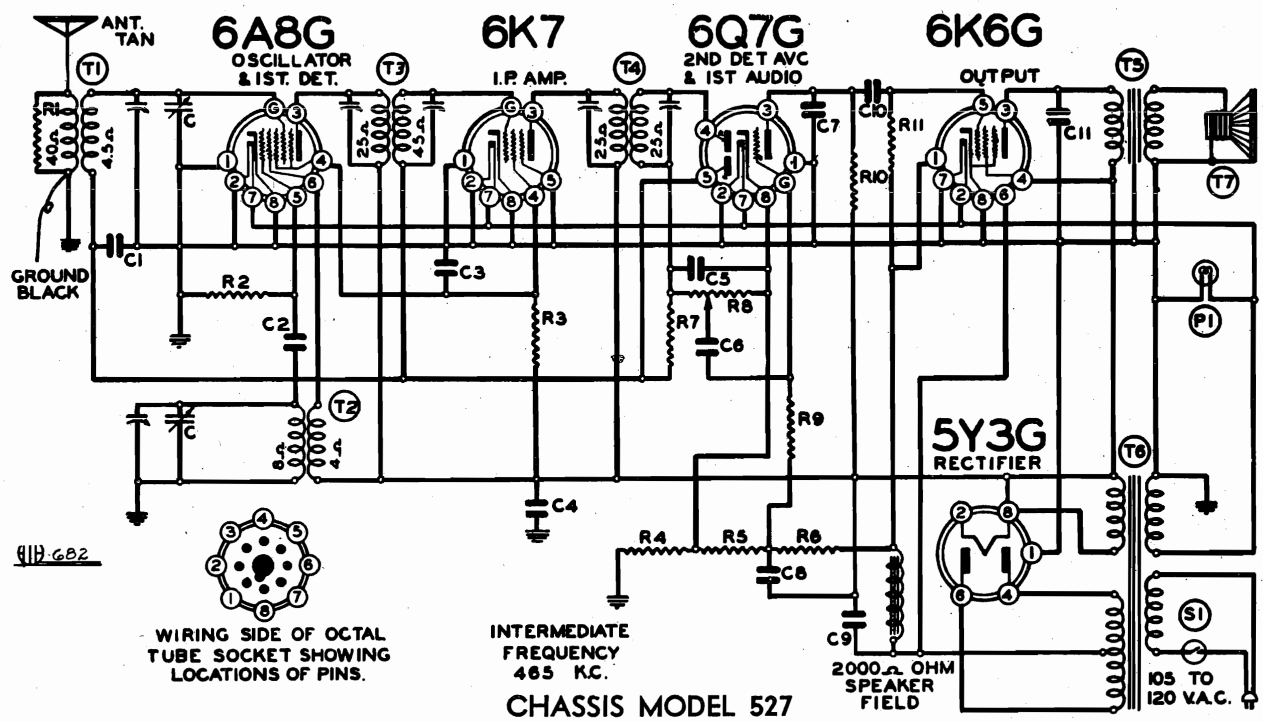
BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6A8	Rotor full open (Plates out of mesh)	Two trimmers (See Fig. 3)	I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	100 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	100 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Broadcast Antenna	Adjust to maximum output

FREQUENCY RANGE
530 to 1720 K.C.

Power Consumption........45 Watts
Power Output........800 Milliwatts Undistorted, 1300 Milliwatts Maximum
Intermediate Frequency........465 K.C.

MODEL 527, Series A
Schematic

BELMONT RADIO CORP.



CHASSIS MODEL 527
Series A

When ordering parts always mention complete factory model number, series and issue.

LIST OF REPAIR PARTS (Serial No. 307600 and up)

Use Only Genuine Factory Replacement Parts

Part No.	Circuit Diagram Reference	Description	List Price Each
		CONDENSERS	
1001	C3	.1 x 400 Volt Tubular Condenser	.25
1009	C1	.05 x 200 Volt Tubular Condenser	.25
10011	C6, C10	.01 x 400 Volt Tubular Condenser	.25
10013	C4	.05 x 400 Volt Tubular Condenser	.25
10019	C11	.006 x 600 Volt Tubular Condenser	.25
11947E	C8, C9	Dual 5 Mfd. x 250 W. V. Filter Condenser	1.50
1292	C7	.0005 Mica Type Condenser—20%	.25
1295	C5	.0001 Mica Type Condenser—20%	.25
12912	C2	.00025 Mica Type Condenser—20%	.25
		RESISTOR	
10635	R4, R5, R6	65 Ohm, 450 Ohm, 220 Metal Clad Resistor	.35
1309	R10	200M Ohm—1/3 Watt Resistor—20%	.20
13012	R2	50M Ohm—1/3 Watt Resistor—20%	.20
13021	R1, R3	20M Ohm—1/3 Watt Resistor—20%	.20
130118	R11	600M Ohm—1/3 Watt Resistor—20%	.20
130170	R7, R9	3 Megohm—1/3 Watt Resistor—25%	.20
		COILS	
10895E	T4	Output I. F. Coil Assembly Complete with Can	1.25
10896F	T3	Input I. F. Coil Assembly Complete with Can	1.25
11073	T2	Oscillator Coil Assembly Complete	.50
11192	T1	Antenna Coil Assembly Complete	.60
		SOCKETS	
12193		Eight Prong Octal Base Tube Sockets	.15
12195		Five Prong Octal Base Tube Socket	.10
		TRANSFORMERS	
104149	T6	50/60 Cycle Power Transformer 105-115 Volt Primary	2.75
104—		25/60 Cycle Power Transformer 105-115 Volt Primary	
104—		40/60 Cycle Power Transformer Universal Primary	
10555D	T5	Output Transformer for Speaker	1.00
		SPEAKER	
114133	T7	Five Inch Dynamic Speaker (Field 2000 Ohms)	3.00
10555D	T5	Output Transformer for Speaker	1.00
		MISCELLANEOUS	
101141	R8, S1	Volume Control and Switch (500M Ohms)	1.00
10290	C	Two Gang Variable Condenser	2.50
10555D	T5	Output Transformer for Speaker	1.00
10798		Line Cord and Plug	.50
128163BR		Brown Bakelite Cabinet Complete (with Carton)	3.00
128163W		Ivory Bakelite Cabinet Complete (with Carton)	5.00
128207BR		Brown Bakelite Knob (Tuning)	.15
128207W		Ivory Bakelite Knob (Tuning)	.20
128203BR		Brown Bakelite Knob (Volume)	.10
128203W		Ivory Bakelite Knob (Volume)	.15
128205		Back for Cabinet (Specify Color)	.10
		DIAL PARTS LIST	
10794	P1	6-8 Volt Pilot Light Bulb Type 44	.10
107203		Socket and Bracket for Pilot Light	.10
115255		Support Bracket for Automatic Tuning Mechanism (Mounts to Variable Condenser)	.10
115254		Support End Bracket for Automatic Tuning Mechanism	.10
115250		Lever Complete with 117309 Roller	.10
115256		Dial Bracket Housing (For Dial Scale) Complete with Two Brass Idler Pulleys	.25
115143		Key Washers (Used on each Side of Tuner Cams)	.02
115146		Cams	.05
115253		Crown Gear (Mounts on Cam Shaft, Used to Drive Pinion Shaft and Gear for Pointer Drive String)	.10
117405		Locking Collar (For Right End of Cam Shaft to Compress Tuner Cams)	.10
117424		Locking Screw (For Center of Tuning Knob; Lock Tuner Cams)	.10
117409		Shaft for Tuner Levers	.15
117406		Brass Spacer (Between Crown Gear and 1st Cam)	.03
117407		Brass Spacer (Between Cams; Three Used)	.03
117408		Brass Spacer (Between 4th and 5th Cam)	.03
117411		Pinion Gear	.07
117412		Shaft for Pinion Gear (Drives Pointer String)	.15
1209		Linen Drive String	.10
120163		Take-up Spring for Drive String	.05
120211		Hair Pin Spring for Tuner Levers	.02
131181		Compression Spring Washer (Used Between Locking Collar and First Tuner Cam)	.02
112499		Pointer	.15
112501		Dial Scale (Calibrated)	.50
112500		Light Diffuser (For Dial Scale)	.15
112514		Set of Station Call Letter Sheets	.15
112515		Clear Pyralin Tabs for Station Call Letters.....Doz.	.10
128192		Bakelite Button for Levers (Specify Color; 4 Used)	.15
128192B		Bakelite Button for Levers (Specify Color; 1 Used) Special Type, Has Rim on Both Sides to Block Light Between Lever Buttons)	.15

Tubes are coded and guaranteed by the tube manufacturer.

Prompter service can be rendered on adjustment if defective tubes are returned direct to the tube manufacturer rather than through our factory.

All resistors are RMA color coded—specify value and/or resistor number (per schematic diagram) and model number.

When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

All prices quoted are list and are subject to the usual trade discounts.

Shipments are F.O.B. our Factory. When remitting in advance, please include postage.

WE CANNOT SUPPLY SPEAKER CONES, OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $1.00 NET, IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MODEL 527, Series A
Socket, Trimmers
Voltage, Alignment
Tuner Data

BELMONT RADIO CORP.

For Instructions for setting Automatic Tuning Levers, see Model 633

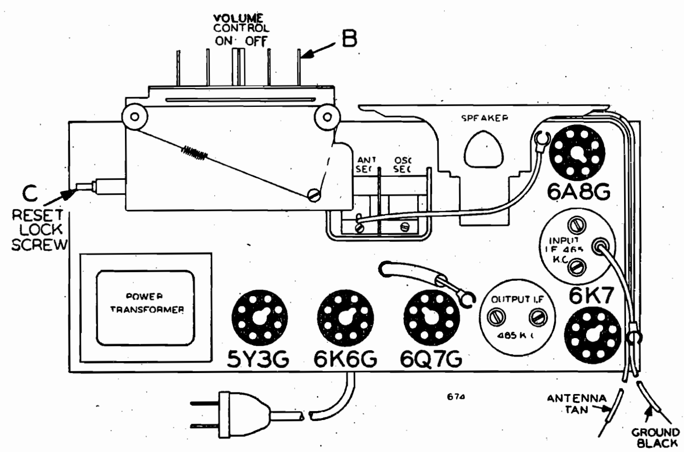


FIG. 1—TOP VIEW

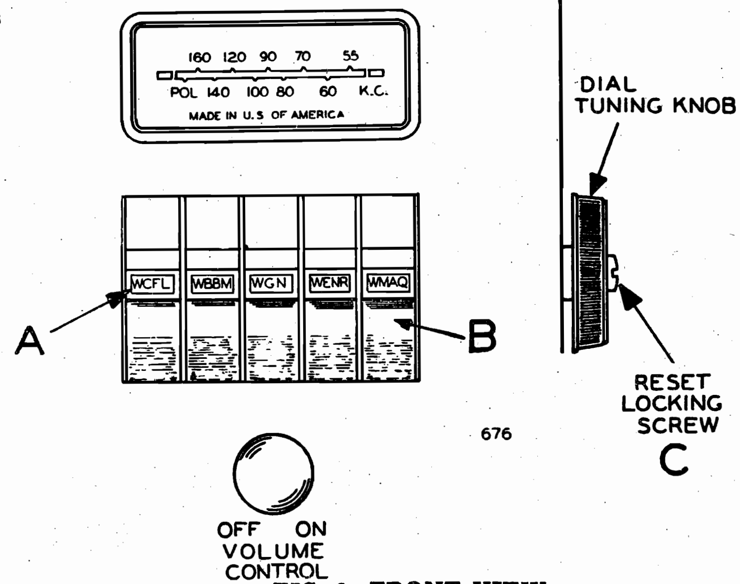


FIG. 2—FRONT VIEW

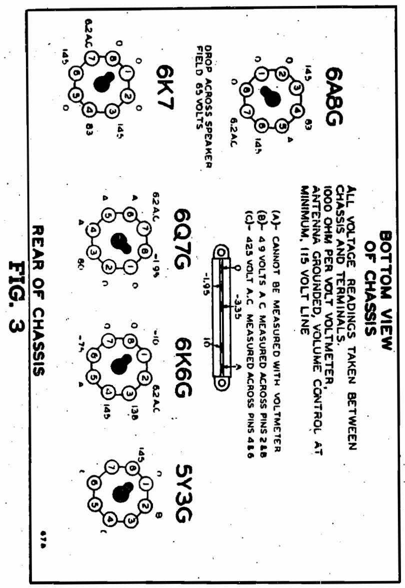


FIG. 3

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:
- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 100 mmf.

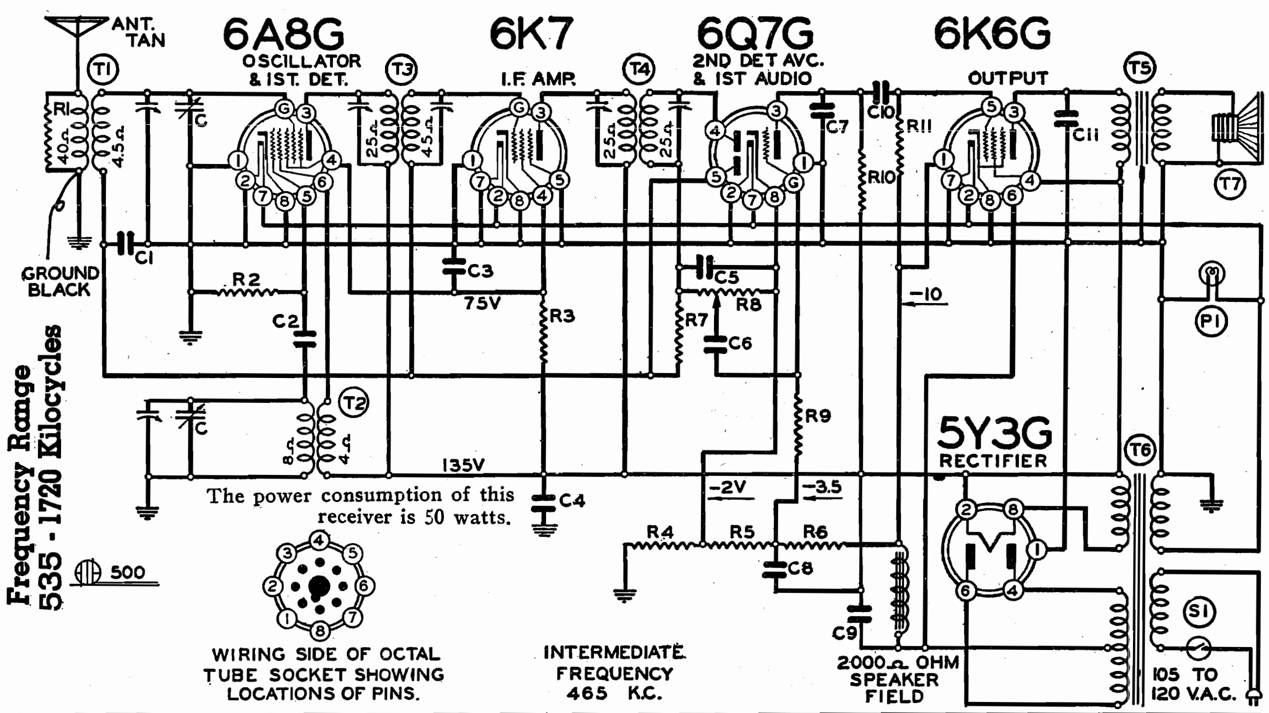
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6A8G	Rotor full open (Plates out of mesh)	Four trimmers (See Fig. 1)	Input I. F. and Output I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	100 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	100 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Broadcast Antenna	Adjust to maximum output

FREQUENCY RANGE
535 to 1720 K.C.

Power Consumption .... 50 Watts
Power Output .... 1 Watt Undistorted, 1.7 Watts Maximum
Intermediate Frequency .... 465 K.C.

MODEL 529
Schematic

BELMONT RADIO CORP.



LIST OF REPAIR PARTS (Serial No. 542,699 and up)

Use Only Genuine Factory Replacement Parts

Part No.	Circuit Diagram Reference	Description	List Price Each
		CONDENSORS	
100-1	C3	.1 x 400 volt Tubular Condenser	$ .25
100-9	C1	.05 x 200 volt Tubular Condenser	.25
100-11	C6, C10	.01 x 400 volt Tubular Condenser	.25
100-13	C4	.05 x 400 volt Tubular Condenser	.25
100-19	C11	.006 x 600 volt Tubular Condenser	.25
119-47D	C8, C9	Dual 5MFD x 250 W. V. Filter Condenser	1.50
129-2	C7	.0005 Mica Type Condenser — 20%	.25
129-5	C5	.0001 Mica Type Condenser — 20%	.25
129-12	C2	.00025 Mica Type Condenser — 20%	.25
		RESISTORS	
106-35	R4, R5, R6	65 Ohm, 45 Ohm, 220 Ohm Metal Clad	.35
130-9	R10	200M Ohm — ⅓ Watt Resistor — 20%	.20
130-12	R2	50M Ohm — 1/3 Watt Resistor — 20%	.20
130-21	R1	20M Ohm — 1/3 Watt Resistor — 20%	.20
130-118	R11	600M Ohm — 1/3 Watt Resistor — 20%	.20
130-21	R3	20M Ohm — ⅓ Watt Resistor — 20%	.20
130-170	R7, R9	3 Megohm — 1/3 Watt Resistor — 25%	.20
		COILS	
108-95B	T4	Output I.F. Coil Assembly Complete with can	1.25
108-96	T3	Input I.F. Coil Assembly Complete with can	1.25
110-73	T2	Oscillator Coil Assembly Complete	.50
111-92	T1	Antenna Coil Assembly Complete	.60
		SOCKETS	
121-93		Eight Prong Octal Socket for "6K6"	.15
121-93		Eight Prong Octal Socket for "6Q7"	.15
121-93		Eight Prong Octal Socket for "6A8"	.15
121-93		Eight Prong Octal Socket for "5Y3"	.15
121-94		Seven Prong Octal Socket for "6K7"	.15
		TRANSFORMERS	
104-129	T6	50/60 Cycle Transformer 105-115 volt Primary	2.75
104-130		25/60 Cycle Transformer 105-115 volt Primary	
104-134		40/60 Cycle Transformer Universal Primary	
		SPEAKER	
114-111	T7	Five Inch Dynamic Speaker (Field 2000 Ohms)	3.00
105-55c	T5	Output Transformer for Speaker (Mounted on Chassis)	1.00
		MISCELLANEOUS	
101-107	R8, S1	Volume Control and Switch (500M Ohms)	1.00
102-78	C	Two Gang Variable Condenser	3.00
105-55c	T5	Output Transformer for Speaker	1.00
107-98		Line Cord and Plug	.50
117-133		Brass Bushings for Mounting Bottom Plate	.02
118-48B		Bottom Cover Plate for Chassis	.35
128-134E		Black Bakelite Volume Knob	.10
128-134BR		Walnut Bakelite Volume Knob	.10
138-134W		Ivory Bakelite Volume Knob	.10
128-137E		Black Bakelite Tuning Knob	.10
128-137BR		Walnut Bakelite Tuning Knob	.10
129-137W		Ivory Bakelite Tuning Knob	.15
128-142E		Black Bakelite Cabinet Complete Including Baffle, Grill Cloth and Carton	3.00
128-142BR		Walnut Bakelite Cabinet Complete Including Baffle, Grill Cloth and Carton	3.00
128-142W		Ivory Bakelite Cabinet Complete Including Baffle, Grill Cloth and Carton	5.00
128-101		Baffle Board	.10
128-102		Grill Cloth Back and Front	.15
128-102B		Grill Cloth, For Side	.05
132-82		No. 6 x 32 x ½ Bottom Plate Mounting Screws, Doz.	.07
134-48B		Rubber Grommet (For Bottom Plate)	.03
134-66E		Black Felt Shield for Lever Openings in Cabinet	.05
134-66BR		Walnut Felt Shield for Lever Openings in Cabinet	.05
134-66W		Ivory Felt Shield for Lever Openings in Cabinet	.05

Part No.	Circuit Diagram Reference	Description	List Price Each
		DIAL PARTS LIST	
107-97	PI	6-8 Volt Pilot Light Bulb Type 51	.10
107-152		Pilot Light Bracket and Socket	.10
112-370		Top and Bottom Wood Pulley Complete with 117-287 Shaft for Indicator Film	.05
112-371		Drive Drum for Indicator Film	.10
112-372		Indicator Film	.05
112-374		Center Wood Idler Pulley for Indicator Film	.03
112-376		Dial Scale (Calibrated)	.35
115-134		Support Bracket for Automatic Tuning Mechanism (Mounts to Variable Condenser)	.10
115-135		Support Bracket for Automatic Tuning Mechanism (Right End of Mechanism)	.10
115-136		Lever Complete with 117-290 Roller	.25
115-144		Dial Bracket Housing (For Dial Scale)	.20
117-256		Brass Spacer (Used on Cam Shaft Between Second and Third Tuner Cam on Left Side of Tuner Assembly)	.05
117-257		Locking Screw for Tuning Knob	.10
117-258		Tuner Cam	.05
117-283		Locking Collar (For Right End of Cam Shaft)	.15
117-359		Spacers (Used on Cam Shaft to Mount Dial Housing Assembly)	.05
117-285		Brass Spacer (Used on Cam Shaft Between Drive Drum and Tuner Cam to Left of Drive Drum	.05
117-286		Brass Spacer (Used on Cam Shaft Between Drive Drum and Tuner Cam to Right of Drive Drum)	.05
120-181		Hair Pin Spring for Tuner Lever	.02
120-163		Take-Up Spring for Indicator Film	.05
128-173BR		Moulded Button Keys for Automatic Tuner Levers	.10
131-43		Cinch Buttons (Used to Fasten Dial Scale to Dial Housing)	.03
131-141		Compression Spring Washer (Used Between Locking Collar and first Tuner Cam on Right End of Cam Shaft)	.02
131-157		Key Washers (Used on Each Side of Tuner Cams)	.02

Tubes are coded and guaranteed by the tube manufacturer.

Prompter service can be rendered on adjustment if defective tubes are returned direct to the tube manufacturer rather than through our factory.

All resistors are RMA color coded—specify value and/or resistor number (per schematic diagram) and model number.

When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

All prices quoted are list and are subject to the usual trade discounts. Shipments are F.O.B. our Factory. When remitting in advance, please include postage.

WE CANNOT SUPPLY SPEAKER CONES, OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $.85 NET, IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MODEL 529
Socket, Trimmers
Alignment, Tuner Data

BELMONT RADIO CORP.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, **with a volt meter having a resistance of 1000 ohms per volt.**

All voltages as indicated on diagram are measured with 115 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

Transformers are available and chassis are sometimes equipped with transformers for operation on 25, 40 and 60 cycles (see parts list).

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. Remove the knobs and the four bolts which are used to **fasten the chassis.**

All adjustments should be made with a non-metallic screwdriver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6K6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No.108-95B Output I.F. Transformer
Part No. 108-96 Input I. F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condensor, to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-95B) to resonance.
   (b) Move oscillator output clip from grid of 6K7 to grid of 6A8G and adjust input I.F. transformer (No. 108-96) to resonance.
   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-95B) if necessary.

1. R.F. ALIGNMENT: (535-1720 K.C.)

1. With the gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 100 mmf. condensor to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) **Check sensitivity at 600 and 1000 kilocycles.**

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2).

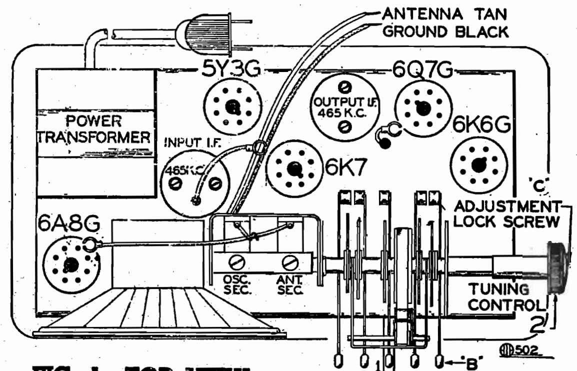


FIG. 1—TOP VIEW

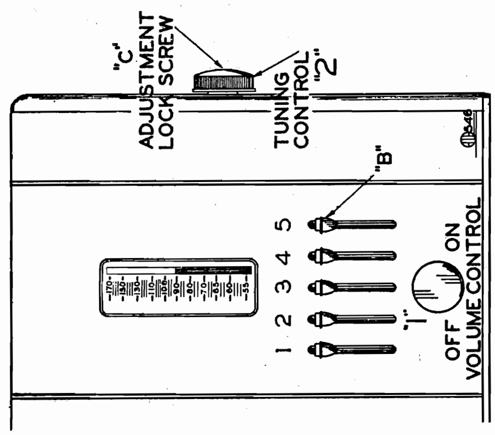


FIG. 2—FRONT VIEW

Make a list of local stations you tune in regularly; any number up to and including five.

Numbers are placed on the cabinet above each automatic tuner lever. These numbers (1 to 5) are used to designate the stations you have chosen them to represent.

Any order of grouping can be used, either by assigning call letters for the levers numerically (1 to 5) or arranging them to correspond with the calibration on the dial scale, namely, starting with the lowest frequency station on the right and so on up in frequency to the highest frequency station on the left.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 1).

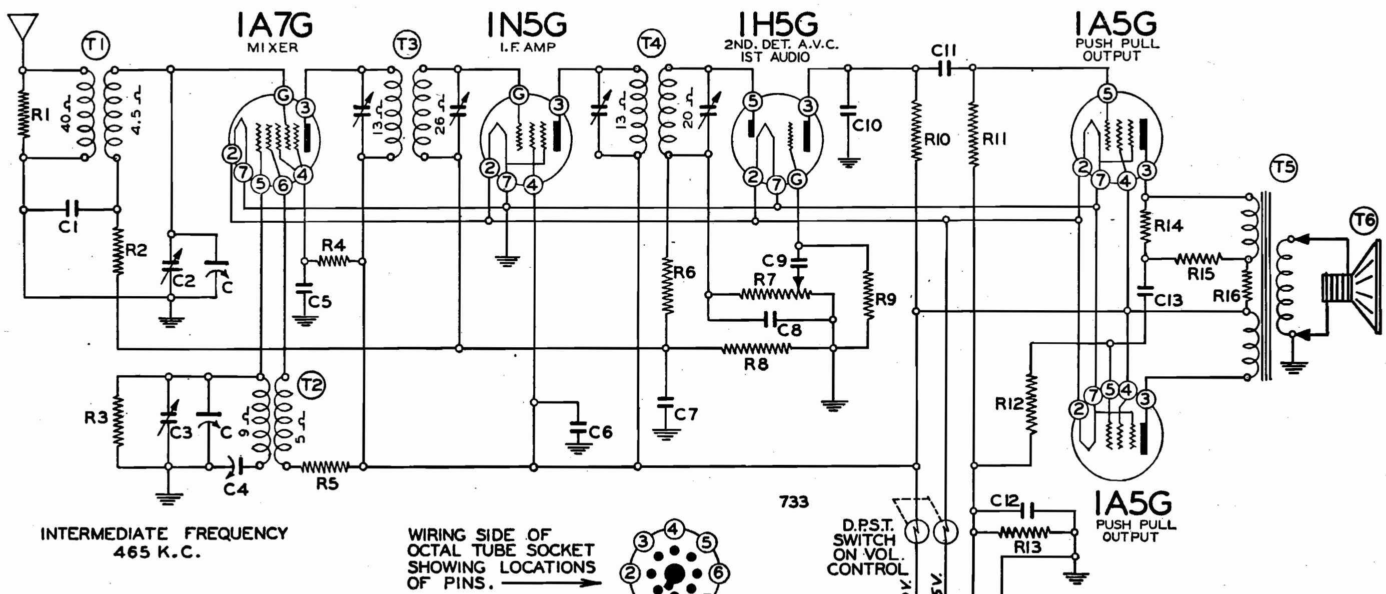
It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob No. 2 securely and with a coin loosen the locking screw "C" one or two turns; select the new station as explained. **Be sure to retighten the locking screw,** otherwise the stations you have selected will not stay adjusted to the levers.

MODEL 551, Series A
Schematic, Voltage
Socket, Trimmers

BELMONT RADIO CORP.

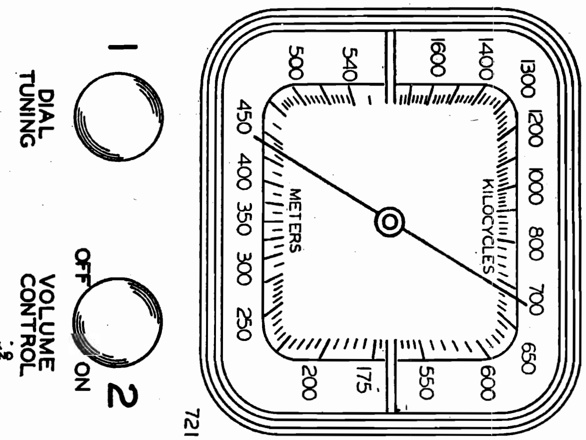


Frequency Range—535 - 1735 Kilocycles

MODEL 551
Series A

Circuit Reference No.	Part No.	Description
		RESISTORS
R1	13021	20M ohm—⅓ w.
R2	13020	100M ohm—⅓ w.
R3	1309	200M ohm—⅓ w.
R4	130208	40M ohm—⅓ w.
R5	13071	4M ohm—⅓ w.
R6	13038	2 megohm—⅓ w.
R7	101140	1 megohm—volume control
R8	13038	2 megohm—⅓ w.
R9	13019	1 megohm—⅓ w.
R10	13037	750M ohm—⅓ w.
R11	13019	1 megohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	130222	350 ohm—⅓ w.
R14	13019	1 megohm—⅓ w.
R15	130232	25M ohm—⅓ w.
R16	130264	1000 ohm—⅓ w.
		CONDENSERS
C	10289	2 gang Variable Condenser
C1	1009	.05 x 200 v.—25%
C2		Antenna Section Trimmer
C3		Oscillator Section Trimmer
C4	12464	Series Pad
C5	10070	.5 x 120 v.—20%
C6	10048	.25 x 200 v.
C7	1009	.05 x 200 v.
C8	1295	.0001 Mica
C9	10011	.01 x 400 v.
C10	12921	.0002 Mica
C11	10078	.01 x 200 v.
C12	11935	10 mfd. x 25 volts—lytic
C13	10078	.01 x 200 v.
		PARTS
T1	11192B	Antenna Coil Complete
T2	11096	Oscillator Coil Complete
T3	108111C	Input I. F. Complete
T4	108112	Output I. F. Complete
T5	10578	Output Transformer
T6	114137	6" P. M. Speaker

Broadcast Band 1½-Volt Battery Operated Superheterodyne Receiver



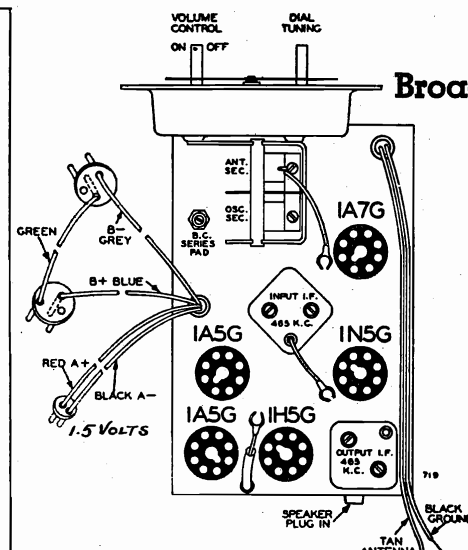
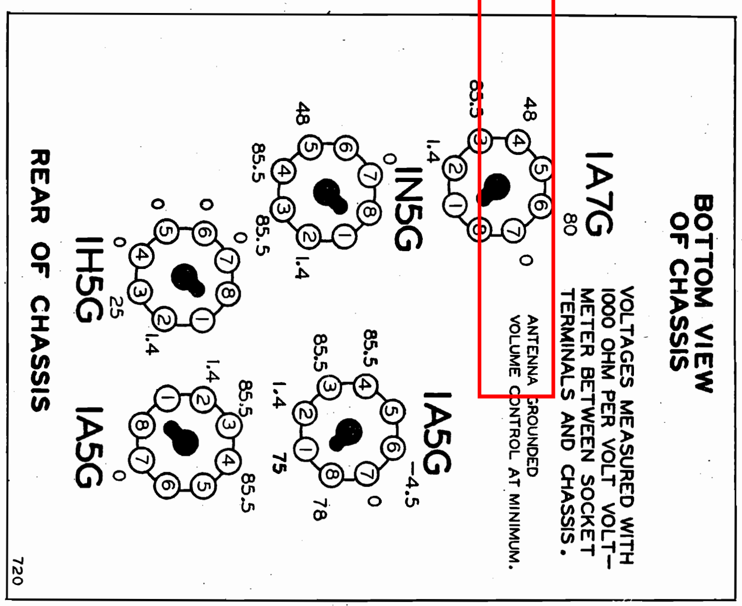


FIG. 1—TOP VIEW



MODEL 551, Series A
Alignment

BELMONT RADIO CORP.

Broadcast Band 1½-Volt Battery Operated Superheterodyne Receiver

MODEL 551 Series A

5 TUBE Frequency Range—535 - 1735 Kilocycles

DESCRIPTION:

TUBES:

The tube complement of this chassis consists of the following tubes.

The type and function of each tube is as follows:

1—Type 1A7G Mixer, First Detector-oscillator.

1—Type 1N5G Remote Cut-Off Pentode, 1st I. F. Amplifier (465 K. C.)

1—Type 1H5G Second Detector, A.V.C., 1st Audio.

2—Type 1A5G Push-Pull Output Amplifier.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with a new set of batteries.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

The approximate current consumption is as follows: "A"—ma., "B"—ma.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low battery voltage, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. Remove the knobs and the 3 bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screw driver.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1N5G I.F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1735 Kc.	200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Set dial at 600 Kc.	B.C. Series Pad (See Fig. 1)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

FREQUENCY RANGE
535 to 1735KC.

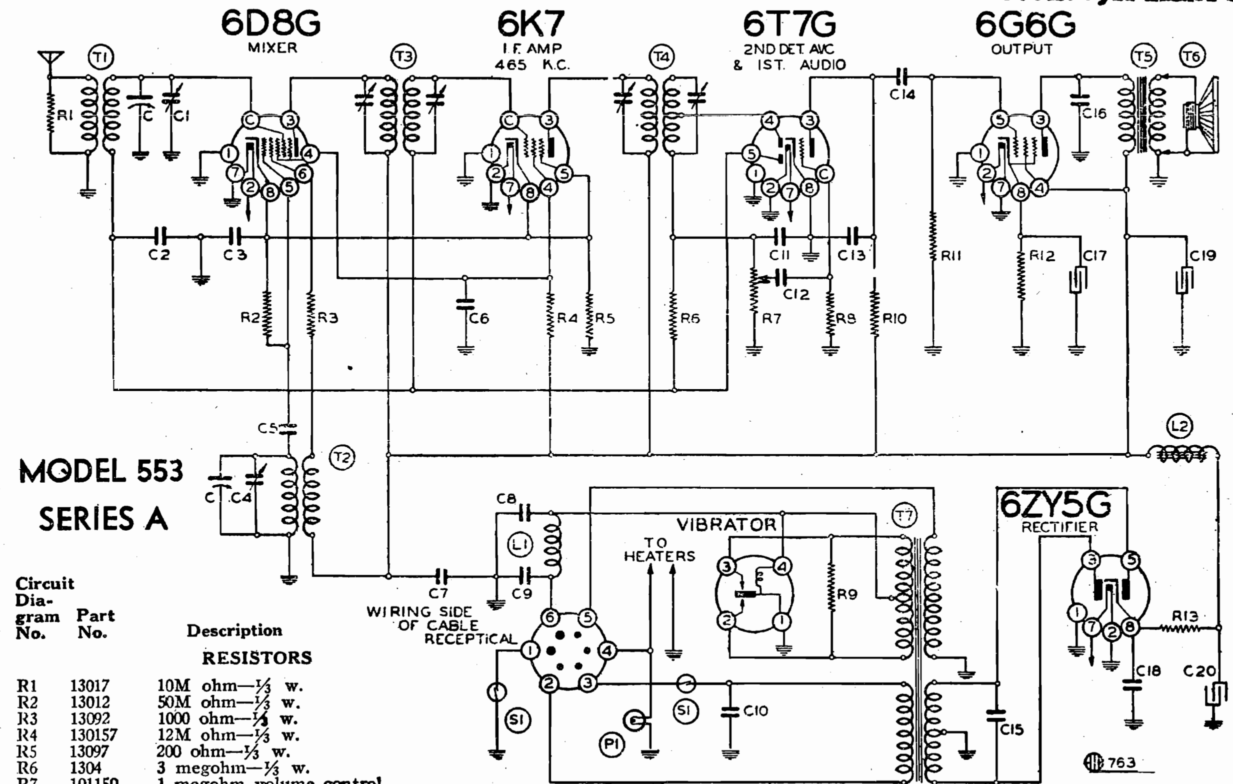
*Power Output..........130 Milliwatts Undistorted, 270 Milliwatts Maximum

Intermediate Frequency ....465 KC.

*Power Output Measured Across 3 Ohm Voice Coil.

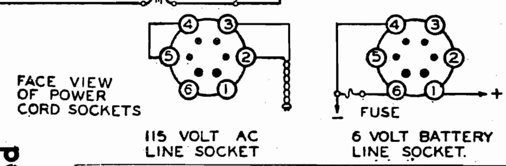
MODEL 553, Series A
Schematic, Voltage
Socket, Trimmers

BELMONT RADIO CORP.



Frequency Range—535 - 1735 Kilocycles

MODEL 553 SERIES A



Circuit Diagram No.	Part No.	Description
		RESISTORS
R1	13017	10M ohm—⅓ w.
R2	13012	50M ohm—⅓ w.
R3	13092	1000 ohm—⅓ w.
R4	130157	12M ohm—⅓ w.
R5	13097	200 ohm—⅓ w.
R6	1304	3 megohm—⅓ w.
R7	101150	1 megohm volume control
R8	130225	15 megohm—⅓ w.
R9	13097	200 ohm—⅓ w.
R10	130266	200M ohm—⅓ w.
R11	130102	500M ohm—⅓ w.
R12	13093	450 ohm—⅓ w.
R13	130168	100 ohm—⅓ w.
		CONDENSERS
C	10295	2 gang variable condenser
C1		Antenna Trimmer
C2	1009	.05 x 200 v.
C3	10064	.25 x 200 v.
C4		Oscillator Trimmer
C5	1295	.0001 mica
C6	10020	.1 x 200 v.
C7	10020	.1 x 200 v.
C8	10040	.5 x 120 v.

Circuit Diagram No.	Part No.	Description
C9	10040	.5 x 120 v.
C10	10011	.01 x 400 v.
C11	12960	.00015 mica
C12	10011	.01 x 400 v.
C13	1292	.0005 mica
C14	1009	.05 x 200 v.
C15	10073	.008 x 1200 v.
C16	10019	.006 x 600 v.
C17	11979	20 mfd. x 25 w. volt
C18	10020	.1 x 200 v.
C19	11979	16 mfd. x 200 w. volt
C20	11979	16 mfd. x 200 w. volt

1. For 6 volt storage battery operation:
   (a) Use cable No. 107128C.
   (b) Connect the lead (containing the fuse receptacle) marked A negative (—) to the negative (—) post of the storage battery.
   (c) Connect the lead marked A positive (+) to the positive (+) post of the storage battery.
2. For 105-115 volts, 60 cycle operation:
   (a) Use special cable No. 107129.
   (b) Plug receptacle of cable into power socket on chassis.

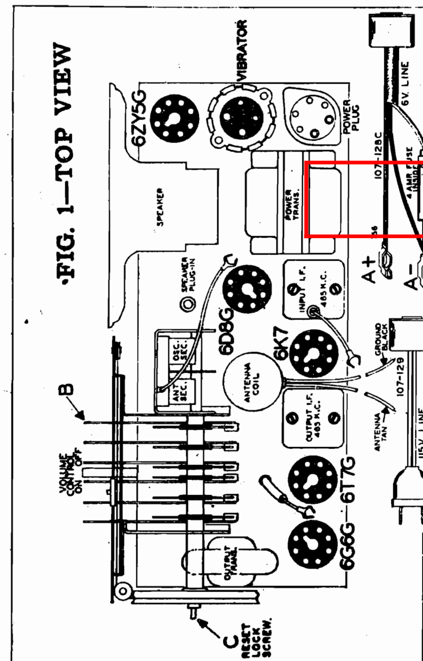
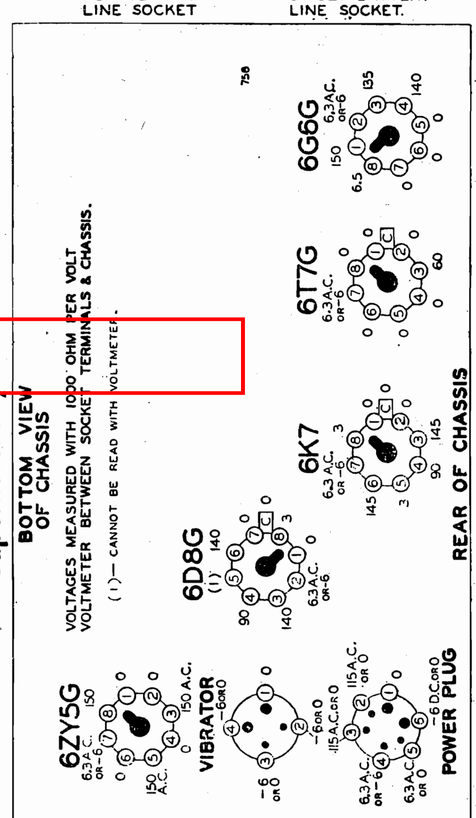


FIG. 1—TOP VIEW

Broadcast Band A. C. and 6-Volt Storage Battery Operated Superheterodyne Receiver



MODEL 553, Series A
Alignment, Tuner Data
Notes

BELMONT RADIO CORP.

SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages are to be measured with 6.3 volts input to receiver.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low battery voltage, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

TO REMOVE CHASSIS FROM THE CABINET:

Remove the four bolts which are used to fasten the chassis to the cabinet shelf; pull the knobs off their shafts and pull off the six button lever keys on front of dial.

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are six levers on the dial by means of which six stations may be selected, (See "B", Fig. 2).

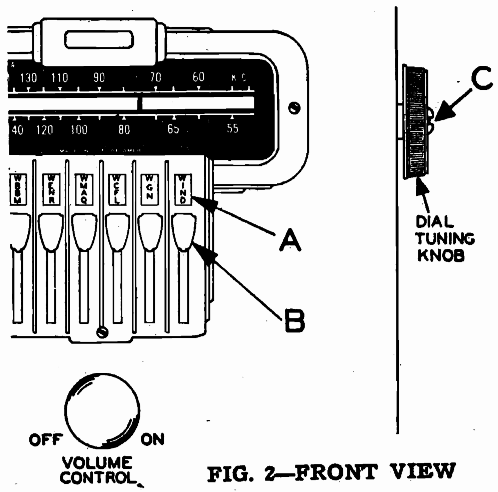


FIG. 2—FRONT VIEW

Press down any one of the six Automatic levers. Holding it down, tune in by means of tuning knob No. 2 any one of your favorite stations. Turn the tuning knob very slowly back and forth until signal is clearest. The station will then be accurately tuned in.

Release this lever and press down any other Automatic lever. Hold this lever down and tune in by means of knob No. 2 another favorite station.

Follow this procedure until stations have been set on all the levers. Hold tuning knob securely with left hand to prevent it from turning and with a coin or screw driver, tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 2).

This screw will lock in place all stations you have selected on the Automatic levers. (Note: Locking Screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob securely and loosen locking screw ("C") one or two turns; select the new station as explained.

BE SURE TO RETIGHTEN THE LOCKING SCREW, otherwise the stations will not stay adjusted to the levers.

Above each Automatic lever an opening in the escutcheon is provided for inserting station call letters, (See "A", Fig. 2).

Punch the correct station call letter tabs from the set of sheets supplied and insert them into the rectangular openings in the escutcheon above each of the levers. One of the small, clear celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

The Automatic Tuner dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

ALIGNMENT PROCEDURE

MODEL 553
SERIES A

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7 I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6D8G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

FREQUENCY RANGE
535 to 1735 KC.

Power Consumption——40 Watts (at 115 Volts 50/60 Cycles) or 2.5 Amperes at 6.3 Volts
Power Output——6 Watts Undistorted, 1 Watt Maximum

BELMONT RADIO CORP.

MODEL 577C
Above Serial 203070
Schematic, Voltage, Notes

GENERATOR INTERFERENCE

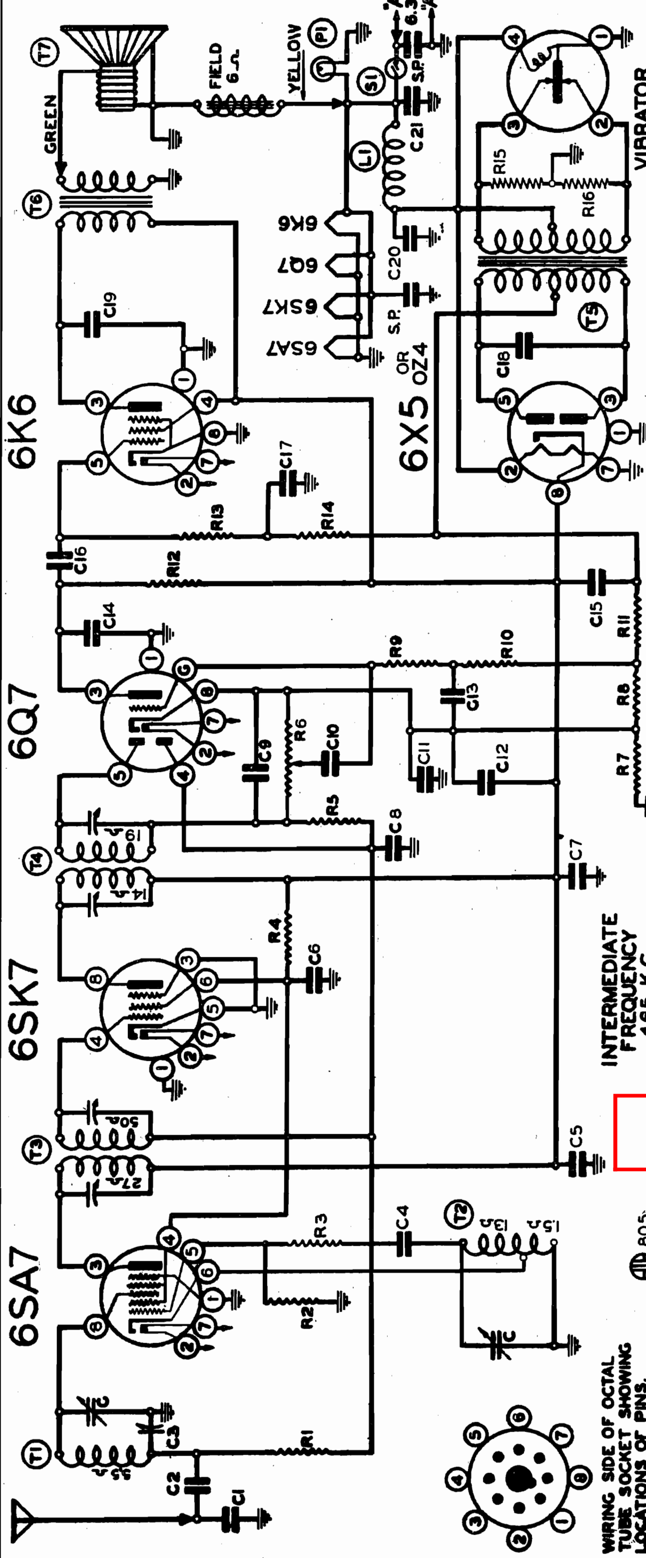
Remove the generator cutout mounting screw and fasten the condenser (100-81) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten down securely.

Connect the condenser lead to the battery terminal of the cutout. The generator condenser is absolutely necessary as it is used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated

CONNECTIONS TO BATTERY

The battery cable, number 107-82, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 100-82, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, additional motor interference may be encountered.



Code No.	Part No.	Description
		RESISTORS
R1	13011	250M ohm - ⅓ w. 20%
R2	130176	20M ohm - ⅓ w. 10%
R3	130272	10 ohm - ⅓ w. 10%
R4	130245	10M ohm - 1 w. 10%
R5	1304	3 megohm - ⅓ w. 20%
R6	101110	1 megohm volume control
R7	130174	50 ohm - ⅓ w. 10%
R8	130211	30 ohm - ⅓ w. 10%
R9	130209	2 megohm - ⅓ w. 20%
R10	130210	1 megohm - ⅓ w. 20%
R11	130212	250 ohm - 1 watt 10%
R12	13011	250M ohm - ⅓ w. 20%
R13	13011	250M ohm - ⅓ w. 20%
R14	13011	250M ohm - ⅓ w. 20%
R15	13060	100 ohm - ⅓ w. 10%
R16	13060	100 ohm - ⅓ w. 10%
		CONDENSERS
C	10269	2 gang variable condenser
C1	1293	.00002 Mica 20%
C2	10055	.01 x 400 v. 25%
C3	12434	Antenna Trimmer
C4	12912	.00025 Mica 20%
C5	1001	.1 x 400 v. 25%
C6	10020	.1 x 200 v. 25%
C7	1295	.0001 Mica

Code No.	Part No.	Description
C8	1009	.05 x 200 v. 25%
C9	1295	.0001 Mica 20%
C10	10078	.01 x 200 v. 25%
C11	10020	.1 x 200 v.
C12	11950	8 mfd. lytic
C13	10078	.01 x 200 v.
C14	1292	.0005 Mica
C15	11950	8 mfd. lytic
C16	10055	.01 x 400 v. 25%
C17	10019	.006 x 600 v.
C18	10034	.005 x 1200 v.
C19	10087	.01 x 600 v.
C20	10031	.5 x 120 v. + 50-10%
C21	10031	.5 x 120 v. + 50-10%
		C12 and C15 in same unit.
		PARTS
T1	11195B	Antenna coil complete
T2	110107	Oscillator coil complete
T3	108139	Input I. F. 465 kc. - complete
T4	108121	Output I. F. 465 kc. - complete
T5	104131	Power Transformer
T6	10567	Output Transformer
T7	114114	5" Dynamic Speaker
L1	10568	"A" Filter Choke
P1	10797	6.8 v. pilot light
S1		Off-on Switch on Volume Control
SP		Spark Plates

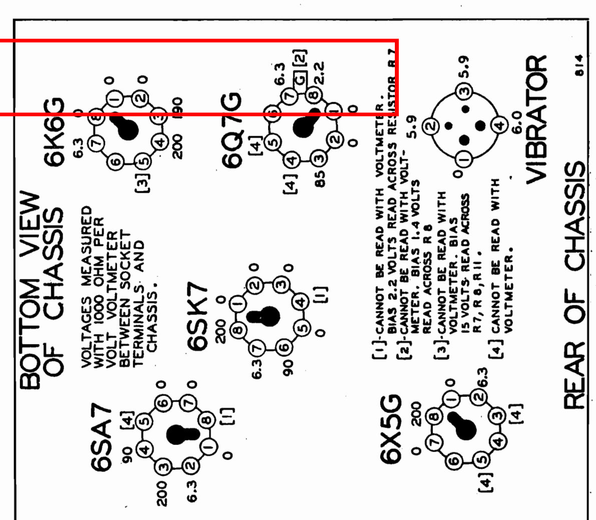


FIG. 4

ADJUST ANTENNA TRIMMER

Tune in a weak signal at approximately 600 K.C. with volume control about three-fourths on. Adjust trimmer screw "X" until maximum output is obtained. (See Fig. 1, Adjustment "X" on right side of radio)

January 1939
Serial No. 203070 Up

MODEL 577C
Above Serial 203070

BELMONT RADIO CORP.

MODEL 677C
Tuner Data

SERVICE NOTES Alignment, Socket, Trimmers
Tuner Data

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the bottom view.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

ALIGNING INSTRUCTIONS

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .5 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 125 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6K6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT: (465 K.C.)

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6SK7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108121 to resonance with oscillator.
3. Move test oscillator connection to grid of 6SA7 tube and adjust trimmer condensers of input I.F. transformer No. 108139 to resonance with oscillator. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver. (See Fig. 3—top view, page 3.)

BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is the rear section of the two-gang condenser—see top view, Fig. 3).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust antenna trimmer (front section of gang condenser) to resonance (see top view, Fig. 3).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 K.C. Adjust series pad in the antenna circuit for maximum gain. This pad is mounted on the side of the antenna can, adjustment "X."
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

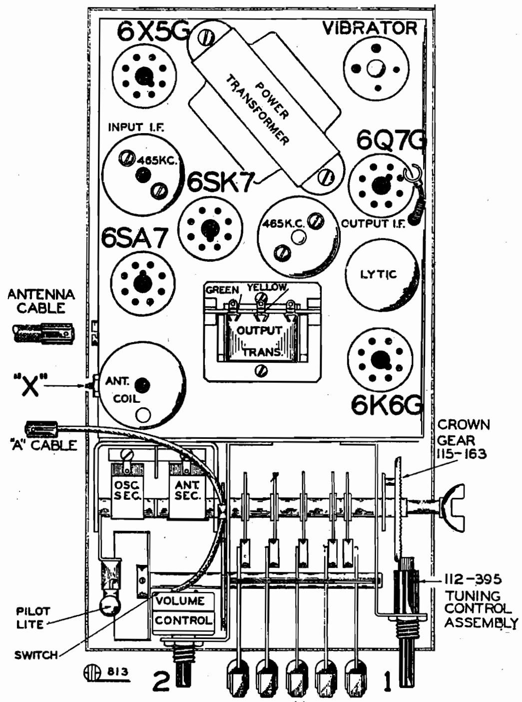


FIG. 3—TOP VIEW

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever an opening is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 1) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 1) to the right (clockwise) as far as it will turn, and tighten the special locking screw ("C") located on left side of tuner dial assembly (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

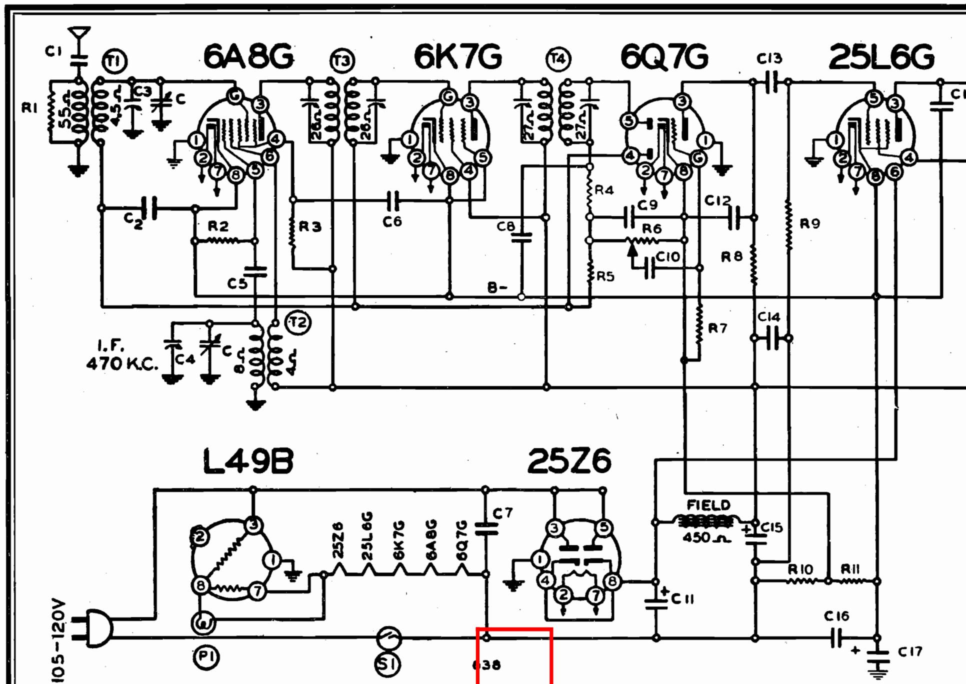
This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" one or two turns, select the new station as explained. Be sure to retighten the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

MODEL 633, Series A
Schematic, Socket
Trimmers, Voltage

BELMONT RADIO CORP.



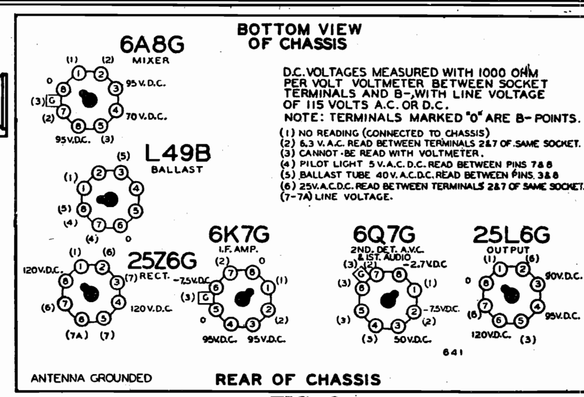
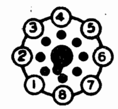


FIG. 3



WIRING SIDE OF OCTAL TUBE SOCKET SHOWING LOCATION OF PINS

Code No.	Part No.	Description
		RESISTORS
R1	13017	10M ohm—⅓ w.
R2	13012	50M ohm—⅓ w.
R3	130149	15M ohm—⅓ w.
R4	13012	50M ohm—⅓ w.
R5	130170	3 megohm—⅓ w.
R6	101127	Volume control (1 megohm)
R7	130225	15 megohm—⅓ w.
R8	130100	150M ohm—⅓ w.
R9	13011	250M ohm—⅓ w.
R10	130231	75 ohm—⅓ w.
R11	130174	50 ohm—⅓ w.
		CONDENSERS
C	10284	2 gang variable condenser
C1	1292	.0005 mica
C2	10026	.02 x 400 v.
C3		Antenna Trimmer—on gang
C4		Oscillator Trimmer—on gang
C5	12912	.00025 mica
C6	1009	.05 x 200 v.
C7	1001	.1 x 400 v.
C8	1295	.0001 mica
C9	1295	.0001 mica
C10	10011	.01 x 400 v.
C11	11953C	30 mfd. lytic
C12	12912	.00025 mica
C13	10011	.01 x 400 v.
C14	1009	.05 x 200 v.
C15	11953C	30 mfd. lytic
C16	11953C	40 mfd. lytic
C17	10091	.15 x 400 v.
C18	10067	.025 x 400 v.

NOTE:—C11, 15 and 16—One unit for 60 cycle Use 11953C (30 mfd. 30 mfd. 40 mfd.)
C11, 15 and 16—One unit for 25 cycle Use 11962C (60 mfd. 60 mfd. 40 mfd.)

Code No.	Part No.	Description
		PARTS
T1	111108	Antenna Coil complete
T2	11073	Oscillator Coil complete
T3	10882F	Input I. F.—470 kc. complete
T4	10883F	Output I. F.—470 kc. complete
T5	10560	Output Transformer
T6	114116E	5 inch Dynamic Speaker (450 ohm field)
S1		Off-on switch on volume control
P1	10794	T-44 Pilot Light

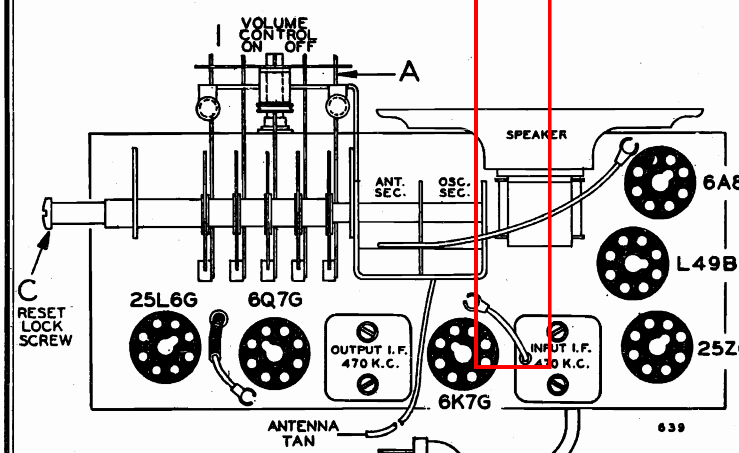


FIG. 1 — TOP VIEW

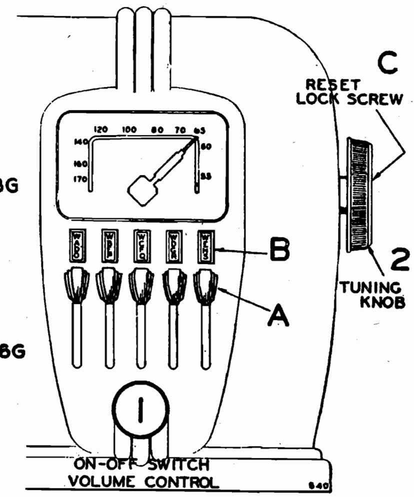


FIG. 2. — FRONT VIEW

MODEL 633, Series A
Alignment, Tuner, Parts

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 100 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	470 Kc.	.1 MFD.	Grid of 6A8G	Rotor full open (Plates out of mesh)	Four trimmers (See Fig. 1)	Output and input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	100 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	100 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Broadcast Antenna	Adjust to maximum output

FREQUENCY RANGE
535 to 1720 K.C.

Power Consumption .... 45 Watts
Power Output .... 1.2 Watts Undistorted, 2.1 Watts Maximum
Intermediate Frequency .... 470 K.C.

9-38

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are five levers on the front of the radio by means of which five stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the cabinet is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in the cabinet above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

HOW TO REMOVE CABINET:

CAUTION:—Always disconnect the line cord from the house current before removing the chassis from the cabinet.

To remove chassis from the cabinet unscrew the locking screw in the center of the tuning knob and pull tuning knob and volume knob off their shafts. Remove the back of the cabinet and the two screws that hold the chassis to the cabinet. Pull off the five buttons on the Automatic levers. Move the chassis toward back of cabinet so that control shafts and tuner assembly clear holes in cabinet, then chassis can be slipped out.

SPEAKER

114116E	T6	Five Inch Dynamic Speaker (450 Ohm Field)	3.00
10560	T5	Output Transformer for Speaker	.75

MISCELLANEOUS

101127	R6, S1	Volume Control and Switch (1 Megohm)	1.00
10284	C, C3, C4	Two Gang Variable Condenser	2.50
10560	T5	Output Transformer for Speaker	.75
10798		Line Cord and Plug	.50
128176BR		Brown Bakelite Cabinet Complete	3.00
128176W		Ivory Finish Bakelite Cabinet Complete	3.50
128134BR		Brown Bakelite Volume Knob	.10
128134W		Ivory Bakelite Volume Knob	.10
128189BR		Brown Bakelite Tuning Knob	.15
128189W		Ivory Bakelite Tuning Knob	.20
128200		Back for Cabinet (Specify Color)	.10
128173BR		Brown Buttons for Tuner Levers	.10
128173W		Ivory Buttons for Tuner Levers	.10
L49B		Ballast Resistor (in Tube Shell with Base)	.75

DIAL PARTS LIST

10794	P1	6-8 Volt Pilot Light Type T-44	.10
107201		Socket and Bracket for Pilot Light	.10
115224		Support Bracket for Automatic Tuning Mechanism (Mounts to Variable Condenser)	.10
115176		End Support Bracket for Automatic Tuning Mechanism	.10
117398		Brass Pulley (String Drive for Pointer; Mounts on Cam Shaft at Variable Condenser End)	.15
117399		Brass Pulley (String Drive for Pointer; Mounts on Right End of Cam Shaft with Spring Take-Up	.15
120200		Take-Up Spring for Drive Spring Pulley	.03
117258		Tuner Cams (Five Used)	.05
131157		Keywashers (Used on Each Side of Tuner Cams)	.02
131157B		Keywashers (Two Used; Have Holes to Attach Take-Up Spring)	.02
115174		Lever Complete with 117337 Roller	.15
117401		Lever Shaft	.15
117400		Locking Collar (for Right End of Cam Shaft)	.15
131141		Compression Spring Washer (for Locking Collar)	.02
117390		Locking Screw (Lock Tuner Cams; Inserted through Center of Tuning Knob)	.10
120181		Hairpin Springs (for Tuner Levers)	.03
117256		Brass Spacer (Three Used on Cam Shaft)	.05
117340		Brass Spacer (One Used on Cam Shaft)	.05
115249		Bracket for Dial Scale Complete with Two Small Brass Pulleys and Bushing for Pointer Shaft	.20
117403		Threaded Pulley and Stud for Pointer	.10
112489		Pointer	.25
112487		Dial Scale Calibrated	.35
112488		Crystal (Cover for Dial Scale)	.25
13143		Cinch Buttons (Fasten Dial Scale to Bracket)	.01
112445GW		Set of Call Letter Sheets	.15
112336		Clear Celluloid Tabs for Station Call Letters.... Doz.	.10
128173BR		Brown Bakelite Buttons for Tuner Levers	.10
128173W		Ivory Bakelite Buttons for Tuner Levers	.10

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance Percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

All prices quoted are list and are subject to the usual trade discounts.

Shipments are F.O.B. our Factory. When remitting in advance, please include postage.

WE CANNOT SUPPLY SPEAKER, CONES OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $0.90 NET, IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Voltage,Alignment

BELMONT RADIO CORP.

MODEL 634,Series A
Schematic,Socket,Trimmers

IF 470 kc. Dummy ant. .1mfd. cond. to grid of 6K7G tube. Variable plates out of mesh. Adjust 1st. IF trimmers to max. output. As above, connect to grid of 6A8G tube. Adjust 2nd IF trimmers to max. output.

B.C. 1720 kc, osc. sec.Variable plates out of mesh. Dummy ant. 100 mmf. to ant. lead. Adjust b.c.osc. trimmer to max. output. At 1400 kc ant. sec.Dummy ant. 100 mmf. Variable set at 1400 kc. Adjust ant. sec. trimmer to max. output.

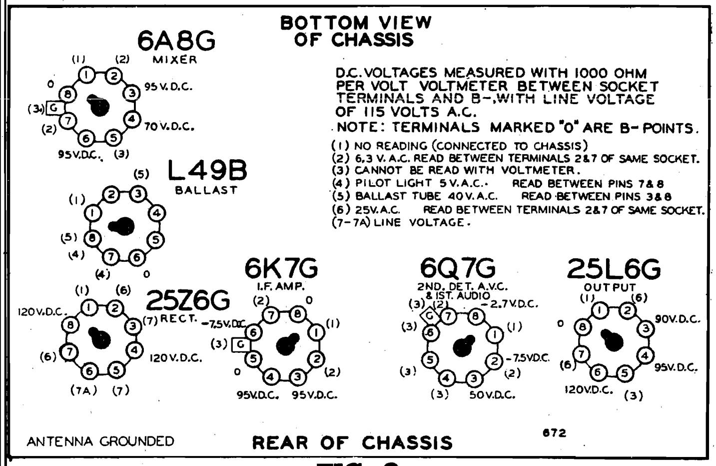
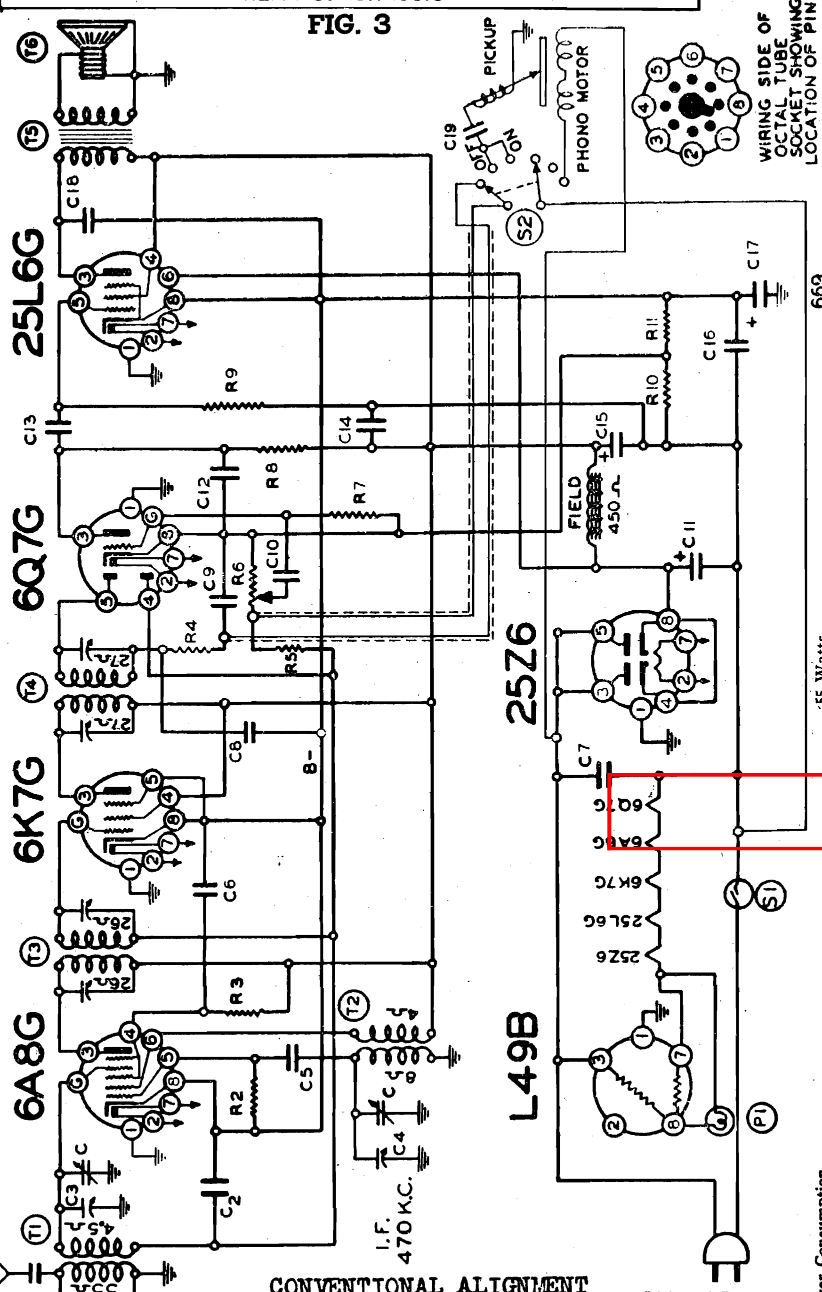


FIG. 3



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

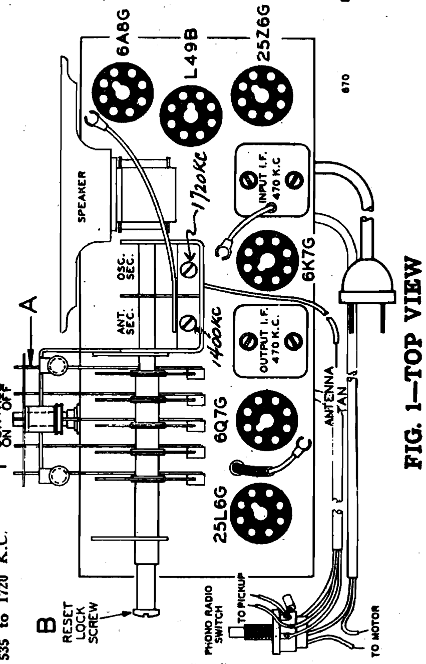


FIG. 1—TOP VIEW

FREQUENCY RANGE
535 to 1720 K.C.

Power Consumption .55 Watts
Power Output 1.2 Watts Undistorted, 2.1 Watts Maximum

Code No.	Part No.	Description
		RESISTORS
R1	13017	10M ohm—1/3 w.
R2	13012	50M ohm—1/3 w.
R3	130149	15M ohm—1/3 w.
R4	13012	50M ohm—1/3 w.
R5	130170	3 megohm—1/3 w.
R6	101139	1 megohm volume control
R7	130225	15 megohm—1/3 w.
R8	130100	150M ohm—1/3 w.
R9	13011	250M ohm—1/3 w.
R10	130231	75 ohm—1/3 w.
R11	130174	50 ohm—1/3 w.
		CONDENSERS
C	10288	2 gang variable condenser
C1	1292	.0005 mica
C2	10026	.02 x 400 v.
C3		Antenna Trimmer—on gang
C4		Oscillator Trimmer—on gang
C5	12912	.00025 mica
C6	1009	.05 x 200 v.
C7	1001	.1 x 400 v.
C8	1295	.0001 mica
C9	1295	.0001 mica

No. Code	No. Part	Description
C10	10011	.01 x 400 v.
C11	11953C	30 mfd. lytic
C12	12912	.00025 mica
C13	10011	.01 x 400 v.
C14	1009	.05 x 200 v.
C15	11953C	30 mfd. lytic
C16	11953C	40 mfd. lytic
C17	10091	.15 x 400 v.
C18	10067	.025 x 400 v.
C19	10026	.02 x 400 v.

NOTE—C11, 15 and 16—One unit for 60 cycle Use 11953C (30 mfd. 30 mfd. 40 mfd.) C11, 15 and 16—One unit for 25 cycle Use 11962C (60 mfd. 60 mfd. 40 mfd.)

PARTS

Code	Part	Description
T1	111108	Antenna Coil Complete
T2	11073	Oscillator Coil Complete
T3	10882F	Input I. F.—470 kc. complete
T4	10883F	Output I. F.—470 kc. complete
T5	10560	Output Transformer
T6	114116D	5" Dynamic Speaker (450 ohm field)
S1		Off-on switch on volume control
S2		Phono Switch
P1	10794	T-44 Pilot Light

MODEL 634, Series A
Tuner, Phono Data, Parts

BELMONT RADIO CORP.

CHASSIS MODEL 634

Series A

When ordering parts always mention complete factory model number, series and issue.

LIST OF REPAIR PARTS (Serial No. 281300 and up)

Use Only Genuine Factory Replacement Parts

Part No.	Circuit Diagram Reference	Description	List Price Each
		CONDENSERS	
1001	C7	.1 x 400 Volt Condenser	.25
1009	C6, C14	.05 x 200 Volt Condenser	.25
10011	C10, C13	.01 x 400 Volt Condenser	.25
10026	C2, C19	.02 x 400 Volt Condenser	.25
10067	C18	.025 x 400 Volt Condenser	.25
10091	C17	.15 x 400 Volt Condenser	.25
11953C	C11, C15, C16	30 MFD—30 MFD—40 MFD Electrolytic Condenser (for 60 Cycle)	1.50
11962C	C11, C15, C16	60 MFD—60 MFD—40 MFD Electrolytic Condenser (for 25 Cycle)	1.75
1292	C1	.0005 Mica Type Condenser—20%	.25
1295	C8, C9	.0001 Mica Type Condenser—20%	.25
12912	C5	.00025 Mica Type Condenser—20%	.25
		RESISTORS	
13011	R9	250M Ohm—1/3 Watt Resistor—20%	.20
13012	R2, R4	50M Ohm—1/3 Watt Resistor—20%	.20
13017	R1	10M Ohm—1/3 Watt Resistor—20%	.20
130100	R8	150M Ohm—1/3 Watt Resistor—20%	.20
130149	R3	15M Ohm—1/3 Watt Resistor—20%	.20
130170	R5	3 Megohm—1/3 Watt Resistor—25%	.20
130174	R11	50 Ohm—1/3 Watt Resistor—10%	.20
130225	R7	15 Megohm—1/3 Watt Resistor—30%	.20
130231	R10	75 Ohm—1/3 Watt Resistor—10%	.20
		COILS	
10882F	T3	Input I. F. Coil Assembly Complete with Can	1.25
10883F	T4	Output I. F. Coil Assembly Complete with Can	1.25
11073	T2	Oscillator Coil Assembly Complete	.50
111108	T1	Antenna Coil Assembly Complete	.75
		SOCKETS	
12193		Eight Prong Octal Sockets	.15
		SPEAKER	
114116D	T6	Five Inch Dynamic Speaker (450 Ohm Field)	3.00
10560	T5	Output Transformer for Speaker	.75
		MISCELLANEOUS	
101139	R6, S1	Volume Control and Switch (1 Megohm)	1.00
10288	C, C3, C4	Two Gang Variable Condenser	2.50
10560	T5	Output Transformer for Speaker	.75
10798		Line Cord and Plug	.50
128134BR		Brown Bakelite Volume Knob	.10
128189BR		Brown Bakelite Tuning Knob	.15
128173BR		Brown Buttons for Tuner Levers	.10
L49B		Ballast Resistor (in Tube Shell with Base)	.75
		PHONOGRAPH PARTS LIST	
104138	T7	Motor Complete with Turntable and Mounting Screws, Washers, etc.	6.50
12221		Turntable Only Less Motor	
107181		Phono Connector Cable	.50
107182		Motor Connector Cable	.10
115102		Needle Cup	.10
114120		Pick-Up Arm Complete	4.95
12541C	S2	Phono-Radio Switch	.75
112335		Indicator Plate for Phono-Radio Switch	.15
128109B		Wood Knob for Phono-Radio Switch	.15

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are five levers on the dial by means of which five stations may be selected, (See "A" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Numbers are placed on the cabinet above each of the automatic tuner levers. These numbers (1 to 5) are used to designate the stations instead of station call letter tabs.

Assign Stations for the levers numerically letting the numbers represent the stations you have chosen.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Part No.	Circuit Diagram Reference	Description	List Price Each
		DIAL PARTS LIST	
10794	P1	6-8 Volt Pilot Light Type T-44	.10
107201		Socket and Bracket for Pilot Light	.10
115224		Support Bracket for Automatic Tuning Mechanism (Mounts to Variable Condenser)	.10
115176		End Support Bracket for Automatic Tuning Mechanism	.10
117398		Brass Pulley (String Drive for Pointer; Mounts on Cam Shaft at Variable Condenser End)	.15
117399		Brass Pulley (String Drive for Pointer; Mounts on Right End of Cam Shaft with Spring Take-Up	.15
120200		Take-Up Spring for Drive Spring Pulley	.03
117258		Tuner Cams (Five Used)	.05
131157		Keywashers (Used on Each Side of Tuner Cams)	.02
131157B		Keywashers (Two Used; Have Holes to Attach Take-Up Spring)	.02
115174		Lever Complete with 117337 Roller	.15
117401		Lever Shaft	.15
117400		Locking Collar (for Right End of Cam Shaft)	.15
131141		Compression Spring Washer (for Locking Collar)	.02
117390		Locking Screw (Lock Tuner Cams; Inserted through Center of Tuning Knob)	.10
120181		Hairpin Springs (for Tuner Levers)	.03
117256		Brass Spacer (Three Used on Cam Shaft)	.05
117340		Brass Spacer (One Used on Cam Shaft)	.05
115249		Bracket for Dial Scale Complete with Two Small Brass Pulleys and Bushing for Pointer Shaft	.20
117403		Threaded Pulley and Stud for Pointer	.10
112489		Pointer	.25
112487		Dial Scale Calibrated	.35
112488		Crystal (Cover for Dial Scale)	.25
13143		Cinch Buttons (Fasten Dial Scale to Bracket)	.01
128173BR		Brown Bakelite Buttons for Tuner Levers	.10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Now rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("B") in the center of the tuning knob, (See Fig. 1).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "B" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob No. 2 securely and with a coin loosen the locking screw "B" one or two turns; select the new station as explained. **Be sure to retighten the locking screw,** otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

RADIO—PHONOGRAPH SWITCH:

The knob for the Radio—Phonograph Switch is located in the front left hand corner of the phonograph compartment. It is marked with a pin and under the knob an escutcheon plate is marked as follows: "Radio"—"Phono Off"—"Phono On"

Rotating the knob so that the pin marker on the knob is in line with the word "Radio" the switch is in radio playing position; when the pin is in line with the word "Phono Off" the switch disconnects the radio and connects the phonograph pick-up; when the pin is in line with the word "Phono-On" the switch connects the phonograph motor and is in phonograph playing position. **The motor must be started by hand.** Press down on the turntable with the fingers, spread and give the record and turntable a quick spin in a clockwise direction. The motor can be started rotating in either direction. For proper operation, however, it must rotate in a clockwise (to the right) direction.

To stop the phonograph motor turn the switch knob to "Phono-Off" position.

To disconnect phonograph entirely turn switch knob to extreme left to "Radio" position.

Volume control knob No. 1 on front of the radio controls the volume in either case; for radio, or for phonograph.

Trimmers, Voltage
Above Serial 50672

BELMONT RADIO CORP.

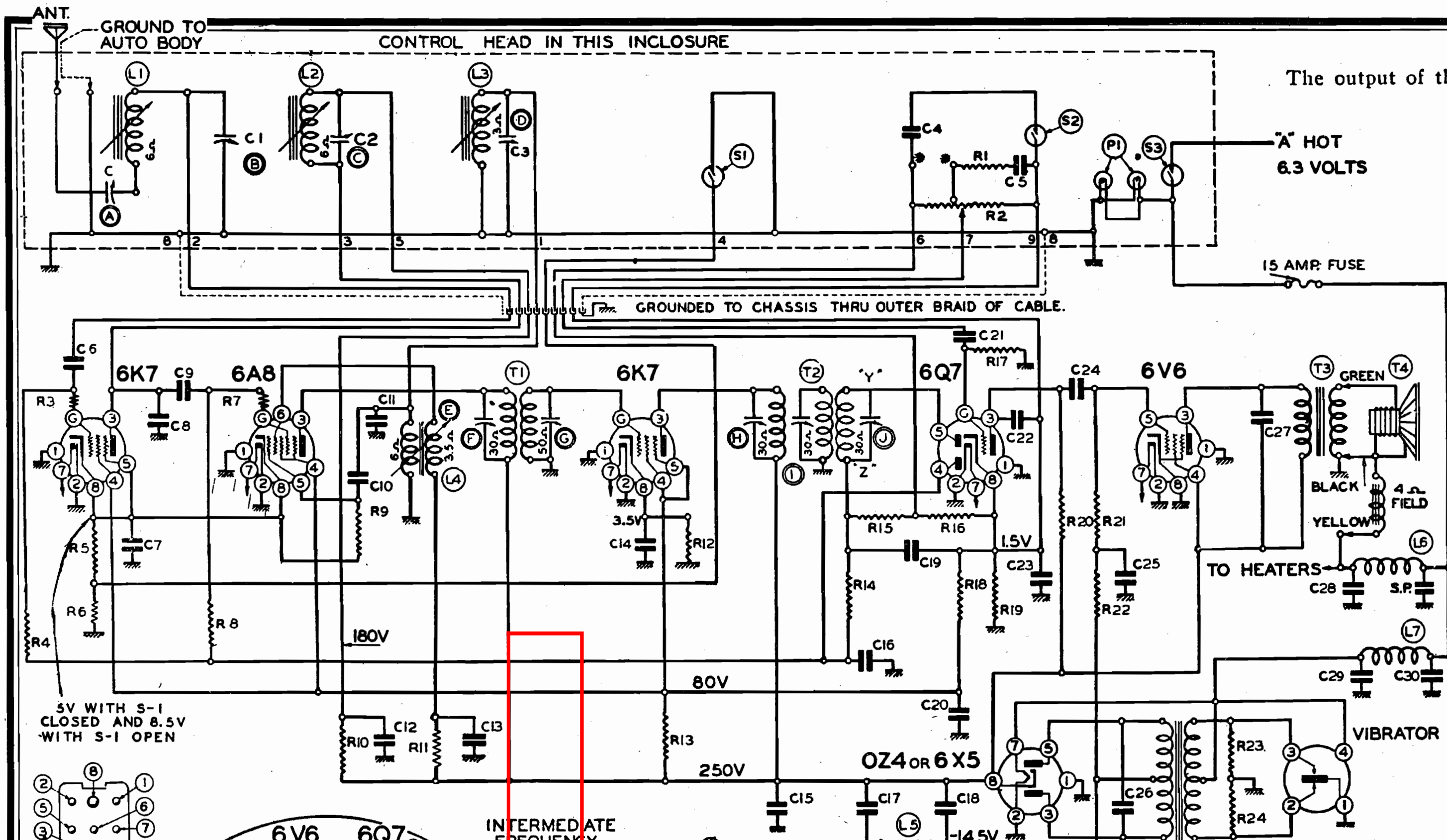
MODEL 677, Issue C
Schematic, Socket

TUBE COMPLEMENT

The tube complement of this chassis consists of the following octal base glass and metal tubes which are interchangeable with metal tubes.

1—Type No. 6K7—Remote Cut-off Pentode as an R.F. Amplifier.
1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator).
1—Type No. 6K7—Remote Cut-off Pentode as an I.F. Amplifier.
1—Type No. 6Q7G—Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1—Type No. 6V6—Beam—Power Amplifier.
1—Type No. OZ4—Rectifier.

The output of the receiver is 6 watts.



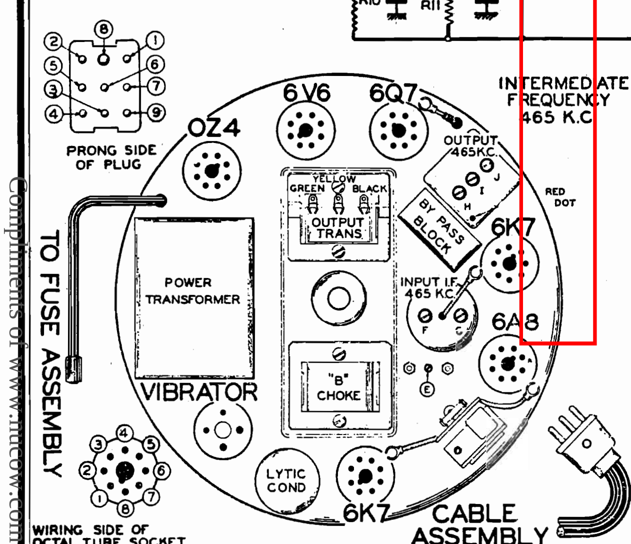


Fig. 3—Top View of Chassis

566

PARTS (Serial No. 50672 and up).

RESISTORS

Code No.	Part No.	Description
R1	130214	30M ohm—½ w.
R2	101109	1.2 megohm volume control
R3	13054	500 ohm—⅓ w.
R4	13019	1 megohm—⅓ w.
R5	13079	400 ohm—⅓ w.
R6	130222	350 ohm—⅓ w.
R7	13054	500 ohm—⅓ w.
R8	13019	1 megohm—⅓ w.
R9	13012	50M ohm—⅓ w.
R10	13021	20M ohm—⅓ w.
R11	13012	50M ohm—⅓ w.
R12	13054	500 ohm—⅓ w.
R13	13065	30M ohm—1 w.
R14	13019	1 megohm—⅓ w.
R15	13020	100M ohm—⅓ w.
R16	130118	600M ohm—⅓ w.
R17	13019	1 megohm—⅓ w.
R18	130208	40M ohm—⅓ w.
R19	130101	600 ohm—⅓ w.
R20	13011	250M ohm—⅓ w.
R21	1305	300M ohm—⅓ w.
R22	13011	250M ohm—⅓ w.
R23	13056	100 ohm—⅓ w.
R24	13056	100 ohm—⅓ w.

CONDENSERS

Code No.	Part No.	Description
C	12436	Antenna Trimmer—Max. 600 min. 100 Wkg. 350 mmf.
C1	12793	Antenna Trimmer 20-100 mmf.
C2	12782B	R. F. Trimmer 5-30 mmf.
C3	12784B	Oscillator Trimmer—5-30 mmf.
C4	10025	.002 x 600 v. condenser
C5	10019	.006 x 600 v. condenser
C6	12939	.00005 mica
C7	10022	.05 x 200 v. condenser
C8	12996	.000035 mica
C9	1292	.0005 mica
C10	12912	.00025 mica
C11	129101	.00007 mica
C12	11624	By-pass block .25 x 400 v.
C13	10013	.05 x 400 v. condenser
C14	1009	.05 x 200 v. condenser
C15	10088	.1 x 400 v. condenser
C16	10022	.05 x 200 v. condenser
C17	11951	12.0 mfd. x 400 w. v. lytic
C18	11951	12.0 mfd. x 400 w. v. lytic
C19	1295	.0001 mica
C20	11624	By-pass block—.25 x 400 v.
C21	10011	.01 x 400 v. condenser
C22	1295	.0001 mica
C23	10026	.02 x 400 v. condenser
C24	10011	.01 x 400 v. condenser
C25	11624	By-pass block—.25 x 200 v.
C26	10036	.01 x 1400 v. condenser
C27	10089	.008 x 800 v. condenser
C28	1296	.002 mica
C29	10031	.5 x 120 v. condenser
C30	10031	.5 x 120 v. condenser
SP		Spark Plate

C12, C20, C25 in same unit
C17, C18 in same unit

PARTS

Code No.	Part No.	Description
L1	111101	Antenna Permeability Coil Complete
L2	10940	R. F. Permeability Coil Complete
L3	11084	Oscillator Permeability Coil Complete
L4	11075	Adjustable Shunt Oscillator Coil
L5	10562	Filter Choke—250 ohms
L6	10566	"A" Choke
L7	10565	"A" Choke
T1	108120	Input I. F. Coil Complete—465 kc.
T2	108115	Output I. F. Coil Complete—465 kc.
T3	10561	Output Transformer
T4	114113	8" Dynamic Speaker
T5	104132	Power Transformer
S1	12547	Sensitivity Switch
S2	12547	Tone Control Switch
S3		Off-on switch on volume control
P1	10797	6-8 v. pilot light (2)

NOTE: Remote Tuner Units marked issue C were designed only to operate with radio chassis units marked issue C.

MODEL 677, Issue C
Alignment, Tuner Data
Notes

BELMONT RADIO CORP.

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

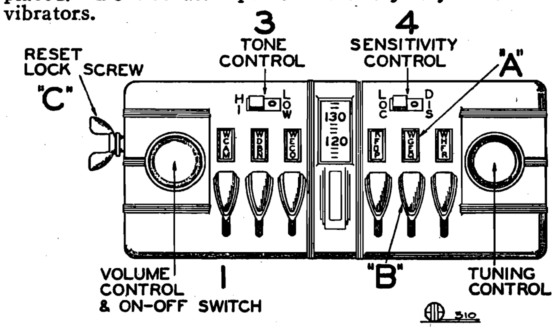


Fig. 2—Front View of Remote Tuner Unit

ALIGNING INSTRUCTIONS

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .5 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 125 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6V6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT: (465 K.C.)

IMPORTANT:
To align the output I.F. transformer without using a cathode ray oscillograph a 10M ohm resistor must be shunted across the tertiary coil of this unit.

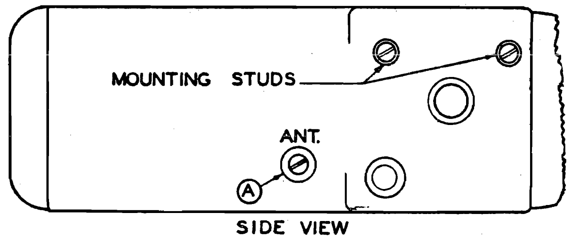
Connect the resistor as indicated by points "Y" and "Z" on the circuit diagram as follows:

Locate the wires coming from the bottom of the output I.F. coil assembly on the underside of the radio chassis.

The white lead with green tracer which is connected to diode plate terminal No. 5 on the 6Q7 tube socket is one point and the white lead with brown tracer which is connected to the end terminal of the terminal strip is the other point. Proceed as follows:

1. With the dial of the Remote Tuner Unit set at 1400 K.C. and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy to grid of 6K7 I.F. tube.
2. Adjust trimmers "H" and "I" of output I.F. transformer for maximum gain, (See Fig. 3, top view).
3. Disconnect the 10M ohm resistor which has been shunted across the tertiary winding and adjust trimmer "J" for maximum gain.
   (a) This transformer is now correctly tuned. Under no circumstances re-adjust trimmers "H" and "I" after the 10M ohm resistor has been removed.
   (b) For alignment of the output I.F. transformer using a cathode ray oscillograph the 10M ohm resistor is not used and the procedure is similar to the alignment of any two circuit I.F. transformer; merely tune for a symmetrical curve of maximum amplitude.
   (c) Output connections for the cathode ray oscillograph should be made to pin No. 8 on 6Q7 tube socket and to the end terminal on the terminal strip; at this point the diode load resistors terminate.
4. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers "F" and "G" of input I.F. transformer for maximum gain.

NOTE: A red dot on top of output I.F. can designates location of trimmer "H"



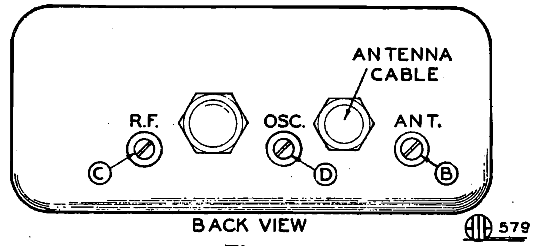


Fig. 4

BROADCAST ALIGNMENT:

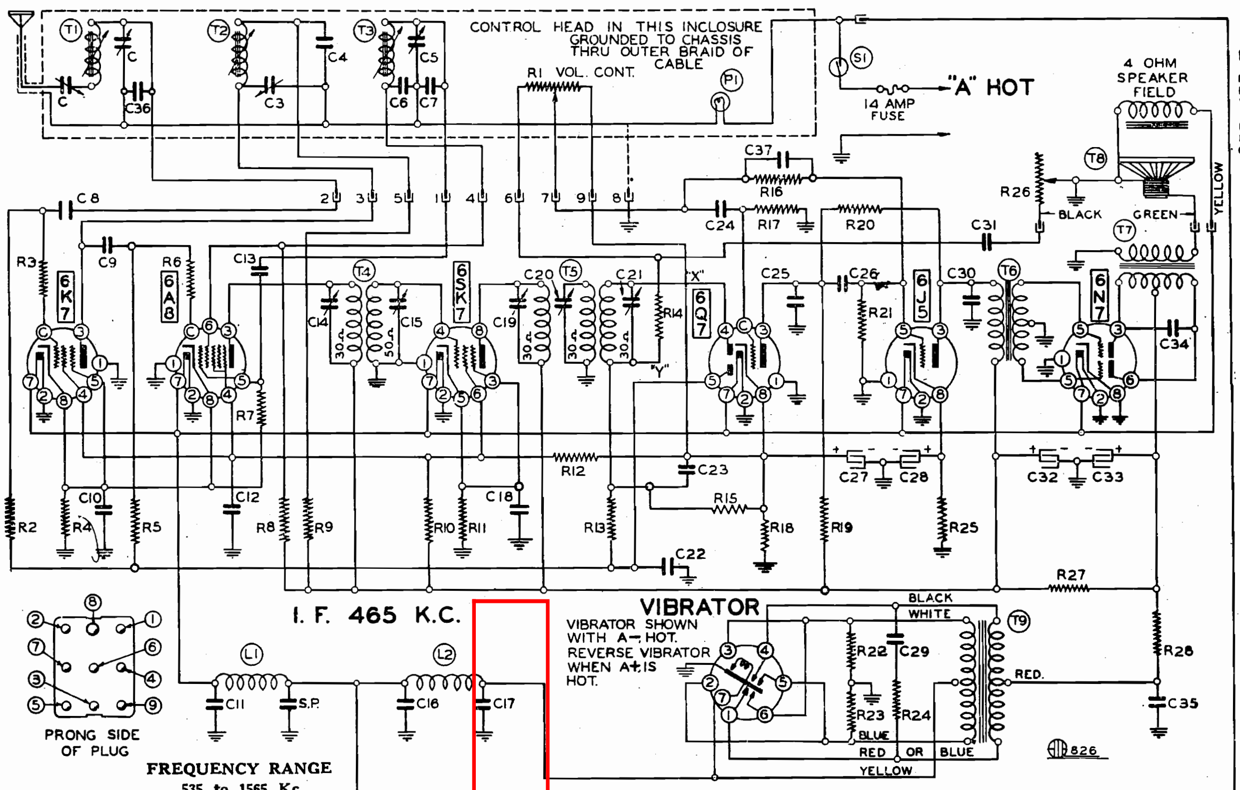
1. With the dial on the Remote Tuner Unit set at 1560 K. C., connect test oscillator set at 1560 K. C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjuts oscillator trimmer (adjustment "D", on back of Remote Tuner Unit) to resonance. (See Fig. 4, back view).
3. Re-set test oscillator to 1400 K. C. and pick up signal by rotating dial on Remote Tuner Unit. Adjust R. F. Trimmer (adjustment "C", on back of Remote Tuner Unit), to resonance. (See Fig. 4, back view).
   CAUTION: In order to realize maximum gain out of the antenna adjustments, back out antenna shunt trimmer (adjustment "B") on back of remote tuner unit all the way out and then adjust antenna series trimmer (adjustment "A") on side of remote tuner unit to resonance.
4. Re-set test oscillator to 600 K.C. and rotate Remote Tuner Unit dial to 600 K. C.
   Adjust shunt oscillator adjustment "E", rotating dial to and fro at the same time adjusting shunt oscillator for maximum gain. This adjustment is accessible from the top of the radio chassis, (See Fig. 3, top view).
5. Go back and check 1400 K. C. If adjustment is made here, check 600 K. C. again.

BELMONT RADIO CORP.

MODEL 678, Issue A
Schematic, Voltage
Socket, Trimmers

Power Output.......7 Watts Undistorted, 9 Watts Maximum

Power Consumption.......7.7 Amperes at 6.3 Volts



FREQUENCY RANGE
535 to 1565 Kc.

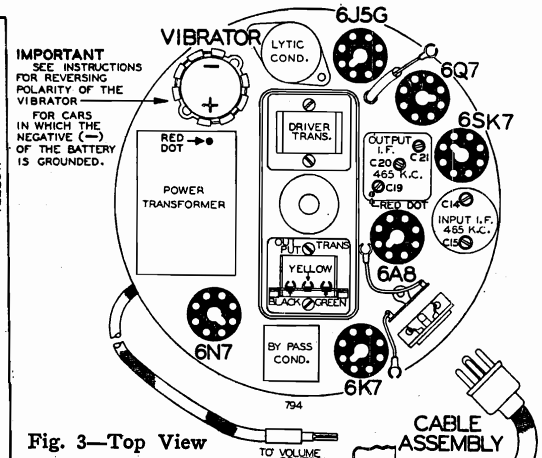


Fig. 3—Top View of Chassis

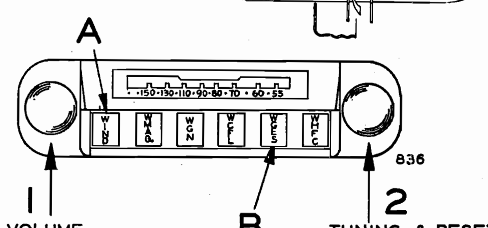


Fig. 2—Front View of Remote Tuner Unit

MODEL 678, Issue A   MARCH 1939   Serial No. 50,001 UP

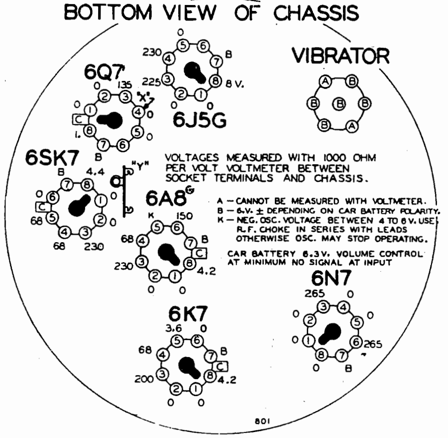


FIG. 5

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	101161	1.2 megohm volume control
R2	13019	1 megohm—1/3 w.
R3	130275	500 ohm—1/3 w.
R4	13079	400 ohm—1/3 w.
R5	13019	1 megohm—1/3 w.
R6	130275	500 ohm—1/3 w.
R7	13012	50M ohm—1/3 w.
R8	13012	50M ohm—1/3 w.
R9	13021	20M ohm—1/3 w.
R10	130196	30M ohm—1 watt
R11	130235	1500 ohm—1/3 w.
R12	1307	40M ohm—1/3 w.
R13	13019	1 megohm—1/3 w.
R14	13020	100M ohm—1/3 w.
R15	130118	600M ohm—1/3 w.
R16	130257	5 megohm—1/3 w.
R17	13019	1 megohm—1/3 w.
R18	130101	600 ohm—1/3 w.
R19	13011	250M ohm—1/3 w.
R20	13038	2 megohm—1/3 w.
R21	1303	500M ohm—1/3 w.
R22	130269	100 ohm—1/3 w.
R23	130269	100 ohm—1/3 w.
R24	13071	4M ohm—1/3 w.
R25	13092	1M ohm—1/3 w.
R26	101162	1 megohm tone control
R27	130199	1500 ohm Resistor—1 watt
R28	130231	75 ohm—1/3 w.
		CONDENSERS
C1	12480	Antenna Shunt Trimmer
C2	12481	Antenna Series Trimmer
C3	12480	R. F. Shunt Trimmer
C4	100102	.15 x 400 v.
C5	12480	Oscillator Shunt Trimmer
C6	129137	.0005 Mica
C7	129136	.00017 Mica
C8	12997	.00005 Mica—5%
C9	1292	.0005 Mica
C10	11625	.05 x 200 v.
C11	1296	.002 Mica
C12	11625	.25 x 400 v.
C13	12912	.00025 Mica
C14		Plate Trimmer on Input I.F. Trans.
C15		Grid Trimmer on Input I.F. Trans.
C16	10031	.5 x 120 v.
C17	10031	.5 x 120 v.
C18	1009	.05 x 200 v.
C19		Plate Trimmer on Output I.F. Trans.
C20		Tertiary Trimmer on Output I.F. Trans.
C21		Grid Trimmer on Output I.F. Trans.
C22	11625	.05 x 200 v.
C23	1295	.0001 Mica
C24	10011	.01 x 400 v.
C25	1295	.0001 Mica
C26	10011	.01 x 400 v.
C27	11978	20 mfd.—25 w. v. lytic
C28	11978	20 mfd.—25 w. v. lytic
C29	100101	.0055 x 1600
C30	129114	.0003 Mica
C31	10047	.002 x 600 v.
C32	11978	15 mfd.—450 w. v. lytic
C33	11978	15 mfd.—450 w. v. lytic
C34	100103	.004 x 800 v.
C35	1001	.1 x 400 volt
C36	12997	.00005 Mica—5%
C37	12967	.00004 Mica
		PARTS
T1	111118	P. B. Antenna Coil Assembly Complete
T2	10949	P. B. R. F. Coil Assembly Complete
T3	110109	P.B. Oscillator Coil
T4	108120B	Input I.F. Coil—465 kc.
T5	108115B	Output I.F. Coil—465 kc.
T6	10584	Audio Driver Transformer
T7	10583	Output Transformer
T8	114155	8" Dynamic Speaker
T9	104158	Power Transformer
L1	10566	"A" Choke
L2	10519	"A" Choke
P1	10794	6-8 v. Pilot Light
S1		Off-on Switch on volume control
	1269	Vibrator (130 cycle synchronous)

MODEL 678, Issue A
Alignment, Notes

BELMONT RADIO CORP.

Tuner Trimmers

DESCRIPTION:

Model 678 is a six tube superheterodyne receiver having a tuning range of 535 K. C. to 1565 K. C.; operates from a six volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a synchronous type vibrator.

The I. F. frequency used is 465 K. C. The output I. F. coil has three tuned circuits giving superior band pass qualities and selectivity as compared to the conventional two tuned circuit coils. Antenna, R. F. and oscillator circuits are permeability tuned, offering automatic tuning applications that are both accurate and stable. The entire coil assembly is mounted in the Remote Tuner control head being connected to the oscillator and R. F. circuits by an R. F. transmission cable.

The R. F. oscillator, I. F. and audio amplifier including the power supply is contained in the speaker case.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the voltage chart.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating which is known to be good, until the defective unit is located.

ALIGNMENT PROCEDURE

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

ALIGNING INSTRUCTIONS:

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 125 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Remote Tuner Dial Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Set dial at 1400 Kc.	Trimmers C19, C20 (See Fig. 3)	Output I. F.	See note "A" Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SK7	Set dial at 1400 Kc.	Trimmer C21 (See Fig. 3)	Output I. F.	See note "B" Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6A8	Set dial at 1400 Kc.	Trimmers C14, C15 (See Fig. 2)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1565 Kc.	125 mmf.	Antenna lead	Set dial at 1565 Kc.	Trimmer C5 (See Fig. 4)	Oscillator	Adjust to maximum output
	1400 Kc.	125 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmers C1, C3 (See Fig. 4)	Antenna and R. F.	Adjust to maximum output
	600 Kc.	125 mmf.	Antenna lead	Set dial at 600 Kc.	Trimmer C2 (See Fig. 4)	Antenna series adj.	See note "C"

NOTE "A" IMPORTANT: To align the output I. F. transformer without using a cathode ray oscillograph a 10M ohm resistor must be shunted across the diode tuned circuit. Connect the resistor as indicated by points "X" and "Y" on the circuit diagram and the bottom view of the radio chassis Fig. 5. A red dot on top of output I. F. can designates location of trimmer "C19."

NOTE "B" Before adjusting trimmer C21 disconnect the 10M ohm resistor. Under no circumstances re-adjust trimmers C19 or C20 after the 10M ohm resistor has been removed.

For alignment of the output I. F. transformer using a cathode ray oscillograph the 10M ohm resistor is not used.

NOTE "C" Maximum gain for this adjustment depends on the capacity of the antenna system of the car in which the radio is installed. For the proper alignment of this adjustment see "Adjusting Antenna Trimmer."

ALIGNMENT OF THE IRON CORES

The iron cores for the antenna, R. F. and oscillator permeability coils have been very carefully adjusted at the factory and require no further adjustment, unless it becomes necessary to replace a coil, or if the adjustments have been tampered with.

The procedure for aligning the iron cores will be supplied with replacement coils when ordered.

IMPORTANT—ADJUSTING ANTENNA TRIMMER:

Tune in any weak station between 600 and 800 kc.

Make sure that the antenna shunt trimmer on the **Bottom of the Remote Tuner** is turned all the way out (counter clockwise), (see adjustment "C1," Fig. 4,).

Adjust antenna series trimmer **on the side of the remote Tuner Unit.** For maximum output. (See adjustment "C2," Fig. 4,).

NOTE: If resonance (maximum output) cannot be obtained within the range of the antenna series trimmer "C2," turn the adjustment screw all the way out (counter clockwise) and then adjust the antenna shunt trimmer "C1" on the **bottom of the remote tuner unit** for a peak of maximum output.

The above arrangement will cover any antenna capacity that is now in use.

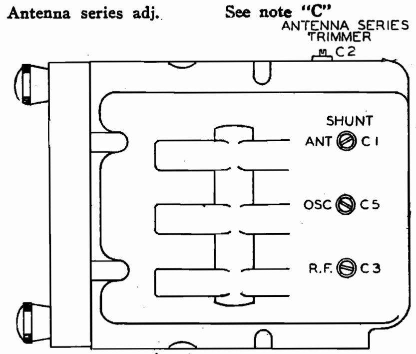


Fig. 4.—Bottom View of Remote Tuner

MODEL 678, Issue A

TUBE COMPLEMENT:

The tube complement of this chassis consists of the following metal and octal base glass tubes which are interchangeable with metal tubes.

1—Type No. 6K7 R. F. Amplifier.
1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator).
1—Type No. 6SK7—Remote Cut-off Pentode as an I. F. Amplifier.
1—Type No. 6Q7—Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1—Type No. 6J5G—Driver Amplifier.
1—Type No. 6N7—Push-Pull Output Amplifier.

BELMONT RADIO CORP.

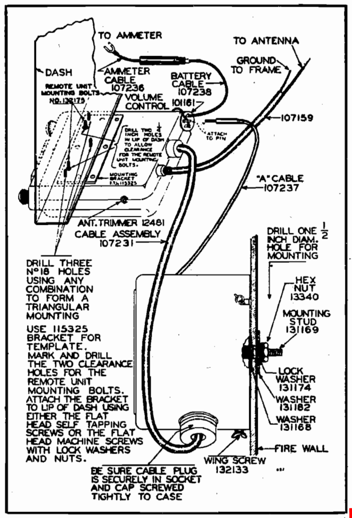


Fig. 1A—General Installation View

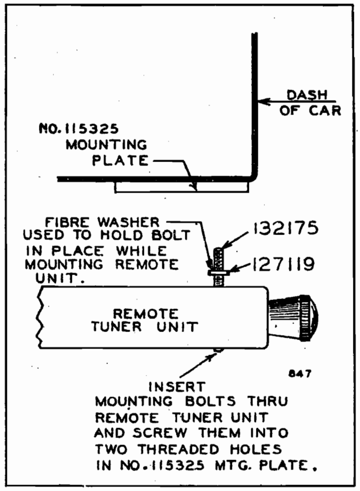


Fig. 1B—Remote Mounting

CONNECTIONS TO BATTERY:

CAUTION: Before making any battery connections, check **the polarity** of the vibrator **unit** (contained in radio unit) to **determine** whether it corresponds with the **polarity** of the **storage** battery in the car.

The radio is shipped from the factory with the vibrator inserted in its socket so that it will operate in **cars in** which the **positive** (+) post of the **storage battery** is **grounded** to the **frame** of the car.

In cars in which the **negative** (—) post of the **storage battery** is **grounded** to the frame of the car, the vibrator **must be pulled out** of its socket and **rotated** and **reinserted** into its **socket** so that the (—) sign on the top of the vibrator is **opposite** the **red dot** on the top of the **transformer cover;** (see Fig. 3, top view of radio chassis).

Check the polarity of the storage battery in car either by checking the actual wire connections on the battery or by using a voltmeter.

The ammeter cable, number 107236 (red wire with fuse receptacle at one end and terminal lug at other end), must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 10082 to battery terminal of ammeter, other end of capacitor to any convenient grounded screw on back of instrument dash panel.

Make certain the fuse is in the receptacle and the ammeter cable is properly connected to the short cable (number 107238), coming from the Remote Tuner Unit. (See Fig. 1A.)

In some installations it is advisable to connect the ammeter cable to the terminal on the ammeter which will not allow the current drawn by the radio to indicate on the ammeter, as additional motor interference may be encountered.

GENERATOR INTERFERENCE:

Remove the generator cutout mounting screw and fasten the condenser (10081) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten down securely.

Connect the condenser lead to the battery terminal of the cutout. The generator condenser is absolutely necessary as it used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated.

ANTENNA CONNECTION:

Insert the antenna plug in cable into the back of the remote tuner unit (see Fig. 1A). The wire at the other end of the antenna cable is connected to the lead-in wire from the antenna. Keep the antenna cable as far away from car wiring as possible and ground the pigtail of the antenna cable shield at the antenna end.

A 36 inch shielded antenna cable is regularly supplied. If a roof or door hinge type antenna is used, this cable will be long enough in practically all cases to reach the corner post or column at which the antenna lead comes down. The shielded cable should be pushed up into the column as far as possible. The reason for this is that ignition interference may be picked up by any unshielded portion of the antenna cable.

If an under car or running board antenna is used, the shielding must be extended to the antenna in all cases. The pigtail on the end of the antenna cable shield must be well grounded at the extreme antenna end. If it is necessary to extend the antenna cable, be sure that a pigtail is put on the end of the shielded extension and that it is well grounded at the extreme antenna end.

To extend the antenna cable shielding, the antenna lead wire should be covered with heavy insulation, such as loom, to properly separate the shielding from the wire. Then connect the two wires together and connect the two shields together, care being taken that no strand of the shield touches the antenna wire.

Aerials suitable for steel roof and convertible cars can be purchased from your dealer.

The majority of 1937, 1938 and 1939 cars have steel roofs, and a running board or other car antenna such as the fish pole, door hinge or over the top types must be used. The 1936 Chrysler Motors cars (except Plymouth—but including Chrysler, Dodge and De-Soto) have a steel roof, separated from the body proper, which is used as an antenna.

PROCEDURE FOR SETTING THE AUTOMATIC PUSHBUTTONS:

There are six pushbuttons on the Remote Tuner Unit by means of which six stations may be set up for automatic tuning (see B, Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the top of each pushbutton a slot is provided for inserting the call letter tabs, (see A, Fig. 2).

Insert the call letter tabs.

NOW, PROCEED AS FOLLOWS:—

1. Push the dial tuning knob **in** hard enough to make it **latch in.**
2. Rotate the dial tuning knob to the **left** (counter-clockwise), until the knob can not be turned any further **without forcing.**

   You will note that as the knob is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually **start unlocking** the tuner mechanism. Beyond this point the knob will **turn quite easily again** until the tuner mechanism is **completely unlocked.** At this point do not force the knob any **further. The tuner mechanism** is now **unlocked.**

   (NOTE:—Automatic **tuner mechanism is locked tight** when radio is shipped from the factory.)
3. Push in **all the way** any one of the pushbuttons and at the same time hold **in firmly** the dial tuning knob. **Both the dial tuning knob** and **the pushbutton** should **be pushed hard** enough to make them **stay latched in.** The reason for holding the dial tuning knob **in firmly** when the **pushbutton** is **pressed** in is due to the latching mechanism in the Remote Tuner unit which is so constructed to release the dial **tuning knob** entirely when a pushbutton is pressed in. When setting up stations for automatic tuning, however, it is necessary that both the dial **tuning knob** and the **pushbutton** be **latched in together.**
4. Press in on the **pushbutton which is latched in.** Holding it in **firmly,** tune in by means of the dial tuning knob the station indicated on the station call letter tab on this pushbutton. Turn the dial tuning knob very slowly back and forth (while still pressing in firmly on the pushbutton), until the station is clearest. The station will then be accurately tuned in.
5. Push in **all the way** another pushbutton, at the same time holding the dial tuning knob in so that **both the pushbutton** and the **dial tuning knob** are **latched in together.** Holding the pushbutton in **firmly,** tune in the station indicated on the call letter tab on this pushbutton.
6. Follow this procedure until you have tuned in all of your favorite stations.
7. When the last pushbutton has been properly set up it is necessary to **release** it from the latched-in position **before** the tuner mechanism can be locked. To release this pushbutton, press in very slightly any one of the other pushbuttons. This will **trip** the latching **mechanism and all the pushbuttons** will be **released** to **out position.**
8. Now, Press on the dial tuning knob hard enough to make it latch in. Rotate the dial tuning knob to the right (clockwise) until the knob can not be turned any further without forcing it.
   This will **lock** the **tuner mechanism** and all the stations that have been set up on the pushbuttons will be **locked** in place for automatic tuning.
9. Press in any one of the pushbuttons and—YOUR FAVORITE STATION IS SELECTED.

The **important** steps to remember when setting up stations on the pushbuttons for automatic tuning are:

1. To **unlock** the tuner mechanism press on the dial tuning knob hard enough to make it stay **latched in.** Rotate the dial tuning knob to the left (counterclockwise) until the knob cannot be turned any further without forcing it.
2. **To set a pushbutton,** Push in **all the way** and hold in **firmly both** the **pushbutton** and the **dial tuning knob** so that **both latch in.** Hold in **firmly** the pushbutton and tune in the station by means of the dial tuning knob. Set all the pushbuttons in the same manner.
3. **To release the last pushbutton** push in very slightly any one of the other pushbuttons. This will trip the latching mechanism.
4. **To lock the tuner mechanism** push on the dial tuning knob hard enough to make it stay latched in. Rotate the dial tuning knob to the right (clockwise) until the knob can not be turned any further without forcing it. (NOTE: All the pushbuttons must **be in out position** when **locking the tuner mechanism.**)

RADIO LOCATION AND MOUNTING:

Determine the most satisfactory mounting position.

Lift the radio case up and temporarily hold it in the proposed position. The case should be mounted high enough to avoid interference with car controls and the location of the Remote Tuner unit in respect to the radio case should be considered. The limiting factor being the length of special connector cable which connects the Remote Tuner unit to the radio case. **(This cable should not be altered in any manner).**

Mark location for the mounting bolt, drill one one-half inch (1/2") hole, making certain that the paint around the hole on the engine side of the fire wall is scraped clean to insure a good ground connection between receiver and the frame of the car.

CAUTION: Before fastening the radio unit read **very carefully** the paragraph on "CONNECTIONS TO BATTERY." This concerns the **polarity** of the **vibrator unit** and must be thoroughly understood as the radio **will not** operate unless the **polarity** of the **vibrator unit** corresponds with the **polarity** of the **storage battery** in the car.

TUNER UNIT MOUNTING: It may be necessary in some instances to move dash panel light switches or car heater control switches, however, in the majority of cases the Remote Tuner Unit will mount very satisfactorily under the dash panel to the left of the steering column. Mount the unit as close to the steering column as possible to allow clearance for the emergency brake which is mounted on the extreme left hand side of some makes of cars.

Details for mounting are shown in Fig. 1A and Fig. 1B, General Installation view.

The bracket No. 115325 for mounting the Remote Tuner Unit has three rows of holes to facilitate the best mounting in all makes of cars.

Use the bracket as a template, marking the lip of the dash for three mounting holes for the bracket and two clearance holes for the Remote Tuner unit mounting bolts. (See Fig. 1A.)

Mount the bracket using either the flat head self-tapping screws or the flat head machine screws, lockwashers and nuts supplied.

Insert the two Remote Tuner Unit mounting bolts through the holes in the unit using the two fibre washers to hold the bolts in place while mounting the unit to the bracket (see Fig. 1B). Screw the mounting bolts into the threaded holes in the mounting bracket (eight threaded holes are provided so that the remote unit can be mounted forward or further back as desired). Fasten the unit securely.

Connect the battery cable, number 107237 coming from the radio case to the pin on the volume control assembly on the rear of the Remote Tuner Unit.

Connect the R. F. cable assembly (cable number 107231) by inserting the plug of the cable into the receptacle socket on the side of the radio unit case. Screw the threaded cap of the cable assembly to the threaded fitting on the radio case **securely.** (See Fig. 1A.)

Important: This cable should not be altered in any manner.

This **unit** has been carefully designed to facilitate servicing; the entire case can be removed by loosening three wing head screws, exposing all tubes, vibrator and receiver circuits.

All adjustments are accessible being located on the side and bottom of the Remote Tuner unit (See Fig. 4), a full eight inch electro dynamic speaker is used.

The output of the receiver is 9 watts.

Model 751 Series A

SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts A.C. line or a fully charged 6 volt storage battery.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

SETTING THE AUTOMATIC TUNER LEVERS:

IMPORTANT—Read carefully before setting the automatic levers.

There are six levers by means of which six stations may be selected. Make a list of local stations or stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever button an opening is provided for inserting the call letter tabs.

Insert the call letter tabs in the rectangular openings of each of the automatic tuner buttons. One of the small celluloid tabs supplied should be inserted into place over each of the station call letter tabs.

NOW. PROCEED AS FOLLOWS:—

1. Pull the dial tuning knob **all the way out** (See Illus. "B," Fig 3), and rotate the tuning knob to the left (counterclockwise) until it cannot be turned any further (See Illus. "D," Fig. 3). This will unlock the automatic tuner mechanism. (NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Press **down all the way** any one of the automatic tuner levers. Holding it down **firmly,** press in on the dial tuning knob No. 3 and tune in the station indicated on the station call letter tab on this lever. You will note that in order to tune the station, the dial tuning knob will have to be **pressed in** (See Illus. "E," Fig. 3). Turn the dial tuning knob very slowly back and forth **(while still holding the automatic tuner lever in downward position),** noting the width of the shadow on the screen of the cathode-ray tuning indicator. **Minimum** width on the tuning indicator indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in.

3. Press down another automatic tuner lever. Holding it down **firmly, press in** on the dial tuning knob and carefully tune in the station indicated on the call letter tab on this lever.

4. Follow this procedure until you have selected all of your favorite stations.

5. Pull the dial tuning knob **all the way out** (See Illus. "B," Fig. 3) and rotate the tuning knob to the **right** (clockwise) until it cannot be turned any further (See Illus. "C," Fig. 3). This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place. After you have locked the tuner mechanism, push the dial tuning knob **in.**

6. If you should desire to change any station you selected to another, pull the dial tuning knob all the way **out** and rotate the knob to the left (counterclockwise) and unlock the tuner mechanism. Select the new station as explained.

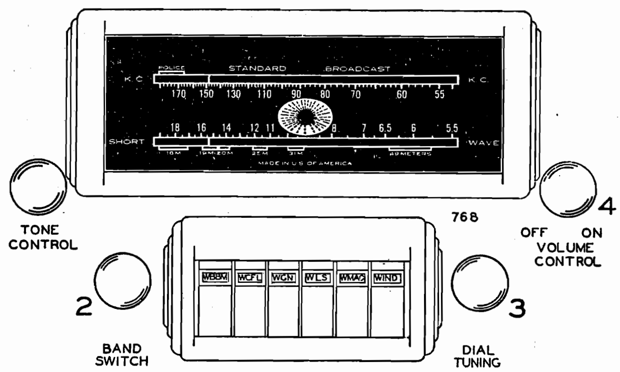


FIG. 2—FRONT VIEW

(NOTE:—**If the dial mechanism works hard when setting up** a new station for one of the automatic tuner levers, it is due to the tuner mechanism not being unlocked all the way. Pull the dial tuning knob out all the way and rotate the knob to the left (counterclockwise) until it will turn no further. The dial mechanism should work freely with the tuner lever pressed down).

7. After you have selected the new station, pull the dial tuning knob all the way **out** and rotate the knob to the **right** (clockwise) to lock the tuner mechanism. Be sure the knob is turned until it will turn no further, then **press** the dial tuning knob **in.**

8. The automatic tuner levers are now set up for quick tuning. Press down the lever key and—YOUR FAVORITE STATION IS SELECTED!

The **important** steps to remember when setting up stations on the tuner levers for automatic tuning are:

1. **To unlock** the tuner mechanism pull **the dial tuning** knob **all the way out.** You may find **it** necessary to rotate the knob slightly when pulling it out to make certain that the gears mesh properly. Rotate the dial tuning knob to the left (counterclockwise) as far as it will turn without forcing.

2. **To set a lever,** press down **all the way** and **hold in this** position while tuning in by means of the dial tuning knob the station you want this lever to be tuned to. (NOTE:—you will notice that it will be necessary to keep pressing in on the dial tuning knob while tuning in the station as a spring tends to push the knob out.) Set all the levers in the same manner before locking the mechanism.

3. To lock the tuner mechanism pull the dial tuning knob **all the way out.** Rotate the dial tuning knob to the right as far as it will turn making certain that it is tight, but it is not necessary to use force.

4. After locking or unlocking the tuner mechanism always return the dial tuning knob to its normal position **(pushed in).**

KNOB NO.3 (DIAL TUNING)

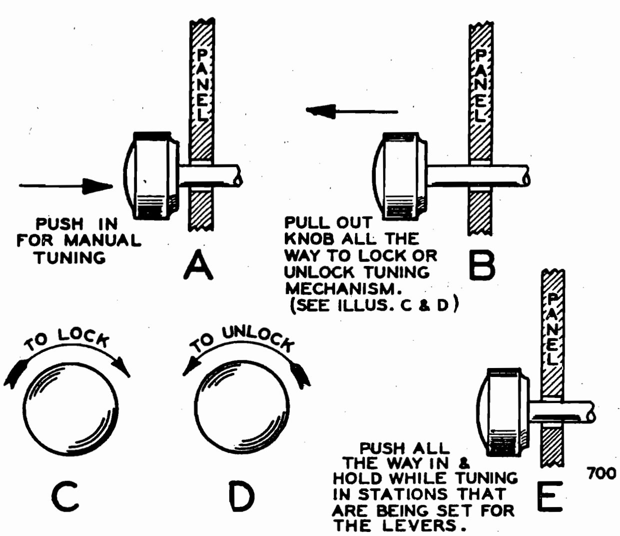
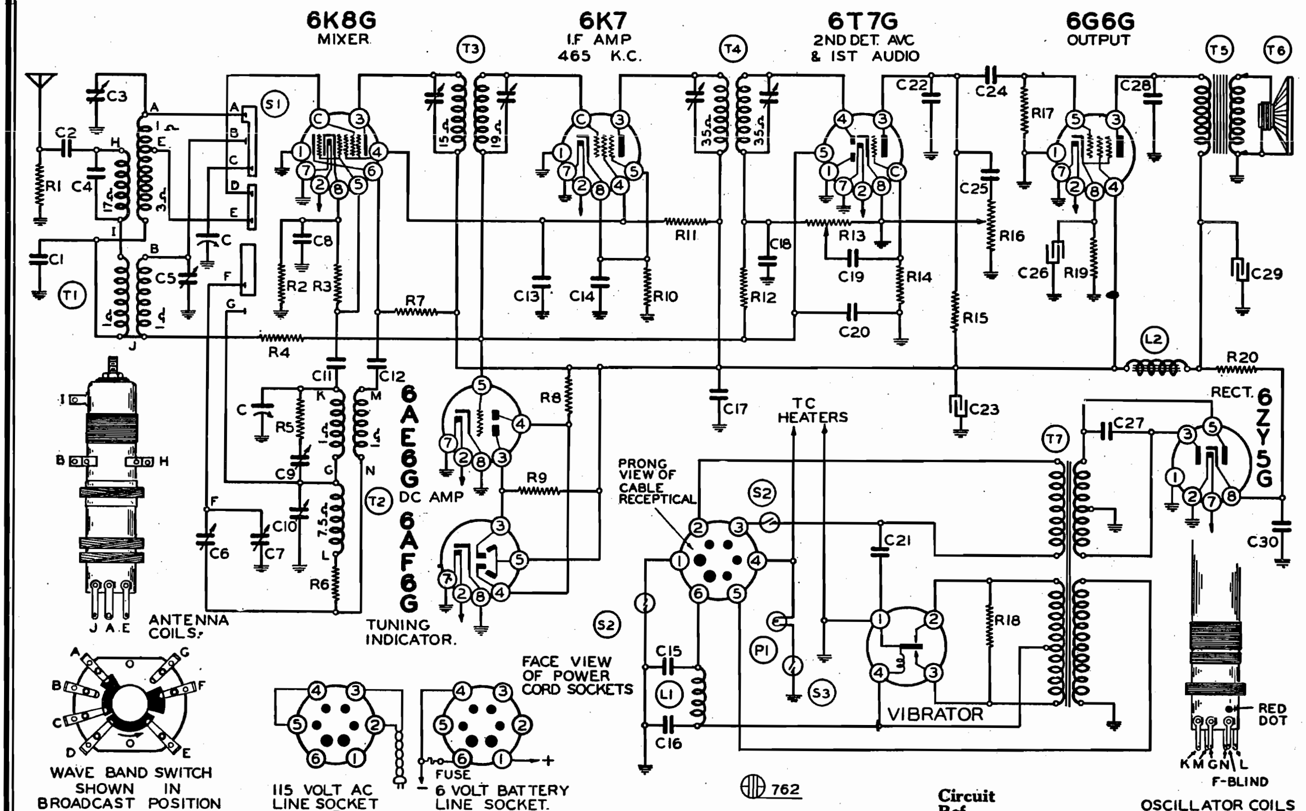
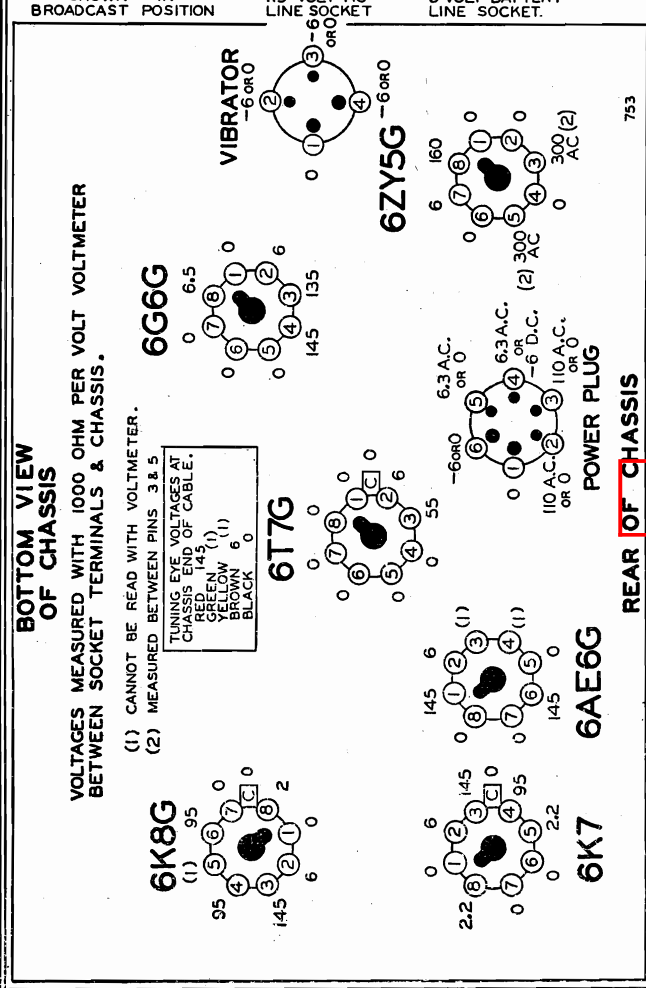


FIG. 3

MODEL 751, Series A
Schematic, Voltage

BELMONT RADIO CORP.





Model 751

Series A

7 TUBE INCLUDING CATHODE-RAY TUNING INDICATOR

2 Band A. C. and 6-Volt Storage Battery Operated Superheterodyne Receiver

BAND	FREQUENCY RANGE
Short Wave	5.6 to 18.1 MC.
Broadcast	535 to 1730 KC.

BAND SWITCH
Extreme Right Rotation
Extreme Left Rotation

Power Consumption.......40 Watts (At 115 volts 50-60 cycles), or 3.3 amperes at 6.3 volts
Power Output.......6 Watts Undistorted, 1 Watt Maximum

Circuit Ref. No.	Part No.	Description
		RESISTORS
R1	13017	10M ohm—1/3 w.
R2	13097	200 ohms—1/3 w.
R3	13094	50M ohm—1/3 w.
R4	13011	250M ohm—1/3 w
R5	130240	30 ohms—1/3 w.
R6	130197	20 ohms—1/3 w.
R7	13048	15M ohm—1/3 w.
R8	13068	1 megohm—1/3 w.
R9	13068	1 megohm—1/3 w.
R10	13079	400 ohms—1/3 w.
R11	13082	10M ohms—1/3 w.
R12	1304	3 megohm—1/3 w
R13	101153	1 megohm volume control
R14	130225	15 megohm—1/3 w.
R15	13011	250M ohm—1/3 w
R16	101154	250M ohm tone control
R17	1303	500M ohm—1/3 w.
R18	13097	200 ohms—1/3 w.
R19	13093	450 ohms—1/3 w.
R20	130168	100 ohms—1/3 w.
		CONDENSERS
C	10292C	2 gang variable condenser
C1	129131	.002775 mica
C2	10012	.003 x 600 v.
C3	12469	BC Antenna Trimmer
C4	129132	.000125 mica
C5	12469	S. W. Antenna Trimmer
C6	12466	B. C. Series Pad
C7	12466	S. W. Series Pad
C8	10020	.1 x 200 v.
C9	12470	S. W. Oscillator Trimmer
C10	12470	B. C. Oscillator Trimmer
C11	12938	.00005 mica
C12	10025	.002 x 600 v.
C13	10020	.1 x 200 v.
C14	10020	.1 x 200 v.
C15	10040	.5 x 120 v
C16	10040	.5 x 120 v.
C17	10020	.1 x 200 v.
C18	12960	.00015 mica
C19	10019	.006 x 600 v.
C20	1009	.05 x 200 v.
C21	10011	.01 x 400 v.
C22	1292	.0005 mica
C23	11979B	16 mfd. lytic—200 w v.
C24	10026	.02 x 400 v.
C25	10019	.006 x 600 v.
C26	11979B	20 mfd.—25 w. v. lytic
C27	10073	.008 x 1200 v.
C28	10019	.006 x 600 v.
C29	11979B	16 mfd. lytic—200 w. v.
C30	10020	.1 x 200 v.

C23, C26 and C29 in same unit

MODEL 751, Series A
Alignment, Socket
Trimmers, Notes

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROADCAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer C10 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer C3 (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer C6 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer C9 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer C5 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer C7 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attentuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all possible causes of trouble, such as poor installations, open or grounded antenna systems, low battery voltage, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

To remove the chassis from the cabinet, remove the four bolts which are used to fasten the chassis to the cabinet bottom; pull the knobs off their shafts and detach the pointer from the drive string (see Fig. 1, top view).

NOTE:—On the side of the string dial drum a calibrated scale is provided for aligning this chassis to the frequencies listed in the alignment procedure. Attach a pointer so that it will indicate proper dial setting in respect to the position of the variable condenser.

1. For 6 volt storage battery operation:
   (a) Use cable No. 107128C.
   (b) Connect the lead (containing the fuse receptacle) marked A negative (—) to the negative (—) post of the storage battery.
   (c) Connect the lead marked A positive (+) to the positive (+) post of the storage battery.
2. For 105-125 volts, 50/60 cycle operation:
   (a) Use special cable No. 107129.
   (b) Plug receptacle of cable into power socket on chassis.

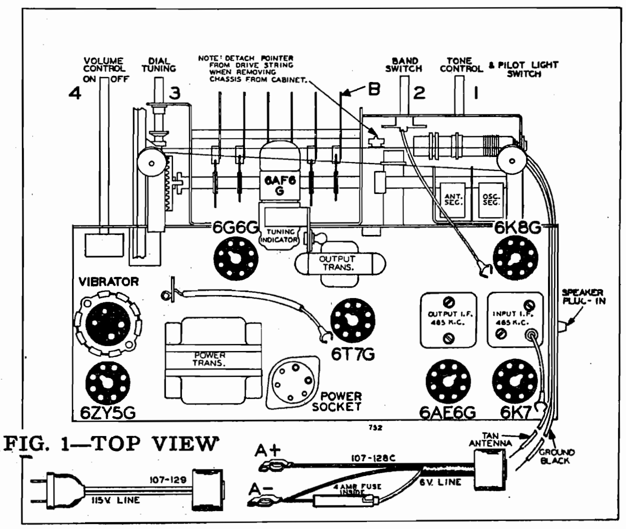
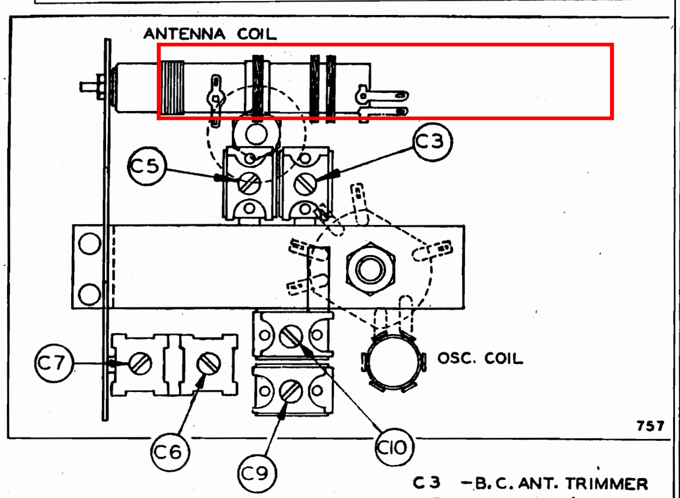


FIG. 1—TOP VIEW



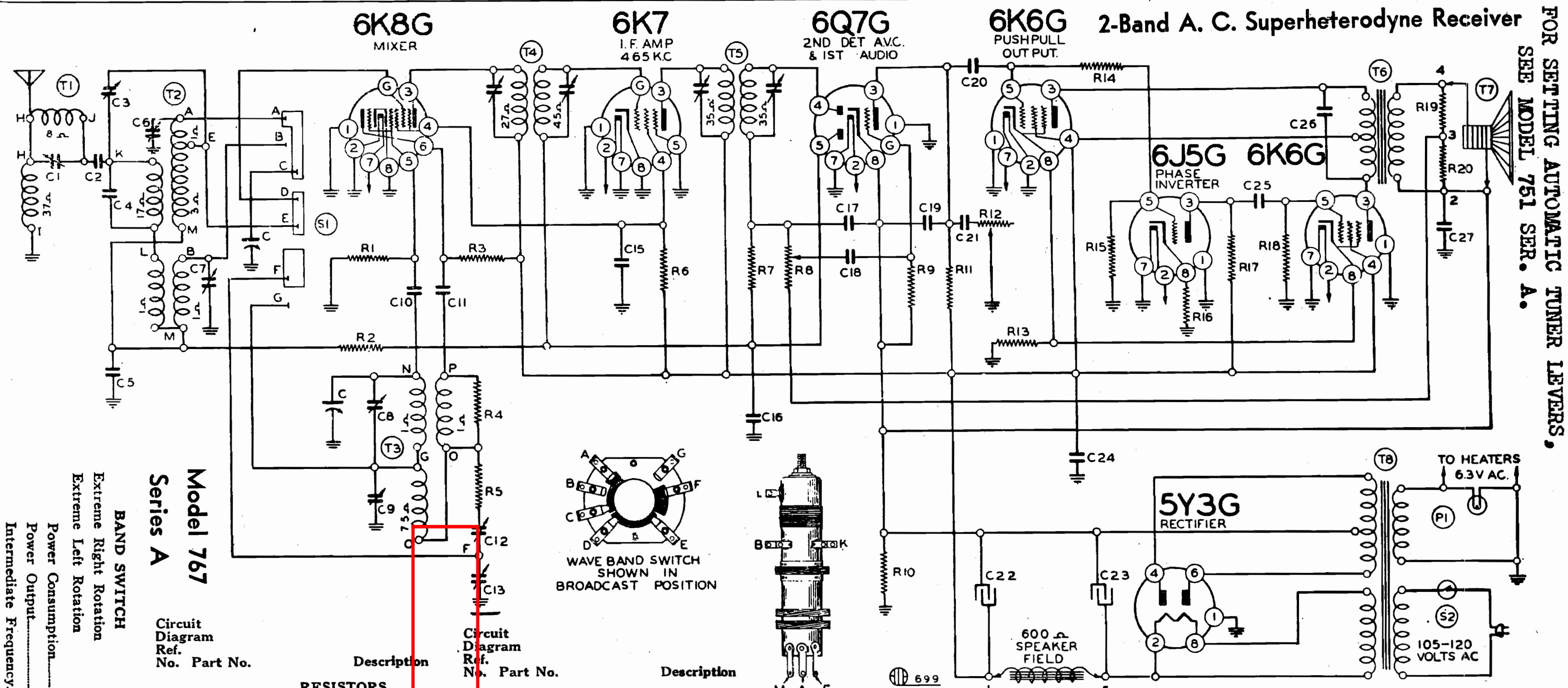
Model 751 Series A

C3 —B.C. ANT. TRIMMER
C5 —S.W. ANT. TRIMMER
C9 —S.W. OSC. TRIMMER
C10 —B.C. OSC. TRIMMER
C6 —B.C. OSC. PAD
C7 —S.W. OSC. PAD

MODEL 767, Series A
Schematic, Socket, Trimmers

BELMONT RADIO CORP.

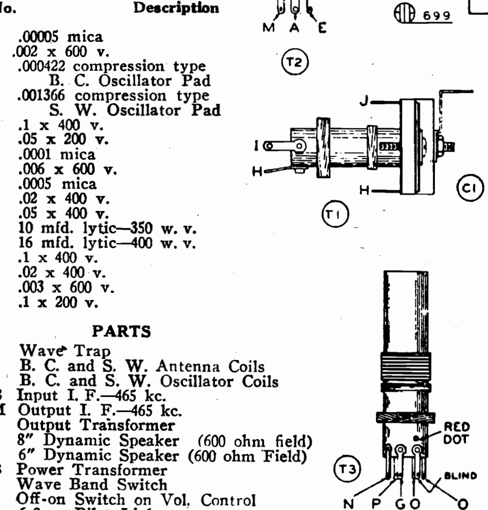
FOR SETTING AUTOMATIC TUNER LEVERS, SEE MODEL 751 SER. A.



Model 767
Series A

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13094	50M ohm—1/3 w.
R2	13011	250M ohm—1/3 w.
R3	13030	25M ohm—1 watt
R4	13031	1500 ohm—1/3 w.
R5	130231	75 ohm—1/3 w.
R6	13030	25M ohm—1 watt
R7	1304	3 megohm—1/3 w.
R8	101144	1 megohm volume control
R9	130225	15 megohm—1/3 w.
R10	130240	30 ohm—1/3 w.
R11	130103	100M ohm—1/3 w.
R12	101145	1 megohm tone control
R13	130220	300 ohm—1 watt
R14	130163	400M ohm—1/3 w.
R15	130103	100M ohm—1/3 w.
R16	130218	5M ohm—1/3 w.
R17	13094	50M ohm—1/3 w.
R18	130102	500M ohm—1/3 w.
R19	130168	100 ohm —1/3 w.
R20	130215	25 ohm—1/3 w.
		CONDENSERS
C	10292	2 gang variable condenser
C1	12467	Wave Trap Trimmer
C2	10011	.01 x 400 v.
C3	12468	Image Adj. Trimmer
C4	129132	.000125 mica
C5	129131	.002775 mica
C6	12469	B. C. Antenna Trimmer
C7	12469	S. W. Antenna Trimmer
C8	12470	S. W. Oscillator trimmer
C9	12470	B. C. Oscillator Trimmer

Circuit Diagram Ref. No.	Part No.	Description
C10	12939	.00005 mica
C11	10025	.002 x 600 v.
C12	12466	.000422 compression type B. C. Oscillator Pad
C13	12466	.001366 compression type S. W. Oscillator Pad
C15	1001	.1 x 400 v.
C16	1009	.05 x 200 v.
C17	1295	.0001 mica
C18	10019	.006 x 600 v.
C19	1292	.0005 mica
C20	10026	.02 x 400 v.
C21	10013	.05 x 400 v.
C22	11974	10 mfd. lytic—350 w. v.
C23	11973	16 mfd. lytic—400 w. v.
C24	1001	.1 x 400 v.
C25	10026	.02 x 400 v.
C26	10012	.003 x 600 v.
C27	10020	.1 x 200 v.
		PARTS
T1	108125	Wave Trap
T2	111112	B. C. and S. W. Antenna Coils
T3	11098	B. C. and S. W. Oscillator Coils
T4	108105B	Input I. F.—465 kc.
T5	108106M	Output I. F.—465 kc.
T6	10554B	Output Transformer
T7	114135	8" Dynamic Speaker (600 ohm field)
T7	114134	6" Dynamic Speaker (600 ohm Field)
T8	104143B	Power Transformer
S1	12568	Wave Band Switch
S2		Off-on Switch on Vol. Control
P1	10794	6-8 v. Pilot Light



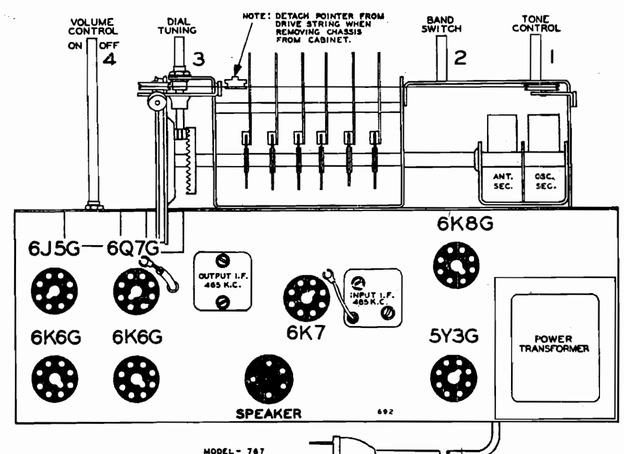


FIG. 1—TOP VIEW

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.6 to 18 MC.
Extreme Left Rotation	Broadcast	540 to 1730 KC.

Power Consumption.............80 Watts (At 115 volts 50-60 cycles)
Power Output.............5 Watts Undistorted, 7 Watts Maximum
Intermediate Frequency.............465 KC.

MODEL 767, Series A
Alignment, Trimmers
Voltage

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

Model 767 Series A

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B" 1400KC is the image frequency of 2330KC. Adjust Trimmer (C3) until a **minimum** output is obtained.

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a snort heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C9) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer (C6) (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C12C) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
	465 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C1) (See Fig. 4)	I. F. Wave Trap	Adjust for minimum output
IMAGE REJECTION ADJUST-MENTS	2330 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1400 Kc. on dial	Trimmer (C3) (See Fig. 4)	Image rejection	Adjust for **minimum** output (See note "B")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer (C8) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 Mc.	Trimmer (C7) (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer (C13) (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

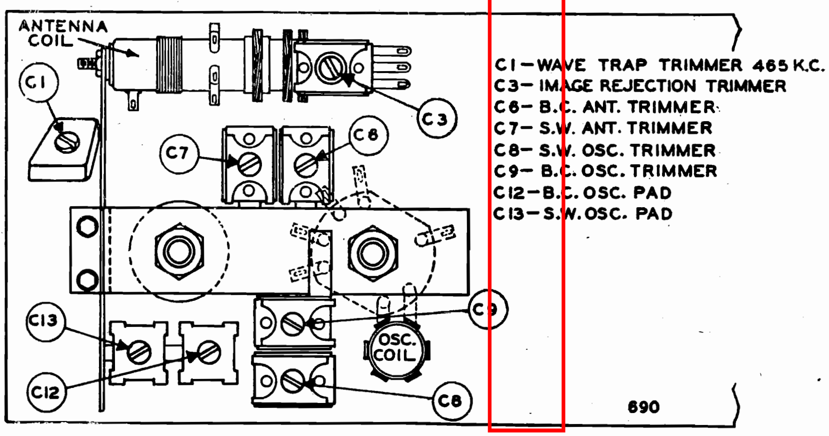


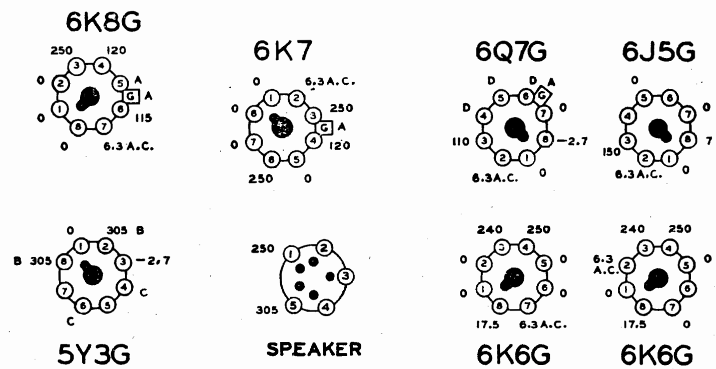
FIG. 4

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

A.C. LINE VOLTAGE 115 VOLTS.

A — CANNOT BE READ WITH VOLTMETER
B — 5.0 V.A.C. BETWEEN PINS 8 AND 2
C — 650 V.A.C. BETWEEN PINS 4 AND 6
D — −2.7 V. BIAS ACROSS RESISTOR R10



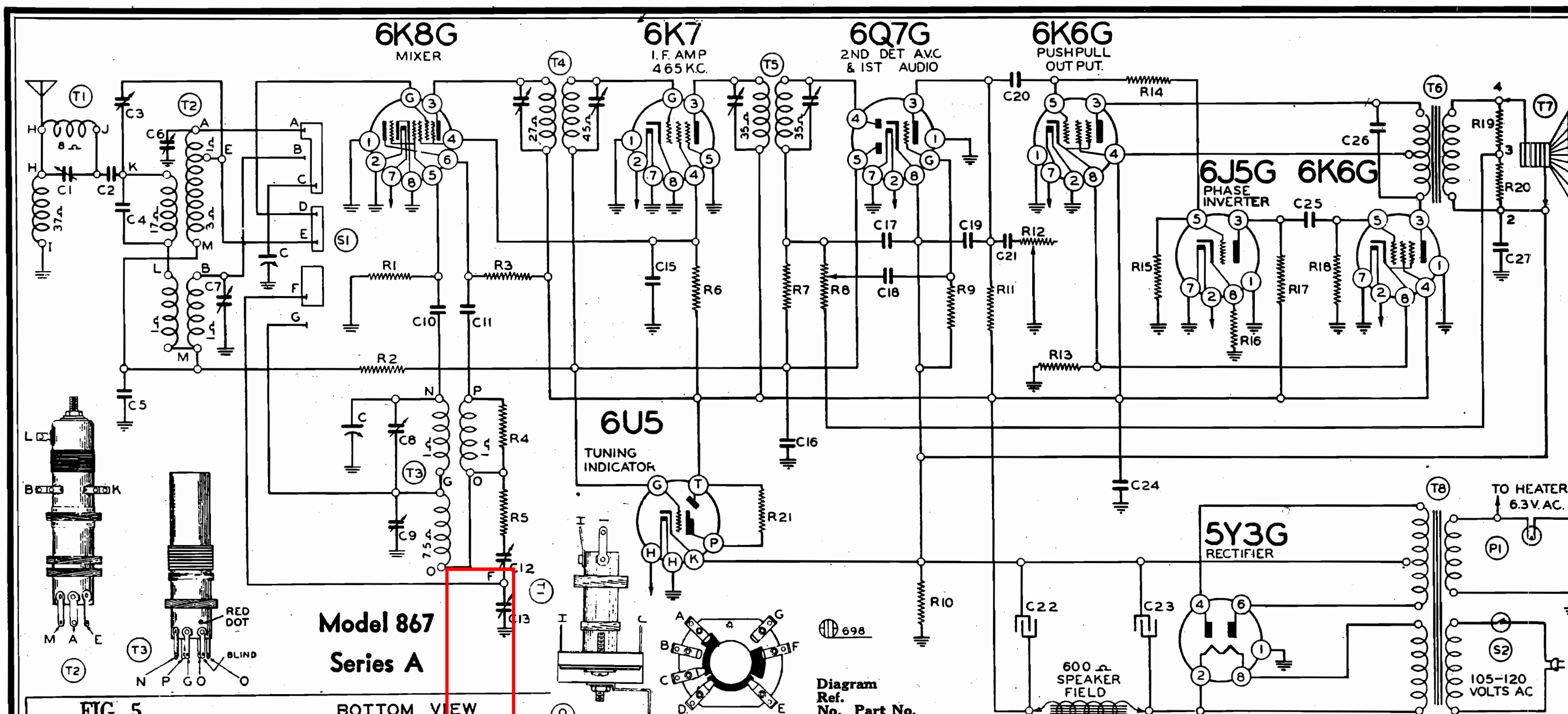
REAR OF CHASSIS

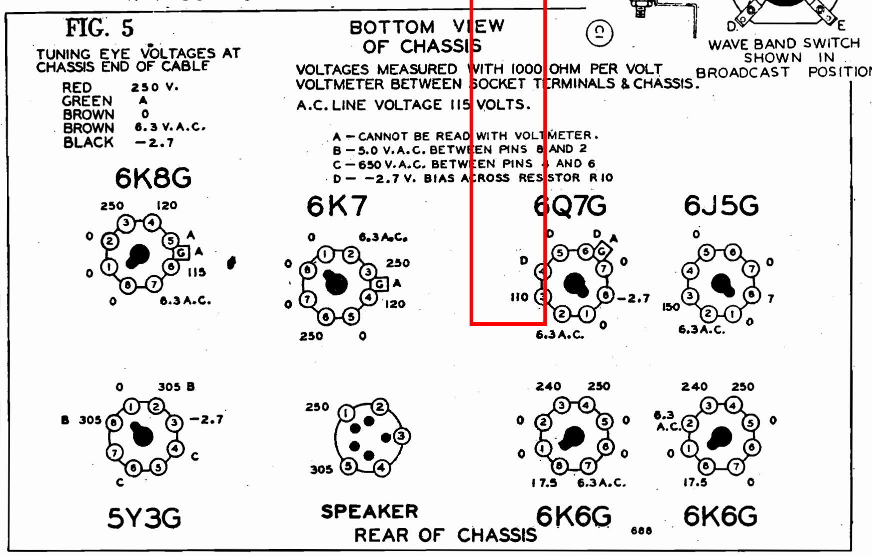
MODEL 867, Series A
Schematic, Voltage
Tuner Data

BELMONT RADIO CORP.

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	540 to 1730 KC. (Kilocycles)
Short Wave	Lower	5.6 to 18.0 MC. (Megacycles)

FOR SETTING AUTOMATIC TUNER LEVERS, SEE INDEX.





PARTS (Serial No. 8J271900 and up)

Diagram Ref. No.	Part No.	
		RESISTORS
R1	13094	50M ohm—1/3 w.
R2	13011	250M ohm—1/3 w.
R3	13030	25M ohm—1 watt
R4	13031	1500 ohm—1/3 w.
R5	130231	75 ohm—1/3 w.
R6	13030	25M ohm—1 watt
R7	1304	3 megohm—1/3 w.
R8	101144	1 megohm volume control
R9	130225	15 megohm—1/3 w.
R10	130240	30 ohm—1/3 w.
R11	130103	100M ohm—1/3 w.
R12	101145	1 megohm tone control
R13	130220	300 ohm—1 watt
R14	130163	400M ohm—1/3 w.
R15	130103	100M ohm—1/3 w.
R16	130218	5M ohm—1/3 w.
R17	13094	50M ohm—1/3 w.
R18	130102	500M ohm—1/3 w.
R19	130168	100 ohm —1/3 w.
R20	130215	25 ohm—1/3 w.
R21	130110	1 megohm— 1/10 in tuning indicator socket
		CONDENSERS
C	10292	2 gang variable condenser
C1	12467	Wave Trap Trimmer
C2	10011	.01 x 400 v.
C3	12468	Image Adj. Trimmer
C4	129132	.000125 mica
C5	129131	.002775 mica
C6	12469	B. C. Antenna Trimmer
C7	12469	S. W. Antenna Trimmer
C8	12470	S. W. Oscillator trimmer
C9	12470	B. C. Oscillator Trimmer
C10	12939	.00005 mica
C11	10025	.002 x 600 v.
C12	12466	.000422 compression type B. C. Oscillator Pad
C13	12466	.001366 compression type S. W. Oscillator Pad
C15	1001	.1 x 400 v.
C16	1009	.05 x 200 v.
C17	1295	.0001 mica
C18	10019	.006 x 600 v.
C19	1292	.0005 mica
C20	10026	.02 x 400 v.
C21	10013	.05 x 400 v.
C22	11974	10 mfd. lytic—350 w. v.
C23	11973	16 mfd. lytic—400 w. v.
C24	1001	.1 x 400 v.
C25	10026	.02 x 400 v.
C26	10012	.003 x 600 v.
C27	10020	.1 x 200 v.
		PARTS
T1	108125	Wave Trap
T2	111112	B. C. and S. W. Antenna Coils
T3	11098	B. C. and S. W. Oscillator Coils
T4	108105B	Input I. F.—465 kc.
T5	108106M	Output I. F.—465 kc.
T6	10554B	Output Transformer
T7	114135	8" Dynamic Speaker (600 ohm field)
T7	114136	10" Dynamic Speaker (600 ohm field)
T8	104143B	Power Transformer
S1	12568	Wave Band Switch
S2		Off-on Switch on Vol. Control
P1	10794	6-8 v. Pilot Light

MODEL 867, Series A
Alignment, Socket
Trimmers

BELMONT RADIO CORP.

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.6 to 18 MC.
Extreme Left Rotation	Broadcast	540 to 1730 KC.

Power Consumption.....80 Watts (At 115 volts 50-60 cycles)
Power Output.....5 Watts Undistorted, 7 Watts Maximum
Intermediate Frequency.....465 KC.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C9) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer (C6) (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C12C) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
	465 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C1) (See Fig. 4)	I. F. Wave Trap	Adjust for minimum output
IMAGE REJECTION ADJUST-MENTS	2330 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1400 Kc. on dial	Trimmer (C3) (See Fig. 4)	Image rejection	Adjust for minimum output (See note "B")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer (C8) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 Mc.	Trimmer (C7) (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer (C13) (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

NOTE "B" 1400KC is the image frequency of 2330KC. Adjust Trimmer (C3) until a minimum output is obtained.
After each band is completed, repeat the procedure as a final check.

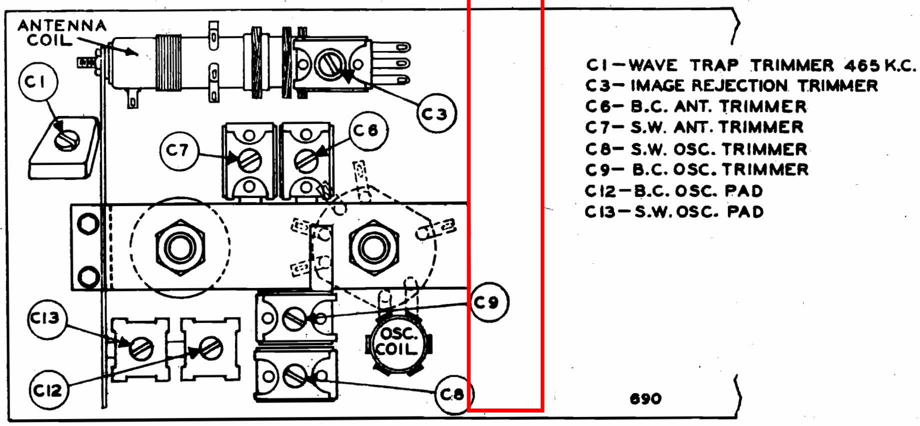


FIG. 4

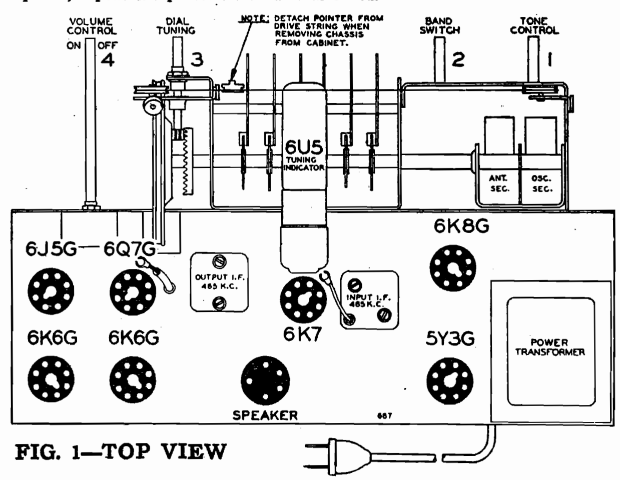
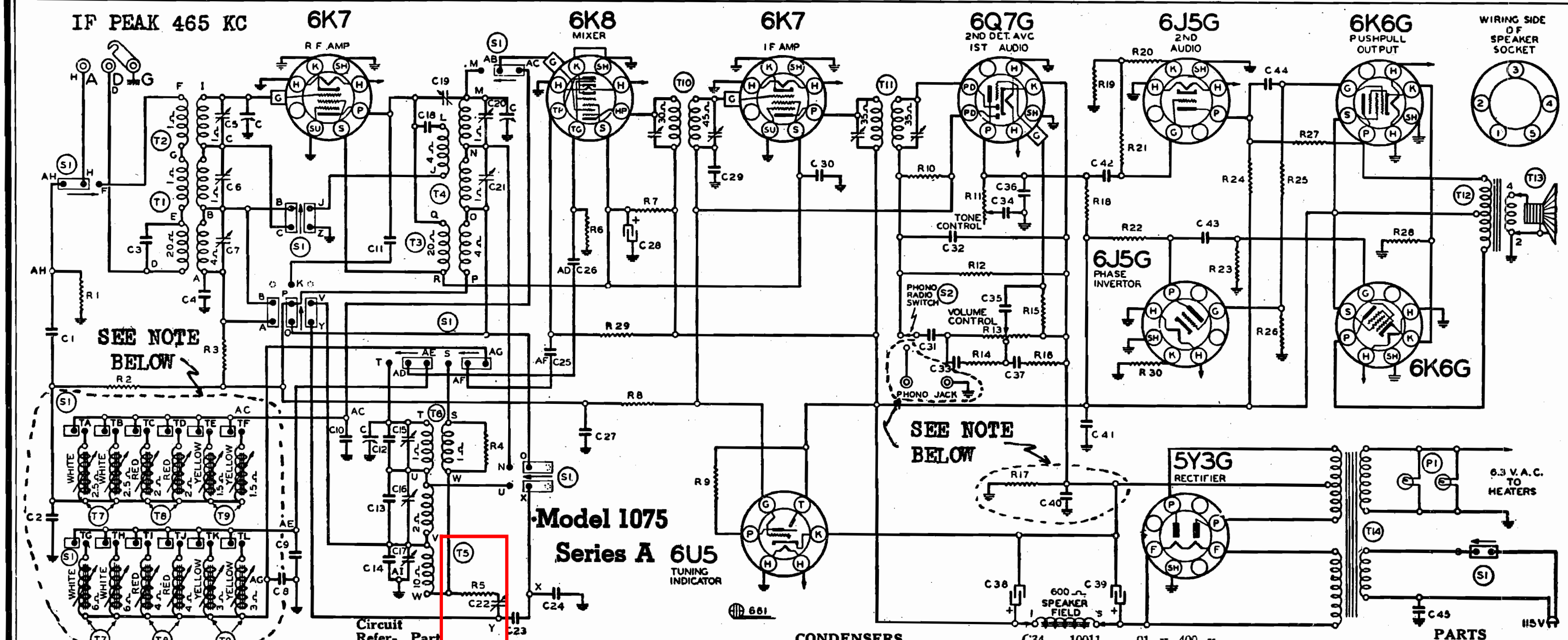


FIG. 1—TOP VIEW

BELMONT RADIO CORP.

MODEL 1075, Series A, B Schematic

IF PEAK 465 KC



Model 1075
Series A

Circuit Reference No.	Part No.	Description
		RESISTORS
R1	130179	20M ohm
R2	130241	200M ohm
R3	130205	100M ohm
R4	130235	1500 ohm
R5	130197	20 ohm
R6	13094	50M ohm
R7	130237	12,500 ohn
R8	130103	100M ohm
R9	130110	1 megohm (in Tuning Indicator Socket)
R10	1304	3 megohm
R11	101129	Tone Control (250M ohm)
R12	1303	500M ohm
R13	101128	Volume Control (1 megohm)
R14	1309	200M ohm
R15	130225	15 megohm
R16	130236	30M ohm
R17	130240	30 ohm
R18	130172	250M ohm
R19	13082	10M ohm
R20	130234	6M ohm
R21	13019	1 megohm
R22	130103	100M ohm
R23	1303	500M ohm
R24	130103	100M ohm
R25	130163	400M ohm
R26	13094	50M ohm
R27	130163	400M ohm
R28	130220	300 ohm
R29	130123	15M ohm
R30	130193	3M ohm
R31	13011	250M ohm
R32	13011	250M ohm

CONDENSERS

C1	10025	.002 x 600 v.
C2	12971	.002 Mica
C3	12940	.0001 Mica
C4	10093	.05 x 200 v.
C5		S. W. Antenna Trimmer
C6		M. W. Antenna Trimmer
C7		B. C. Antenna Trimmer
C8	129123	.0008 Mica (Silver Mica type; 0-Temperature Coefficient)
C9	129119	.000329 Mica (Silver Mica type; 0-Temperature Coefficient)
C10	129111	.000484 Mica (Silver Mica type; 0-Temperature Coefficient)
C11	12934	.0002 Mica
C12	12981	.000010 Mica
C13	129113	.000015 Mica
C14	129113	.000015 Mica
C15		S. W. Oscillator Trimmer
C16		M. W. Oscillator Trimmer
C17		B. C. Oscillator Trimmer
C18	12938	.00005 Mica
C19		B. C. R. F. Trimmer
C20		S. W. R. F. Trimmer
C21		M. W. R. F. Trimmer
C22	12435	B. C. Series Pad
C23	129105	.0035 Compression Type
C24	129115	.00232 Compression Type
C25	10025	.002 x 600 v.
C26	12962	.00003 mica
C27	10093	.05 x 200 v.
C28	11961	12 mfd.-350 w.v. lytic condenser
C29	10026	.02 x 400 v.
C30	10053	.25 x 400 v.
C31	1009	.05 x 200 v.
C32	12921	.0002 Mica
C33	12921	.0002 Mica
C34	10011	.01 v 400 v.
C35	10071	.004 x 600 v.
C36	129114	.0003 Mica
C37	10078	.01 x 200 v.
C38	11964	10 mfd.—350 w.v. lytic
C39	11964	16 mfd.—400 w.v. lytic
C40	10020	.1 x 200 v.
C41	10074	.1 x 400 v.
C42	10026	.02 x 400 v.
C43	10026	.02 x 400 v.
C44	10026	.02 x 400 v.
C45	10061	.02 x 600 v.
C	10280	3 gang variable
		C38 and C39 in same unit
C46	11977	200 mfd. x 6 v. lytic

PARTS

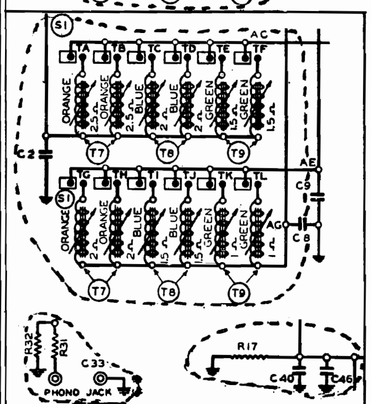
T1	111105	B. C. Antenna Coil
T2	111106	B. W. M. W. Antenna Coil
T3	10945	B. C. R. F. Coil
T4	10946	S. W. M. W. R. F. Coil
T5	11090	B. C. Oscillator Coil
T6	11091	S. W. M. W. Oscillator Coil
T12	10556B	Output Transformer
T13	114126	Dynamic Speaker (600 ohm field)
T14	104143	Power Transformer
S1	112466	Push Button Switch
S2		Phono Radio Switch
P1		(2) 6-8 volts pilot lights

Series A only

T7	11083 and 11083B	Low Frequency Tuner Coils
T8	11082	Medium Frequency Tuner Coils
T9	11081 and 11081B	High Frequency Tuner Coils
T10	108105H	Input I. F.—465 kc.
T11	108106G	Output I. F.—465 kc.

Series B only

T7	110102 and 110102B	Low Frequency Tuner Coils
T8	110101	Medium Frequency Tuner Coils
T9	110100 and 110100B	High Frequency Tuner Coils
T10	108105H	Input I. F.—465 kc.
T11	108126	Output I. F.—465 kc.



Model 1075 Series B

Series A and Series B are similar. Series B differs from Series A as shown above.

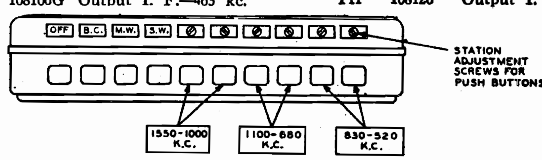


FIG. 4—Showing Station Adjustment Screws.

MODEL 1075, Series A, B
Alignment

BELMONT RADIO CORP.

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metalic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Pushbutton Indicated Below Pushed "In"	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7 1.F Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
BAND BROAD-CAST	1690 Kc.	200 mmf	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer (C17) (See Fig. 5)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set dial at 1400 Kc.	Trimmer (C7), (C19) (See Fig. 5)	Broadcast antenna and R. F.	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set dial at 600 Kc.	Trimmer (C22) (See Fig. 5)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set dial at 17 MC	Trimmer (C15) (See Fig. 5)	Short wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave	Set dial at 17 MC	Trimmer (C5), (C20) (See Fig. 5)	Short wave antenna and R. F.	Adjust to maximum output
MEDIUM WAVE BAND	5 Mc.	400 ohms	Antenna lead	Med. Wave	Set dial at 5 MC	Trimmer (C16) (See Fig. 5)	Medium wave oscillator	Adjust to maximum output
	5 Mc.	400 ohms	Antenna lead	Med. Wave	Dial set at 5 MC	Trimmer (C6), (C21) (See Fig. 5)	Medium wave antenna and R. F.	Adjust to maximum output

NOTE "A". Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

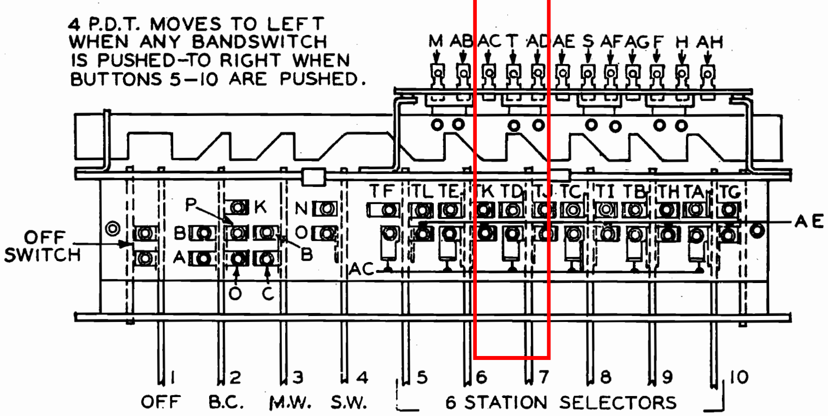
Attentuate the signal from the signal generator to prevent the leveling-off action of the AVC.

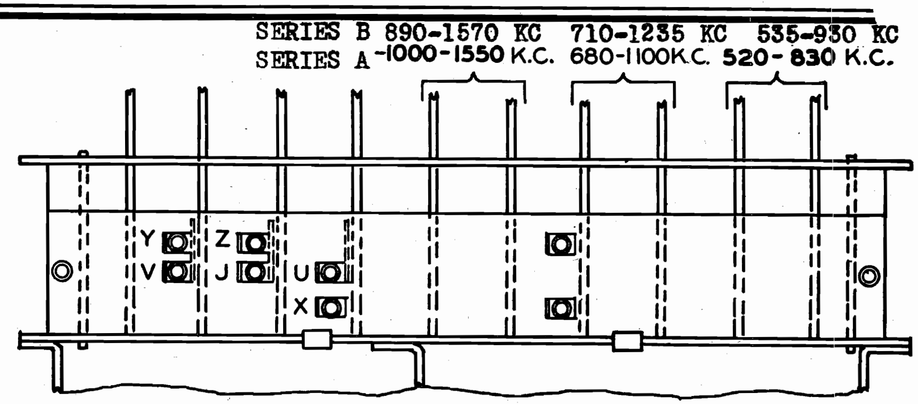
After each range is completed, repeat the procedure as a final check.

BAND	FREQUENCY RANGE
Broadcast	535 to 1690 Kc.
Medium Wave	1.66 to 5.5 MC.
Short Wave	5.5 to 18.0 MC.

Power Consumption........100 Watts (At 115 volts 50-60 cycles)
Power Output........5 Watts Undistorted, 7.5 Watts Maximum
Intermediate Frequency........465 KC.

TOP VIEW





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BOTTOM VIEW

BELMONT RADIO CORP.

MODEL 1075, Series A, B
Socket, Trimmers, Voltage
Phono, Notes

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper Scale "BC"	535 to 1690 KC. (Kilocycles)
Medium Wave	Center Scale "MW"	1.66 to 5.5 MC. (Megacycles)
Short Wave	Lower Scale "SW"	5.5 to 18.0 MC (Megacycles)

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

To remove the chassis from the cabinet, remove the four bolts which are used to fasten the chassis to the cabinet bottom; pull the knobs off their shafts and detach the pointer from the drive string (see Fig. 2, top view).

NOTE:—On the back of the string dial drum a calibrated scale is provided for aligning this chassis to the frequencies listed in the alignment procedure. Attach a pointer so that it will indicate proper dial setting in respect to the position of the variable condenser.

DIAL CALIBRATION:

To correct dial calibration rotate the tuning knob to the right until the dial pointer reaches the extreme end of the dial scale; then rotate the tuning knob to the left until the pointer reaches the other extreme end of the dial scale.

Stop clamps on the pointer slider bar make the pointer self aligning thereby correcting dial calibration.

POWER SUPPLY:

Caution:—This radio, unless otherwise marked, must be operated from 105-115 volts, 50-60 cycle A. C. supply only. If you are in doubt as to the voltage and frequency rating of the power supply, consult your local power company before inserting plug. Do not insert plug unless all tubes and speaker plug are in their proper sockets.

Receivers of this model which are to be used on voltages or frequencies other than 105-115 volts, 50-60 cycles are so marked. The power consumption of this receiver is 100 watts.

PHONOGRAPH CONNECTIONS:

A phonograph connector and switch are provided on the rear of the chassis. To operate; insert plug on end of phonograph pick-up lead into connector on chassis and move phonograph switch to "Phono" position. Volume and tone may be controlled by using the controls on the front of the radio.

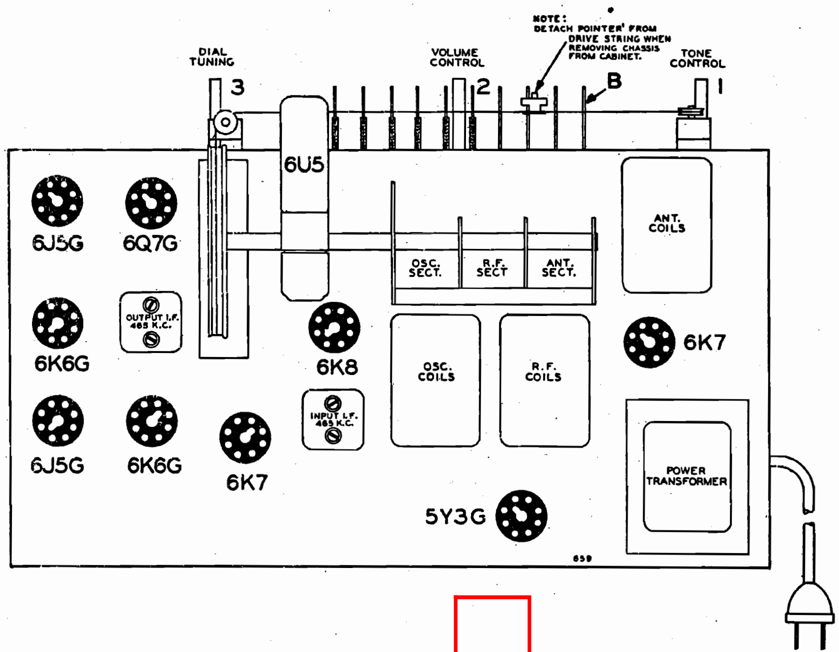


FIG. 2—TOP VIEW

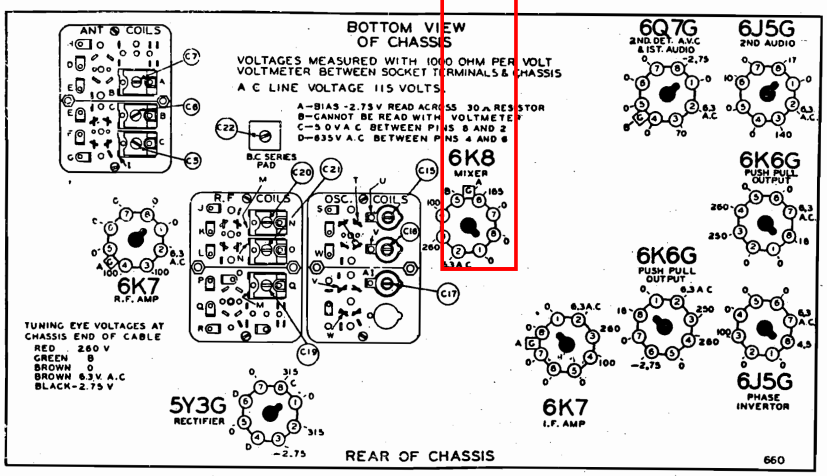


FIG. 5

MODEL 1075, Series A, B
Tuner Data, Notes, Parts

BELMONT RADIO CORP.

PROCEDURE FOR SETTING THE AUTOMATIC STATION PUSHBUTTONS:

Important: Allow the radio to "warm up" for about 15 minutes before setting the station adjustment screws for the pushbuttons.

Only a single adjustment for each station is required in setting up your favorite stations for automatic pushbutton operation. These adjustments are located at the front of the chassis shown in Fig. 4 and are accessible through the station call letter tab holes. The only equipment needed is a small screw driver to make the adjustments.

Make a list of your favorite local stations, those which you tune in regularly. Put down the frequency (kilocycle number) of these stations. There may be 2, 3, 5 or any number up to and including six in this list.

If you do not know the broadcasting frequencies, consult your local newspaper or a radio log book. They can also be obtained by pressing the button marked "Broadcast" on the left and tuning in the stations manually, noting the numbers on the dial at which they are received.

The automatic station pushbuttons are grouped to cover specific frequency ranges.

The range of the frequencies covered by each button are given below and are also shown in Fig. 4. Only stations within the frequency ranges given can be obtained on a particular button. Counting the **station buttons** from left to right, looking at the front of the set, the frequency ranges are as follows:

1. 1550 to 1000 Kilocycles.
2. 1550 to 1000 Kilocycles.
3. 1100 to 680 Kilocycles.
4. 1100 to 680 Kilocycles.
5. 830 to 520 Kilocycles.
6. 830 to 520 Kilocycles.

This means that any station which has a kilocycle number lying between 1550 and 1000 K.C. can be set up on either Button 1 or Button 2. Any station which has a kilocycle number lying between 1100 and 680 K.C. can be set on either Button 3 or Button 4. Any station which has a kilocycle number lying between 830 and 520 K.C. can be set on either Button 5 or Button 6.

After you have made up your list of stations, press button marked "Broadcast" and tune set manually until station selected having the highest frequency is tuned in and the program noted. Press button covering frequency range in which station is located (See Fig. 4). Adjust screw through station tab opening above button pressed until the same station is heard clearly and tuning indicator indicates that it is correctly tuned.

Press pushbutton marked "Broadcast" and tune in next station selected. Press button covering frequency range in which station is located. Adjust screw through station tab opening above button pressed until the same station is heard clearly and with maximum volume.

Follow this procedure for each button until you have selected all of your stations. The automatic buttons are now set up for quick tuning and no further adjustment is necessary.

NOTE: In setting up the pushbuttons, station identification may require switching back and forth to button marked "Broadcast" until the same program is heard for both. If the same program is heard on more than one station, find the station on dial tuning and select the proper one on the pushbutton by comparing the order or sequence of programs with that on dial tuning.

Punch out the station call letter tabs of the stations you have set up for the automatic buttons from the set of sheets supplied and insert them into the rectangular openings in the escutcheon. One of the small, clear celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

ANTENNA AND GROUND CONNECTIONS:

Antenna connections are made on the terminal board, with terminals marked "A" and "D" on the rear of chassis. When using a conventional antenna connect the lead-in to terminal "A". The ground lead should be connected to Terminal "G". When using a Doublet Antenna, connect one lead-in of the doublet to "A" and the other lead-in to "D". Connect a ground wire to Terminal "G". (See Fig. 1).

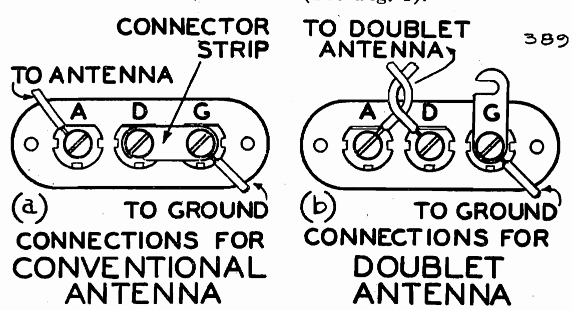


FIG. 1

TRANSFORMERS

104143	T14	50/60 Cycle Power Transformer 105-115 Volt Primary	4.00
104147		25/60 Cycle Power Transformer 105-115 Volt Primary	
104		25/60 Cycle Power Transformer Universal Primary	
104144		40/60 Cycle Power Transformer Universal Primary	
10556B	T12	Output Transformer for Speaker	1.50

SPEAKER

114126	T13	Twelve Inch Dynamic Speaker (600 Ohm Field)	7.00
10556B	T12	Output Transformer for Speaker	1.50

MISCELLANEOUS

101128	R13	Volume Control (1 Megohm)	1.00
101129	R11	Tone Control (250M Ohm)	.75
10280	C	Three Gang Variable Condenser	5.00
10556B	T12	Output Transformer for Speaker	1.50
1075		Line Cord and Plug	.50
11378		Antenna and Ground Terminal Strip	.25
11535		Shield for Ant., R.F., Osc., Coils	.15
115229		Tube Shield	.15
12561	S2	Phono-Radio Switch	.25
13437		Rubber Grommet for Variable Condenser Mounting	.02
13447		Rubber Chassis Mounting Cushions	.05
13244		No. 10—32 x 1¼" Chassis Mounting Bolts	.01

AUTOMATIC PUSHBUTTON ASSEMBLY PARTS

112466		Pushbutton Tuner Assembly Complete with Coils and Switch Mechanism	12.00
12562		Switch Assembly for Pushbutton Tuner (Less Coils)	4.50
11083	T7	Low Frequency Coil	1.25
11083B	T7	Low Frequency Coil	1.25
11082	T8	Medium Frequency Coil (Two Used)	1.25
11081	T9	High Frequency Coil	1.25
11081B	T9	High Frequency Coil	1.25
112492		Moulded Escutcheon for Pushbuttons (10 Hole)	.50
12199		Pushbuttons	.10

COILS FOR PUSHBUTTON TUNER ASSEMBLY

11083	T7	Low Frequency Coil	1.25
11083B	T7	Low Frequency Coil	1.25
11082	T8	Medium Frequency Coils (Two Used)	1.25
11081	T9	High Frequency Coil	1.25
11081B	T9	High Frequency Coil	1.25

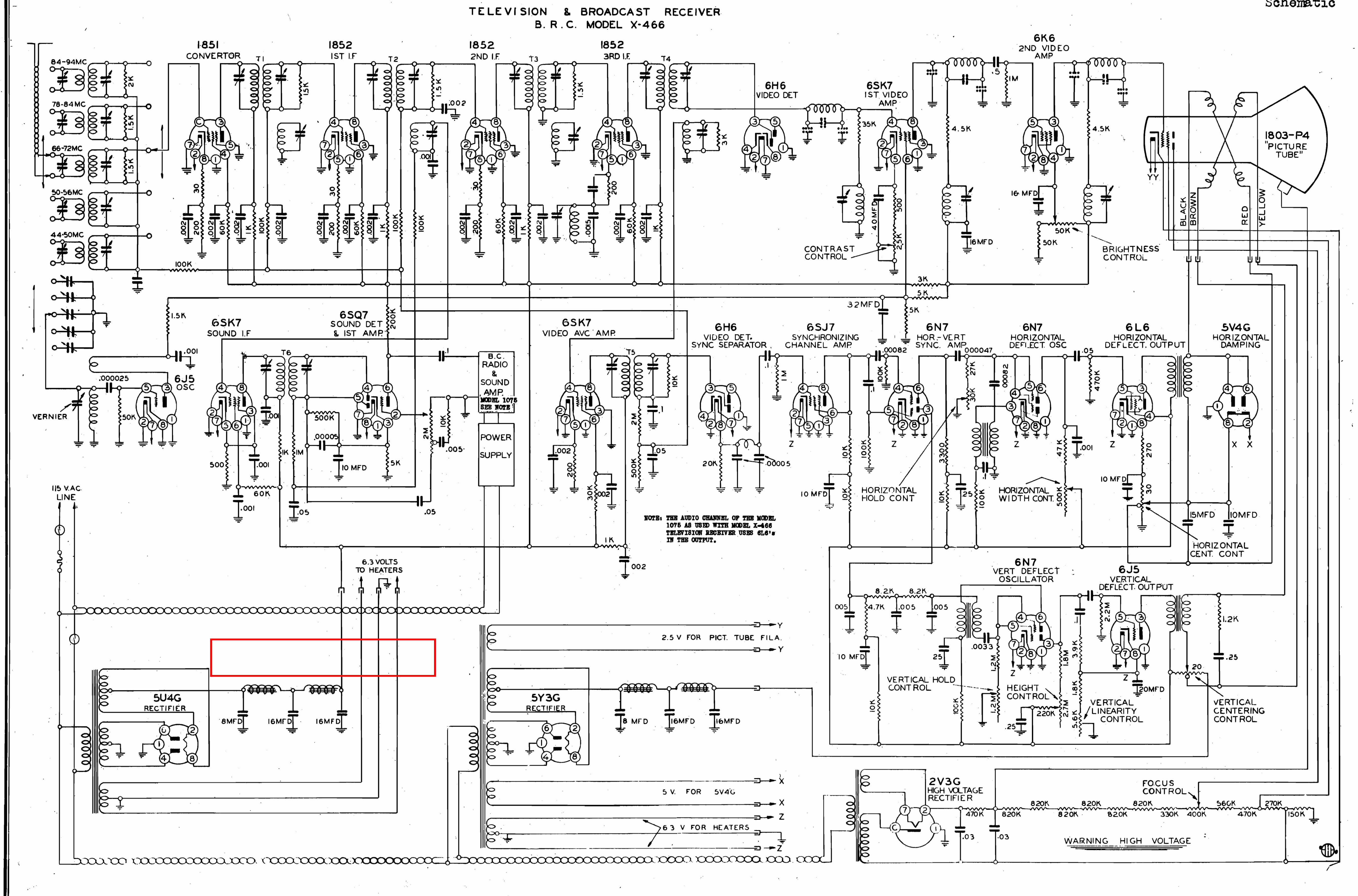
DIAL PARTS LIST

112509	Dial Scale (Calibrated)	1.00
112495	Moulded Escutcheon for Dial	.75
112446	Set of 2 Sheets Station Call Letters	.15
112336	Clear Pyralin Tabs for Station Call Letters, Doz.	.10
128199	Pushbuttons	.10
112492	Moulded Escutcheon for Pushbuttons (10 Hole)	.50
128195	Bakelite Knobs	.15
112459	Drive Drum Complete with Bushing and Set Screw	.25
112468C	Background Diffuser for Dial Complete with 115208 Slider Bar for Pointer	.50
112436	Carriage for Pointer (Attach Pointer to String Drive)	.03
112431	Pointer	.15
115234	Stop Clamps (Attach to Slider Bar; Limit Travel of the Pointer)	.08
112469	Manual Tuning Control (Shaft)	.50
115235	Bracket Complete with Idler Pulley (for Drive String)	.20
11774	Collar for Manual Tuning Control Shaft	.10
1209	Linen Drive String	.10
120145	Take-Up Spring for Drive String	.05
10794	6-8 Volt Pilot Light Bulb Type 44	.10
107178B	Socket and Bracket for Pilot Light	.15

CATHODE-RAY TUNING INDICATOR PARTS

107112	R9	Cable and Socket Assembly (with 1 Megohm Resistor in Socket)	.75
117211		Bracket for Tuning Indicator	.15
11757B		Clamp for Tuning Indicator	.15
11757C		Wing Bolt	.05

MODEL X-466
Schematic



BELMONT RADIO CORP.

MODEL X-466
Voltage,Notes

TUBE DESCRIPTION	1	2	3	4	5	6	7	8	CAP
	VOLTAGE ON PIN # TO GND. (NO SIGNAL CONDITION)								
1851 Convertor	0	6.3 AC	290	150	0		0	2	0
1852 - 1st I.F.	0	6.3 AC	0	0	2	150	0	290	
1852 - 2nd I.F.	0	6.3 AC	0	0	2	150	0	290	
1853 - 3rd I.F.	0	0	0	0	2	150	6.3 AC	290	
6H6 Video	0	6.3	0	0	N.C.		0	N.C.	
6SK7 1st video amp.	0	0	0	0	3→10	100 v.	6.3 AC	180	
6K6G 2nd video	0	6.3	150	70-150	0	N.C.	0	0	
6J5 Osc.	0	0	95 v.approx.	N.C.	0	N.C.	6.3 AC	0	
6SK7 Sound I.F. amp.	0	0	4.5 v.	0	4.5	100	6.3 AC	290	
6SQ7 Sound Det.	0	0	1.5	0	0	70	0	6.3 AC	
6SK7 Video AVC Amp	0	6.3 AC	0	0	2	110	0	290	
6H6 Video Det. Sync.	0	0	0	N.C.	N.C.		6.3 AC	0	
6SJ7 Sync.Channel Amp.	0								
5U4G Rectifier	0	Pin 2-8 5 AC		280 AC		280 AC	N.C.	N.C.	
5Y3G Rectifier	0	Pin 2-8 5 AC		280 AC		280 AC	N.C.	N.C.	
6SJ7 Sync.Channel Amp.	0	Pin 2-7 6.3 AC	0	0	0	110		110	
6N7 Hor.Vert. Sync.Amp.	0	Pin 2-7 6.3 AC	195	0	0	205		0	
6N7 Hor.Osc.	0	Pin 2-7 6.3 AC	105	-22	-22	200		0	
6L6 Hor.Output	0	Pin 2-7 6.3 AC	Cannot be Checked	300	0			24	
5V4 Hor.Damping	0	Pin 2-8 5.0 AC	0	0		0		0-13 v.	
6N7 Vert.Osc.	0	Pin 2-7 6.3 AC	290	-50	-50	20		0	
6J5 Vert.Output	0	Pin 2-7 6.3 AC	300	300	0	6		13 v.approx.	
2V3G *	0	7000 O					Pin 2-7 2.5 v.		0 □ 6000AC

* Great caution should be exercised in checking high voltage circuits. It is best never to attempt to measure heater voltage on the 2V3G. If the tube lights brightly, it is sufficient indication that the heater voltage is correct. To measure high voltage, disconnect power supply and insert 0-5 m.a. meter in ground end of bleeder chain. (With protection fuse) current should read about 1 m.a. when power supply is reconnected. If bleeder current is appreciably off measure individual resistors in chain, to see if difficulty is there. Thus by replacing rectifier tubes an appropriate check of transformer the high voltage circuits can be checked without the use of dangerous probes.

□ Electrostatic voltmeter

O Special High resistance voltmeter

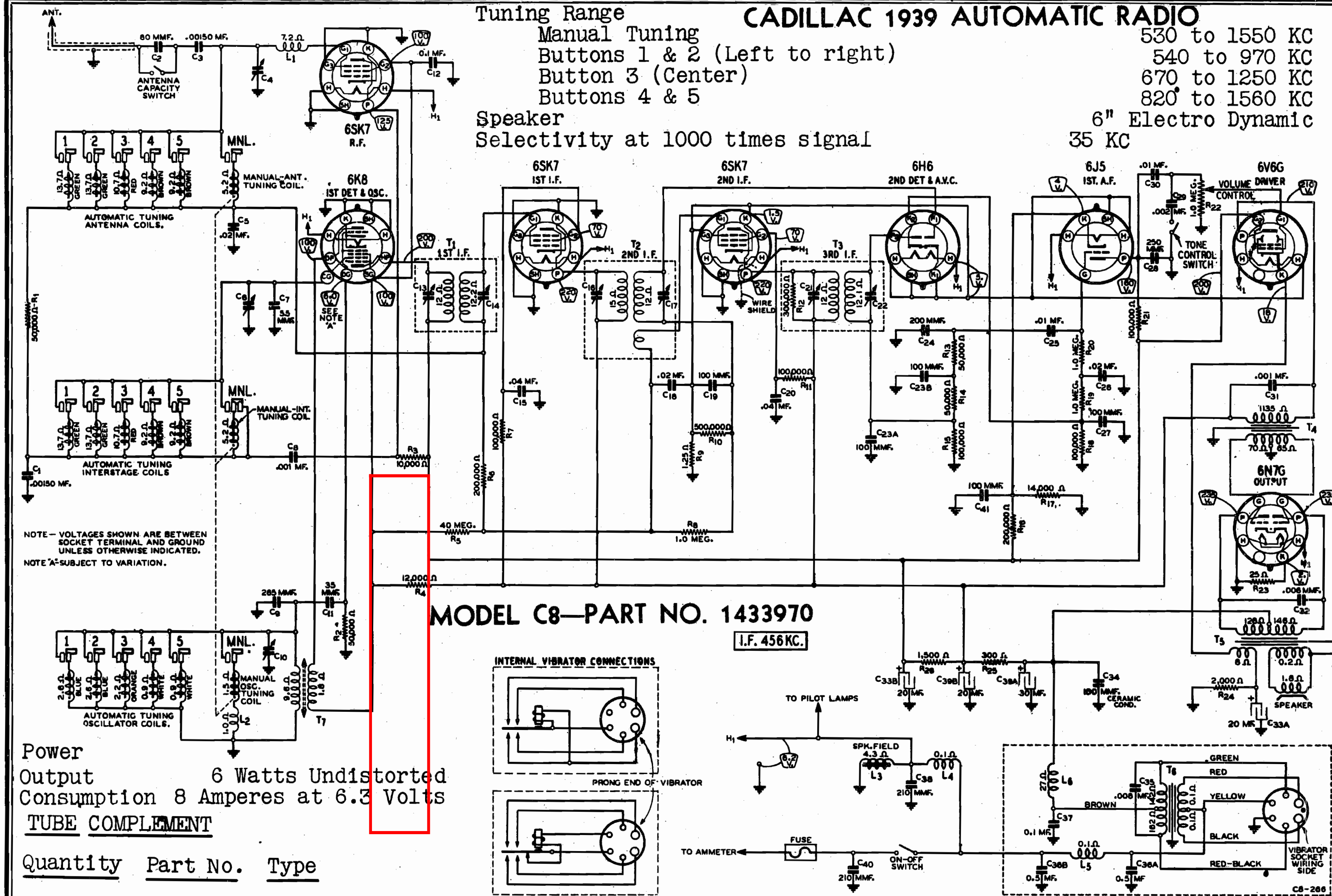
MODEL C-8
Schematic, Voltage
Sensitivity

CADILLAC DIV.—GEN. MOTORS

Sensitivity
Manual Tuning — 1 Microvolt at .5 Watt Output
Automatic Tuning — 1 Microvolt at .5 Watt Output

CADILLAC 1939 AUTOMATIC RADIO

Tuning Range
Manual Tuning — 530 to 1550 KC
Buttons 1 & 2 (Left to right) — 540 to 970 KC
Button 3 (Center) — 670 to 1250 KC
Buttons 4 & 5 — 820 to 1560 KC
Speaker — 6" Electro Dynamic
Selectivity at 1000 times signal — 35 KC



MODEL C8—PART NO. 1433970

I.F. 456KC.

Power
Output — 6 Watts Undistorted
Consumption — 8 Amperes at 6.3 Volts

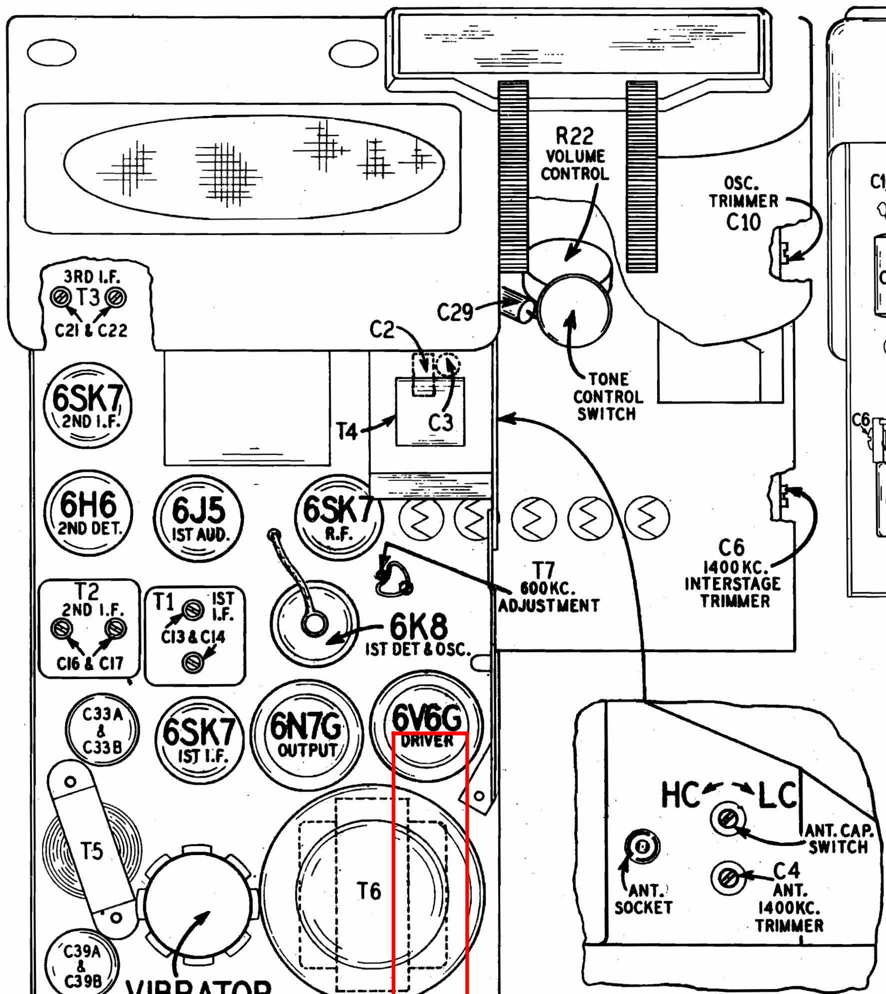
TUBE COMPLEMENT

Quantity	Part No.	Type
3	1213392	6SK7
1	1213393	6K8
1	1213395	6H6
1	1213394	6J5
1	1213396	6V6G
1	7233587	6N7G

Antenna Capacity Screw Settings
Low Capacity Setting - In tight (clockwise) -- 59 mmf. -- Total of antenna and shielded cable.
High Capacity Setting -- Out (counter clockwise) -- 193 mmf. -- Total of under car antenna and shielded lead.
Antenna Trimmer Range ±15 mmf. of above antenna capacities

MODEL C-8
Socket, Trimmers
Chassis

CADILLAC DIV.—GEN. MOTORS

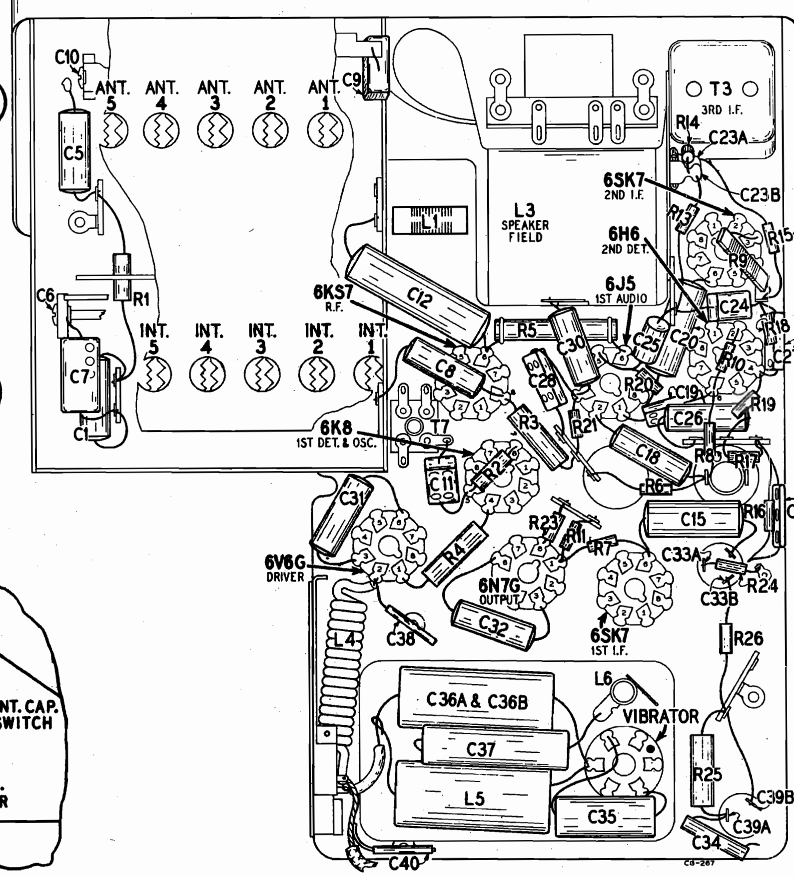


C8-268 Fig. 2 Parts Layout, Top View

Cadillac 1939 Automatic Radio

Fig. 3 Parts Layout, Bottom View

Cadillac 1939 Automatic Radio



Original Part Number	Replacement Part Number	Quan.	Illus. No.	Description		List Price
				Sockets		
3A267	1428011	8		Tube socket-Octal (8 prong)	-	$ .15
3A276	1435452	1		Vibrator socket (6 prong molded)	-	.10
26A129	1435453	1		Antenna connection socket and bracket assembly	-	.15

Speaker

When ordering parts for speakers, specify part number of speaker and letters preceding part number stamped on the speaker.

Original Part Number	Replacement Part Number	Quan.	Description		List Price
12A319	1434972	1	6" Dynamic Speaker	-	$3.85
	1435454	1	Cone & voice coil assembly for above speaker.	-	1.75
14x230		1	Wire screen to cover front of speaker	-	.35
7x32		1	Cardboard Ring for above wire screen	-	.05

CADILLAC DIV.—GEN. MOTORS

MODEL C-8
Tuner, Alignment Notes

FEATURES

The 1939 Cadillac Automatic Radio is an 8-tube automobile radio covering the standard wave band incorporating the very latest developments in automobile radio engineering. The outstanding features are:

1. Permeability tuning, providing a dual input circuit to the 1st detector, one for manual tuning and one for automatic push button tuning, is used.
2. A new noise-limiting circuit in the audio system controlled by signal voltage developed by the 2nd detector and the AVC network, providing for the first time effective noise-limiting action without affecting sensitivity.
3. Two stages of Intermediate Frequency, increasing considerably Automatic Volume Control action.
4. A three-circuit Automatic Tuner, providing the same sensitivity on both manual and automatic tuning sections.
5. An OFF-switch incorporated in the push button operating mechanism to provide practically complete automatic operation, making it necessary to push only one button to select a station, tune and turn on the radio.

MANUAL TUNING CIRCUIT

When the manual tuning button is depressed, the manual antenna tuning coil is connected to the grid of the 6SK7 R.F. amplifier tube through a series motor noise filter. The plate of the R.F. tube is fed through a resistor and is capacity coupled to the detector grid of the 6K8 tube through the manual intermediate tuning coil. This grid is also controlled by the AVC system through the manual intermediate tuning coil. The manual oscillator tuning coil is capacity coupled to the oscillator grid of the 6K8 tube in parallel with the fixed oscillator coil T7 which also functions as the low frequency adjustment.

All the automatic tuning coils are open circuited when the manual tuning button is depressed.

Manual tuning is accomplished by varying the inductance of the manual tuning coils by changing the permeability of the magnetic circuit. This is done by moving an iron core of special design in and out of the coil by rotating the manual station selector drum.

The extreme position of the iron cores within the coils has been precision adjusted at the factory and should not be disturbed.

AUTOMATIC TUNING CIRCUIT

Automatic tuning is accomplished by the use of a new and highly efficient three-circuit push button permeability tuner.

The tuning of the R.F., Interstage and Oscillator semi-fixed tuned circuits, is accomplished by varying the inductance of the coils, by changing the permeability of the intermediate circuit and by moving the iron core in and out of the coil. The iron cores within the coils are rigidly secured to a brass rod. This brass rod moves in and out of the coils as the adjustment screw is turned, changing the inductance of the coils, giving the same result as the variable tuning condenser across the coil except that this method is more precise and stable, and it is not affected by moisture or temperature changes as is the case with a normal tuning condenser.

ALIGNMENT

Alignment between the Oscillator, Antenna and Interstage automatic tuning coils is obtained by changing the Antenna (center) and Interstage (rear) coil positions while the iron cores are held stationary on the shaft. To describe the connections for automatic tuning, let us assume that button No. 1 is depressed

The automatic tuning antenna coil, No. 1, is connected to the grid of the R.F. tube. The plate of the R.F. tube is fed through a resistance and is capacity coupled to the automatic tuning Interstage coil, No. 2, which is connected to the control grid of the 6K8 tube.

The manual Interstage tuning coil is short-circuited.

The automatic tuning Oscillator coil, No. 1, is capacity coupled to the Oscillator grid of the 6K8 tube.

Two stages of I.F. amplification are employed, using 6SK7 tubes. The primary and secondaries of each of the I.F. transformers are tuned by small trimmer condensers. Directly below the secondary of the 2nd I.F. is a third winding which couples the control grid circuit of the 2nd I.F. tube to the 2nd I.F. transformer.

The signal voltage across the secondary of the 2nd I.F. transformer is used to drive the plate of the AVC section of the 6H6 tube. AVC voltage is applied to the control grid circuits of the R.F., 1st detector and 1st and 2nd I.F. tubes. The rectified output of the 2nd detector section of the 6H6 tube is applied to the control grid of the 6J5 tube.

At no signal, the 6J5 tube is biased to cut off by virtue of the current flowing through resistor network R16 and 17. This gives a constant potential across R17, which keeps the tube biased to cut off when no signal is being received. When a station is being received, a positive voltage is applied to the control grid by both sections of the 6H6 tube through resistor networks R13, 14 and 15, and R18, 19 and 20, causing a very rapid reduction in bias so that the noise gate or noise limiter does not affect the sensitivity of the receiver. This is a very outstanding development in automobile radio circuit design and provides unusually quiet operation.

The 6J5 is resistance coupled to the 6V6G driver tube. The 6V6G is transformer coupled to the 6N7G output tube. This tube is a class "B" power amplifier and combines two triodes in one envelope. A 6" electro dynamic reproducer is employed.

Degeneration, or negative feed-back, is used in the audio amplifier. The voltage developed across the separate small secondary of the output transformer is fed back into the cathode circuit of the driver tube. The voltage fed back is of the proper phase to reduce the amplitude of certain frequencies. This results in a reduction in distortion.

A synchronous type vibrator is used in the power unit. This vibrator interrupts the current through the primary of the power transformer and also rectifies the current in the secondary circuit.

ALIGNMENT AND CALIBRATION PROCEDURE

The following equipment is required for proper alignment:

An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
An Output Indicating Meter.
Non-metallic screwdriver.
Dummy Antennas - .1mf., and 35 mmf.

The Radio Chassis must be removed from the case, but the front cover must remain on the chassis with all screws in place. THIS IS ABSOLUTELY NECESSARY TO ALIGN.

The Volume Control must be at maximum for all adjustments.

The Normal-Quiet Control must be in the Normal position for all adjustments.

The Antenna Capacity Switch (See Fig. 2,) screw should be in the maximum clockwise position for the Low Capacity (Vacuum Type) Antenna. The total capacity of the Low Capacity Antenna and the shielded lead is 59 mmf.

Connect Radio Chassis to Ground Post of Signal Generator with a short heavy lead.

Allow chassis and Signal Generator to "Heat Up" for several minutes.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
Refer to Alignment Charts

MODEL C-8
Tuner, Alignment Data

CADILLAC DIV.—GEN. MOTORS

ALIGNMENT CHART NUMBER ONE

SIGNAL GENERATOR Frequency Setting	Connection at Radio	Dummy Antenna	Button Depressed	Inductive Tuner and Dial Setting	Adjust Trimmers to Maximum
I.F. ADJUSTMENT					
456 KC	Control Grid (prong No. 4) 6SK7 2nd I.F. Tube See Note A	.1 mf.	Manual	1550 KC	3rd I.F. (C21) & (C22) See Fig. 2
456 KC	Control Grid (prong No. 4) 6SK7 1st I.F. Tube	.1 mf.	Manual	1550 KC	2nd I.F. (C16) & (C17) See Fig. 2
456 KC	Control Grid (top cap) 6K8 1st Det. Tube	.1 mf.	Manual	1550 KC	1st I.F. (C13) & (C14) See Fig. 2
OSCILLATOR ADJUSTMENT					
1550 KC	Control Grid (top cap) 6K8 1st Det. Tube	.1 mf.	Manual	1550 KC	Osc. (C10)
1400 KC ADJUSTMENT					
1400 KC	Antenna Cable - See Note B	35 mmf.	Manual	Tune to Maximum Output with station selector drum.	Int. 1400 KC (C6) Ant. 1400 KC (C4) See Fig. 2
600 KC ADJUSTMENT					
600 KC	Antenna Cable	35 mmf.	Manual	Tune to Maximum Output with station selector drum.	600 KC (T7) See Fig. 2 Rocking Adjustment - Note C
1400 KC READJUSTMENT					
1400 KC	Antenna Cable	35 mmf.	Manual	Tune to Maximum Output with station selector drum.	Osc. (C10) See Fig. 2 Rocking Adjustment - Note C

NOTE A - Insert antenna cable at chassis and short circuit open end of cable to cable shield for all I.F. and oscillator adjustments.
NOTE B - Remove antenna cable short circuit and insert 35 mmf. condenser between open end of antenna cable and signal generator.
NOTE C - Rotate station selector drum back and forth and turn the adjusting screw until the peak of greatest intensity is obtained.

ALIGNMENT CHART NUMBER TWO

CAUTION - DO NOT CHANGE SETTING OF ANY TRIMMERS THAT HAVE BEEN ADJUSTED UP TO THIS POINT.

SIGNAL GENERATOR Frequency Setting	Connection at Radio	Dummy Antenna	Button Depressed	Automatic Tuner Setting	Adjust Coil Positions to Maximum Output
AUTOMATIC TUNER ADJUSTMENTS AND ALIGNMENT				WITH BUTTON DEPRESSED, TURN AUTOMATIC TUNER ADJUSTING SCREW TO MAXIMUM OUTPUT.	See Note D
700 KC	Antenna Lead	35 mmf.	No. 1	Ajusting Screw No. 1	Antenna Coil No. 1 Interstage Coil No. 1
700 KC	Antenna Lead	35 mmf.	No. 2	Adjusting Screw No. 2	Antenna Coil No. 2 Interstage Coil No. 2
850 KC	Antenna Lead	35 mmf.	No. 3	Adjusting Screw No. 3	Antenna Coil No. 3 Interstage Coil No. 3
1100 KC	Antenna Lead	35 mmf.	No. 4	Adjusting Screw No. 4	Antenna Coil No. 4 Interstage Coil No. 4
1100 KC	Antenna Lead	35 mmf.	No. 5	Adjusting Screw No. 5	Antenna Coil No. 5 Interstage Coil No. 5

NOTE D - At the top of the automatic tuning unit can be seen ten round openings - See Fig. 3. Through these openings can be seen the ten "W" openings on the other side of the unit. Insert a thin blade screw driver through the round openings and in the "W" opening of the proper button and adjust the position of the coil by twisting the screw driver until maximum output is obtained.

ADJUSTING ANTENNA 1400 KC TRIMMER

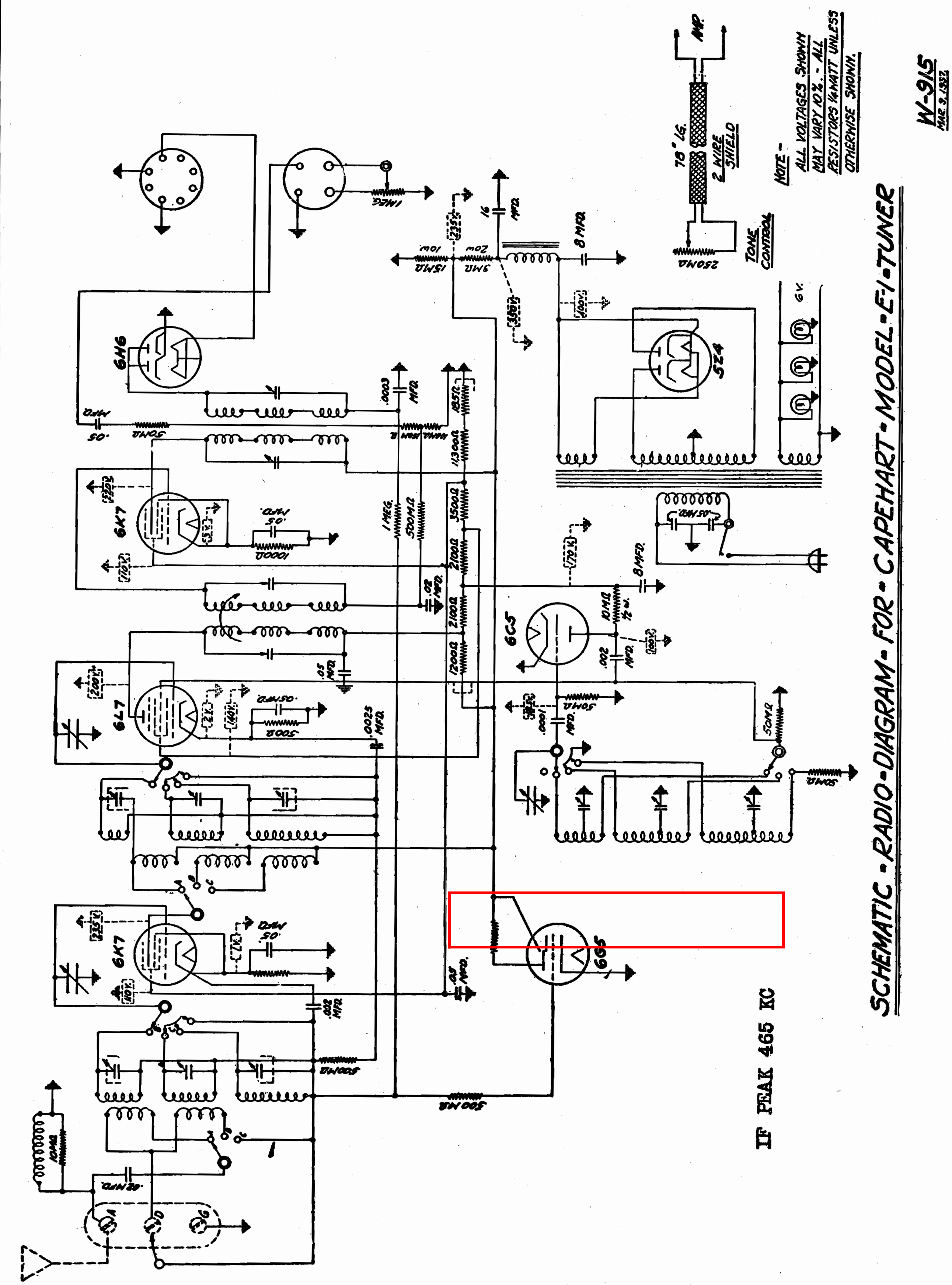
After the radio is installed and the car antenna is connected, it is necessary to readjust the antenna 1400 KC trimmer.

There are two small holes in the chassis case near the antenna connection through which the antenna capacity and antenna trimmer adjustments are to be made. See Fig. 2. With the Cadillac Vacuum Antenna, the screw marked "Capacity" should be set to the extreme clockwise position. With the Cadillac Under Car or Running Board Antenna, the screw marked "Capacity" should be set to the extreme counter clockwise or high capacity position.

To adjust trimmer, tune in a weak signal at approximately 1400 KC with the volume control about three-fourths on, turn the adjusting screw (marked trim) in or out until maximum output is obtained. On Vacuum Antenna this adjustment should be made with antenna fully extended.

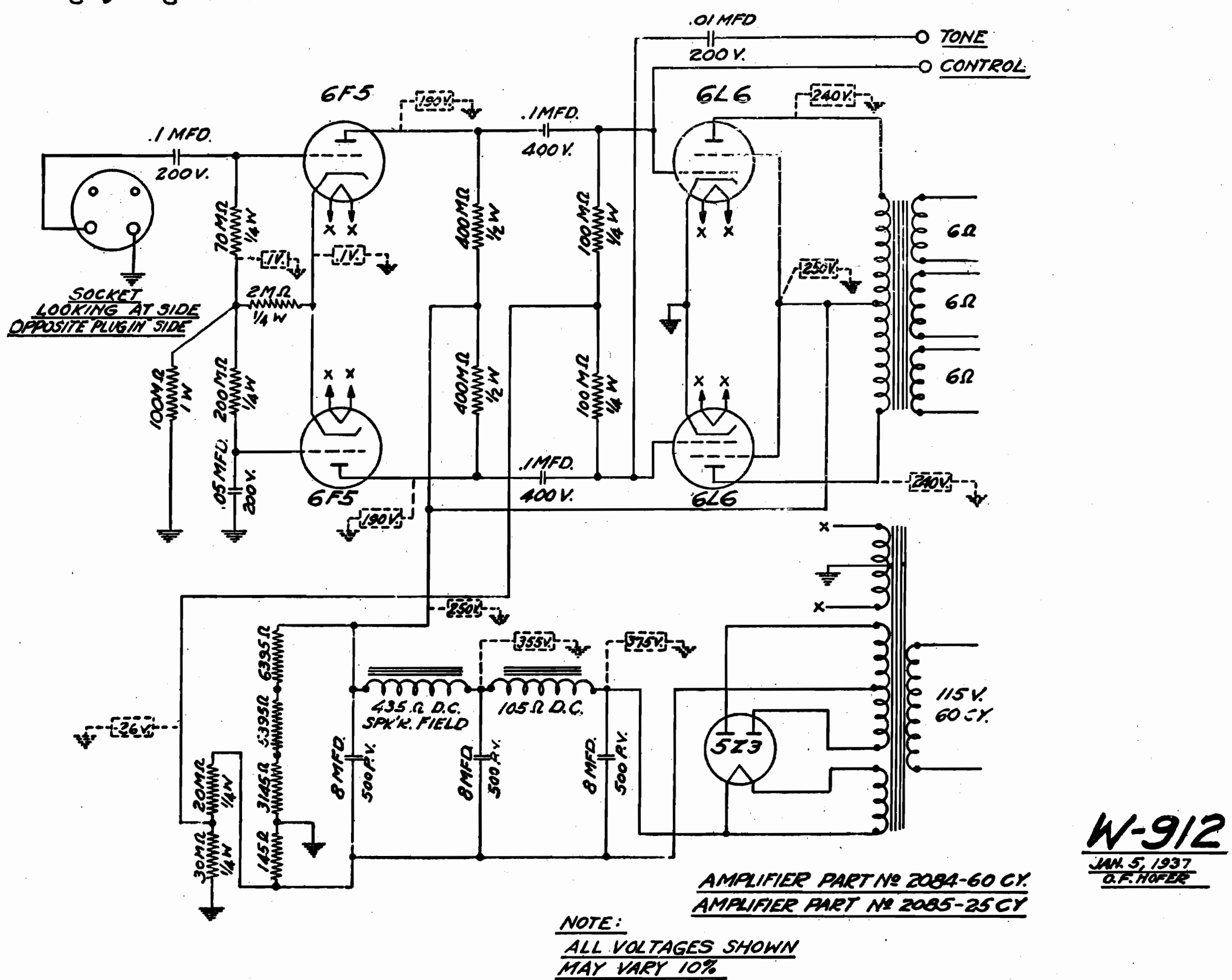
CAPEHART CORPORATION

MODEL E-1
Tuner Schematic
Voltage



MODEL E-1
Amplifier Schematic
Voltage,Alignment

CAPEHART CORPORATION



·SCHEMATIC·CAPEHART·AMPLIFIER·E-1·SERIES

Align the i-f stages at 465 kc after removing the 6C5 oscillator and with the test oscillator connected to the grid of the 6L7 first detector.

R-F Alignment: Replace the 6C5 and connect the test oscillator to the antenna post of the receiver. Start with the oscillator trimmer with the dial set on the high-frequency end of the band at the frequencies listed below:

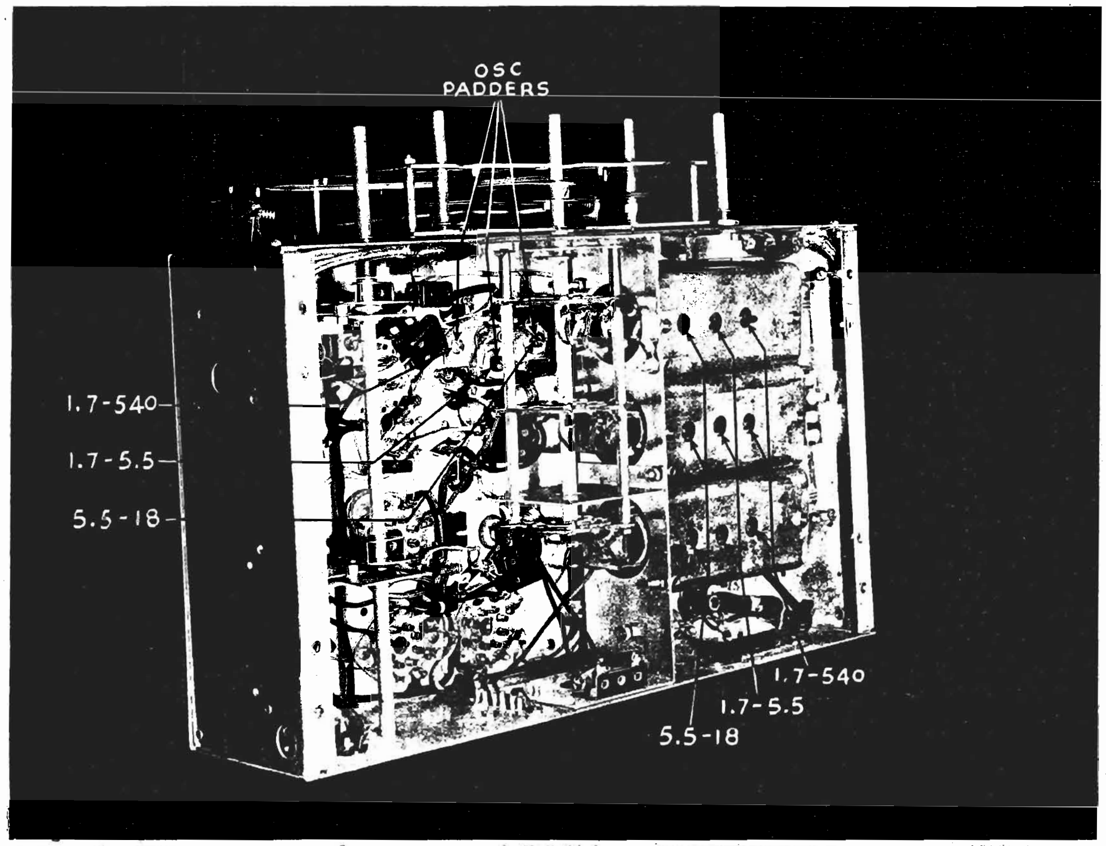
Broadcast Band - 1400 kc   1st H-F Band - 5.0 mc   2nd H-F Band - 17 mc

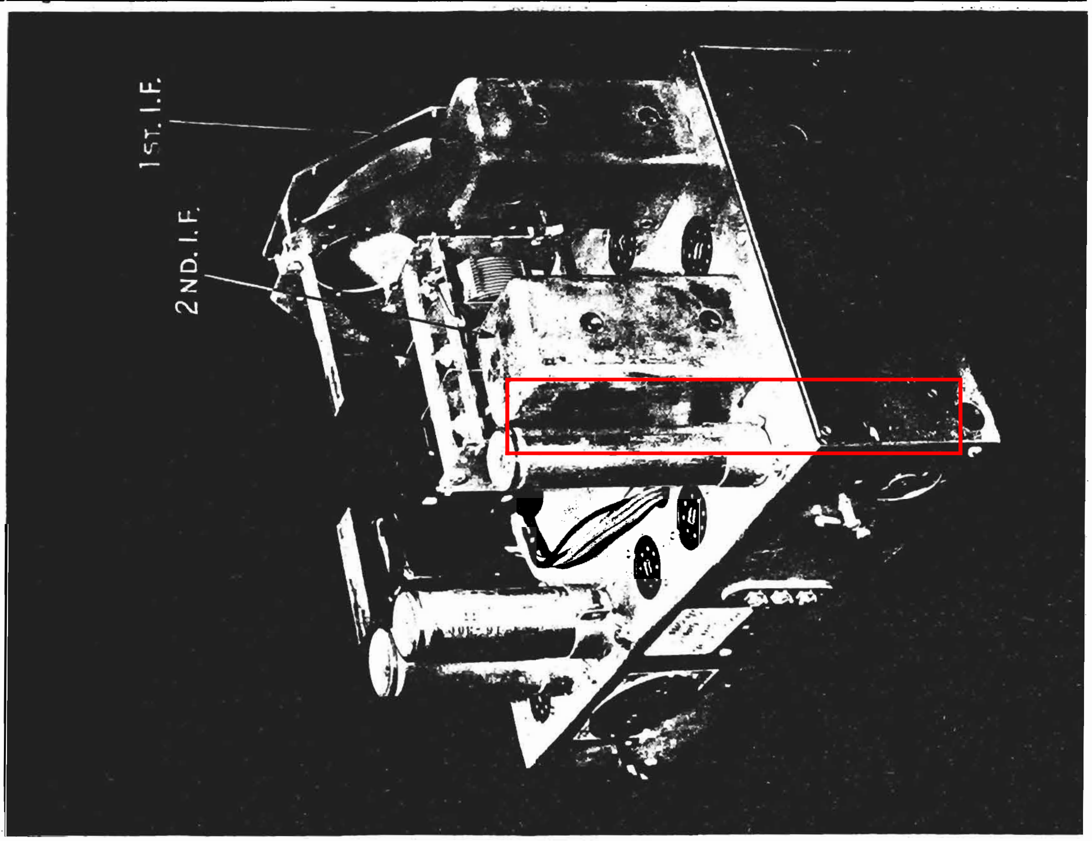
After the oscillator trimmer has been adjusted,align the r-f trimmer of each band. Then set the oscillator padding condensers of the various bands at the following frequencies:

Broadcast Band - 550 kc   1st H-F Band - 2.0 mc   2nd H-F Band - 6.0 mc

CAPEHART CORPORATION

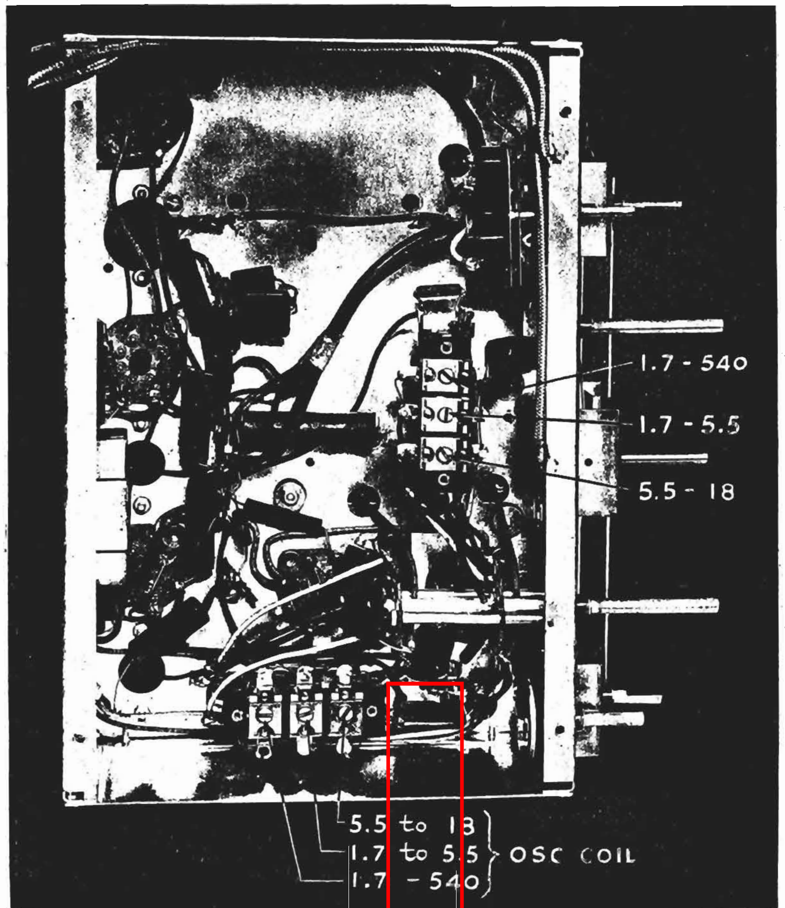
MODEL E-1
Trimmers, Chassis

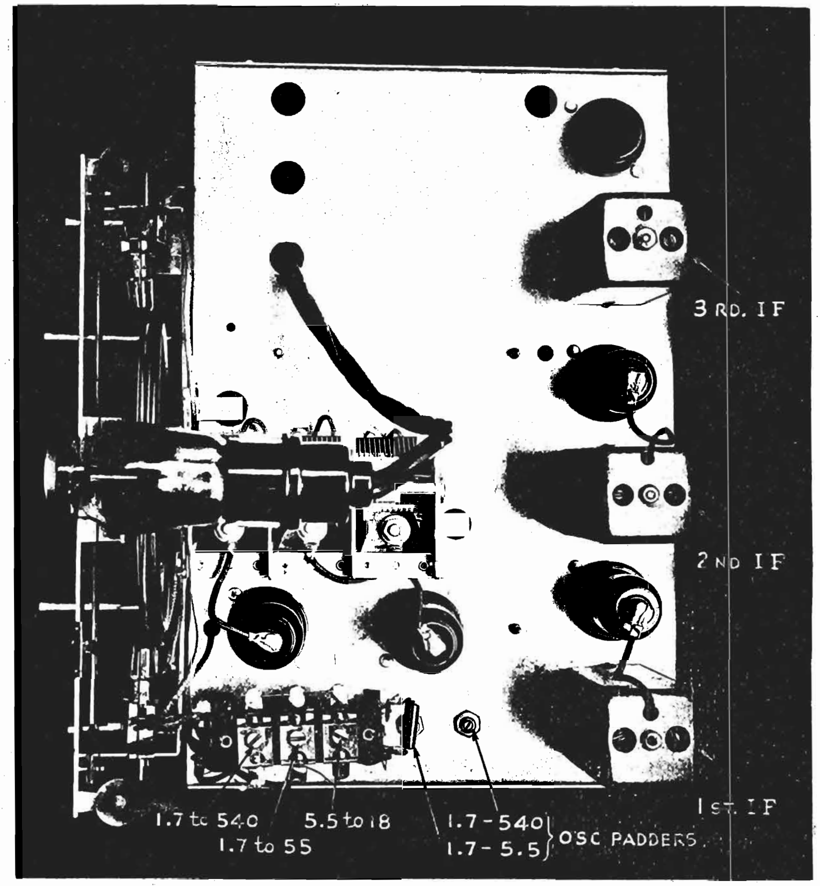




MODEL 110-G, Panamuse
Trimmers, Chassis
Alignment

CAPEHART CORPORATION





ALIGNMENT INSTRUCTIONS

When aligning the i-f stages, short the oscillator section of the tuning condenser to ground. Set test oscillator to 465 kc and connect to the grid of the 6A8 first detector. Set the i-f trimmers for maximum reading of the output meter connected across the voice coil.

When aligning the r-f amplifier, connect the test oscillator to the antenna post, after removing ground from the tuning condenser mentioned above. Regardless of which band is being aligned, start with the oscillator coil trimmer with the dial set on the high-frequency end of the band at the following frequencies:

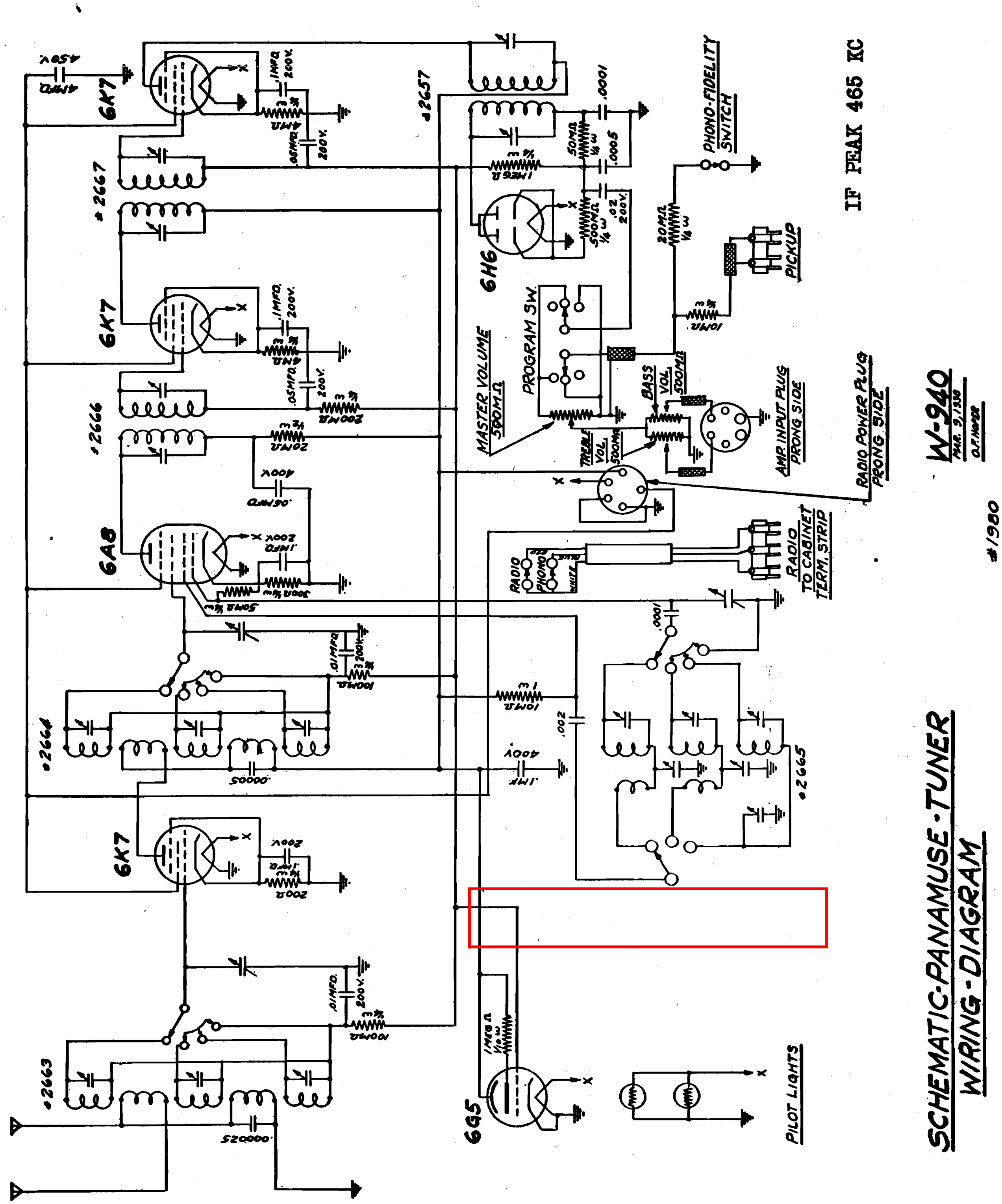
Broadcast band	------ 1400 kc
1st H-F band	------ 5.0 mc
2nd H-F band	------ 17 mc

After the oscillator coil trimmer has been set, align the r-f trimmers. Next set the oscillator padding condensers of the various bands at the following frequencies:

Broadcast band	----- 550 kc
1st H-F band	----- 2.0 mc
2nd H-F band	----- 6.0 mc

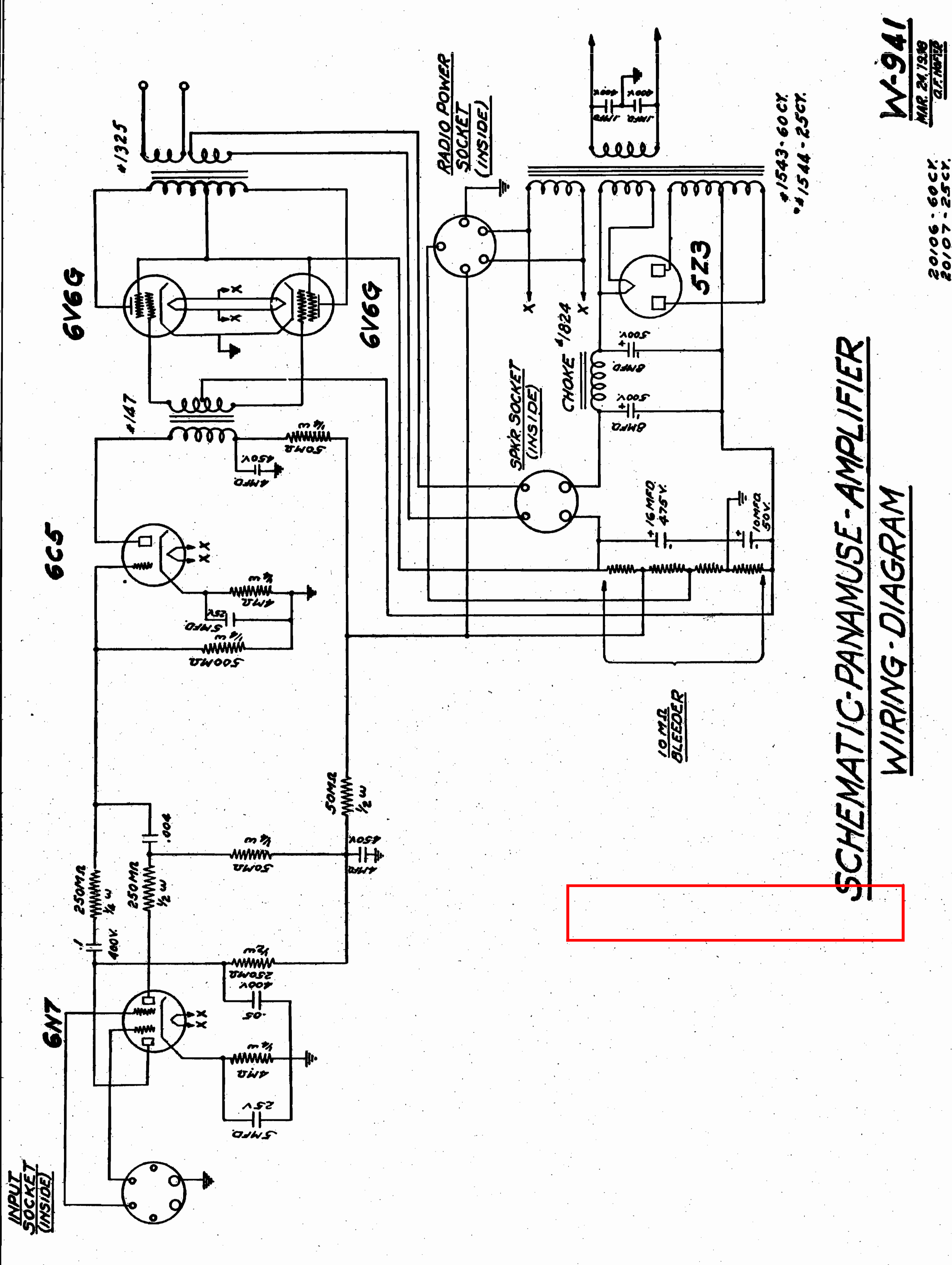
CAPEHART CORPORATION

MODEL 110-G, Panamuse
Tuner Schematic



MODEL 110-G, Panamuse
Amplifier Schematic

CAPEHART CORPORATION



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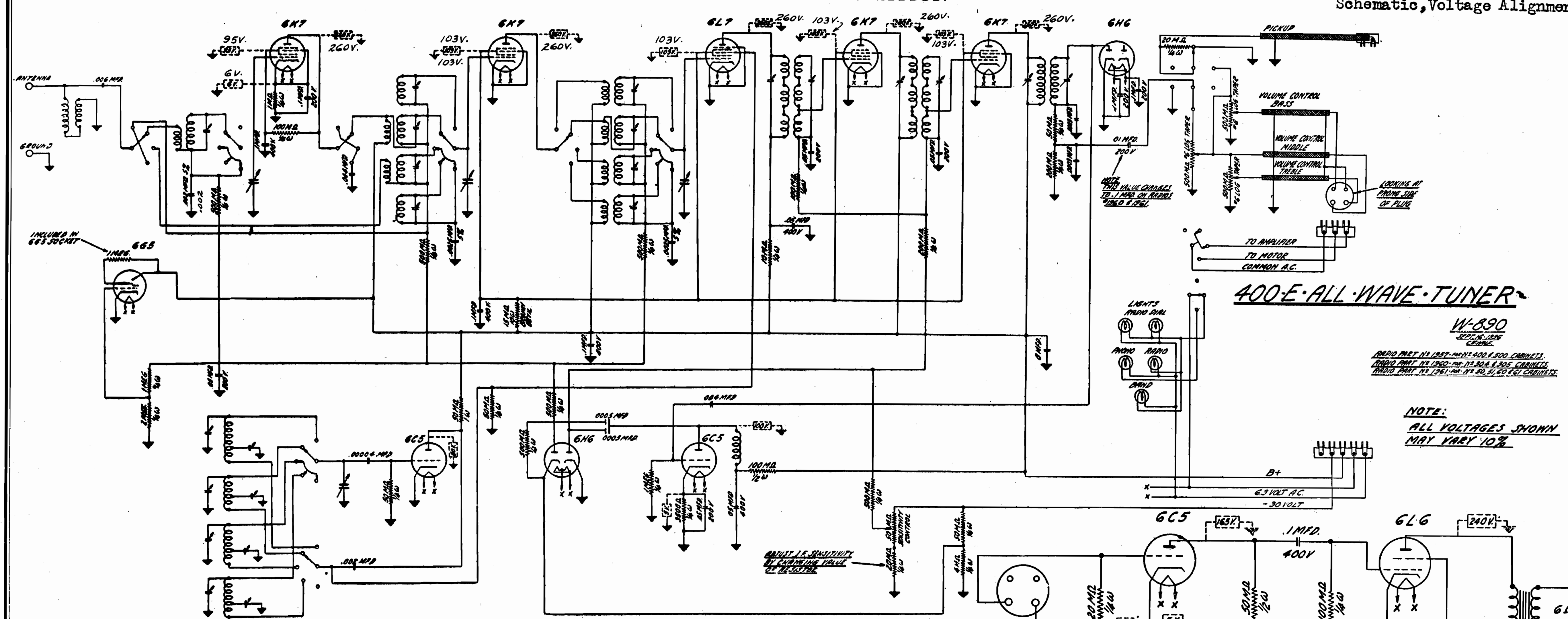
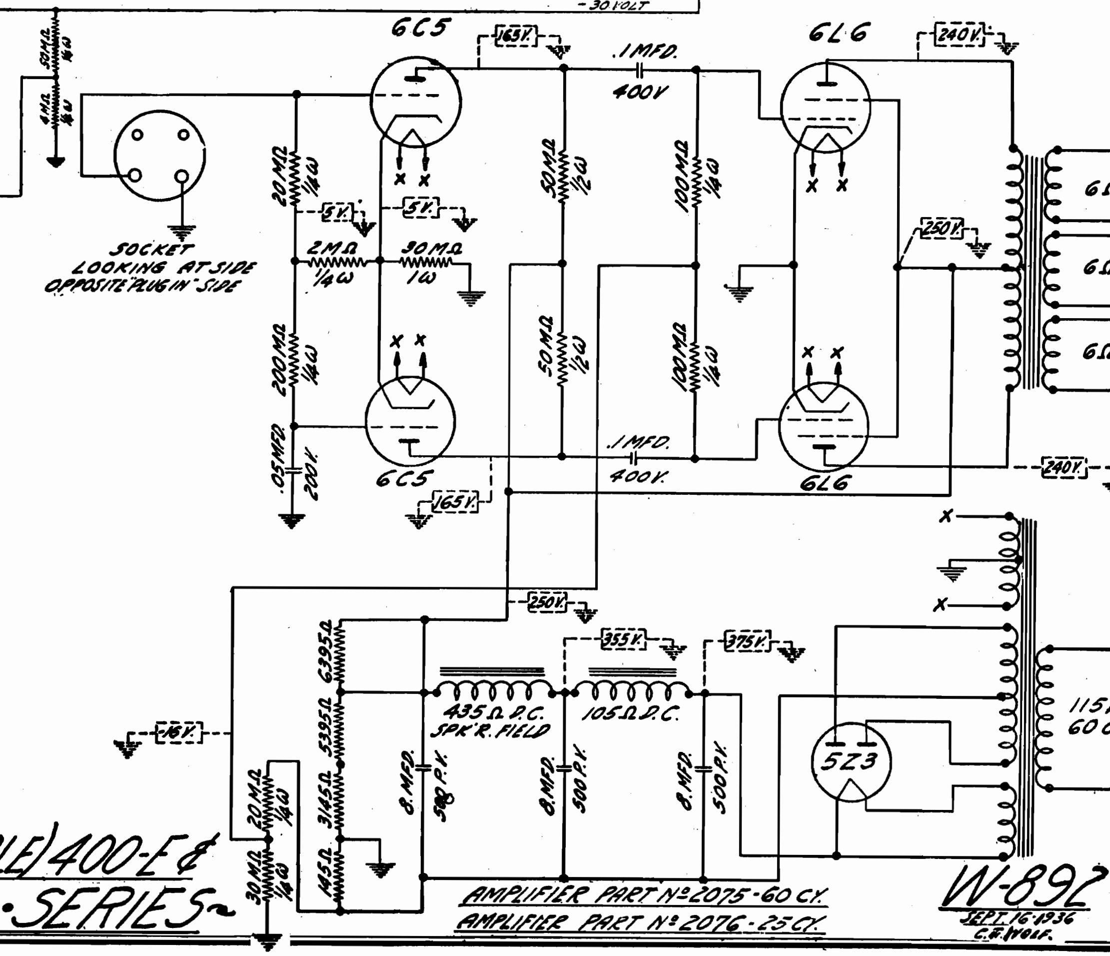
MODELS 400-E,500-E Series
Schematic,Voltage Alignment





ALIGNMENT PROCEDURE

When aligning the i-f stages at 465 kc, make certain the Selectivity Control is in the extreme counter-clockwise position, i.e. set to "sharp tuning". Remove the 6C5 oscillator tube and connect the output of the test oscillator to the grid of the 6L7 first detector. The bias of this tube is fixed, therefore it will be necessary to leave the grid cap on the tube and couple the oscillator through a .001 or .002-mf condenser. Adjust the trimmers on the three i-f transformers for maximum readings.

R-F Alignment: Replace the 6C5 oscillator tube. Connect the test oscillator to the antenna post with the dial set on the high-frequency end of the band at the following frequencies:

Long-Wave Band ... 400 kc	First H-F Band ... 5.0 mc
Broadcast Band ...1400 kc	Second " " ...17.0 mc

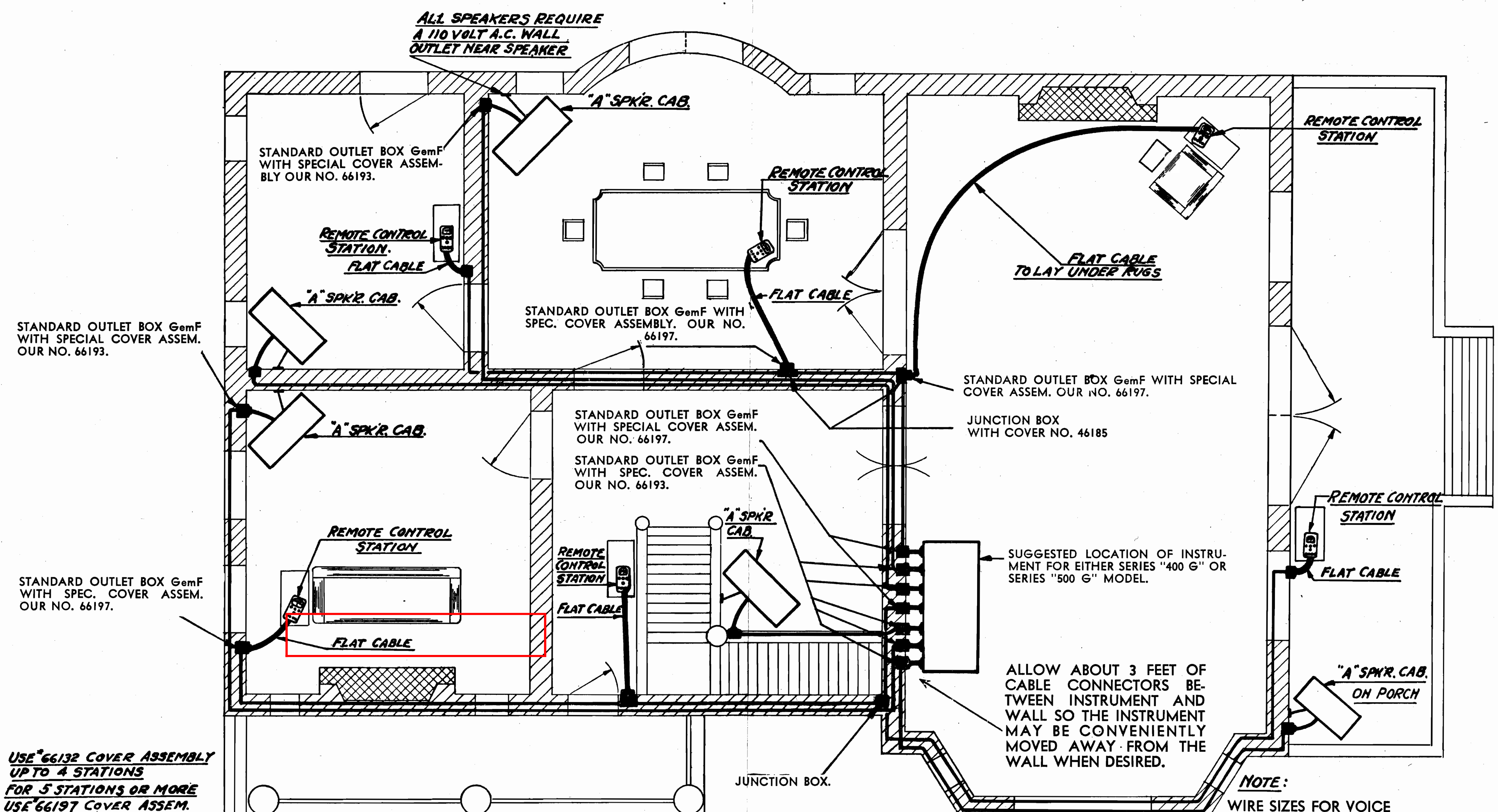
First adjust the oscillator trimmers and then the r-f trimmers. After the adjustments of these trimmers, set the oscillator padding condensers of the various bands at the following frequencies:

Long-Wave Band ... 200 kc	First H-F Band ... 2.0 mc
Broadcast Band ... 550 kc	Second " " ... 6.0 mc

MODELS 400-G,500-G Series
Remote Control Installation

CAPEHART CORPORATION

THIS DRAWING SHOWS A CAPEHART REMOTE INSTALLATION OF 5 REMOTE SPEAKERS AND 6 REMOTE CONTROL STATIONS. THE WIRES FOR THESE CONTROL STATIONS HAVE BEEN RUN FROM A SET OF BASEBOARD OUTLET BOXES MOUNTED IN THE BASEBOARD AT THE REAR OF THE INSTRUMENT THROUGH CONDUIT PIPES TO THE BASEBOARD OUTLET BOXES AT THE REMOTE LOCATIONS.



USE #66132 COVER ASSEMBLY UP TO 4 STATIONS
FOR 5 STATIONS OR MORE USE #66197 COVER ASSEM.

NOTE:
WIRE SIZES FOR VOICE COIL CONNECTIONS
UP TO 100 FEET, NO. 14 WIRE
100 FT. TO 250 FEET, NO. 12 WIRE
250 FT. AND OVER, NO. 10 WIRE

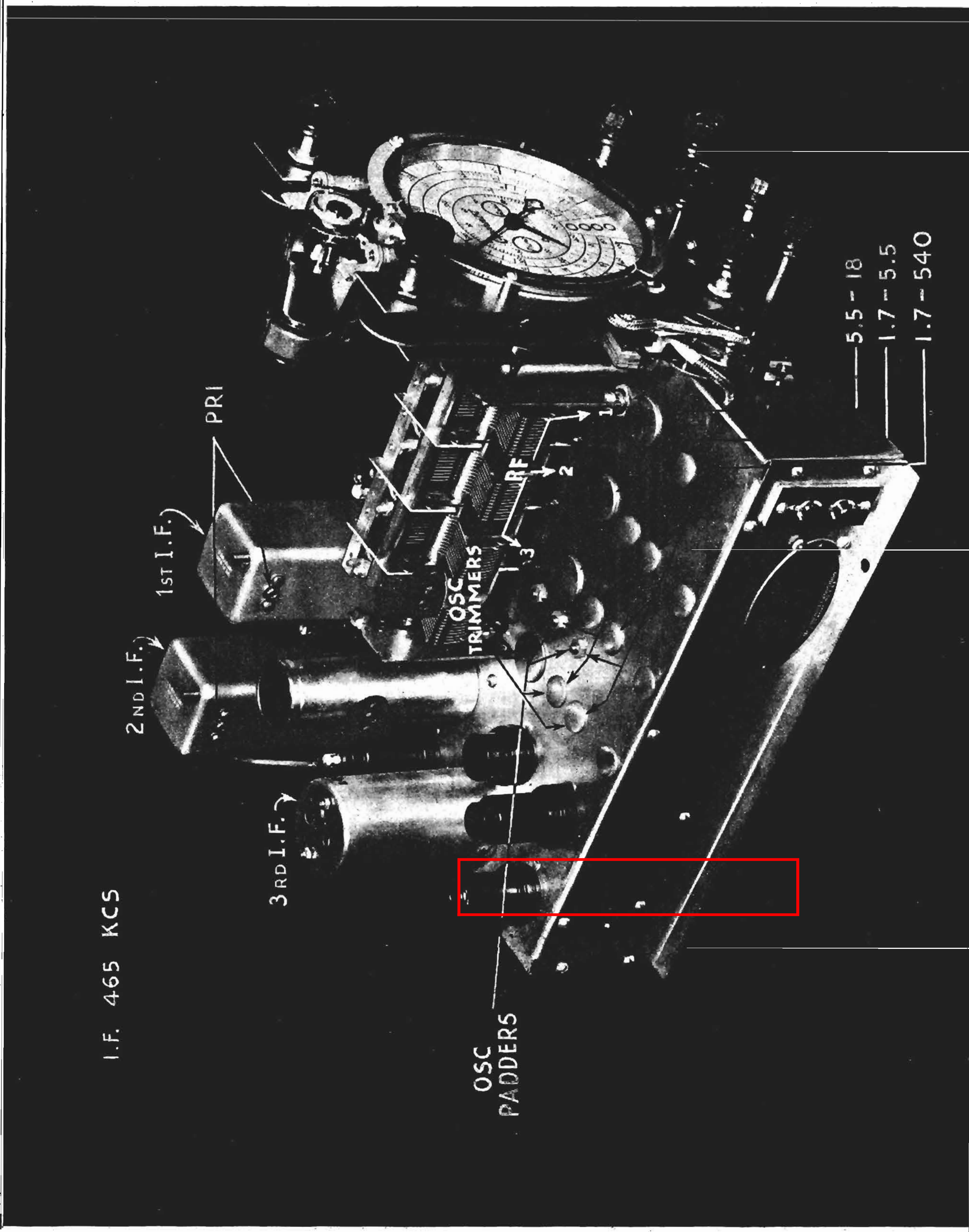
THE CAPEHART, INCORPORATED
Fort Wayne, Ind., U. S. A.

CAPEHART REMOTE CONTROL INSTALLATION

AVAILABLE ON MODELS OF THE SERIES 400G AND SERIES 500G INSTRUMENTS

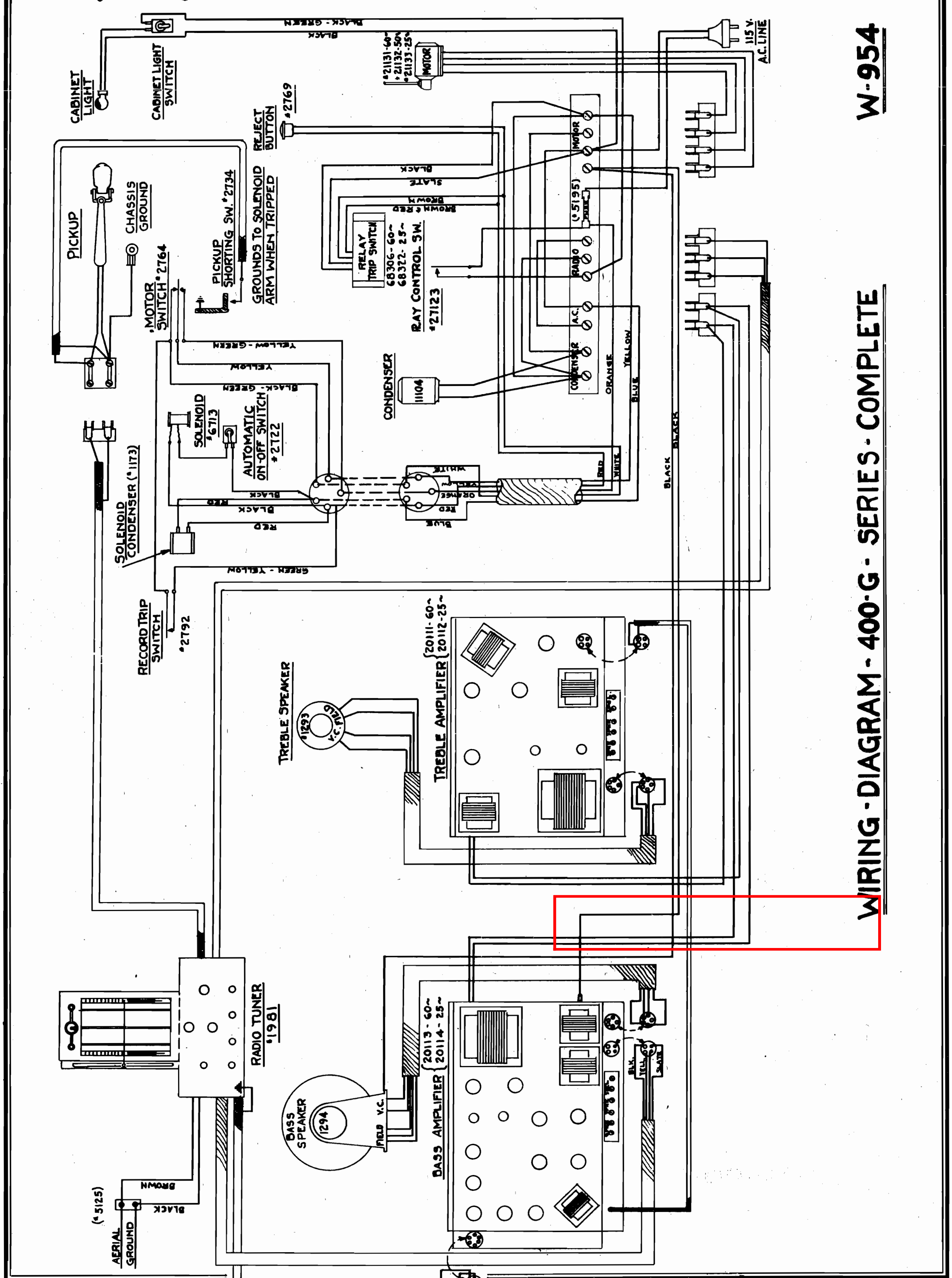
MODELS 400-E,500-E Series

CAPEHART CORPORATION Trimmers,Layout



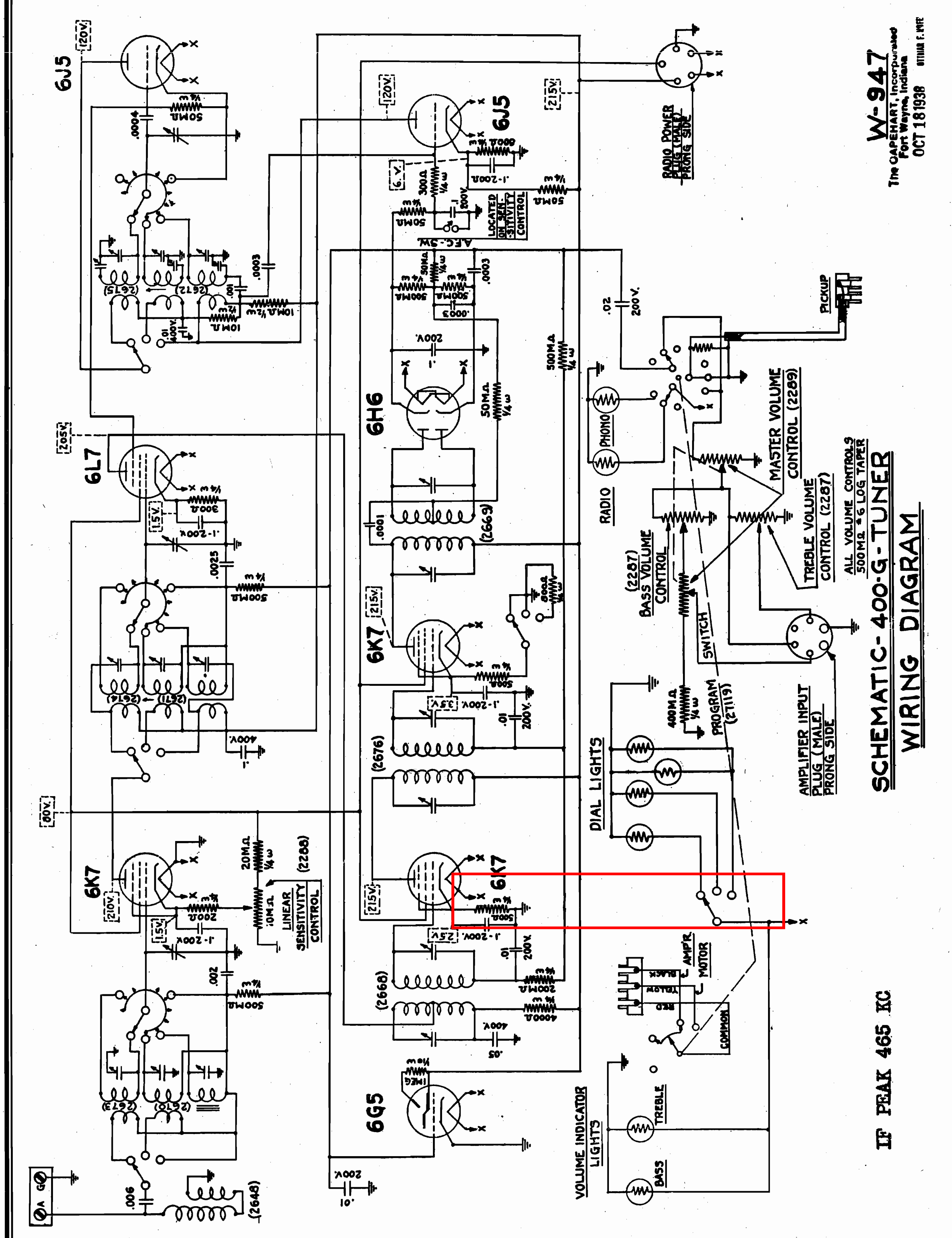
MODEL 400-G
Assembly Wiring

CAPEHART CORPORATION



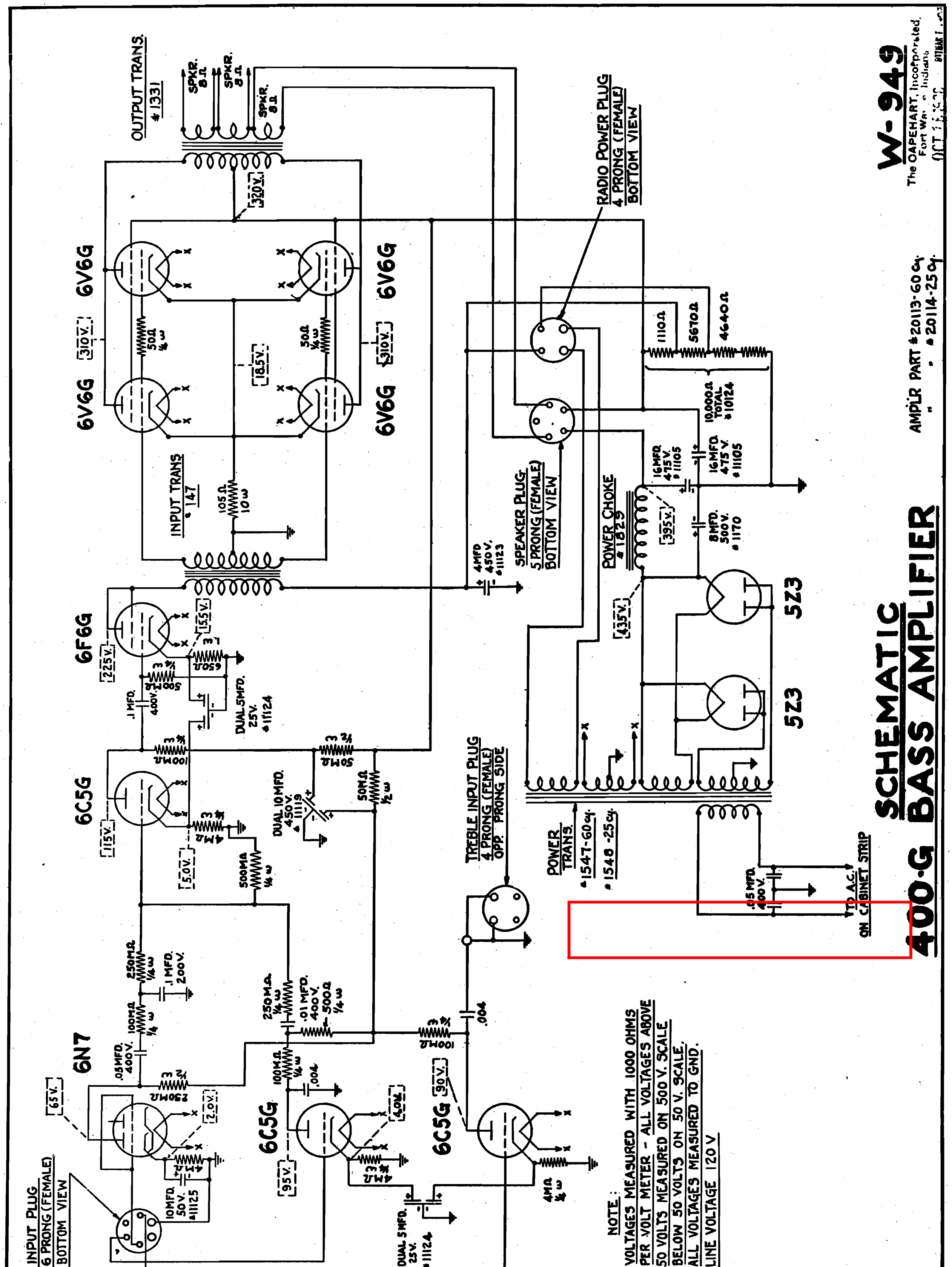
CAPEHART CORPORATION

MODEL 400-G
Tuner Schematic
Voltage



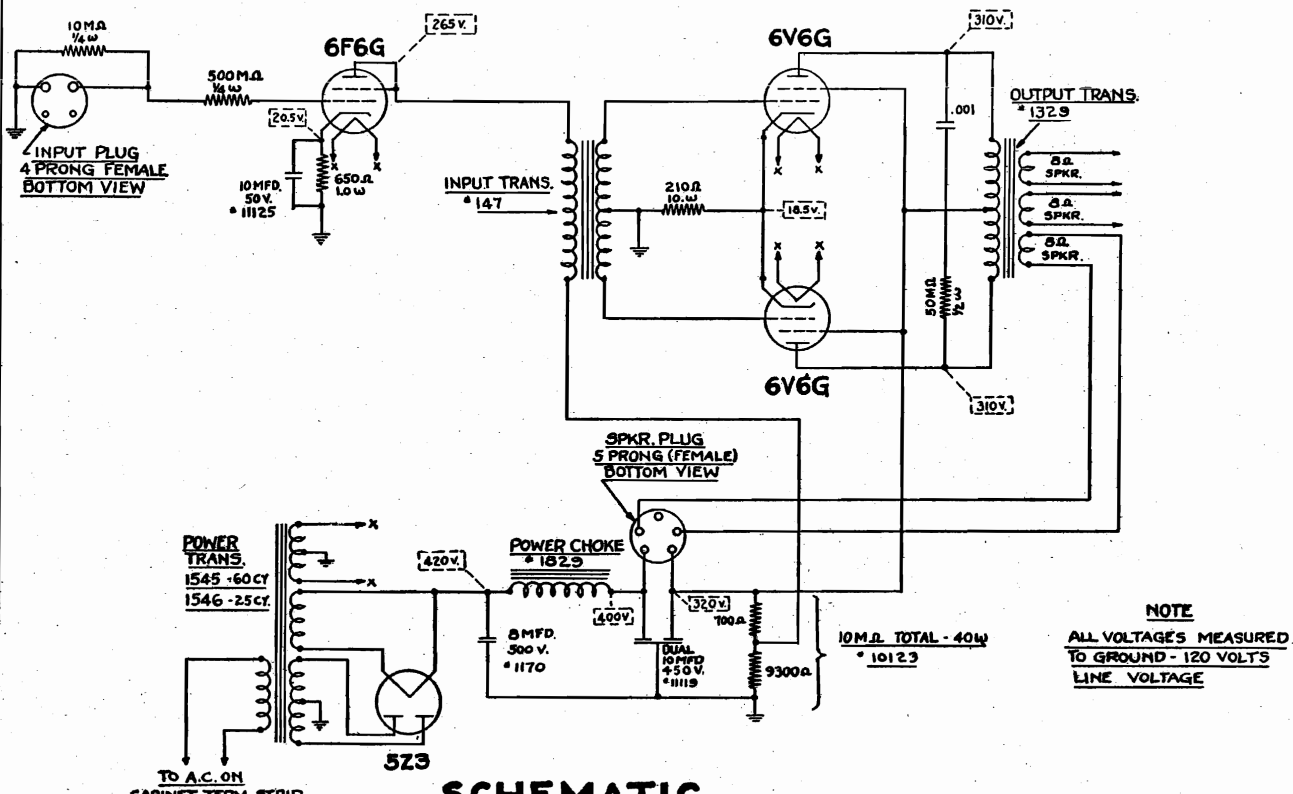
MODEL 400-G
Bass Amplifier Schematic
Voltage

CAPEHART CORPORATION



MODEL 400-G
Treble Amplifier
Schematic, Alignment

CAPEHART CORPORATION



SCHEMATIC
400-G TREBLE AMPLIFIER

W-948

AMPLR. PART No. 20111-60~
" " " 20112-25~

Alignment: I-F

The i-f stages are peaked at 465 kc. Remove the 6J5 oscillator tube. Set the test oscillator at 465 kc and connect the output to the grid of the 6L7 first detector. Adjust the trimmers for maximum reading of the output meter.

AFC :

The AFC circuit is aligned when aligning the i-f amplifier at 465 kc. The primary of the discriminator transformer, marked DIODE transformer in the layout, is aligned at 465 kc. The secondary is aligned with the AFC switch closed on a broadcast or oscillator signal, using either the electric eye or output meter for checking resonance. The AFC switch should then be opened and the secondary re-aligned. If alignment has been made correctly, turning the AFC switch off and on should make no difference in the cathode-ray tuning tube.

R-F :

Replace the oscillator tube. Connect oscillator to antenna post. No matter what band is being aligned, start with the oscillator trimmer with the dial set to the high-frequency end of the band at the following frequencies:

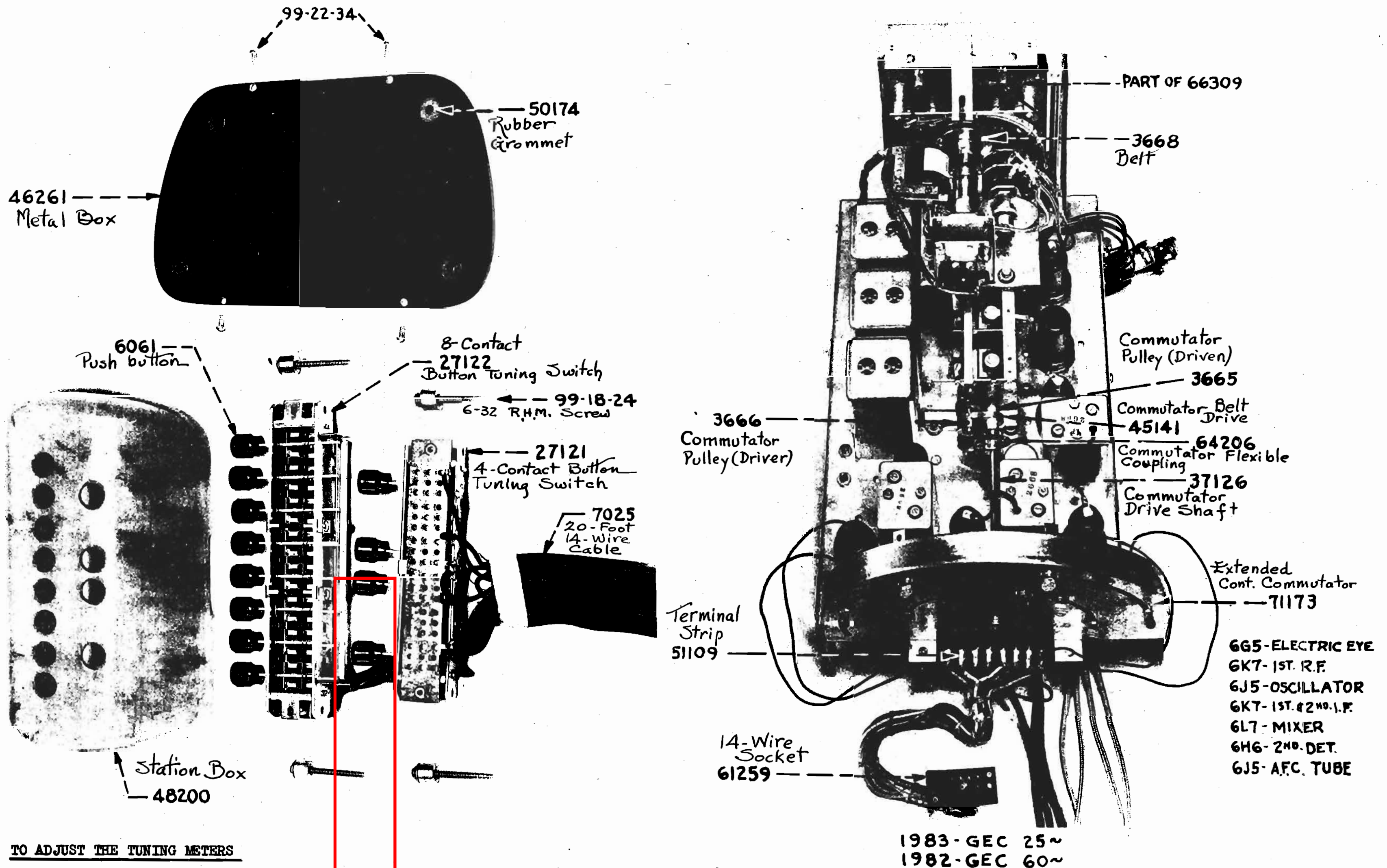
Broadcast Band ... 1400 kc
First H-F Band ... 5.0 mc
Second " " ... 17.0 mc

After the oscillator trimmer has been set for resonance, align the r-f trimmers. After these have been adjusted properly and checked, set the oscillator padding condensers of the bands at the following frequencies:

Broadcast Band ... 550 kc
First H-F Band ... 2.0 mc
Second " " ... 6.0 mc

MODEL 400-G
Tuning Meter Adjustments
Chassis, Assembly

CAPEHART CORPORATION



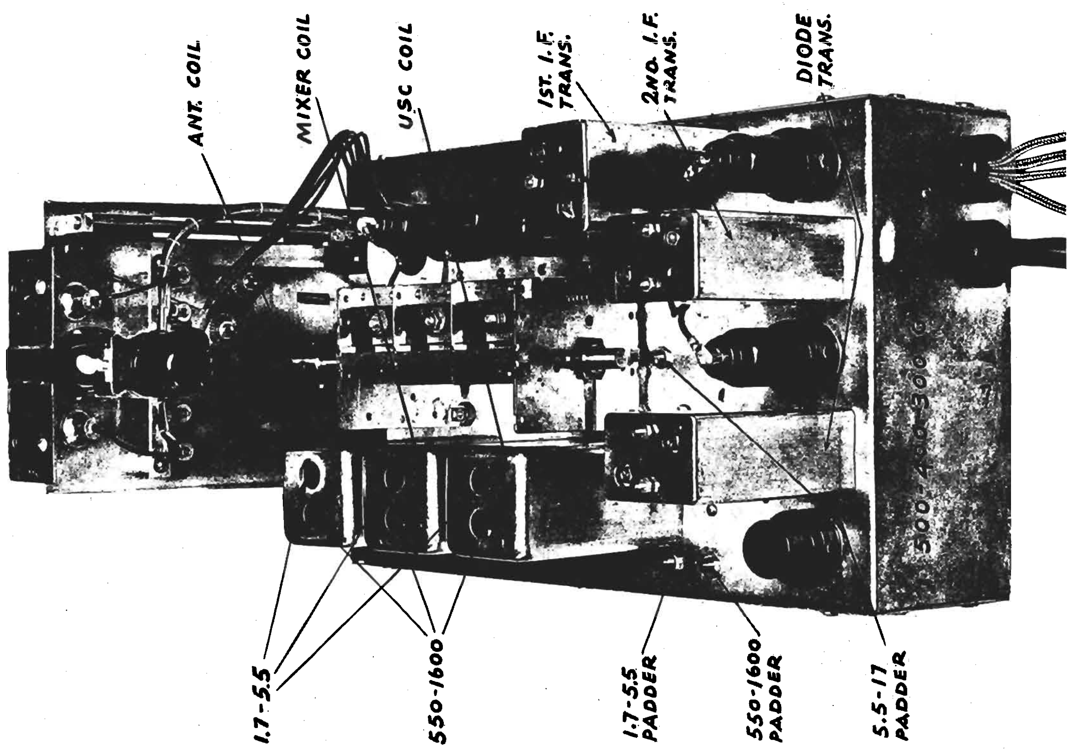
TO ADJUST THE TUNING METERS

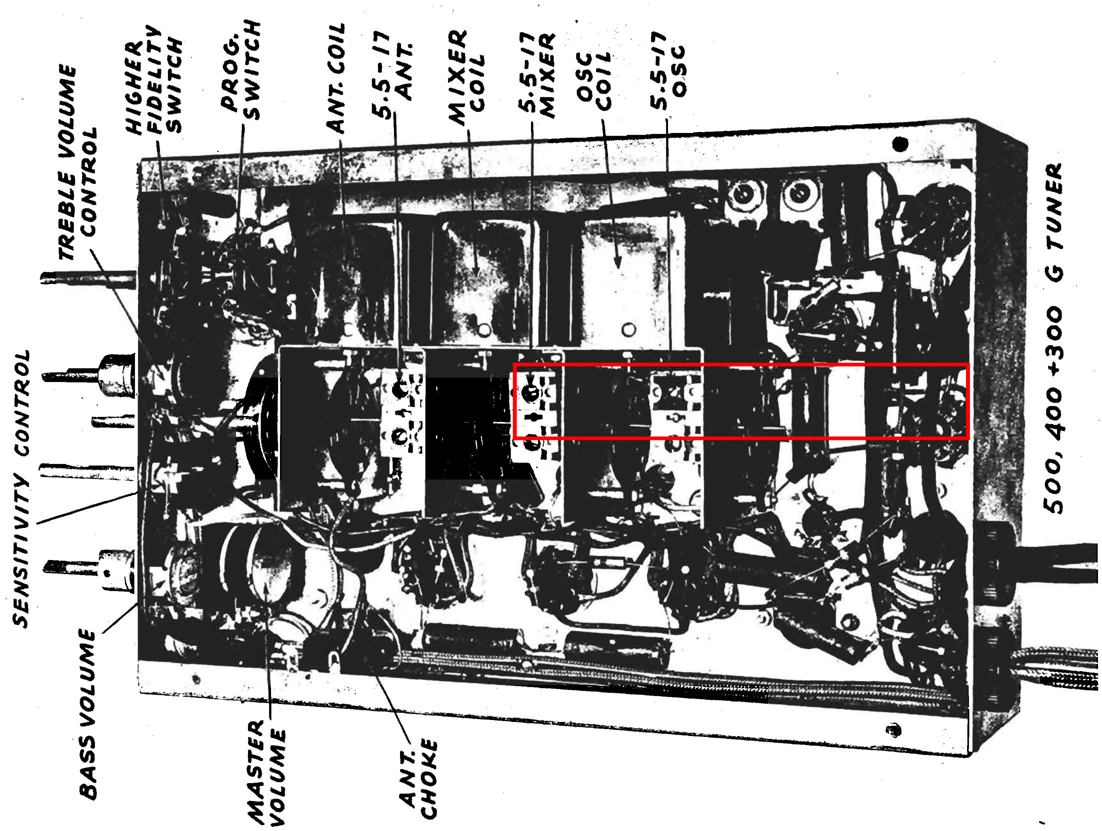
IN ORDER THAT THE CALIBRATION OF THE TUNING METERS, IN THE REMOTE CONTROL STATIONS MAY BE MADE TO AGREE WITH THE TUNING DIAL, A RHEOSTAT IS PROVIDED. THIS RHEOSTAT IS MOUNTED ON THE RADIO CHASSIS, DIRECTLY ABOVE THE ANTENNA GROUND TERMINAL STRIP. THIS RHEOSTAT IS USED TO COMPENSATE FOR THE VARIOUS LENGTHS OF CABLE REQUIRED IN THE DIFFERENT INSTALLATIONS, AND TO COMPENSATE IN THE DROP IN BATTERY VOLTAGE.

TO ADJUST A REMOTE CONTROL STATION, TUNE THE SET BY HAND, TO 550 KILOCYCLES, THEN AT EACH STATION BOX, SET THE METER TO THIS FREQUENCY BY THE ZERO ADJUSTING SCREW ON THE FACE OF THE METER. THEN TUNE THE SET, BY HAND TO 1600 KILOCYCLES, AND ADJUST THE RHEOSTAT UNTIL THE METERS INDICATE THIS FREQUENCY. AGAIN CHECK THE LOW FREQUENCY SETTING, MAKING THE NECESSARY ADJUSTMENTS BY THE ADJUSTING SCREW IN EACH BOX.

MODEL 400-G,500-G Series
Trimmers,Chassis

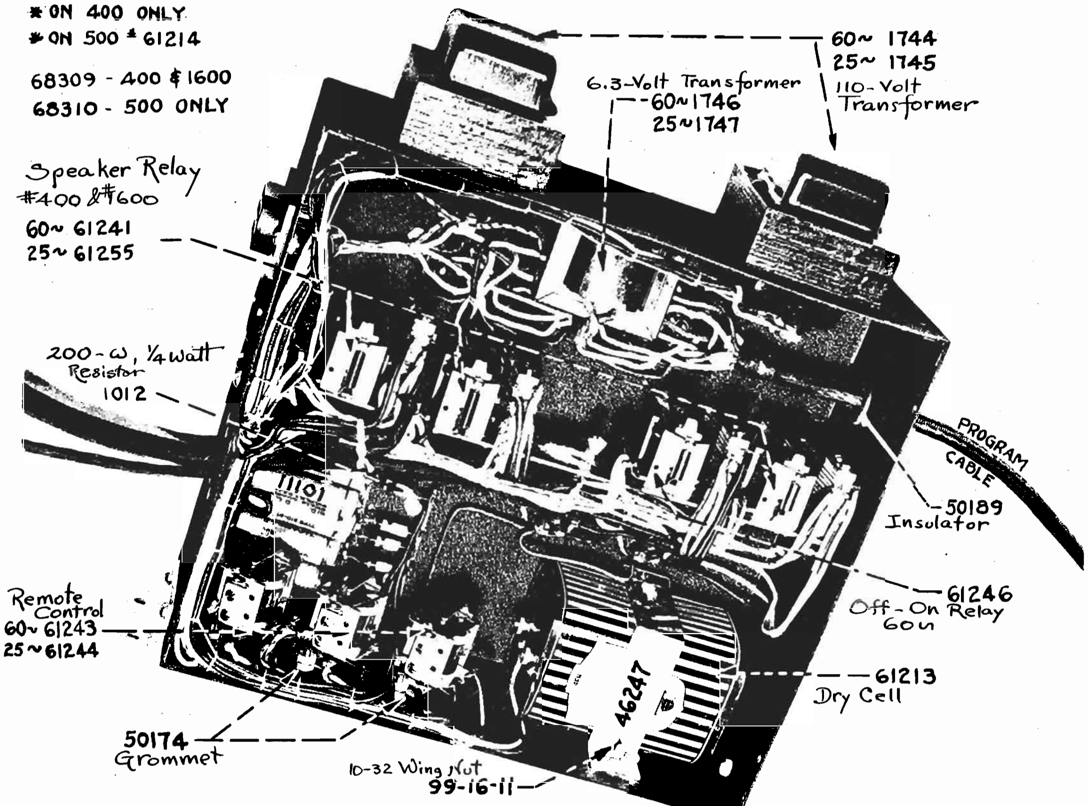
CAPEHART CORPORATION

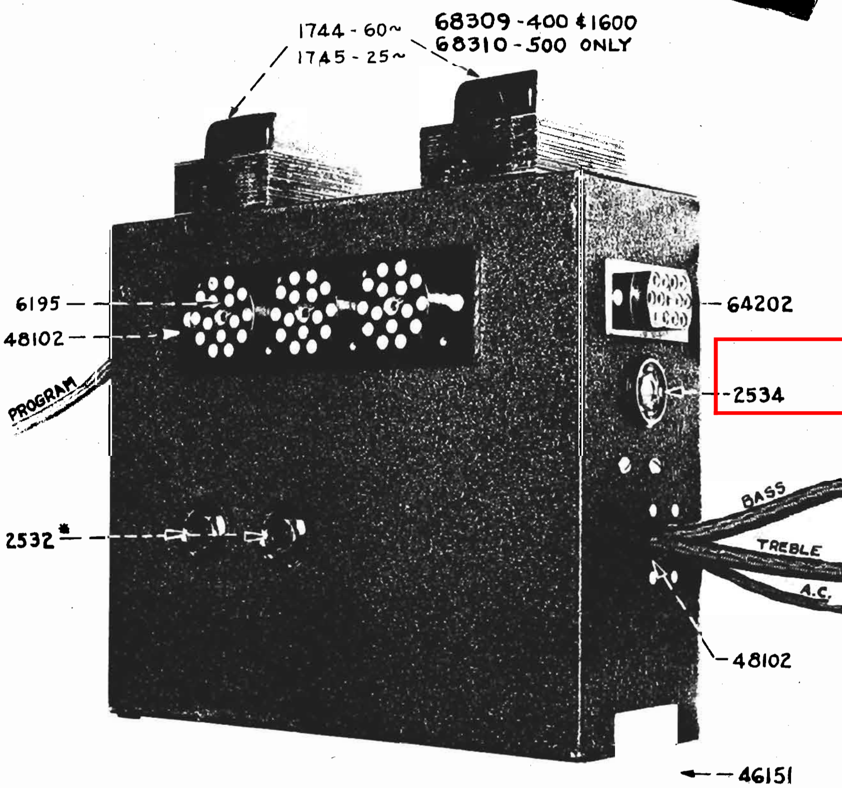




MODEL 400-G,500-G Series
Mixing Panel Chassis
Notes

CAPEHART CORPORATION





THE #1744 TRANSFORMERS, #1745 IF 25 CYCLE, ARE FOR THE PURPOSE OF ENERGIZING THE VARIOUS RELAYS NEEDED TO PERFORM THE NECESSARY SWITCHING OPERATIONS WHEN CUTTING IN OR OUT A GROUP OF SPEAKERS, CHANGING FROM RADIO TO PHONOGRAPH, ETC. ONE OF THESE TRANSFORMERS IS ALWAYS ON THE LINE, EXCEPT WHEN THE PLAY CONTROL IS AT ZERO, TO PROVIDE VOLTAGE FOR THE OFF-ON RELAY.

TRANSFORMER #1746, #1747 IF 25 CYCLE, IS EMPLOYED FOR THE PILOT LIGHT IN THE REMOTE CONTROL STATIONS. IF TRANSFORMER #1746 OR #1747 FAILS TO WORK, THE RESULT WILL BE NO PILOT LIGHT IN THE REMOTE STATIONS, THE OUTPUT VOLTAGE OF THESE TRANSFORMERS IS 6.3 VOLTS.

THE DRY CELL, #61213, IS TO SUPPLY A STEADY SOURCE OF DIRECT CURRENT TO OPERATE THE TUNING OR KILOCYCLE METERS IN THE REMOTE STATIONS. IF IT BECOMES IMPOSSIBLE TO BRING THE METERS IN THE REMOTE STATIONS INTO SYNCHRONISM WITH THE TUNING DIAL, BY ADJUSTING THE RHEOSTAT ON THE RADIO CHASSIS, A NEW BATTERY IS INDICATED.

IF THE OFF-ON BUTTON DOES NOT TURN THE INSTRUMENT ON AND OFF, IT MAY BE THAT THE COIL IN RELAY #61246, #61257 IF 25 CYCLE, IS OPEN. HOWEVER, IF THE COIL IS NOT OPEN, THE CONTACTS MAY NEED CLEANING, OR THE SPRINGS ADJUSTED.

CAPEHART CORPORATION

MIXING PANEL - G-SERIES

If any speaker button does not switch its associated speaker group on or off, the #61241 relay, #61255 if 25 cycle, #61242 60 cycle or #61256, 25 cycle if a Model-500 instrument, may be open, or the contacts in need of adjustment or cleaning. Low volume from one set of speakers, is probably due to lack of field current, due to defective field supply rectifier tube, or the 110-volt relay not making proper contact.

The 200-Ohm resistors, in series with the 0.1 Mfd. condensers, are across the points of some of the relays as thump filters to reduce the radio interference when the relays open or close.

If either the tuning or volume control knobs are ineffective, the trouble may be located in the #61243, #61244 if 25 cycle relay. In the "G" model remote control, the relays operate from 16-volts, instead of 110-volts, with a large reduction in radio interference.

The covers, for the unused 16-wire sockets of the face of the mixing panel, used to connect the remote cables to the instrument, should be left in place. These covers hold the jumpers in the sockets, which complete the tuning meter circuit. If any cover is removed, see that the tuning meter circuit is completed, as these meters operate in series and if a jumper is removed, all meters will fail to function.

When installing a remote control system, all control stations are wired in parallel, except the tuning meters, these meters are in series. The leads for the meters are coded red for one load, and green for the other. In the event that one, or more station tuning meters read backward, the remedy is, of course, to reverse the polarity of the leads going to the meter.

If extra outlets are provided, it is necessary that some method be provided to close the meter circuit in the unused outlets, otherwise the meters will not function.

TO REPLACE KILOCYCLE METER OR GLASS

Remove the station box rear cover, by removing the six screws from the back, thus exposing the bakelite meter cover. This cover has three solder lugs at the bottom edge, all leads to these lugs should be unsoldered. Extreme care should be used in removing the two leads going into the meter case. After the leads are free, remove the three screws holding the meter cover in the box, lift the meter cover and the pilot light, out. Check the position of the Zero adjuster in the face of the box. This is a bakelite part and its pin, which adjusts the meter hand, should be turned to the large opening, in the slot of the Zero correcting arm. Now remove the two screws holding the meter mounting bracket to the case. Care should be exercised when handling the meter, not to bend the hand or get any foreign bodies, especially steel particles, in its moving parts. The glue used to hold the glass in place, is water soluble, and any broken pieces of glass, remaining in the case, may be removed by soaking.

Linoleum cement may be used to hold the new glass in place. This cement requires a minimum of 36 hours to dry, due to the impervious nature of the box and glass. After the cement has hardened, clean the glass carefully, on the inside before remounting the meter. Also check the Zero adjuster before setting the meter into the box, to see that the pin will enter its slot without striking and bending the correcting arm.

When replacing the pointer, #6062, turn the shaft to the position where the switch is open, then turn the shaft ONE notch or step toward one hundred, at this point, set the indicator on Zero and set up the set screw, checking to see that the pointer does not ride on the dial at any point.

TO SET STATION STOPS ON EXTENDED TUNING CHASSIS

Starting at the high frequency (shortest wave length) end of the broadcast band, with the AFC off, pick the desired station, nearest the end of the dial. Slide station stop #1 on the commutator, meanwhile holding button #1 down, until the station desired comes in best, then lock the station stop, by the thumb screw. The odd numbered stops are in the outer row and the even numbered stops in the inner row, (by having two rows of stops, stations on adjacent channels may be tuned in). Next, adjust stop #2 for the next low frequency station, using button #2 and so on, until all eight stops are adjusted. Always have the AFC switch in circuit when using extended tuning, except during the time the stops are being set. Proper call letter strips should be inserted in the buttons with the celluloid covers over them. These call letter slips and covers are packed in a manila envelope with each extended control instrument.

On the chassis, is a relay #61235, #61245 if 25 cycles, which is used to shift the clutch so that the meter may drive either the gang condenser or the volume control, a set of contacts is mounted on this relay to mute the speakers when the meter is tuned from station to station. If a station button is depressed, this relay should close, muting the speakers and shifting the clutch so as to engage with the condenser drive pulley, in the event of failure of the instrument to tune when a station button is depressed, failure may be traced to an open coil in this relay, if the meter operates properly.

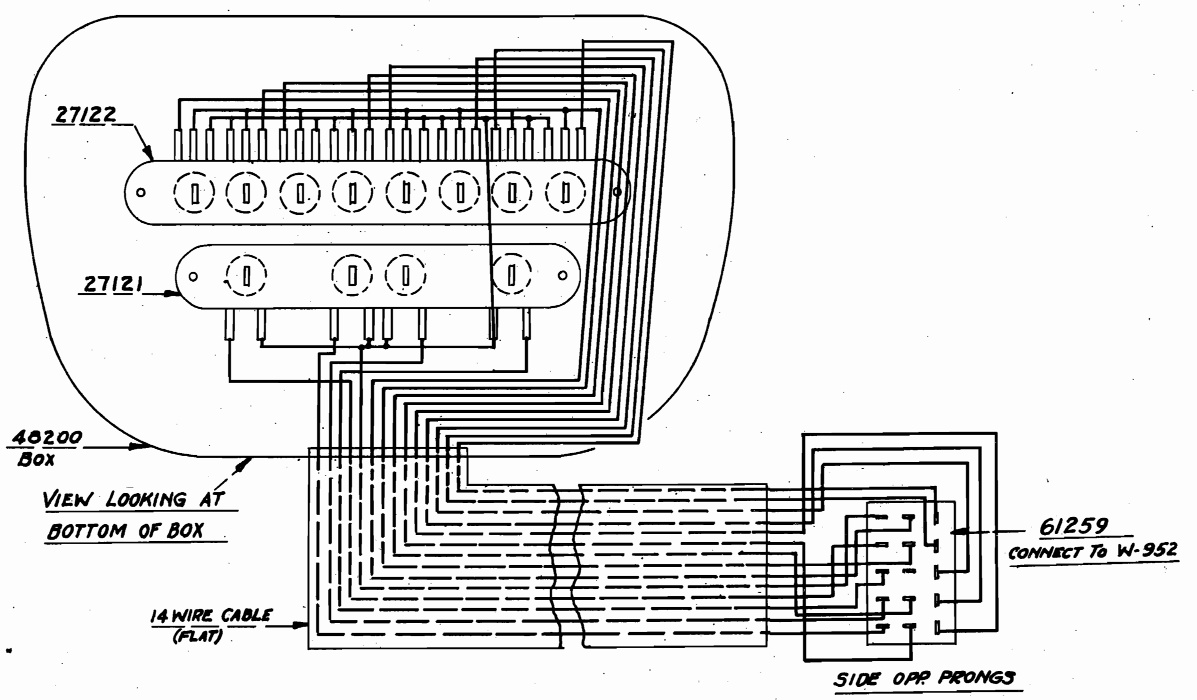
Underneath the chassis is the program relay, #61240, #61258 if 25 cycle. Failure to change from radio to phonograph, or from phonograph to radio, may be due to an open coil or improper contact adjustment here.

In the bottom of the cabinet is the OFF-ON relay, #61246, #61257 if 25 cycle. Failure of the instrument to start or shut off when the corresponding buttons are pushed, may be due to failure of the relay coil or improper adjustment of the contacts.

In case a control button fails to operate from the control box, but the corresponding button on the instrument works, the trouble may be located in the cable.

MODEL 400-G,500-G Series
Extended Control Wiring

CAPEHART CORPORATION



EXTENDED-CONTROL-BOX WIRING-DIAGRAM

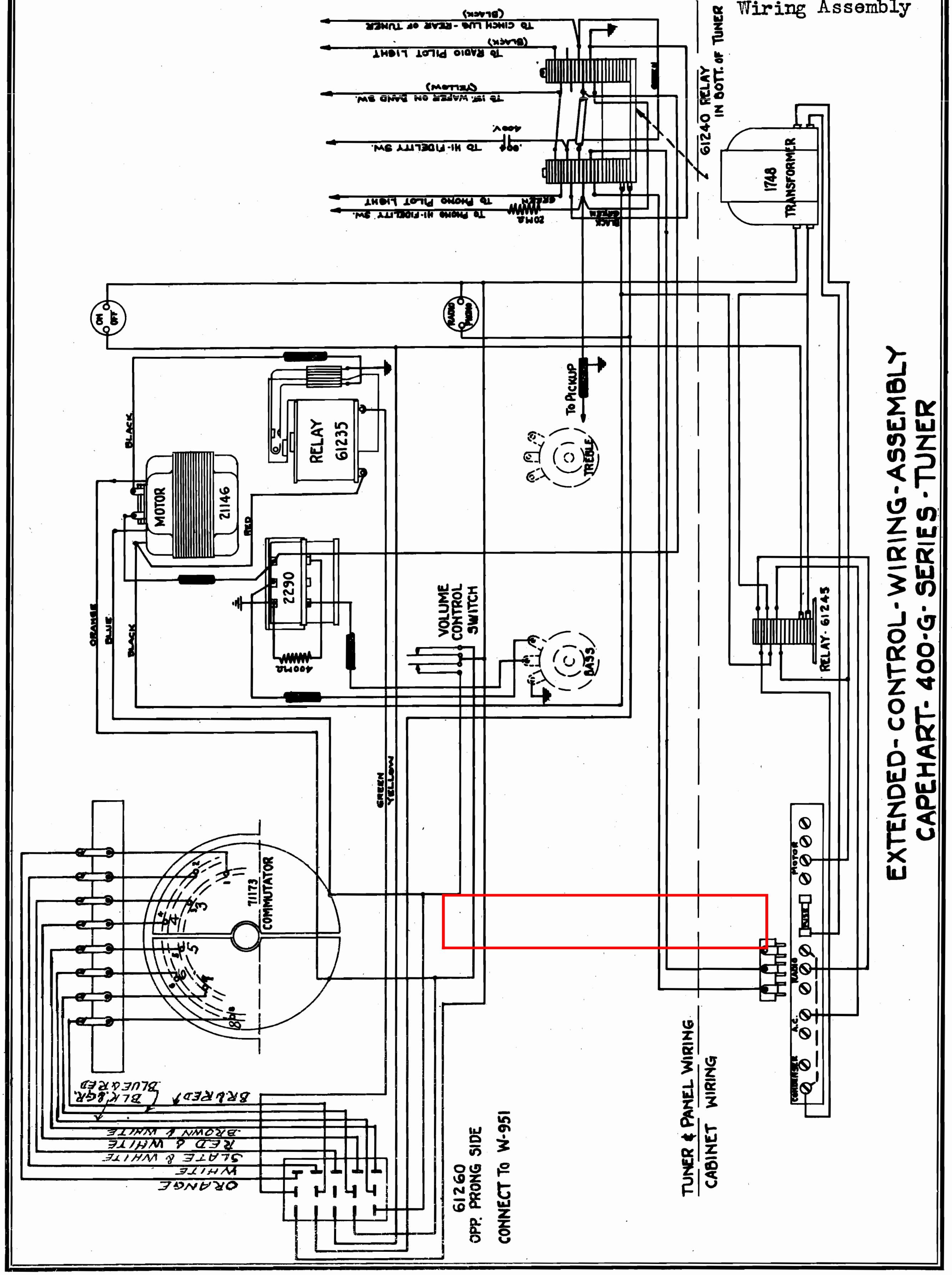
W-951
The CAPEHART, Incorporated
Fort Wayne, Indiana
NOV 2 1938

RATING	NAME	PART NO.	LOCATION	REGULAR #300-400 #500-#1600	EXTENDED CONTROL #300-#400-#500 #1600	REMOTE CONTROL #400-#1600	REMOTE CONTROL #500
110-Volt							
60 Cycle	Cabinet	61228	Cabinet	1	1	1	1
25 Cycle	Cabinet	61229	Cabinet	1	1	1	1
16-Volt							
60 Cycle	Off-On	61246	Cabinet	-	1	-	-
60 Cycle	Off-On	61246	Mixing Panel	-	-	1	1
25 Cycle	Off-On	61257	Cabinet	-	1	-	-
25 Cycle	Off-On	61257	Mixing Panel	-	-	1	1
60 Cycle	Program	61240	Chassis	-	1	1	1
25 Cycle	Program	61258	Chassis	-	1	1	1
60 Cycle	Motor	61235	Chassis	-	1	1	1
25 Cycle	Motor	61245	Chassis	-	1	1	1
60 Cycle	Speaker	61241	Mixing Panel	-	-	*	-
25 Cycle	Speaker	61255	Mixing Panel	-	-	*	-
60 Cycle	Speaker	61242	Mixing Panel	-	-	-	*
25 Cycle	Speaker	61256	Mixing Panel	-	-	-	*
60 Cycle	Remote	61243	Mixing Panel	-	-	3	3
25 Cycle	Remote	61244	Mixing Panel	-	-	3	3
60 Cycle	Off-On	61224	Speaker Cabinet	) These relays used			
25 Cycle	Off-On	61226	Speaker Cabinet	) at extension speakers only			

*One speaker relay is required for each speaker installation, including the speakers in the instrument, in the case of the #400 and #500 Series.

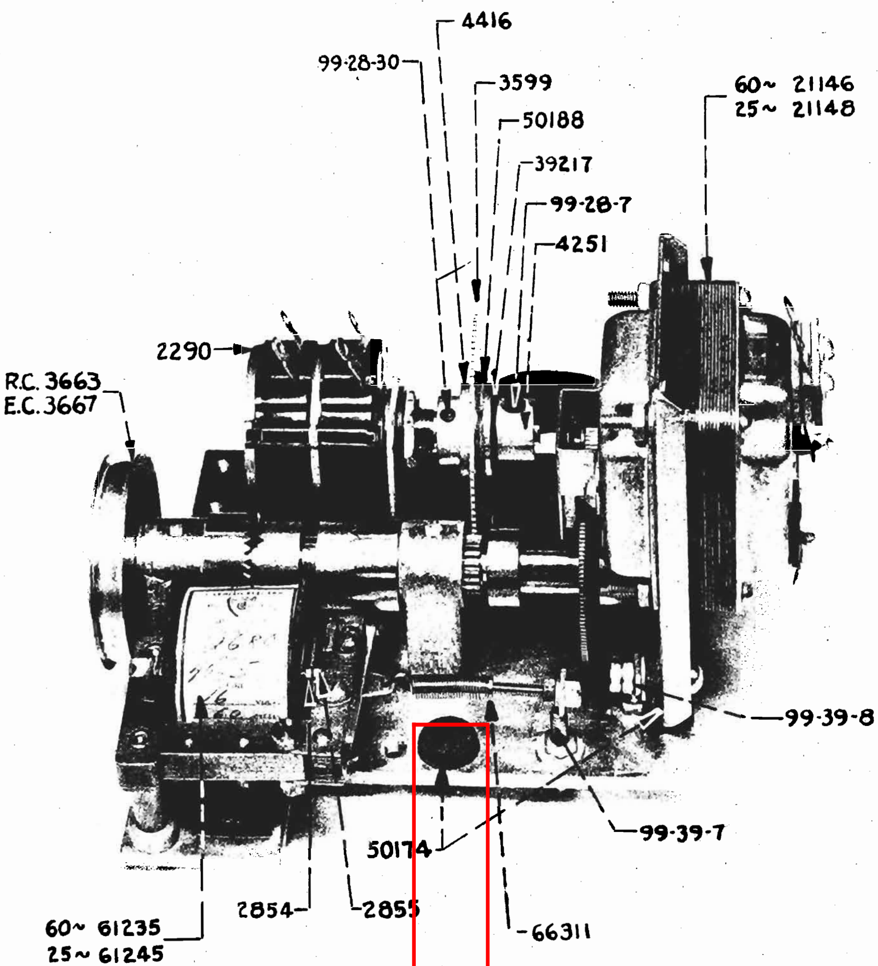
MODEL 400-G, 500-G Series
Extended Control
Wiring Assembly

CAPEHART CORPORATION



MODEL 400-G
Volume Control Schematic
Data, Parts list

CAPEHART CORPORATION



The motor which operates the tuning and volume control mechanism has a thermostat on it. This thermostat will allow the motor to operate continuously for ten minutes before shutting off the motor.

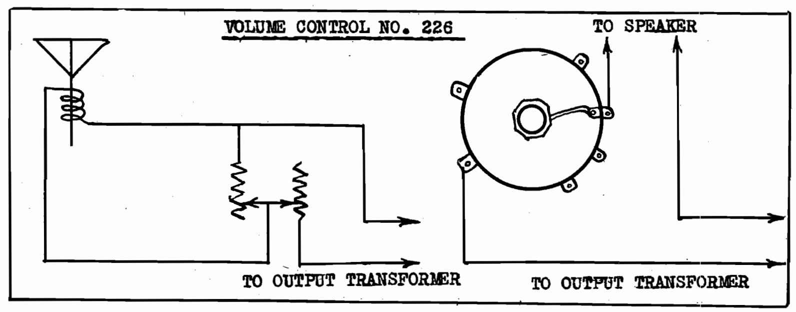
If the motor fails to operate when the proper controls are used, the thermostat has undoubtedly shut off the motor. Allowing the tuning and volume controls to remain unused for three or four minutes, will close the thermostat and the instrument can be used in the regular manner. This thermostat is placed on this motor as a safety device and if the above occurs, it is a normal function of this motor.

Part No.	Description
2290	Master Volume Control
2854	Muting Switch Contact Assembly
2855	" " " "
3599	Volume Control Gear
3662	Clutch (Driver)
3663	Drive Pulley for Remote Control only
3667	" " " Extended " "
4251	Collar
4416	"
21146	Motor, 60 cycles
21148	" 25 "
39217	Spring Washer, Volume Control
50174	Grommet
50188	Friction disc, Volume Control
61235	Relay, 60 cycles
61245	" 25 "
66311	Relay Spring Assembly
99-28-7	10-32 x 3/16" setscrew
99-28-30	6-32 x 1/4" "
99-37-7	6-32 x 7/8" Spade bolt
99-39-8	6-32 x 3/4" " "

VOLUME CONTROL NO. 226 (CONSTANT IMPEDANCE)

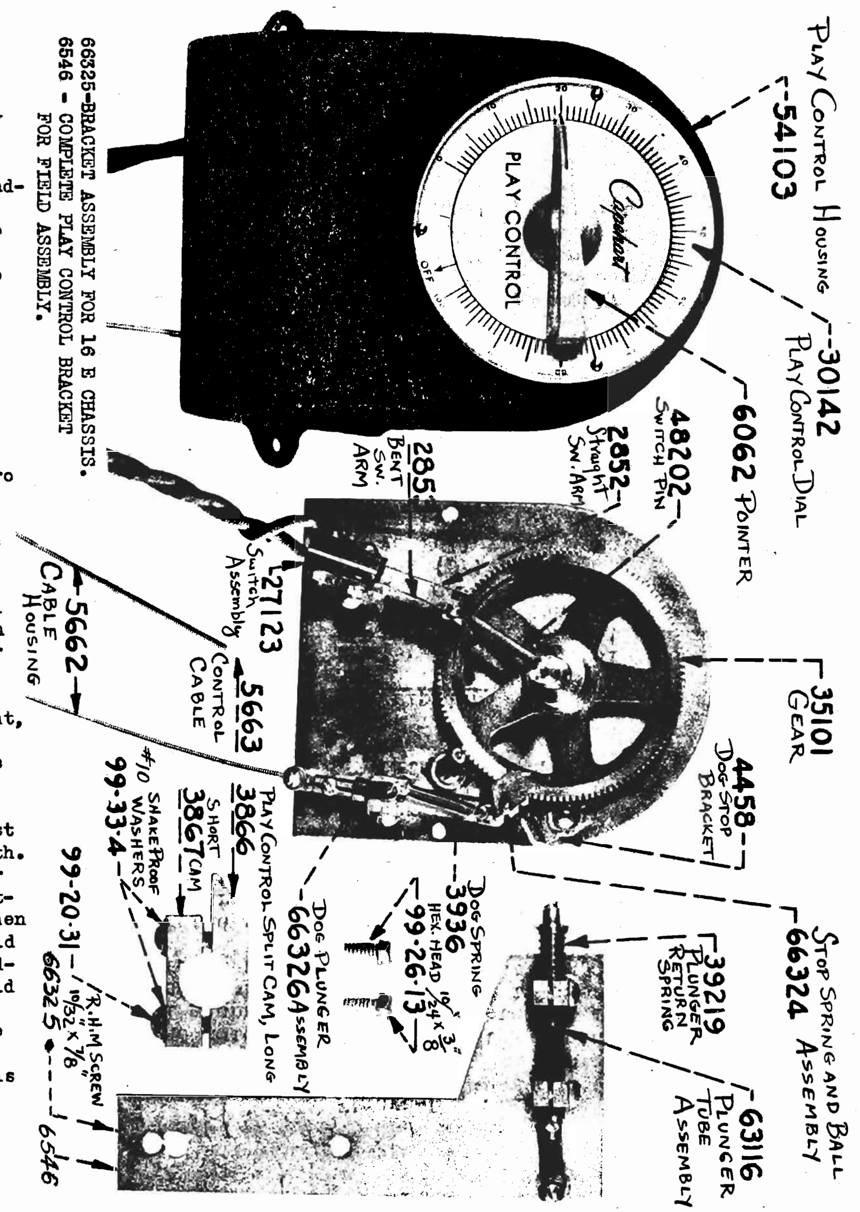
THIS DIAGRAM AND VOLUME CONTROL ARE TO BE USED WHEN IT IS NECESSARY TO HAVE VOL--UME CONTROL FOR EACH INDIVIDUAL REMOTE SPEAKER. ONE VOLUME CONTROL IS NEEDED FOR EACH SPEAKER TO BE CONTROLLED, THAT IS, TWO FOR EACH 400-G REMOTE SPEAKER INSTALLATION, AND THREE FOR EACH 500-G REMOTE SPEAKER INSTALLATION. THIS VOLUME CONTROL NO. 226, MY ONLY BE USED IN LOW IMPEDANCE CIRCUITS, FROM 6 TO 10 OHMS. IT IS NOT SUITABLE FOR USE WITH HIGH IMPEDANCE SPEAKERS OF THE MAGNETIC TYPE, OR ELECTRODYNAMIC SPEAKERS, HAVING HIGH IMPEDANCE TRANSFORMERS.

THE OUTPUT TRANSFORMERS OF THE CAPEHART AMPLIFIERS MATCH TO 8 OHMS, AT 400 CYCLES.



CAPEHART CORPORATION

MODEL 400-G
Play Control
Assembly, Adjustments



66325-BRACKET ASSEMBLY FOR 16 E CHASSIS.
6546 - COMPLETE PLAY CONTROL BRACKET FOR FIELD ASSEMBLY.

THE CAPEHART PLAY CONTROL

The play control allows the operator to set the phonograph to play a predetermined number of selections and have the instrument automatically stop when that number of selections have been played.

When the play control is set at Zero, all remote control and extended control stations are rendered ineffective. An off position is provided on the play control, so an indefinite number of selections may be played without the control operating.

In disconnecting the play control from the record changer, the two set screws on the cable and the cable housing, should be loosened and the cable and cable housing carefully removed. When the cable is removed from the plunger, see that the wire is not broken, and the kink, due to the set screw, should be straightened out before reinstalling the cable.

TO ADJUST THE PLAY CONTROL

When setting up a play control, the counter should be reset at Zero just as the needle touches the record. That is, the play control cam, on the record changer main shaft, should be from 1/4" to 1/2" beyond the plunger after the main clutch has disengaged. The control cable is put in the hole in the plunger and the set screw tightened, then the cable housing should be held in place by the set screw - do not set the screw tight. Turn the pointer back and forth over the play control dial, if the pointer catches or binds, slip the cable housing away from the bracket slightly, until the pointer runs free, then run the changer through a cycle to see that the play control resets properly, then tighten the screw.

When adjusting the play control, which is in the record compartment, after removing the wood screws which mount the control to the shelf, remove the clips holding the 110-volt loads to the switch. Then remove the pointer and the two round head machine screws from the back. The stop spring of the stop spring and ball assembly, #66324, should be tangent to the gear and the ball should be in the space between the last and the next to the last tooth, before the blank space in the gear tooth. With the ball in this position, the set screw in the collar at the rear of the unit should be firmly against the stop pin. To make this adjustment, loosen the set screw, while holding the gear, move the collar, then tighten the set screw. In this position, the switch pin, #48202, should hold the switch open and permit the switch to close when the gear is advanced one tooth. The stop bracket #4450, for the resetting dog, should allow the dog to advance only one tooth at a time, if it picks up more than one tooth, move the step toward the dog until it advances only one tooth at a time.

The resetting dog #3839, should not ride on the gear tooth, as this will prevent turning the pointer toward one hundred. Shift the stud, #4354 until the dog clears the tooth, then check the alignment of the plunger tube and the cable housing stud, for if the cable is bent here, the play control may fail to function.

MODEL 400-G
Remote Control
Cable Notes

CAPEHART CORPORATION

REMOTE CONTROL CABLE BULLETIN

SERIES-G

TO SPEAKERS --

Speaker cable of size according to the charts below, must be run from the instrument to each individual speaker.

The 110-volt AC lead for the speaker fields may be run from any 110-volt AC line nearest, or most convenient to each individual speaker The above is all the wiring necessary for remote speakers.

TO REMOTE STATIONS --

Remote station cable of size according to the chart below, may be run from the instrument to each individual remote station, or extended from one remote station to another in parallel. This one cable is all the wiring required for remote stations.

CABLE SIZES ON #500-GR (REMOTE CONTROL)

No. of Remote Control Stations and Speakers	Speaker Cable Sizes	Remore Control Cable Sizes
4 or less	8-Wire	16-Wire To All Stations
5 to 13	8-Wire	24-Wire To All Stations

CABLE SIZES FOR #400-GR and #1600-GR (REMOTE CONTROL)

No. of Remote Control Stations and Speakers	Speaker Cable Sizes	Remote Control Cable Sizes
4 or less	6-Wire	16-Wire To All S tations
5 to 13	6-Wire	24-Wire To All Stations

Note the Model-1600GR does not include any speakers. All speakers used with this model must be of the AC type, Models G2 or AG2. All remote speakers on the #400-GR Series are AC speakers, Models G2 and AG2. All remote speakers on the #500-GR Series are G3.

Note the Model 1600-GR does not include any speakers; while the Series #400-GR and #500-GR models include one set of DC speakers in the instrument cabinet. No DC speakers are required with the Model-1600GR and all speakers for this model and all remote speakers for the Series #400-GR and #500-GR are of the AC type.

Instruments equipped for four speakers or less (including the speaker in the instrument) contain one set of amplifiers. For five and including eight speakers, two sets of amplifiers are used, and for nine and including twelve speakers, three sets of amplifiers are used. These additional sets of amplifiers are not installed in the instrument cabinet and may be located in a closet or other convenient place, apart from the instrument.

In all models where additional sets of amplifiers are used, all speakers operating from these amplifiers are of the AC type. When ordering equipment calling for additional sets of amplifiers, specify length of cable necessary to connect additional amplifiers to the instrument.

REMOTE CONTROL EQUIPMENT INCLUDES:

Instrument equipped for remote control operation.
One remote control station with 20-ft. flat cable.
Provision for attaching number of additional remote control stations as ordered.
Provision for attaching number of auxiliary speakers as ordered.

Speaker push buttons will be engraved with any lettering desired as specified, maximum limit two lines of six letters each, or one line of seven letters. Unless otherwise specified, speaker push buttons will be engraved "spkr. 1", "spkr. 2", etc.

Plug #61106 and outlet box cover #66132, are used where the 24-wire remote control station cable enters and leaves the wall.

Plug #6194 and outlet box cover #66132, are used where the 16-wire remote control station enters and leaves the wall.

24-wire flat cable is used between each remote control station and the instrument, or between remote station and wall receptacle on instrument, or between remote station and wall receptacle on instruments having more than four remote stations and speakers.

16-wire flat cable is used between each remote control station and the instrument, or between remote station and wall receptacle on instruments having four or less remote stations and speakers.

Round Cable is used whenever the cable is concealed.

Standard Gem "F" Outlet Box is used with #66197, #66264, #66132, #66131, #66104 and #66193 outlet box covers and is obtainable at any local electrical dealer.

Use standard house wire, approved by the Underwriters' Laboratories for connecting AC speaker fields.

CAPEHART CORPORATION

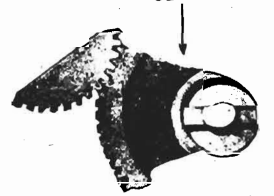
MECHANICAL INSTRUCTIONS

No. 16-E De Luxe Record Changer

1. TO LOCATE AND ADJUST THE RECORD TRAY (6687) (Fig. 6).

In assembling the record tray to the record changer, the first tooth of the driver quadrant (3551) (Fig. 5) should mesh with the second tooth of the driven quadrant of the tray as shown.

6257



With the two gears properly meshed, loosen the Allen set screws which hold pins No. 34133, Fig. 1, in place. This will allow you to move the record tray sidewise, adjust tray sidewise until the turntable spindle is exactly in the center of the 10″ record level of the record tray. (The 10″ record level is that part of the tray where the felts No. 4913 are indicated in Fig. 6.)

With the central lever in the "one side" position, run the record changer through its cycle until the large hole in the main cam is exactly half way past the upper edge of the record tray cam follower, as shown at No. 5, figure 1. At this position, the points of the ten-inch felts (4913) (Fig. 6) should be level with the top of the turntable felt. If this tray is too low or too high, it may be adjusted to the proper level by loosening the eccentric screw (3237) (Fig. 1) No. 4 and turning this screw until the proper level is obtained. Be sure to tighten the lock nut after adjustment.

If the tray is too high, at this position, the ten-inch records will not be centered over the turntable spindle. If the record tray is too low, the ten-inch records will slide out over the ten-inch tray shoulder and not properly center.

2. THE ADJUSTMENTS OF THE RECORD MAGAZINE.

Before attempting to adjust the magazine, be sure that the center of the magazine pivot pins (34132) (Fig. 1) is 8⅜″ above the base plate. This height is very important and we recommend checking the height of the right hand pin, when looking at the magazine, before any adjustments are made.

The record magazine is positioned by moving it sideways on its bearing or pivot pins. The two set screws underneath the pivot pins lock the magazine in position. Loosen these set screws, then see that the left hand side of the record reverse assembly fork (part of 6228, Fig. 6) is between $\frac{1}{32}$″ and $\frac{1}{16}$″ inside the left hand side of the Reverse crank, when looking at the magazine. That is, the left hand edge of the record reverse fork is about $\frac{1}{32}$″ or $\frac{1}{16}$″ to the right of the left hand edge of the crank. After moving the magazine, lightly set up the set screws. Then with the selector arm in the "Repeat" position swing the record reverse arm around in front of the magazine, to see whether the record guide strikes either of the record support pins (34138) (Fig. 6). If the guide strikes either of the support pins it will be necessary to bend the pin away from the guide so they can not strike. If it is necessary to bend either pin, set the control lever in the "Repeat" position, then raise the record tray by hand, with a 10″ record on it, observing the way the record strikes the support pins, the record should hit both pins about $\frac{1}{16}$″ from the end of the pin; if it does not it will again be necessary to adjust the pin until the record hits both pins an equal distance from the ends. If it is necessary to bend the pins, check the clearance between the record guide arms and the pins and between the arm carrying the record guide and the right hand pin. Also if the magazine has been shifted it is necessary to see that the two points, which extend downward from the magazine, have ample clearance in the channels, in the record tray, which are provided for their passage. If there is possibility of the points striking it probably means the magazine has been shifted too much.

If the magazine has been adjusted, it is also necessary to see that the record separator hook (6226) (Fig. 1) does not bind in the slot in the end of the record separator arm (6445) (Fig. 6). If it does the section covering these parts give the adjustment.

3. MAGAZINE STOP SCREW.

The magazine stop screw No. 2, Fig. 5, should be adjusted so that the crank pin (part of 6230, Fig. 1) is approximately $\frac{1}{16}$″ from the edge of the record reverse arm fork (part of 6228, Fig. 6) which is furthest from the magazine, when the record reverse guide is in front of the magazine, that is, in the reversing position.

4. MAGAZINE LINK ADJUSTING SCREWS (No. 2) (Fig. 1).

The record magazine should always come back snugly against the magazine stop screw, No. 2, Fig. 5. If it does not, it is necessary to loosen the two set screws (No. 2, Fig. 1) to a sliding tension and run the record changer through a cycle of change. When the magazine has reached the horizontal position, as shown in Fig. 1, press down on the lower end of the magazine; this will lengthen the link assembly. Then when the magazine returns to its normal position, the magazine link will adjust itself so that the magazine is snugly against the stop screw. Then tighten the magazine link screws.

5. RECORD REVERSE GUIDE (6444) (Fig. 6).

With a 12″ record in the magazine the record reverse guide assembly (6444) (Fig. 6) should be parallel with the record when in the reversing position, in front of the magazine.

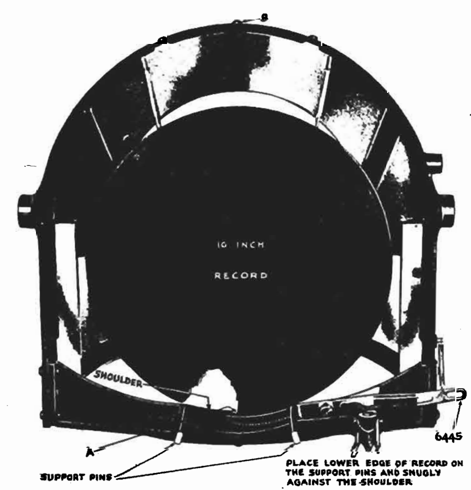
If the record reversing assembly is parallel with a 12″ record as above, it should come around and lay against the reverse guide pin tubing (34134) (Fig. 6), if the eccentric cam (3825) (Fig. 8) is properly adjusted. This cam can be adjusted, by loosening the screw through the cam and turning it so that the record reversing assembly returns to the reverse guide pin tubing. Care should be taken when making this adjustment so that the crank pin (part of 6230, Fig. 1) does not hold the reverse guide away from the pin tubing. This cam should be turned so that the reverse guide assembly just touches the pin tubing; if the cam is turned too far it will allow the reverse guide assembly to hit the pin tubing, but in the reversing position the assembly will not be able to assume a position parallel with a 12″ record.

6. REVERSE ASSEMBLY LINK ROD.

Loosen lock nut No. 9, Fig. 3, while the record changer is in the reversing position, that is, when the reversing assembly (6444) (Fig. 6) is in front of the magazine. Remove the screw (3241) (Fig. 8) holding the reverse segment link (34141) (Fig. 8) to the reverse segment (3550) (Fig. 8) and lengthen or shorten the link, by the link thread until the reversing crank (6230) (Fig. 1) stands with the crank pin just barely touching, but not binding, against the front side of the fork (6228) (Fig. 6). After the adjustment has been made, lock the link in place with the lock nut No. 9, Fig. 3.

7. RECORD SEPARATOR ADJUSTMENT.

The separator stop No. 3, Fig. 1, should be adjusted so that a small 10″ record will positively clear the knife portion of the separator lever as shown in the following illustration. A standard to use is to make certain that there is approximately $\frac{1}{32}$″ clearance between the edge of the small record and the point of the separator lever, as shown at "A" in illustration below. However, it may be necessary to vary one way or the other from this measurement, depending on whether or not the slotted end of the record separator lever goes over the hook (6226) (Fig. 1) without binding.



8. RECORD SEPARATOR HOOK ADJUSTMENT.

After adjusting the record separator it will be necessary to check the record separator hook (6226) (Fig. 1) to see that it enters the slot in the record separator without binding. This hook is threaded and by loosen-

MODEL 16-E
Adjustments, Part 2

CAPEHART CORPORATION

ing the locknut the hook can be turned in either direction, to raise or lower it. After the correct adjustment is obtained, tighten the locknut.

It should never be necessary to change these adjustments on record changers unless they have been tampered with by an inexperienced person.

9. SEPARATOR HOOK AND ARM (6226) (Fig. 12).

Be sure set screw No. 10 in Fig. 8 is screwed all the way in.

10. RECORD MAGAZINE BUSHING (4020) (Fig. 1).

If a ringing noise is heard while the instrument is changing records, i. e., such a noise that might be made by a spring, it will be found that the Durex bushing (4020) (Fig. 1) is too tight, in which case it will be necessary to loosen the lock nut of the holding bolt, and back the bolt out, from a quarter to a half turn, then tighten the lock nut.

11. TO ADJUST THE TONE ARM HEIGHT.

To adjust the tone arm height, first place a 12" record on the turntable and adjust the tone arm stop lever (64197) (Fig. 1) so that the record hits the rubber roller (5044) (Fig. 1) in the center. Start the record changer through a cycle and stop it when the tone arm lever hook (5658) (Fig. 1) just touches the stop lever assembly. In this position adjust the tone arm height so that the top of the stop lever is the same height as the center of the hook. This adjustment is made by loosening the two Allen set screws at the rear of the tone arm. These Allen set screws are accessible by raising the tone arm by hand. After making the height adjustment it is necessary to make certain that there is a clearance of approximately ⅝" between the pickup head and the record tray. This distance may be checked between the bottom of the record tray and the bottom of the pickup when the record tray is approximately parallel with the pickup.

12. TO ADJUST THE PICKUP ELEVATION.

When the tone arm swings in towards the record, the pickup arm lever hook (5658) (Fig. 1) comes to rest against the pickup arm stop lever (64197) (Fig. 1) and when the tone arm lowers the pickup toward the record it pauses momentarily before the pickup arm lever hook goes through the stop lever. If the record changer is stopped during this pause, it will be found that the ball in the end of the pickup arm lift shaft (6457) (Fig. 9) is at the point marked "L" in Fig. 9 on the lift cam (6449) (Fig. 9.) Now if the pickup, with a needle in the proper position, is moved beyond the edge of the record, the point of the needle will extend below the top surface of the record a distance equal to half the thickness of the record. The correct elevation of the pickup is made by the screw in the underside of the tone arm fork against which the pickup cover rests. Loosen the locknut, adjust the screw to bring the needle to the position mentioned above, then lock the locknut.

13. PICKUP FEED IN ADJUSTMENT.

The collar of the pickup arm swing lever and collar assembly (6232) (Fig. 9) should ride on the leather facing of the friction cam (6691) (Fig. 10) until the pickup arm lever hook (5658) (Fig. 1) has engaged the stop lever (64197) (Fig. 7). Then a slight amount of friction should be maintained after the ball at the end of the pickup lift arm (6457) (Fig. 9) has engaged with the lift cam (6449) (Fig. 9). This friction should be maintained until the needle has touched the record, otherwise the pickup arm may move away from the stop lever and the needle miss the record. If the friction be maintained too long the needle may be forced beyond the first playing groove. To adjust this, the pin locking the friction cam to the main cam shaft should be driven out and the Allen set screw loosened to a sliding tension. The cam is rotated forward, in the direction of rotation of the main cam shaft, to maintain the friction a longer time and backward to maintain it for a shorter time.

14. TO ADJUST THE PICKUP.

After removing the pickup cover, it should be noted whether the stylus (5610) (Fig. 10) is centrally located in respect to the pole pieces (569) (Fig. 10). To center the stylus loosen the lock-nuts (99-11-1) (Fig. 10), then loosen the two headless set screws (99-28-3) (Fig. 10). These set screws hold the spool assembly (6711) (Fig. 10). The spool assembly should be shifted until the stylus is centralized with the pole pieces, then tighten the set screws carefully, so as not to crack the spool, then tighten the lock nuts.

If for any reason it is necessary to shift the pole pieces, which are held to the back by two screws, the two set screws holding the spool should be loosened before attempting to move the pole pieces. If any adjustment, of pole pieces, is made carefully check the centering of the stylus before replacing the cover by means of its three screws.

15. TO ADJUST THE STOP LEVER HOOK (5658) (Fig. 1).

Always adjust the tone arm position on a 12" record before adjusting for a 10" record. Adjust the tone arm stop lever hook (5658) (Fig. 1) by moving it in or out. This hook is locked in place by a set screw in the stud whose nut is shown in Fig. 1 as No. 43159. This set screw is at the bottom of this stud. Adjust the hook so that it will pass through the notch in the pickup arm lever (64197) (Fig. 1) without binding against the top or bottom of the notch, when in the playing position. With a 12" record on the turntable, the rubber roller (5044) (Fig. 1) against the edge of the record and the stop lever hook (5658) against the blade of the stop lever (64197) the needle should stop on the record exactly $\frac{3}{32}$" from the edge of the record.

With the record changer in exactly the same position as described above, and with a 10" record on the turntable and the hook (5658) (Fig. 1) against the blade, the stop lever should allow the needle to stop on the record $\frac{3}{32}$" from the edge of the 10" record. A 6-32 screw shown in Fig. 1 is provided for making this adjustment, simply by screwing it in or out. A check should be made for clearance between the roller and the tray, this roller should never bind on the record tray. This can be taken care of by slightly bending the tone arm stop lever (64197) (Fig. 1) up or down. If it is necessary to bend the stop lever it will be necessary to readjust for 12" records.

16. TO ADJUST THE CLUTCH THROWOUT LEVER AND CAM.

The clutch throwout lever cam is shown at 15 in Fig. 2 and is adjusted by loosening the shoulder screw (3317) (Fig. 2) to a sliding tension after the record changer has been stopped in the playing position. The clutch throwout lever cam should just clear the point of the turntable throwout cam (6448) (Fig. 10) with the clutch disengaged. Unless clearance between the turntable throwout cam and the clutch lever throwout cam is maintained the record changer will jam. If too much clearance is allowed the turntable throwout cam will not disengage the clutch and the record changer will continue to change records without playing them.

17. TO ADJUST SOLENOID WEDGE SPRING.

This phosphor bronze spring is located on one of the three spacers used to mount the solenoid plate bracket to the solenoid bracket. It is used to prevent clutch chatter or bounce when the clutch engages. The only adjustment is to bend the spring to a snug fit with a long screw driver so as to increase or decrease its pressure on the solenoid to clutch lever (6455) (Fig. 11).

18. TO ADJUST THE REVERSE CAM SHIFT LEVER (5326) (Fig. 5).

This lever is moved by the record control shaft (3724) (Fig. 12) and is held in position by an Allen set screw. It should be positioned on its shaft so that the record reverse cam (6325) (Fig. 4) is firmly engaged with its pin (34144) (Fig. 8) in the "Both Sides" position. In the "One Side" and "Repeat" positions it should have good clearance with the pin. If any adjustment of this lever is made be sure to check the setting of the Reverse Cam Arm and Roller Assembly (6450) (Fig. 8) as instructed in Section 7 of the instructions on replacing a reverse cam.

19. TO ADJUST THE RECORD REPEAT LOCK LEVER (5334) (Fig. 12).

The purpose of this lever is to prevent accidental shifting of the Selector Arm while the instrument is not in the playing position. In the "Repeat" position this lever is on the side of the Solenoid to Clutch Lever (6455) (Fig. 11) away from the main cam. In the "One Side" and "Both Sides" positions it is on the main cam side of the solenoid to clutch lever. With the tone arm in the playing position (Main Clutch Disengaged) this lock lever should clear the solenoid to clutch lever by approximately $\frac{3}{16}$" when moved under it.

20. TO ADJUST THE REVERSE CAM LOCK LEVER (5339) (Fig. 12).

This lever should be on the main cam side of the solenoid to clutch lever when in the "Both Sides" position. And on the opposite side when in the "One Side" and "Repeat" positions. With the main clutch disengaged the lock lever should clear the solenoid to clutch lever by approximately $\frac{1}{16}$" when moving under it.

21. TO ADJUST REVERSE CAM ARM AND ROLLER ASSEMBLY (6450) (Fig. 4).

See Section 7 under Instructions For Replacing a Reverse Cam.

22. TO ADJUST RECORD REPEAT THROWOUT LEVER (4663) (Fig. 12).

No adjustment of this part is necessary.

23. TO ADJUST RECORD REPEAT CLUTCH LEVER (5332) (Fig. 12).

The adjustment of this lever is made by loosening the Allen set screw to a sliding tension then moving the part along the shaft. The sliding clutch should engage in the "One Side" and "Both Sides" positions, but should be disengaged in the "Repeat" position. The fork of this lever should not bind the sliding clutch in either the "Repeat" or "Both Sides" position.

24. LATERAL LOCATION OF THE MAIN CAM SHAFT.

Both end bearings of the main cam shaft are movable, and are used to locate the cam shaft in its proper lateral position, as well as adjust the amount of end play. The main cam shaft is located laterally so that the

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MODEL 16-E
Adjustments, Part 3

ball in the end of the tone arm lift rod (6457) (Fig. 9) travels in the exact center of the tone arm lift cam (6449) (Fig. 9). As shown at H in Fig. 9.

25. TO ADJUST THE STOP TRIP SWITCH (2792) (Fig. 7).

This switch is accessible by removing the turntable, which will expose the switch cover. To remove the switch cover it is necessary to remove the trip arm, which goes through the switch cover and the two flat head screws which hold the cover in place. The clearance between the contact points on the fixed and moveable arms of the switch should be 1/32". After replacing the trip arm (6510) (Fig. 7) in the switch, after the switch cover has been removed, set the turntable on the spindle, push stop trip arm (4533) (Fig. 7) slowly about 1/4" toward the magazine and then turn the turntable through one complete revolution. This will insure the fibre cam, on the turntable, resetting the trip switch, the clearance between the trip arm and the moveable arm of the switch should be 1/32". The distance between the trip arm and the switch trip guard finger should also be 1/32".

To adjust the clearance between the trip arm hook (6510) (Fig. 7) and the moveable switch arm, loosen the screw in the bakelite switch base, at the end nearest the tone arm. Move the switch until 1/32" clearance is secured between the trip arm hook and the moveable arm of the switch, then tighten the screw holding the switch. In making this adjustment be sure that the stationary arm of the switch is not bent when tightening this screw.

On some models a headless set screw, near the end of the coil spring, is used to lock the switch in position; loosen this screw, adjust the switch, then tighten the set screw.

26. TO ADJUST THE SOLENOID MOTOR SWITCH (2764) (Fig. 3).

After the switch cover has been removed the switch is exposed. The upper switch points should make good electrical contact, while the main clutch is disengaged, in this position the clearance between the bottom points should be approximately 1/32". While the clutch moves from the disengaged to the engaged position the upper switch points should remain closed until the lower set of points are closed. When the clutch is fully engaged the lower points should make good contact and the clearance between the upper points should be approximately 1/32".

To adjust the switch loosen the screw through the bakelite switch base at the rear of the switch assembly. After the position is found where proper clearance is secured with the clutch engaged and disengaged, the switch should be locked in position with the screw.

In some machines a headless set screw is used to lock the switch in position. This screw is near the point of the tapered bakelite insulating block. Loosen this screw and adjust switch to get proper clearance then lock the switch in position by the set screw.

The two upper contacts are in series with the auto trip switch and the two lower contacts are shunted across the motor switch. When the clutch is engaged the auto trip switch is out of circuit and the motor switch is shunted by the lower contacts thus insuring the completion of the change cycle even though the instrument is switched to radio or turned off.

27. TO ADJUST THE FRICTION JOINT OF AUTOMATIC TRIP SWITCH.

The amount of friction necessary in the friction joint between the auto stop trip lever—long (6510) (Fig. 7) and the auto stop trip lever—short (4533) (Fig. 7) should be just sufficient to close the automatic stop trip switch (2792) (Fig. 7). The friction is regulated by adjusting the screw which tightens the flat spring (3998) (Fig. 7). If the tension is too great the instrument may trip before finishing a record, if not enough tension is had the instrument will not change records when the needle hits the automatic change groove.

28. RECORD SIZE LIMIT.

The 16-E Series record changer will play any 10" or 12" record of standard size. The minimum size for 12" records is 11 7/8". The minimum size for 10" records is 9 31/32". Records smaller than these limits are very apt to miss centering over the turntable spindle and in most cases are broken.

These record changers will automatically trip on any record having an automatic stop change groove, either spiral or oscillating, where the blank space in the center of the record is not more than 6 1/2" in diameter.

29. RECORDS.

Always inspect the records to see that no rough edges are present. Occasionally you will find a record which has a rough outside edge. This rough edge will greatly interfere with the satisfactory performance of the record changer. A small piece of #00 sandpaper will assist you greatly in removing this rough edge.

30. TO ADJUST THE VERTICAL BUMPER GUIDE (6693) (Fig. 6).

This guide is located back of the magazine cross bar (6685) (Fig. 6). After the records are separated from the magazine they are guided in dropping off the separator so they hit the center of the record bumpers (5081) (Fig. 6). This vertical bumper guide also guides the records when the elevating hook, on the rear of the record tray lifts the record. The vertical bumper should be set back just far enough to allow a 12" record to drop onto the record bumpers freely. The lower part of the vertical bumper, which extends into the record well, should extend toward the center of the well rubber bumpers far enough to make sure that the upper edges of the records fall behind the points of the upper record support (5517) (Fig. 6). This adjustment is not critical. In most cases it will be found that the upper end of the vertical bumper will just clear the elevating hook on the rear of the tray. In cases where it is found that 10" records are chipping about the edges, due to bouncing against the points of the upper record support (5517) (Fig. 6) it will be necessary to bend the vertical bumper (6693) (Fig. 6) back at the top to a point where it just barely clears the elevating hook at the rear of the tray. It should never be bent back far enough to raise the front of the tray.

31. CLUTCH CLEARANCE.

The clearance between the driven (6326) (Fig. 10) and driving (3630) (Fig. 10) members of the clutch should be approximately .020" (Twenty thousandths), and is adjusted by loosening screw No. 16 Fig. 3 to a sliding tension and adjusting the clutch fork (5333) (Fig. 2) and the solenoid to clutch lever and pin assembly until the proper clearance is obtained. After adjustment is made lock the screw No. 16, Fig. 3.

32. MOTOR CONNECTIONS (21131).

The 21131 motor is a synchronous motor and will run equally well in either direction, when properly connected. For this reason, all motors shipped from the factory are equipped with a terminal strip and cable. However, if it should ever be necessary to disconnect the leads from the terminal strip the leads should be replaced in the following order: With the cable extending to the right of the terminal strip and the mounting lugs pointing downward, and the soldering lugs towards you, the leads go on from left to right in the following order—small black, black with yellow tracer, blue and large black. In that order they are ground, one side of 110 volt line, one side of the condenser, and the remaining 110 volt and condenser leads. The motor terminal strip should be mounted to the cabinet terminal strip so that the cable extends to the right, with the soldering lugs towards you.

33. OILING INSTRUCTIONS.

Due to its careful design and precise workmanship, the Capehart 16-E record changer requires a minimum of oiling.

About once each year a light coat of vaseline or petroleum jelly should be applied to all moving surfaces which were coated with graphite at the factory.

A very light coat of vaseline should be applied to the surfaces of the magazine, indicated at "A" in Figure 6. It is best to apply this coating every six months. The vaseline should be applied with, and removed by, the fingers, on the magazine faces. DO NOT USE EXCESSIVE AMOUNTS OF LUBRICANT ANYWHERE ON THE RECORD CHANGER.

A good grade of machine oil, not too light, should be used on the sliding clutches, reverse cam shaft and all eccentric and shoulder screws.

NEVER OIL THE "DUREX" BUSHINGS, AS THIS WILL CAUSE THEM TO DISINTEGRATE.

Once each year the motor oil cups should be oiled with a good grade of motor oil. At the same time the gear box should be inspected, and the grease replaced if it has become hard. A good mixture to use here is 75% vaseline and 25% SAE 40 motor oil.

34. INSTRUCTIONS FOR REPLACING THE RECORD REVERSE CAM AND ITS ADJUSTMENTS.

1. Set record changer in the playing position. Carefully mark the drive gear (3516) (Fig. 10) on the main shaft and the driven gear shown as part of 6223, Fig. 10, by prick punch marks or scriber, so that the same teeth can be engaged after reassembly, thus insuring proper timing.

2. Remove the two bolts, one (3238) (Fig. 4) securing the magazine slide and roller assembly to the magazine slide arm lever, and one (3237) (Fig. 1) securing the record slide arm and stud assembly to the record tray drive crank.

3. Looking in from the rear of the instrument, remove the Durex bushing from the end of the main cam shaft, nearest the motor drive shaft. This is accomplished by loosening the bolt to the right of the main shaft. Care should be taken when replacing this bushing so as not to tighten the bolt enough to crush the bushing; a snug fit only is required.

4. Remove lower half of bearing and Durex bushing from the other end of the main cam shaft and work the cam shaft out of the record changer. The same precaution against crushing this bushing should be taken with this one as with the one in the preceding section.

5. Remove taper pin from gear and loosen set screw in the collar, both shown as 6233 in Fig. 8, of the reverse cam shaft assembly, as well as the pin (34144) (Fig. 10) over which the reverse cam forks, when in

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Notes

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the reversing position. After removing the collar and sliding the gear to one side, file all burs from the edges of the holes in the reverse cam shaft. Slide the shaft through its Durex bushing toward the rear of the instrument far enough to allow the removal and replacement of the reverse cam (6325) (Fig. 10).

6. Reassemble the reverse cam shaft assembly, making certain that the taper pin holes in the shaft and gear are correctly aligned to permit the taper pins being properly inserted. The set screw in the collar at the end of the shaft should be properly tightened.

7. Remove the reverse cam arm and roller assembly (6450) (Fig. 2) and make sure that the roller pin and arm are not bent, if either of these items are found bent we suggest that you replace the reverse arm and roller assembly.

8. In reassembling the reverse cam arm and roller assembly (6450) (Fig. 2) in its proper position for alignment with the reverse cam, be sure the roller is about $\frac{1}{32}''$ inside the ridge on the reverse cam, when the cam is in the reversing position.

9. Remove the taper pin from the gear (3516) (Fig. 10) on the main shaft, which drives the gear on the reverse cam shaft assembly (6233) (Fig. 10) and remount the main shaft to the record changer chassis, pushing the above gear, from which the pin was removed, to one side so that it will not mesh with its driven gear.

10. Locate the main shaft so that the lower end of the pickup arm lift shaft travels in the center of the pickup arm lift cam, as shown at "H" in Fig. 9. With the main shaft in this position, adjust the main shaft Durex bushings so that there is no end play in the main cam shaft assembly.

11. Rotate the main cam shaft to the playing position so that the pickup arm is lowered over the turntable.

12. Set the reverse cam in its lowest position, with the control lever in the "Both Sides" position, so that the fork of the reverse cam is meshed with the driving pin.

13. Mesh the reverse cam assembly driver gear (3516) (Fig. 10) with the reverse cam assembly driven gear so that the identifying punch marks correspond to the original position. The taper pin for the driver gear should be inserted next. If the assembly has been properly made there should be approximately $\frac{1}{32}''$ clearance between the roller or the reverse cam arm and the reverse cam. See "A", Fig. 9.

14. Throw the control lever to the "One Side" position and rotate the reverse cam with the fingers until it is in the reversing position. Again throw the control lever to the "Both Sides" position. Now there should be approximately $\frac{1}{32}''$ clearance between the reverse cam and the roller. See "B", Fig. 9. If the clearance is not approximately $\frac{1}{32}''$ for both positions of the reverse cam it indicates either the gears are not properly meshed or the reverse segment link rod may be bent. A careful check of the latter while the main shaft is out will save time and trouble later.

35. INSTRUCTIONS FOR REMOVING THE 16-E RECORD CHANGER.

There is a great possibility, when removing the chassis from the cabinet, to mar or scratch the cabinet. If you will place a piece of cardboard around the record changer it will eliminate, to a great extent, the possibility of marring the finish. A rubber auto mat, with a hole for the record changer, the same size as the one in the cabinet, makes an excellent pad. This pad can be split and is easily put in position and removed.

Remove the backs from the record changer, radio and amplifier compartments.

Remove the screws from the partition between the radio and record changer compartments, so it can be moved back out of the way.

Remove the wood screw, under the turntable, also the three bolts which hold the record changer down.

Remove the two wood screws that mount the play control.

Remove the female chassis plug, from the male chassis plug (6178) (Fig. 1), the pickup lead, which runs from the radio chassis to the terminal block, then dismount the terminal block by removing the wood screw in its center, the straps holding the shielded lead, which runs from the shorting switch, and the 110 volt leads to the Play Control.

Release the play control cable and cable housing from the bracket on the record changer chassis, by loosening the two set screws. Care should be taken to prevent breaking the control cable when removing it. The end which has been kinked by the set screw should be straightened before attempting to reinstall it.

Loosen the two Allen set screws in the flexible coupling and allow it to slide down the motor shaft, so as to clear the record changer shaft.

Move the play control as far into the radio compartment as possible.

Remove the screw marked "B" in the illustration on page 8. This is the middle one of the screws holding the upper record support.

Remove the magazine link shoulder screw (3239) (Fig. 6). This will allow the magazine to be swung out of the way. As soon as the record reverse arm and fork assembly have cleared the reverse crank and pin (6230) (Fig. 1) it should be swung over the magazine and locked with the record reverse arm lock (4659) (Fig. 6), to keep it out of the way.

Lift the record changer up, until the tone arm just touches the top of the cabinet, carry it forward through the doors, tilting it to keep the main cam clear of the shelf.

All parts of the cabinet liable to damage should be protected by soft cloths while removing or installing the record changer.

It is not necessary that the above operations be carried out in the above sequence.

36. ALIGNMENT OF TRUE-TANGENT PICKUP.

When adjusting the TRUE-TANGENT pickup, the pickup head and tone arm should form a straight line, when the needle is exactly one and one half inches from the point of the turn table drive shaft cap (4320) (Fig. 6). To adjust the pickup angle, loosen the nut at the rear of the steering arm assembly (66254) (Fig. 1), turn the steering arm either right or left until the correct position for the pickup is found, then set the lock nut up tight. Then see that there still is $\frac{5}{8}''$ clearance between the pickup and the record tray per Section 11.

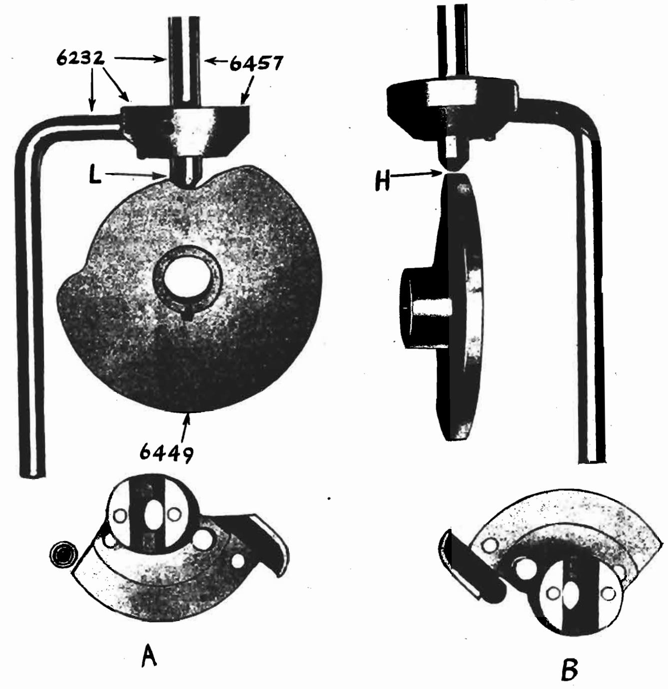

Fig. 9

6232 Pickup Swing Lever and Collar Assembly
6325 Reverse Cam
6449 Pickup Arm Lift Cam
6457 Pickup Arm Lift Shaft

MODEL 16-E
Complete Assembly

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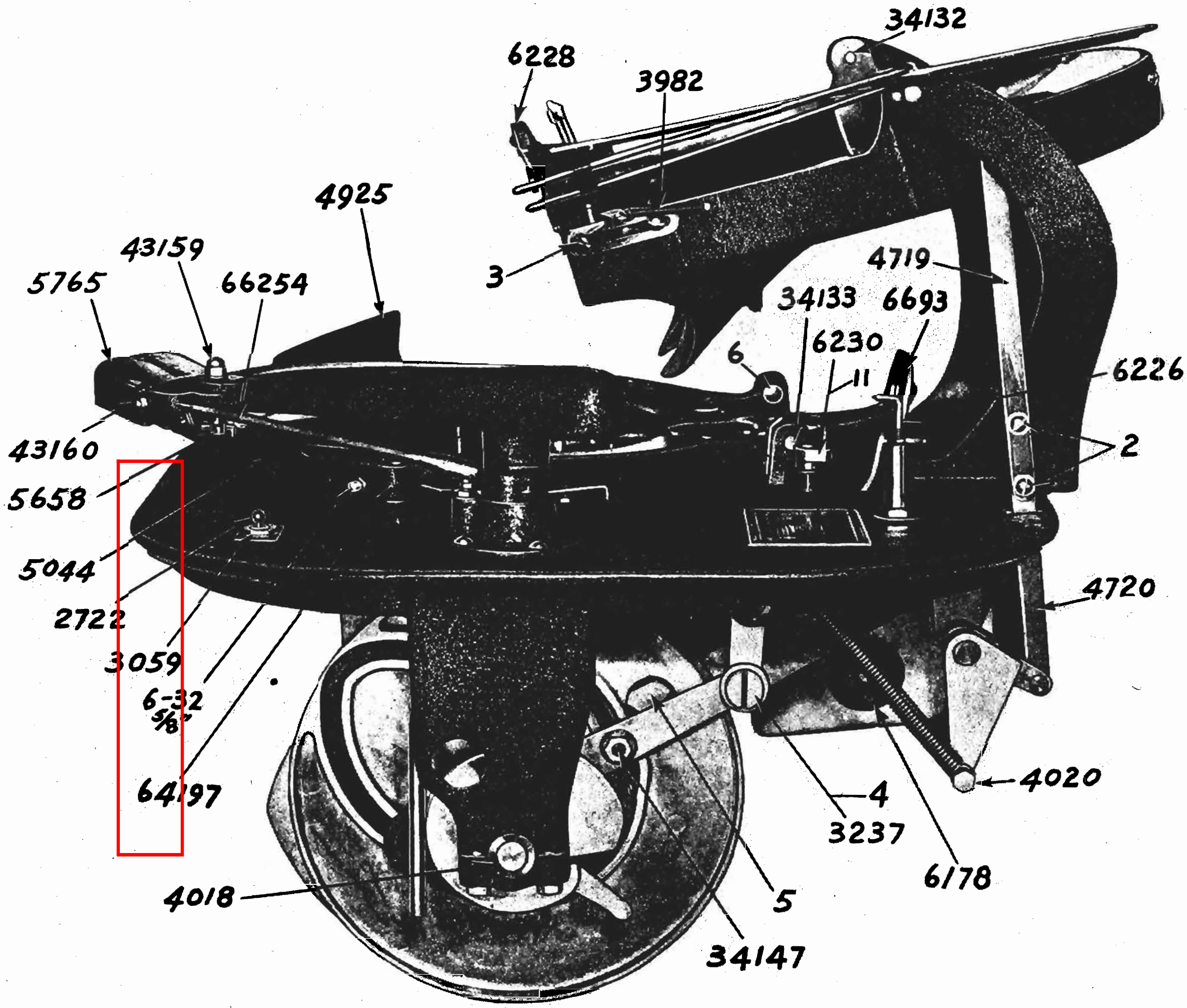

Fig. 1

2722 Switch AC Line
3059 Escutcheon Plate Off-On
3237 Shoulder Screw — Record Tray Slide
3982 Spring—Separator
4018 Main Shaft Bushing
4020 Record Magazine Bushing
4719 Magazine Link Upper
4720 Magazine Link Lower
4925 Record Tray Shield Felt—Outer
5044 Stop Lever Roller Tubing
5658 Pickup Arm Lever Hook
5765 Pickup Cover
6178 Chassis Plug
6226 Separator Hook and Arm Assembly
6228 Record Reverse Arm and Fork Assembly
6230 Reverse Pinion and Crank Assembly
6693 Record Bumper Guide and Felt Assembly
34132 Pin—Magazine Pivot
34133 Pin—Record Tray Pivot
34147 Pin—Record Tray Slide
43159 ¼"—28 Hex. Cap Nut
43160 Lock Nut for Pivot Screw
64197 Pickup Arm Stop Lever Assembly (Specify color).
66254 Steering Arm Ass'y.
6—32x⅝" Pickup Stop Lever Screw

NOTE: In ordering any part that is painted, please specify color wanted.

MODEL 16-E
Chassis Views

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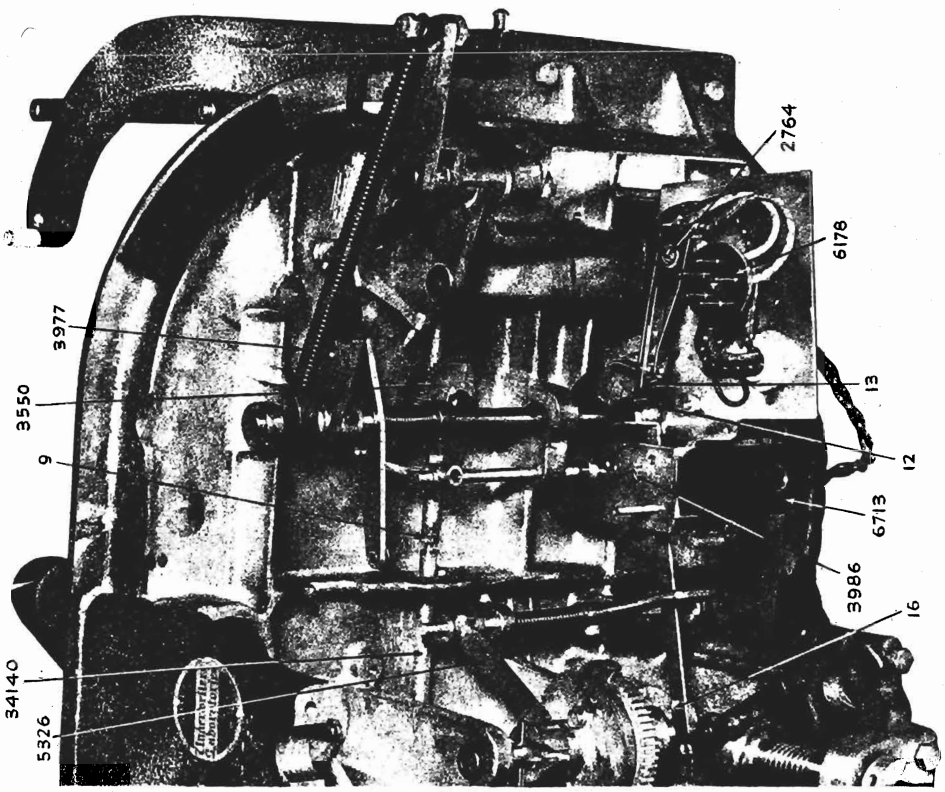

Fig. 3

2764 Switch Assembly—Solenoid and Motor
3550 Record Reverse Pinion Segment
3977 Spring—Magazine Slide Arm
3986 Spring—Solenoid Lever Torsion
5326 Record Reverse Cam Shaft Lever
6178 Chassis Plug 5 Prong
6713 Solenoid Assembly
34140 Pin—Long, Reverse Segment

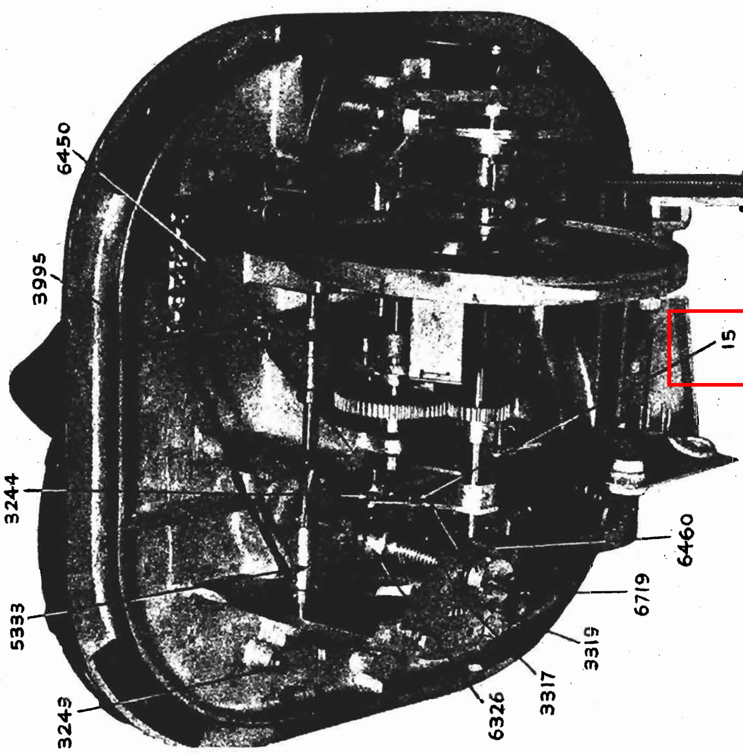

Fig. 2

3243 Shoulder Screw—Repeat Lever
3244 Shoulder Screw—Clutch Throwout Lever
3317 Screw—Clutch Throwout Cam
3319 Screw—Turntable Shaft Collar
3995 Spring—Reverse Arm
5333 Main Clutch Fork Lever
6326 Worm and Bushing Assembly
6450 Reverse Cam Arm and Roller Assembly
6460 Clutch Throwout Lever and Spring Assembly
6719 Turntable Drive Shaft Assembly

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MODEL 16-E
Chassis Views

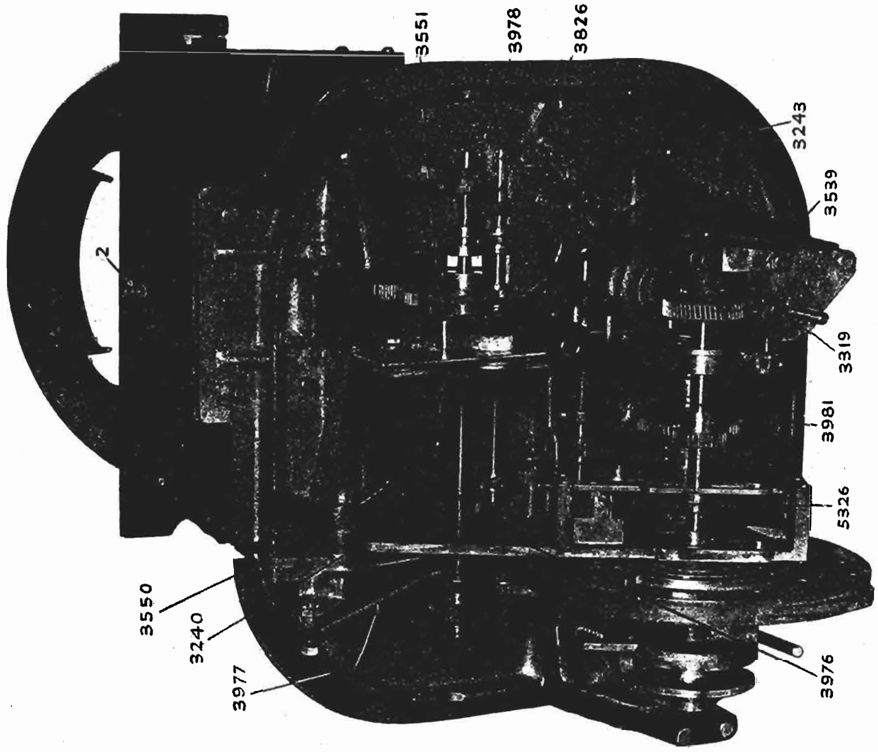

Fig. 5

3240 Shoulder Screw—Reverse Segment
3243 Shoulder Screw—Repeat Lever
3319 Screw—Turntable Shaft Collar
3539 Worm Gear—Main Drive
3550 Record Reverse Pinion Segment
3551 Record Tray Gear—Driver
3826 Record Repeat Sliding Clutch Cam
3976 Spring—Record Separator Hook Lever
3977 Spring—Magazine Slide Arm
3978 Spring—Record Repeat Clutch
3981 Spring—Record Reverse Cam Control
5326 Record Reverse Cam Shift Lever

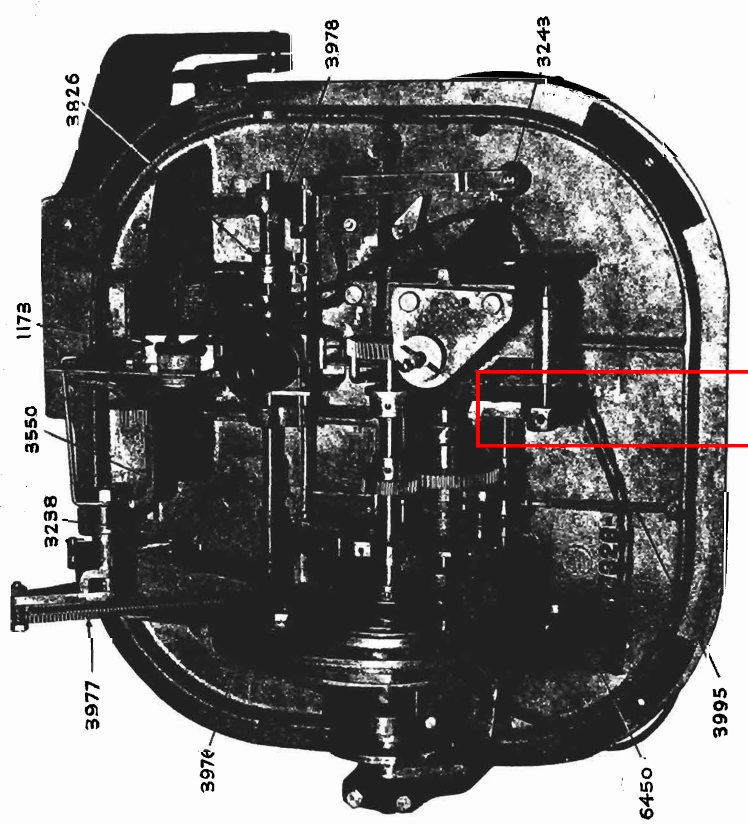

Fig. 4

1173 Condenser—0.1 Mfd 400-Volt (in can)
3238 Shoulder Screw—Magazine Slide Arm
3243 Shoulder Screw—Repeat Lever
3550 Record Reverse Pinion Segment
3826 Record Repeat Sliding Clutch Cam
3976 Spring—Record Separator Hook Lever
3977 Spring—Magazine Slide Arm
3978 Spring—Record Repeat Clutch
3995 Spring—Reverse Arm
6450 Reverse Cam Arm and Roller Assembly

MODEL 16-E
Chassis Views

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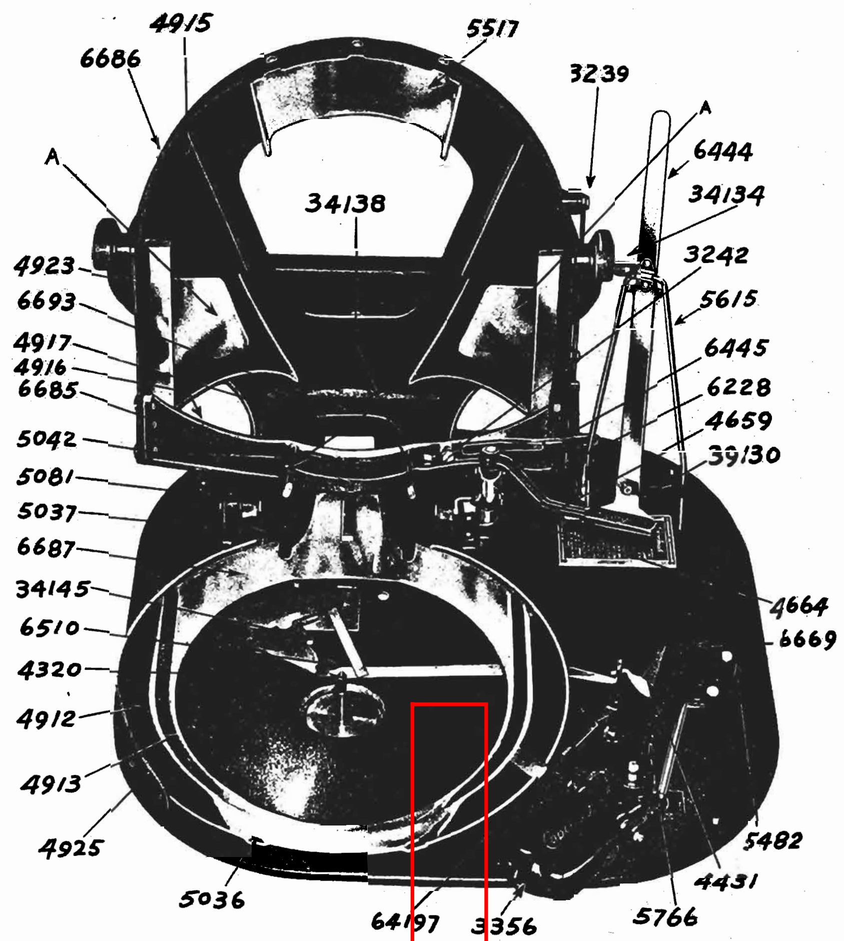

Fig. 6

3239 Shoulder-Screw-Magazine Link
3242 Shoulder Screw—Separator
3356 Pickup Needle Screw (Magnetic)
4320 Turntable Drive Shaft Cap
4431 Automatic Stop Trip Quadrant Bracket
4659 Record Reversing Arm Lock
4664 Record Reverse Arm Lock Stop
4912 Record Tray Felt—Large
4913 Record Tray Felt—Small
4915 Record Magazine Felt
4916 Lower Record Support Felt
4917 Record Bumper Guide Felt
4923 Magazine Side Felt
4925 Record Way Shield Felt Outer
5036 Record Tray Bumper—Front
5037 Record Tray Bumper—Rear
5042 Reverse Arm Bumper
5081 Record Bumper
5482 Pickup Arm Base
5517 Record Support—Upper
5615 Record Reverse Guide
5766 Pickup Arm
6228 Record Reverse Arm and Fork Assembly (Specify color)
6444 Record Reverse Guide Assembly
6445 Record Separator and Hub Assembly
6510 Automatic Stop Trip Lever Assembly
6669 Pickup Arm Assembly complete
6685 Lower Record Support Assembly
6686 Record Magazine Assembly
6687 Record Tray Assembly
6693 Record Bumper Guide and Felt Assem
34134 Pin—Reverse Guide Stop
34138 Pin—Record Support
34145 Pin—Record Control Rod
39130 Record Reverse Guide Spring
64197 Pickup Arm Stop Lever Assembly (specify color)

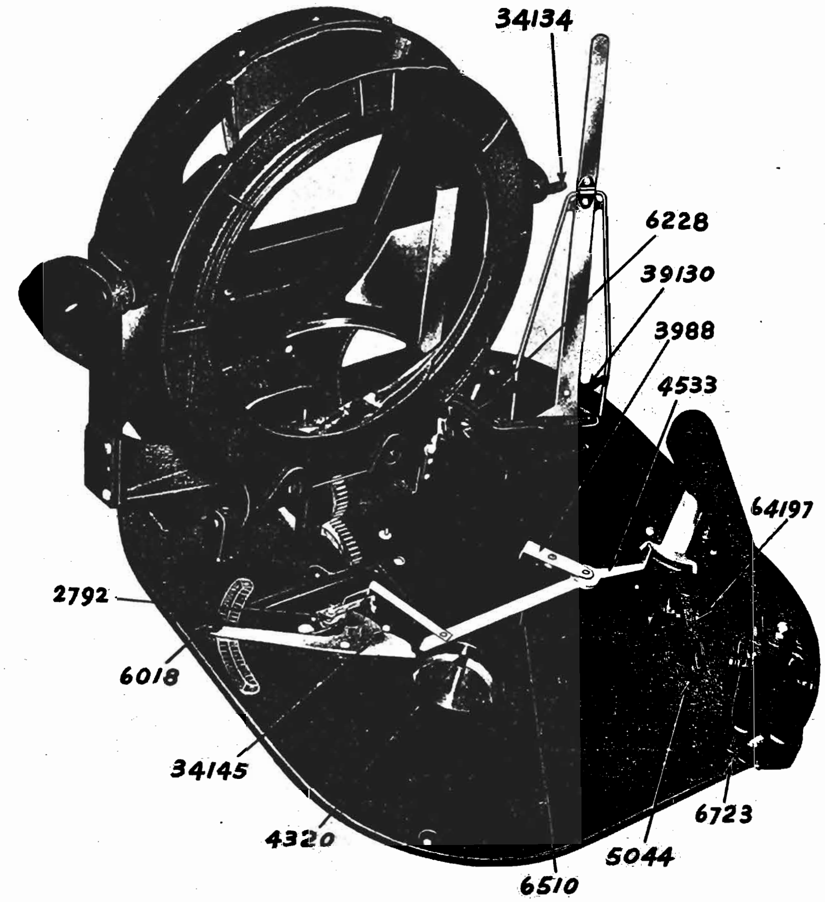

Fig. 7

2792 Record Trip Switch Assembly—complete
3988 Spring—Automatic Trip Lever Pin
4320 Turntable Drive Shaft Cap
4533 Automatic Stop Trip Lever—Short
5044 Stop Lever Roller Tubing
6018 Selector Knob
6228 Record Reverse Arm and Fork Assembly (specify color)
6510 Automatic Stop Trip Lever Assembly
6723 Pickup Brush Assembly
34134 Pin—Reverse Guide Stop
34145 Pin—Record Control Rod
39130 Record Reverse Guide Spring
64197 Pickup Arm Stop Lever Assembly (specify color)

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MODEL 16-E
Chassis View, Parts

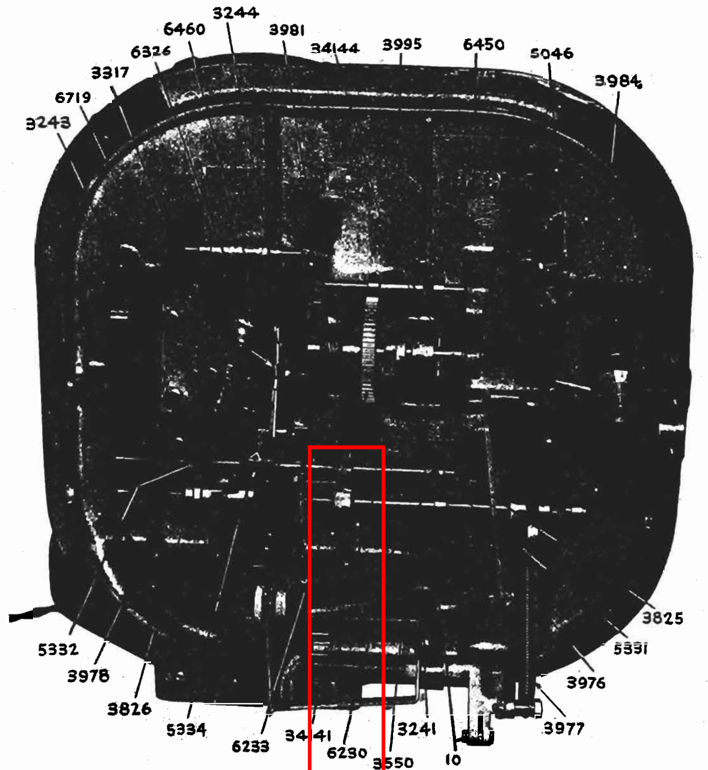

Fig. 8

3241 Shoulder Screw—Reverse Segment Link
3243 Shoulder Screw—Repeat Lever
3244 Shoulder Screw—Clutch Throwout Lever
3317 Screw—Clutch Throwout Cam
3550 Record Reverse Pinion Segment
3825 Reverse Segment Stop Cam
3826 Record Repeat Sliding Clutch Cam
3976 Spring—Record Separator Hook Lever
3977 Spring—Magazine Slide Arm
3978 Spring—Record Repeat Clutch
3981 Spring—Record Reverse Cam Control
3984 Spring—Tone Arm Lever
3995 Spring—Reverse Arm

5046 Stop Lever Collar Pin Tubing
5331 Record Repeat Throwout Hook Lever
5332 Record Repeat Clutch Fork Lever
5334 Record Repeat Lock Lever
6230 Reverse Pinion and Crank Assembly
6233 Record Reverse Cam Shaft Assembly
6326 Worm and Bushing Assembly
6450 Reverse Cam Arm and Roller Assembly
6460 Clutch Throwout Lever and Spring Assembly
6719 Turntable Drive Shaft Assembly
34141 Pin—Short—Reverse Segment
34144 Pin—Reverse Cam Shaft

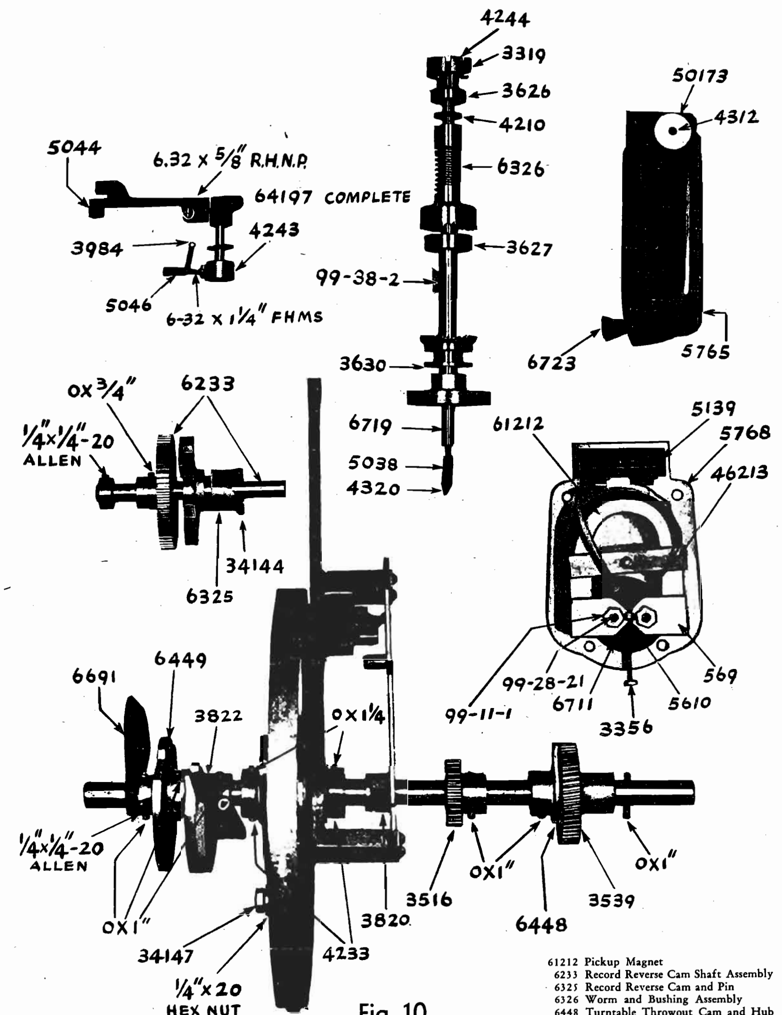

Fig. 10

3319 Screw—Turntable Shaft Collar
3356 Pickup Needle Screw
3516 Gear—Reverse Cam Shaft Driver
3539 Worm Gear
3626 Ball Bearing
3627 Ball Bearing
3630 Turntable Shaft Clutch
3820 Magazine Slide Arm Cam
3822 Pickup Arm Swing Cam
3984 Spring—Tone Arm Stop Lever
4210 Thrust Washer—Worm Shaft
4233 Main Cam Collar
4243 Pickup Arm Stop Lever Collar

4244 Turntable Shaft Collar
4312 Pivot Bushing
4320 Turntable Driveshaft Cap
46213 Magnet Holder
5038 Turntable Driveshaft Cap Tubing
5044 Stop Lever Roller Tubing
5046 Stop Lever Collar Pin Tubing
50173 Tone Arm Insulating Bushing
5139 Terminal Block
569 Pole Piece
5610 Stylus
5765 Pickup Cover
5768 Pickup Back

61212 Pickup Magnet
6233 Record Reverse Cam Shaft Assembly
6325 Record Reverse Cam and Pin
6326 Worm and Bushing Assembly
6448 Turntable Throwout Cam and Hub Assembly
6449 Pickup Lift Cam and Hub Assembly
64197 Pickup Arm Stop Lever Assembly
6691 Pickup Arm Friction Cam Assembly
6711 Spool Assembly
6719 Turntable Shaft Assembly
6723 Brush Assembly
34144 Pin—Reverse Cam Shaft
34147 Pin—Record Tray Slide
99-11- 1 6-32 Hex Nut
99-18-21 6-32x3/8" RHMS
99-28- 3 6-32x1/4" Headless Set Screw
99-28-21 6-32x1/8" Headless Set Screw
99-38-2 No. 2 Woodruff Key

MODEL 16-E
Chassis Views

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Fig. 11

- 565 Clutch Throwout Cam
- 3241 Reverse Segment Link Shoulder Screw
- 3626 Ball Bearing
- 3825 Reverse Segment-Stop Cam
- 3977 Magazine Slide Arm Spring
- 3978 Record Repeat Clutch Spring
- 3986 Solenoid Lever Torsion Spring
- 4018 Main Shaft Bushing
- 4022 Record Tray Shaft Bushing
- 4331 Bearing Retainer Plug
- 4433 Solenoid Plate Bracket
- 5040 Pickup Arm Brake Facing
- 5323 Magazine Slide Arm Lever
- 5331 Record Repeat Throwout Hook Lever
- 6178 Chassis Plug
- 6257 Record Tray Gear and Sliding Cam Assembly
- 6450 Reverse Cam Arm and Roller Assembly
- 6455 Solenoid to Clutch Lever and Pin Assembly
- 6460 Clutch Throwout Lever and Spring Assembly
- 6713 Solenoid Assembly
- 34140 Reverse Segment Pin, Long
- 34141 Reverse Segment Pin, Short

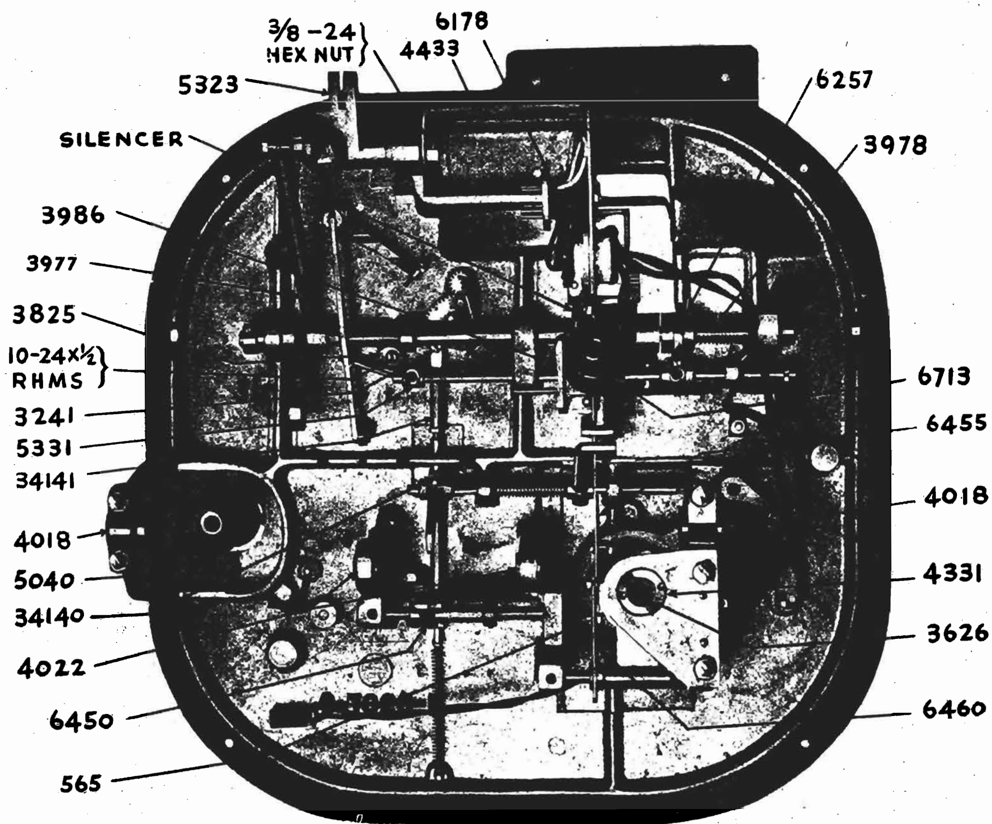
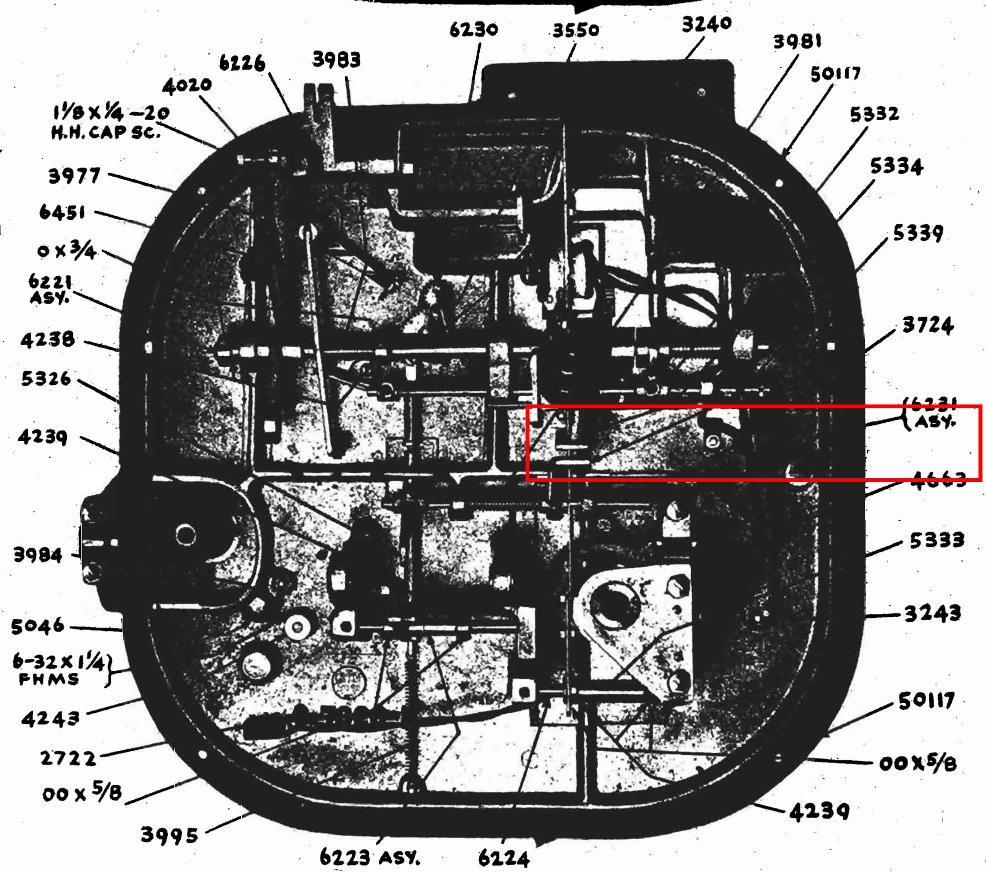


Fig. 12

- 2722 AC Line Toggle Switch
- 3240 Reverse Segment Shoulder Screw
- 3243 Repeat Lever Shoulder Screw
- 3550 Record Reverse Pinion Segment
- 3724 Record Control Shaft
- 3977 Magazine Slide Arm Spring
- 3981 Record Reverse Cam Control Spring
- 3983 Separator Hook Spring
- 3984 Tone Arm Stop Lever Spring
- 3995 Reverse Arm Spring
- 4020 Record Magazine Bushing
- 4238 1/8" Collar
- 4239 1/8" Collar
- 4243 Pickup Arm Stop Lever Collar
- 4663 Record Repeat Throwout Lever
- 5046 Stop Lever Collar Pin Tubing
- 5326 Record Reverse Cam Shaft Lever
- 5332 Record Repeat Clutch Fork Lever
- 5333 Main Clutch Fork Lever
- 5334 Record Repeat Lock Lever
- 5339 Reverse Cam Lock Lever
- 6221 Record Tray Drive Shaft Assembly
- 6223 Record Reverse Arm Shaft Assem.
- 6224 Solenoid Lever Shaft Assem.
- 6226 Separator Hook and Arm Assembly
- 6230 Reverse Pinion and Crank Assembly
- 6231 Record Control Lever and Stud Assembly
- 6451 Separator Hook Lever and Roller Assembly
- 50117 Main Frame Pad
- 00x5/8 Taper Pin
- 0x3/4 Taper Pin



CASE ELECTRIC CORP.

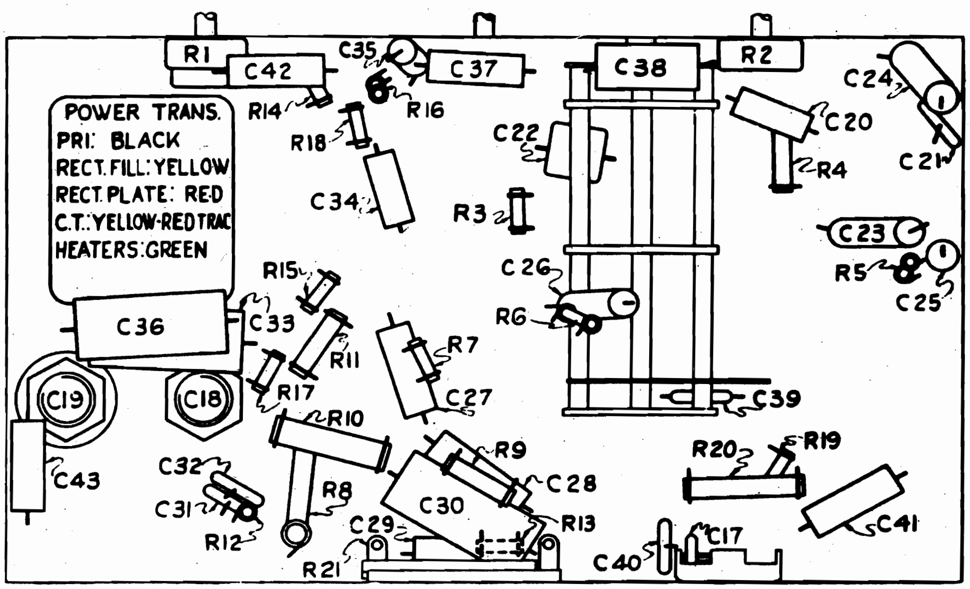
MODELS 710,713,714
715,716,718,719
Chassis 17
Voltage,Chassis,Parts

VOLTAGE CHART

115 VOLT LINE

Measurements taken from elements to chassis--1000 Ohm per volt meter.
*Across Candohm (R=21)
Total "B" current drain 72 Ma.--speaker field drop--92 volts.

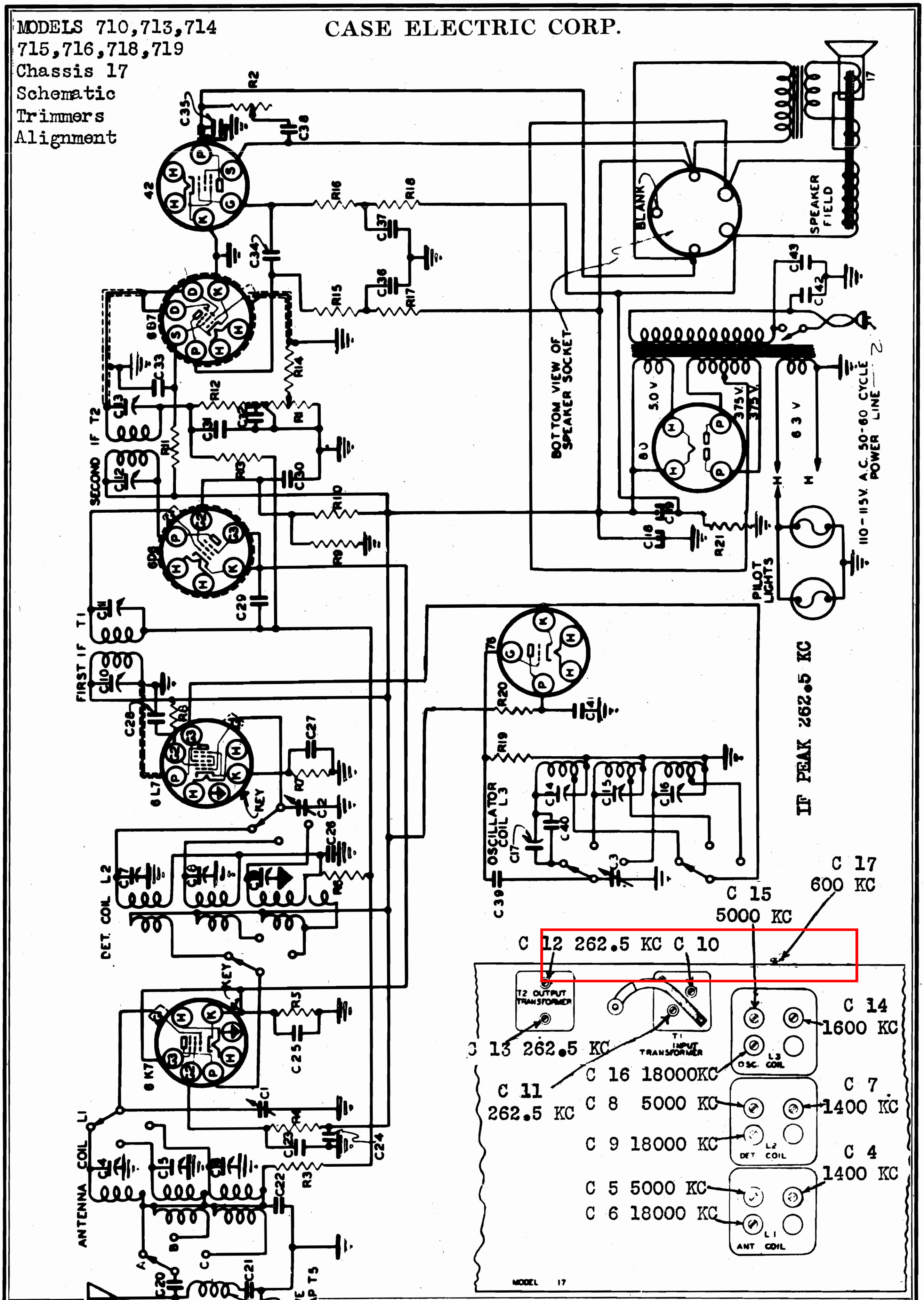
POSITION	TUBE	E_f	E_k	E_g Screen	E_g Suppressor	E_p Triode	E_p Pentode
RF Amplifier	6K7	6.0	3.0	110.0	3.0		250.0
Mixer	6L7	6.0	2.0	125.0	0.0		250.0
IF Amplifier	6D6	6.0	3.0	120.0	3.0		250.0
AVC Detector	6B7	6.0	0.0	20.0	0.0		18.0
Oscillator	76	6.0	0.0			125.0	
Audio Output	42	6.0	*20.0	250.0			240.0
Rectifier	80	6.0					



PARTS CHASSIS 17, PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

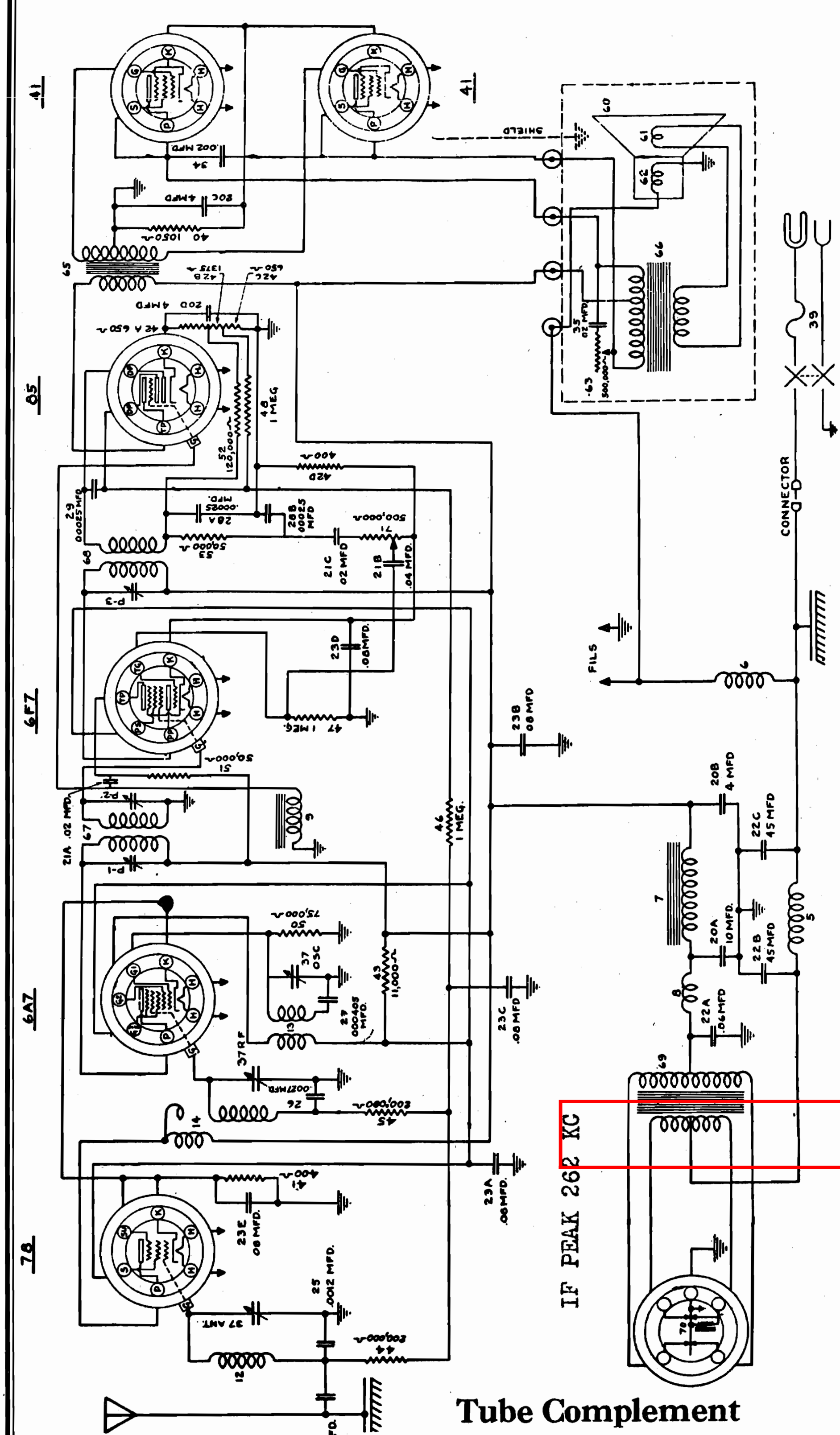
	A15016	Belt Drive	.21
	B15045	Bezel	.94
	15225	Book Instruction	.27
	15070	Clip Grid (Glass Tube)	.01
	15071	Clip Grid (Metal Tube)	.01
	15330	Clutch Assembly	.26
C4 C5 C6 L1	15127	Coil Antenna in Shield Sold	3.36
C7 C8 C9 L2	15128	Coil Detector in Shield in sets	4.72
C14 C15 C16 L3	15126	Coil Oscillator in Shield of 3	3.22
	A15069	Cord Attachment	.35
C1 C2 C3	D15076	Cond. Variable	5.21
C19	15078	Cond. Electrolytic 16 Mfd 475v	1.16
C18	15079	Cond. Electrolytic 16 Mfd 300v	.92
C31 C32	15900	Cond. Mica 50 Mmfd	.11
C21	15904	Cond. Mica 2000 Mmfd	.26
C22	15911	Cond. Mica 4500 Mmfd	.37
C39	15918	Cond. Mica 35 Mmfd	.11
C40	15908	Cond. Mica 650 Mmfd	.19
C33 C36 C30	15750	Cond. Tubular .25 Mfd 400v	.19
C27 C26	15752	Cond. Tubular .05 Mfd 200v	.12
C35	15753	Cond. Tubular .002 Mfd 600v	.11
[redacted] C20, C34	15754	Cond. Tubular .01 Mfd 400v	.11
C38	15755	Cond. Tubular .05 Mfd 600v	.14
C28 C23	15756	Cond. Tubular .05 Mfd 400v	.12
C41 C24	15757	Cond. Tubular .1 Mfd 400v	.14
C42 C43 C29 C25	15761	Cond. Tubular .1 Mfd 200v	.12
C37	15764	Cond. Tubular .03 Mfd 400v	.12
R2	A15116	Control Tone	.70
R1	A15113	Control Volume	.89
	15301	Dial & Paper Strip Assembly	1.96
	B15044	Glass Convex	.25
	A15037 [redacted]	Knob Drive	.14 [redacted]
	A15098	Knob Switch	.23
	A 15039 [redacted]	Knob Volume & Tone	.15 [redacted]
	15089	Lamp Dial 6.3 V. Bayonet Type	.19
	15129	Lamp Dial Assembly	.68
	A15082	Lug Ground Electrolytic	.01
	A15032	Mounting Chassis Rubbers	.03
	B15168	Paper Dial Backing	.02
	A15023	Pointer (Minute)	.04
	A15024	Pointer (Tuning)	.04
	A15006	Pulley Idler Assembly	.10
	A15072	Planetary Assembly	.46
R21	A15159	Resistor Candohm 235 Ohm	.23
R13	15500	Resistor Carbon 2 Meg. .25W	.08
R20 R8	15501	Resistor Carbon 25M Ohm 1W	.11
C17	A15189	Var. Padder Cond.	.34

R10	15502	Resistor Carbon 16M Ohm 2W	.16
R18	15504	Resistor Carbon 150M Ohm .25W	.08
R4	15506	Resistor Carbon 60M Ohm .5W	.10
R11	15507	Resistor Carbon 300M Ohm .5W	.10
R5	15508	Resistor Carbon 150 Ohm .25W	.10
R15	15509	Resistor Carbon 60M Ohm .25W	.08
R17	15510	Resistor Carbon 20M Ohm .25W	.08
R12 R19	15511	Resistor Carbon 50M Ohm .25W	.08
R3 R6	15512	Resistor Carbon 250M Ohm .25W	.08
R9	15513	Resistor Carbon 20M Ohm .5W	.10
R14	15515	Resistor Carbon 100M Ohm .25W	.08
R16	15518	Resistor Carbon 180M Ohm .25W	.08
R7	15527	Resistor Carbon 500 Ohm .25W	.10
	B15041	Retaining Spring for Bezel	.18
	B15043	Retaining Ring for Glass	.16
	A15020	Shaft Drive	.15
	15095	Shield Coat (Long)	.12
	15094	Shield Coat (Short)	.11
	15118	Shielded Grid Lead	.26
	15195	Shielded Plate Lead	.24
	15196	Shielded Vol. Control Lead	.25
	A15053	Socket Dial Lamp (Left Hand)	.11
	A15054	Socket Dial Lamp (Right Hand)	.11
	15062	Socket Speaker	.10
	B15063	Socket 80	.09
	B15064	Socket 42	.11
	B15065	Socket 76	.10
	B15067	Socket 6B7	.11
	B15068	Socket 6D6	.11
	B15087	Socket 6L7	.14
	B15066	Socket 6K7	.14
	A15033	Spacer (For Chassis Rubbers)	.02
	B15170 [redacted]	Speaker 6"	5.34 [redacted]
	C15172	Speaker 10"	6.94
	A15017	Spring Tension	.02
	C15256	Switch Range	2.14
	15123	Switch Range Pulley & String	.65
C10 C11 T1	B15208-4	Transformer Input IF	1.42
C12 C13 T2	B15209-4	Transformer Output IF	1.63
	B15050	Transformer Power 60 cycles 110V	4.29
	15242	Trap Wave	1.26
	1950	Washer Felt (Small Knob)	.01
	1951	Washer Felt (Switch Knob)	.01
	A2111	Washer Extruding Fibre	.02
	A2105	Washer Plain Fibre	.01
	A2300	Washer Rubber RF Panel	.02


MODELS 710,713,714
715,716,718,719
Chassis 17
Schematic
Trimmers
Alignment
CASE ELECTRIC CORP.
BOTTOM VIEW OF SPEAKER SOCKET
SPEAKER FIELD
BLANK
PILOT LIGHTS
110-115V. A.C. 50-60 CYCLE POWER LINE
IF PEAK 262.5 KC
SECOND IF T2
FIRST IF T1
DET. COIL L2
ANTENNA COIL L1
OSCILLATOR COIL L3
WAVE TRAP T5
C 12 262.5 KC C 10
C 15
5000 KC
C 17
600 KC
C 13 262.5 KC
C 14
1600 KC
C 16 18000KC
C 11
262.5 KC
C 8 5000 KC
C 7
1400 KC
C 9 18000 KC
C 4
1400 KC
C 5 5000 KC
C 6 18000 KC
T2 OUTPUT TRANSFORMER
T1 INPUT TRANSFORMER
OSC. COIL L3
DET COIL L2
ANT COIL L1
MODEL 17

MODEL 601525
Schematic
Voltage

CHEVROLET DIV.—GEN. MOTORS



601525 CIRCUIT DIAGRAM

Part No. 601525
Date 6-1-37

The voltages shown below are average readings taken from the tube socket contacts to the chassis frame, and will vary 10% when the set is tested on a 6 volt battery due to differences in characteristics of vibrators and tubes.

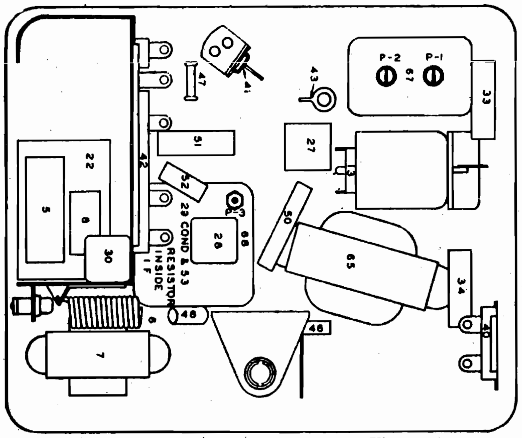
Type	Function	H	Pp	S	Tp	Gt	G	G1	G2	G3,5	K
78	R. F.	6	240	130	—	—	0	—	—	—	8.0
6A7	Det. Osc.	6	240	130	—	—	0	0	130	130	8.0
6F7	I. F.—AF	6	240	130	115	0	0	—	—	—	4.5
85	Det.—2nd AF	6	—	—	235	0	0	—	—	—	16.5
41	Output	6	240	240	—	—	—	—	—	—	23.0
41	Output	6	240	240	—	—	—	—	—	—	23.0

Tube Complement

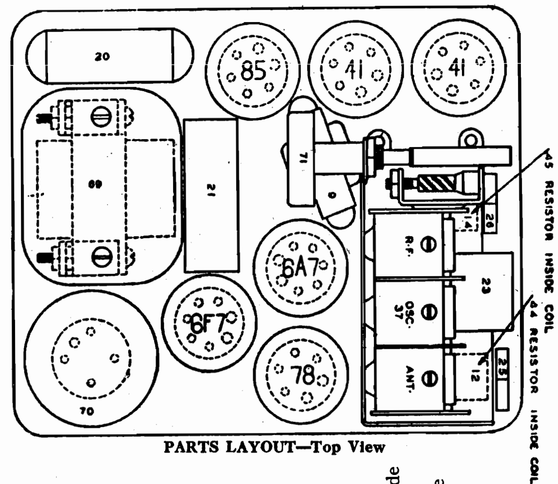
Type	Function	Type	Function
78	1st R. F. Amplifier	85	2nd Detector—A. V. C.—2nd Audio
6A7	1st Detector—Oscillator	41	Power Output (Class "A Prime")
6F7	I. F.—1st Audio Amplifier	41	Power Output (Class "A Prime")

MODEL 601525
Socket, Trimmers
Chassis, Changes
Alignment

CHEVROLET DIV.—GEN. MOTORS



PARTS LAYOUT—Bottom View



PARTS LAYOUT—Top View

Peaking I. F. Stages at 262 K. C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect a 1 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube leaving the tube's grid clip in place. The 1 mfd. condenser is necessary to prevent the oscillator circuit of the receiver from affecting the I. F. adjustments.

(b) Set the test oscillator on 262 kilocycles.

(c) Turn the volume control of the receiver on full.

(d) Peak the I. F. trimmer P-3 located on the 2nd I. F. coil shown on Figure 2.

(e) Then peak trimmers P-2 and P-1 located on the first I. F. Coil also shown on Figure 2.

(f) In order to insure accurate settings of the I. F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable deflection of the output meter pointer. Make all adjustments for maximum output.

GENERAL: This auto radio is a six tube, two unit (dash speaker) superheterodyne receiver. It is equipped with a remote control and a plug-in vibrator of the full wave self-rectifying type.

Circuit Changes

A number of the early receivers have ¼ mfd. tubular condenser mounted above the candohm resistor, illustration #42 of Figure 2 and connected in parallel with the 85 tube cathode by-pass section 20D of the #1209144 electrolytic condenser block. The use of the tubular condenser was necessary in production to reduce the R. F. resistance of the 85 cathode by-pass. A change has been made in the design of the condenser block, making the use of the tubular condenser unnecessary. All of the service parts replacement stock of #1209144 electrolytics are of the new design and it is immaterial whether or not the tubular condenser is left in the receiver when replacing the electrolytic condenser block.

It may be noted on some of the earlier receivers that there is a small condenser in a metal case mounted below the candohm resistor, Illus. #42, Figure 2, with two terminals that are not connected. This condenser was originally placed in the set to filter vibrator interference, but it was found after production started that two small condensers mounted in the vibrator unit were more effective and the external condenser was simply disconnected.

Peaking Instructions

Peaking Gang Condenser at 1530 and 1400 K. C.

(a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. Do not use the 1 mfd. condenser that was required in aligning the I. F. stages.

(b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

(c) Set the test oscillator on 1530 kilocycles.

(d) Adjust the trimmer condenser for the oscillator section (middle section) of the gang condenser CAREFULLY for maximum output. Then adjust the trimmers for the "R. F." and "ANT" sections of the gang condenser.

(e) Set the test oscillator on 1400 kilocycles.

(f) Turn the condenser rotor plates until the 1400 K. C. signal from the test oscillator is turned in with maximum output. (No calibration blocks should be used as the oscillator circuit is adjusted at 1530 K. C. on this set.)

(g) Readjust the parallel trimmers for the "R. F." and "ANT" section of the gang condenser for maximum output. DO NOT disturb the oscillator trimmer (middle section) as this is adjusted at 1530 K. C. only and any further adjustments at this point will affect both the tuning range of the receiver and the tracking of its circuits.

CAUTION: Always use the lowest possible test oscillator output that will give a reasonable deflection of the output meter pointer in order to prevent the A. V. C. from leveling out the output as the adjustments are made.

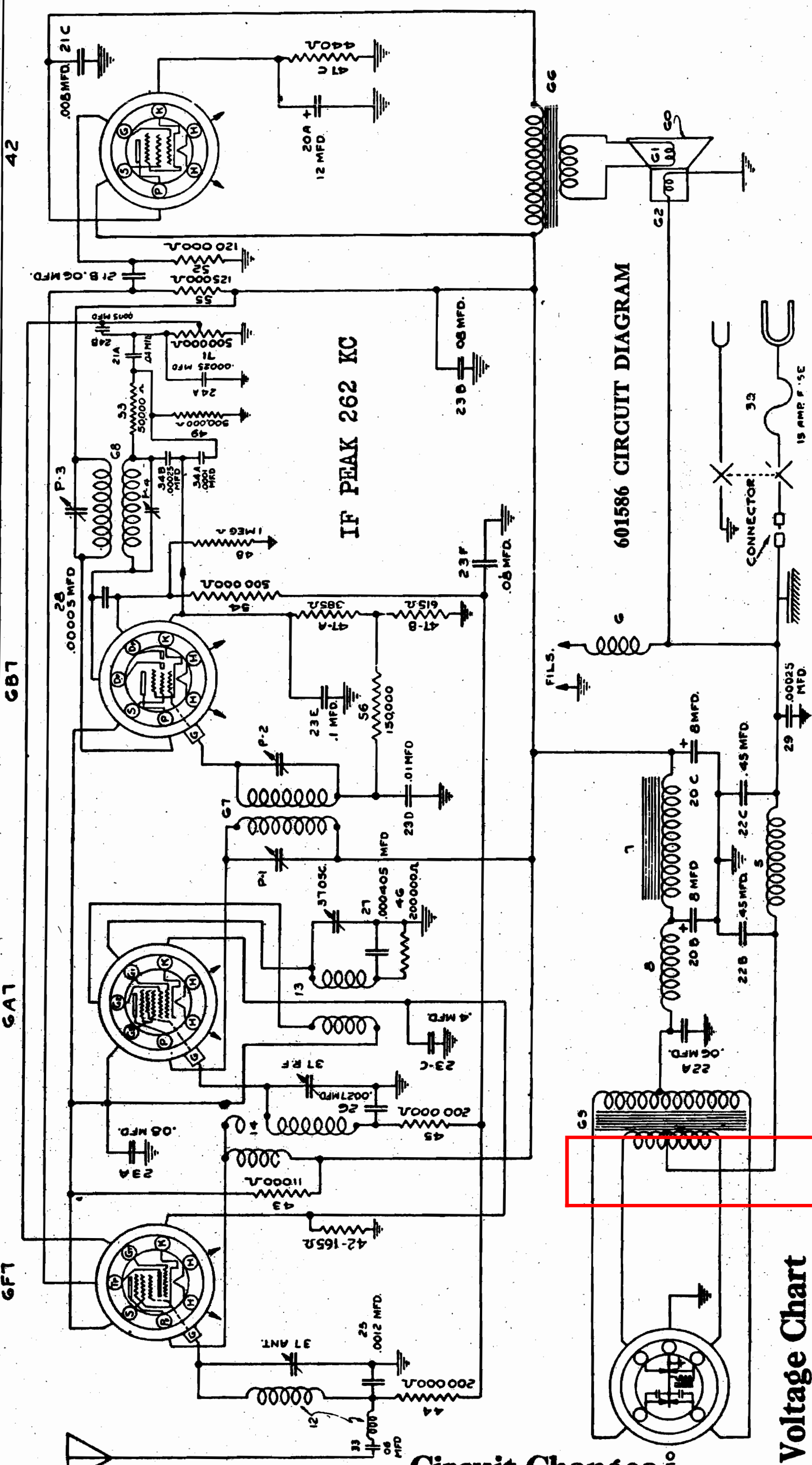
Part No. 601525
Date 11-1-35

CODE FOR SYMBOLS

Gt—Grid-triode
G—Control grid
G1—Osc. Grid
G2—Osc. plate
G3,5—Osc. Screen
H—Heater
Pp—Plate-pentode
S—Screen
Tp—Triode-plate
K—Cathode

MODEL 601586
Schematic, Voltage
Changes

CHEVROLET DIV.—GEN. MOTORS



Code for Symbols

H—Heater
Pp—Plate-pentode
S—Screen
Tp—Triode-plate
Gt—Grid-triode
G—Control grid
G1—Osc. grid
G2—Osc. plate
G3,5—Osc. screen
K—Cathode

Voltage Chart

The voltages shown below are average readings taken from the tube socket contacts to the chassis frame, and will vary 10% when the set is tested on a 6 volt battery due to differences in characteristics of vibrators and tubes. All readings were taken with a 1000 ohm per volt meter.

Type	Function	H	Pp	S	Tp	Gt	G	G1	G2	G3,5	K
6F7	R. F.	6	250	135	80	0	0	—	—	—	6.2
6A7	Det.-Osc.	6	250	—	—	—	0	0	120	135	6.2
6B7	2nd Det. AVC	6	250	135	—	—	0	—	—	—	8.5
42	Output	6	240	250	—	—	0	—	—	—	16.0

NOTE: Ampere drain of set at 6 volts is 6.2 amperes.
Milliampere drain from "B" supply is approximately 55 M. A.

Part No. 601586
Date 11-1-35

Circuit Changes

A number of .05 mfd. tubular condensers were used at the factory in place of the .06 mfd. condenser part #1209213 condenser shown on Fig. 2 as Illus. #33. For Service Replacement purposes of any defective .05 mfd. condensers—use part #1209213 condenser.

MODEL 601586
Socket, Trimmers
Chassis, Alignment
Parts

CHEVROLET DIV.—GEN. MOTORS

GENERAL: This auto radio is a four tube, single unit superheterodyne radio. It was designed for the 1935 Standard Model Chevrolets. A tuning control of the type that mounts on the bottom flange of the instrument is used.

Peaking Instructions

Peaking I. F. Stages at 262 K. C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect a .5 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the tube's grid clip in place. The .5 mfd. condenser is necessary to prevent the oscillator circuit of the receiver from affecting the I. F. adjustments.

(b) Set the test oscillator on 262 kilocycles.

(c) Turn the volume control of the receiver on full.

(d) Peak the I. F. trimmer P-3 for the 2nd I. F. coil shown on Fig. 3.

(e) Then peak trimmers P-2 and P-1 of the first I. F. coil also shown on Fig. 3.

(f) In order to insure accurate settings of the I. F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable output meter scale deflection. Make all adjustments for maximum output.

Peaking Gang Condenser at 1530 and 1400 K. C.

(a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. Do not use the .5 mfd. condenser that was required in aligning the I. F. stages.

(b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

(c) Set the test oscillator on 1530 kilocycles.

(d) Adjust the oscillator section (middle section) of the gang condenser CAREFULLY for maximum output. Then adjust the trimmers for the "R. F." and "ANT" sections of the gang condenser.

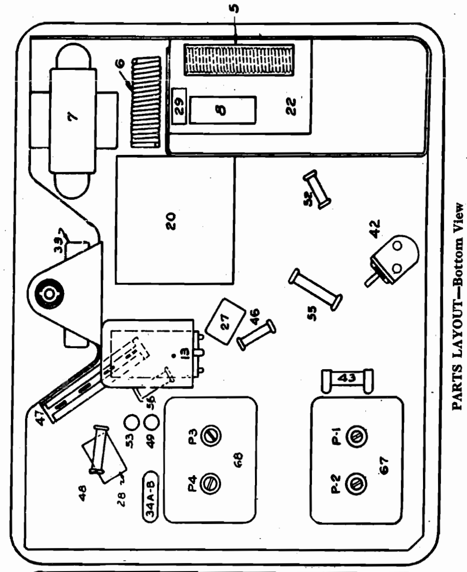
(e) Set the test oscillator on 1400 kilocycles.

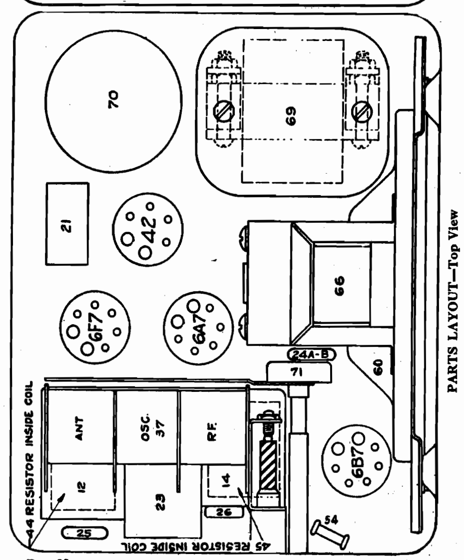
(f) Turn the condenser rotor plates until the 1400 K. C. signal from the test oscillator is tuned in with maximum output. (No calibration blocks should be used as the oscillator circuit is adjusted at 1530 K. C. on this set.)

(g) Readjust the parallel trimmers for the "R. F." and "ANT" sections of the gang condenser (shown on Fig. 2) for maximum output. DO NOT disturb the oscillator trimmer (middle section) as this is adjusted at 1530 K. C. only, and any further adjustments at this point will affect both the tuning range of the receiver and the tracking of its circuits.

(h) The capacity of the output circuit of the test oscillator may be slightly different than that of the under car antenna the receiver is to be used on. Therefore, it is advisable to readjust the "ANT" trimmer to the car antenna when reinstalling the receiver. This may be done by tuning the receiver to a broadcast station around 1400 K. C. and adjusting for maximum volume.

CAUTION: Always use the lowest possible test oscillator output that will give a reasonable deflection of the output meter pointer, in order to prevent the A. V. C. from leveling out the output as the adjustments are made.





PARTS

Part No. 601586
Date 11-1-35

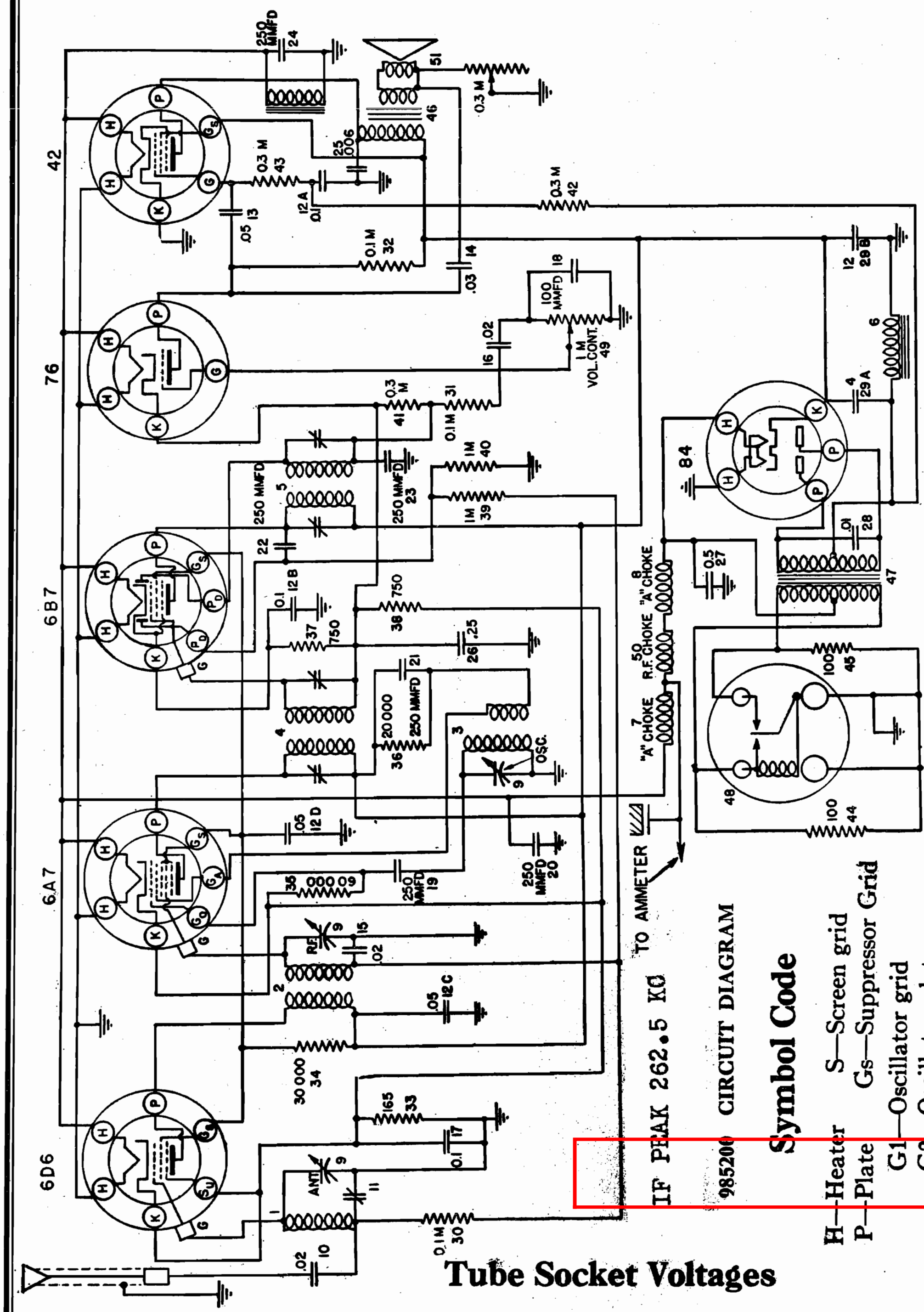
Part No.	Part Name	Description	Illus. No.
1209079	Case	Chassis	....
1207683	Clip	Tube grid connector	....
1209039	Coil	Vibrator "A" choke	5
1209209	Condenser	By-pass block	23
	Sec. A	.08 Mfd., 400 v.	....
	Sec. B	.08 Mfd., 400 v.	....
	Sec. C	.4 Mfd., 100 v.	....
	Sec. D	.01 Mfd., 100 v.	....
	Sec. E	.1 Mfd., 100 v.	....
	Sec. F	.08 Mfd., 100 v.	....
1209051	Condenser	Molded .0012 Mfd.	25
1209052	Condenser	Molded .00027 Mfd.	26
1209053	Condenser	Molded .000405 Mfd.	27
1209878	Condenser	Molded .00005 Mfd.	28
1209055	Condenser	Molded .00025 Mfd.	29
*1209534	Condenser	Tubular .06 Mfd., 200 v.	33
1209950	Condenser	3 gang tuning—incl. coupling	35
	**Connector Assembly	"A" power on chassis	....
1836869	Cap	Ferrule holder	....
1838476	Ferrule	Contact	....
	*Connector Assembly	Antenna on chassis	....
1836878	Body	Antenna connector	....
1838476	Ferrule	Contact	....
1836876	Spring	Ferrule tension	....
1843713	Washer	Antenna connector	....
1209059	Coupling	Condenser drive	....
1209083	Cover	Chassis top	....
1209084	Cover	Tube lid	....
1209210	Resistor	Candohm 165 ohms	42
1209063	Resistor	Ohmite 11,000 ohms—1⅓ watt	43
1210119	Resistor	Insulated 200,000 ohms—½ watt	44, 45, 46
1209211	Resistor	Candohm strip	47
	Sec. A	385 ohms	....
	Sec. B	615 ohms	....
	Sec. C	440 ohms	....

Part No.	Part Name	Description	Illus. No.
1210470	Resistor	Insulated 500,000 ohms—½ watt	54
1211157	Resistor	Insulated 120,000 ohms—½ watt	55
1211163	Resistor	Insulated 150,000 ohms—½ watt	56
1208018	Shield	Tube (without grid shield)	.....
1207594	Sleeve	Volume control shaft	.....
1210759	Socket	6 prong tube (42)	.....
1209065	Socket	Vibrator	.....
1209071	Speaker Assembly	Complete (6-½")	60
1209074	Transformer	1st I. F. assembly	67
1209367	Transformer	2nd I. F. assembly	68
1209076	Transformer	Vibrator	69
5039661	Vibrator	Plug-in synchronous	70
1209368	Volume control	Res. 500,000 ohms	71
1209130	Bracket	Dial support	.....
1208197	Clip	Ammeter lead	.....
1209099	Dial	Chart	.....
119496	Dial Light	6-8 volt	.....
1209098	Drive Head	Less flex. shaft assembly	.....
361656	Fuse	15 ampere	.....
1209132	Gear	Pointer drive	.....
1209100	Knob	Tuning or volume	.....
1209204	Lead Assembly	Ammeter	.....
1209885	Resistor	Insulated 1 megohm—½ watt	48
1210470	Resistor	Insulated 500,000—½ watt	49
1211157	Resistor	Insulated 120,000 ohms—½ watt	52
1210116	Resistor	Insulated 50,000 ohms—½ watt	53

*See "CIRCUIT CHANGES."
**Complete assembly not available as a service part.

MODEL 985200
Schematic, Voltage

CHEVROLET DIV.—GEN. MOTORS



IF PEAK 262.5 KC

985200 CIRCUIT DIAGRAM

Symbol Code

H—Heater
P—Plate
S—Screen grid
Gs—Suppressor Grid
G1—Oscillator grid
G2—Oscillator plate
K—Cathode

Circuit Description

The circuit used is of the conventional superheterodyne type and does not employ regeneration which might affect its stability. A high gain antenna circuit especially designed for use with an under car antenna is used. An antenna compensating condenser is provided in this circuit which can be adjusted so as to bring the antenna circuit of the receiver into resonance with the car antenna.

Part No. 985200
Date 11-1-35

Tube Socket Voltages

Type	Function	H	P	S	Gs	G1	G2	K
6D6	R. F. Amplifier	6	240	100	—	—	—	3.6
6A7	1st Det.-Osc.	6	140	100	—	—	160	3.6
6B7	IF Amp.-2nd Det.	6	130	100	—	—	—	3.6
76	1st A. F.	6	130	—	—	—	—	8.0
42	Output	6	220	240	—	—	—	0
84	Rectifier	6	*	—	—	—	—	240

*A. C.

Note: Above readings taken from tube socket contacts to ground with a D. C. voltmeter having a resistance of 1000 ohms per volt.

MODEL 985200
Socket, Trimmers
Alignment, Chassis
Parts

CHEVROLET DIV.—GEN. MOTORS

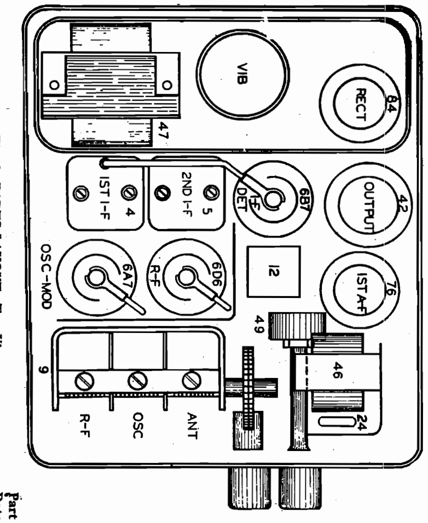


Fig. 3 PARTS LAYOUT—Top View

Part No. 985200
Date 11-1-35

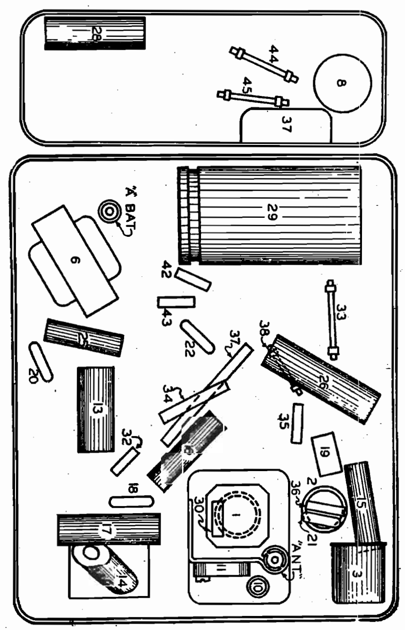


Fig. 2 PARTS LAYOUT—Bottom View

Peaking Procedure

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 42 output tube.

BE SURE the meter is protected from D. C. by connecting a condenser (.1 Mfd. or arger—not electrolytic) in series with one of the leads.

'eaking I. F. Stages at 262.5 K. C.

(a) Connect the ground lead of the signal generator to the chassis frame. Connect a .5 Mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the tube's grid clip in place.

(b) Set the signal generator to 262.5 kilocycles.

(c) Turn the volume control of the receiver on full and turn the tone control to the treble position.

(d) Rotate the station selector until the tuning condenser plates are completely in mesh.

(e) Adjust the trimmer condensers located on top of the 2nd I-F coil (Fig. 00) for maximum reading on the output meter.

(f) Adjust the trimmer condensers located on top of the 1st I-F coil for maximum output.

NOTE: In order to insure accurate settings of the I-F trimmer condensers the above adjustments should be repeated using the lowest signal generator output that will give a reasonable scale deflection on the output meter. Make all adjustments for maximum output.

eaking R. F. Stages

(a) Remove the .5 Mfd. condenser from the output lead of the signal generator and connect a .00025 Mfd. condenser in its place. Then, connect this lead to the antenna connection of the receiver.

(b) Set the signal generator to 1400 kilocycles.

(c) Rotate the station selector until the pointer points to 140 on the dial.

NOTE: Special care should be exercised in making the adjustments at this frequency as the correct logging of stations on the dial is dependent upon these adjustments.

(d) Adjust the "Osc" trimmer of the tuning condenser (Fig. 2) for maximum output.

(e) Adjust the "R-F" trimmer for maximum output.

(f) Adjust the "ANT" trimmer for maximum output.

(g) Repeat operations (e) and (f) using the lowest signal generator output that will give a reasonable scale deflection on the output meter.

NOTE: The "Osc," "R-F," and "ANT" trimmers should not be adjusted at any frequency other than 1400 kilocycles.

(h) Set the signal generator to 600 kilocycles.

(i) Tune in the 600 kilocycles from the signal generator with the station selector for maximum output.

(j) Peak the antenna compensating condenser (Fig. 3) for maximum output.

(k) Repeat operation (j) and (k) alternately until no further improvement in output can be obtained.

(l) Set the signal generator to 1400 kilocycles again.

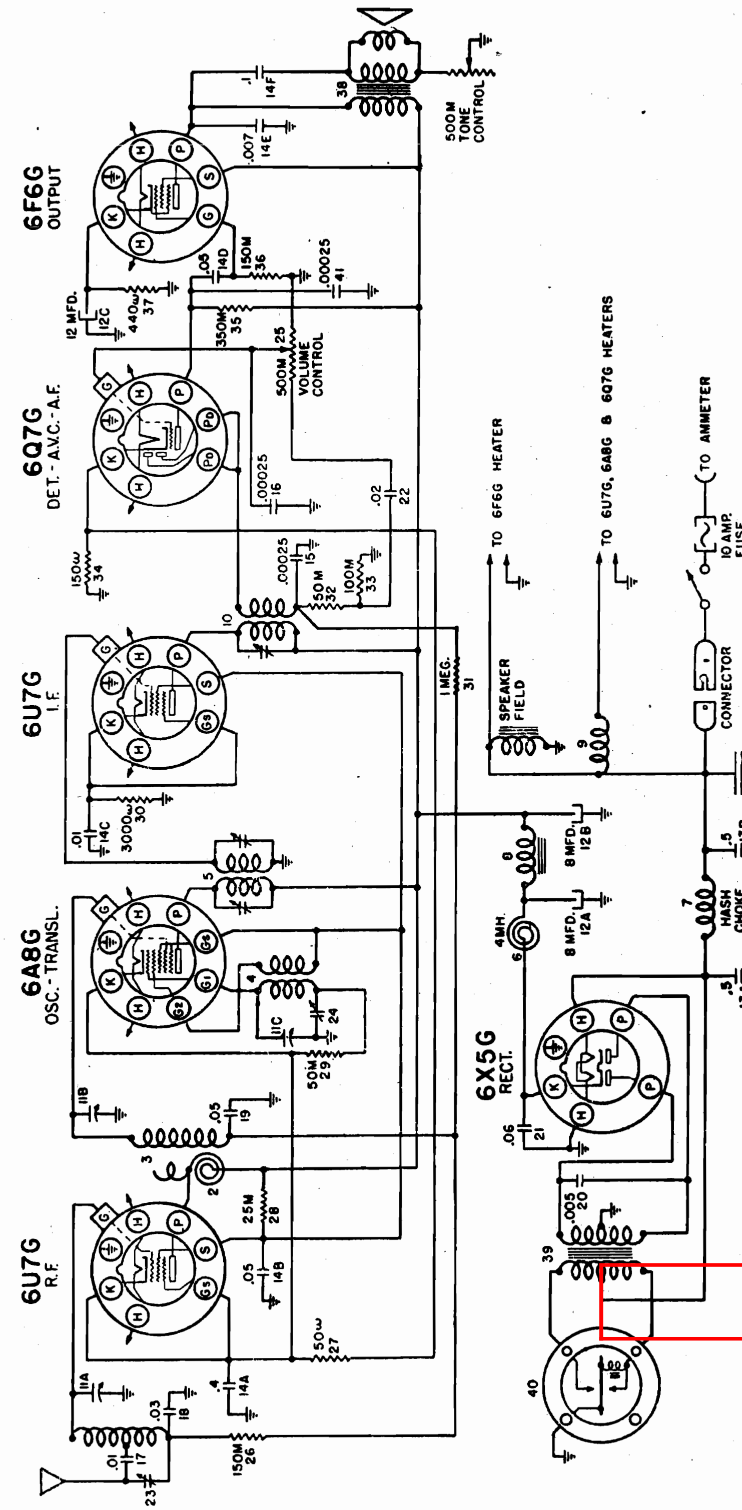
(m) Tune in the 1400 kilocycle with the station selector for maximum output.

(n) Readjust the "ANT" trimmer of the tuning condenser for maximum output.

Part No.	Part Name	Description	Illus. No.
1210652	Coil	Antenna	1
1210653	Coil	R. F.	2
7231040	Coil	Oscillator	3
1210654	Coil Assembly	1st I. F.	4
1210655	Coil Assembly	2nd I. F.	5
1209803	Coil	"B" filter choke	6
1210656	Coil	"A" filter choke	7
1210656	Coil	"A" filter choke	8
1210657	Condenser	3 gang variable	9
1210658	Condenser	Ant. blocking .02 Mfd.,	10
1210659	Condenser	Antenna trimmer	11
1210660	Condenser	By-pass block	12
	Sec. A	.1 Mfd., 200 volt	
	Sec. B	.1 Mfd., 200 volt	
	Sec. C	.05 Mfd., 400 volt	
	Sec. D	.05 Mfd., 400 volt	
7230592	Condenser	Tubular .05 Mfd.,	13
1209625	Condenser	Tubular .03 Mfd.,	14
1212099	Condenser	Tubular .02 Mfd.,	15
1212099	Condenser	Tubular .02 Mfd.,	16
1207908	Condenser	Tubular .1 Mfd.,	17
1210275	Condenser	Molded .0001 Mfd.	18
1209055	Condenser	Molded .00025 Mfd.	19
1209055	Condenser	Molded .00025 Mfd.	20
1209055	Condenser	Molded .00025 Mfd.	21
1209055	Condenser	Molded .00025 Mfd.	22
1209055	Condenser	Molded .00025 Mfd.	23
1209055	Condenser	Molded .00025 Mfd.	24
7230593	Condenser	Tubular .006 Mfd.,	25
7231594	Condenser	Tubular .25 Mfd.,	26
1212100	Condenser	Tubular .5 Mfd.,	27
1209805	Condenser	Oil type .01 Mfd.,	28
1210662	Condenser	Electrolytic block	29
	Sec. A	4. Mfd., 350 volt	
	Sec. B	12. Mfd., 350 volt	
1209883	Resistor	Insulated 100,000 ohms—½ watt	30
1209883	Resistor	Insulated 100,000 ohms—½ watt	31
1209883	Resistor	Insulated 100,000 ohms—½ watt	32
1208140	Resistor	Flexible 165 ohm—½ watt	33
1211102	Resistor	Insulated 30,000 ohm—1 watt	34
1210881	Resistor	Insulated 60,000 ohm—½ watt	35
1210882	Resistor	Insulated 20,000 ohm—½ watt	36
1208800	Resistor	Flexible 750 ohm—½ watt	37
1208800	Resistor	Flexible 750 ohm—½ watt	38
1209885	Resistor	Insulated 1 Megohm—½ watt	39
1209885	Resistor	Insulated 1 Megohm—½ watt	40
1209884	Resistor	Insulated 300,000 ohm—½ watt	41
1208984	Resistor	Insulated 300,000 ohm—½ watt	42
1209884	Resistor	Insulated 300,000 ohm—½ watt	43
1209015	Resistor	Flexible 100 ohm—½ watt	44
1209015	Resistor	Flexible 100 ohm—½ watt	45
1209629	Transformer	Output	46
1210663	Transformer	Power	47
5040000	Vibrator	Plug-in type	48
1210664	Volume Control	1 megohm	49
1210665	Coil	Motor noise choke	50

CHEVROLET DIV.—GEN. MOTORS

MODEL 985254
Schematic, Voltage



985254 CIRCUIT DIAGRAM

IF PEAK 262 KC

Part No. 985254
Date 11-1-36

Tube Socket Voltage

Model 985254

Type	Function	H	P	S	GS	GL	G2	K
6U7G	R.F. Amplifier	5.75	230	60	2.5			2.5
6A8G	Translator	5.75	230		6.0	3.0	60	2.5
	Oscillator							
6U7G	I.F. Amplifier	5.75	230	60	5.0			5.0
6Q7G	Det-1st I.F.	5.75	80					1.2
6F6G	Output	5.8	220	230				14.0
6X5G	Rectifier	5.75	*					240

*AC.

Symbol Code

H. Heater
P Plate
S Screen Grid
GS Supressor Grid
G1 Oscillator Grid
g2 Oscillator Plate
K Cathode

NOTE: Above readings taken from tube socket contacts to ground with a D.C. voltmeter having a resistance of 1000 ohms per volt; "A" Batt 6 volts.

ANTENNA CIRCUIT: The antenna circuit is directly coupled to the antenna in contrast with the capacity coupled circuit used in some Chevrolet Models. A small adjustable condenser is provided for adjusting the antenna circuit to the antenna. This adjustment is made near the high frequency end of the dial (1400 K.C.) instead of at the low frequency end as with the capacity coupled sets.

POWER SUPPLY: The power supply in this receiver differs from previous Chevrolet Models in that a rectifier tube (type 6X5G) is used in conjunction with a full wave, plug-in vibrator. The vibrator circuit is permanently connected for operation on negative battery ground as is the case on all Chevrolets.

MODEL 985254
Socket, Trimmers
Chassis, Alignment
Parts

CHEVROLET DIV.—GEN. MOTORS

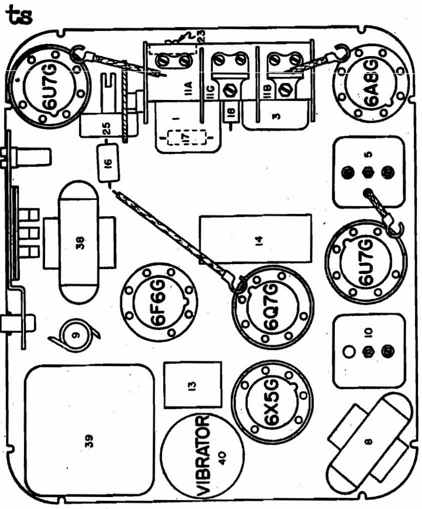


Fig. 2

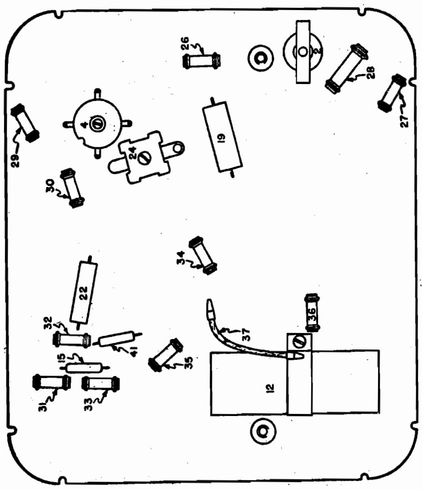


Fig. 1

Part No.	Illustration No.	Part Name	Function
1211585	1	Coil	Antenna Assy. (includes 17)
1210690	2	Coil	Choke (R. F. Primary)
1210501	3	Coil	R. F.
1211583	4	Coil	Oscillator
1211587	5	Coil	1st I. F. Assy.
1210547	8	Choke	Hum Filter
1211586	10	Coil	2nd I. F. Assy.
1211591	11	Condenser	Variable 3-gang tuning
1211580	12	Condenser	Electrolytic
			Sec. A "B" Voltage Filter
			Sec. B "B" Voltage Filter
			Sec. C 6F6G Bias Resistor By-Pass
1211581	13	Condenser	Filter Block
		Sec. A. .5 mfd. 160 V. Hash Filter	
		Sec. B. .5 mfd. 160 V. Hash Filter	
1211584	14	Condenser	By-pass Block
		Sec. A. .4 mfd. 160 V-R. F. and translator bias resistor By-Pass	
		Sec. B. .05 mfd. 400 V-Screen By-Pass	
		Sec. C. .01 mfd. 160 V-1. F. Bias Resistor By-Pass	
		Sec. D. .05 mfd. 400 V. Audio Coupling	
		Sec. E. .007 mfd. 400 V. 6F6G Plate By-Pass	
		Sec. F. .1 mfd. 400 V. Tone Control	
1209055	15	Condenser (.00025 mfd.) molded Diode Return	
1209055	16	Condenser (.00025 mfd.) molded R. F. By-Pass	
1208600	17	Condenser .01 mfd. Antenna Coupling	
1209625	18	Condenser .03 mfd. 6U7G Grid Return (Tubular)	
7230592	19	Condenser .05 mfd. 6A8G Grid Return (Tubular)	
7230912	20	Condenser .005 mfd. Buffer	
1209534	21	Condenser .05 mfd. Hash Filter (Tubular)	
1212099	22	Condenser .02 mfd. Audio Coupling (Tubular)	
1210543	23	Condenser (Ant. Padder) (7.5 mfd. to 75 mfd)	
1211592	24	Condenser (Oscillator Padder)	
1210512	25	Control 500,000 ohms Volume	
1210545	25	Control 500,000 ohms (tapped) Volume	
1211163	26	Resistor 150,000 ohms ½ Watt Grid Filter	
1211661	27	50 ohm Resistor 6U7G and 6A8G Bias Resistor	
1211663	28	Resistor 25,000 ohms 2 Watt Screen Voltage	
1210116	29	Resistor 50,000 ohm ½ watt Oscillator Grid Leak	
1211225	30	Resistor 3,000 ohm ½ Watt 6U7G I. F. Grid Bias	
1209885	31	Resistor 1 meg. ½ Watt Isolation AVC Filter	
1210116	32	Resistor 50,000 ohms ½ Watt AVC	
1209883	33	Resistor 100,000 ohms ½ Watt Diode Load	
1211003	34	Resistor 150 ohm ½ watt	6Q7G Bias
1211627	35	Resistor 350,000 ohm ½ watt	6Q7G Plate Load
1211163	36	Resistor 150,000 ohm ½ watt	6F6G Grid
1211622	37	Resistor WW 440 ohms 1 watt	6F6G Bias Resistor
1211588	38	Transformer	Output
1211589	39	Transformer	Power
5050673	40	Vibrator	Plug-In
1209055	41	Condenser (.00025 mfd molded)	R. F. By-Pass
1211220	42	Resistor 300 ohm ½ watt	
1210116	43	Resistor 50,000 ohm ½ watt	

Circuit Alignment

IMPORTANT: Do not make any adjustments to this receiver with the chassis case removed from the receiver chassis or without the proper equipment. If maximum sensitivity is to be obtained from this receiver after realignment, it is very important that the following procedure be closely observed:

1. Aligning I-F Stages at 262 Kilocycles

(a) Connect the signal lead of the test oscillator to the grid cap of the 6A8G tube, through a .1 mfd. condenser, leaving the tube's grid clip in place.

(b) Connect the ground lead of the test oscillator to the chassis frame.

(c) Connect output meter in plate circuit of 6F6G output tube or across the voice coil of the speaker.

(d) Set the test oscillator to exactly 262 K.C.

(e) Adjust the trimmers on the I-F coils (Illus. 5 and 10) carefully for maximum output. These adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistent with obtaining readable indication on the output meter.

2. Aligning at 1530 Kilocycles

(a) Leave the test oscillator leads connected the same as for aligning the I-F circuits.

(b) Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.

(c) Set the test oscillator to 1530 kilocycles.

(d) Adjust the parallel trimmer for the oscillator section of the condenser gang (Illus. 11C. Fig. 2) for maximum output. It is very important that this frequency be set accurately as a slight missetting will cause the receiver to be out of track over the entire high frequency end of the dial.

3. Aligning at 540 Kilocycles

(a) Leave the test oscillator leads connected the same as before.

(b) Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.

(c) Set the test oscillator to 540 K.C.

(d) Adjust the oscillator tracking condenser (Illus. 24, Fig. 3) located on the underside of the receiver sub-panel to maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

4. Aligning at 1400 Kilocycles

(a) Remove the signal lead of the test oscillator from the grid of the 6A8G tube and connect to the antenna terminal of the receiver through a .002 mica condenser connected in place of the .1 mfd. condenser previously used.

(b) Set the test oscillator to 1400 K.C.

(c) Turn the condenser rotor plates until this frequency is tuned in with maximum output.

(d) Adjust the R-F parallel trimmer on the condenser gang (Illus. 11B, Fig. 2) located on the side of the receiver case for maximum output.

5. Aligning at 600 Kilocycles

The oscillator padding condenser was previously adjusted at 540 K.C.; however, it is necessary, in most cases, to repeak the oscillator tracking condenser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

(a) Set the test oscillator on 600 K.C.

(b) Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output.

(c) Maintain a low output signal from the test oscillator and readjust the oscillator tracking condenser (Illus. 24, Fig. 3) while rocking the variable condenser gang tuning shaft back and forth through the signal. This operation should be continued until no further increase in output can be obtained.

NOTE: If the entire alignment procedure has been accomplished correctly, the receiver should be very nearly uniformly sensitive over the entire frequency range.

Part No. 985254
Date 11-1-36

Visual Alignment

If the visual method of alignment is preferred to the method outlined above, the vertical input terminals of the cathode ray oscillograph should be connected to the second detector output with the high side connected between the junction of the 50,000 ohm resistor (Illus. 32, Fig. 1) and the secondary of the second I.F. transformer (Illus. 10, Fig. 1).

CHEVROLET DIV.—GEN. MOTORS

SUBJECT: Service Hints On Tuning Unit For 985283 Radio

FOR OTHER DATA, SEE VOL. IX

1. Motor does not run

(a) Press button down and check motor terminals for voltage. The voltage on the motor must be measured across the terminals because a voltage reading will show at all times from any one of the four motor terminals to ground or chassis. The voltage across the motor terminal should read 5.5 volts with 6 volts on the radio set, and will only show a reading when a button is pressed down and the relay is operating.

(b) If no voltage reading is obtained at the motor terminals to ground, check high "A" wiring from spark plate to motor terminals for open circuit. This check is made with no buttons down.

(c) When there is a voltage reading on some of the motor terminals to ground with no buttons down and not on other terminals, check motor fields and armature for open circuit. This is done with the regular continuity test.

(d) Check all motor terminals for ground with high "A" disconnected from the motor.

(e) Check the brushes on motor to make sure that they are seating properly on the commutator.

(f) Polish commutator with very fine emery paper, then wipe with a clean rag. Be sure that no abrasive is left on the commutator.

2. Motor stalls or does not pull condenser gang, but still motor checks okeh under No. 1

(a) Rotate armature of motor with finger to see if motor bearings are not frozen up. If the armature has a slight drag, it may be caused by the following:

1. Tight motor bearings.
2. Improper adjustment of motor worm with respect to the motor worm gear.

(b) Rotate condenser gang coupling if chassis is out of case and make sure that all moving parts rotate freely. Check remote control and be sure that all moving parts rotate freely.

(c) Hold clutch armature from engaging clutch and run motor by pressing button. Motor should run at very high speed with no load on it. This will check the motor and motor worm gear for freeness.

(d) Check remote control for binding either in the control head or in drive cables. Make sure that there are no sharp bends in control cables when installed in the car.

(e) Check motor armature for proper end play.

(f) If any bearings or gears appear to be running tight, oil only with 3 in 1 oil or its equivalent. This is very important, and only a very light grade of oil should be used, otherwise motor unit will not operate properly under low temperature conditions.
Caution: Do not oil motor bearings excessively because the motor used on this unit has oil-less bearings and should require very little oil. If an excessive amount of oil is used on the bearings it may get on the commutator or windings and cause damage to the motor. Do not oil the commutator under any circumstances.

3. If motor unit runs slow in both directions

(a) The same checks as outlined in Nos. 1 and 2 will apply to a slow running motor.

4. Motor unit runs slow in one direction

(a) Check motor brushes for proper fit to commutator.

(b) Check motor worm for proper adjustment. Motor worm should be exactly on a center with motor worm gear, with about .002 inch of backlash to worm gear when motor armature is held rigid.

(c) Check remote control and gang condenser assembly for binding in one direction or both.

SUBJECT: Service Hints On Tuning Unit For 985283 Radio—Cont'd

5. Noisy motor unit mechanically

(a) Check remote control for grinding or squeaking by spinning remote control knob.

(b) Check all gear adjustments for proper backlash and alignment.

(c) Check gears for proper lubrication. Use a light grade of vaseline on gears.

(d) Check gears and bearings for worn parts or poor bearing fits and lack of lubrication. Refer to No. 2 for oiling.

(e) Check motor brushes for noise.

6. Set noisy when jarred. This deals only with troubles in the motor unit that may cause the above trouble

(a) Relay armature bouncing on relay contacts. To remedy this condition adjust relay spring if weak and relay spring contacts for a wider gap.

(b) Push button cable plug not pushed in socket far enough.

(c) Weak push button springs in push button box. This will be noticeable only when the button box itself is jarred.

7. Motor runs but condenser gang and dial pointer do not move

(a) Check the set screw in rear of gang condenser worm gear that locks the drive shaft to the gang condenser worm. The drive shaft may be turning free and not driving the gang. The drive shaft is adjustable endwise for the clutch armature adjustment only, and not for the motor worm gear. If this set screw has come loose the drive shaft will be out of adjustment and the clutch and motor worm will have to be adjusted in the order named.

(b) Clutch armature not operating. Check voltage across the clutch coil and also check the clutch coil for continuity.

(c) If the clutch armature is operating, the clutch arm on the drive shaft may not be engaging the pin and roller on the motor worm gear. Adjustment can be made by moving the drive shaft endwise, but be sure to adjust motor after moving the drive shaft.

8. Motor unit operates and gang condenser oscillates but remote control does not operate

(a) This condition will be caused by the bakelite gang condenser coupling slipping in the gang condenser worm. This coupling is a friction drive and is pushed inside the gang condenser worm with spring pressure exerted outwards on the worm. Do not oil this friction drive. To tighten this friction drive, pull coupling out and spread the split shaft with a small screwdriver. A very small spread is all that is required. Be sure to clean off all grease on split shaft and inside of hole in gang condenser worm gear, then replace the coupling.

(b) Check remote control for any faults.

9. Push buttons do not release when one button is pressed at a time

(a) Buttons may be binding on control panel plate. Loosen the nuts holding push button box and adjust box so that buttons are free to move in and out.

(b) Buttons may be binding on top plate of button box. Adjust box plate so that buttons are free

(c) Rubber bands around buttons may be causing the buttons to bind.

(d) Push button box may be defective. Try a new box. Do not repair push button box internally.
Caution: Remember, the push buttons will not release until the proper station is tuned in and the motor unit has ceased to run.

MODEL 985283
Tuning Unit Notes
Part 2

CHEVROLET DIV.—GEN. MOTORS

SUBJECT: **Service Hints On Tuning Unit For 985283 Radio—Cont'd**

10. Push buttons do not release when two or more buttons are pressed at the same time. This is a fault that should seldom be complained about because it is not the correct way to operate the tuning unit, but provision has been made in the design to eliminate continuous oscillation of the tuning unit when two or more buttons are pressed at the same time. Three or four oscillations are permissible before buttons release. If the buttons do not release, proceed as follows:

(a) Try a new push button box.
(b) Check adjustment of relay spring contacts for proper gap.
(c) Check relay control arm for free operation and also for proper spring tension. Make sure that relay control arm is returning to normal position after relay operates.
(d) Check instrument panel plate and button box as outlined in No. 9.

11. Dial pointer slides past the proper station or setting and then returns to station when the corresponding button is pressed the second time

(a) This is a fault of the clutch which is not releasing fast enough or is not releasing at all. If the clutch does not release, the momentum of the locating motor will carry the gang condenser past the required setting. Check the clutch armature for free operation.
(b) Check the clutch arm on drive shaft for free operation.
(c) Check the clutch arm spring on drive shaft for proper tension.
(d) Check the small roller on motor worm gear for free operation on its retaining pin.
(e) Check the motor worm gear for free rotation on drive shaft when clutch arm is disengaged from the clutch pin.
(f) Check the clutch magnet gap clip for proper tension.
(g) Check the clutch arm spring for proper tension.
(h) Check the clutch arm for proper alignment with control shaft.

12. Stations do not log properly when dial pointer comes towards the station from the high frequency end—in other words, rotating in a counter clockwise direction

(a) Bakelite control disc for that particular station has not been set accurately. Adjust as per instructions.
(b) This condition may also be caused by fault No. 11. Check as per instructions in No. 11.

13. Stations do not log properly when dial pointer comes towards station from the low frequency end of dial—in other words, rotating in a clockwise direction. Under this fault, it is assumed that fault No. 12 has been checked

(a) The contact spring on control switch corresponding to the particular button under question may not be adjusted properly. If dial is over-riding on station it means that the contact spring is too close to the contact arm. To correct this condition it is necessary to loosen the screw on the discriminator switch to give contact spring a wider gap. If dial is under-shooting the station, that is, not dialing entirely to the station, it means that the contact spring is too far from the contact arm. To correct this condition it is necessary to tighten the adjusting screw on the discriminator switch. Be sure that none of the other adjusting screws are disturbed.

SUBJECT: **Service Hints On Tuning Unit For 985283 Radio—Cont'd**

(b) Check idler gear between control disc shaft and gang condenser worm gear for proper adjustment and also for being loose.

Caution: If the idler gear is moved from its original position for any reason or for any cause, it will be necessary to readjust all eight contact springs on control switch, and also to reset all eight bakelite control discs. Under no condition make any adjustment to any of the spring adjusting screws or to the idler gear unless all other remedies have been tried.

14. Set very noisy when motor unit is running. This would be electrical noise from the speaker

(a) Improper adjustment of the silencing contact on the relay. This silencing contact is the back contact, or the one nearest the condenser gang. The lead running from this contact is connected to the tab of the push-pull input choke and hence when the relay is operated to either side, the input choke tab is then grounded, silencing the audio of the set. Check wiring, soldered joints and contact resistance of silencing contact on relay. Polish relay contacts with very fine emery paper to remove dirt and grease. This will assure a good contact.

15. Set noisy immediately after motor unit has ceased to operate dial pointer

(a) This noise will only last for one or two seconds after the unit has stopped running and is caused by a voltage being generated in the motor and hence the "A" circuit by the rotation of the armature in a small residual field of the pole pieces. Check motor brushes and commutator for high resistance. Polish commutator as previously outlined.
(b) Check the .01 mfd. condenser across motor terminals for open.

16. Push buttons do not hold down when pressed

(a) Check the voltage between the black and yellow leads on push button cable socket.
(b) Make sure that push button cable plug is making good contact to the socket.
(c) Try a new push button box.

17. Calibrating light inside of case lights when calibrating switch is closed and push button is pressed. Motor will not run when this happens

(a) This condition is due to a faulty calibrating switch. Bend the switch arm down slightly so that a good contact is assured. This light is in series with relay coils and when light is not shorted out with calibrating switch the relay will not operate.

18. Calibrating light inside of case does not light when calibrating switch is open and push button is pressed

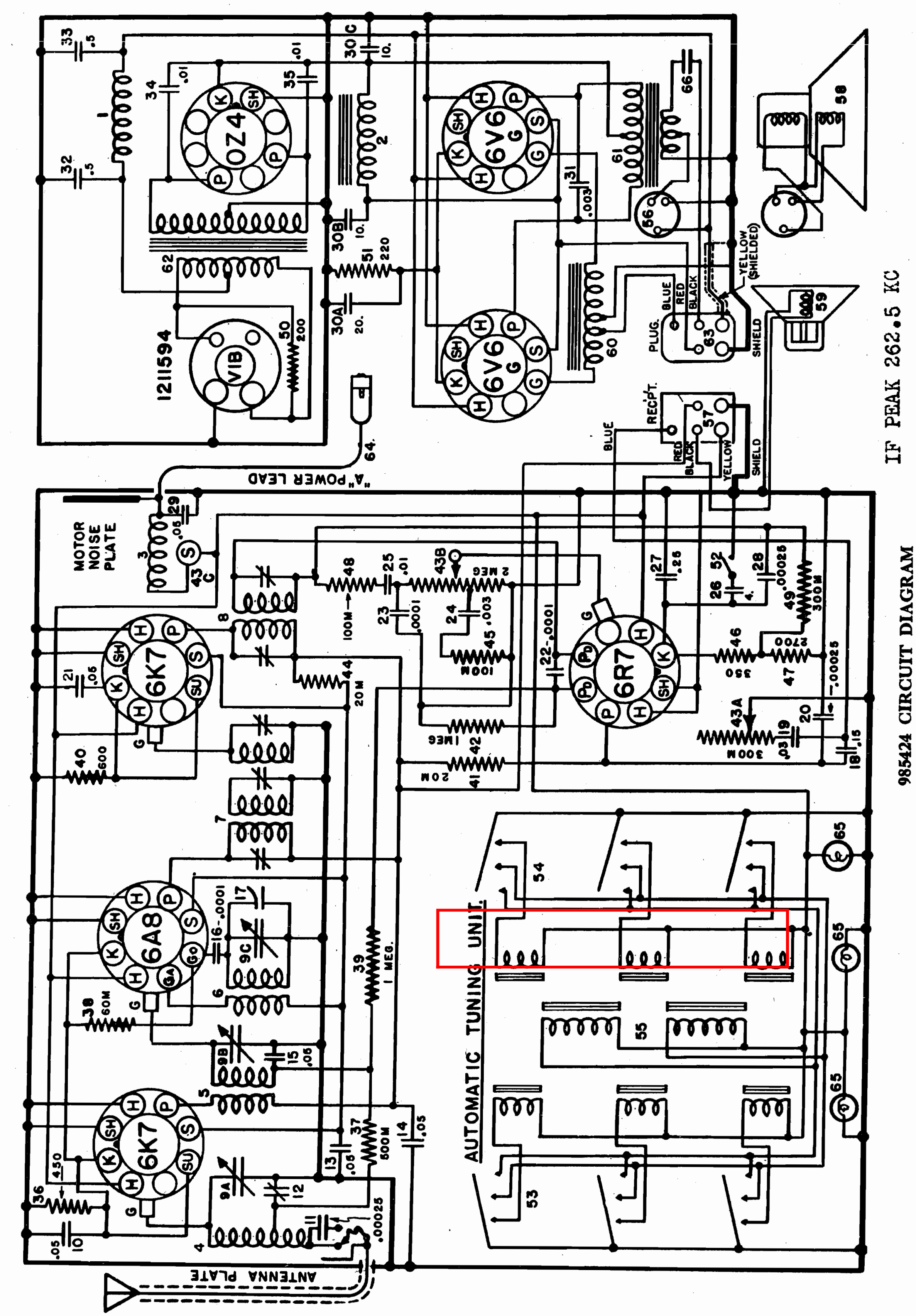
(a) Be sure calibrating light is not burned out.
(b) Check the voltage on relay coils.
(c) Check the relay coils for continuity.
(d) Check the calibrating switch contact for grounded connection.

19. Shift in station logging

(a) Check bakelite control discs for being loose on shaft. Discs are not supposed to slip when unit operates. This is a friction fit on the control shaft and should never be oiled.
(b) Check the oscillator circuit for shift.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985424
Schematic

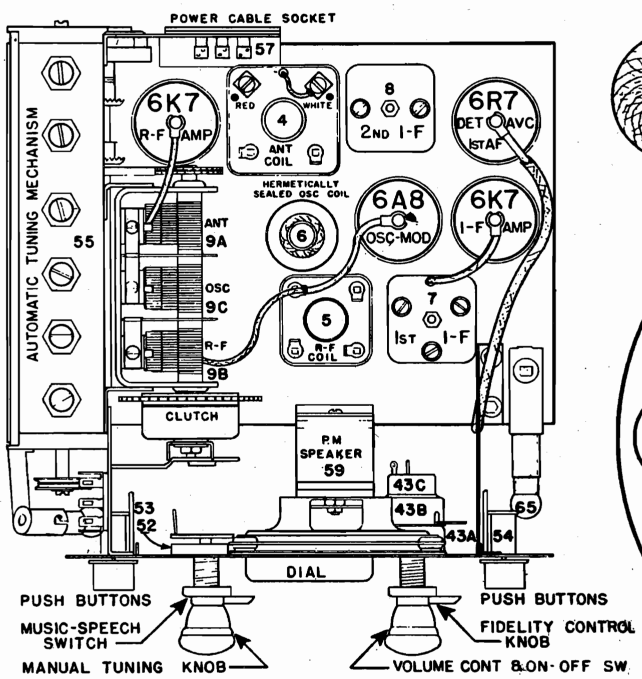


MODEL 985424
Socket, Trimmers
Chassis Views

CHEVROLET DIV.—GEN. MOTORS

Tube Complement

Type	Function	Type	Function
6K7	R. F. Amplifier	6R7	2nd Det.—A. V. C.—1st A. F. Amplifier
6A8	Oscillator-Modulator	6V6G	Output
6K7	I. F. Amplifier	0Z4	Rectifier



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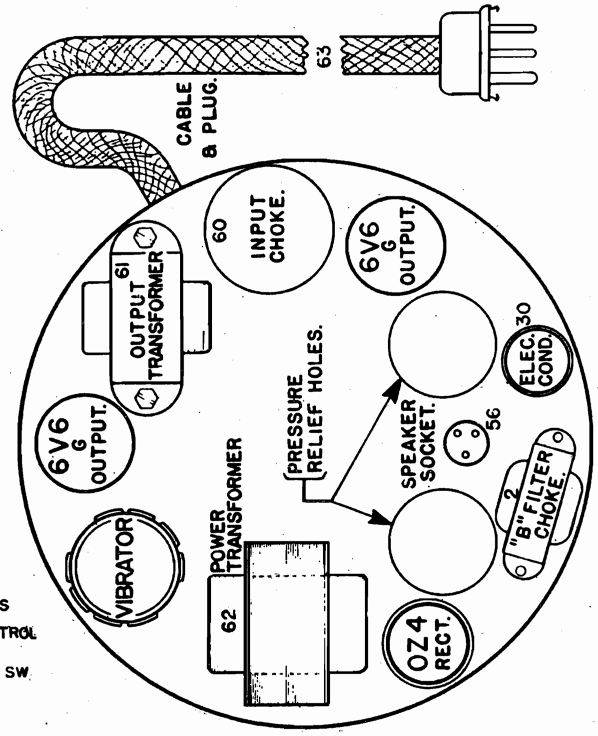

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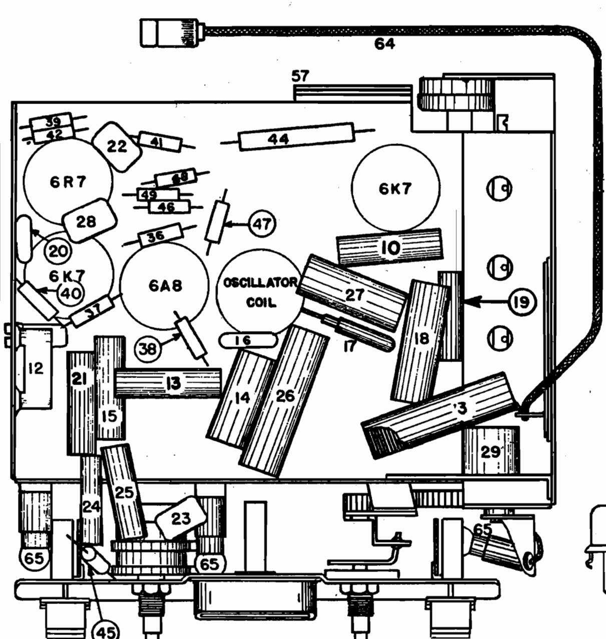
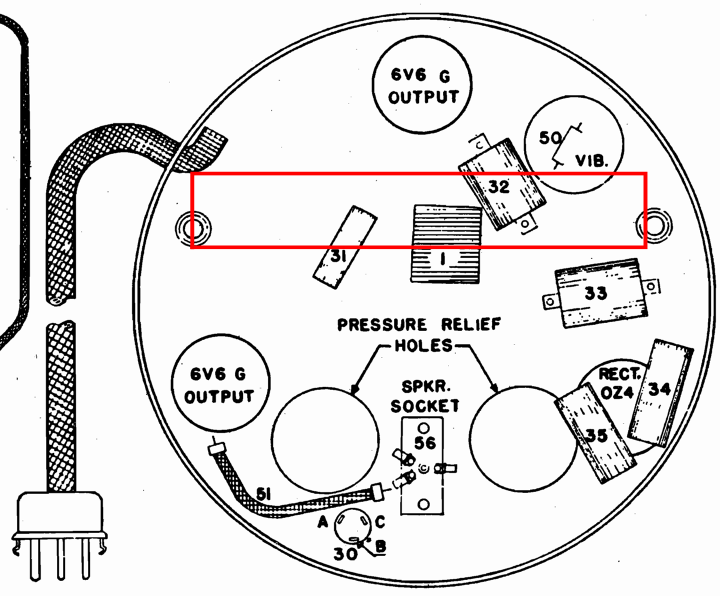


Bottom

985424 PARTS LOCATING DIAGRAM



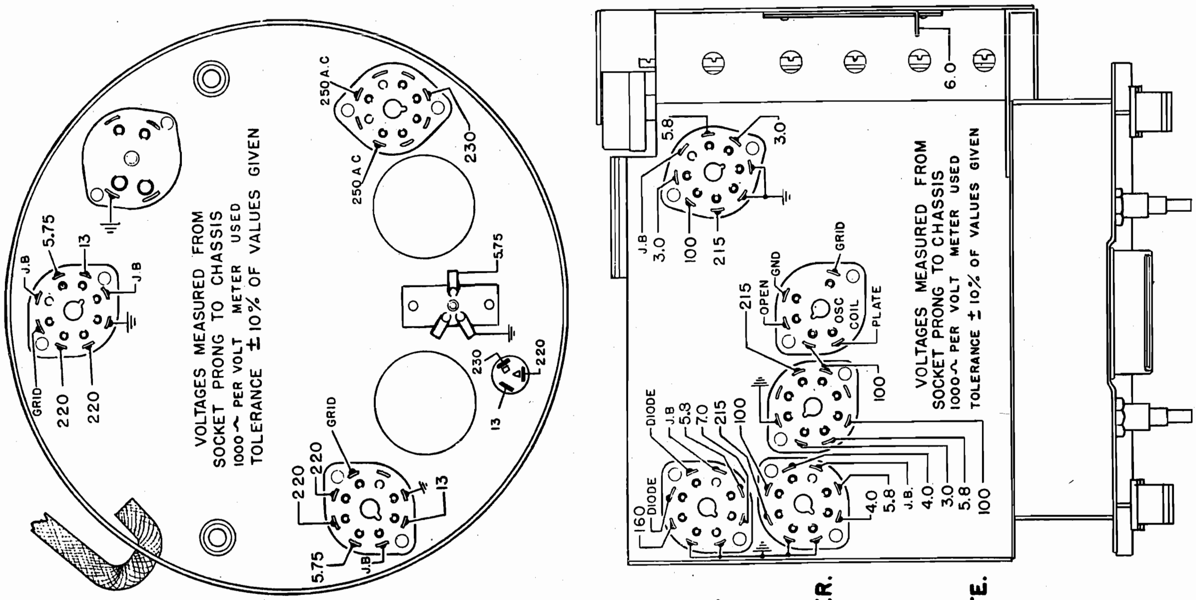
Bottom

985424 PARTS LOCATING DIAGRAMS

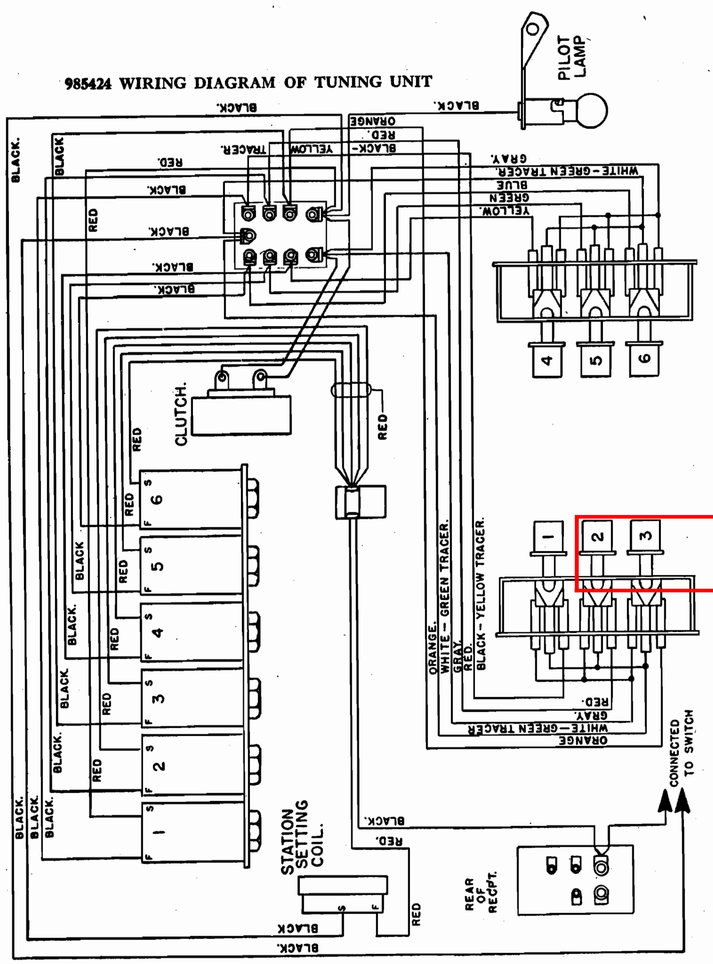
CHEVROLET DIV.—GEN. MOTORS

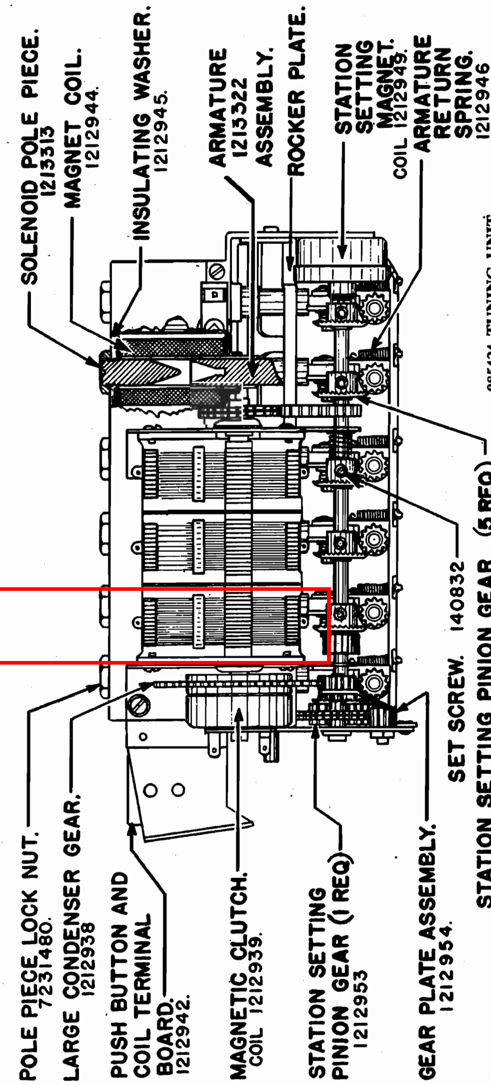
MODEL 985424
Tuning Unit Wiring
Condenser Assembly
Voltage

985424 SOCKET LOCATION and TUBE VOLTAGE



985424 WIRING DIAGRAM OF TUNING UNIT





985424 TUNING UNIT

MODEL 985424
Alignment

CHEVROLET DIV.—GEN. MOTORS

Circuit Alignment

If alignment is found necessary the circuits can be adjusted only with the use of a calibrated test oscillator or signal generator and an output meter. The signal generator output should be adjusted to give a reasonable scale deflection on the output meter. Before turning the receiver on or making any adjustments, a speaker similar to the one used with the receiver or a universal test speaker, should be connected to the chassis. It is also possible to use an 8000 ohm load connected across the primary of the output transformer.

1. Aligning I. F. Stages at 262.5 Kilocycles

The I. F. amplifier may best be aligned by first using a modulated signal generator and an output meter in the conventional manner, and then making the final adjustment with a radio frequency modulator signal generator and oscillograph. The accuracy of the push-button tuning system partially depends upon the symmetry of the I. F. wave form. In most cases the symmetry is only approximate without the aid of the oscillograph equipment.

(a) Connect one terminal of the output meter to the plate of one of the 6V6G output tubes and connect the other terminal through a .1 mfd. condenser (not electrolytic) to the plate of the other 6V6G output tube.

(b) Connect the output of the signal generator through a .02 mfd. condenser to the grid of the 6K7 I. F. amplifier tube leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the frame of the receiver chassis.

(c) Turn the volume control on full. Adjust station selector so that the rotor plates of the condenser gang are completely in mesh and turn the audio fidelity control to the treble position. The music-speech control should be in the "music" position.

(d) Adjust the signal generator to 262.5 kilocycles.

(e) Adjust both transformers located on the 2nd I. F. transformer to maximum reading on the output meter.

Note: Always use the lowest signal generator output that will give a reasonable reading on the output meter.

(f) Connect the output of the signal generator to the grid of the 6A8 tube leaving the tube's grid clip in place.

(g) Open the middle trimmer on the 1st I. F. transformer two or three turns of the adjustment screw. Care should be taken that the adjustment screw does not become dislodged from the nut.

(h) Adjust the other two trimmers on the 1st I. F. transformer for maximum reading on the output meter.

(i) Adjust the middle trimmer on the I. F. transformers for maximum reading on the output meter.

Caution: Do not readjust the trimmers on the 2nd I. F. transformer.

2. Oscillograph Alignment

For more accurate adjustment of the I. F. amplifier a cathode ray oscillograph in conjunction with a radio frequency modulated signal generator may be used to obtain a visual alignment. It will allow adjusting for a more symmetrical wave form.

(a) Disconnect the conventional signal generator from the receiver.

(b) Connect the vertical plates of the oscillograph to the receiver connecting the (HI) terminal through a .02 mfd. condenser to the grid cap of the 6R7 tube leaving the tubes grid clip in place. (Condenser is built into most oscillographs.) Connect the ground terminal to the frame of the receiver chassis.

(c) Connect the output of the R. F. modulated signal generator also through a .02 mfd. condenser to the grid cap of the 6A8 tube leaving the tube's grid clip in place. Connect the ground lead to the frame of the receiver chassis.

(d) Adjust the signal generator to 262.5 kilocycles.

(e) With the modulator switch of the signal generator turned off, a horizontal line will appear on the window of the oscillograph by means of the amplitude control on the oscillograph. Adjust the length of this line so that it is equal to the width of the celluloid scale supplied with the oscillograph.

(f) Turn the frequency modulator switch of the signal generator on.

(g) Adjust the vertical control of the oscillograph so that the image is just within the top and bottom lines of the oscillograph scale.

Note: Use the lowest signal generator output that will give a stable image on the oscillograph window. If too much signal input is used; the humps desired on the wave form will not be visible even at perfect alignment.

(h) Readjust the middle trimmer on the 1st I. F. transformer for maximum symmetry above the vertical resonance line in the center of the celluloid scale. The hump or shoulder appearing on each side of the wave form will be equal distance from the nose of the curve when maximum symmetry is reached.

3. Aligning the R. F. Amplifier

(a) Connect the output of the signal generator through a .00016 mfd. condenser and Chevrolet shielded antenna lead-in to the antenna connection of the receiver. Connect the ground lead to the frame of the receiver chassis.

(b) Adjust the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial logging the dial from the low frequency end.

(d) Adjust the trimmer on the oscillator section of the condenser gang for maximum reading on the output meter.

(e) Adjust the trimmer on the R. F. trimmer gang for maximum reading on the output meter.

(f) Adjust the trimmer on the antenna gang for maximum reading on the output meter.

(g) Readjust the station selector for maximum reading on the output meter.

Note: Do not readjust the oscillator trimmer.

(h) Repeat operations (e) and (f) for more accurate adjustments.

4. Adjusting Antenna Compensating Condenser

(a) Adjust the signal generator to 600 kilocycles.

(b) Tune in the 600 kilocycle signal with the station selector for maximum reading on the output meter.

(c) Adjust the antenna compensating condenser for maximum reading on the output meter.

(d) Repeat operations (b) and (c) alternately until no further improvement in output can be obtained.

(e) Readjust the signal generator to 1400 kilocycles.

(f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the antenna section of the condenser gang for maximum reading on the output meter.

5. Adjusting the Antenna Compensating Condenser When Set Is Installed on Car

(a) After installation is complete, tune-in a weak station between 55 and 65 on the dial that is just audible with volume control on full.

(b) Adjust the antenna compensating condenser for maximum volume in the speaker.

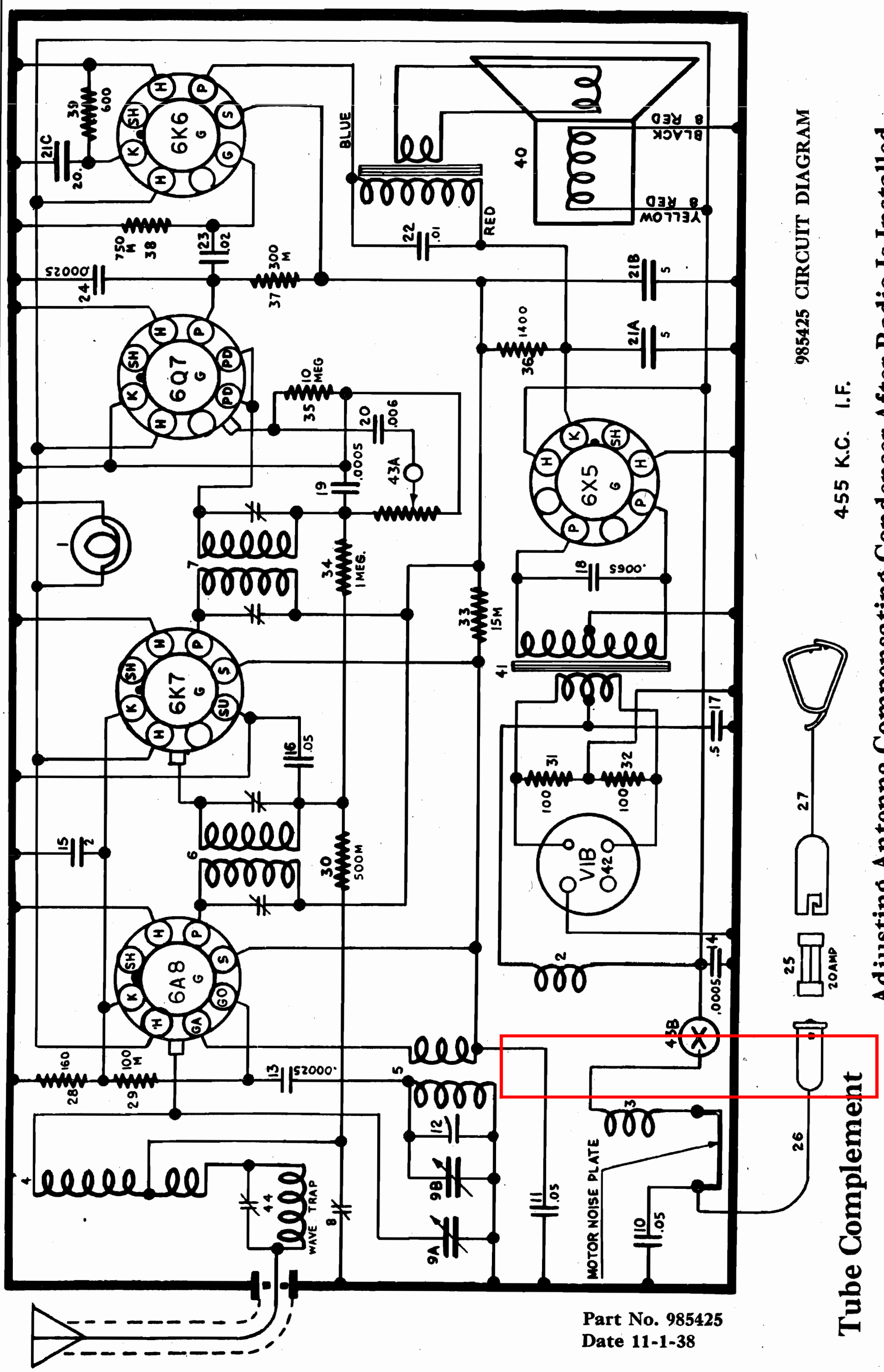
6. Setting the Push-Buttons

The order in which the stations are set-up on the push-buttons will in no way affect the operation of the tuning unit. To set the push-buttons no tools are required, but an understanding of the operation of the push-button switch is essential. There are two definite pressures and movements required to actuate the switch. First, a slight touch and a movement of less than one-eighth of an inch is all that is required to tune the receiver with a push-button after the button has been adjusted. Second, a heavier pressure and a movement of about one-quarter of an inch is required when the push-button is to be set to the station selected. To adjust the button, push the button all the way down (a slight snap will be felt when going past first stop position), and hold it in that position while you tune-in as accurately as possible with the manual tuning knob, the station selected. Release button, the station is set. Follow the same procedure in setting the remaining buttons.

Note: The accuracy of the push-buttons depends upon how accurate you tune-in the station while setting them.

MODEL 985425
Schematic

CHEVROLET DIV.—GEN. MOTORS



Part No. 985425
Date 11-1-38

Adjusting Antenna Compensating Condenser After Radio Is Installed

(a) After installation, tune-in a weak station between 55 and 65 on the dial that is just audible with the volume control on full.

(b) Adjust the antenna compensating condenser for maximum volume in the speaker.

ANTENNA SYSTEM: There are three antenna systems available for use with this receiver: The under-car; the turret top, or the telescopic cowl antenna. Any one of these antennas will operate very efficiently with this receiver.

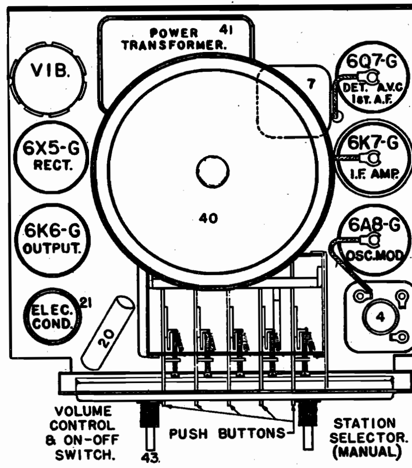
Tube Complement

Type	Function
6A8G	Oscillator-Modulator
6K7	I. F. Amplifier
6Q7G	2nd Det. A. V. C. —1st A. F. Amplifier
6K6G	Power Output
6X5G	Rectifier

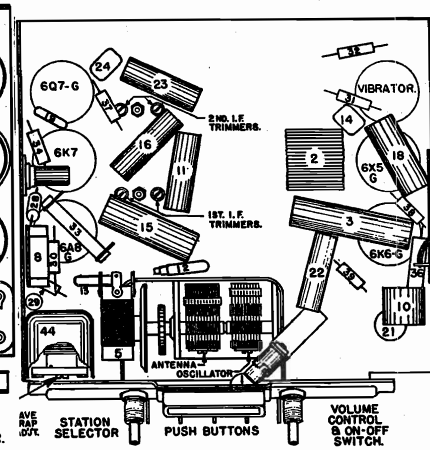
A highly efficient superheterodyne circuit is used. Bias for the 6A8G and 6K7 tubes is obtained across the 160 ohm resistor, item No. 28. Bias for the 6K6G tube is obtained across a 600 ohm resistor, item No. 39.

MODEL 985425
Socket, Trimmers
Voltage, Chassis
Alignment, Tuner

CHEVROLET DIV.—GEN. MOTORS



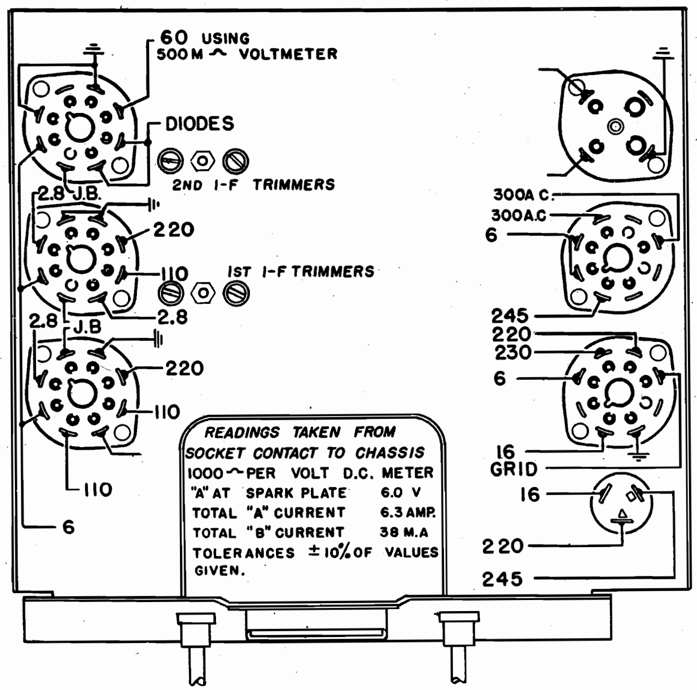
Top



Bottom

Setting the Push-Buttons

The push-button can be quickly and accurately set from the front of the receiver. Remove the push-button to be set (clasp between forefinger and thumb and pull straight out) and loosen the set screws that are concealed by the buttons. Determine the five broadcasting stations that are to be set up. By means of a manual tuning knob, tune in as accurately as possible, the station desired. Push the button on which that station is to be set up on and hold in that position, then securely tighten the set screw. Replace the button on that key and adjust the remaining buttons in the same manner.



985425 TUBE SOCKET LAYOUT and VOLTAGES

Circuit Alignment

1. Aligning the I. F. Stage at 455 Kilocycles

(a) Connect the output meter to the plate and screen of the 6K6G output tube. Be sure the meter is protected from D. C. by connecting a .1 mfd. condenser (not electrolytic) in series with one of the leads.

(b) Connect the output of the signal generator through a .02 mfd. condenser to the grid of the 6K7 I. F. tube leaving the tubes grid clip in place. Connect the ground lead from the signal generator to the receiver chassis frame.

Note: Keep the generator leads as far as possible from the grid leads of the other screen grid tubes.

(c) Adjust the station selector so that the rotor plates of the tuning condenser are completely disengaged and turn the volume control to the maximum position.

(d) Adjust the signal generator to 455 kilocycles.

(e) Adjust both 2nd I. F. trimmer condensers for maximum output.

(f) Transfer generator lead to the grid of the 6A8G tube leaving the tube's grid clip in place.

(g) Adjust both trimmers located on the 1st I. F. transformer for maximum output.

(h) Repeat operations (e) and (g) for more accurate adjustments.
Note: In order to prevent A. V. C. action always use the lowest signal generator output that will give a reasonable output meter reading.

2. Aligning the R. F. Amplifier

To obtain the greatest gain from the antenna system, the capacity of the dummy antenna should be accurate to the capacity of the antenna with which the receiver is to be used. The capacities of auto radio antennas range from 65 mmf. to 250 mmf., depending upon the size and type. If the receiver is adjusted for maximum efficiency when used with an antenna having a high capacity, it will not operate at its maximum efficiency on an antenna having a much lower capacity or vice versa.

(a) If the receiver is to be used with a turret-top antenna or a telescopic cowl antenna, the output lead from the signal generator should be connected through a .00005 mfd. condenser, and shielded lead, to the antenna connection of the receiver. If a large antenna such as the running board type is used, a .00016 mfd. condenser should be used and a long shielded lead in place of the .00005 mfd. condenser and short shielded lead.

(b) Adjust the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the oscillator section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the antenna section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output.

Note: Do not readjust the oscillator trimmer.

(g) Repeat operation (e) for more accurate adjustment.

Adjusting Antenna Compensating Condenser

(a) Set the signal generator to 600 kilocycles.

(b) Tune-in the 600 kilocycle signal with the station selector for maximum output.

(c) Adjust the antenna compensating condenser for maximum output.

(d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.

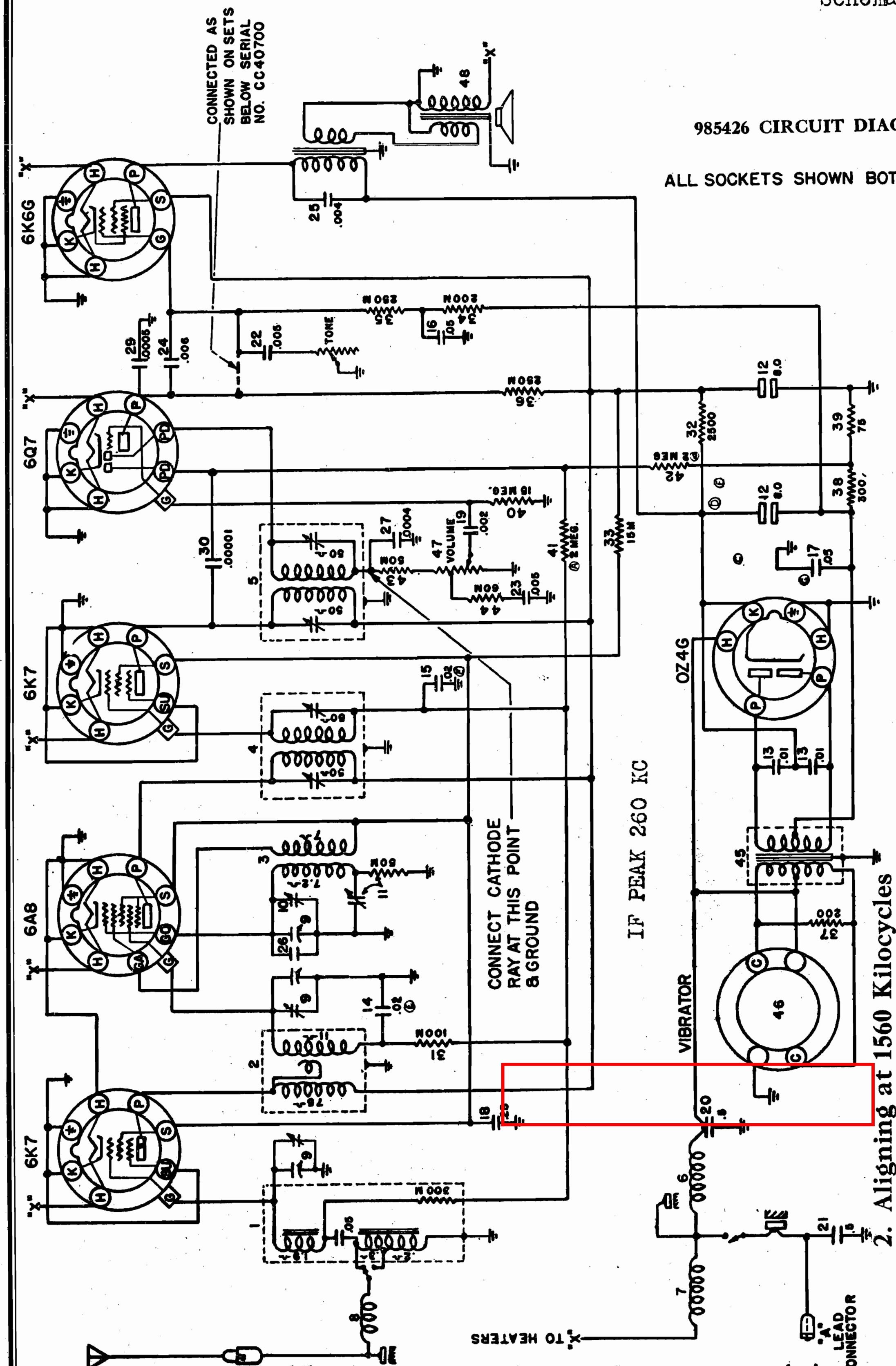
(e) Set the signal generator to 1400 kilocycles.

(f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the antenna section of the tuning condenser for maximum output.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985426
Schematic, Alignment



Part No. 985426
Date 11-1-38

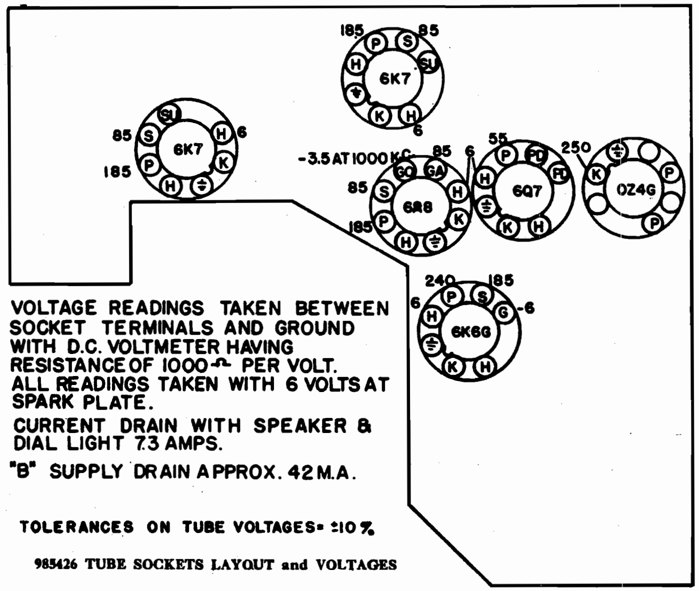
Circuit Alignment When adjustments are being made, the chassis must be in its case to provide proper shielding, and the volume control should be turned full on to the maximum position. The signal generator output should be adjusted to give a reasonable scale deflection on the output meter.

2. Aligning at 1560 Kilocycles

(a) Remove the signal lead of the signal generator from the grid of the 6A8 tube and connect to the antenna terminal of the receiver through a .000186 mica condenser connected in place of the .1 mfd. condenser previously used. (It is very important that a .000186 mica condenser be used when aligning the antenna stage of these receivers, and that the antenna coil tap is in the running board position "HC" in order that this circuit can be made to track properly.) Adjust the oscillator parallel trimmer (e) for maximum output.

MODEL 985426
Voltage, Socket
Trimmers, Alignment
Chassis

CHEVROLET DIV.—GEN. MOTORS



985426 TUBE SOCKETS LAYOUT and VOLTAGES

FOR CONVENTIONAL ALIGNMENT PROCEDURE, SEE SPECIAL SECTION VOL. VIII.

ALIGNMENT:

1. IF 260kc. Connect output meter through .25 mfd. condenser to screen grid prongs of 6K6G tube. Signal generator through .1 mfd condenser to grid cap of 6A8 tube. Generator ground lead to chassis. Variable out of mesh. Adjust trimmers A,B,C,D for maximum output. Check IF band spread with oscillograph.

2. At 1560 kc, see "ALIGNING AT 1560 KILOCYCLES" with schematic.

3. With connections as in 2. Generator and variable tuned to 1400 kc Adjust parallel trimmers on top and bottom sections of variable for maximum output.

4. At 600 kc. Tune variable to 600 kc Adjust oscillator padder (f) to maximum output while rocking variable.

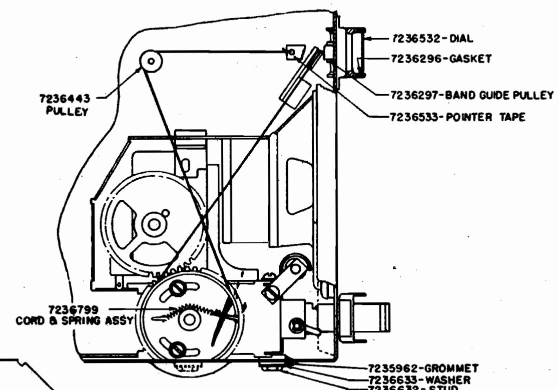
5. Adjustment of the Receiver to the Car Antenna

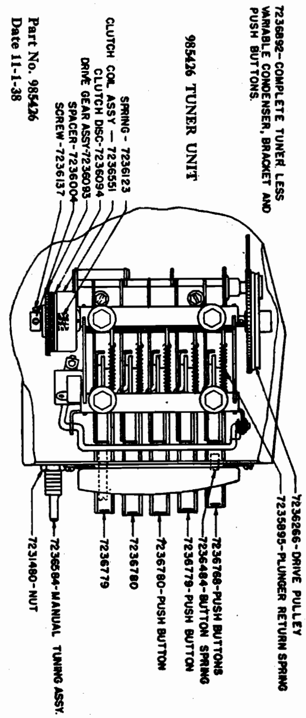
When the receiver leaves the factory the antenna circuit is properly aligned to match the under running board type of antenna. Therefore when the receiver is installed in a car and connected to the standard Chevrolet running board antenna, only a slight adjustment of the antenna circuit is required. If the receiver is connected to a turret top antenna or a telescopic cowl antenna, proceed as follows to properly adjust the receiver:

(a) Tune in a weak station about 1400 kilocycles, which is barely audible, with the volume control full on.

(b) If the turret-top antenna or the telescopic cowl antenna is used, remove the bottom tube cover and change the position of the antenna plug from the hole marked "HC" to the hole marked "LC," and replace the cover.

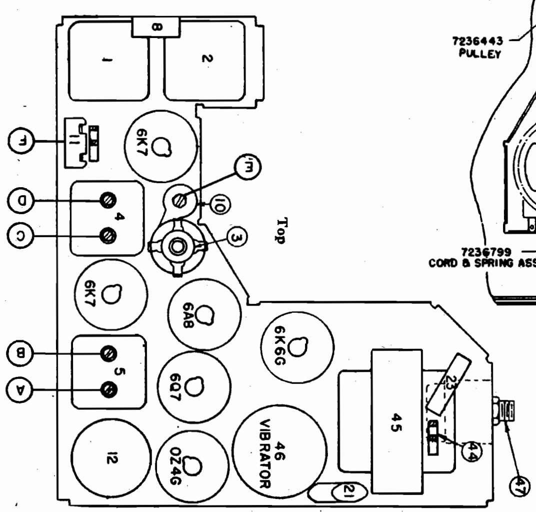
(c) Adjust the antenna trimmer condenser for maximum volume.





985426 TUNER UNIT

Part No. 985426
Date 11-1-38



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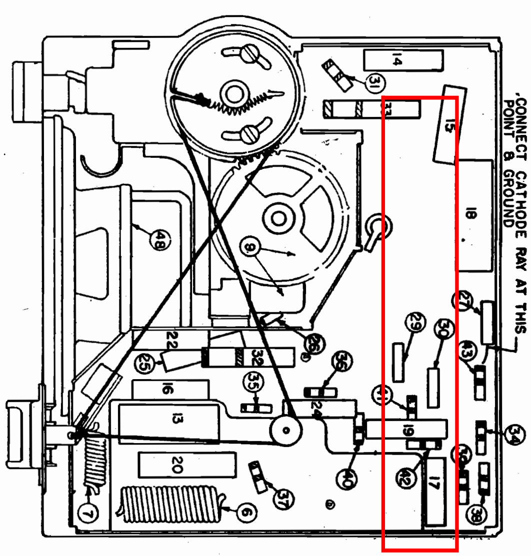


Bottom

MODEL 985400
Socket, Trimmers
Alignment, Chassis

CHEVROLET DIV.—GEN. MOTORS

Part No. 985400
Date 1-1-36

Peaking I-F Stages at 262 K.C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect the output of the test oscillator through an .02 mfd. condenser to the grid cap of the 6A7 tube (1st detector-oscillator) leaving the tube's grid clip in place. Keep the leads of the test oscillator as far as possible from the grid wires of the other screen grid tubes.

(b) Set the test oscillator to 262 kilocycles.

(c) Adjust the station selector so that the plates of the tuning condenser are completely in mesh.

(d) Turn the volume control on full and turn the tone control to the treble position.

(e) Adjust both trimmer condensers located on top of the second I. F. coil. Illustration No. 10—Fig. 1, for maximum output.

(f) Adjust both trimmer condensers located on top of the first I. F. coil. Illustration No. 9—Fig. 1, for maximum output.

(g) Repeat operations (c) and (f) for more accurate adjustments.

Always use the lowest signal generator output that will give a reasonable output meter reading.

Peaking R. F. Stages

(a) Remove the .02 mfd. condenser from the output lead of the test oscillator and connect a .00025 mfd. condenser in its place. Then, connect this lead to the antenna connection of the receiver.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "Osc" section of the tuning condenser for maximum output. (Fig. 1.)

(e) Adjust the trimmer on the "R-F" section of the tuning condenser for maximum output. (Fig. 1.)

(f) Adjust the trimmer on the "ant" section of the tuning condenser for maximum output. (Fig. 1.)

(g) Readjust the station selector for maximum output. Do not readjust the "Osc" trimmer.

(h) Repeat operations (e) and (f) for more accurate adjustments.

Adjusting Antenna Compensating Condenser

(a) Set the signal generator to 600 kilocycles.

(b) Tune in the 600 kilocycle signal with the station selector, for maximum output.

(c) Adjust the antenna compensating condenser, Illustration No. 11, for maximum output.

(d) Repeat operations (b) and (c) alternately until no further improvement in output can be obtained.

(e) Set the signal generator to 1400 kilocycles again.

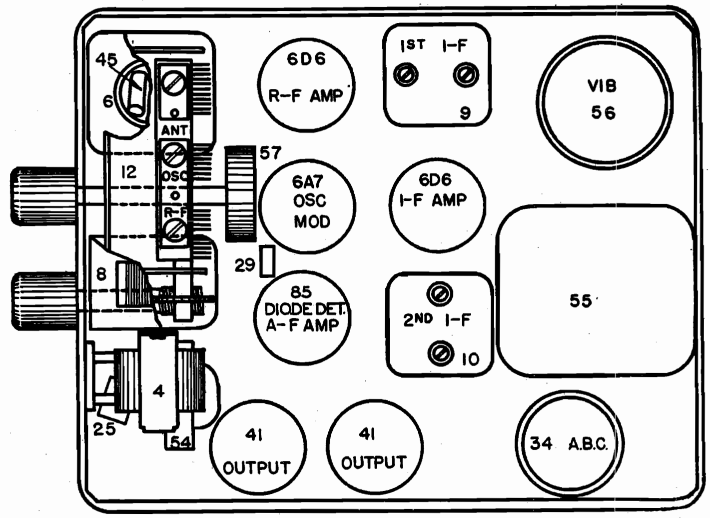
(f) Tune in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the "ant" section of the tuning condenser, for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune in a weak station between 55 and 65 on the dial.

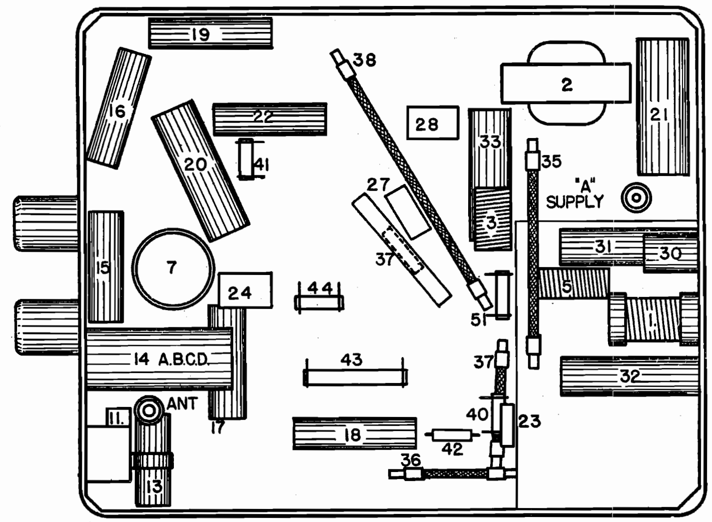
(b) Adjust the antenna compensating condenser for maximum volume in the speaker.



PARTS LAYOUT—Top View (Fig. 1)

Chevrolet Model 985400

FOR OTHER DATA, SEE VOL. VIII

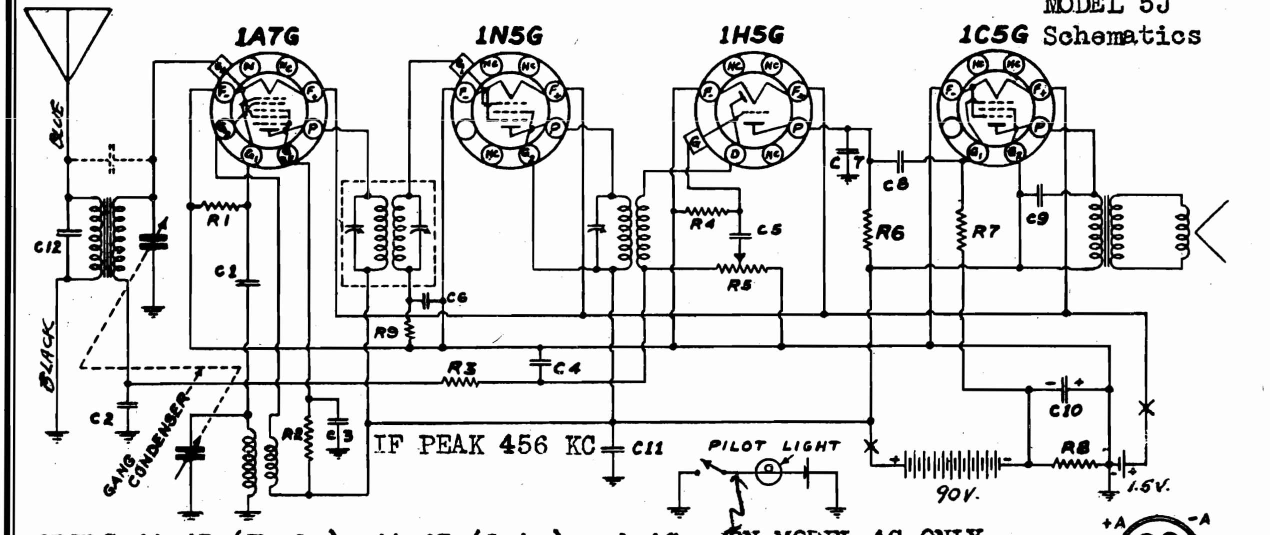


PARTS LAYOUT—Bottom View (Fig. 2)

CONTINENTAL RADIO & TELEV. CO.

MODELS 4A,4B,Early, Late,4C
MODEL 5J
Schematics

RANGE 535 - 1730 KILOCYCLES



MODELS 4A,4B (Early), 4A,4B (Late) and 4C. ON MODEL 4C ONLY

PRONGS TOWARD OBSERVER +A -A +B -B

CAPACITORS

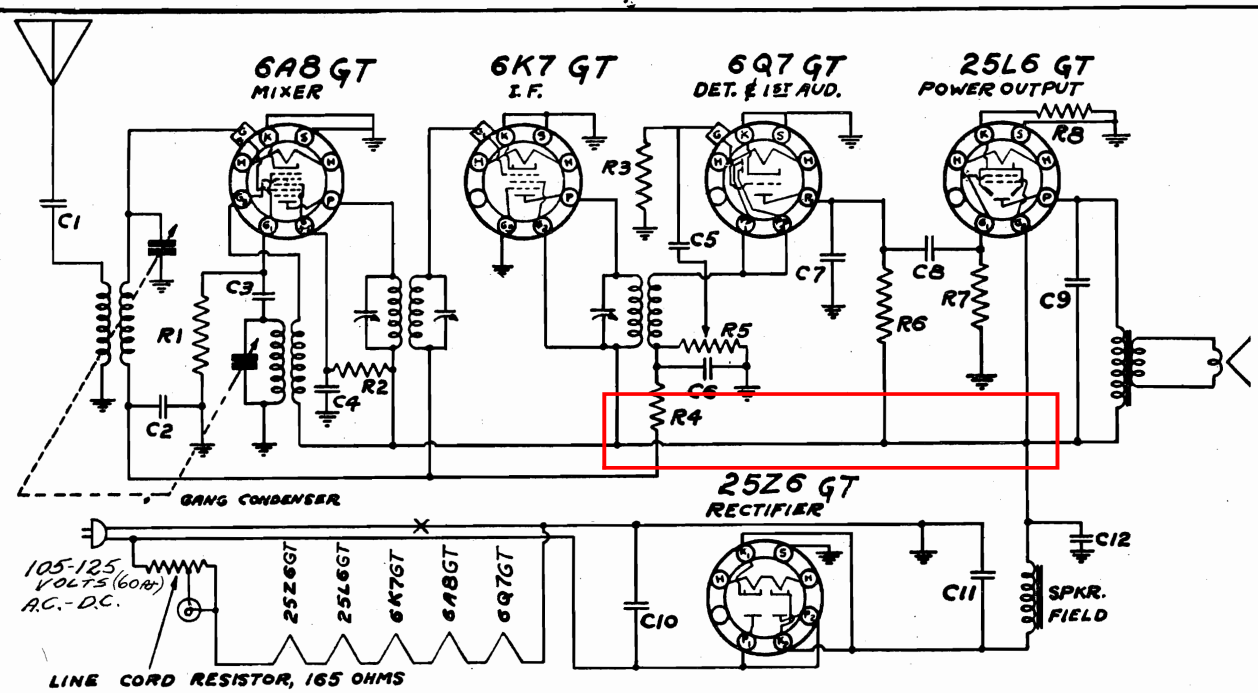
No	CAP.-MFDS.	TYPE	No	CAP.-MFDS	TYPE
C1	.00025	MICA	C7	.00025	MICA
C2	.05	200V.	C8	.01	400V.
C3	.1	200V.	C9	.005	400V.
C4	.00025	MICA	C10	20. (ELECT.)	25V.
C5	.01	400V.	C11	.1	200V.
C6	.002	400V.	C12	.00005	MICA

RESISTORS

No	OHMS	WATTS	No	OHMS	WATTS
R1	200,000	1/4	R6	250,000	1/4
R2	70,000	1/4	R7	500,000	1/4
R3	1 MEG.	1/4	R8	600	1/4
R4	2 MEG.	1/4	R9	2 MEG.	1/4
R5	500,000	VOL. CONTROL			

FOR ALIGNMENT AND LAYOUT SEE INDEX

CHANGES:- LATE MODELS 4A AND 4B DIFFER FROM THE ABOVE DIAGRAM AS FOLLOWS; 1Q5G REPLACES 1C5G OUTPUT TUBE; CONDENSER C1 IS .00005 MICA, INSTEAD OF .00025 MICA AND RESISTOR R8 IS 440 OHMS 1/4 WATT INSTEAD OF THE 600 OHM 1/4 WATT IN EARLY MODELS.



RANGE 535 - 1730 KILOCYCLES

RESISTORS

No.	OHMS	WATTS	
R1	60,000	1/2	
R2	40,000	1/2	
R3	5 MEG	1/2	
R4	2 MEG	1/2	
R5	500,000		VOL. CONT.
R6	250,000	1/2	
R7	500,000	1/2	
R8	150	1/2	±10%

CONDENSERS

No	MFD.	TYPE	No	MFD.	TYPE
C1	.00025	600V.	C10	.05	400V.
C2	.02	400V.	C11	25. ELECT.	150V.
C3	.00005	MICA	C12	10. ELECT.	150V.
C4	.01	400V.			
C5	.01	400V.			
C6	.0002	MICA			
C7	.00025	MICA			
C8	.01	300V.			
C9	.005	600V.			

I.F. 456 K.C.

FOR ALIGNMENT AND LAYOUT SEE INDEX

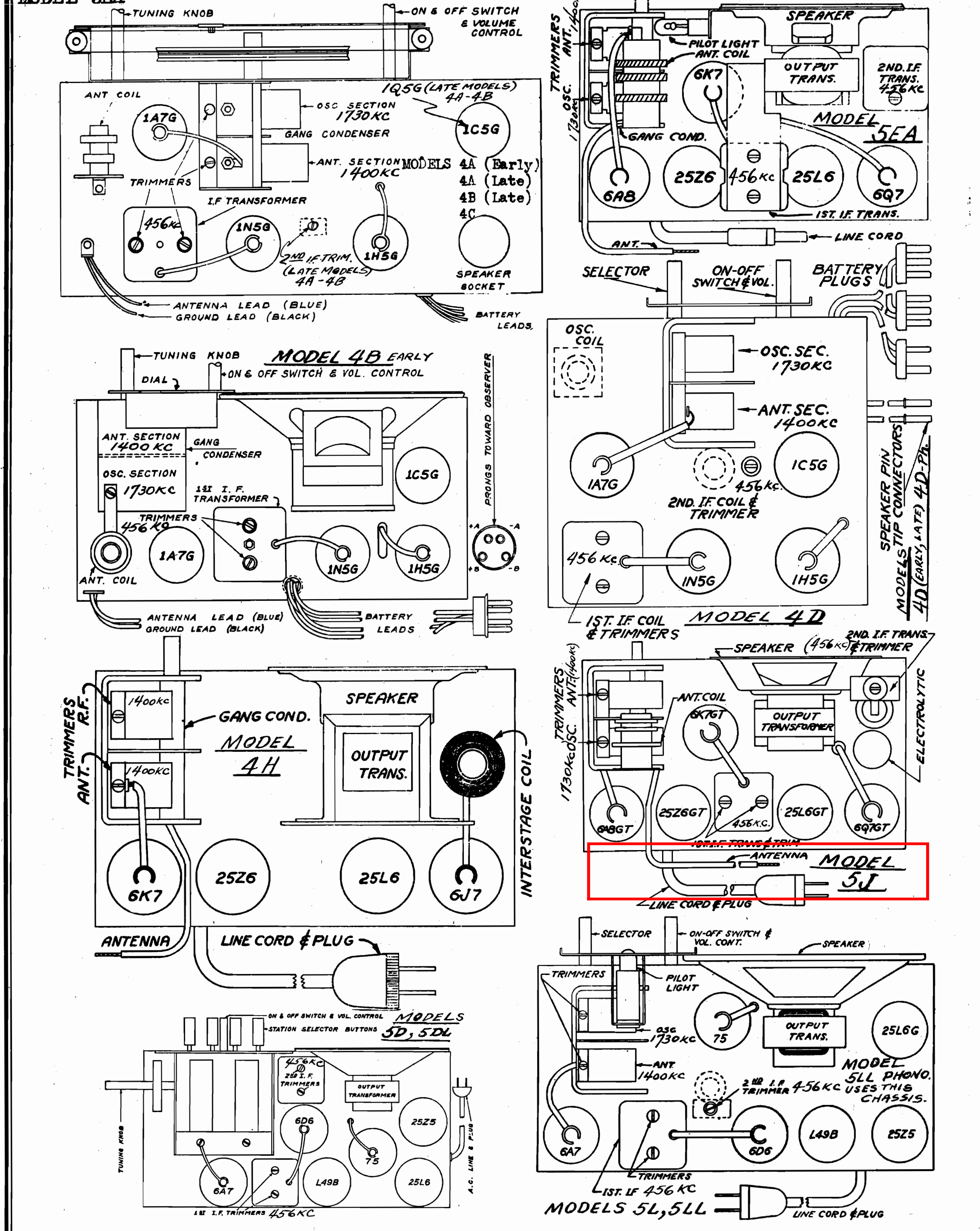
MODEL 5J

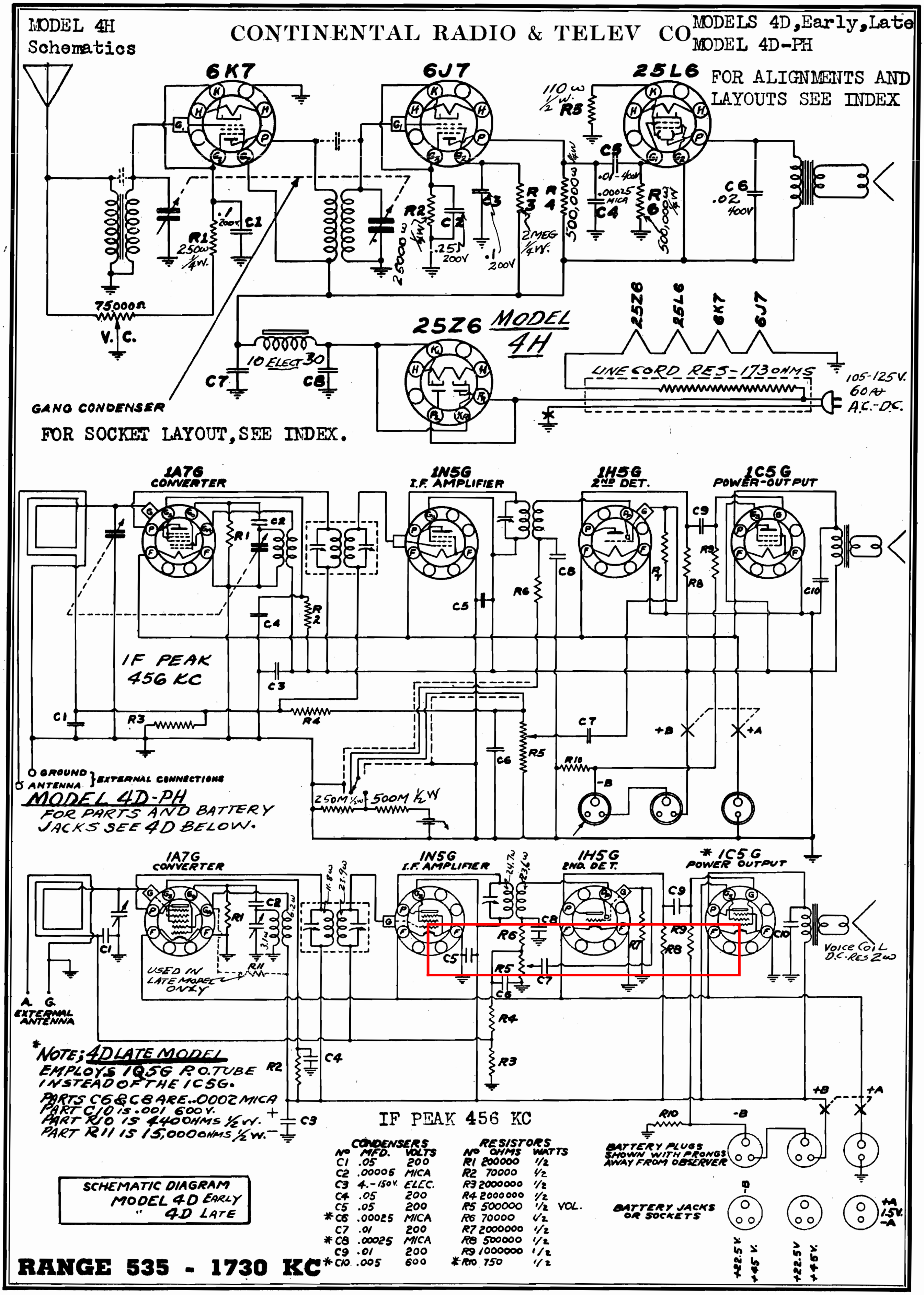
A.C.-D.C.

MODELS 4A,4B Early, Late
MODEL 4C
MODEL 4D,Early,Late,4D-PH
MODEL 4H
MODELS 5D,5DL
MODEL 5EA

CONTINENTAL RADIO & TELEV. CO.

MODEL 5J
MODELS 5L,5LL
Alignment,Socket
Trimmers





CONDENSERS

Nº	MFD.	VOLTS
C1	.05	200
C2	.00006	MICA
C3	4.-150V.	ELEC.
C4	.05	200
C5	.05	200
*C6	.00025	MICA
C7	.01	200
*C8	.00025	MICA
C9	.01	200
*C10	.005	600

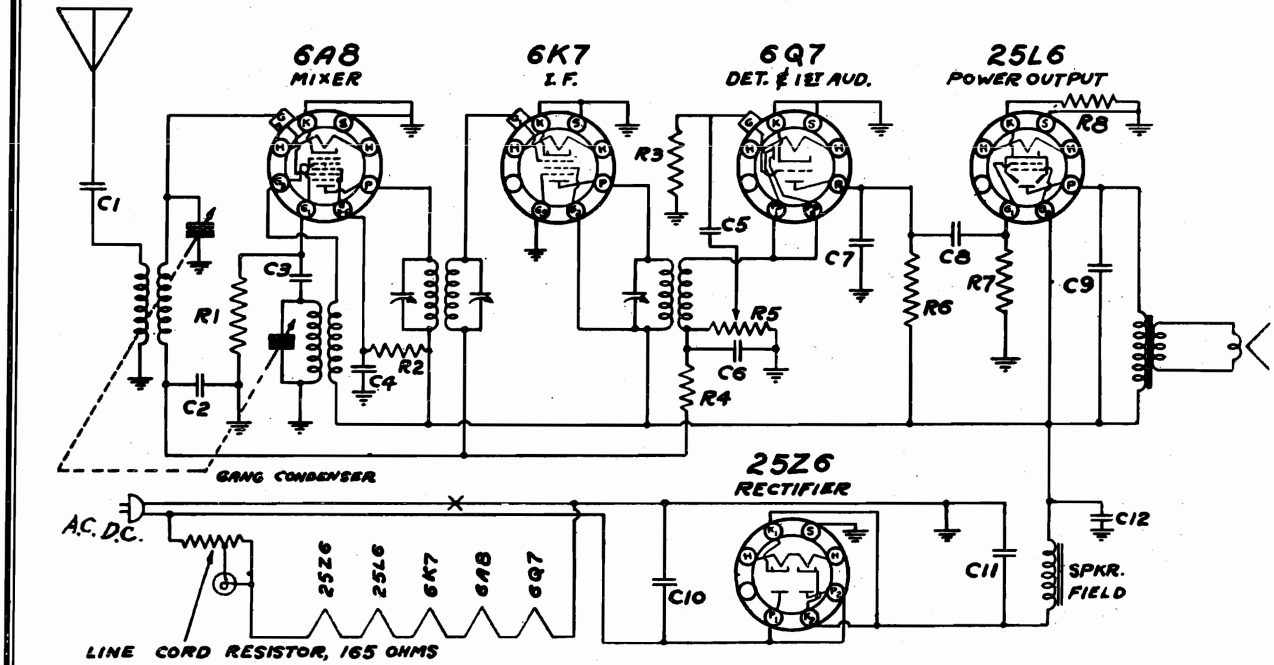
RESISTORS

Nº	OHMS	WATTS	
R1	200000	1/2	
R2	70000	1/2	
R3	2000000	1/2	
R4	2000000	1/2	
R5	500000	1/2	VOL.
R6	70000	1/2	
R7	2000000	1/2	
R8	500000	1/2	
R9	1000000	1/2	
*R10	750	1/2	

MODELS 5D, 5DL
MODEL 5EA.

CONTINENTAL RADIO & TELEV. CO.

Schematics



RESISTORS

No.	OHMS	WATTS
R1	50,000	1/4
R2	40,000	1/4
R3	15 MEG	1/4
R4	2 MEG	1/4
R5	500,000	VOL. CONT.
R6	250,000	1/4
R7	500,000	1/4
R8	110	1/4 ±10%

CONDENSERS

No.	MFD.	TYPE
C1	.005	600V.
C2	.02	400V.
C3	.00025	MICA
C4	.01	400V.
C5	.01	400V.
C6	.00025	MICA
C7	.00025	MICA
C8	.01	400V.
C9	.005	600V.
C10	.05	400V.
C11	25. ELECT.	150V.
C12	10. ELECT.	150V.

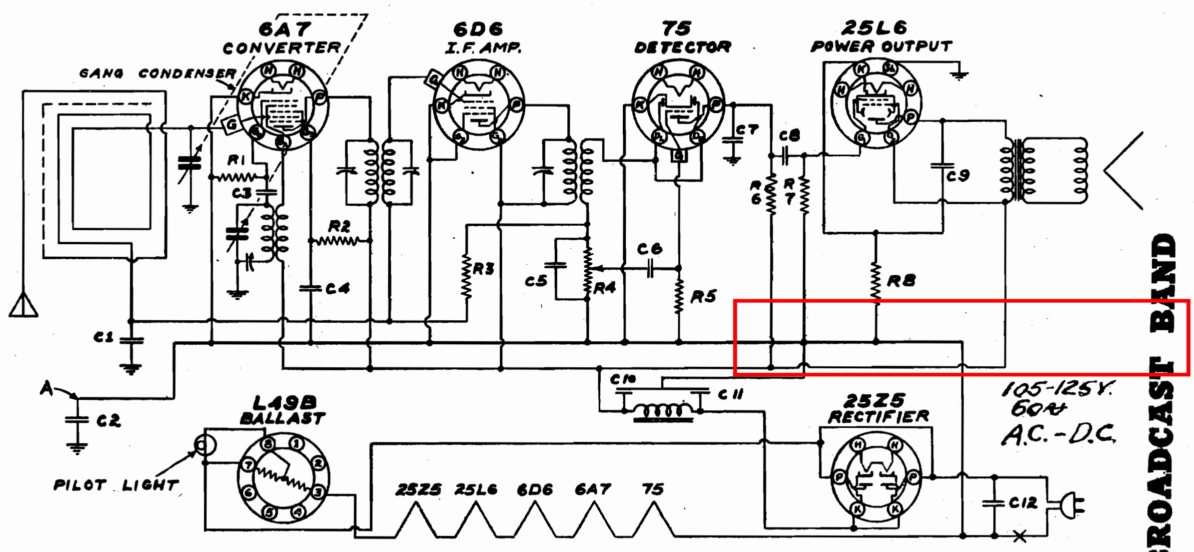
IF PEAK 456 KC

MODEL 5EA

FOR ALIGNMENT AND LAYOUTS SEE INDEX

A.C.-D.C.

RANGE 535 - 1730 KILOCYCLES



BROADCAST BAND

A.C.-D.C.

RESISTORS

No.	OHMS	WATTS
R1	50,000	1/2
R2	30,000	1/2
R3	2,000,000	1/2
R4	500,000	VOL. CONT.
R5	5,000,000	1/2
R6	250,000	1/2
R7	500,000	1/2
R8	150 ± 10%	1/2

CONDENSERS

No.	MFDS.	VOLTS
C1	.02	400
C2	.25	200
C3	.00005	MICA
C4	.05	400
C5	.00025	MICA
C6	.01	400
C7	.00025	MICA
C8	.01	400
C9	.005	600
C10	20.	150
C11	20.	150
C12	0.05	400

NOTE:- C2 USED ON MODEL 5DL ONLY. ON MODEL 5D POINT "A" IS CONNECTED TO CHASSIS

IF PEAK 456 KC

⏚ INDICATES CHASSIS GROUND

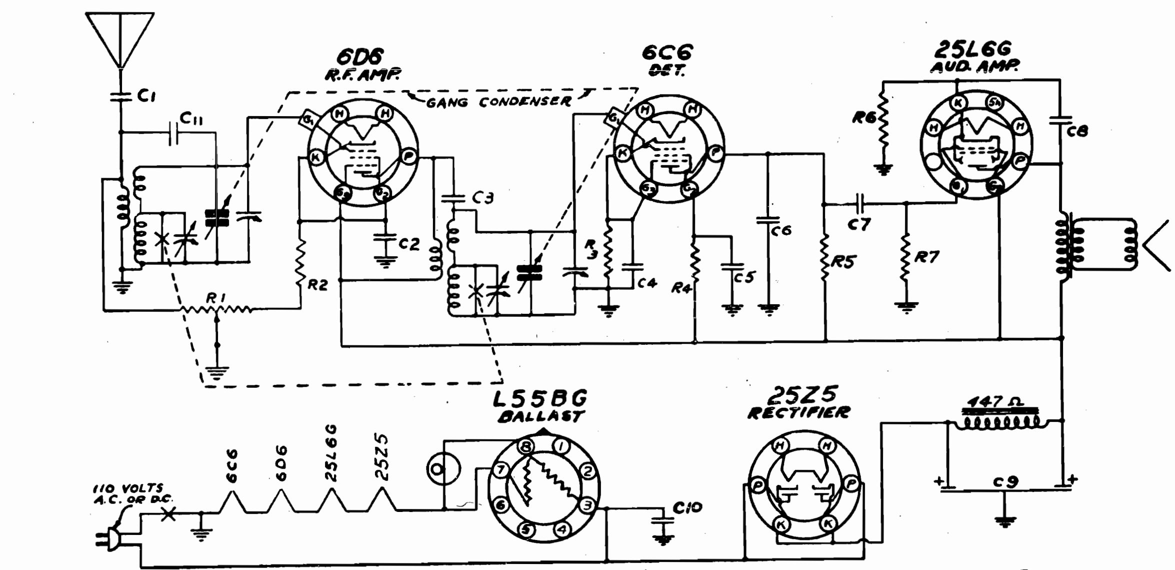
FOR SOCKET LAYOUT SEE INDEX

SCHEMATIC DIAGRAM
MODEL 5DL
MODEL 5D

RANGE 545 - 1630 KILOCYCLES

CONTINENTAL RADIO & TELEV. CO.

MODEL 5B
MODEL 5CU
Schematics



CONDENSERS

No	CAPACITY	TYPE
C1	.002 MFD.	400 V.
C2	.1 "	200 V.
C3	5. μμf.	GIMMIK
C4	.25 Mfd.	200 V.
C5	.1 "	200 V.
C6	.0002 "	600 V.
C7	.01 "	400 V.
C8	.02 "	400 V.
C9	16.0-16.0"	150V. ELECT.

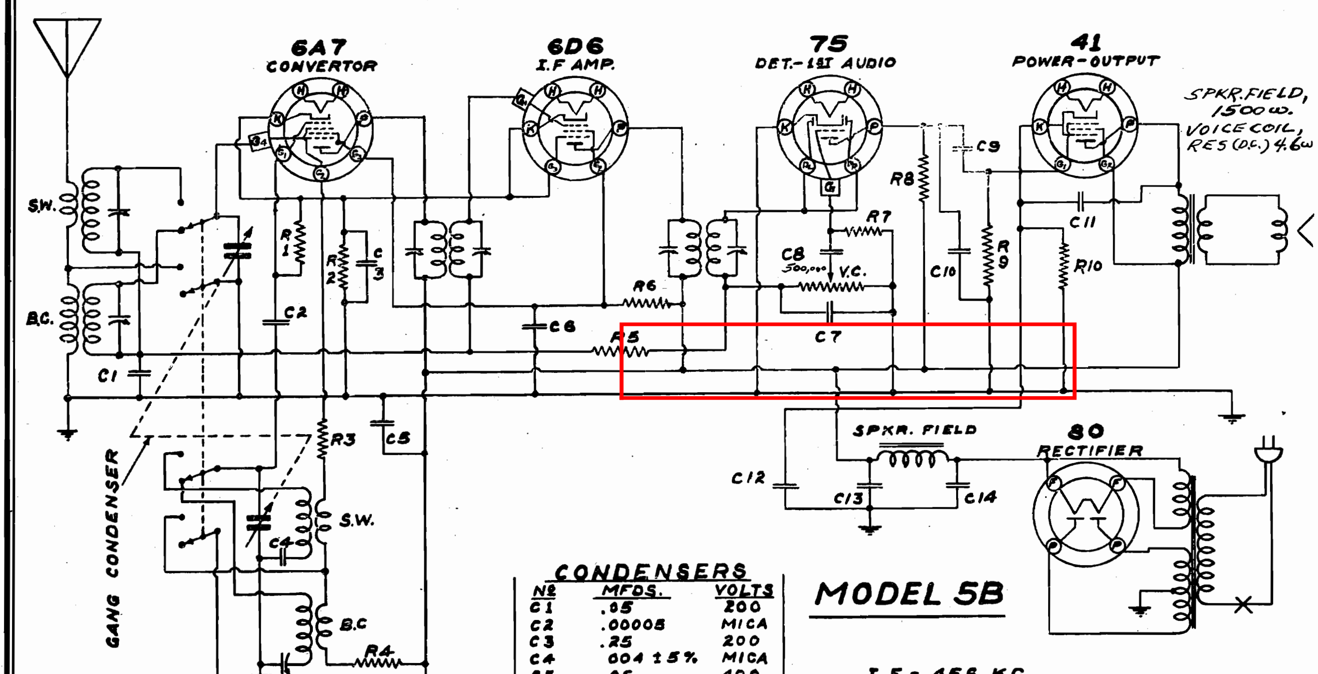
RESISTORS

No	OHMS R.	WATTS	
R1	75,000	1/4	VOL. CONT.
R2	250	1/4	
R3	25,000	1/4	
R4	2,000,000	1/4	
R5	500,000	1/4	
R6	110	1/2	WIRE WOUND
R7	500,000	1/4	

C10 .1 Mfd. 400V.
C11 2.5 μμf. Gimmik

RANGES:-
535-1730 KC
350-135 KC

SCHEMATIC DIAGRAM
MODEL 5CU



CONDENSERS

No	MFDS.	VOLTS
C1	.05	200
C2	.00005	MICA
C3	.25	200
C4	.004 ±5%	MICA
C5	.05	400
C6	.1	400
C7	.00025	MICA
C8	.01	400
C9	.01	400
C10	.0005	MICA
C11	.005	600
C12	20.	25
C13	10 } ELECT	350
C14	10	350

MODEL 5B

RESISTORS

No	OHMS	WATTS	No	OHMS	WATTS
R1	50,000	1/2	R6	30,000 ±10%	1/2
R2	170 ±10%	1/2	R7	5 MEG.	1/2
R3	30	1/2	R8	250,000	1/2
R4	1000	1/2	R9	500,000	1/2
R5	1 MEG.	1/2	R10	750 ±10%	1/2

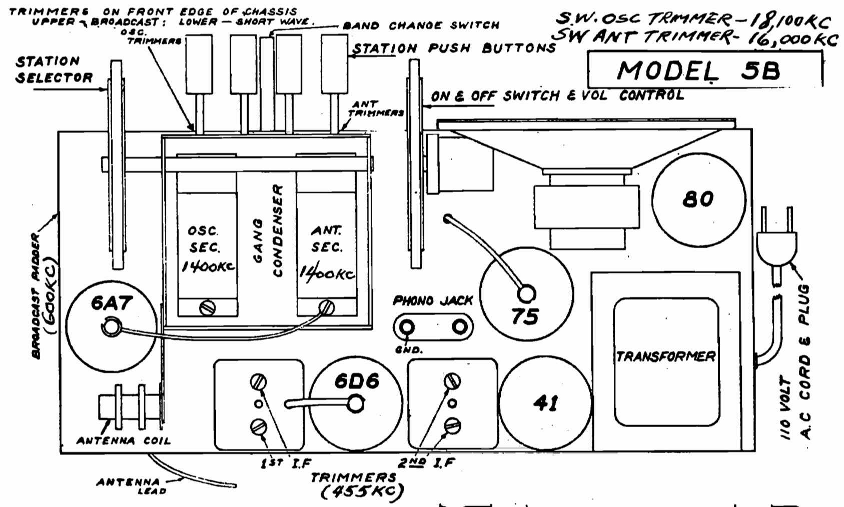
I.F - 456 K.C.
SWITCHES IN BROADCAST POSITION
V.C. - VOLUME CONTROL

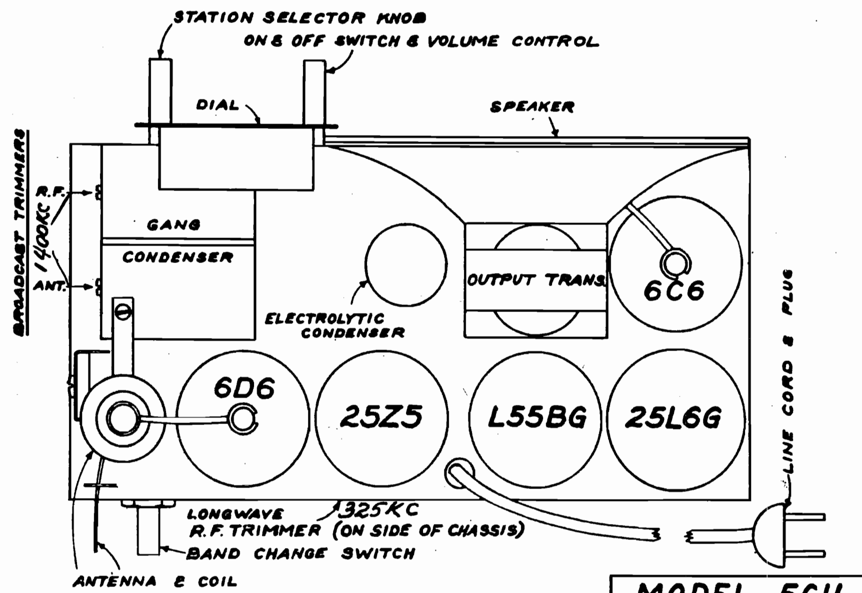
535-1730 KILOCYCLES
16.57-52.63 METERS

MODEL 5CU
Socket, Trimmers
Alignment

CONTINENTAL RADIO & TELEV. CO.

MODEL 5B
Socket, Trimmers
Alignment, Tuner
Voltage Phono





PROCEDURE FOR SETTING UP PUSH BUTTONS

MODEL 5B

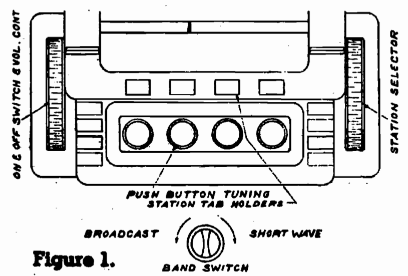


Figure 1.

There are four push buttons by means of which four stations may be selected (see Fig. 1). Make a list of four stations tuned in regularly. Loosen any of the push buttons by turning the push botton proper, counter clockwise a few turns. Holding it in, tune in any one of your favorite stations by means of the station selector. Turn the selector very slowly back and forth until the signal is clearest. Now tighten **the push button knob by turning clockwise.**

Release the push button and loosen another push button. Holding it in, tune in another favorite station using the station selector. Turn the selector wheel very slowly back and forth until the signal is clearest. Now tighten the push button by turning it clockwise.

Repeat this operation for the remaining two buttons, tightening each button securely as it is set.

If it is desired to change a station, simply loosen the push button and re-set.

Punch the correct station call letter tabs from the set of sheets supplied and insert them into the windows above the push buttons.

The dial is now set up for quick tuning.

PHONOGRAPH CONNECTIONS MODEL 5B This receiver is provided with a phono jack (see chassis layout) and connection may be made from the phonograph to this jack by means of phone tips. It is necessary that the phonograph be equipped with a volume control and a switch to break connection between the phonograph and the set as the radio will not operate properly if a permanent connection is made. When the phonograph is in use the volume control of the set will act to some extent as a tone control. Best results will be obtained with the volume control of the set near maximum and no station tuned in.

MODEL 5B VOLTAGE READINGS—LINE VOLTAGE 115

Volume control minimum, antenna shorted to ground and band switch in broadcast position. Meter 1,000 ohms per volt.

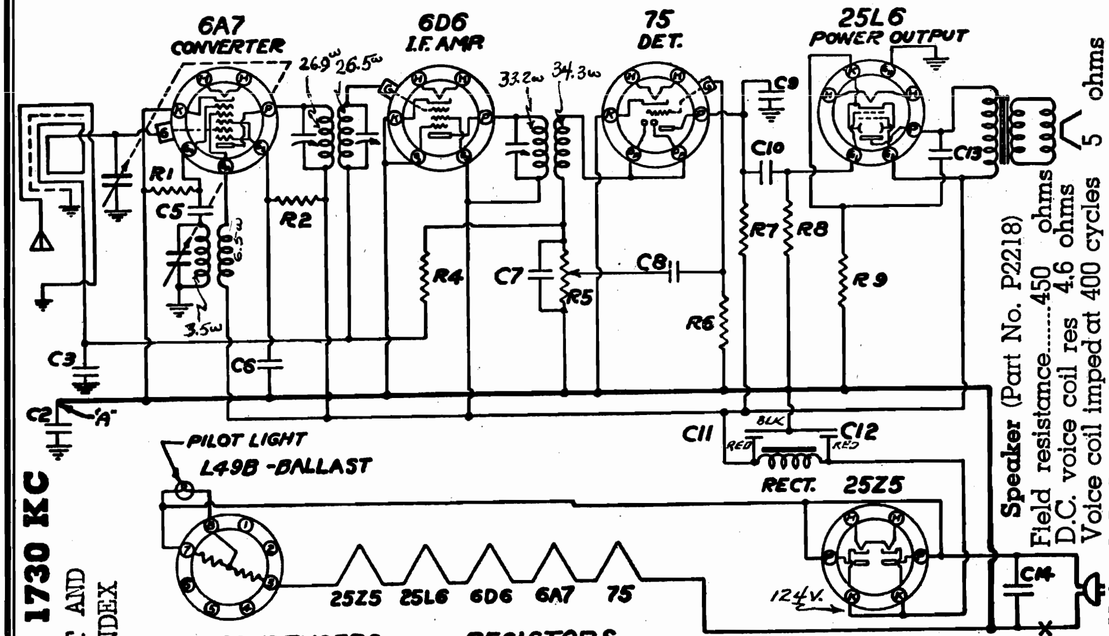
Filament of 80 tube to ground	253 Volts
Screen of 41 tube to ground	196 Volts
Screens of 6A7 and 6D6 tubes to ground	87 Volts
Cathode of 41 tube to ground	13 Volts
Cathode of 6A7 tube to ground	2.75 Volts

CONTINENTAL RADIO & TELEV. CO.

MODEL 5L, 5LL
MODEL 5LL Phono.
Schematics

RANGE 535 - 1730 KC

FOR ALIGNMENT AND LAYOUT SEE INDEX



Speaker (Part No. P2218)
Field resistance......450 ohms
D.C. voice coil res 4.6 ohms
Voice coil imped at 400 cycles 5 ohms
Line 115 Volts A.C. Power Consumption 44 Watts.

Voltages—Volume Control minimum. Antenna shorted to ground. Meter 1,000 ohms per volt.

Cathode of 25Z5 tube to Ground............124 volts
Screen of 25L6 tube to Ground............95 volts
Screen of 6A7 tube to Ground............44 volts
Cathode of 25L6 tube to Ground............5.7 volts

MODELS 5L 5LL 5LL-PHONO

CONDENSERS

No	MFD.	VOLTS
C2	.25	200
C3	.02	400
C5	.00005	MICA
C6	.05	400
C7	.00025	MICA
C8	.01	400
C9	.00025	MICA
C10	.01	400
C11	20.	150
C12	20.	
C13	.005	600
C14	.05	400

RESISTORS

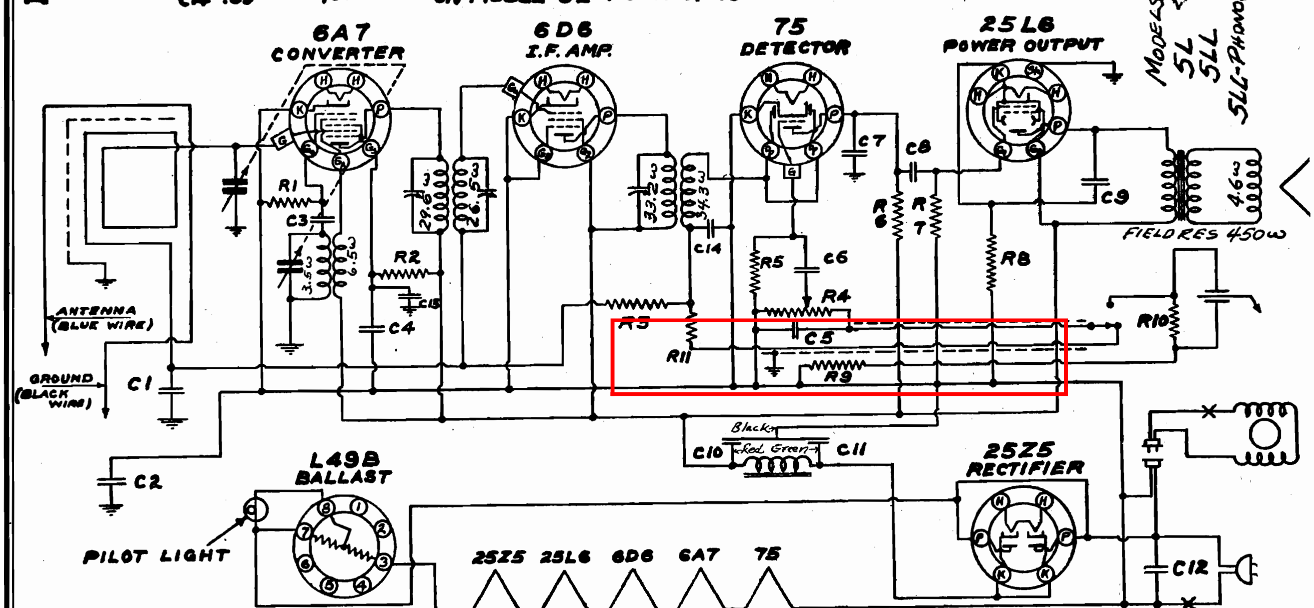
No	OHMS	WATTS
R1	50,000	½
R2	30,000	½
R4	2,000,000	½
R5	500,000	VOL CONT
R6	5,000,000	½
R7	250,000	½
R8	500,000	½
R9	150	½ ±10%

↓ IND. CHASSIS GND.

SCHEMATIC DIAGRAM
MODEL 5LL
MODEL 5L

IF PEAK 456 KC

NOTE: C2 USED ON MODEL 5LL ONLY. ON MODEL 5L POINT "A" IS CONNECTED TO CHASSIS



RESISTORS

No	OHMS	WATTS
R1	50,000	½
R2	30,000	½
R3	2,000,000	½
R4	500,000	VOL. CONT.
R5	5,000,000	½
R6	250,000	½
R7	500,000	½
R8	150 ± 10%	½
R9	500,000	½
R10	500,000	½
R11	80,000	½

CONDENSERS

No	MFDS.	VOLTS
C1	.02	400
C2	.1	200
C3	.00005	MICA
C4	.05	400
C5	.00025	MICA
C6	.01	400
C7	.00025	MICA
C8	.01	400
C9	.005	600
C10	20.	150
C11	20.	150
C12	0.05	400
C13	.05	400
C14	.0001	MICA

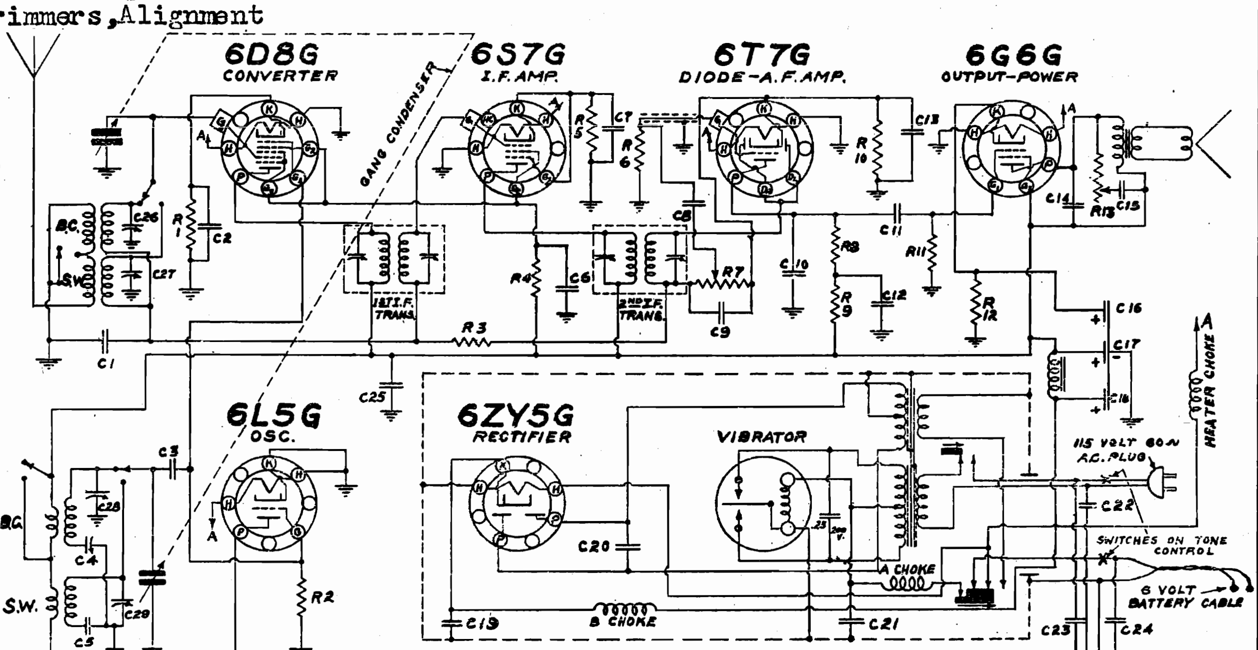
I.F. 455 K.C.
↓ INDICATES CHASSIS GROUND

SCHEMATIC DIAGRAM
MODEL 5LL
PHONO

MODEL 6A
Schematic, Socket
Trimmers, Alignment

CONTINENTAL RADIO & TELEV. CO.

Six Tube 6 Volt Battery 110-120 Volt AC Superheterodyne



IF PEAK 456 KC

CONDENSERS

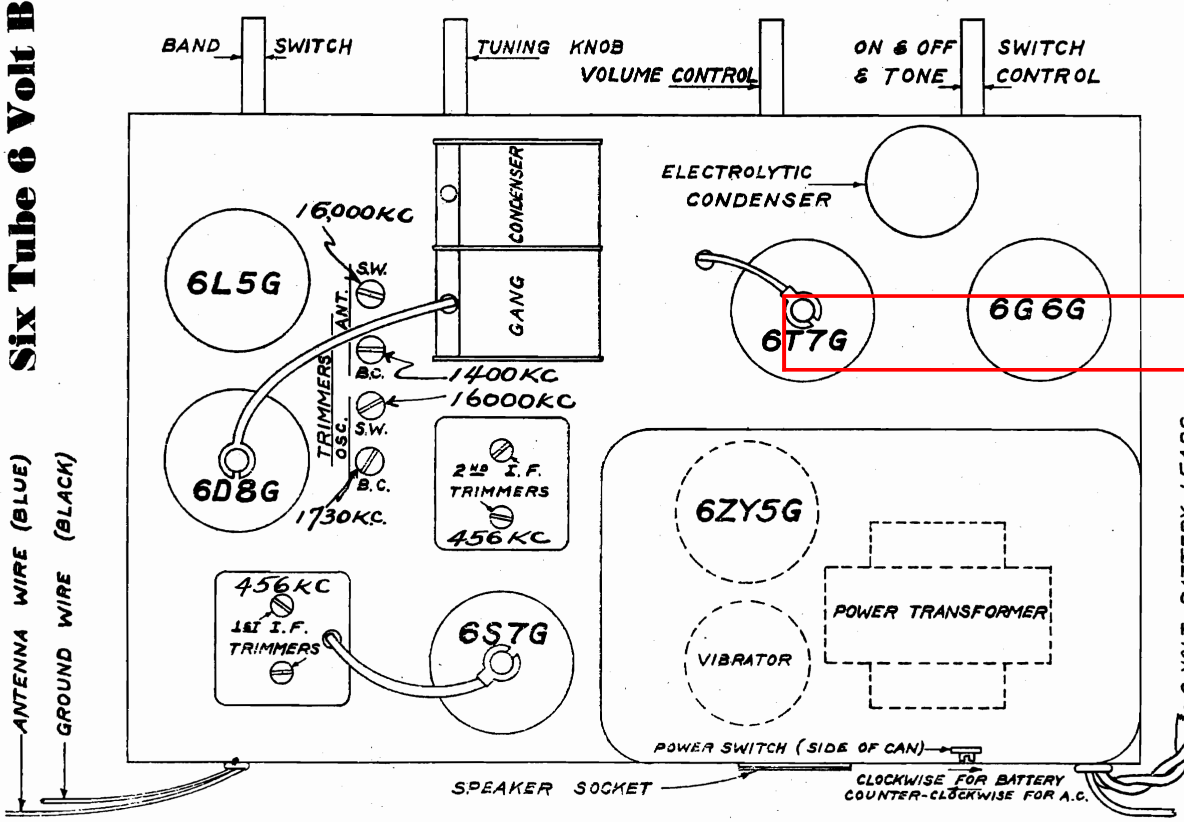
No	CAPACITY	TYPE	No	CAPACITY	TYPE
1	.05 Mfd.	200 V.	13	.5 Mfd.	200 V.
2	.05 Mfd.	200 V.	14	.005 "	600 V.
3	100 mmf.	MICA	15	.05 "	400 V.
4	300-600 mmf	"	16	5. "	25 V.
5	4000 mmf	M. ±5%	17	8. "	200 V.
6	.1 Mfd	200 V.	18	8. "	200 V.
7	.05 "	200 V.	19	.01 "	600 V.
8	.01 "	400 V.	20	.015 "	1000 V. OIL TYPE
9	250 mmf.	MICA	21	.5 "	10 V.
10	250 "	"	22	.05 "	400 V.
11	.01 Mfd.	400 V.	23	.01 "	600 V.
			24	.5 "	10 V.
12	.1 "	200 V.	25	.1 "	200 V.

RESISTORS

No	OHMS	WATTS	SPL. TOL.
1	1500	¼	± 10%
2	50,000	¼	
3	1,000,000	¼	
4	30,000	¼	
5	1,000	¼	± 10%
6	1,000,000	¼	
7	500,000	¼	(VOL. CONT)
8	500,000	¼	
9	200,000	¼	
10	10,000	¼	± 10%
11	500,000	¼	
12	450	¼	± 10%
13	100,000	¼	(TONE CONT.)

BAND SWITCH IN BROADCAST POSITION.
POWER SWITCH IN BATTERY POSITION.
I.F. – 456 K.C.
C26 TO C29 – 2 TO 20 mmf. TRIMMERS

SCHEMATIC DIAGRAM
MODEL 6A

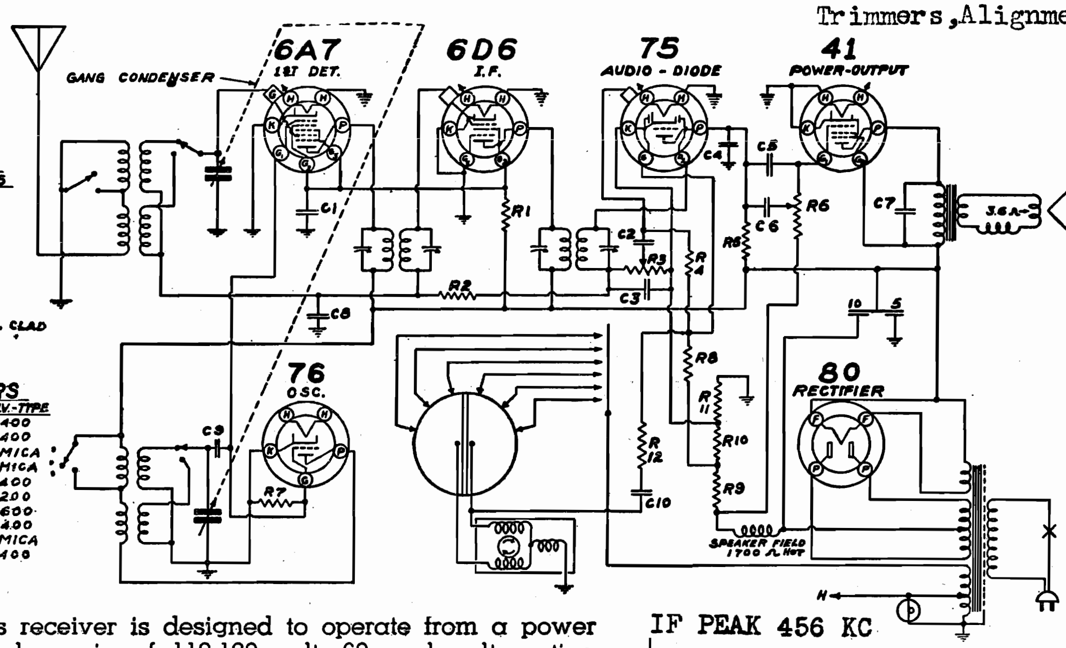


This receiver requires a good ground.

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOL. VIII

CONTINENTAL RADIO & TELEV. CO.

MODEL 6B
Schematic, Socket
Trimmers, Alignment



RESISTORS

Nº	OHMS	WATTS
1	10,000	¼
2	1 MEG.	¼
3	500,000	V.C.
4	2 MEG.	¼
5	200,000	¼
6	500,000	T.C.
7	50,000	¼
8	1 MEG.	¼
9	200	METAL CLAD
10	33	METAL CLAD
11	100	METAL CLAD
12	1 MEG.	¼

CONDENSERS

Nº	CAP.-MFD.	W.V.-TYPE
1	.05	400
2	.01	400
3	.00025	MICA
4	.00025	MICA
5	.01	400
6	.05	200
7	.005	600
8	.05	400
9	.0001	MICA
10	.002	400

This receiver is designed to operate from a power supply main of 110-120 volt, 60 cycle alternating current AC). **Never plug into a DC outlet.**

GROUND Where ever possible, a good ground should be employed. Water pipes and steam or hot water radiators make a very desirable ground connection. The ground wire should be connected to the "Black" lead.

IF PEAK 456 KC

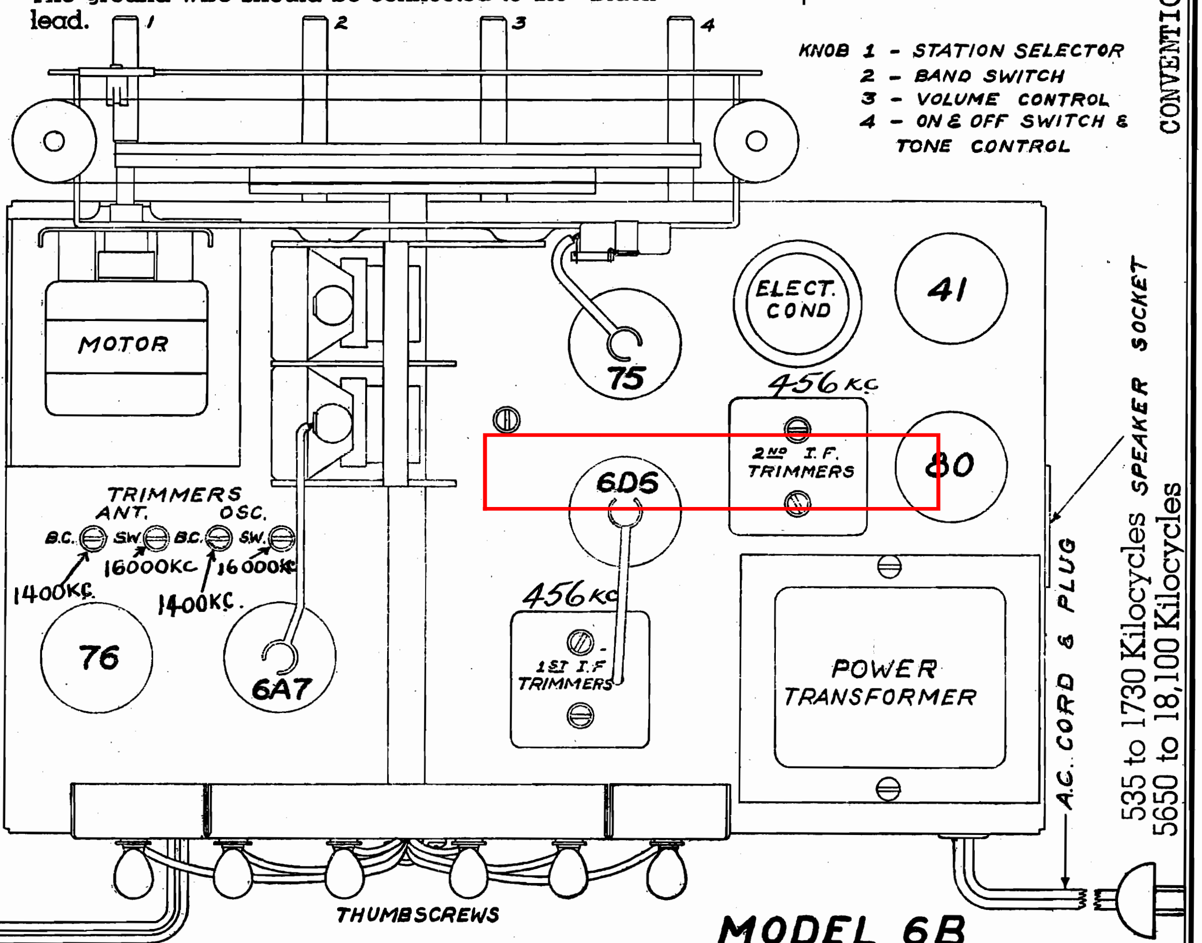
BAND SWITCH IN BROADCAST POSITION
I.F. - 456 K.C.
V.C. - VOLUME CONTROL
T.C. - TONE CONTROL

SCHEMATIC DIAGRAM MODEL 6B

KNOB 1 - STATION SELECTOR
2 - BAND SWITCH
3 - VOLUME CONTROL
4 - ON & OFF SWITCH & TONE CONTROL

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOL. VIII

ANTENNA Use a standard outside antenna of at least 50 feet including lead-in. Connect the antenna to the "Blue" lead.



535 to 1730 Kilocycles
5650 to 18,100 Kilocycles

MODEL 6B

MODEL 6B
MODEL 6C
MODEL 6G

CONTINENTAL RADIO & TELEV. CO.

Tuner Data **MODEL 6B**

ELECTRIC MOTOR The power for this tuner is provided by a small, efficient electric motor, of the brushless variety. It is fitted with an automatic clutch and a silent gear train. The bearings and the oil retainer hold sufficient oil to lubricate the motor for a lifetime.

SETTING UP SELECTOR MECHANISM List six (6) strong local stations which are free from excess fading. The station on your list that comes in nearest the left hand end of the dial should be called station No. 1 and should be set up on button No. 1. (See Figure 1.) Located on the back of the receiver is the thumb screw bracket and six (6) thumb screws whose positioning determines the points at which the pointer will stop when the buttons are being used. Figure 2 shows a detail of the thumb screws numbered for reference to the push buttons.

Located on the rotating selector plate is a fibre dead spot which locates the position at which station selector contacts should be set in order to have the selector plate stop for a certain station. Follow closely the steps listed below:

1. Using the manual selector knob, tune in station No. 1, the station near the left hand end of the dial—the 170 K.C. end. Make certain that the station is properly tuned in.

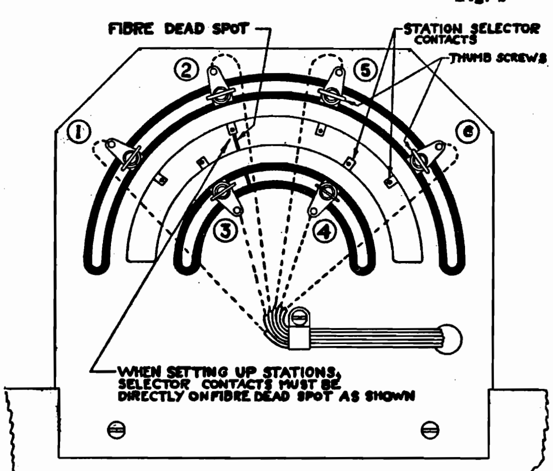
2. From the back of the receiver loosen thumb screw No. 1 (See Figure 2) just enough to allow it to slide freely in the groove.

3. Now adjust the thumb screw until the contact is resting directly on the fibre dead spot.

4. Tighten thumb screw securely, making sure that in tightening you do not move the contact off the fibre dead spot.

5. Check the above operation by pressing button No. 1 and note if there is any pointer movement. If there is no pointer movement, the contact is properly set. If the pointer moves, the contact was not set directly on fibre dead spot. In this case, the station should be re-tuned manually, and procedure No. 3 should be repeated.

Fig. 2



6. Using the same procedure, set up the remaining five stations, in each case using the station of the next highest frequency and the thumb screw having the same number as the corresponding button. Never skip buttons, always set up in numerical order from button 1 to 6 from left to right.

7. After all the stations have been set up, insert the proper station call tabs (found with the instructions) into the recesses of their respective buttons.

8. To receive any of the six stations set up as described above turn receiver "ON" by rotating the left hand knob to the right until the switch clicks. Allow the tubes to heat up, press the buttons designated by the call letter of the station desired and hold the button in until the pointer stops moving and the station comes in. Adjust tone and volume. IMPORTANT: Be sure the band switch is in the position for Standard Broadcast Reception.

AUTOMATIC PUSH BUTTONS

MODELS 6C and 6G

A glance at Fig. 1 will show that there are eight (8) push buttons, six (6) of which are for automatic use; the adjusting screws are located directly below these push buttons. Fig. 1 also shows the tuning range or frequencies covered by each button.

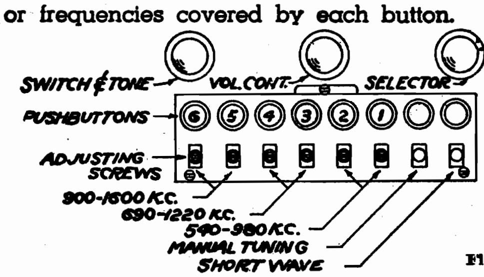


Fig. 1

The remaining two (2) push buttons located at the extreme right hand end of the push button plate are for short wave and manual tuning. See Fig. 1. Short wave. tuning is accomplished by pressing "short wave" button and tuning with the selector knob. By pressing "manual tuning" button, the automatic disconnects and the selector knob becomes active for the broadcast band.

1. Choose a station havng a frequency within the range of button No. 1 (540 to 980 kc).

2. Press "Manual Tuning" button and tune this station conventionally by using the selector knob.

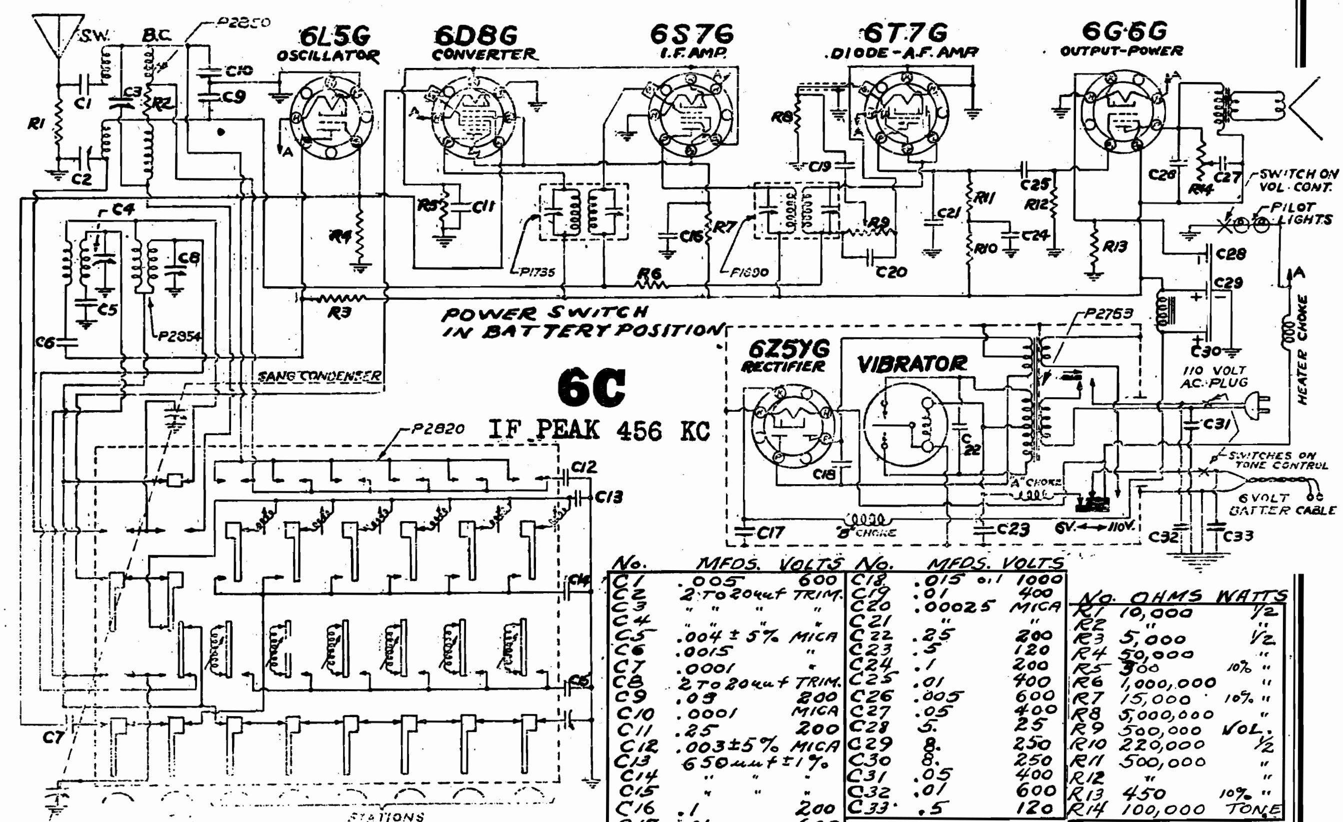
3. Now press button No. 1 and turn adjusting screw in either direction until the previously selected station is heard. Adjust the screw until the station is received with maximum volume.

4. Remove the call letters of the station from the call letter sheet furnished and insert in the window of the adjusting screw.

5. Repeat the above procedure for the remaining five (5) stations.

CONTINENTAL RADIO & TELEV. CO.

MODEL 6C
Schematic, Socket
Trimmers, Alignment



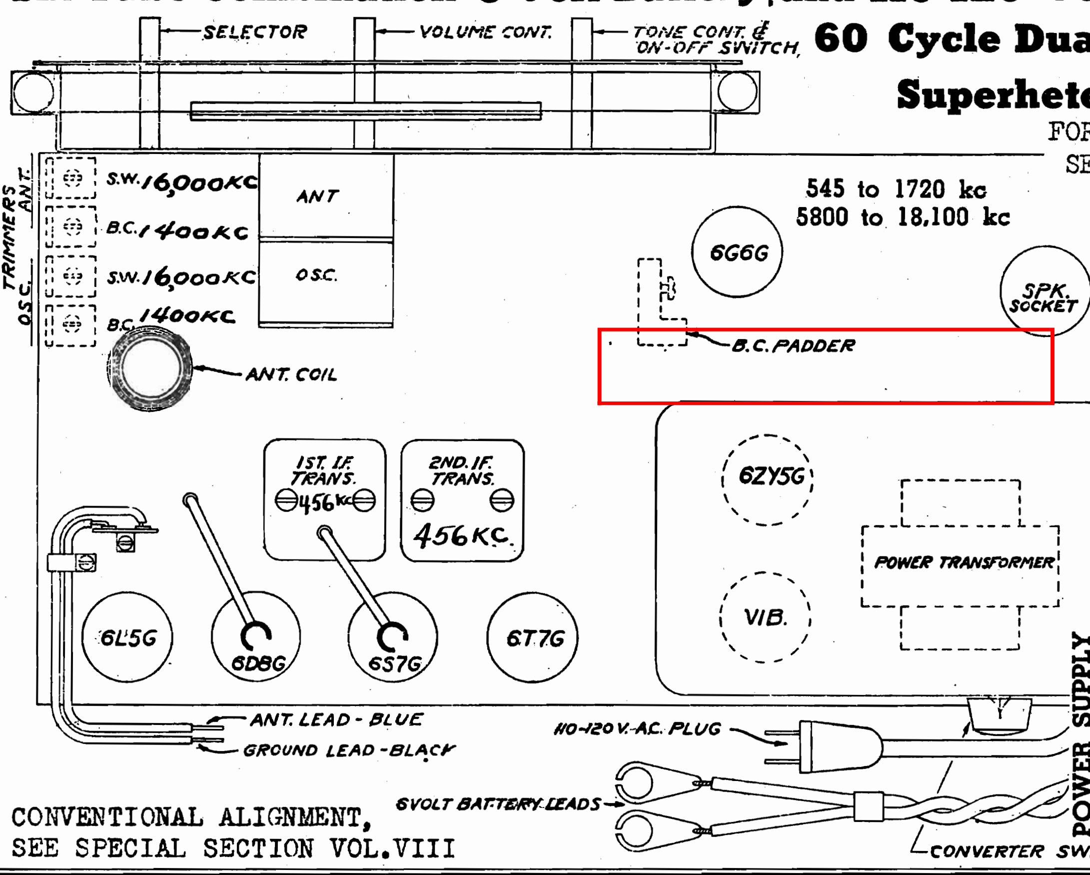
No.	MFDS.	VOLTS
C1	.005	600
C2	2 TO 20 uuf	TRIM.
C3	" "	"
C4	" "	"
C5	.004 ± 5%	MICA
C6	.0015	"
C7	.0001	"
C8	2 TO 20 uuf	TRIM.
C9	.03	200
C10	.0001	MICA
C11	.25	200
C12	.003 ± 5%	MICA
C13	650 uuf ± 1%	
C14	" "	"
C15	" "	"
C16	.1	200
C17	.01	600

No.	MFDS.	VOLTS
C18	.015 0.1	1000
C19	.01	400
C20	.00025	MICA
C21	"	"
C22	.25	200
C23	.5	120
C24	.1	200
C25	.01	400
C26	.005	600
C27	.05	400
C28	5.	25
C29	8.	250
C30	8.	250
C31	.05	400
C32	.01	600
C33	.5	120

No.	OHMS	WATTS
R1	10,000	1/2
R2	"	"
R3	5,000	1/2
R4	50,000	"
R5	300 10%	"
R6	1,000,000	"
R7	15,000 10%	"
R8	5,000,000	"
R9	500,000	VOL.
R10	220,000	1/2
R11	500,000	"
R12	"	"
R13	450 10%	"
R14	100,000	TONE

Six Tube Combination 6 Volt Battery and 110-120 Volt AC 60 Cycle Dual Wave Superheterodyne

FOR TUNER DATA SEE INDEX



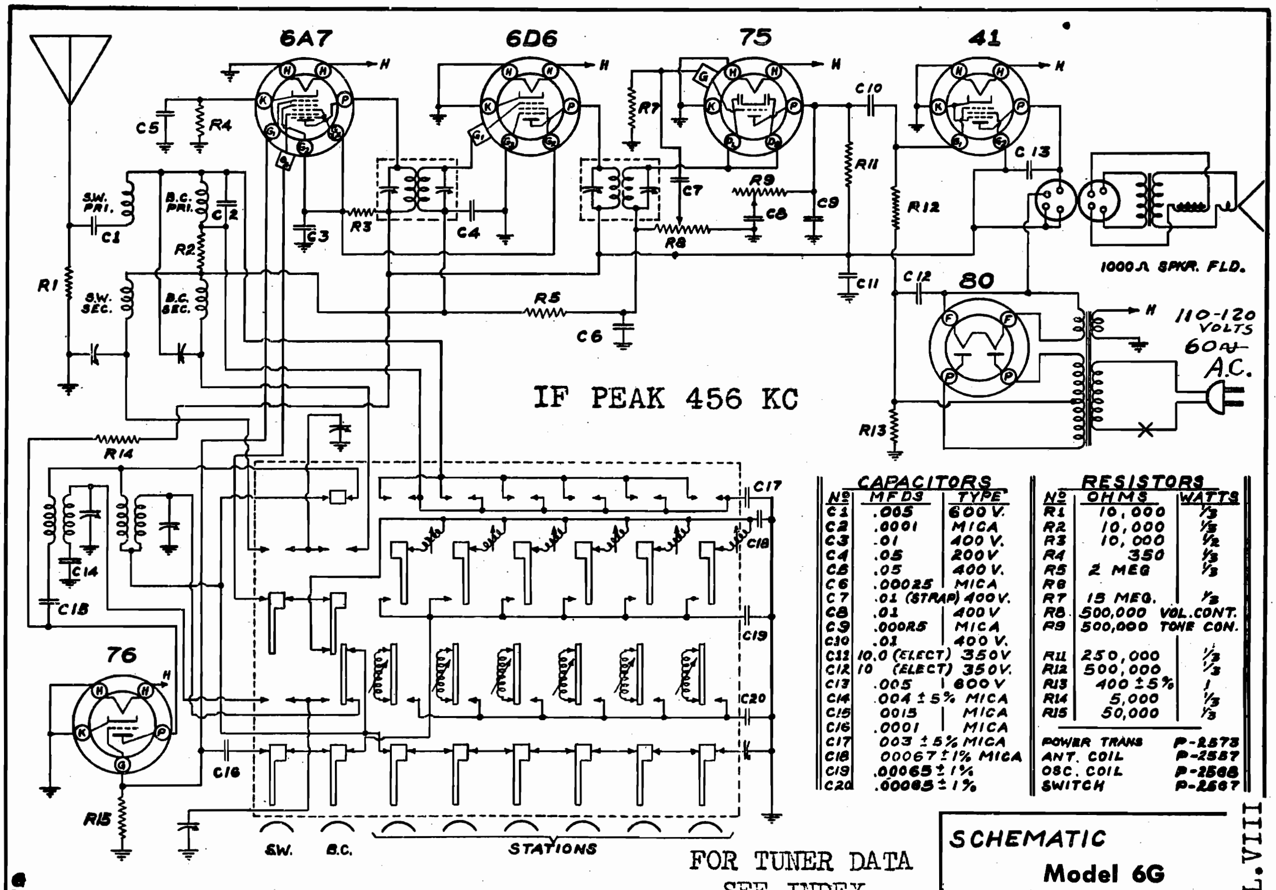
POWER SUPPLY
Never plug into a D.C. outlet. In order to adapt the receiver to either type of current (6 volt or 110-120 volt—A.C.) simply insert a screw driver into the slot in the hole located on the back of the can, which is mounted on the chassis, and turn to the left or counter-clockwise for 110-120 volt A.C. 60 cycle current; turn to the right or clockwise for 6 volt battery operation.

CONVENTIONAL ALIGNMENT,
SEE SPECIAL SECTION VOL.VIII

MODEL 6G
Schematic, Socket
Trimmers, Alignment

CONTINENTAL RADIO & TELEV. CO.

This receiver is designed to operate over two tuning ranges: the broadcast range which extends from 545 to 1720 kc (174.4 to 550.4 meters) and the international short wave band which extends from 5800 to 18,100 kc (16.5 to 51.7 meters). This latter range is the one which includes the 5 internationally assigned bands—the 16, 19, 25, 31 and 49 meter bands.



CAPACITORS No	MFDS	TYPE
C1	.005	600 V.
C2	.0001	MICA
C3	.01	400 V.
C4	.05	200V
C5	.05	400 V.
C6	.00025	MICA
C7	.01 (STRAP)	400V.
C8	.01	400V
C9	.00025	MICA
C10	.01	400 V.
C11	10.0 (ELECT)	350V
C12	10 (ELECT)	350V.
C13	.005	600V
C14	.004 ± 5%	MICA
C15	.0015	MICA
C16	.0001	MICA
C17	.003 ± 5%	MICA
C18	.00067 ± 1%	MICA
C19	.00065 ± 1%	
C20	.00065 ± 1%	

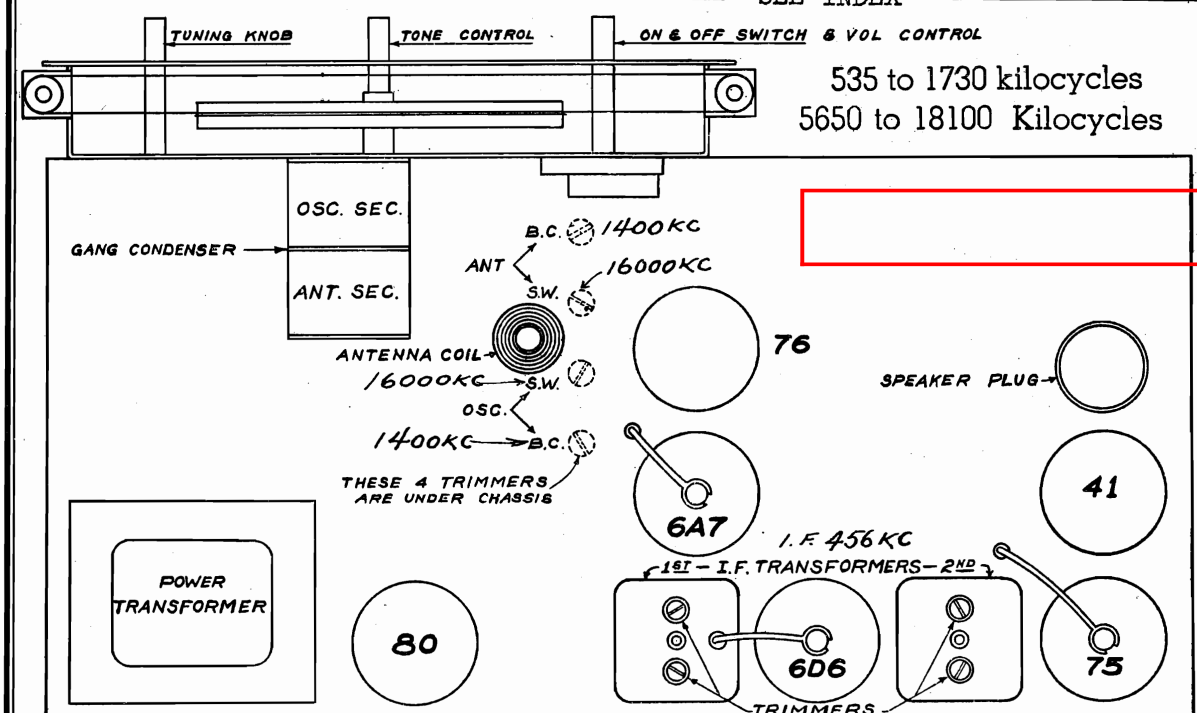
RESISTORS No	OHMS	WATTS
R1	10,000	1/3
R2	10,000	1/3
R3	10,000	1/2
R4	350	1/3
R5	2 MEG	1/3
R6		
R7	15 MEG.	1/3
R8	500,000	VOL. CONT.
R9	500,000	TONE CON.
R11	250,000	1/3
R12	500,000	1/3
R13	400 ± 5%	1
R14	5,000	1/3
R15	50,000	1/3

POWER TRANS	P-2573
ANT. COIL	P-2557
OSC. COIL	P-2568
SWITCH	P-2567

SCHEMATIC
Model 6G

FOR TUNER DATA SEE INDEX

535 to 1730 kilocycles
5650 to 18100 Kilocycles



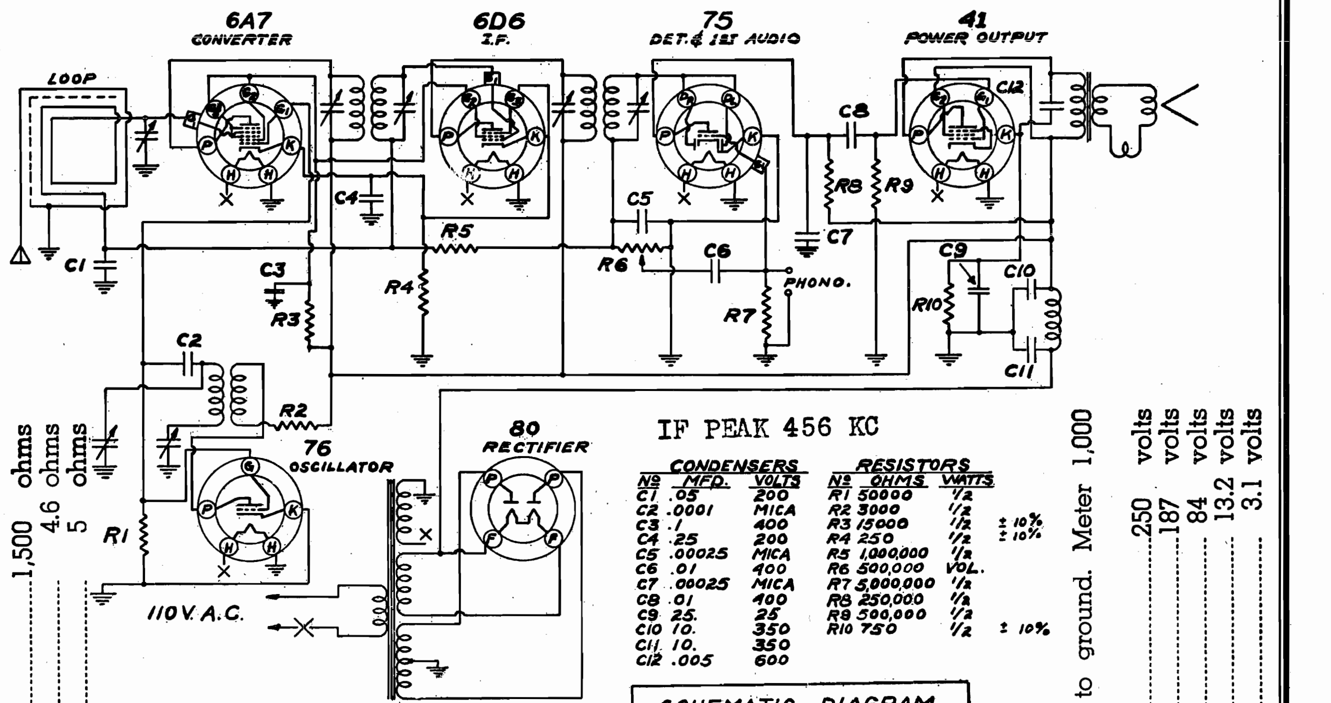
Six Tube AC Automatic Tuning

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOL. VIII

MODEL 6K
Schematic, Socket
Trimmers, Voltage
Alignment

CONTINENTAL RADIO & TELEV. CO.

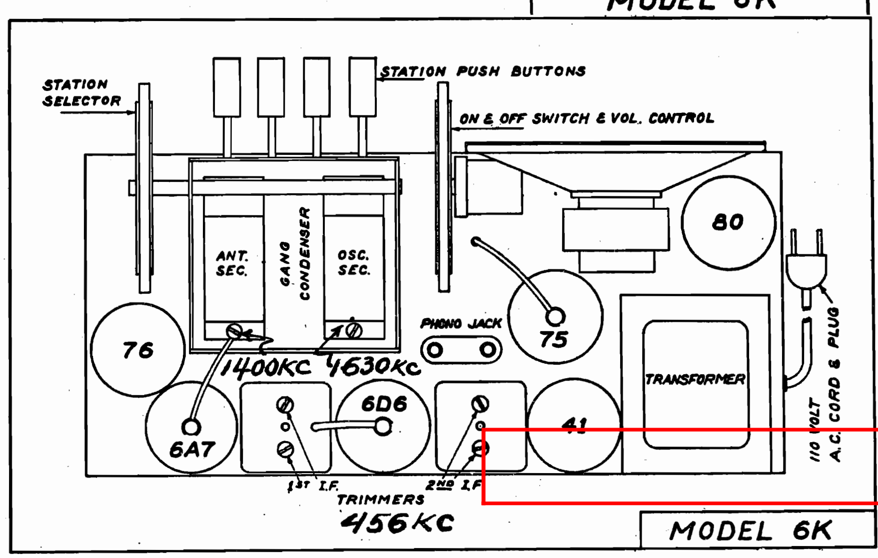
6 TUBE AC SUPERHETERODYNE BROADCAST BAND



IF PEAK 456 KC

CONDENSERS No	MFD.	VOLTS	RESISTORS No	OHMS	WATTS	
C1	.05	200	R1	50000	1/2	
C2	.0001	MICA	R2	3000	1/2	
C3	.1	400	R3	15000	1/2	±10%
C4	.25	200	R4	250	1/2	±10%
C5	.00025	MICA	R5	1,000,000	1/2	
C6	.01	400	R6	500,000	VOL.	
C7	.00025	MICA	R7	5,000,000	1/2	
C8	.01	400	R8	250,000	1/2	
C9	25.	25	R9	500,000	1/2	
C10	10.	350	R10	750	1/2	±10%
C11	10.	350				
C12	.005	600				

SCHEMATIC DIAGRAM
MODEL 6K



MODEL 6K

Speaker (Part No. P3087)
Field resistance........1,500 ohms
DC voice coil resistance........4.6 ohms
Voice coil impedance at 400 cycles........5 ohms

Voltages—Line 115 Volts AC.
Volume control minimum. Antenna shorted to ground. Meter 1,000 ohms per volt.
Filament of 80 tube to ground........250 volts
Screen of 41 tube to ground........187 volts
Screens of 6A7 and 6D6 tubes to ground........84 volts
Cathode of 41 tube to ground........13.2 volts
Cathode of 6A7 tube to ground........3.1 volts

6K PARTS LIST

PAPER CONDENSERS

P148	.05 mfd. 200 volt
P141	.25 mfd. 200 volt
P276	.10 mfd. 400 volt
P1322	.005 mfd. 600 volt
P164	.01 mfd. 400 volt
P1313	.01 mfd. 400 volt with strap

RESISTORS

P137A	500,000 ohm ½ watt
P2344	250,000 ohm ½ watt
P162A	1,000,000 ohm ½ watt
P1729	750 ohm ½ watt 10%
P2578	15,000 ohm ½ watt 10%
P1942	250 ohm ½ watt 10%
P1952	50,000 ohm ½ watt
P2735	5,000,000 ohm ½ watt
P481	3,000 ohm ½ watt

MICA CONDENSERS

P817	.00025 mfd.
P480	.0001 mfd.

ELECTROLYTIC CONDENSERS

P3086	10 mfd. 350 w. v. 10 mfd. 350 w. v. 20 mfd. 25 w. v.

ADJUSTABLE CONDENSERS

P3072	Gang Condenser and Tuner
P2560	Padding Condenser

TRANSFORMERS AND COILS

P3083	1st I.F. Transformer
P2606	2nd I.F. Transformer
P3084	Oscillator Coil

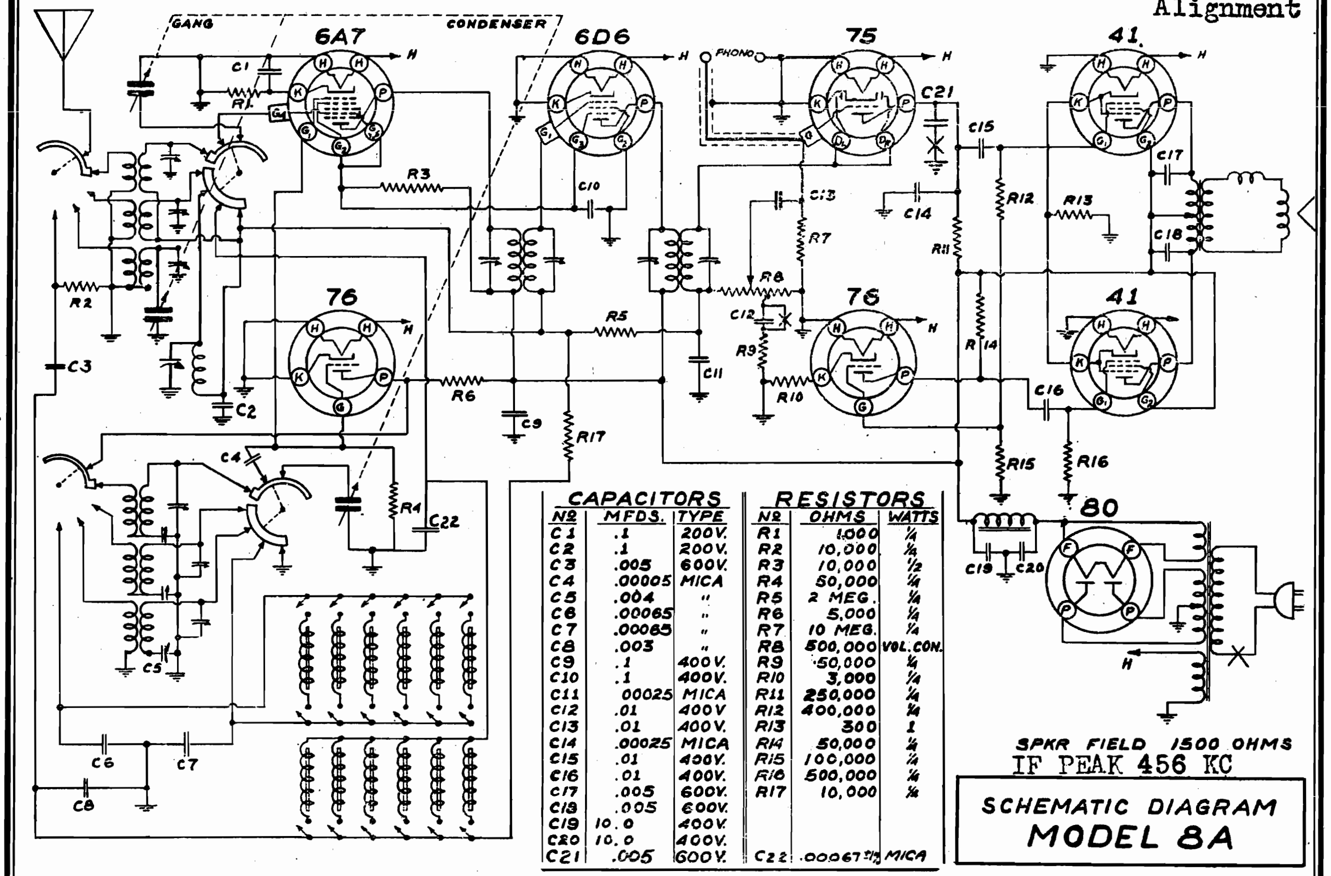
MISCELLANEOUS

P3082	Volume Control and Switch
P3074	4 Prong Socket
P3075	5 Prong Socket
P3076	6 Prong Socket
P3077	7 Prong Socket
P533	Tube Shield Base
P530	Tube Shield
P531	Tube Shield Cap
P1504	Pilot Light Bulb
P3085	Pilot Light, Socket and Bracket
G5891	Antenna Loop Assembly
G5892	Static Shield Assembly
P929	Line Cord
P3087	6" Dynamic Speaker and Output Transformer
P3139	Pressed Paper Back
P3096	Call Letter Sheet
P2965	Pointer
P3066	Dial Scale—Order by Name and Model Number
P3073	Push Button
P2867	Bakelite Thumb Wheels

MODEL 8A
Schematic, Alignment

CONTINENTAL RADIO & TELEV. CO.

MODEL 8AU
MODEL 11A
Alignment



CAPACITORS			RESISTORS		
№	MFDS.	TYPE	№	OHMS	WATTS
C1	.1	200V.	R1	1,000	¼
C2	.1	200V.	R2	10,000	¼
C3	.005	600V.	R3	10,000	½
C4	.00005	MICA	R4	50,000	¼
C5	.004	"	R5	2 MEG.	¼
C6	.00065	"	R6	5,000	¼
C7	.00065	"	R7	10 MEG.	¼
C8	.003	"	R8	500,000	VOL. CON.
C9	.1	400V.	R9	50,000	¼
C10	.1	400V.	R10	3,000	¼
C11	00025	MICA	R11	250,000	¼
C12	.01	400V	R12	400,000	¼
C13	.01	400V.	R13	300	1
C14	.00025	MICA	R14	50,000	¼
C15	.01	400V.	R15	100,000	¼
C16	.01	400V.	R16	500,000	¼
C17	.005	600V.	R17	10,000	¼
C18	.005	600V.			
C19	10.0	400V.			
C20	10.0	400V.			
C21	.005	600V.	C22	.00067 ±1%	MICA

IF PEAK 456 KC

SCHEMATIC DIAGRAM
MODEL 8A

POWER SUPPLY This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycles alternating current (AC). Never plug into a DC outlet.

ALIGNMENT DATA AND SERVICING

GENERAL DATA The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1730, 1800, 4000, 5600, 6000, 16,000 and 18,100 KC and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should always be the next procedure, after which, either or both of the Short Wave Bands may be aligned.

I.F. ALIGNMENT With the wave switch in the Broadcast Band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground if the test oscillator is not grounded to one side of the power line. In case one side is connected to ground, connect a large condenser from ground on the test oscillator to ground of the chassis. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT Connect the output of the signal generator to the antenna lead (blue) through at .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "preselector" and "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the preselector of the R.F. section. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

POLICE BAND ALIGNMENT The police band is adjusted by first replacing the .0002 dummy with a 400 ohm resistor and setting the generator to 5600 KC. With the gang set at minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to give maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit of this frequency as described in the instructions for padding the broadcast circuits.

SHORT WAVE BAND ALIGNMENT The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and the oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

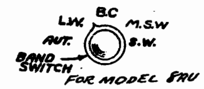
CONTINENTAL RADIO & TELEV. CO.

MODEL 8A
MODEL 8AU
Parts Socket
Trimmers, Tuner,

8A **8AU**

Eight Tube AC Automatic Tuning

This receiver is designed to operate over three tuning ranges; the broadcast range which extends from 535 to 1730 K.C. (173 to 560 meters), police and aviation band which extends from 1700 to 5600 K.C. (53 to 176 meters) and the international short wave band which extends from 5600 to 18,100 K.C. (16.5 to 53 meters). This latter range is the one which includes the five internationally assigned bands — the 16, 19, 25, 31, and 49 meter bands.



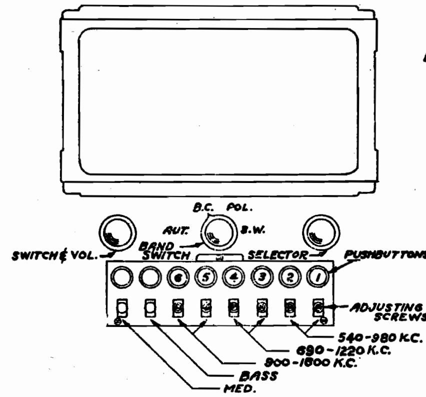


Fig. 1

PROCEDURE FOR SETTING UP AUTOMATIC PUSH BUTTONS

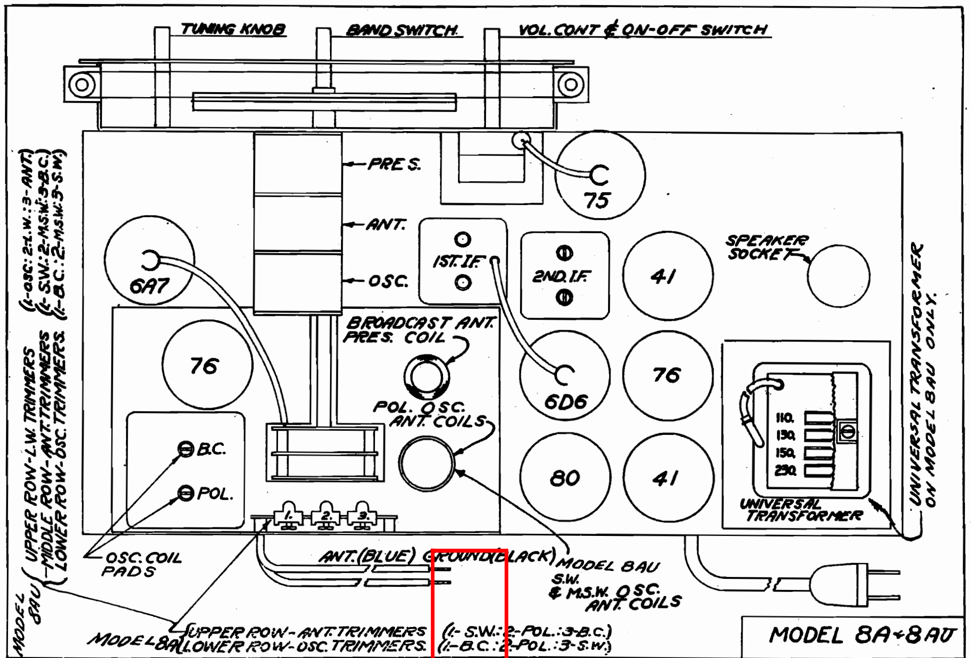
A glance at Fig. 1 will show that there are eight (8) push buttons, six (6) of which are for automatic use; the adjusting screws are located directly below these.

Fig. 1 also shows the tuning range or frequencies covered by each button.

The remaining two (2) push buttons, located at the extreme left hand end of the push button plate are for tone control.

1. Choose a station having a frequency within the range of button No. 1 (540 K.C. to 930 K.C.)
2. With the middle knob in the "broadcast" position, tune this station conventionally by using the selector knob.
3. Now turn the middle knob to the "automatic" position and press button No. 1 and turn the adjusting screw in either direction until the previously selected station is heard. Adjust the screw for maximum volume and sensitivity.
4. Remove the call letters of the station from the call letter sheet furnished and insert in the window of the adjusting screw. Insert "Med" and "Bass" tabs in windows as shown in Fig. 1.
5. Repeat the above procedure for the remaining five (5) stations.

NOTE: It is advisable to retain the call letter sheet in case of station change later on.



REPLACEMENT PARTS LIST
MODEL 8A

RESISTORS—CARBON

P417	50,000 Ohm ¼ Watt
P167	10,000 Ohm ¼ Watt
P139	250,000 Ohm ¼ Watt
P297	15,000 Ohm ½ Watt
P481	3,000 Ohm ¼ Watt
P2684	400,000 Ohm ¼ Watt 10%
P137	500,000 Ohm ¼ Watt
P2665	300 Ohm 1 Watt 10%
P278	1,000 Ohm ¼ Watt 20%
P2664	10,000,000 Ohm ¼ Watt
P2685	100,000 Ohm ¼ Watt 10%

CONDENSERS—PAPER

P164	.01 Mfd. 400 Volt
P1322	.005 Mfd. 600 Volt
P276	.10 Mfd. 400 Volt
P334	.05 Mfd. 400 Volt
P1313	.01 Mfd. 400 Volt with Strap
P142	.10 Mfd. 200 Volt

MICA CONDENSERS

P817	.00025 Mfd.
P1683	.004 Mfd.
P1382	.00005 Mfd.
P336	.0005
P480	.0001 Mfd.
P336	.0005 Mfd.

ELECTROLYTIC CONDENSERS

P2631	Dual 10 Mfd., 400 W.V.

ADJUSTABLE CONDENSERS

P2623	Gang Condenser
P2656	Trimmer Strip
P2657	Trimmer Strip

TRANSFORMERS AND COILS

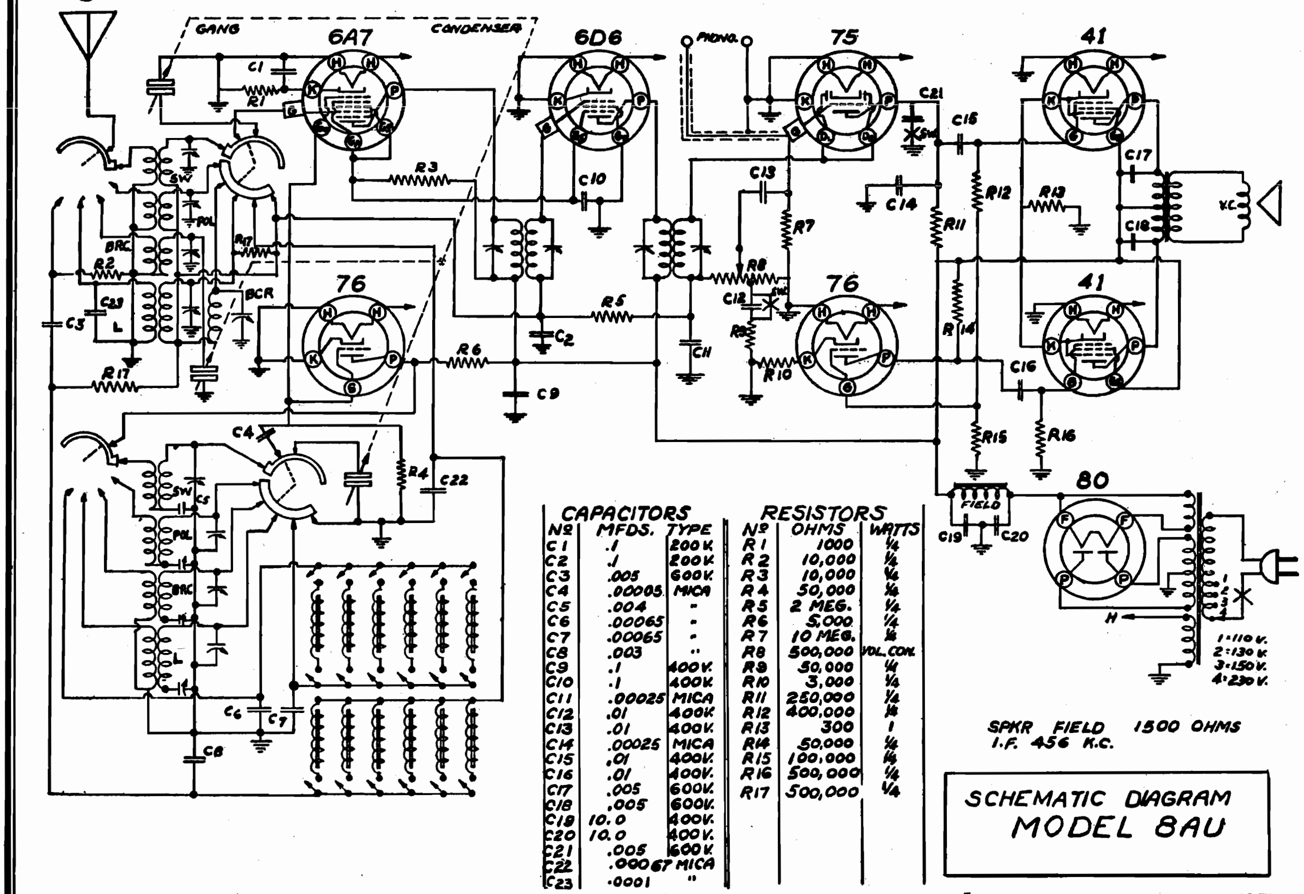
P2628	Power Transformer
P2630	230 Volt Power Transformer
P2633	1st I.F. Transformer Coil
P1756	2nd I.F. Transformer Coil
P1751	Broadcast Antenna Coil
G5310	Police and Short Wave Antenna Coil
G5307	Oscillator Coil, Trimmer and Shield Assembly

MISCELLANEOUS

P492	80 Tube Socket
P1277	41 Tube Socket
P537	76 Tube Socket
P536	6D6 Tube Socket
P506	6A7 Tube Socket
P521	75 Tube Socket
P945	Speaker Socket
P2637	8" Dynamic Speaker (Mantel)
P2638	10" Dynamic Speaker (Console and Phono.)
P2659	Volume Control and Switch
P929	A.C. Line Cord and Plug
P1455	Tube Shield
P1456	Tube Shield Base
P1503	Pilot Light Socket
P1504	Pilot Light Bulb
P2636	Band Switch
P897	Phono. Socket
P2632	Dial Scale (Specify Name)
P2585	Walnut Push Buttons
P2586	Ivory Push Buttons
G5762	Permeability Tuner Assembly
P2533	Automatic Record Changer

MODEL 8AU
Schematic,
Alignment

CONTINENTAL RADIO & TELEV. CO.



CAPACITORS

Nº	MFDS.	TYPE
C1	.1	200V.
C2	.1	200V.
C3	.005	600V.
C4	.00005	MICA
C5	.004	"
C6	.00065	"
C7	.00065	"
C8	.003	"
C9	.1	400V.
C10	.1	400V.
C11	.00025	MICA
C12	.01	400V.
C13	.01	400V.
C14	.00025	MICA
C15	.01	400V.
C16	.01	400V.
C17	.005	600V.
C18	.005	600V.
C19	10.0	400V.
C20	10.0	400V.
C21	.005	600V.
C22	.00067	MICA
C23	.0001	"

RESISTORS

Nº	OHMS	WATTS
R1	1000	1/4
R2	10,000	1/4
R3	10,000	1/4
R4	50,000	1/4
R5	2 MEG.	1/4
R6	5,000	1/4
R7	10 MEG.	1/4
R8	500,000	VOL. CON.
R9	50,000	1/4
R10	3,000	1/4
R11	250,000	1/4
R12	400,000	1/4
R13	300	1
R14	50,000	1/4
R15	100,000	1/4
R16	500,000	1/4
R17	500,000	1/4

This receiver is designed to operate over four tuning ranges; **long wave** 150 to 350 K.C. (2000 to 857 meters); **broadcast** 535 to 1730 K.C. (173 to 561 meters); **medium short wave band** 2350 to 7100 K.C. (127.6 to 42 meters); **international short wave** 7000 to 22,000 K.C. (13.6 to 42.8 meters), which includes five—5 internationally assigned bands—16, 19, 25, 31 and 49 meter bands.

PROCEDURE FOR SETTING UP AUTOMATIC PUSH BUTTONS See Model 8A.

ALIGNMENT

Align I F and Broadcast Bands using the procedure for Model 8A. Using this procedure align Med. S.W. and S.W. Band likewise, using the following frequencies; Med. S.W.,7000 KC Osc. Trimmer,6000Kc Ant. Trimmer,2500 Kc"pad". S.W., 22000 KC S.W.Osc Trimmer, 18000 KC S.W.Ant Trimmer,8000 KC "pad". Align L.W. Band as below;

LONG WAVE BAND ALIGNMENT The long wave band is adjusted by connecting the output of the signal generator through a .0002 Mfd. mica condenser to the blue antenna lead. Then set the gang to minimum and the generator to 360 KC and adjust the long wave oscillator trimmer to receive this signal. Then set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set generator to 160 KC and pad the circuits to maximum output. Owing to the nature of the long wave band, the trimmer and padding condensers react upon each other to quite a degree; consequently, several re-adjustments at the trimming and padding positions are required before the circuits are adjusted properly.

For parts not listed below see Parts List Model 8A.

PARTS LIST MODEL 8AU

P2727 6" Dynamic Speaker (Mantel)

TRANSFORMERS AND COILS

P2663 Universal Transformer

MISCELLANEOUS

P2661 Band Switch
P2660 Dial Scale
G5775 Medium Short Wave and Short Wave Antenna Coil
G5774 Oscillator Coil, Trimmer and Shield Assembly
G5777 Long Wave Antenna Coil Assembly

RESISTORS—CARBON

P1114 2,000,000 Ohm ¼ Watt
P2735 5,000,000 Ohm ¼ Watt

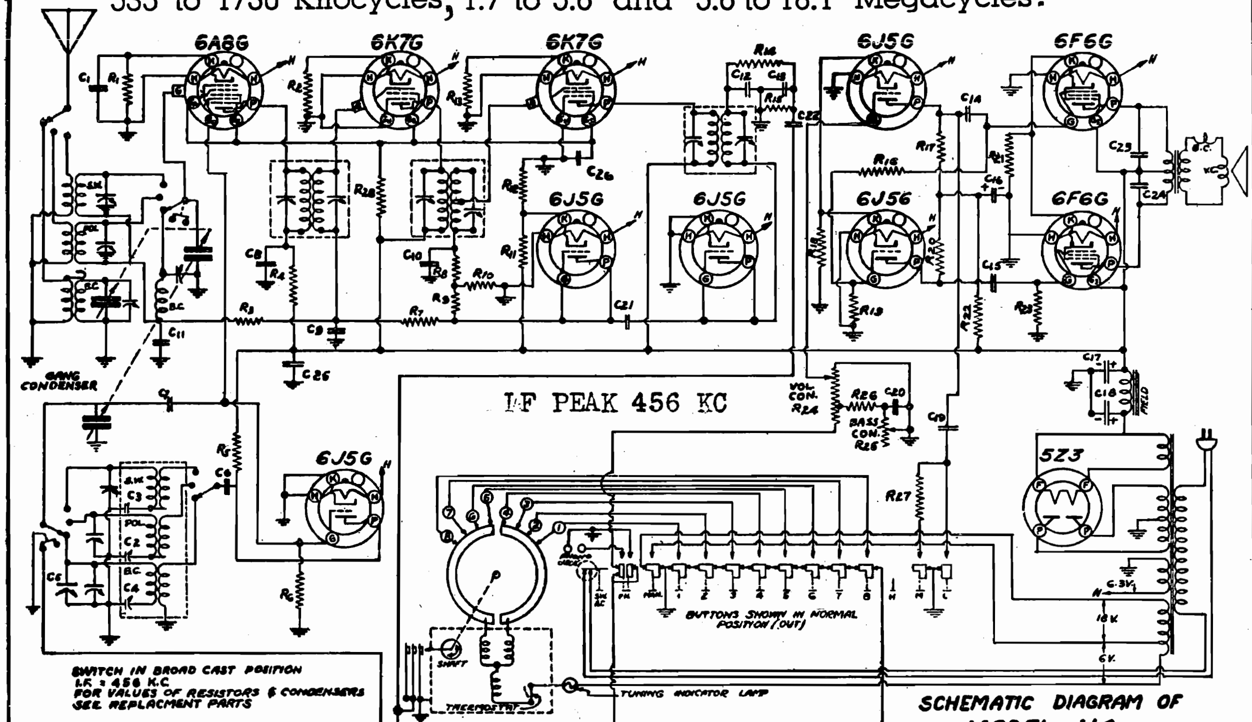
MICA CONDENSERS

2701 .005 5%
2702 .0018 3%

CONTINENTAL RADIO & TELEV. CO.

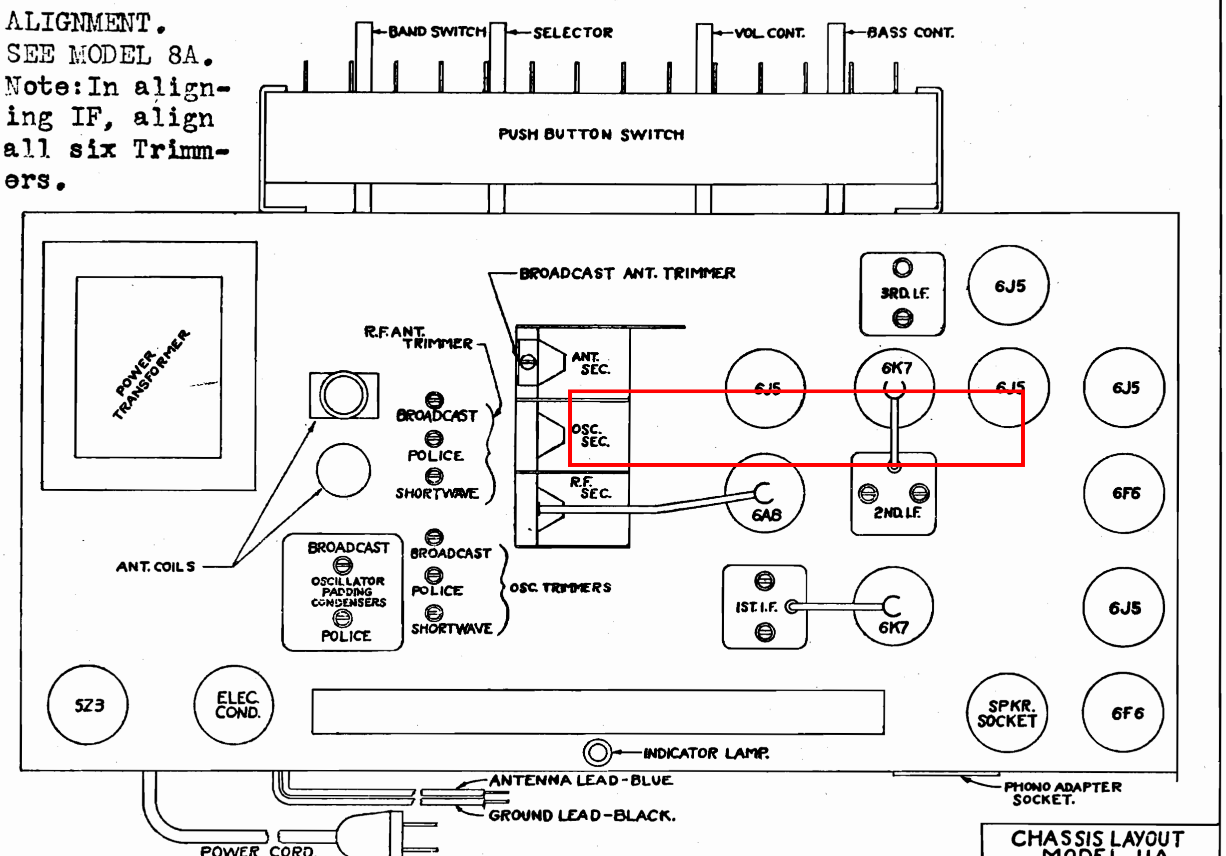
MODEL 11A
Schematic, Socket
Trimmers
Alignment

This receiver is designed to operate over three tuning ranges; 535 to 1730 Kilocycles, 1.7 to 5.6 and 5.6 to 18.1 Megacycles.



SCHEMATIC DIAGRAM OF MODEL 11A

ALIGNMENT.
SEE MODEL 8A.
Note: In aligning IF, align all six Trimmers.



CHASSIS LAYOUT MODEL 11A

MODEL 11A
MODEL 16S
Tuner Data
Parts

CONTINENTAL RADIO & TELEV. CO.

INSTRUCTIONS FOR ADJUSTMENT AND OPERATION OF THE ELECTRIC TUNER

It is very important to read the following instructions carefully before attempting to adjust the electric tuner.
The electric tuner is made up of three integral units:

PUSH BUTTON SWITCH: The push button switch consists of eight (8) brown push buttons flanked on either side by three (3) white push buttons.

SELECTOR MECHANISM: The selector mechanism is made up of the selector plate, eight (8) thumb screws, and the adjustment light bulb.

ELECTRIC MOTOR: The power for this tuner is provided by a small, efficient electric motor, of the brushless variety. It is fitted with an automatic clutch. The bearings and the oil retainer hold sufficient oil to lubricate the motor for a lifetime.

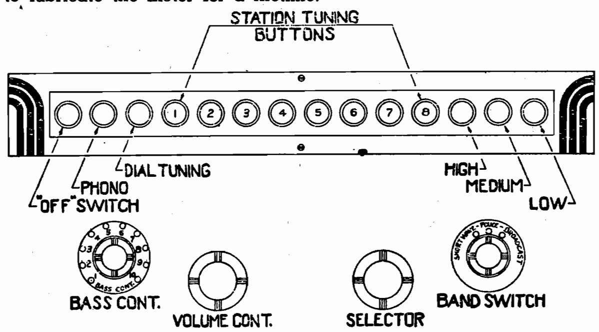


Fig. 1

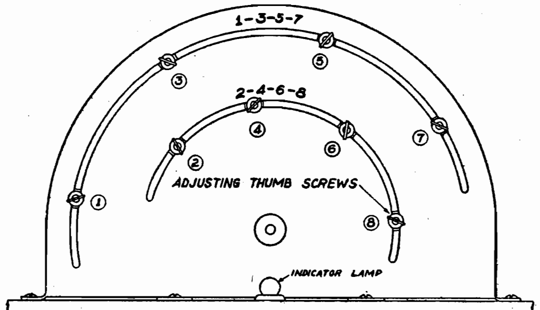


Fig. 2

SETTING UP STATIONS The first step to take in adjusting the electric push button device incorporated into this receiver is to choose eight (8) of the most powerful local stations, stations which are free from excess fading. Turn on the receiver (broadcast band) and press in the dial tuning button; tune in the station of the **lowest frequency,** using the station selector knob. Now hold the dial tuning button in and press in button number one (1). (See Figure 1). Both buttons are now locked into place; a small pilot lamp located at the rear of the chassis will light up unless the thumb screw at the rear accidently happens to be correctly set. Loosen thumb screw number one (See Figure 2 for order of thumb screws) enough to allow it to slide freely back and forth until the light goes out. Now tighten the thumb screw; the adjustment for the first station is now complete. Out of the station call letter sheet supplied remove the proper station call disc and insert into the recess of button number one. Push one of the clear celluloid discs into the recess also, over the station call disc. Now release button number one by pressing the dial tuning button in as far as it will go.

With the white button still in, tune in the station of the next highest frequency and holding the white button, press in button number two. Both buttons are now locked into place. Loosen thumb screw number two (see Figure 2) and slide back and forth until a point is reached at which the pilot lamp in the rear goes out; tighten the thumb screw. Insert the proper station call disc and celluloid disc into the window of button number two.

Follow this same procedure for the remaining stations, always choosing the station with the next highest frequency. After all eight (8) stations have been adjusted, check each adjustment by tuning in each station. Note: In the window above the white button, insert the word "OFF" found in the call letter sheet.

NOTE: In the recesses of the white push buttons insert the words found in the call letter sheet as shown in Figure 1.

HOW TO TUNE IN STATIONS USING THE ELECTRIC PUSH BUTTON TUNER

In order to operate the receiver satisfactorily—using the electric push button tuner, the dial tuning button must be in released position, that is, all the way out. To tune in a station, merely press the selector button which designates the station desired. **Note:** Should the station fail to come in clearly, check the adjustment by following the adjustment procedure described in the paragraph above.

To change from electric tuning to manual selecting, simply press in the dial tuning button. When the dial tuning button is in, the set may be tuned as a conventional receiver.

RESISTORS

R 1—P140	500 Ohm ¼ Watt
R 2—P1950	350 Ohm ¼ Watt 10%
R 3—P139	250,000 Ohm ¼ Watt
R 4—P481	3,000 Ohm ¼ Watt
R 5—P673	10,000 Ohm ½ Watt
R 6—P417	50,000 Ohm ¼ Watt
R 7—P137	500,000 Ohm ¼ Watt
R 9—P137	1,000,000 Ohm ¼ Watt
R11—P2731	25,000 Ohm 1 Watt
R12—P278	600 Ohm ¼ Watt
R13—P1950	350 Ohm ¼ Watt
R14—P417	50,000 Ohm ¼ Watt
R15—P139	250,000 Ohm ¼ Watt
R16—P1220	200,000 Ohm ¼ Watt
R17—P166	25,000 Ohm ¼ Watt
R18—P376	750 Ohm ¼ Watt
R19—P258	15,000 Ohm ¼ Watt
R20—P166	25,000 Ohm ¼ Watt
R21—P2732	220 Ohm 2 Watt
R22—P167	10,000 Ohm ¼ Watt
R23—P139	250,000 Ohm ¼ Watt
R24	Volume Control— 2,000,000 Ohms
R25	Bass Control— 1,000,000 Ohms
R26—P1217	60,000 Ohm ¼ Watt
R27—P167	10,000 Ohm ¼ Watt
R28—P165	25,000 Ohm ¼ Watt
R29	Speaker Field—600 Ohm

TRANSFORMERS AND COILS

P2710	Power Transformer
P1930	1st I.F. Transformer
P2704	2nd I.F. Transformer
P2711	3rd I.F. Transformer
G5794	Oscillator Coil Assembly
G5310	Police and Short Wave Antenna Coil
G5347	Broadcast Antenna Coil

PAPER CONDENSERS

C 1—P148	.05 Mfd. 200 V.
C 2	Police Band Padder— (.0008—.0016 Mfd.)
C 4	Broadcast Band Padder— (.003—.0006 Mfd.)
C 6—P1322	.005 Mfd. 600 V.
C 8—P276	.1 Mfd. 400 V.
C 9—P148	.05 Mfd. 200 V.
C11—P142	.1 Mfd. 200 V.
C14—P334	.05 Mfd. 400 V.
C15—P334	.05 Mfd. 400 V.
C19—P334	.05 Mfd. 400 V.
C20—P1322	.005 Mfd. 600 V.
C22—P148	.05 Mfd. 200 V.
C23—P1322	.005 Mfd. 600 V.
C24—P1322	.005 Mfd. 600 V.
C25—P276	.1 Mfd. 400 V.
C26—P276	.1 Mfd. 400 V.
C28—P148	.05 Mfd. 200 V.

MISCELLANEOUS

P1928	Tube Socket
P1153	5Z3 Socket
P945	Speaker Socket
P2705	Volume Control
P2706	Bass Control
G5788	Band Switch and Lead Assembly
P929	A.C. Line Cord
P1455	Tube Shield
P1456	Tube Shield Base
P2716	12" Dynamic Speaker

MICA CONDENSERS

C 3—P1683	.004 Mfd.
C 7—P480	.0001 Mfd.
C12—P480	.0001 Mfd.
C13—P480	.0001 Mfd.
C21—P1382	.00025 Mfd.
C27—P480	.0001 Mfd.

ELECTROLYTIC CONDENSERS

C16, C17	P1939 Dual Electrolytic
C18—P1937	Electrolytic

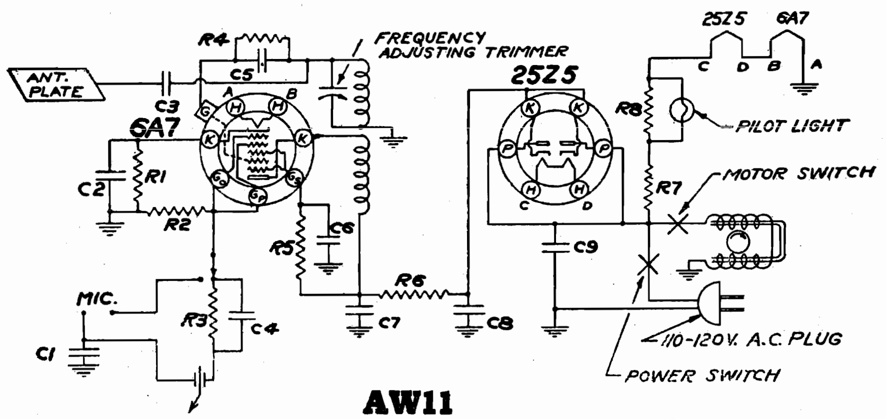
ADJUSTABLE CONDENSERS

P1918A	Variable Condenser
P2743	Gang Trimmer Strip
P1682	Oscillator Padder Condensers
P2694	Push Button Switch
P1503	Pilot Light Socket
P1504	Pilot Light Bulb
P2690	Electric Motor
P2689	Rubber Drive Belt
P2688	Dial Scale
P2644	Dial Pointer
G5462	Lower Segment Adjustment Bracket and Contact
G5463	Upper Segment Adjustment Bracket and Contact

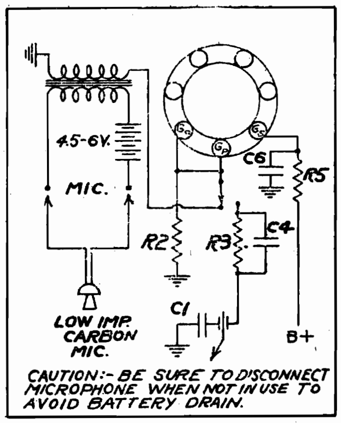
Schematic, Layout Notes

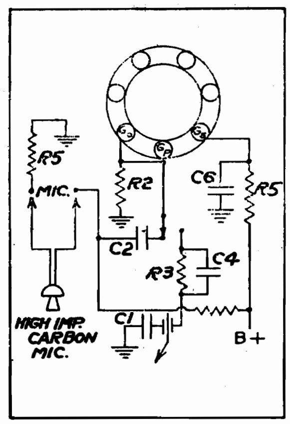
CONTINENTAL RADIO & TELEV. CO.

MODEL AW11
Wireless Record Player



AW11





CONDENSERS

Nº	MFD.	VOLTS
C1	.05	200
C2	.05	200
C3	.00005	MICA
C4	.0006	MICA
C5	.0001	MICA
C6	.05	200
C7	20.	110
C8	20.	150
C9	.1	400

RESISTORS

Nº	OHMS	WATTS
R1	700	1/4
R2	250,000	1/4
R3	250,000	1/4
R4	50,000	1/4
R5	10,000	1/4
R6	5,000	1/4
R7	40. COLD	METAL CLAD
R8	258. COLD	METAL CLAD

RESISTORS

P1952	50,000 Ohm ½ Watt Ins.
P2344	250,000 Ohm ½ Watt Ins.
P1381	1,000 Ohm ½ Watt Ins.
P673	10,000 Ohm ½ Watt Ins.
P1304	5,000 Ohm ½ Watt Ins.
P2833	Candohm Resistor

CONDENSERS

P276	.10 Mfd. 400 V. Paper
P148	.05 Mfd. 200 V. Paper
P2821	Electrolytic Condenser
P480	.0001 Moulded Mica
P1382	.00005 Moulded Mica
P336	.0005 Moulded Mica
P2826	Trimmer Condenser

MISCELLANEOUS

P506	6A7 Tube Socket
P559	25Z5 Tube Socket
P2827	Oscillator Coil
P2798	Motor and Turntable
P2828	Pickup Arm
P2800	Automatic Stop Switch
P2615	Needle Cup
P897	Phono Jack
P2829	Slide Switch
P2825	Power Switch
P2831	Power Switch Knob
P2215	Line Cord
P1923	Pilot Light Socket
P1504	Pilot Light Bulb
P2844	Pickup Rest

MICROPHONE

It will be noticed that the unit is provided with a sliding switch to change from phono pickup to microphone. Before attempting to use the **Mic** the switch should be set in the proper position.

The wireless record player unit is shipped from the factory, connected for use with a **Brush** type SM-37 crystal microphone, and **Quam Permanic** microphone. Insert pin tip connectors into microphone jacks. For use with other types of microphones, schematic diagrams are enclosed wherein the necessary wiring changes are shown.

The high impedance carbon microphone is the type usually recommended for home use and is connected in the plate circuit of the audio tube. Such microphones as the Philmore, I.R.C. and others fall into this group.

The low impedance microphones include the single and double button types and are as a rule the most satisfactory for use with the wireless unit. These are usually of a higher grade and are recommended for use when maximum output and tone quality is required. With such a microphone and a receiver having sufficient power output, a very simply installed and effective P.A. system may be had.

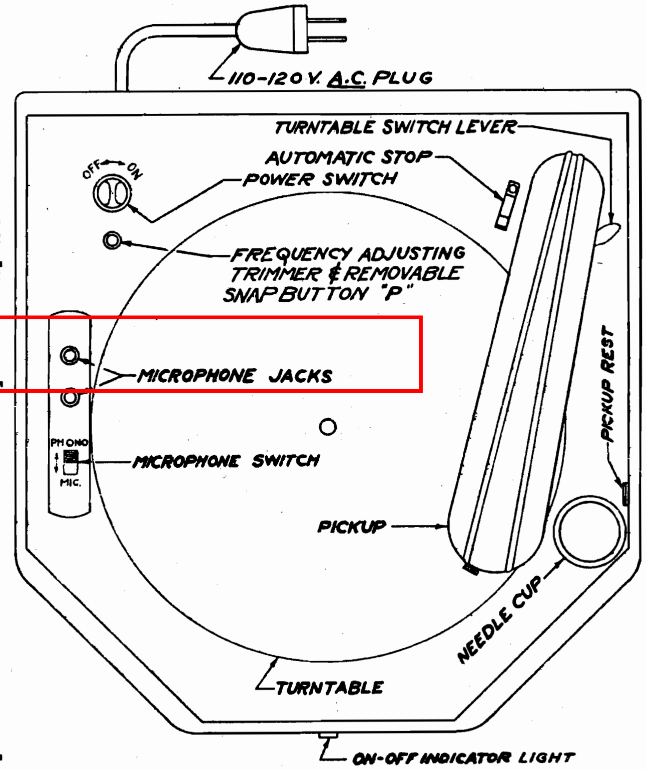
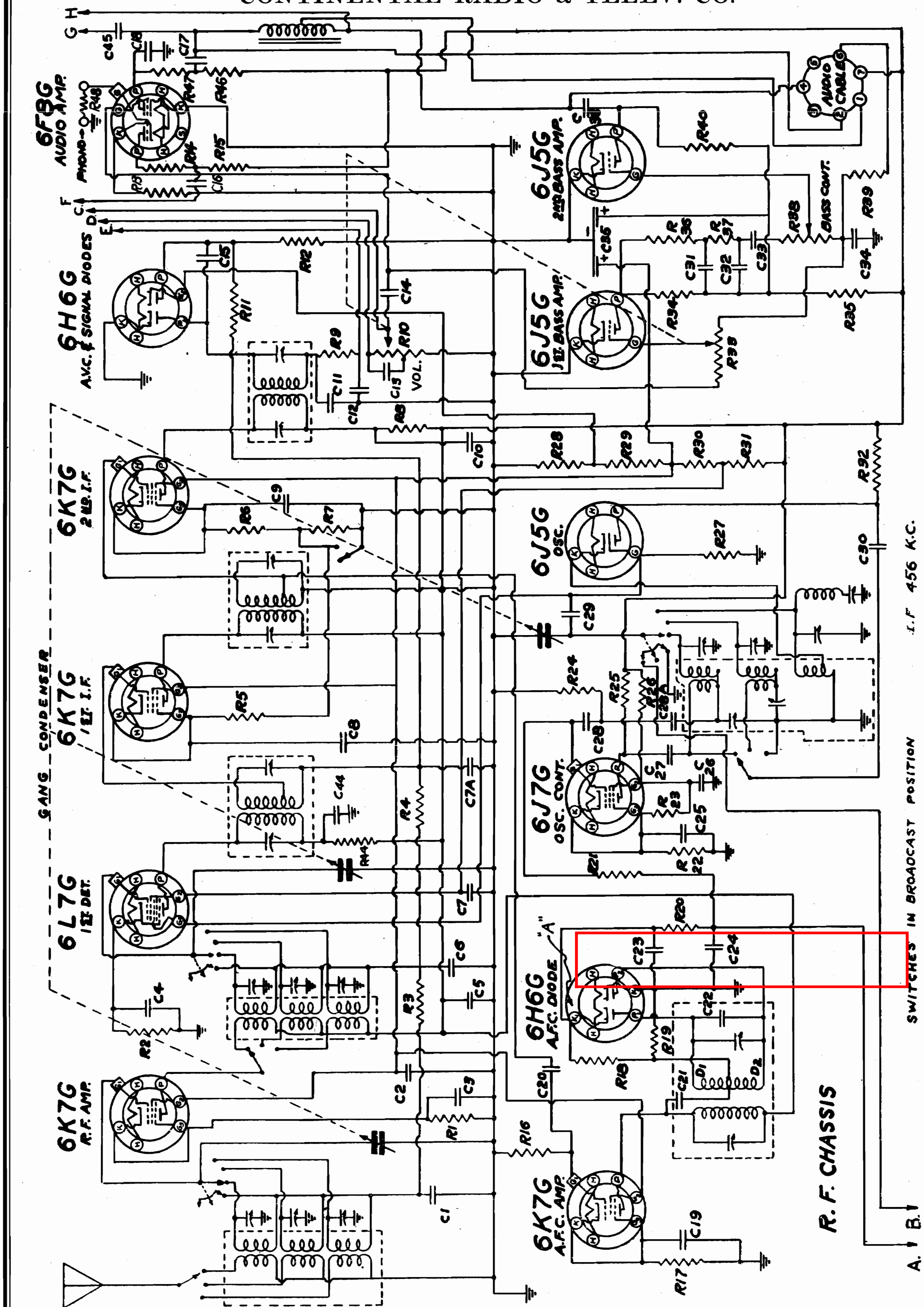


Fig. 1

MODEL 16S

CONTINENTAL RADIO & TELEV. CO.

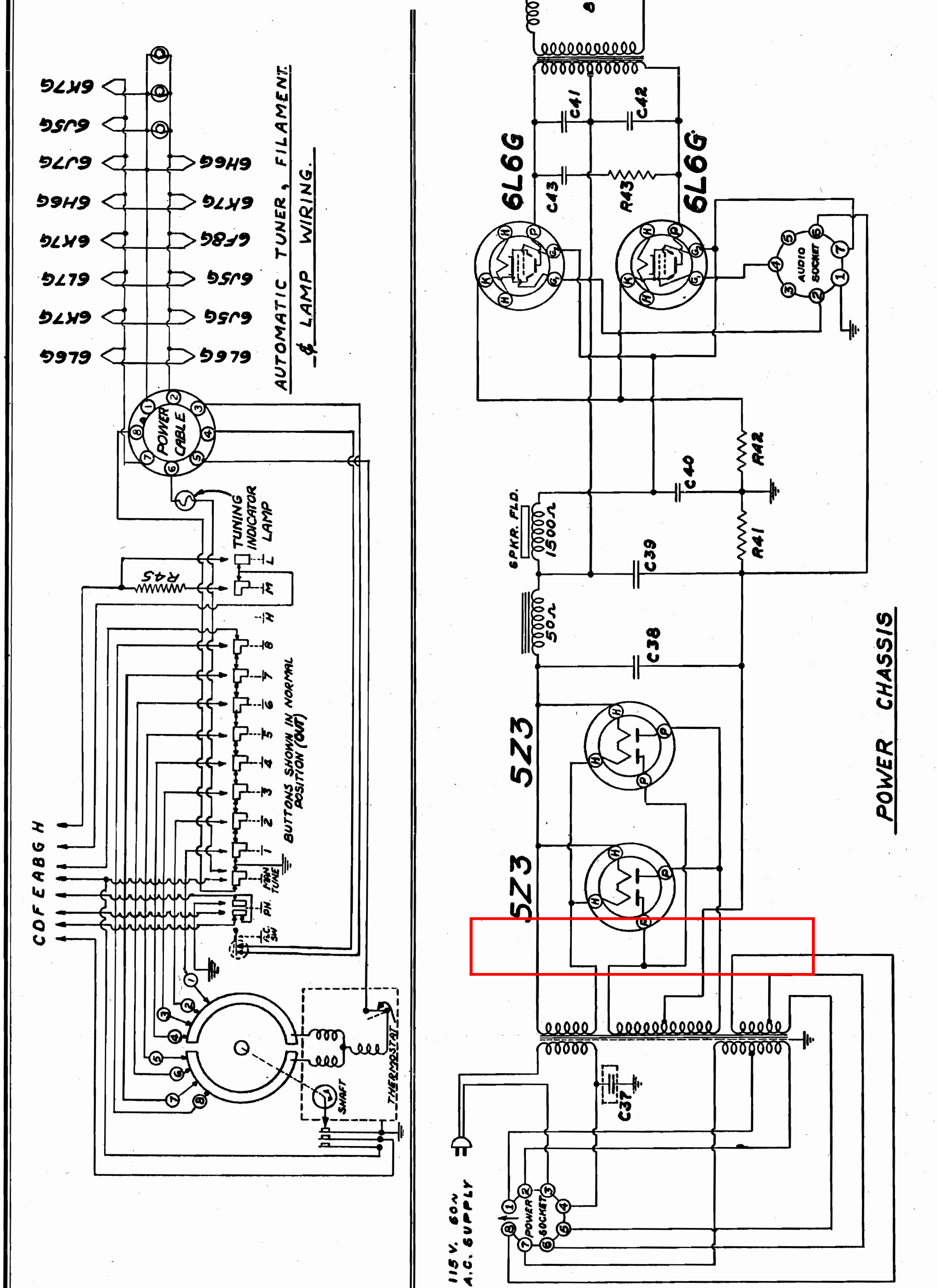
R-F Schematic



16S R. F. CHASSIS SCHEMATIC

CONTINENTAL RADIO & TELEV. CO.

MODEL 16S
Tuner, A-F and
S.P.U. Schematic

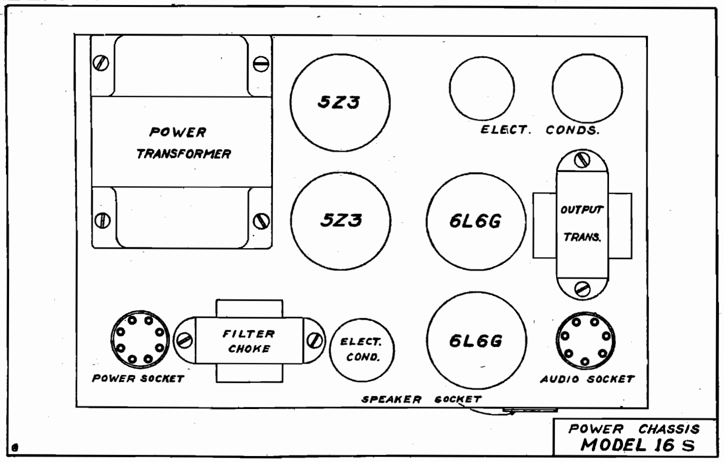


16S COMBINED TUNER and A. F. SCHEMATIC

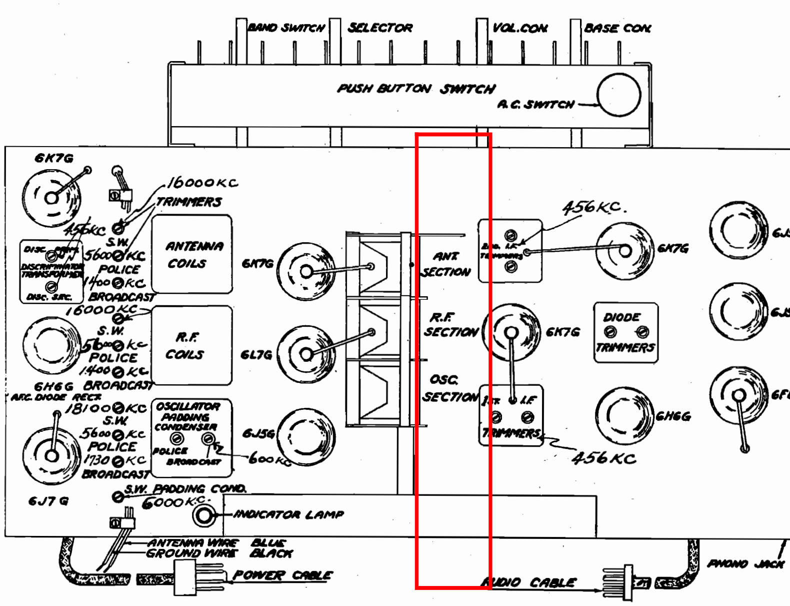
MODEL 16S.
Socket, Trimmers
Alignment, Notes
Parts

CONTINENTAL RADIO & TELEV. CO.

FOR ADJUSTMENT AND OPERATION OF THE ELECTRIC TUNER AND HOW TO TUNE IN STATIONS USING THE ELECTRIC PUSH BUTTON TUNER SEE MODEL 11A.



16S CHASSIS LAYOUT DIAGRAMS



This receiver is designed to operate over three tuning ranges with a Horizontal Pointer movement; the broadcast band which extends from 535 to 1730 Kilocycles (KC) (173 to 560 Meters), Police and Aviation Band which extends from 1.7 to 5.6 Megacycles (MC) (53 to 176 Meters) and the International Short Wave Band which extends from 5.6 to 18.1 Megacycles (MC) (16.5 to 53 Meters). This latter range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.

This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (AC). **Never plug into a DC outlet.**

FLOATING CHASSIS (IMPORTANT) **Loosen the four (4) mounting screws) and two (2) hook bolts that secure the chassis to the cabinet and remove the two (2) wooden strips that are underneath the chassis. This allows the chassis to float and rest on the rubber pads used for this purpose. After the strips have been removed, adjust the chassis in the cabinet so that the dial will be in the center of the front escutcheon plate. Do not retighten the mounting screws. NOTE: Save the mounting screws and wooden strips to use in case the set is reshipped or moved, otherwise damage may be done to the instrument, cabinet or tubes.**

GROUND Wherever possible, a good ground should be employed. Water pipes and steam or hot water radiators make a very desirable ground connection. The ground wire should be connected to the ground lead (Black).

Where the above mentioned ground facilities are not available, a good outside ground may be had by sinking a metal pipe or ground rod about six feet into moist earth. An excellent bed can be prepared by digging a hole and filling with charcoal, in which the ground rod is placed. The charcoal bed surrounding the ground rod will maintain a moist condition throughout the year.

REPLACEMENT PARTS LIST 16S

CARBON RESISTORS

- R 1-P1729 750 Ohm ¼ Watt 10%
- R 2-P2020 700 Ohm ¼ Watt 10%
- R 3-P280 100,000 Ohm ¼ Watt
- R 4-P280 100,000 Ohm ¼ Watt
- R 5-P376 750 Ohm ¼ Watt
- R 6-P1729 750 Ohm ¼ Watt 10%
- R 7-P2019 600 Ohm ¼ Watt 10%
- R 8-P1216 5,000 Ohm ¼ Watt
- R 9-P419 20,000 Ohm ¼ Watt
- R10-P1989 250,000 Ohm Volume Control
- R11-P137 500,000 Ohm ¼ Watt
- R12-P137 500,000 Ohm ¼ Watt
- R13-P756 2,000 Ohm ¼ Watt
- R14-P167 10,000 Ohm ¼ Watt
- R15-P419 20,000 Ohm ¼ Watt
- R16-P1114 2,000,000 Ohm ¼ Watt
- R17-P1729 750 Ohm ¼ Watt 10%
- R18-P137 500,000 Ohm ¼ Watt
- R19-P137 500,000 Ohm ¼ Watt
- R20-P1114 2,000,000 Ohm ¼ Watt
- R21-P137 500,000 Ohm ¼ Watt
- R22-P2024 1,100 Ohm ¼ Watt 5%
- R23-P2021 25,000 Ohm ½ Watt 10%
- R24-P1950 350 Ohm ¼ Watt 10%
- R25-P166 25,000 Ohm ¼ Watt
- R26-P1215 35,000 Ohm 1 Watt
- R27-P417 50,000 Ohm ¼ Watt
- R28-P2022 450 Ohm ¼ Watt 10%
- R32-P165 25,000 Ohm 1 Watt
- R33-P1989 500,000 Ohm Bass Boost on Volume Control
- R34-P166 25,000 Ohm ¼ Watt
- R35-P673 10,000 Ohm ½ Watt
- R36-P167 10,000 Ohm ¼ Watt
- R37-P419 20,000 Ohm ¼ Watt
- R38-P1991 500,000 Ohm Bass Control
- R39-P137 500,000 Ohm ¼ Watt
- R40-P166 25,000 Ohm ¼ Watt
- R43-P1944 15,000 Ohm 2 Watt
- R44-P278 1,000 Ohm ¼ Watt
- R45-P167 10,000 Ohm ¼ Watt
- R46-P166 25,000 Ohm ¼ Watt
- R47-P2018 7,000 Ohm ¼ Watt 10%
- R48-P137 500,000 Ohm ¼ Watt

PAPER CONDENSERS

- C 1-P334 .05 Mfd. 400 V.
- C 2-P141 .25 Mfd. 200 V.
- C 3-P142 .1 Mfd. 200 V.
- C 4-P142 .1 Mfd. 200 V.
- C 5-P1789 .25 Mfd. 400 V.
- C 6-P334 .05 Mfd. 400 V.
- C 7-P142 .1 Mfd. 200 V.
- C7A-P334 .05 Mfd. 400 V.
- C 8-P142 .1 Mfd. 200 V.
- C 9-P142 .1 Mfd. 200 V.
- C10-P334 .05 Mfd. 400 V.
- C14-P334 .05 Mfd. 400 V.
- C16-P334 .05 Mfd. 400 V.
- C17-P1789 .25 Mfd. 400 V.
- C19-P142 .1 Mfd. 200 V.
- C23-P142 .1 Mfd. 200 V.
- C24-P142 .1 Mfd. 200 V.
- C25-P142 .1 Mfd. 200 V.
- C26-P276 .1 Mfd. 400 V.
- C27-P904 .002 Mfd. 600 V.
- C31-P334 .05 Mfd. 400 V.
- C32-P276 .1 Mfd. 400 V.
- C33-P276 .1 Mfd. 400 V.
- C34-P141 .25 Mfd. 200 V.
- C36-P1789 .25 Mfd. 400 V.
- C37-P2030 .02 Mfd. 600 V. Metal Clad
- C41-P904 .002 Mfd. 600 V.
- C42-P904 .002 Mfd. 600 V.
- C43-P1079 .01 Mfd. 1000 V.
- C44-P334 .05 Mfd. 400 V.
- C45-P334 .05 Mfd. 400 V.

MICA CONDENSERS

- C11-P480 .0001 Mfd.
- C12-P480 .0001 Mfd.
- C13-P817 .00025 Mfd.
- C15-P1382 .00005 Mfd.
- C18-P336 .0005 Mfd.
- C20-P672 .001 Mfd.
- C21-P480 .0001 Mfd.
- C28-P672 .001 Mfd.
- C28A-P1044 .0002 Mfd.
- C29-P480 .0001 Mfd.
- C30-P818 .002 Mfd.

CANDOHM RESISTORS

- R29, R30, R31 } P2013: 2400 Ohms, 2250 Ohms, 2260 Ohms
- R41, R42 } P2010 { 150 Ohms, 31 Ohms

ELECTROLYTIC CONDENSERS

- C35 { 4 100 W. V. / 4 250 W. V. } Dry
- C38 25 450 W. V. / C39 12 450 W. V. / C40 25 300 W. V. } Wet

ADJUSTABLE CONDENSERS

- P1980A Variable Condensers
- P1682 Trimmer Condenser (Osc.)
- P2009 4 Gang Trimmer Strip
- P2008 3 Gang Trimmer Strip

TRANSFORMERS AND COILS

- P2000 Power Transformer
- P2001 1st I.F. Transformer
- P2002 2nd I.F. Transformer
- P2003 3rd I.F. Transformer
- P1940 Discriminator Coil
- G5494 Oscillator Coil Assembly
- G5497 R.F. Coil Assembly
- G5499 Antenna Coil Assembly
- P2005 Iron Core Filter Choke
- P2006 Iron Core Audio Choke
- P2007 Output Transformer
- G5501 Tracking Coil

MISCELLANEOUS

- P1928 Tube Socket
- P1153 5Z3 Tube Socket
- P945 Speaker Socket
- P2014 Cable Socket
- P929 A.C. Line Cord
- P1988 Power Cable
- P1987 Audio Cable
- P1989 Volume Control
- P1991 Bass Control
- P1986 Band Change Switch
- G5793 Electric Tuner Cable
- P2017 12" Dynamic Speaker
- P1504 Pilot Light Bulb
- P1503 Pilot Light Socket
- P1455 Tube Shield
- P1456 Tube Shield Base
- P2694 Push Button Switch
- P2689 Rubber Drive Belt
- P2688 Dial Scale
- P2644 Dial Pointer
- P2532 Tilt Escutcheon
- P2619 Push Button Escutcheon
- P2698 Bass Control Escutcheon
- P2699 Band Switch Escutcheon
- G5462 Lower Segment Adjustment Bracket and Contact
- G5463 Upper Segment Adjustment Bracket and Contact
- P2690 Electric Motor
- P2677 Ivory Push Button Knob
- P2678 Walnut Push Button Knob
- P2720 Band Switch Knob and Bass Control Knob
- P2721 Selector Knob
- P2722 Volume Control Knob

CROSLEY CORP.

MODEL 438,438M,486 Phono. Chassis,Voltage,Alignment Drive Data,Phono.Data,Tuner

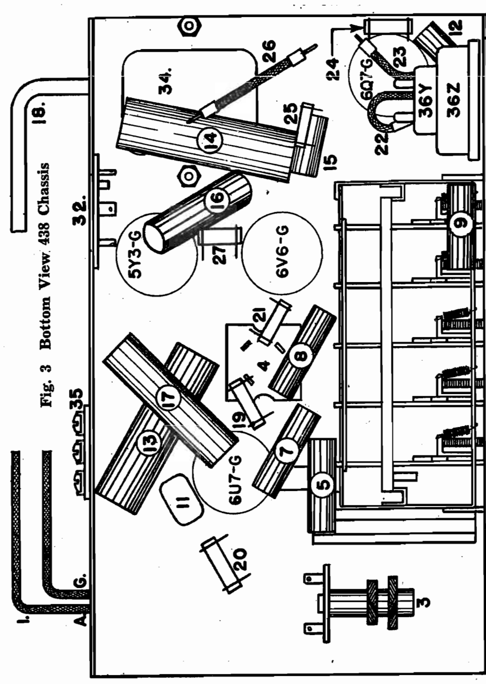


Fig. 3 Bottom View 438 Chassis

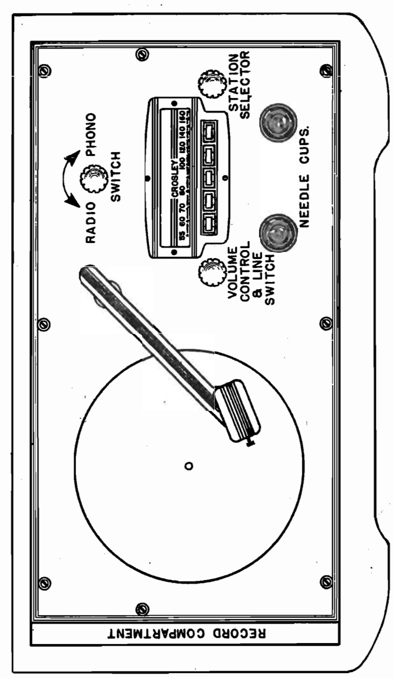


Fig. 4 Top View — Combination

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	G	Su
6U7G	Amplifier	6.7	175	100	—	–3	—
6Q7G	Det., A. V. C., 1st. A-F	6.7	78	—	–3	–1.5	—
6V6G	Output	6.7	172	178	—	–10.	—
5Y3G	Rectifier	4.1	negative end of spk. field to No. 8 pin 225 volts				

Voltage drop across speaker field 40 volts.
Maximum power output approximately 3. Watts
Power consumption at 117.5 line approx. 36 watts. Phono—15 watts additional.

Item No.		
10	Deleted	Was Capacity Coupling (Twisted Leads)

MODEL 438-M
Chassis 438 — Phono Assy. 486

FOR SCHEMATIC SEE INDEX

OCTOBER, 1938

SPECIFICATIONS

This model combination consists of a four-tube T. R. F. radio receiver and Record Player in a console cabinet, designed for operation on electric circuits as specified on the Model and License Notice Label.

Incorporated in the receiver design is, a mechanical Push Button tuning system, an iron cored antenna coil with antenna to match, A.V.C., beam power output and dynamic speaker.

The frequency range of the receiver is from 1725 to 540 kilocycles. The tubes used and their function are as follows: one 6U7G as R-F amplifier, one 6Q7G as detector, A.V.C. and 1st audio amplifier, one 6V6G as beam power and one 5Y3G as rectifier.

The bias for the 6U7G is obtained from the voltage drop across a 60 ohm resistor (item 22) and is measured from the chassis to the Cathode of the 6Q7G. The bias for the 6Q7G is obtained from the drop across a 32 ohm resistor (item 23) and is measured from the cathode of the 6Q7G to the junction of items 23 (32 ohm)—24 (3 meg) and 26 (140 ohm). The 6V6G bias is obtained from the total drop across items 22 (60 ohm., 23 (32 ohm) and 26 (140 ohm) resistors which are in series with the speaker field that is in the negative leg of the power supply. The bias is measured from chassis to the junction of items 26, 27 and speaker field.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 6V6G output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd., or larger—not electrolytic) in series with one of the leads.

ALIGNMENT PROCEDURE

The signal generator high side should be connected to the antenna through a .0001 Mf. condenser, after the antenna has been completely uncoiled. The low side of the signal generator is connected to chassis.

(a) First check to see that the pointer makes a complete trip both ways.
(b) Set the signal generator to 1400 kilocycles.
(c) Set the pointer of receiver to 140 on the dial.
(d) Adjust trimmer condensers on the gang for maximum output.
(e) Check to see that set will tune to 1725 kilocycles, it does not have to tune through a peak at this frequency.

Any large discrepency in tracking may be compensated for by slight adjustments of the split end plates of the condenser gang.

Check Push Buttons to see if they need resetting.

SETTING THE PUSH BUTTONS

The push buttons may be quickly and accurately set from the front of the receiver. Insert a small screw driver in the whole in the front of each push button to be set and loosen (DO NOT REMOVE) the set screw at the bottom of the hole.

Determine the favorite broadcasting stations whose call letters are to be placed in the push buttons. By means of the station selector knob, tune-in AS ACCURATELY AS POSSIBLE the station having the highest frequency (kilocycles), that is the one nearest the 150 marking on the knob. Completely depress and hold the right hand push button in that position, while you SECURELY TIGHTEN THE SET SCREW.

The push button system is now set for the first station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles.)

Cut the call letters of the stations selected, from the list supplied with your receiver and press them into the openings in the front of the push buttons. Four pieces of clear celluloid are supplied in a small envelope and should be snapped into place over the call letters to protect and hold them in place.

REPLACING DRIVE CORD

1.—Remove the chassis from the cabinet.
2.—Remove the broken drive cord, first from the pointer then from the pulleys. Remove the cord tension spring.
3.—Remove the dial (glass and mask) and the manual tuning shaft bracket.
4.—Cut a piece of drive cord 44 inches in length (G2-41582).
5.—Tie the cord tension spring approximately 1½ inches from the one end of the cord. Open gang condenser, this should place the eyelet in the pulley up. Insert the end of the cord through eyelet, from the inside of pulley. Hook end of the tension spring on the catch in pulley, opposite the eyelet.
6.—Bring the cord forward and down, then around lower idler pulley, (on gang bracket) on the underside, continue over to the left hand idler pulley. Bring around and over in a clockwise direction. Continue on over to top of right hand idler pulley, then straight down to and around pulley on drive shaft. Make two complete turns around drive shaft pulley in a clockwise direction. Then bring cord up and over top idler pulley on gang bracket, making ½ turn in a counter clockwise direction. Continue cord straight down then back and around large pulley on the gang, in a counter clockwise direction to eyelet. Insert end of cord through eyelet (top down). Pull cord until tension spring is stretched to about ¾ inches in length. Loop cord in tension spring and tie in knot. Clamp cords together with cord clamp (W-46290) approximately ⅛ inch from inside rim of large pulley.

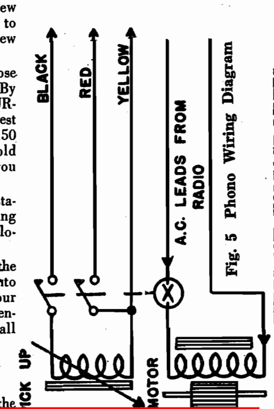


Fig. 5 Phono Wiring Diagram

7.—Replace manual drive shaft bracket, dial mask and dial.
8.—Close condenser gang, place pointer at 540 on dial and then insert drive cord in pointer. Check pointer travel before cementing the cord to pointer.

PHONO

The motor is mounted in such a manner that it will swing up and down a short distance. The reason for this is, that when the turntable is in operating position the weight of the motor is applied to the friction drive and against the inside surface of the turn-table rim. The amount of friction obtained is just right for proper operation. When placing the turn-table in position, first hook the rim over the friction drive on the motor shaft then carefully place the center hole in the turn-table on the record guide (spindle). During this operation you should be very careful to see that the friction drive is completely under the rim and that the turn-table is all the way down on the record guide (spindle).

The Radio-Phono Switch (Fig. 4) when turned to the left is for radio broadcast reception and when turned to the right cuts off the radio signals and starts the phonograph motor.

The Volume Control and Line Switch of the receiver must be turned on before the motor will operate. This volume control also controls the output level of the phonograph.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with volume control full on and no signal input. The filament voltages should be measured with an accurate low range voltmeter. Voltage limits may vary plus or minus 10% of values given.

MODEL 448 Combination
Socket, Trimmers, Voltage
Alignment, Phono. Data, Tuner

CROSLEY CORP.

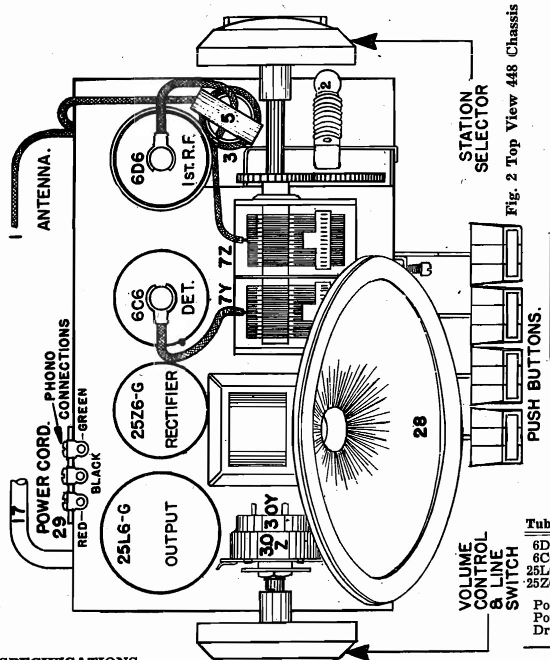


Fig. 2 Top View 448 Chassis

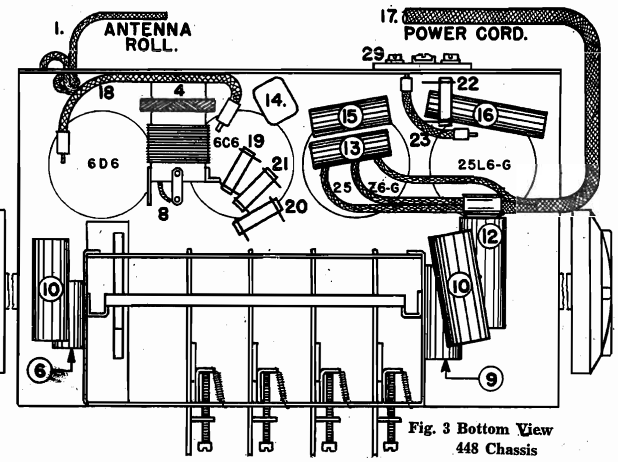


Fig. 3 Bottom View 448 Chassis

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	Su.	G
6D6	R-F Amplifier	6.3	97	98	2.5-25	2.5-25	—
6C6	Detector	6.3	20	10	7	—	—
25L6-G	Output	25	85	98	6	—	—
25Z6-G	Rectifier	25	—	—	126	—	—

Power output approximately 2 watts.
Power consumption at 117.5 volts line 45 watts. Phono. Motor 15 watts additional.
Drop across field 28 volts.

SPECIFICATIONS

The receiver is a four-tube Tuned Radio Frequency receiver designed for operation on A. C. circuits as specified on Model Sticker. Push Button tuning, Beam power output, Dynamic Speaker are a few of the features incorporated in this receiver. The frequency range is from 1725 to 540 Kc. The tubes used and their functions are as follows: one 6D6 as R-F amplifier, one 6C6 as biased detector, one 25L6G as beam power output and one 25Z6G as rectifier. The volume control varies the bias on the 6D6 and at the same time the amount of signal fed to the antenna coil primary. The bias for the 6C6 is obtained from the voltage drop across item 19 (25000 ohm resistor) and for the 25L6G from the drop across item 23 (110 ohm resistor).

This receiver incorporates a certain amount of fixed regeneration to improve selectivity and sensitivity. With a normal antenna the receiver is stable and the performance approaches that of a three gang T. R. F. receiver in spite of the fact that only a two gang condenser is used. However with no antenna or a very small antenna the receiver will oscillate but this oscillation can readily be controlled by the volume control.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with volume control full on and no signal input. The filament voltages should be measured with an accurate low range voltmeter. Voltage limits may vary plus or minus 10% of values given.

NOTE: The RED and BLACK terminals on the phono terminal board supply the current for the phono motor, therefore HAVE 110 VOLTS ACROSS THEM WHEN THE RECEIVER IS IN OPERATING POSITION. BE CAREFUL NOT TO TOUCH OR SHORT CIRCUIT THEM WHILE WORKING ON THE CHASSIS.

CONNECTING OUTPUT METER

Connect the one terminal of the output meter to the plate and the other terminal to the screen of the 25L6G Output tube. Be sure the output meter is protected from D. C. by connecting a condenser (.1 mfd. or larger —NOT electrolytic) in series with one of the leads.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power line, therefore when using an A. C. operated signal generator for alignment the following precaution should be taken.

(a) Connect the output lead of the signal generator through a .0001 Mf. condenser to the antenna lead on the receiver (after the antenna has been completely unrolled. The ground lead of the generator should be connected through a .001 Mf. condenser to the chassis.
(b) Open the gang condenser all the way.
(c) Set the generator to 1725 Kilocycles.
(d) Adjust the trimmer condensers on the gang until the 1725 Kc signal is heard. The gang does not have to tune through this signal.
(e) Set the generator to 1400 Kc.
(f) Tune the set to the 1400 Kc. signal, then alternately adjust the trimmers on the gang until no further improvement can be noticed on the output meter.

NOTE: Always use the lowest signal generator output that will give a reasonable indication on the output meter.

Keep the two grid leads as far as possible from each other.

If the receiver has been re-aligned it may be necessary to readjust the setting of the push buttons.

SETTING THE PUSH BUTTONS

The push buttons may be quickly and accurately set from the front of the receiver. Insert a small screw driver in the hole in the front of each push button to be set and loosen (DO NOT REMOVE) the set screw at the bottom of the hole.

Determine the favorite broadcasting stations whose call letters are to be placed in the push buttons. By means of the station selector knob, tune-in AS ACCURATELY AS POSSIBLE the station having the highest frequency (kilocycles), that is the one nearest the 150 marking on the knob. Completely depress and hold the right hand push button in that position, while you SECURELY TIGHTEN THE SET SCREW.

The push button system is now set for the first station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles).

Cut the call letters of the stations selected, from the list supplied with your receiver and press them into the openings in the front of the push buttons. Four pieces of clear celluloid are supplied in a small envelope and should be snapped into place over the call letters to protect and hold them in place.

RECORD PLAYER ASSEMBLY

The record player assembly consists of a small self-starting motor, Phono-Radio switch, magnetic pickup and a separate volume control mounted on a metal base plate.

Connections—

A three lead cable is used for connecting the Phono Unit to the Radio receiver. The green lead is the high side of the magnetic pickup and is connected to the 6C6 cathode through a .25 Mf. 160 V. condenser. The red lead is the high side of the 110 volt circuit for the motor. The black lead is connected to the receiver chassis and is the low side of the pickup and motor.

Operation—

Place turn table in position by hooking the rim over the rubber friction drive on the motor shaft, then carefully placing center hole over record guide spindle. Be sure that the table is all the way down on the spindle and that the friction drive is riding full on the inside surface of the rim.

FOR SCHEMATIC SEE INDEX

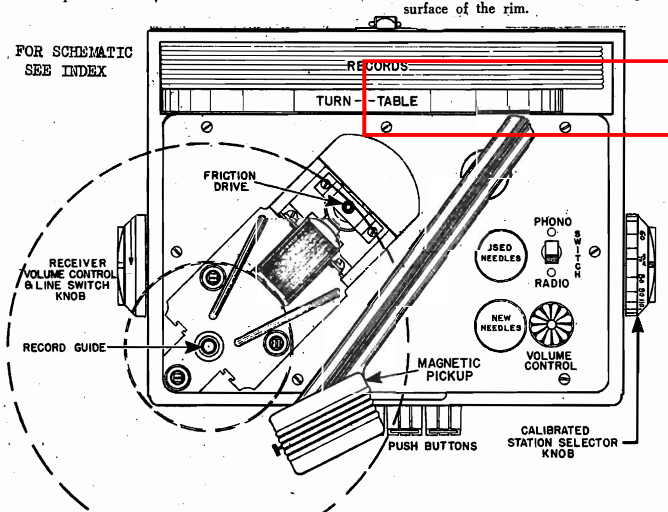


Fig. 4—Top View Phono Assembly

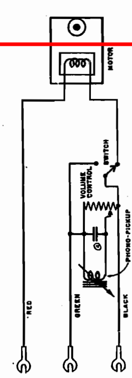


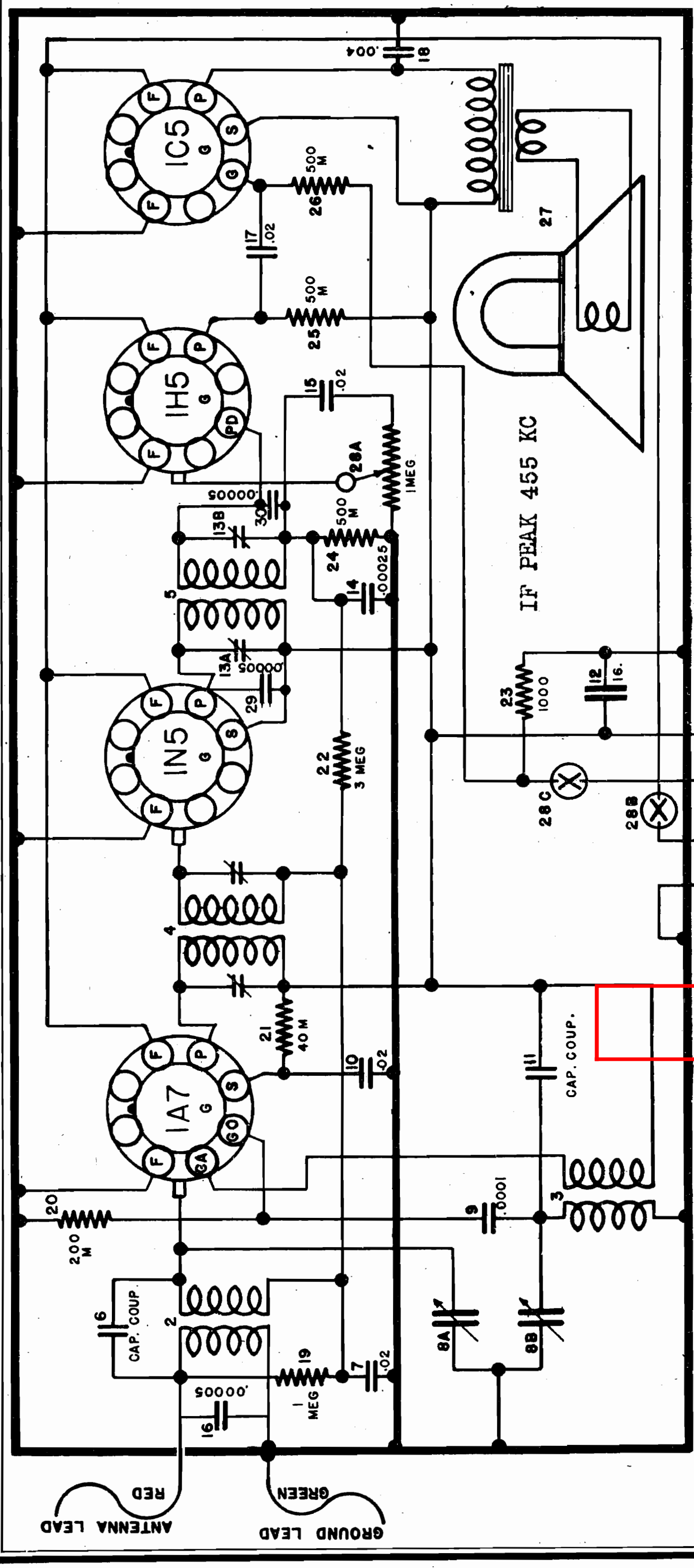
Fig. 5—Phono Wiring Diagram

CROSLEY CORP.

MODEL 458, Battery Vanity
Schematic, Socket, Trimmers
Voltage, Chassis

Tube	Function	H	P	S	G	Ga	Go
1A7-G	Oscillator-Modulator	1.5	82	43	0	82	-6
1N5-G	I-F Amplifier	1.5	82	82	0	—	—
1H5-G	Detector & 1st A-F Amp.	1.5	17	—	0	—	—
1C5-G	Output	1.5	78	82	8*	—	—

Power Output approximately .5 Watt.
"A" Battery Drain approximately .25 Ampere at 1.5 Volts.
"B" Battery Drain approximately 9 Milliamperes at 90 Volts.
*Measured at No. 8 Socket Lug and Chassis.



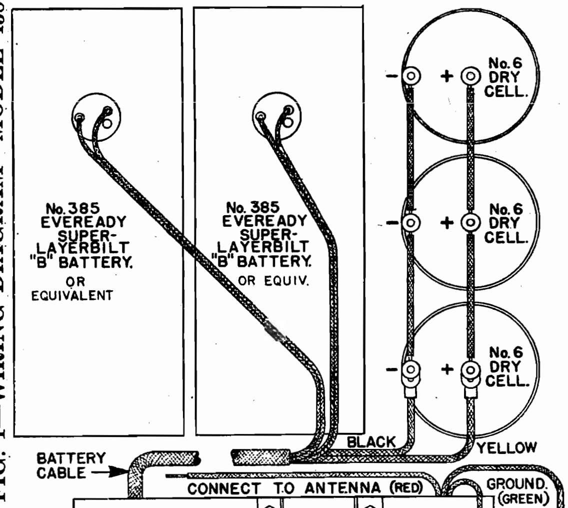


FIG. 1—WIRING DIAGRAM—MODEL 458

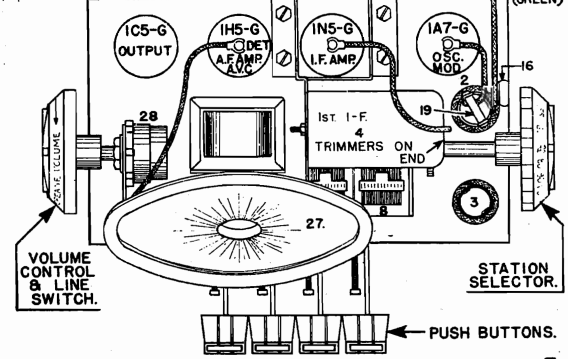
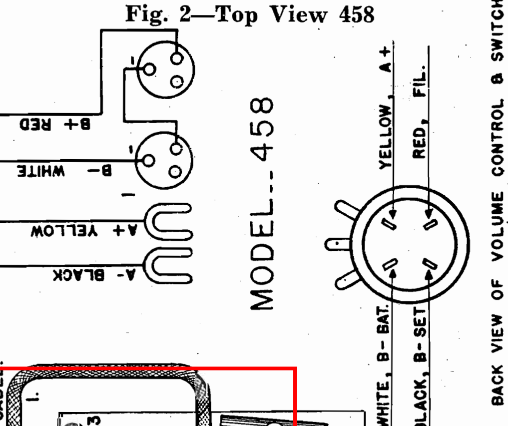


Fig. 2—Top View 458



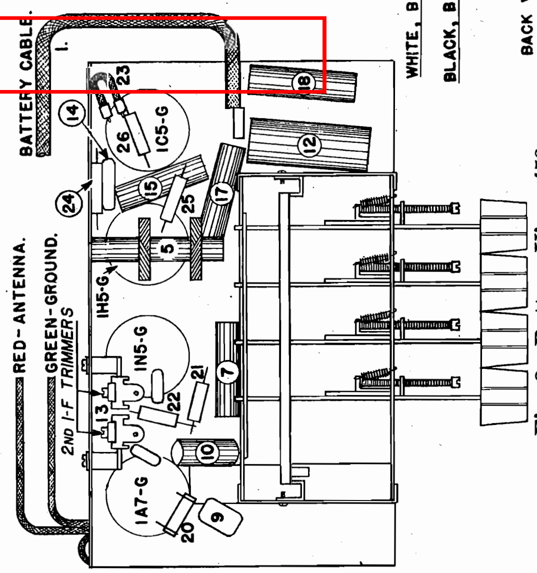


Fig. 3—Bottom View 458

MODEL 458, Battery Vanity
Alignment, Tuner, Notes
Parts

CROSLEY CORP.

MODEL 458 (Battery Vanity)

SPECIFICATIONS

The Crosley Model 458 radio is a four-tube superheterodyne receiver designed for operation from batteries. The method of connecting the battery cable to the batteries is shown on the Wiring Diagram. The batteries required are: one 1.5 volt "A" (EVEREADY NO. 740 or equivalent) or 3 or 4 No. 6 DRY CELLS in parallel, and two plug-in type 45 volt "B" batteries.

TUBES AND VOLTAGE LIMITS

The table gives the function of the tubes used, together with the voltage readings between the tube socket contacts and the negative side of the "A" battery circuit. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with receiver in operating condition and the volume control full on and no signal input. The filament voltages should be measured with an accurate low range DC voltmeter (approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary, the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter across the "P" and "S" terminals of the 1C5G output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 1A7G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely in mesh and turn the volume control knob to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I-F trimmers (located through rear of chassis flange) for maximum reading on the output meter. (Fig. 3).

(e) Adjust both trimmers located on the 1st I-F transformer (right end) for maximum output. (Fig. 2).

(f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0002 mfd. condenser to the "ANT" terminal of the receiver.

(a) Set the signal generator to 1725 kilocycles.

(b) Open the condenser gang all the way.

(c) Adjust the "OSC" trimmer condenser on gang for maximum output.

(d) Set the signal generator to 1400 kilocycles.

(e) Tune the receiver to the generator signal for maximum output (approximately 140 on the dial).

(f) Adjust the "ANT" trimmer condenser on gang for maximum output. DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.

(g) Repeat operations (e) and (f) alternately until no further improvement in output can be obtained.

If any of the circuits have been re-adjusted it may be necessary to reset the push buttons.

SETTING THE PUSH BUTTONS

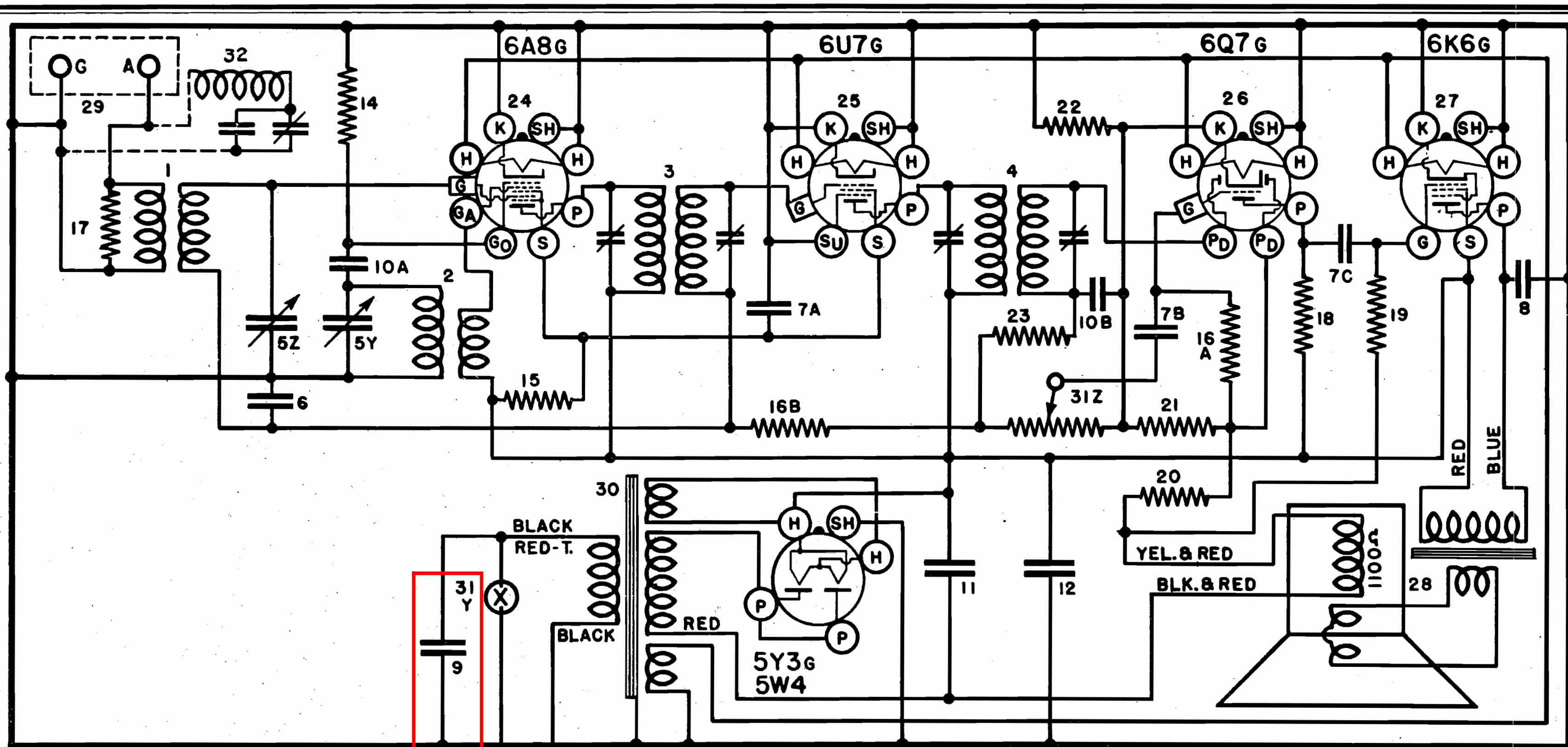
With a small screw driver or pen knife remove celluloid cover and the call letters. Insert screw driver in the hole in the front of the button and loosen the set screw a turn or two. With the manual tuning knob tune-in as ACCURATELY AS POSSIBLE the station for which the button is to be set. Then push the button all the way down and while you hold it in that position SECURELY TIGHTEN the set screw. Replace the call letter and call letter cover. Use same procedure in resetting or adjusting the rest of the push buttons.

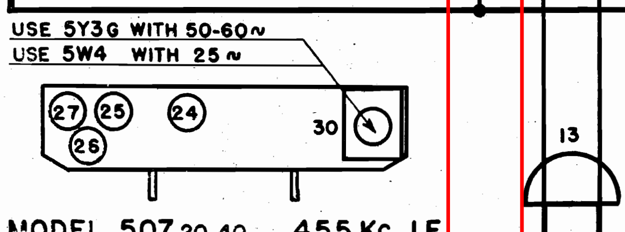
Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	C —46433A	Battery Cable
2	G176—32000	Antenna Coil
3	G177—32002	Oscillator Coil
4	G194—32004	1st I.F. Transformer
5	G204—32004	2nd I.F. Transformer
6	G6 —50640	Condenser Capacity Coupling
7	W —28621	Condenser, .02 Mf. 200 V. Paper
8A, 8B	G65 —33001	Var. Condenser, Antenna Section; Var. Condenser, Oscillator Section
9	G2 —34002	Condenser, .0001 Mf. Molded
10	W —28621	Condenser, .02 Mf. 200 V. Paper
11	G3 —50640	Capacity Condenser Coupling
12	W —45783	Condenser, 16 Mf. 125 V. Elect.
13A, 13B	W —44882	Trimmer Condenser; Trimmer Condenser
14	G1 —34002	Condenser, .00025 Mf. Molded
15	W —28621	Condenser, .02 Mf. 200 V. Paper
16	G5 —34002	Condenser, .00005 Mf. Molded
17	W —28621	Condenser, .02 Mf. 200 V. Paper
18	W —28904	Condenser, .004 Mf. 200 V. Paper
19	—21454	Resistor, 1 Megohm 1/3W. Carbon
20	—34018	Resistor, 200,000 Ohm 1/3W. Carbon
21	—36761	Resistor, 40,000 Ohm 1/3W. Carbon
22	—36688	Resistor, 3 Megohm 1/4W. Carbon
23	W —35581	Resistor, 1,000 Ohm 3/4W. Flexible
24	—36322	Resistor, 500,000 Ohm 1/4W. Carbon
25	—36322	Resistor, 500,000 Ohm 1/4W. Carbon
26	—36322	Resistor, 500,000 Ohm 1/4W. Carbon
27	274-PL-5-"B"	Speaker, Spec. 55PWS1 (P. M.)
	—47083	Cone and V. C. Assy.
	—47084	Output Transformer
	—46685	Cardboard Ring
28A, 28B, 28C	—46435	Volume Control, 1 Megohm; "A" Supply Switch; "B" Supply Switch
	—46259	Cabinet 8BB
	—45825A	Knob, Volume Control
	—45822	Knob, Dial
	W —45931A	Rubber Foot and Screw
	—45553B	Push Button
	W —45852A	Baffle Board
	W —45852	Grille Cloth
	—50841	Call Letter Sheet
	W —50551A	Call Letter Cover
	W —45930C	Rubber Foot
	—46450	Instructions
	G26 —45683	Riveted Key Assy.
	G27 —45683	Rocker Plate Assy.
	W —50542C	Key Clip (Lock Clamp)
	W —50561	No. 6 x 40 x 1/8" Fil. Hd. Screw, Rocker Plate Bearing
	W —50547	Key Plate
	W —50607C	Push Button Spring
	—45717	No. 6 x 32 x 1 7/16" Fil. Hd. Screw, Clamp Adjusting
	—31388	No. 8 x 32 x 3/16" H. H. Mach. Screw, Key Plate Mounting Screw
	—2046	No. 8 Shakeproof Washer, Key Plate Screw

MODEL 507
Schematic
Voltage
Socket

CROSLEY CORP.





DECEMBER, 1937

REFRIGERATOR RADIO, CHASSIS NO. 507

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	G	Ga
6A8G	Oscillator-Modulator	6.3	160	115	0	-1.2	160
6U7G	I-F Amplifier	6.3	160	115	0	-1.2	—
6Q7G	Diode Det & A-F Amplifier	6.3	80	—	2.5	-2.5	—
6K6G	Output	6.3	160	160	0	-5.0	—
5Y3	Rectifier	5.0	—	—	225	—	—

Power output approximately 2 watts.
Power consumption approximately 40 watts at 117.5 volts.
Voltage drop across speaker field 36 volts.

MODEL 507
Trimmers, Chassis
Alignment, Parts

CROSLEY CORP.

SPECIFICATIONS

This model Crosley radio chassis is especially designed for installation in Crosley Shelvador electric refrigerators. It should be operated only from an ALTERNATING CURRENT power supply as specified on the rear of the receiver.

The tuning range of the receiver is from 540 to 1725 kilocycles or 555 to 173 metres.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between tube socket contacts and chassis. Voltage readings taken with a 1000 ohm per volt, 500 volt voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Voltage limits may vary plus or minus 10% of values given.

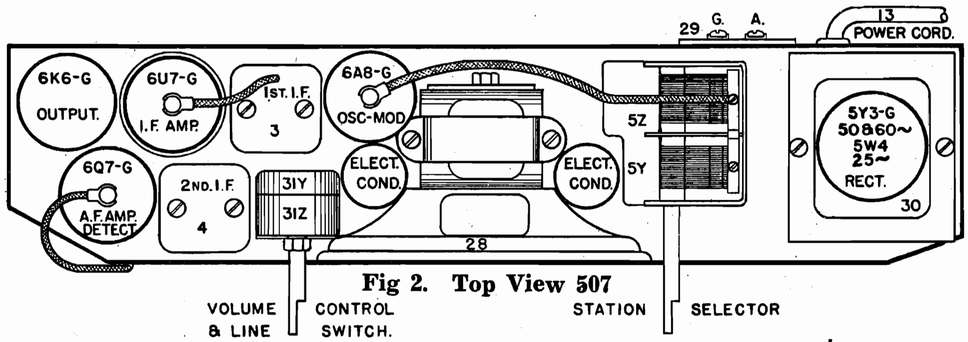


Fig 2. Top View 507

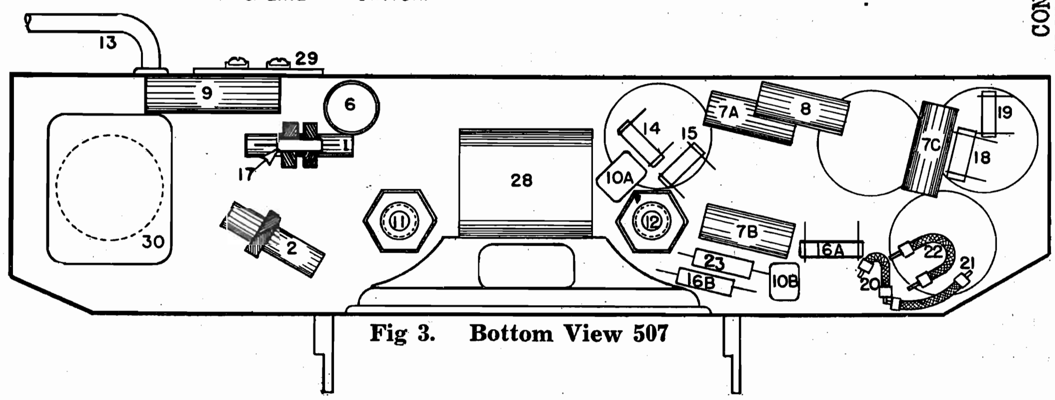


Fig 3. Bottom View 507

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOL. VIII.

Connect output meter across "P" and "S" of 6K6G tube.
IF Generator 455 kc through .02 cond. to 6A8G grid cap. Gen. gnd. to receiver gnd. Variable out of mesh. Vol. control (ON).
Adjust 2nd and 1st IF trimmers to maximum output.
RF Gen. at 1725 kc through .0002 cond to Ant. terminal. Variable out of mesh. Adjust osc trimmer (33Y) for max. out.
Gen. 1400 kc. Dial 1400 kc. Adjust ant trimmer(33Z) max. out.

PARTS LIST—MODEL 507

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description	Item No.	Part No.	Description
1	G132—32000	Ant. Coil	20	W —25937	Resistor, 275 Ohm ½W. Flex.
2	G132—32002	Osc. Coil	21	W —23012A	Resistor, 40 Ohm ¾W. Flex.
3	G177—32004	1st I-F.	22	W —24357	Resistor, 75 Ohm ¾W. Flex.
4	G178—32004	2nd I-F.	23	—36761	Resistor, 40,000 Ohm ¼W. Insu.
5	G48 —33001	2 Section Gang Cond.	24	G156—36400	Socket, Type 6A8
	W —45368B	Pointer Shaft	25	G171—36400	Socket, Type 6U7
	W —45367	Pointer Shaft Bracket	26	G160—36400	Socket, Type 6Q7
	—41582	Drive Cord (9-inch)	27	G172—36400	Socket, Type 6K6
	W —44635	Tension Spring		W —40911	Tube Shield (6U7-G)
	W —45155B	Pointer	28	275BL7"B"	Speaker
6	W —36541	Condenser, .02 Mf. 160 V.		—45467	V. C. and Cone Assy.
7A	W —28621	Condenser, .02 Mf. 200 V.	29	G1 —26719	Ant. and Gnd. Terminal Assy.
7B	W —28621	Condenser, .02 Mf. 200 V.	30	—45149	Power Trans., 50-60 Cy.—110 V.
7C	W —28621	Condenser, .02 Mf. 200 V.		—45148	Power Trans., 25 Cy.—110 V.
8	W —34647	Condenser, .006 Mf. 400 V.	31	—45162	Vol. Cont. (1 Meg.) and Line Switch
9	W —30805	Condenser, .01 Mf. 400 V.	32	G165—32004	Wave Trap
10A	G1 —34002	Condenser, .00025 Mf. Molded		W —45198A	Speaker Screen
10B	G1 —34002	Condenser, .00025 Mf. Molded		C —45173A	Escutcheon
11	W —44012	Condenser, 16 Mf. 250 V.		W —45380	Knob (2 Req.)
12	W —43450	Condenser, 16 Mf. 200 V.		W —45157	Chassis Mtg. Brkt.
13	B —44867	Power Cord and Plug		C —45158B	Chassis Bottom Cover
14	—21237A	Resistor, 60,000 Ohm ⅓W. Carb.		W —45401	Support Angle—to Brkt. on Spkr.
15	—24990	Resistor, 25,000 Ohm ⅓W. Carb.		W —45402B	Support Brkt.—to Spkr. Stud
16A	—26577	Resistor, 3 Megohm ⅓W. Carb.		W —23880	Thumb Screw—Sup. Angle Mtg.
16B	—26577	Resistor, 3 Megohm ⅓W. Carb.			
17	—22196	Resistor, 20,000 Ohm ⅓W. Carb.			
18	—35601	Resistor, 300,000 Ohm ¼W. Insu.			
19	—23785	Resistor, 500,000 Ohm ⅓W. Carb.			

CROSLEY CORP.

MODEL 568, Trouper
Schematic, Voltage, Chassis
Socket, Trimmers

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	Su	G
6K7GT	R-F Amplifier	6.3	97	98	2.5–25	2.5–25	—
6 J7GT	Detector	6.3	20	10	7	—	—
25L6GT	Output	25	85	98	6	—	—
25Z6GT	Rectifier	25	—	—	126	—	—
W-46416	Ballast	55 Volts A. C.					

Power output approximately 2 watts.
Drop across field 28 volts.
Power consumption at 117.5 volts line 45 watts (A.C.).
All readings except filaments will be approximately 10% lower on 117.5 D. C.

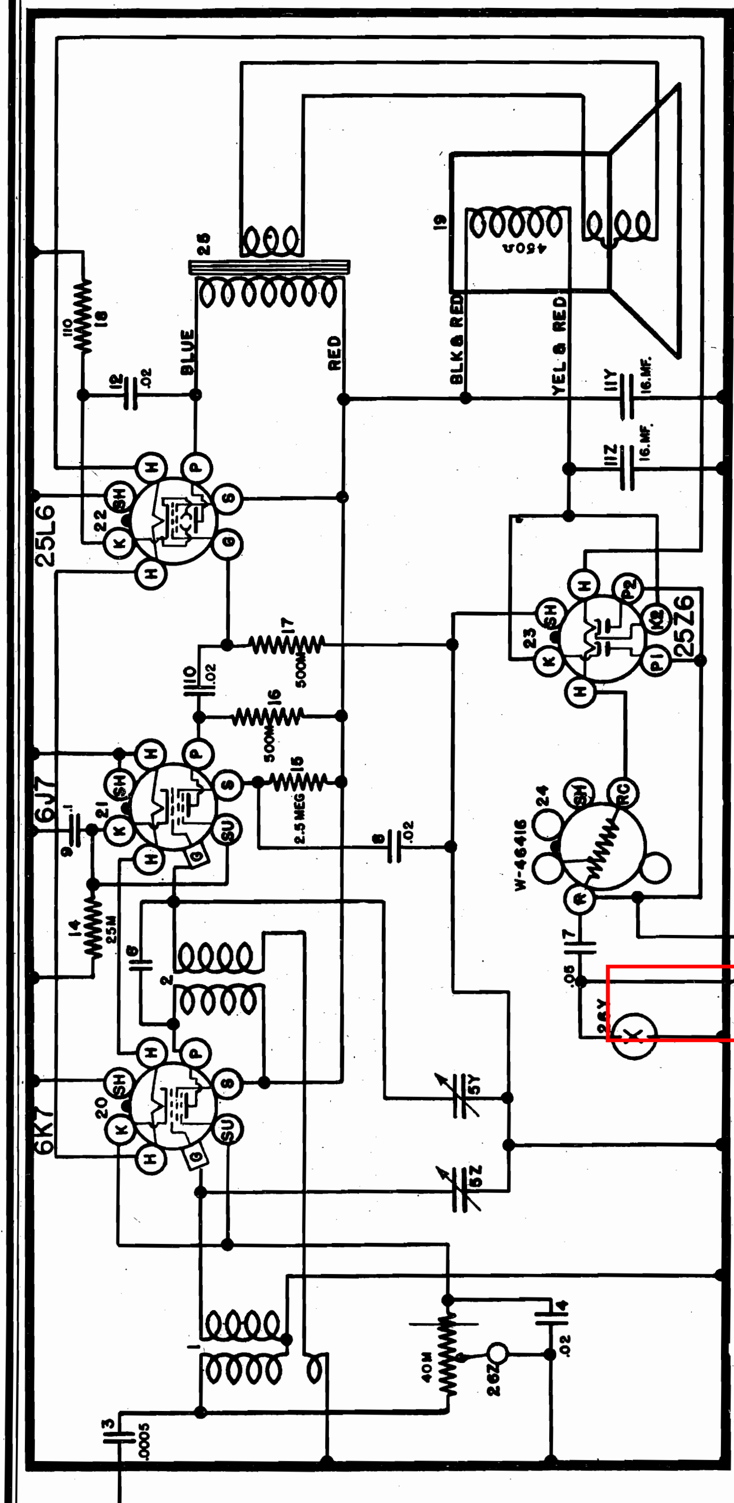


FIG. 1—WIRING DIAGRAM—MODEL 568

DECEMBER, 1938

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with volume control full on and no signal input. The filament voltages should be measured with an accurate low range voltmeter. Voltage limits may vary plus or minus 10% of values given.

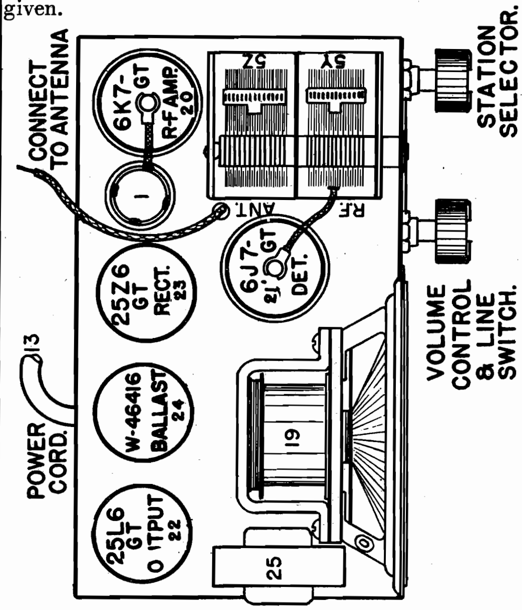


Fig. 2 Top View No. 568

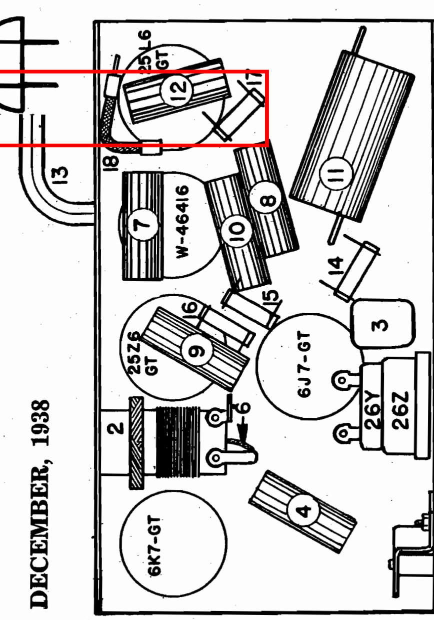


Fig. 3 Bottom View No. 568

MODEL 568, Trouper
Alignment, Notes
Parts

CROSLEY CORP.

CHASSIS NO. 568 (TROUPER)

SPECIFICATIONS

This model Crosley employs four tubes in a highly efficient T. R. F. circuit and on Ballast tube for dropping the line voltage instead of resistance in the power cord.

The frequency range is from 1725 to 540 kilocycles.

The tubes used are of the new Bantam type. Their functions are as follows, one 6K7-GT as R-F amplifier, one 6J7-GT as detector, one 25L6-GT as beam power output, one 25Z6-GT as rectifier. The all metal ballast tube has approximately 200 ohms resistance when cold.

The volume control varies the bias on the 6K7-GT and at the same time the amount of signal fed to the primary of the antenna coil. The bias for the 6J7-GT is obtained from the drop across item 14, a 25,000 ohm resistance and for the 25L6-GT, the drop across item 18, a 110 ohm resistance. The speaker field (450 ohms), is used for filtering in the high side of the "B" supply.

This receiver incorporates a certain amount of fixed regeneration to improve selectivity and sensitivity. With a normmal antenna the receiver is stable and the performance approaches that of a three gang T. R. F. receiver in spite of the fact that only a two gang condenser is used. However with no antenna or a very small antenna the receiver will oscillate but this oscillation can readily be controlled by the volume control.

CONNECTING OUTPUT METER

Connect the one terminal of the output meter to the plate and the other terminal to the screen of the 25L6-G Output tube. Be sure the output meter is protected from D. C. by connecting a condenser (.1 mfd. or larger —NOT electrolytic) in series with one of the leads.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power line, therefore when using an A. C. operated signal generator for alignment the following precaution should be taken.

(a) Connect the output lead of the signal generator through a .0001 Mf. condenser to the antenna lead on the receiver. The ground lead of the generator should be connected through a .001 Mf. condenser to the chassis.

(b) Open the gang condenser all the way.

(c) Set the generator to 1725 Kilocycles.

(d) Adjust the trimmer condensers on the gang until the 1725 Kc signal is heard. The gang does not have to tune through this signal.

(e) Set the generator to 1400 Kc.

(f) Tune the set to the 1400 Kc. signal, then alternately adjust the trimmers on the gang until no further improvement can be noticed on the output meter.

NOTE: Always use the lowest signal generator output that will give a reasonable indication on the output meter.

Keep the two grid leads as far as possible from each other.

PARTS LIST — MODEL 568

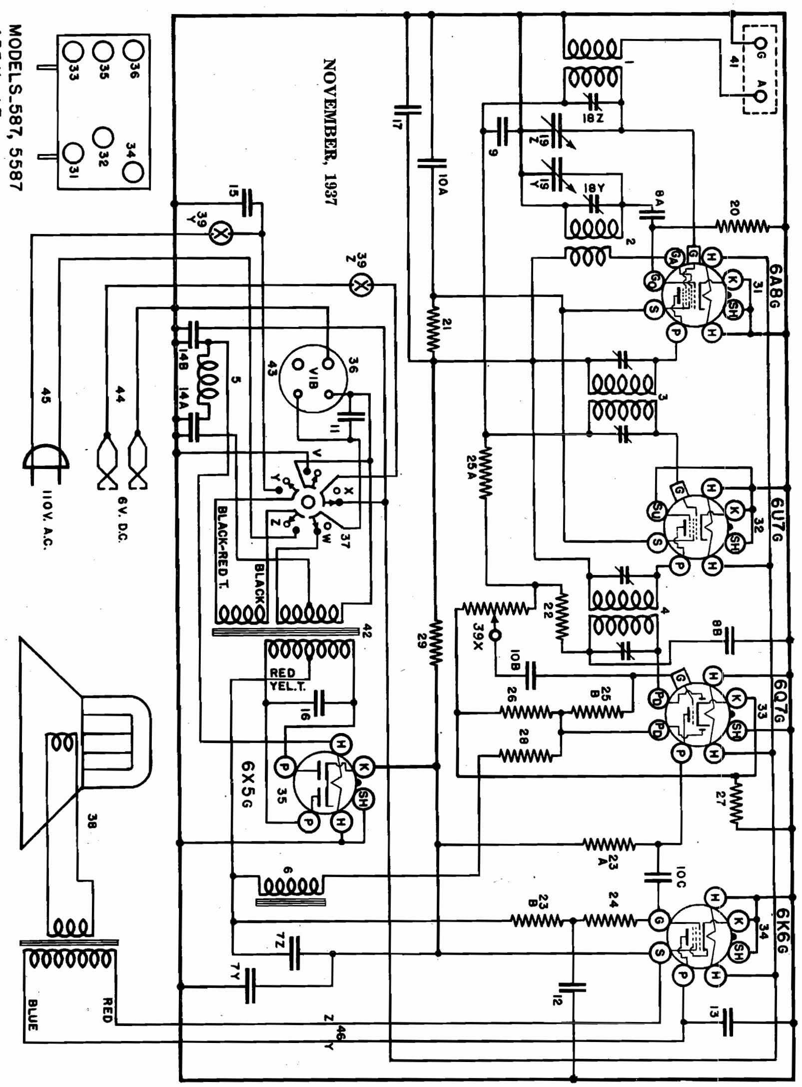
Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G182—32000	Antenna Coil
2	G102—32001	R-F. Coil
3	G3 —34002	Condenser, .0005 Mf. Molded
4	W —45708B	Condenser, .02 Mf. 160 V.
5	G60 —33001	2 Section Gang Condenser
	D —46418	Dial Face
	W —46425	Pointer
	—41587	Pointer Mtg. Screw
	W —44809C	Drive Shaft
	W —44808B	Bracket—Shaft Mtg.
	W —43549	"C" Washer—Shaft Mtg.
	G10 —41582	Drive Cord—8¼ Inches
	W —44989	Spring—Cord Tension
	W —46854A	Dial Support Brkt.
6	G3 —50640	Twisted Lead—Cap. Coupling Assy.
7	W —45782B	Condenser, .05 Mf. 120 V.
8	W —45780B	Condenser, .02 Mf. 160 V.
9	W —50105	Condenser, .1 Mf. 160 V.
10	W —45708B	Condenser, .02 Mf. 160 V.
11Z 11Y	W —46398	Condenser, 16 Mf. 125 V. Condenser, 16 Mf. 125 V.
12	W —45780B	Condenser, .02 Mf. 160 V.
13	B —45784	Power Cord and Plug
14	—24990	Resistor, 25,000 Ohm ⅜W.
15	—37583	Resistor, 2.5 Megohm ⅜W.
16	—23785	Resistor, 500,000 Ohm ⅜W.
17	—23785	Resistor, 500,000 Ohm ⅜W.
18	W —45965	Resistor, 110 Ohm ½W.

Item No.	Part No.	Description
19	284-BL-4"B"	Speaker—Spec. No. 40WA3
	—46691	Field Coil—450 Ohm 60 M. A.
	284-BL-4"H"	Speaker—Spec. No. S5330M4
	—46901	Field Coil—450 Ohm 60 M. A.
20 to 24	G178—36400	Socket—8 Prong Octal
	W —46477	Tube Shield
25	G25 —29535	Output Transformer
26Z 26Y	—46411	Volume Control— Line Switch—
	W —46416	Ballast Tube
	B —46880	Power Cable for 220 V. (Resistor)
	8FC	Cabinet—Mottled Brown
	—45242	Knob—2 Req.
	—45505A	Cabinet Back
	8FD	Cabinet—Ivory
	W —45324	Knob—2 Req.
	—45506A	Cabinet Back
	G3 —45281	Baffle and Grille Cloth Assy.
	W —46421	Celluloid Dial Lens
	—46437	Instruction Booklet
	W —46454	Cabinet Assy.—8FC—Mottled Brown
	W —46866	Cabinet Assy.—8FD—Ivory
	—44763	Single Shipping Carton

MODELS 587,5587
Schematic,Voltage
Socket,Parts

CROSLEY CORP.



MODELS_587, 5587
455 Kc. I.F.

FIG. 1—WIRING DIAGRAM—MODELS 587 and 5587

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G154—32000	Ant. Coil, 1725–540 Kc.
2	G156—32002	Osc. Coil, 1725–540 Kc.
3	G173—32004	1st I–F., 455 Kc.
4	G174—32004	2nd I–F., 455 Kc.
5	G26 —28067	"A" Filter Choke
6	G23 —29535	"B" Filter Choke
7	W —44769A	Condenser, Dual 6 Mf. 250 V. (587 only)
7	W —44868A	Condenser, Dual 8 Mf. 250 V. (5587 only)
8A	G1 —34002	Condenser, .00025 Mf. Molded
8B	G1 —34002	Condenser, .00025 Mf. Molded
9	W —36541	Condenser, .02 Mf. 160 V.
10A	W —28621	Condenser, .02 Mf. 200 V.
10B	W —28621	Condenser, .02 Mf. 200 V.
10C	W —28621	Condenser, .02 Mf. 200 V.
11	W —35936	Condenser, .05 Mf. 200 V.
12	W —24049C	Condenser, .1 Mf. 200 V.
13	W —35758	Condenser, .008 Mf. 400 V.
14A	W —50161	Condenser, .5 Mf. 120 V.
14B	W —50161	Condenser, .5 Mf. 120 V.
15	W —30805	Condenser, .01 Mf. 400 V.
16	W —50170	Condenser, .01 Mf. 1,000 V.
17	W —37173	Condenser, .25 Mf. 300 V.
18	W —37986A	2 Section Shunt Trimmer Cond. Assy.
19	G46 —33001	2 Section Var. Tuning Condenser (587 only)
	B —44981A	Dial Face (587 only)
	—44285	Dial Mask, Paper (587 only)
	W —44001A	Ring—Dial Support (587 only)
	—44267	Dial Mask (587 only)
	B —45033	Support—Dial Face (587 only)
	W —43550A	Dial Hand (587 only)
	W —40486	Screw—Hand Mtg.
	W —44989	Spring—Cord Tension (587 only)
	—41582	Drive Cord
	W —45030	Bracket—Drive Shaft Mtg.
	W —45031	Drive Shaft (587 only)
	W —43549	Ring—Shaft Retaining
19	G47 —33001	2 Section Var. Tuning Condenser (5587 only)
	B —44994A	Dial Face (5587 only)
	W —44085B	Dial Mask (5587 only)
	W —44084	Ring—Dial Support (5587 only)
	C —44082E	Support Bracket—Dial (5587 only)
	W —44299	Dial Hand (5587 only)
	G1 —43564	Pulley and Hub Assy. (5587 only)
	W —43542B	Bracket—Drive Shaft (5587 only)
	W —44134A	Drive Shaft (5587 only)
	W —43561	Spring—Cord Tension (5587 only)
20	—35928	Resistor, 60,000 Ohm ¼W. Ins.
21	—24990	Resistor, 25,000 Ohm ⅓W. Carb.
22	—35600	Resistor, 100,000 Ohm ¼W. Ins.
23A	—35601	Resistor, 300,000 Ohm ¼W. Ins.
23B	—35601	Resistor, 300,000 Ohm ¼W. Ins.
24	—36322	Resistor, 500,000 Ohm ¼W. Ins.
25A	—36688	Resistor, 3 Megohm ¼W. Ins.
25B	—36688	Resistor, 3 Megohm ¼W. Ins.
26	W —23012A	Resistor, 40 Ohm ¾W. Flex.
27	W —25357	Resistor, 75 Ohm ¾W. Flex.
28	W —27504	Resistor, 100 Ohm ½W. Flex.
29	W —23907	Resistor, 750 Ohm 1½W. Flex.
31	G156—36400	Socket, 6A8 Type
32	G171—36400	Socket, 6U7 Type
33	G160—36400	Socket, 6Q7 Type
34	G172—36400	Socket, 6K6 Type
35	G168—36400	Socket, 6X5 Type
36	G105—28807	Socket, Vibrator
	W —40911	Tube Shield
37	W —45028	A. C.–D. C. Switch (Change Over)
38	274–PL–18"U"	Speaker, Spec. 5–PA–4 (587 only)
-	—44537	V. C. and Cone Assy. (274–PL–18"U")
	—45295	Output Transformer (274–PL–18"U")
38	474–PJ–2"M"	Speaker, Spec. 1–D–1282
	—45551	Cone Assembly (474–PJ–2"M")
	—45552	Output Trans. (474–PJ–2"M")
	—43676	Ring, Cone Mtg. (474–PJ–2"M")
39Z	—43854A	6 V. D. C. Switch (On-Off)
39Y	—43854A	110 V. A. C. Switch (On-Off)
39X	—43854A	Volume Control
41	G1 —26719	Ant. and Gnd. Terminal Assy.
42	G19 —32769	Power Transformer
	W —50130	Trans. Shield
43	W —45110	Vibrator, 6 Volt
44	G3 —44948	Battery Cable Assy.
	—34903	Battery Clip (Pos.)
	—34904	Battery Clip (Neg.)
45	B —44004	Power Cord and Plug (A. C.)
46Z	G1 —45078	Red Speaker Lead (5587 only)
46Y	G2 —45078	Blue Speaker Lead (5587 only)
47		
	G20 —45022	Vib. Shield Assy.
	G19 —45022	Switch Shield Assy.
	7MD	Cabinet (5587 only)
	7AF	Cabinet (587 only)
	W —44432	Knob (1)
	W —44381B	Knob (2)
	—44268A	Escutcheon (587 only)
	B —44226B	Escutcheon (5587 only)
	W —45056	Rubber Mtg. Foot (5587 only)
	W —43553	Rubber Mtg. Foot (587 only)
	B —45231	Bottom Mtg. Plate (5587 only)

SOCKET VOLTAGE READINGS TAKEN ON 117.5 VOLT A. C. POWER SUPPLY

Tube	Function	H	P	S	Su	K	G	Ga
6A8G	Oscillator-Modulator	6.3	192	94	–	0	–	192
6U7G	I.-F. Amplifier	6.3	192	94	0	0	–	–
6Q7G	Det., AVC, 1st A. F.	6.3	72	–	–	2.5	-1.0*	–
6K6G	Output	6.3	195	205	–	0	-20.**	–
6X5G	Rectifier	6.3	–	–	–	205	–	–

SOCKET VOLTAGE READINGS TAKEN ON 6 VOLT STORAGE BATTERY

Tube	Function	H	P	S	Su	K	G	Ga
6A8G	Oscillator-Modulator	6.0	131	62	–	0	–	131
6U7G	I.-F. Amplifier	6.0	131	62	0	0	–	–
6Q7G	Det., AVC, 1st A. F.	6.0	47	–	–	1.9	-2.7*	–
6K6G	Output	6.0	132	139	–	0	-12.**	–
6X5G	Rectifier	6.0	–	–	–	131	–	–

* Measured across item 26.
** Measured from junction of items 6 and 23B to chassis.

Power output approximately 2.5 watts on 117.5 volts A. C. and 1.1 watts on 6 volt storage battery.
Power consumption approximately 28 watts on 117.5 volts A. C. and 2.9 amperes on 6 volt storage battery.

MODELS 587,5587
Socket,Trimmers
Chassis,Alignment,Notes

CROSLEY CORP.

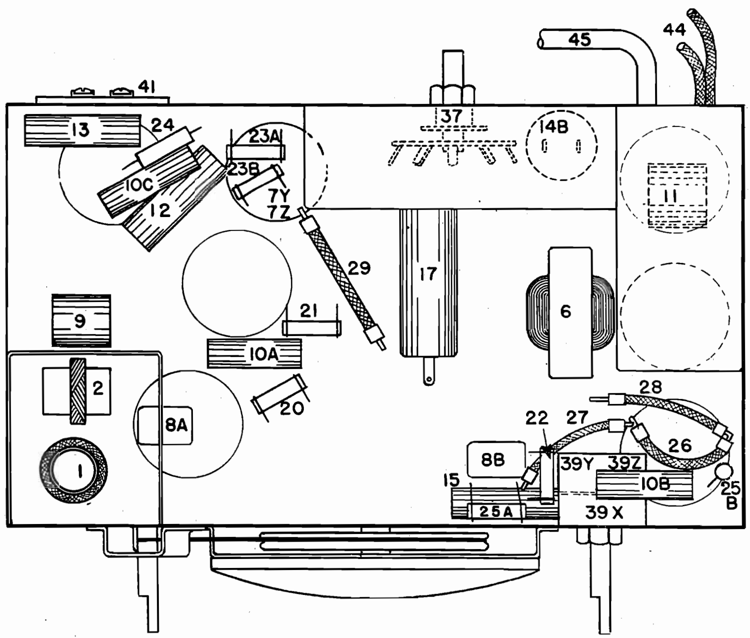


Fig. 3—Bottom View Models 587 and 5587

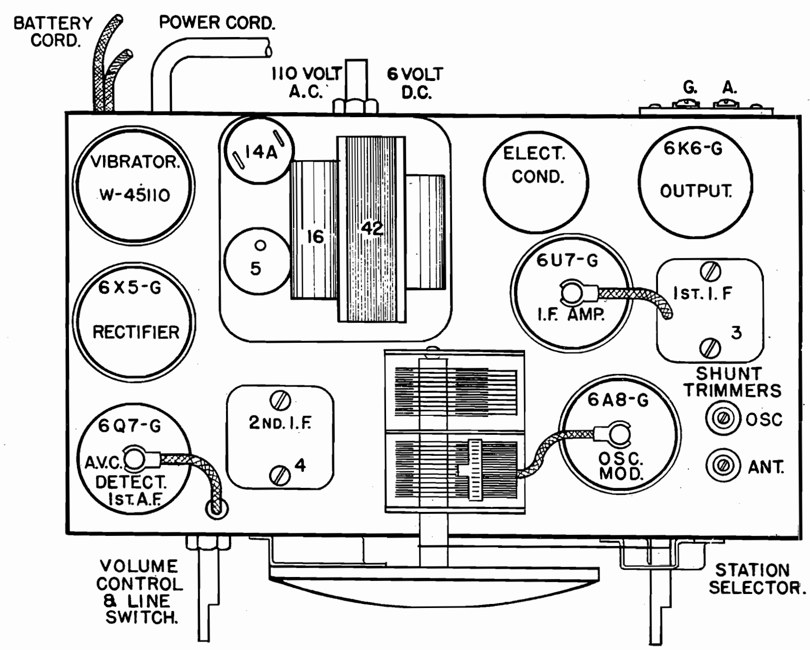


Fig. 2—Top View Models 587 and 5587

ALIGNMENT PROCEDURE

All the circuits in this receiver were very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits may be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 6K6G output tube. Be certain that the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier To 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the ground terminal of the receiver. (KEEP THE SIGNAL GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES).

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the trimmer condensers located on the 2nd I. F. transformer, item 4—fig. 2, for maximum reading on the output meter.

(e) Adjust the trimmer condensers located on the 1st I. F. transformer, item 3—fig. 2, for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning The R-F Amplifier.

(a) Connect the output of the signal generator through a .00025 mfd. condenser to the antenna terminal of the receiver.

(b) Set the signal generator to 1725 kilocycles.

(c) With the condenser gang rotated to the minimum capacity position, adjust the "OSC" SHUNT TRIMMER so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(d) Set the signal generator to 1400 kilocycles.

(e) Tune-in the 1400 kilocycle signal, in the region of 140 on the dial, for maximum output.

(f) Adjust the "ANT" SHUNT TRIMMER for maximum output. NOTE: Do not readjust the "OSC" SHUNT TRIMMER.

(g) Repeat operations (e) and (f) for more accurate adjustments.

SPECIFICATIONS

These model Crosley radios are designed for operation on 110-volt, 60 cycle A. C. power lines or on a six-volt storage battery. No "B" or "C" batteries are required. The tuning range is from 535 to 1725 kilocycles (560 to 173 Metres). Model 5587 is identical with Model 587 except that it has a larger dial assembly, an 8" speaker, larger electrolytic condenser, and is mounted in a console cabinet.

CIRCUIT DESCRIPTION

Five octal base glass tubes are employed in a superheterodyne circuit which consists of an oscillator-modulator tube, 455 kilocycle I. F. amplifier, composite detector—AVC and A. F. amplifier tube, pentode output and power supply. An AC-DC switch is located on the rear of the chassis and must be set according to the power supply the receiver is to be used on. The 6Q7G tube supplies AVC voltage to the grids of the 6A8G and 6U7G tubes through items 22 and 25A. The initial bias for the 6A8G and 6U7G tubes is developed across a 75 ohm resistor, item 27. The bias for the 6Q7G tube is developed across a 40 ohm resistor, item 26. The bias for the output tube is obtained by the combined voltage drop across items 6 ("B" filter choke), 26 (40 ohms), 27 (75 ohms) and 28 (100 ohms). The speaker is a permanent magnet type dynamic.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range voltmeter. Voltage limits may vary plus or minus 10% of values given.

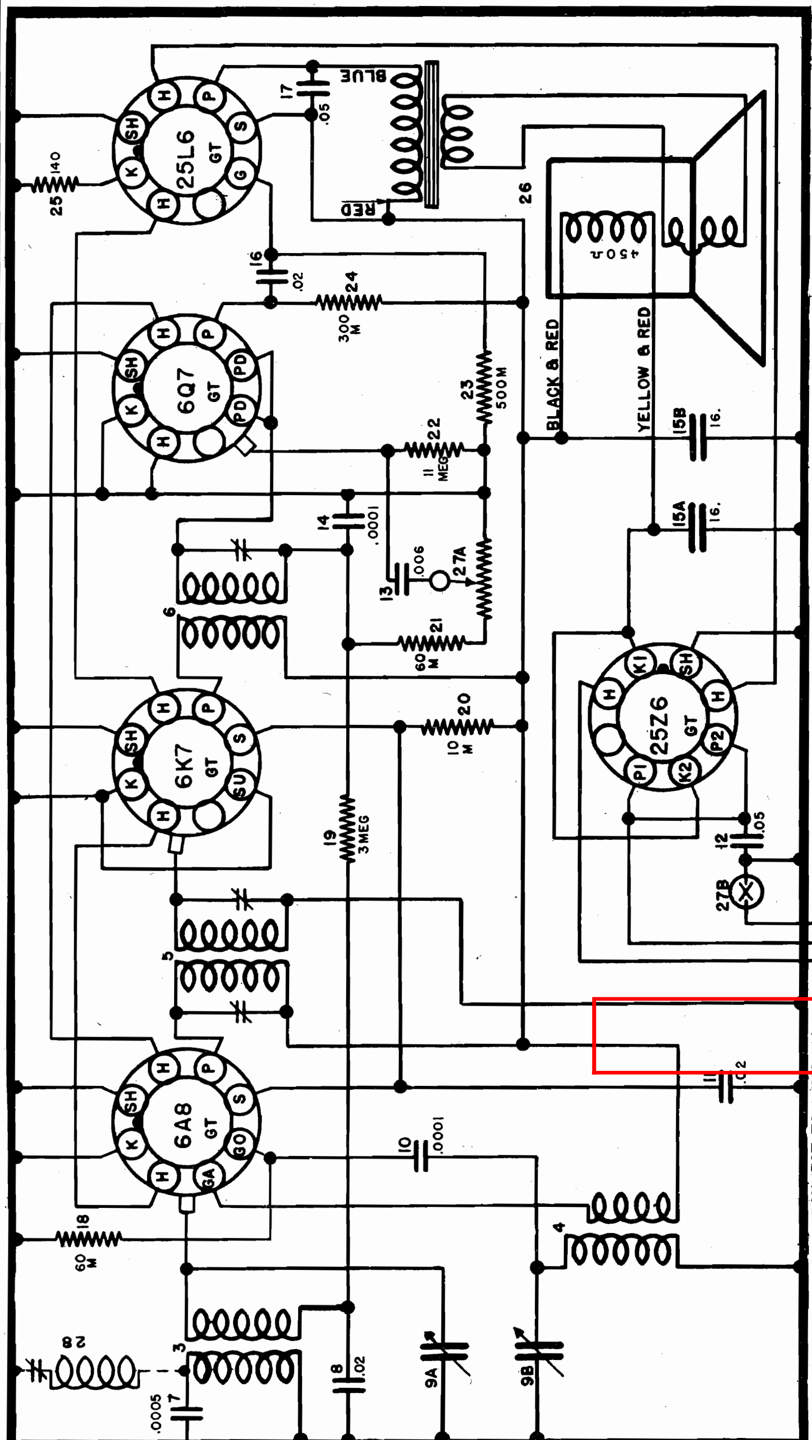
CROSLEY CORP.

MODEL 588, Super Vanity Fiver
588BC, 588BD, 588BE
Schematic, Socket, Trimmers
Alignment, Voltage, Chassis

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Go	Ga
6A8-GT	Oscillator-Modulator	6.3	105	65	—	—	-10	105
6K7-GT	I-F Amplifier	6.3	105	65	—	—	—	—
6Q7-GT	Det, AVC, A-F Amplifier	6.3	42	—	—	—	—	—
25L6-GT	Output	25.1	95	105	—	—	—	—
25Z6-GT	Rectifier	25.1	117.5 A.C.	—	—	132	—	—

Power output approximately 2 watts. Power consumption approximately 47 watts. Voltage drop across speaker field 27 volts.
All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.



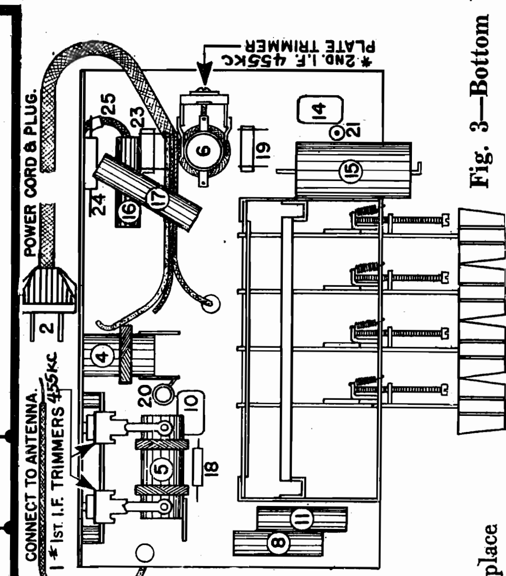


Fig. 3—Bottom View

MODEL .. 588
456 K.C. I.F.

CHASSIS NO. 588
(Super Vanity Fiver)
JANUARY, 1939

*Leave grid cap of 6A8GT in place

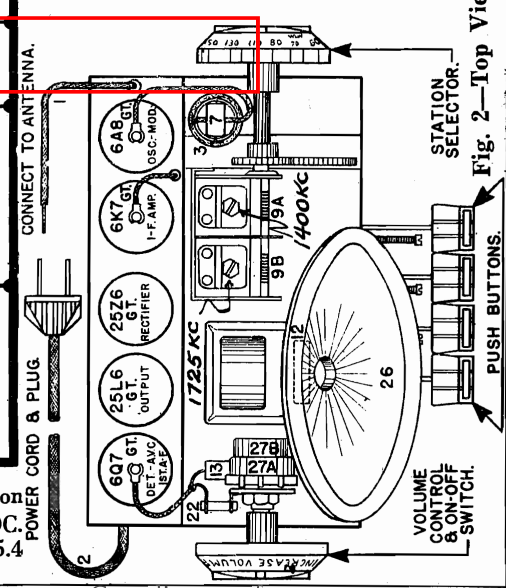


Fig. 2—Top View

SPECIFICATIONS This model Crosley radio is designed for operation on 100 to 125 volt electric circuits, either AC or DC. The tuning range is from 540 to 1725 kilocycles (555.4 to 173 metres).

MODEL 598, Vanity, 598BB, 598BD
Schematic, Socket, Trimmers
Alignment, Voltage, Chassis

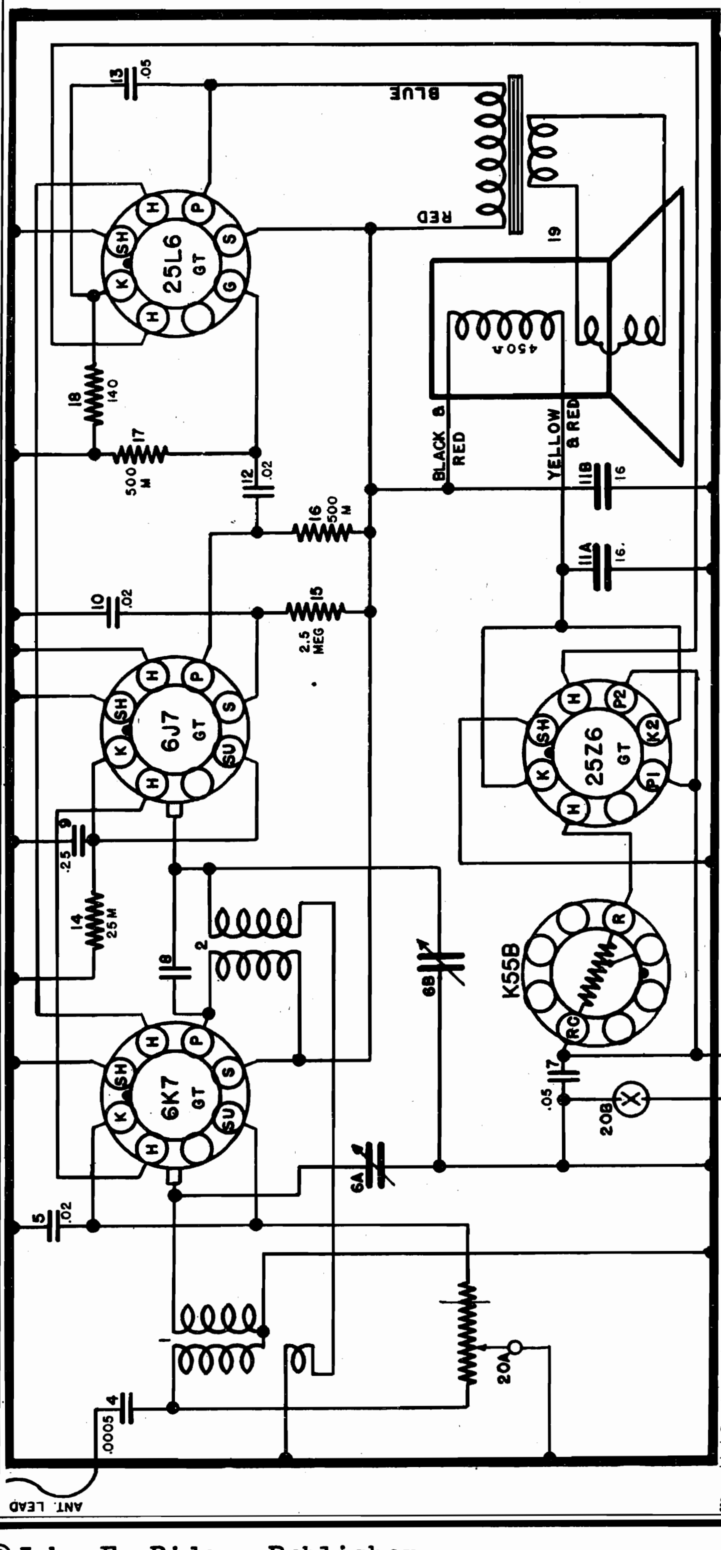
CROSLEY CORP.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	Su	G
6K7-GT	R-F Amplifier	6.3	110	110	2.5–25	2.5–25	—
6 J7-GT	Detector	6.3	20	7	6	—	—
25 L6-GT	Output	25.1	98	110	6	—	—
25 Z6-GT	Rectifier	25.1	117 A.C.	—	135	—	—
W–46416	Ballast	Approx. 54.7 Drop A.C.					

Power output approximately 2 watts.
Drop across field 25 volts.
Power consumption at 117.5 volts line 47 watts (A.C.).
All readings except filaments will be approximately 15% lower on 117.5 D. C.

FIG. 1—WIRING DIAGRAM



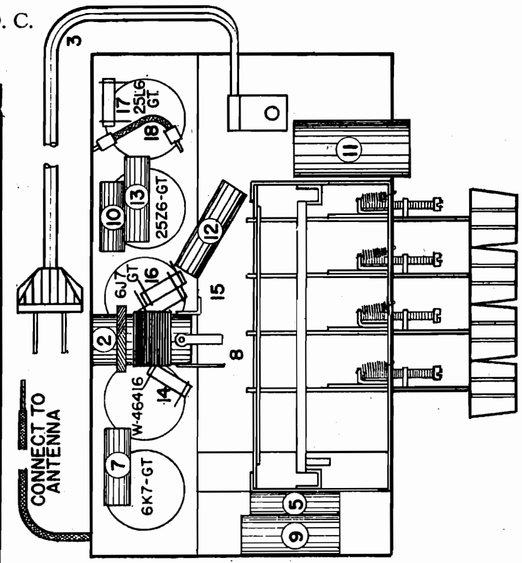


Fig. 3—Bottom View 598

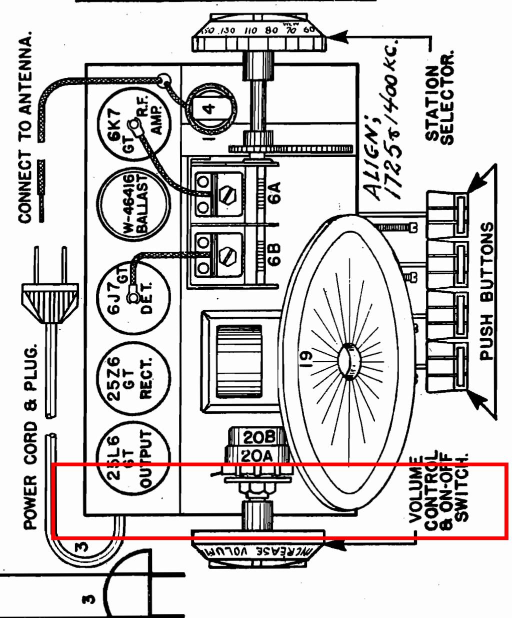


Fig. 2—Top View 598

MODEL...598

MODEL 598 VANITY

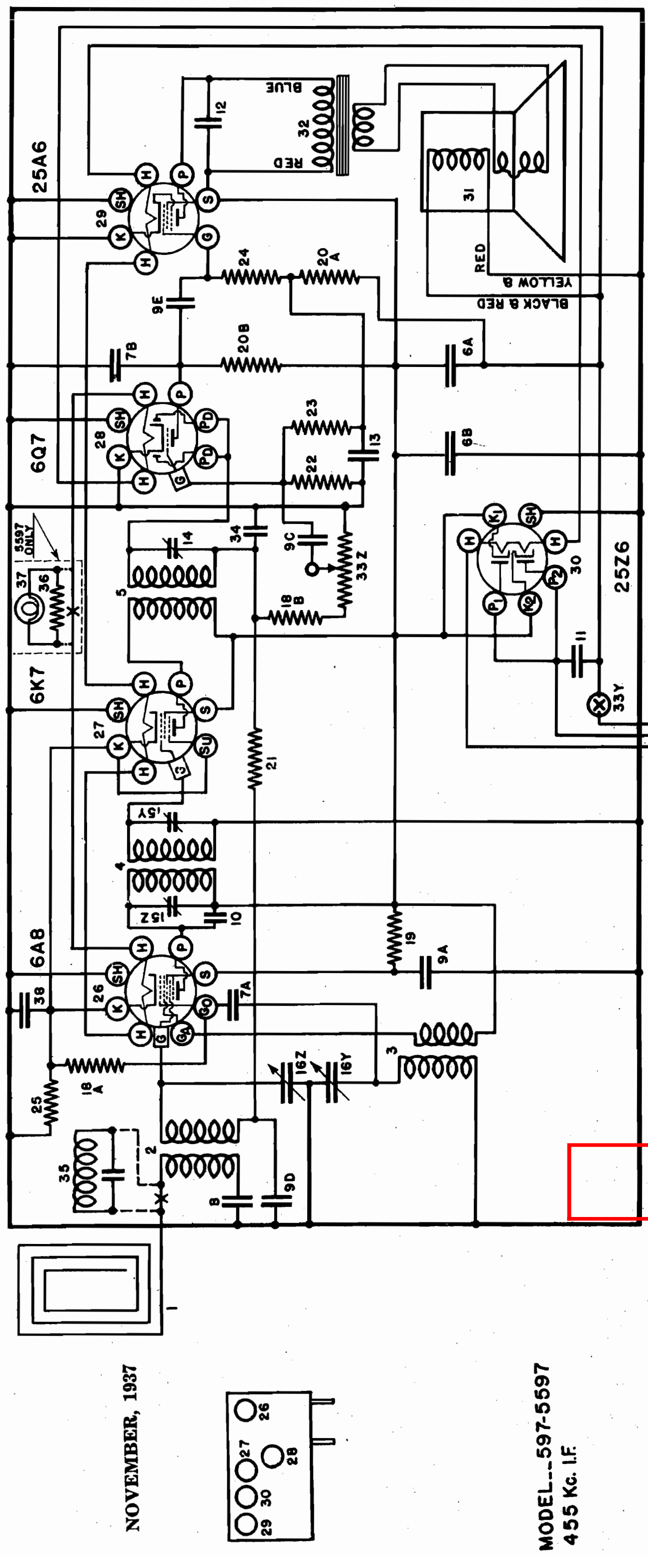
JANUARY, 1939

TUBES AND VOLTAGE LIMITS

The table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with volume control full on and no signal input. The filament voltages should be measured with an accurate low range voltmeter. Voltage limits may vary plus or minus 10% of values given.

MODELS 597,5597
Schematic,Parts

CROSLEY CORP.



NOVEMBER, 1937

MODEL--597-5597
455 Kc. I.F.

FIG. 1—WIRING DIAGRAM—MODEL 597 and 5597

Figures in first column refer to parts in Diagrams.

Item	Part No.	Description
1	W —31765C	Ant. Roll
2	G163—32000	Ant. Coil
3	G155—32002	Osc. Coil
4	G168—32004	1st I-F
5	G167—32004	2nd I-F
6A	W —44935	Condenser, 30 Mf. 125 V.
6B	W —44935	Condenser, 30 Mf. 125 V.
7A	G 2—34002	Condenser, .0001 Mf. Molded
7B	G 2—34002	Condenser, .0001 Mf. Molded
8	W —26571	Condenser, .0005 Mf. 200 V.
9A	W —28621	Condenser, .02 Mf. 200 V.
9C	W —28621	Condenser, .02 Mf. 200 V.
9D	W —28621	Condenser, .02 Mf. 200 V.
9E	W —28621	Condenser, .02 Mf. 200 V.
10	G 5—34002	Condenser, .00005 Mf. Molded
11	W —23615	Condenser, .05 Mf. 400 V.
12	W —28619	Condenser, 006 Mf. 200 V.
13	W —24049C	Condenser, .1 Mf. 200 V.
14	W —44142	Condenser, 2nd I-F Plate Trimmer.
15	W —44882	Condenser, 1st I-F Trimmer Assy.
16	G 45—33001	2 Sect. Var. Tuning Cond.
	B —44801A	Dial Face (Glass)
	W —50173A	Pointer
	W — 2045	Washer (Pointer Lock)
	W —40486	Screw (Pointer Mtg.)
	W —44810C	Dial Support
	W —44811	Ring (Dial Glass Support) 597
	W —45342	Ring (Dial Glass Support) 5597
	W —44809C	Drive Shaft
	W —44808A	Bracket Drive Shaft
	—41582	Drive Cord
	W —43561	Spring—Cord Tension
	W —43549	Ring—Drive Shaft Retaining
17	B —44917B	Power Cord & Plug (160 Ohm) 597 Only
	B —45491B	Power Cord & Plug (140 Ohm) 5597 Only
18A	—35928	Resistor, 60,000 Ohm ¼ W. Ins.
18B	—35928	Resistor, 60,000 Ohm ¼ W. Ins.
19	—22831	Resistor, 15,000 Ohm 1/3 W. Ins.

Item	Part No.	Description
20A	—21455	Resistor, 300,000 Ohm 1/3 W. Carb.
20B		See Item 39
21	—26577	Resistor, 3. Megohm 1/3 W. Carb.
22	—21454	Resistor, 1. Megohm 1/3 W. Carb.
23	—37584	Resistor, 11. Megohm 1/3 W. Carb.
24	—34020	Resistor, 250,000 Ohm 1/3 W. Carb.
25	W —25357	Resistor, 75 Ohm ¾ W. Flex.
26	G156—36400	Socket Type 6A8
27	G151—36400	Socket Type 6K7
28	G160—36400	Socket Type 6Q7
29	G161—36400	Socket Type 25A6
30	G162—36400	Socket Type 25Z6
31	—270BL6"O"	Speaker Spec. No. 3-101
	—45174	Cone & V.C. Assy. } For Above
	—45175	Ring (Cone Mtg.) } Speaker
32	G 21—29535	Output Transformer
33	—44920A	Vol. Cont. (1 Meg.) & Line Switch
34	G 1—34002	Condenser .00025 Mf. Molded
35	G182—32004	Wave Trap
36	W —44396	Resistor 40 Ohm 3½ W. Flex 5597
37	W —44337	Bulb 6-8 V. Dial Light 5597
	G 6—27134	Dial Light Socket Assy. 5597
	W —45313	D. L. Socket Mtg. Brkt. 5597
38	W —27216	Condenser .05 Mf. 200 V.
	—7F	Cabinet (Black) 597
	W —44934	Knob—Black 597
	G 1—45281	Grille & Baffle Assy. 597
	—7FB	Cabinet (Brown) 597
	W —45242	Knob—Brown 597
	G 1—45281	Grille & Baffle Assy. 597
	—7FA	Cabinet (Ivory) 5597
	W —45324	Knob 5597
	G 1—45281	Grille & Baffle Assy. 5597
	W —45282	Shield—Heat Reflector
	B —45505	Back—7FB Cab.
	B —44885A	Back—7F Cab.
	B —45506	Back—7FA Cab.
39	—23403	Resistor, 150,000 Ohm 1/3 W. Carb.

MODELS 597,5597
Socket,Trimmers,Chassis
Alignment,Voltage,Data

CROSLEY CORP.

CHASSIS NO. 597—5597

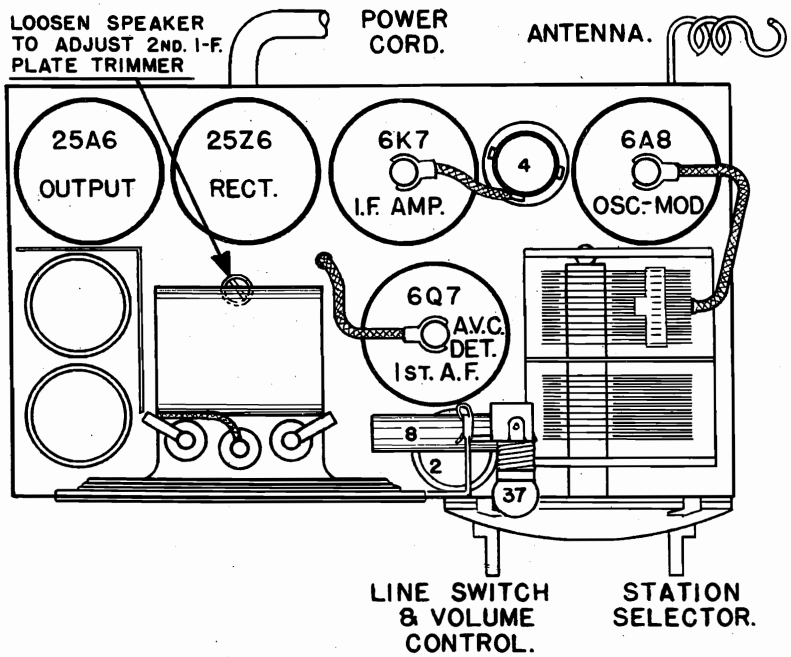


Fig. 2—Top View Model 597 and 5597

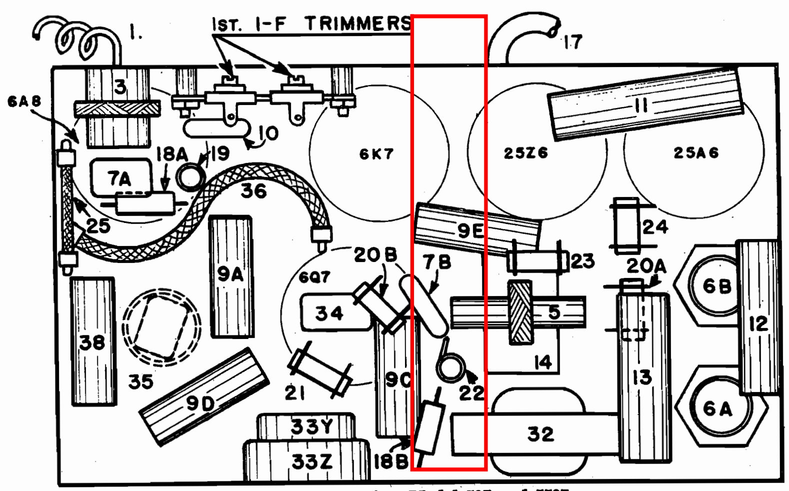


Fig. 3—Bottom View Model 597 and 5597

SPECIFICATIONS

These model Crosley radios are designed for operation on 100 to 125 volt electric circuits, either AC or DC. The tuning range is from 535 to 1725 kilocycles (550 to 173 metres). Model 5597 is identical with Model 597 except that it has an illuminated dial and a different cabinet.

CIRCUIT DESCRIPTION

Five metal tubes are employed in a superheterodyne circuit which consists of a combination oscillator-modulator tube, 455 kilocycle I-F amplifier, pentode output and power supply. The 6Q7 tube serves as the detector and 1st A-F amplifier and supplies AVC voltage to the grid of the 6A8 tube. The bias voltage for the 6A8 and 6K7 tubes is obtained across a 75 ohm resistor, item 25. The bias for the 6Q7 and 25A6 tubes is obtained across the speaker field. A resistance type power supply cord is used to provide the proper heater voltage to the tubes. The filaments of the tubes are wired in series. A .05 mfd. condenser, item 11, is connected across the power supply leads to reduce electrical interference from that source.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range voltmeter. When measured on a 117.5 volt AC line voltage limits may vary plus or minus 10% of the values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Go	Ga
6A8	Oscillator-Modulator	6.3	105	65	—	3	-10	105
6K7	I-F Amplifier	6.3	105	105	0	3	—	—
6Q7	Det, AVC, A-F Amplifier	6.3	50	—	—	0	—	—
25A6	Output	25.1	100	105	—	0	—	—
25Z6	Rectifier	25.1	117.5	—	—	110	—	—

Power output approximately 1 watt.
Power consumption approximately 55 watts.
Voltage drop across speaker field 18 volts.
All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25A6 output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier To 455 Kilocycles.

(a) Disconnect the antenna roll from the receiver and connect the output of the signal generator through a 50 mmf. condenser to the antenna connection on the receiver. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condenser, Item 14, located beneath the edge of speaker field, for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers, located on back flange of the chassis, for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning The R-F Amplifier.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

Note: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil and a fixed condenser as illustrated by dotted lines in the Wiring Diagram.

MODEL 648, Super Sexette
Schematic, Voltage, Data

CROSLEY CORP.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Go	Ga
6A8G	Oscillator-Modulator	6.3	105	70	—	—	-10	105
6U7G	I-F Amplifier	6.3	105	70	—	—	—	—
6Q7G	Det, AVC, A-F Amplifier	6.3	35	—	—	—	—	—
25A6G	Output	25.1	100	105	—	6	—	—
25Z6G	Rectifier	25.1	117.5 A.C.	—	—	132	—	—
W-46773	Ballast Tube	Approx. 48.4 A.C. Drop						

Power output approximately 2 watts.
Power consumption approximately 48 watts.
Voltage drop across speaker field 27 volts.
All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

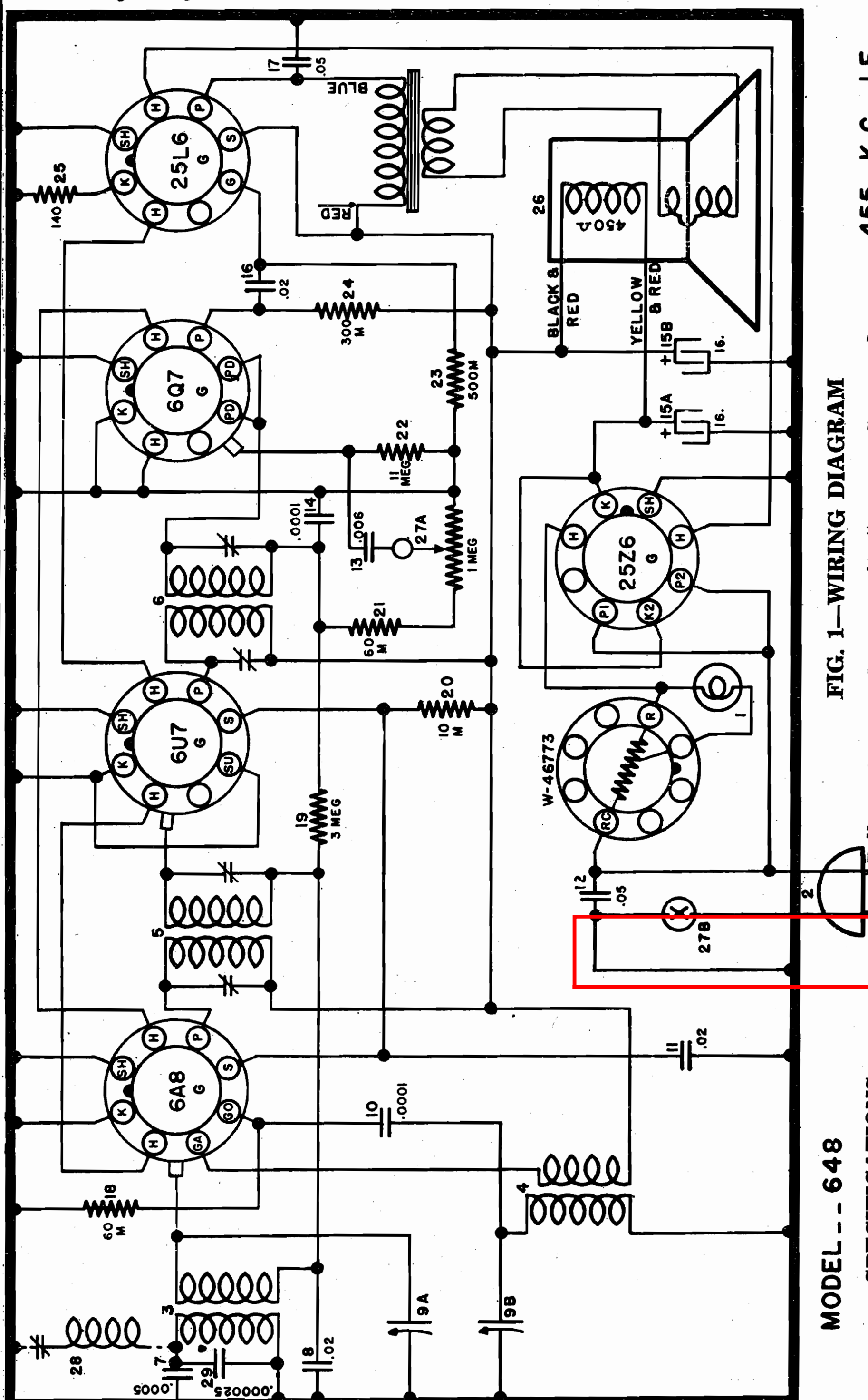


FIG. 1—WIRING DIAGRAM

455 K.C. I.F.

CHASSIS NO. 648
(Super Sextette)

JANUARY, 1939

MODEL -- 648

SPECIFICATIONS

This model Crosley radio is designed for operation on 100 to 125 volt electric circuits, either AC or DC. The tuning range is from 540 to 1725 kilocycles (555 to 173 metres).

CIRCUIT DESCRIPTION

Five Octal Glass tubes and one metal Ballast tube are employed in a superheterodyne circuit which consists of a combination oscillator-modulator tube, 455 kilocycle I-F amplifier, Beam Power output and power supply. The 6Q7 tube serves as the detector and 1st A-F amplifier and supplies AVC voltage to the grid of the 6A8-G and 6U7-G tubes. The bias for the 25L6-G tube is obtained from item 25 a 140 ohm resistor. A Ballast tube is used to provide the proper heater voltage to the tubes. The filaments of the tubes are wired in series. A .05 mfd. condenser, item 12, is connected across the power supply leads to reduce electrical interference from that source.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range voltmeter. When measured on a 117.5 volt AC line voltage limits may vary plus or minus 10% of the values given.

MODEL 648, Super Sexette
Socket, Trimmers, Chassis
Alignment, Notes, Parts

CROSLEY CORP.

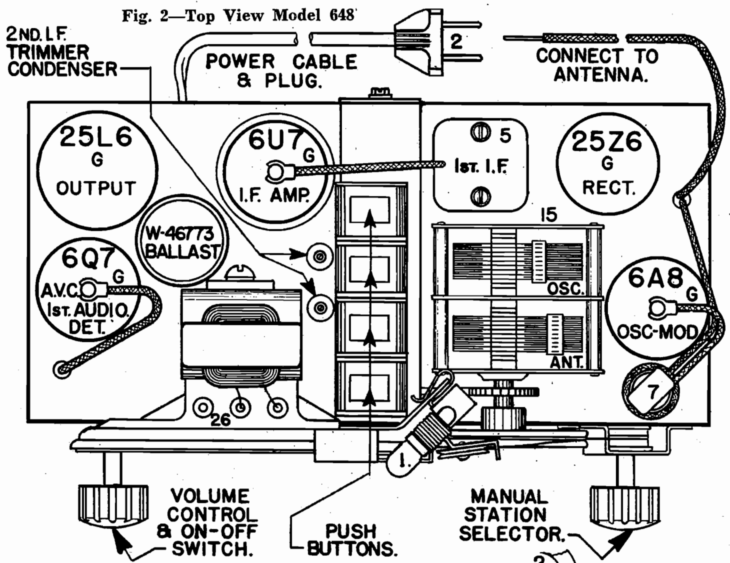


Fig. 2—Top View Model 648

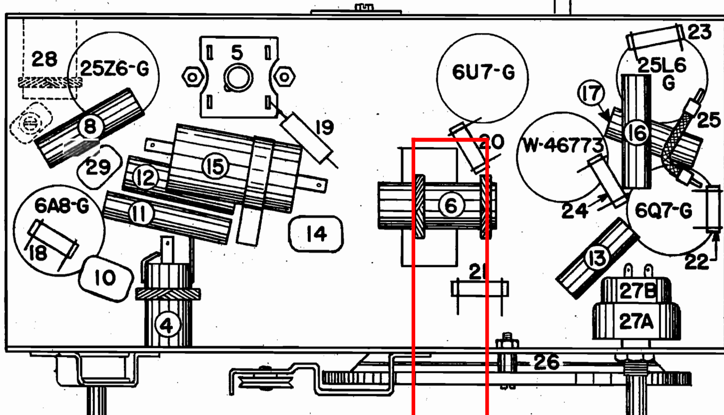


Fig. 3—Bottom View Model 648

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25L6G output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier To 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mf. condenser to the grid cap of 6A8-G, leaving grid cap in place. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers, Fig. 2, located between Push Button Assembly and speaker field, for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning The R-F Amplifier.

Connect output of signal generator through a .0001 condenser to the antenna lead of receiver.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil and a fixed condenser as illustrated by dotted lines in the Wiring Diagram.

If any of the circuits have been re-aligned, check push buttons to see if they need resetting.

SETTING THE PUSH BUTTONS

The push buttons are easily and accurately set from the top of the receiver. It is not necessary that all the buttons be set at the same time. Remove the push buttons to be set by grasping the button between the forefinger and thumb and pulling straight up. Loosen the set screws on the keys but do not remove them.

Determine the favorite broadcasting stations whose call letters are to be placed in the buttons. By means of the manual tuning knob, tune-in AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is the station that is tuned-in nearest the 1500 Kc. end of the dial. Then push the front key all the way down, and while you hold it in that position SECURELY TIGHTEN THE SET SCREW. Replace push button on key.

The push button tuning system is now correctly set for the 1st station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles). Detach the call letters of the favorite stations from the list supplied with your receiver and press them into the openings in the front of the push buttons. Thin pieces of clear celluloid are supplied in a small envelope and should be snapped in place over the call letters to protect and hold them in place.

PUSH BUTTON PARTS

G33	—45683	Push Button Unit Complete
G26	—45683	Key Assembly
W	—50542C	Key Clip (Lock Clamp)
W	—45646B	Adjusting Clip (3 Req.)
W	—50547	Key Plate
W	—50588B	Adjusting Clip (1 Req.)
W	—50607C	Spring (Key Return)
W	—50561	No. 6—40 x 1/8" Bearing Screw (Rocker Plate)
	—2046	No. 8 Shakeproof Washer
G62	—45683	Rocker Plate Assembly
	—46841A	Push Button (8AK) (Brown)
	—46879A	Push Button (8AH and 8AG) (Black)
	—46887	Call Letter Sheet (8AH and 8AG)
	—50841	Call Letter Sheet (8AK)
W	—50551	Call Letter Cover (5 in Envelope)
	—46840A	Instructions
	—46953	Knob (8AK) (Brown)
	—44552	Knob (8AH and 8AG) (Black)

PARTS LIST — MODEL 648

Figures in first column refer to parts in Diagrams.

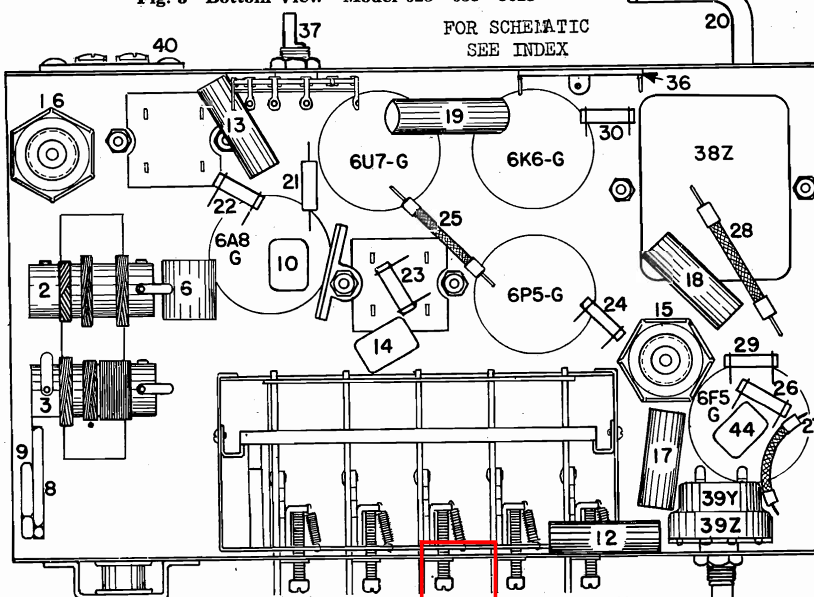
Item No.	Part No.	Description
1	W —4099B	Dial Light, 6-8 Volt
	G6 —27134	Dial Light Bracket Assembly
2	B —45784	Power Cable and Plug
3	G185—32000	Antenna Coil
4	G182—32002	Oscillator Coil
5	G208—32004	1st I.F. Transformer
6	G209—32004	2nd I.F. Transformer
7	G3 —34002	Condenser, .0005 Mf. Molded
8	W —45780B	Condenser, .02 Mf. 160 V. Paper
9A	G66 —33001	2 Section Gang: Antenna Section
9B		Oscillator Section
	W —46753	Var. Con. Mtg. Plate
	—6416	No. 8—32 x 3/16" W. H. M. Screw
	C —46815A	Dial Glass
	W —46921	Speed Nut (2 Req.)
	MG12—46750	Dial Back Plate Assembly
	W —46831A	Dial Pointer
	G13 —41582	Drive Cord (30 Inches)
	G4 —41582	Guide Cord (9 Inches)
	W —46848	Guide Cord Spring
	W —46087	Drive Cord Spring
	G15 —43564	Pulley and Hub Assembly
	W —23877	Set Screw for Drive Pulley (2 Req.)
	W —46290	Cord Clamp
	W —43542B	Drive Shaft Bracket
	—45746	Drive Shaft
	—45808	P. K. Screw for Bracket (2 Req.)
	O-8	Flat Washer
10	G2 —34002	Condenser, .0001 Mf. Molded
11	W —45780B	Condenser, .02 Mf. 160 V. Paper
12	W —45782B	Condenser, .05 Mf. 120 V. Paper
13	W —45810B	Condenser, .006 Mf. 160 V. Paper
14	G2 —34002	Condenser, .0001 Mf. Molded
15A	W —46398	Condenser, 16 Mf. 125 V. Elect.
15B		Condenser, 16 Mf. 125 V. Elect.
16	W —45780B	Condenser, .02 Mf. 160 V. Paper
17	W —45817B	Condenser, .05 Mf. 160 V. Paper
18	—21237A	Resistor, 60,000 Ohm 1/3W. Carbon
19	—36688	Resistor, 3 Megohm 1/3W. Carbon
20	—21876	Resistor, 10,000 Ohm 1/3W. Carbon
21	—21237A	Resistor, 60,000 Ohm 1/3W. Carbon
22	—46497	Resistor, 11 Megohm 1/3W. Carbon
23	—23785	Resistor, 500,000 Ohm 1/3W. Carbon
24	—21455	Resistor, 300,000 Ohm 1/3W. Carbon
25	W —41759	Resistor, 140 Ohm 1/2W. Flex.
26	281-BL-7-"B"	Speaker, Spec. 55WA43 (450 Ohm)
	—47290	Speaker Cone and V. C. Assembly
	—46686	Field Coil (450 Ohm 60 M. A.)
	—46687	Output Transformer
	—46685	Cardboard Ring, Cone Mtg.
	W —46967A	Speaker Support Bracket
	—6876	No. 6—32 x 1/4" Washer H. M. Screw
	N —5062	No. 6—32 H. H. Nut
	W —20800	No. 6 Shakeproof Washer
	L —10	Lock Washer
	R —181	No. 10—32 x 7/16" Ro. H. M. Screw
	W —4318B	Spacer
27A	—46847	Volume Control (1 Meg.)
27B		Power Switch
	W —46668	3/8" Palnut
	G178—36400	8 Prong Socket (No Marking)
	W —46773	Ballast Tube
	W —40911	Tube Shield
28	G184—32004	Wave Trap
29	G6 —34002	Condenser, .000025 Mf. 200 V. Molded
	—46894	8AK Cabinet (Brown)
	—46909	8AH Cabinet (Ivory)
	—47081	8AG Cabinet (Red)
	—46842A	8AK Cabinet Back
	—46876A	8AH Cabinet Back
	—46990A	8AG Cabinet Back
	B —128	Screws for Mounting Back (4 Req.)
	—46816	Rubber Bottom Mtg. Screw (4 Req.)

MODELS 628,638(Late)
5628
Socket,Trimmers,Chassis
Alignment,Data,Late Parts

CROSLEY CORP.

Fig. 3 Bottom View—Model 628—638—5628

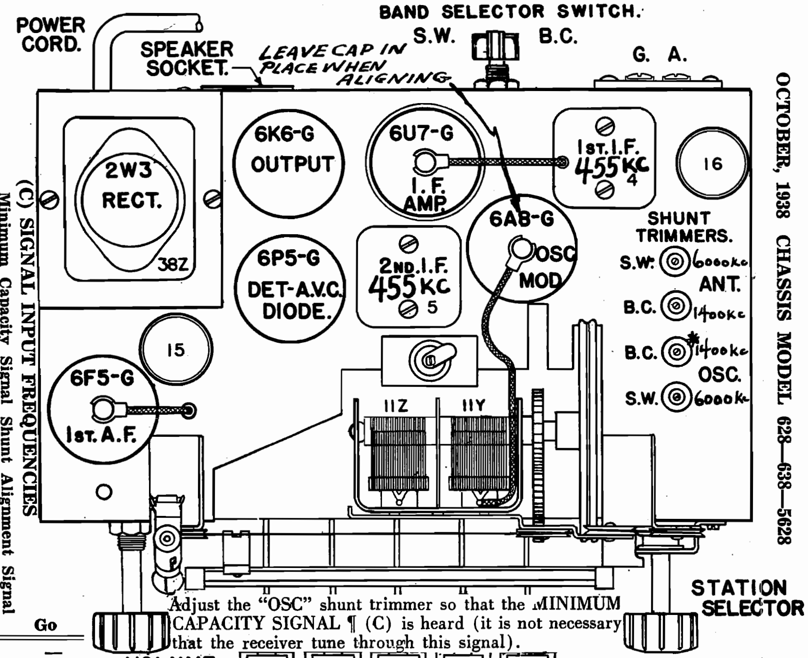
FOR SCHEMATIC SEE INDEX



(C) SIGNAL INPUT FREQUENCIES

	Minimum Capacity Signal	Shunt Alignment Signal
American Broadcast Band	1,725 Kilocycles	1,400 Kilocycles
Short-Wave Band	7,000 Kilocycles	6,000 Kilocycles

OCTOBER, 1938 CHASSIS MODEL 628—638—5628



Adjust the "OSC" shunt trimmer so that the MINIMUM CAPACITY SIGNAL ¶ (C) is heard (it is not necessary that the receiver tune through this signal).

Fig. 2 Top View—Model 628—638—5628

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	K	G	Ga	Go
6A8G	Oscillator-Modulator	6.3	175	80	—	—	175	—
6U7G	I-F Amplifier	6.3	175	80	—	—	—	—
6P5G	Detector—A. V. C.	6.3	—	—	—	—	—	—
6F5G	1st. A-F Amplifier	6.3	105	—	—	—	—	—
6K6G	Power Output	6.3	160	170	—	-14.5	—	—
2W3	Rectifier	2.2	—	—	230			

Voltage drop across speaker field 45 volts.
Maximum power output approximately 2 watts.
Power consumption at 117.5 volts approx. 37 watts.

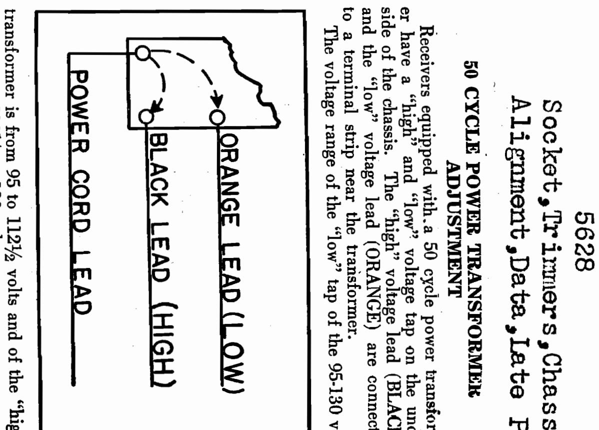
(LATE) PARTS LIST—MODEL 628, 638—5628 (FOR OTHER PARTS SEE SCHEMATIC DIAGRAM)

Item No.		Part No.	Description
		—45940	Power Trans., 50 Cycle, 220 V.
39Z 39Y		—45864	Vol. Cont., 1 Meg. (628-5628) Line Switch
39Z 39Y		—46314	Vol. Cont., 1 Meg. (638) Line Switch
17	W	—28619	Condenser, .006 Mf., 200 V.
22		—33390	Resistor, 30,000 Ohm, 1/3 W.
26		—37584	Resistor, 11 Megohm, 1/3 W.
28	W	—21965	Resistor, 375 Ohm, 1 W (was 275 Ohm)
			Model 628
		—8AA	Cabinet (Brown)
	W	—43552	Clamp, Speaker Plug
		—45957	Knob, Band Switch
		—45771	Knob, V. C. & Tuning
		—50841	Station Call List
		—45553B	Push Button
	W	—50551A	Celluloid Call Letter Cover
			Model 5628
		—8AB	Cabinet (Red)
		—8AC	Cabinet (Ivory)
		—44552	Knob, V. C. & Tuning
		—44934	Knob, Band Switch
		—46887	Station Call List
	W	—50551A	Call Letter Cover
		—50617	Push Button
		—45910	Instructions (628)
		—46326	Instructions (638)
		—46897	Instructions (5628)
			Model 638
		—8G	Cabinet (Wood Has Inlays)
		—8K	Cabinet (Wood)
		—46399C	Escutcheon
	D	—30	Screws, Escutcheon Mtg.
		—46407	Knob, Band Switch
		—46408	Knob, V. C. & Tuning
		—50841	Station Call List
	W	—50551A	Celluloid Cover
		—46417	Push Button

50 CYCLE POWER TRANSFORMER ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt



transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

MODEL 667
Socket, Trimmers, Chassis
Voltage

CROSLEY CORP.

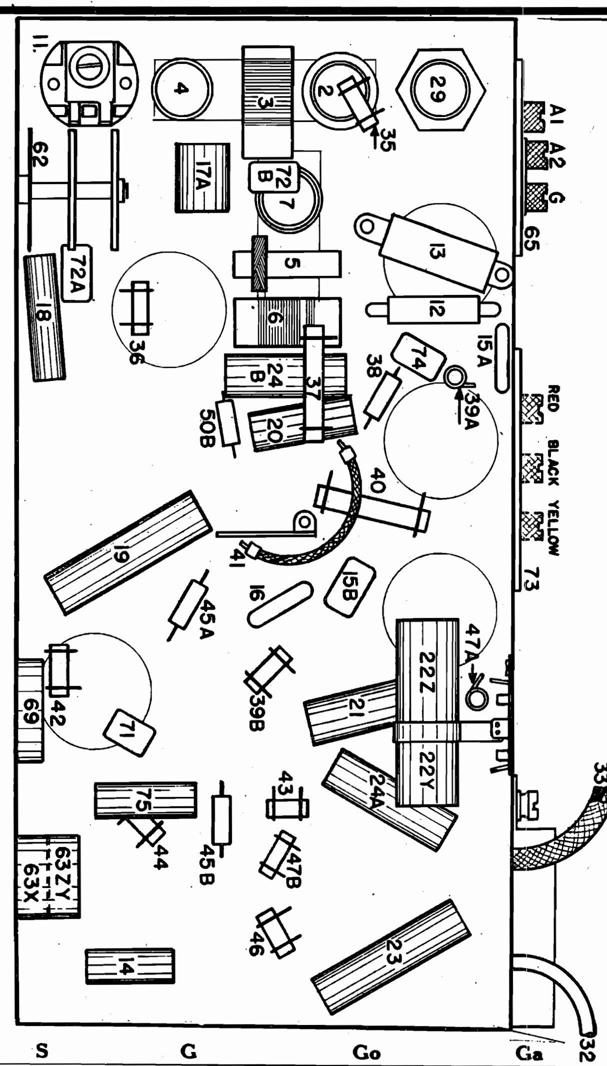


Fig. 3—Bottom View Model 667

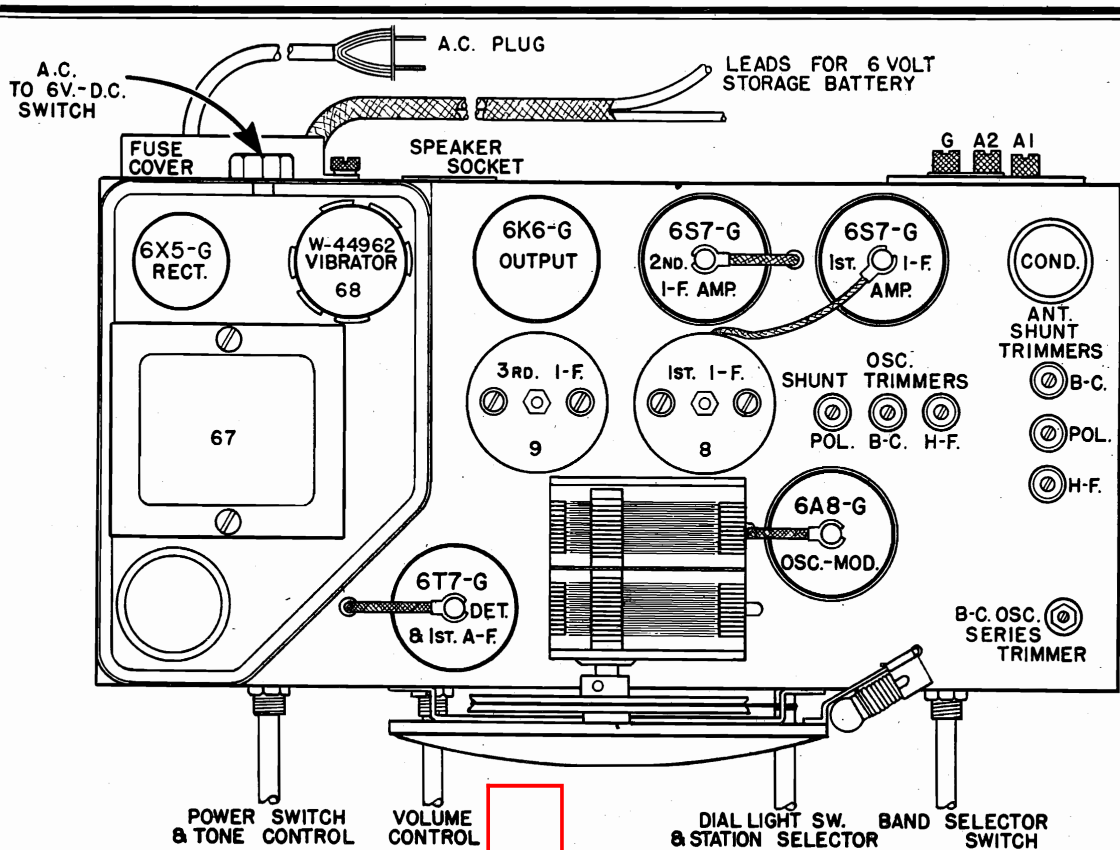


Fig. 2—Top View Model 667

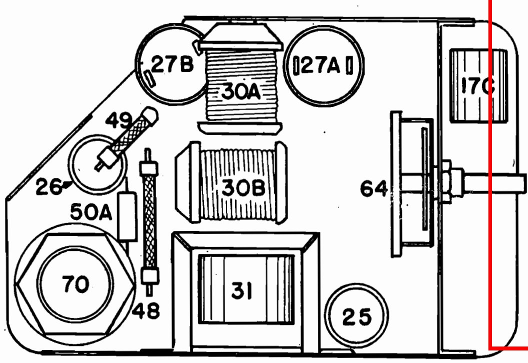


Fig. 4—Power Unit—Model 667

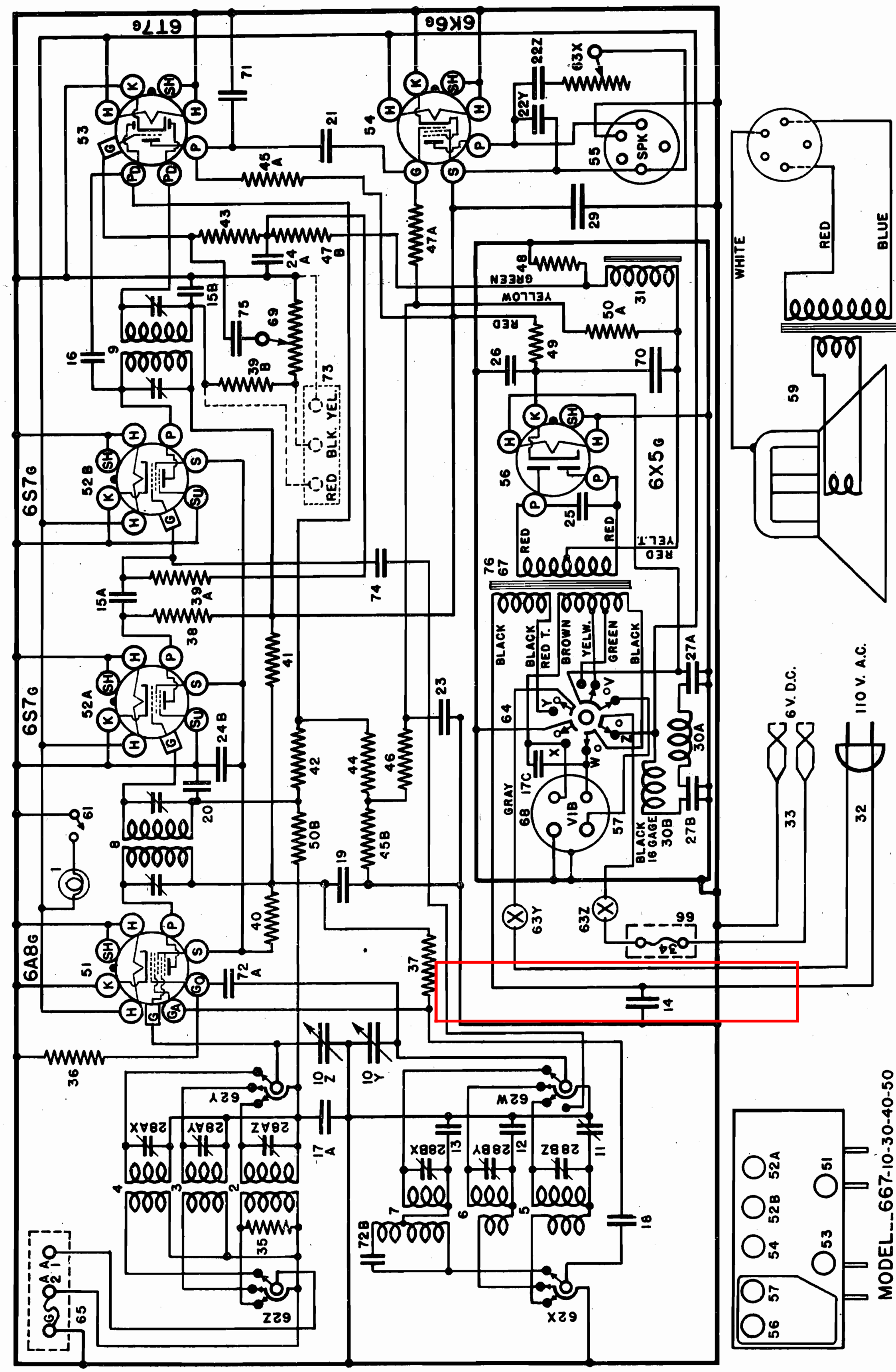
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	Go	Ga
6A8G	Oscillator-Modulator	6.2	170	92	-3*	-6 to -9**	125
6S7G	1st I-F. Amplifier	6.2	150	92	-3*	—	—
6S7G	2nd I-F. Amplifier	6.2	198	92	-2	—	—
6T7G	Det. AVC & 1st A. F.	6.2	100	—	-2	—	—
6K6G	Output	6.2	193	198	-18.5*	—	—
6X5G							

Power consumption approximately 25 watts at 117.5 volts or 5 amperes at 6 volts.
Power output approximately 3 watts at 117.5 volts or 2.5 watts at 6 volts D. C.
When using a 6 volt storage battery, all voltages will be approximately as given except "H" which will be 6 volts.
*See CIRCUIT DESCRIPTION.
**100 to 150 microamperes measured between 60,000 ohm grid lead (item 36) and chassis.

MODEL 667
Schematic

CROSLEY CORP.



MODEL 667
Alignment, Parts
Data

CROSLEY CORP.

DECEMBER, 1937 — CHASSIS NO. 667

CIRCUIT DESCRIPTION

Six octal base glass tubes are employed in a superheterodyne circuit which consists of an oscillator-modulator tube, two-stage 455 kilocycle I-F amplifier, composite detector, AVC and 1st A-F amplifier tube, pentode output and power supply. Items 45B, 46 and 50 serve as a voltage divider. The initial bias for the 6A8G and 6S7G 1st I-F tubes is obtained by the voltage drop across item 45B, measured with a vacuum tube voltmeter or 20,000 ohms per volt voltmeter. The bias for the 6S7G 2nd I-F and 6T7G tubes is developed across item 48. The bias for the output tube is obtained by the voltage drop across items 45B and 46, also measured with a vacuum tube voltmeter or 20,000 ohms per volt voltmeter.

When the AC-DC change-over switch is turned to the "6 volt" position as shown in the wiring diagram, the BROWN to BLACK winding of the power transformer serves as the primary and the filament voltage is taken direct from the storage battery. When the switch is thrown to the "AC" position, the BLACK to BLACK with RED tracer winding serves as the primary and the filament voltage is obtained across the GREEN and BROWN leads.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube prongs to the chassis with a 1000 ohm per volt, 500 volt voltmeter (except filaments) with the receiver in operating condition and the volume control full on but with no signal input. The filament voltages should be measured with a low range voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits may be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to the plate and screen of the 6K6G output tube. Be certain that the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier to 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the ground terminal (G) of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right, (ON).

(c) Turn the band selector switch to the Standard Broadcast Band.

(d) Set the signal generator to 455 kilocycles.

(e) Adjust both trimmers located on top of the 3rd I-F transformer for maximum output.

(f) Adjust both trimmers located on top of the 1st I-F transformer for maximum output.

(g) Check operations (e) and (f) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier.

When aligning the R-F amplifier, the output lead from the signal generator is connected to the antenna (A1) terminal of the receiver. For the Broadcast Band, a 200 mmf. condenser should be connected in series with the output lead of the signal generator and for the Police and Short Wave Bands, a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be SHUNT ALIGNED and then SERIES ALIGNED where provision is made for series alignment (Broadcast Band). The band selector switch should be set for the band being aligned and the station selector and signal generator should be set to the frequency indicated for each adjustment, paragraph (D) below.

(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh, adjust the "OSC" shunt trimmer so that the MINIMUM CAPACITY SIGNAL (D) is heard. (It is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT SIGNAL (D) is tuned-in with maximum output. Then, adjust the "ANT" shunt trimmer for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and check the adjustment of the "ANT" trimmer. DO NOT READJUST THE OSCILLATOR TRIMMER.

NOTE: When shunt aligning the Police and Short Wave bands, care must be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times or more and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct frequency.

(c) To align the series trimmer (See Fig. 2), set the signal generator to the frequency indicated below (D) and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer, it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output.

(D) SIGNAL INPUT FREQUENCIES

	Min. Cap. Signal	Shunt Align.	Series Align.
Standard Broadcast Band	1725 Kilocycles	1400 Kilocycles	600 Kilocycles
Police Band	6.6 Megacycles	6.0 Megacycles	
Short Wave Band	22.5 Megacycles	18 Megacycles	

SPECIFICATIONS

This model Crosley radio is a six-tube superheterodyne receiver designed for operation either from a 6-volt storage battery or commercial A. C. power supply.

No "B" or "C" batteries are required when the receiver is operated from a storage battery. The tuning range is divided into three bands as follows:

535-1725 Kilocycles or 550-173 Metres (Standard Broadcast)
1.9- 6.6 Megacycles or 158-45.5 Metres (Police and Amateurs)
6.4- 22 Megacycles or 47-13.5 Metres (Short Wave).

PARTS LIST—MODEL 667

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	W —44337	Dial Light Bulb, 6-8 V.
	G6 —27134	Dial Light Socket Assy.
2	G157—32000	Ant. Coil, B-C.
3	G158—32000	Ant. Coil, Pol.
4	G153—32000	Ant. Coil, H-F.
5	G159—32002	Osc. Coil, B-C.
6	G157—32002	Osc. Coil, Pol.
7	G162—32002	Osc. Coil, H-F.
8	G153—32004	1st I-F.—455 Kc.
9	G179—32004	3rd I-F.—455 Kc.
10	G41 —33001	2 Section Gang Condenser
	B —45009A	Dial Face (6 V.-110 V.)
	B —45009	Dial Face (Export Only)
	C —44964A	Support Brkt.—Dial Glass
	W —44085B	Metal Mask—Dial
	W —44084B	Ring—Glass Support
	W —44299	Pointer
	W —40486	Screw—Pointer Mtg.
	W —43622	Felt Washer
	G1 —43564	Pulley and Hub Assy.
	—41582	Drive Cord (18 in.)
	W —43561	Drive Spring (Tension)
	W —44130A	Drive Shaft
	W —43549	Ring—Shaft Retaining
11	—40769	B-C. Osc. Series Trimmer (Variable)
12	G23 —34000	Pol. Osc. Series Trimmer (Fixed 1,560 Mmf.)
13	G20 —34000	H-F. Osc. Series Trimmer (Fixed 4,910 Mmf.)
14	W —30805	Condenser, .01 Mf. 400 V.
15A	G2 —34002	Condenser, .0001 Mf. Molded
15B	G2 —34002	Condenser, .0001 Mf. Molded
16	G3 —34002	Condenser, .0005 Mf. Molded
17A	W —35936	Condenser, .05 Mf. 200 V.
17C	W —35936	Condenser, .05 Mf. 200 V.
18	W —35139	Condenser, .004 Mf. 400 V.
19	W —22688	Condenser, .1 Mf. 400 V.
20	W —28621	Condenser, .02 Mf. 200 V.
21	W —30488	Condenser, .02 Mf. 400 V.
22Z }	W —31052	Condenser, .05 Mf. 400 V.
22Y }		Condenser, .004 Mf. 400 V.
23	W —34712	Condenser, .25 Mf. 160 V.
24A	W —24049C	Condenser, .1 Mf. 200 V.
24B	W —24049C	Condenser, .1 Mf. 200 V.
25	W —50068A	Condenser, .006 Mf. 1,000 V. (60 Cy.)
25	W —45473	Condenser, .003 Mf. 1,000 V. (25 Cy.)
26	W —37173	Condenser, .25 Mf. 300 V.
27A	W —50161	Condenser, .5 Mf. 120 V.
27B	W —50161	Condenser, .5 Mf. 120 V.
28	W —35951A	3 Section Shunt Trimmer Assy.
29	W —44012	Condenser, 16 Mf. 250 V.
30A	G25 —28067	Choke "A" Filter
30B	G25 —28067	Choke "A" Filter
31	G22 —29535	Choke "B" Filter
32	B —44004	A-C Power Cord and Plug
33	G2 —44948	Battery Cable and Clips
	—34903	Battery Clip (Pos.)
	—34904	Battery Clip (Neg.)
34	W —31103	Fuse, 10 Amp.
35	—22196	Resistor, 20,000 Ohm 1/3W. Carb.
36	—21237A	Resistor, 60,000 Ohm 1/3W. Carb.
37	—4921C	Resistor, 10,000 Ohm 1W. Carb.
38	—36316	Resistor, 2,700 Ohm 1/4W. Ins.
39A	—21875	Resistor, 100,000 Ohm 1/3W. Carb.
39B	—21875	Resistor, 100,000 Ohm 1/3W. Carb.
40	—23616	Resistor, 15,000 Ohm 1W. Carb.

Item No.	Part No.	Description
41	W —23013	Resistor, 2,000 Ohm 1 1/4W. Flex.
42	—34883	Resistor, 2 Megohm 1/3W. Carb.
43	—26577	Resistor, 3 Megohm 1/3W. Carb.
44	—37590	Resistor, 750,000 Ohm 1/3W. Carb.
45A	—35601	Resistor, 300,000 Ohm 1/4W. Ins.
45B	—35601	Resistor, 300,000 Ohm 1/4W. Ins.
46	—37245	Resistor, 1.5 Megohm 1/3W. Carb.
47A	—23785	Resistor, 500,000 Ohm 1/3W. Carb.
47B	—23785	Resistor, 500,000 Ohm 1/3W. Carb.
48	W —23012A	Resistor, 40 Ohm 3/4W. Flex.
49	W —27504	Resistor, 100 Ohm 1/2W. Flex.
50A	—35600	Resistor, 100,000 Ohm 1/4W. Ins.
50B	—35600	Resistor, 100,000 Ohm 1/4W. Ins.
51	G156—36400	Socket, Type 6A8
52	G182—36400	Socket, Type 6S7
53	G183—36400	Socket, Type 6T7
54	G172—36400	Socket, Type 6K6
55	G103—28807	Socket Spkr.
56	G168—36400	Socket, Type 6X5
57	G105—28807	Socket Vib.
	W —40911	Tube Shield
59	51PP18"B"	Speaker, Spec. No. 100-PG-4 (Console)
59	31PP18"A"	Speaker, Spec. No. R-6000, M-16 (Table Model)
	—44218	V. C. and Cone Assy. } 31PP18"A" only
	—44220	Cone Mtg. Ring (Cardboard) } 31PP18"A" only
	—45071	Output Transformer } 31PP18"A" only
60		
61	G1 —44950	Switch—Dial Light
62	—44049A	Band Switch
63	—44946	Switch—On-Off and Tone Control (100,000 Ohm)
64	W —44951	Switch—A. C.-D. C.
65	G27 —26719	Ant. and Gnd. Terminal Assy.
66	G2 —33339	Fuse Panel
	W —33310A	Fuse Cover
	W —34223	Insulator—Fuse Cover
	W —4072	Thumb Screw—Fuse Cover
67	—44961	Power Trans., 50-60 Cy.—110 V.
68	W —44962A	Vibrator (6 V.)
69	—44081	Volume Control (1 Megohm)
70	W —44990	Condenser, 30 Mf. 250 V.
71	G1 —34002	Condenser, .00025 Mf. Molded
72A	G5 —34002	Condenser, .00005 Mf. Molded
72B	G5 —34002	Condenser, .00005 Mf. Molded
73	G37 —26719	Phono. Terminal Assy.
74	G13 —34002	Condenser, .000035 Mf. Molded
75	W —41461	Condenser, .0014 Mf. 200 V.
76	—45454	Power Trans., 25 Cy.—125 V.
	—45497	Power Trans., 25 Cy.—220 V.
	—45498	Power Trans., 50 Cy.—220 V.
	7G	Cabinet—Table
	7WD	Cabinet—Console
	B —44226B	Escutcheon
	W —43553	Rubber Mtg. Foot
	W —41221	Knob—Station Selector }
	W —41222	Knob—Dial Light }
	W —41605	Knob—Vol. Cont.
	W —41224	Knob—Tone Cont.
	W —45037	Knob—Band Sw.
	W —28601	Knob—A. C.-D. C. Sw.

MODEL 718
Socket, Trimmers, Voltage
Chassis, Data

CROSLEY CORP.

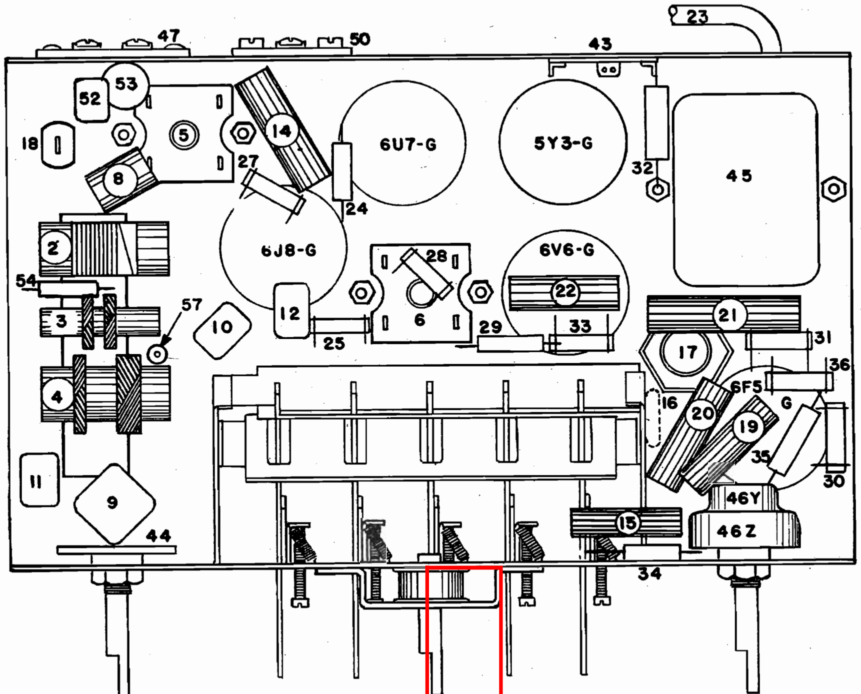


Fig. 3 Bottom View Model 718

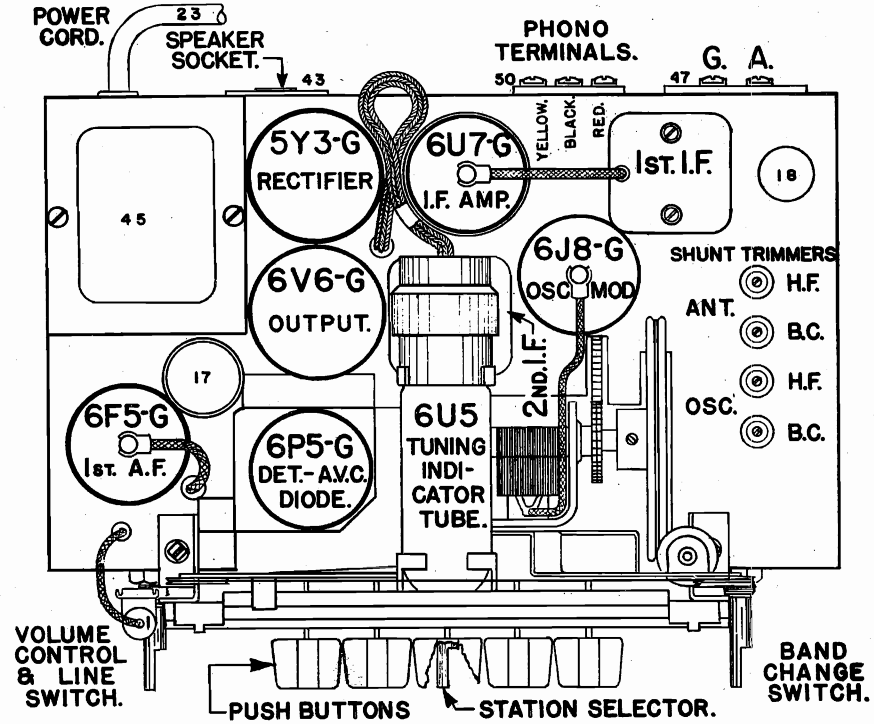


FIG. 2 Top View Model 718

SPECIFICATIONS

This model Crosley is a compact seven-tube super-heterodyne receiver designed for operation on ALTERNATING CURRENT as specified on the Model and License sticker.

The features included in its design consist of a Mechanical Push Button Tuning System, Beam Power Output Tube, Radio-Log Dial, Tuning Indicator Tube, Bass Compensation and a moving coil dynamic speaker.

The Tuning Range is divided into two bands as follows:

540-1725 Kilocycles or 555-173 Meters (American and some Police)
5.7-18.3 Megacycles or 52.6-16.4 Meters (Foreign)

The tubes used and their functions are as follows: one 6J8G as Oscillator-Modulator, one 6U7G as I-F amplifier, one 6P5G as Detector, A. V. C. diode, one 6F5G as first Audio amplifier, one 6V6G as Beam Power output, one 5Y3G as Rectifier and one 6U5 as eye Tuning Indicator.

The initial bias for the 6J8G and 6U7G (drop across item 34 a 60 ohm resistor) is measured from chassis to the low end of the volume control. For the 6F5G, (drop across item 35 a 32 ohm resistor) is measured from the low end of the 10 megohm resistor to the cathode of the 6F5G. The bias for the 6V6G is obtained from the drop across items 34, 35, 32, 60 ohms, 32 ohms, 100 ohms respectively, measured from the junction of item 32 and speaker field to chassis. The speaker field is in the negative leg of the power supply. Item 51Y is a 1 megohm resistor assembled in the socket of the 6U5.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between tube socket contacts and chassis. Voltage readings taken with a 1,000 ohm per volt, 500 volt voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A-C voltmeter (Approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	Ga	K
6 J8G	Oscillator-Modulator	6.3	172	88	−3	120	0
6U7G	I-F Amplifier	6.3	172	88	−3	0	0
6P5G	Detector A.V.C. Diode	6.3	0	0	0	0	−3
6F5G	1st A-F Amplifier	6.3	100	0	−2	0	−3
6V6G	Output	6.3	160	172	−10	0	0
5Y3G	Rectifier	3.9	A.C.				217
6U5	Tuning Indicator	6.3	170				

Maximum power output approximately 5 watts.
Voltage across speaker field 37 volts.
Power consumption approximately 52 watts at 117.5 line.

OCTOBER, 1938 FOR SCHEMATIC SEE INDEX CHASSIS MODEL 718

MODEL 718
Alignment, Drive Data

CROSLEY CORP.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

SETTING THE PUSH BUTTONS

Should it become necessary to realign the various circuits of this receiver, it may be necessary to reset the Push Button Tuning System.

The buttons are set by means of a set screw that is accessible through the front of the push button.

Loosen set screw, tune-in with the manual tuning knob the station whose call letters are to be placed in that button.

PUSH THAT BUTTON ALL THE WAY DOWN, AND WHILE YOU HOLD IT IN THAT POSITION, SECURELY TIGHTEN THE SET SCREW.

The first button is now set, follow the same procedure with the rest of the push buttons.

The accuracy of the buttons depends on how accurate the station is tuned-in while setting them.

CONNECTING OUTPUT METER

Connect the output meter to P and S of the 6V6G Output Tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6J8G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh and turn the volume control to the right (ON).

(c) Turn the band selector switch to the left (American Broadcast Band).

(d) Set the signal generator to 455 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F Transformer for maximum output. (Fig. 2).

(f) Adjust both trimmers located on top of the 1st I-F Transformer for maximum output.

(g) Check operations (e) and (f) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier

When aligning the R-F amplifier the output of the modulated signal generator should be fed through a dummy antenna and connected to the "ANT" terminal of the receiver.

For the "Foreign" band use a 250 ohm carbon resistor for dummy and for the "American" band use a .0002 Mf. condenser.

Align the "Foreign" band first.

(a) Set Band selector to "Foreign" band, right.

(b) Set signal generator to 18.3 Megacycles.

(c) Open gang all the way. Minimum capacity.

(d) Tune-in with H-F Osc. shunt trimmer 18.3 signal. This signal will be heard at two settings of this trimmer always choose the setting furthest open.

(e) Set signal generator to 18.0 Megacycles.

(f) Tune-in 18.0 Mc. signal with station selector, then align the H-F ANT. trimmer condenser for maximum output. DO NOT ADJUST OSC. TRIMMER AT THIS FREQUENCY.

(g) Repeat operations (d), (e) and (f) until no further improvement can be obtained.

(h) Set the band selector to the American Broadcast band.

(i) Set the signal generator to 1725 Kilocycles.

(j) Open the gang all the way. Minimum capacity.

(k) Adjust B-C OSC. trimmer for maximum output.

(l) Set signal generator to 1400 Kc.

(m) Tune receiver for maximum general signal (approx. 140 on the dial).

(n) Adjust B-C ANT. trimmmer for maximum output. DO NOT RE-ADJUST OSC. TRIMMER AT 1400 Kc.

(o) REPEAT operations (m) and (n) alternately until no further improvement in output can be obtained.

NOTE: If at any time the H-F coils in this receiver are replaced, it may be necessary to vary the inductance of the "OSC" coil by moving the cross-over turn of wire at the gap to make the set track at the 6 megacycle end. Moving the turn toward the short end of the coil will decrease the inductance and moving it toward the long end will increase the inductance. If the signal is weak at 6 megacycles, a similar slight change in the inductance at the "ANT" coil should bring up the signal strength. THIS IS A CRITICAL OPERATION AND SHOULD NOT BE DONE ON ANY SET UNLESS CHANGING COILS MAKES IT NECESSARY.

NOTE: When aligning the high frequency band care should be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator approximately 10 times and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles below the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct dial setting.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 Kc. This assembly is located on the underneath side of the chassis and consists of a coil and a trimmer condenser as indicated by item 48 in the wiring diagram.

The wave trap should not be adjusted until all other adjustments have been made. To adjust, feed a 455 Kc. signal through a .0002 Mf. condenser to the antenna terminal of the receiver. With the band selector turned to the broadcast band and the condenser gang closed and the volume control on full, adjust the trimmer condenser on the wave-trap for MINIMUM SIGNAL.

Should the interfering station be operating on a frequency of slightly more or less than 455 Kc., the exact frequency should be determined with the aid of a signal general by the beat note method. Then instead of feeding a 455 Kc. signal through, the exact frequency of the interfering station should be used. If it is not possible to determine the exact frequency of the interfering signal, the antenna may be attached to the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave-trap for minimum interference.

REPLACING DIAL DRIVE CORD

To replace a broken drive cord proceed as follows:

1—Remove broken cord from dial pointer and the cord tension spring from the large pulley on the condenser gang.

2—Remove complete dial assembly, fastened with two P. K. screws to top of chassis.

3—Remove screw and washer that fastens felt key mask to chassis and fold felt to one side.

4—Remove manual drive shaft bracket, fastened with two P. K. screws.

5—Place ends of replacement drive cord (G3-41582) together and tie a knot about $1\frac{1}{4}$ inches from the end. Slip tension spring through knot. Fasten the other end of spring on hook in large pulley on gang.

6—Close the gang then thread loop through the eyelet in pulley rim.

7—Bring one side of drive cord loop forward over pulley and around ($\frac{1}{4}$ turn) horizontal idler pulley, then under and over the righ hand idler pulley (counter-clockwise).

8—Loop the other side of drive cord over large pulley on gang in a clockwise direction, continue around and up and over the small idler pulley.

9—Then remove drive shaft from chassis, wrap two complete turns around pulley on the shaft, taking the cord coming over the small idler pulley and wrapping in a clockwise direction while holding shaft in right hand.

10—Replace drive shaft in position, taking care that the drive cord coming down to the pulley goes between the 4th and 5th keys and the cord going up from the pulley goes between the 1st and 2nd keys.

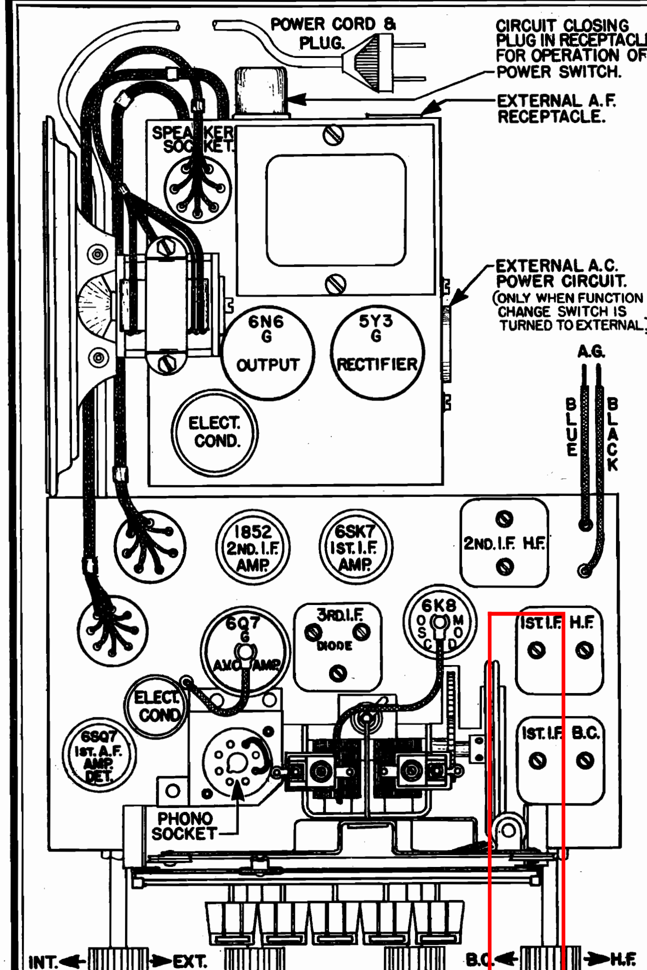
11—Hook drive cord over left hand idler pulley. Mount drive shaft bracket in position. Check to see that cord is running on all pulleys, and tension spring is stretched to approx. one inch in length.

12—Place drive cord clamp (W-46290) on drive cord approx. $\frac{1}{8}$ inch from inside edge of large pulley rim.

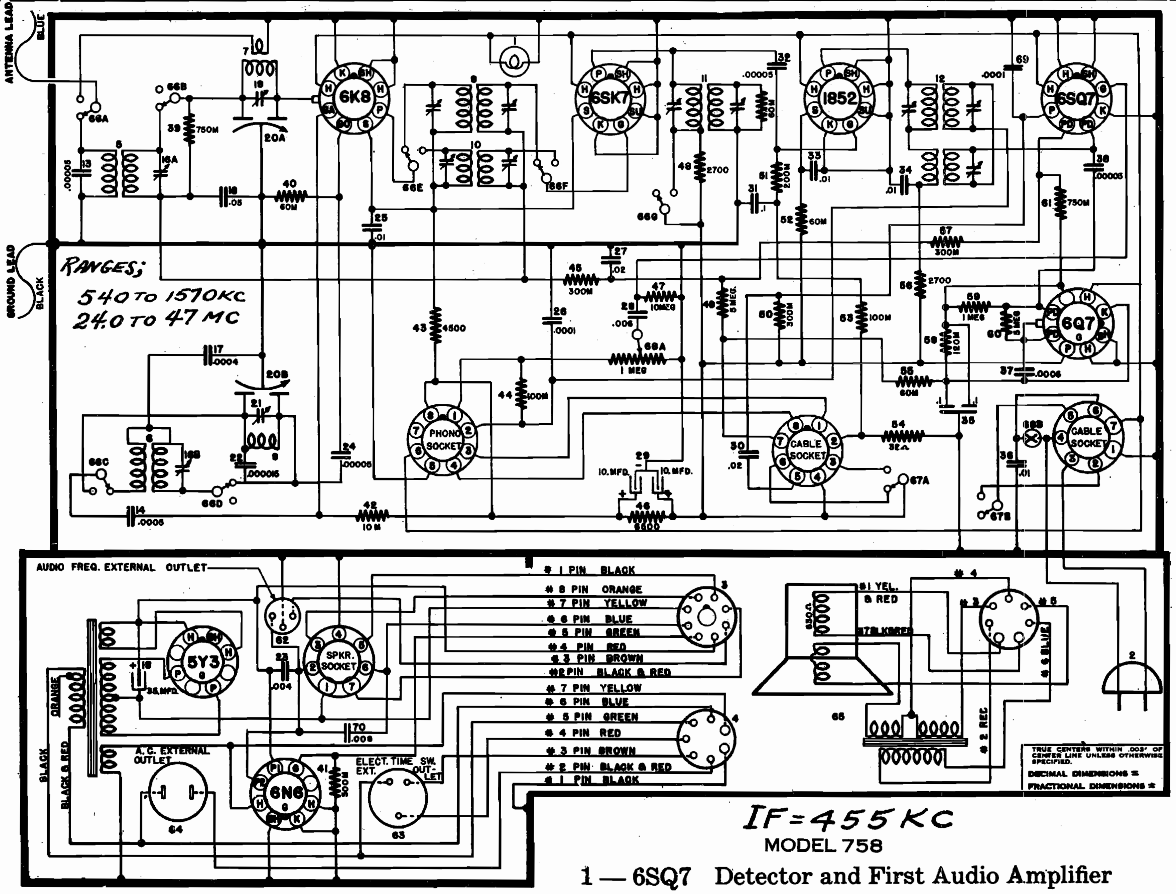
13—Replace key felt, rubber bands and dial assembly.

14—Close gang, set the pointer at 540 Kc., place cord in pointer, check pointer travel from end to end before gluing cord to pointer.

MODEL 758
Schematic, Socket, Trimmers Chassis



CROSLEY CORP.



IF = 455 KC
MODEL 758

1 — 6K8 Oscillator and Mixer or Modulator
1 — 6SK7 1st Intermediate Frequency Amplifier
1 — 1852 2nd Intermediate Frequency Amplifier
1 — 6SQ7 Detector and First Audio Amplifier
1 — 6Q7-G Automatic Volume Control Amplifier
1 — 6N6-G Triple Twin Output
1 — 5Y3-G Rectifier

1	W-37922	Bulb, Dial Light 6-8V
2	B-45769-A	Cable & Plug A.C.
3	B-47154	Cable & Plug 8-Lead
4	B-47153	Cable & Plug 7-Lead
5	G192-32000	Coil B.C. Ant.
6	G190-32002	Coil B.C. Osc.
7	G191-32000	Coil Ultra H.F. Ant.
8	G189-32002	Coil Ultra H.F. Osc.
9	G214-32004	1st I.F. Trans. B.C.
10	G213-32004	1st I.F. Trans. H.F.
11	G215-32004	2nd I.F. Trans.
12	G212-32004	Dual I.F. Trans.
13	G5-34002	Cond. 50 MMF Mica
14	G3-34002	Cond. 500 MMF Mica
15	W-36055-B	Cond. 35 MF 400V (Elec.)
16A	W-47147	Trimmer Cond. (B.C. Ant.)
16B		Trimmer Cond. (B.C. Osc.)
17	G18-34002	Cond. 400 MMF Mica
18	W-35936	Cond. .05 MF 200V Paper
19	W-45979	Trimmer Cond. (U.H.F. Ant.)
20A	G70-33001	Var. Cond. (Ant. Sect.)
20B		Var. Cond. (Osc. Sect.)
21	W-47126	Trimmer Cond. (U.H.F. Osc.)
22	G1-34009	Cond. 15 MMF Temp. Comp.
23	W-35139	Cond. .004 MF 400V Paper
24	G2-34009	Cond. 50 MMF Temp. Comp.
25	W-23191-A	Cond. .01 MF 400V Paper
26	G2-34002	Cond. 100 MMF Mica
27	W-28621	Cond. .02 MF 200V Paper
28	W-34713	Cond. .006 MF 160V Paper
29	W-47256	Cond. 10-10 MF 300V (Elec)
30	W-30488	Cond. .02 MF 400V Paper
31	W-24049-C	Cond. .1 MF 200V Paper
32	G5-34002	Cond. 50 MMF Mica
33	W-23191-A	Cond. .01 MF 400V Paper
34	W-23191-A	Cond. .01 MF 400V Paper
35	W-28622	Cond. .1-.1 MF 200V "
36	W-30805	Cond. .01 MF 400V Paper
37	G3-34002	Cond. 500 MMF Mica
38	G5-34002	Cond. 50 MMF Mica
39	38623	Res. 750,000 Ohm $\frac{1}{4}$ W. Ins.
40	36928	Res. 60,000 Ohm $\frac{1}{4}$ W. Ins.
41	36322	Res. 500,000 Ohm $\frac{1}{4}$ W. Ins.
42	36317	Res. 10,000 Ohm $\frac{1}{4}$ W. Ins.
43	31094	Res. 4500 Ohm 1/3 W. Carb.
44	35600	Res. 100,000 Ohm $\frac{1}{4}$ W. Ins.
45	35601	Res. 300,000 Ohm $\frac{1}{4}$ W. Ins.
46	47101	Res. 6500 Ohm $2\frac{1}{2}$ W. Ins. Wire Wd.
47	50956	Res. 10 Meg. $\frac{1}{4}$ W Ins.
48	36316	Res. 2700 Ohm $\frac{1}{4}$ W Ins.
49	47131	Res. 5 Meg. $\frac{1}{4}$ W Ins.
50	35601	Res. 300,000 Ohm $\frac{1}{4}$ W Ins.
51	35930	Res. 200,000 Ohm $\frac{1}{4}$ W Ins.
52	35928	Res. 60,000 Ohm $\frac{1}{4}$ W Ins.
53	35600	Res. 100,000 Ohm $\frac{1}{4}$ W Ins.
54	45981	Res. 32 Ohm $\frac{1}{2}$ W. Ins. Wire Wd
55	35928	Res. 60,000 $\frac{1}{4}$ W Ins.
56	36316	Res. 2700 Ohm $\frac{1}{4}$ W. Ins.
57	35601	Res. 300,000 Ohm $\frac{1}{4}$ W Ins.
58	36320	Res. 120,000 Ohm $\frac{1}{4}$ W. Ins.
59	35602	Res. 1 Meg $\frac{1}{4}$ W. Ins.
60	47131	Res. 5 Meg $\frac{1}{4}$ W. Ins.
61	38623	Res. 750,000 Ohm $\frac{1}{4}$ W Ins.
62	W-47133	Socket A.F. Ext. Outlet
63	W-50243	Socket Elec. Time S.W.
64	W-47163	Socket A.C. Ext. Outlet
65	B-47073	Spkr. 388 B.P. 6
66A	B-47157	Switch-Band Chg.
66B		Switch-Band Chg.
66C		Switch-Band Chg.
66D		Switch-Band Chg.
66E	B-47157	Switch-Band Chg.
66F		Switch-Band Chg.
66G		Switch-Band Chg.
67A	47155-A	Switch-Function Chg.
67B		Switch-Function Chg.
68A	47138-A	Volume Control
69	G2-34002	Cond. 100 MMF Mica
70	W-35768	Cond. .008 MF 400V. Paper

MISCELLANEOUS

8GE	Cabinet
46408	Knob (4)
46417	Push Button
47190	Instructions

MODEL 818
Socket, Trimmers, Chassis
Voltage, Phono.

CROSLEY CORP.

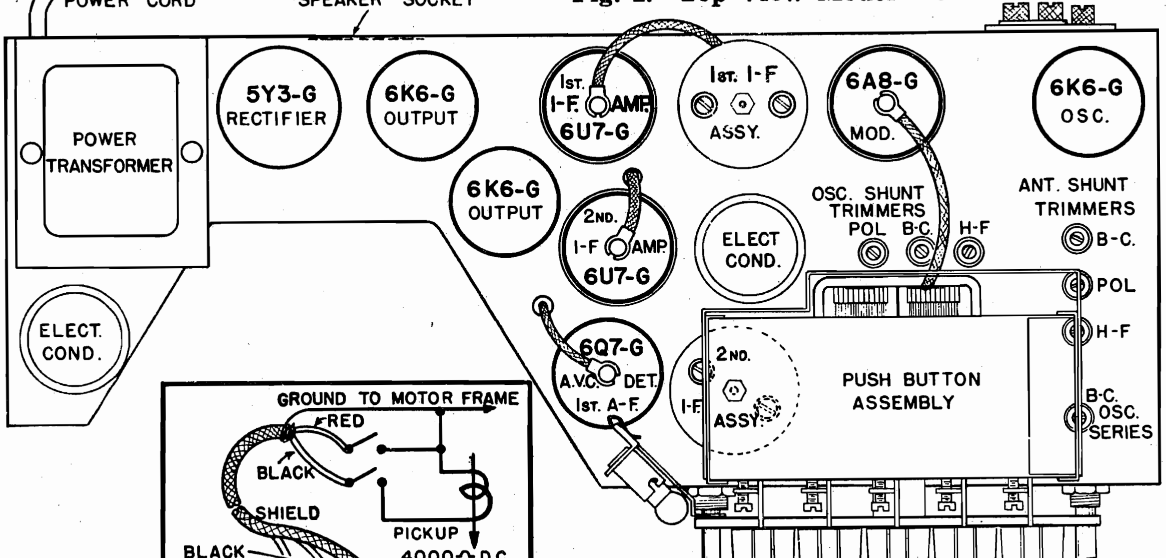
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	K	Go	Ga
6A8G	Modulator	6.3	240	85	Neg	0	Neg	85
6K6G	Oscillator	6.3	145	145	Neg	0	—	—
6U7G	1st I-F Amp	6.3	240	85	Neg	0	—	—
6U7G	2nd I-F Amp	6.3	210	85	Neg	0	—	—
6Q7G	Det., AVC & 1st A-F Amp	6.3	120	—	Neg	0	—	—
6K6G	Output	6.3	235	230	0	18.5	—	—
6K6G	Output	6.3	235	230	0	18.5	—	—
5Y3G	Rectifier	5.0	—	—	—	240	—	—

Power output approximately 5.5 watts.

Power consumption approximately 70 watts at 117.5 volts.
Voltage drop across speaker field 80 volts.

Fig. 2. Top View Model 818



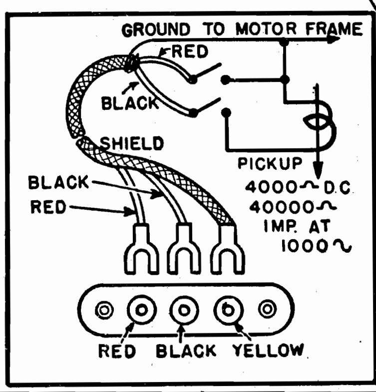


Fig. 4
Phonograph Pickup

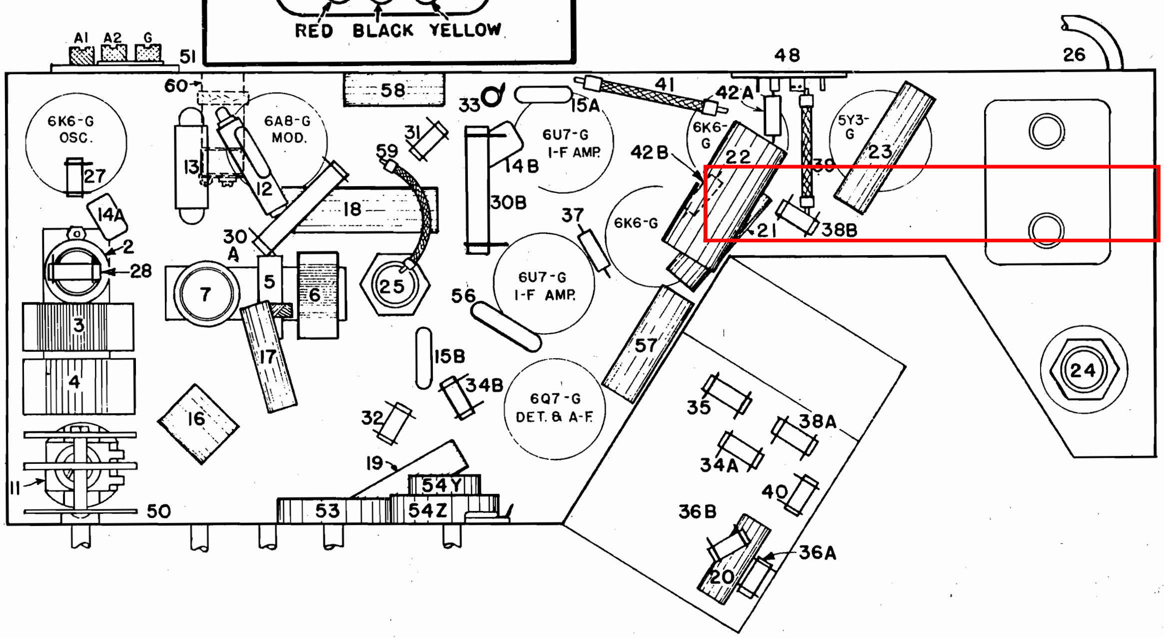
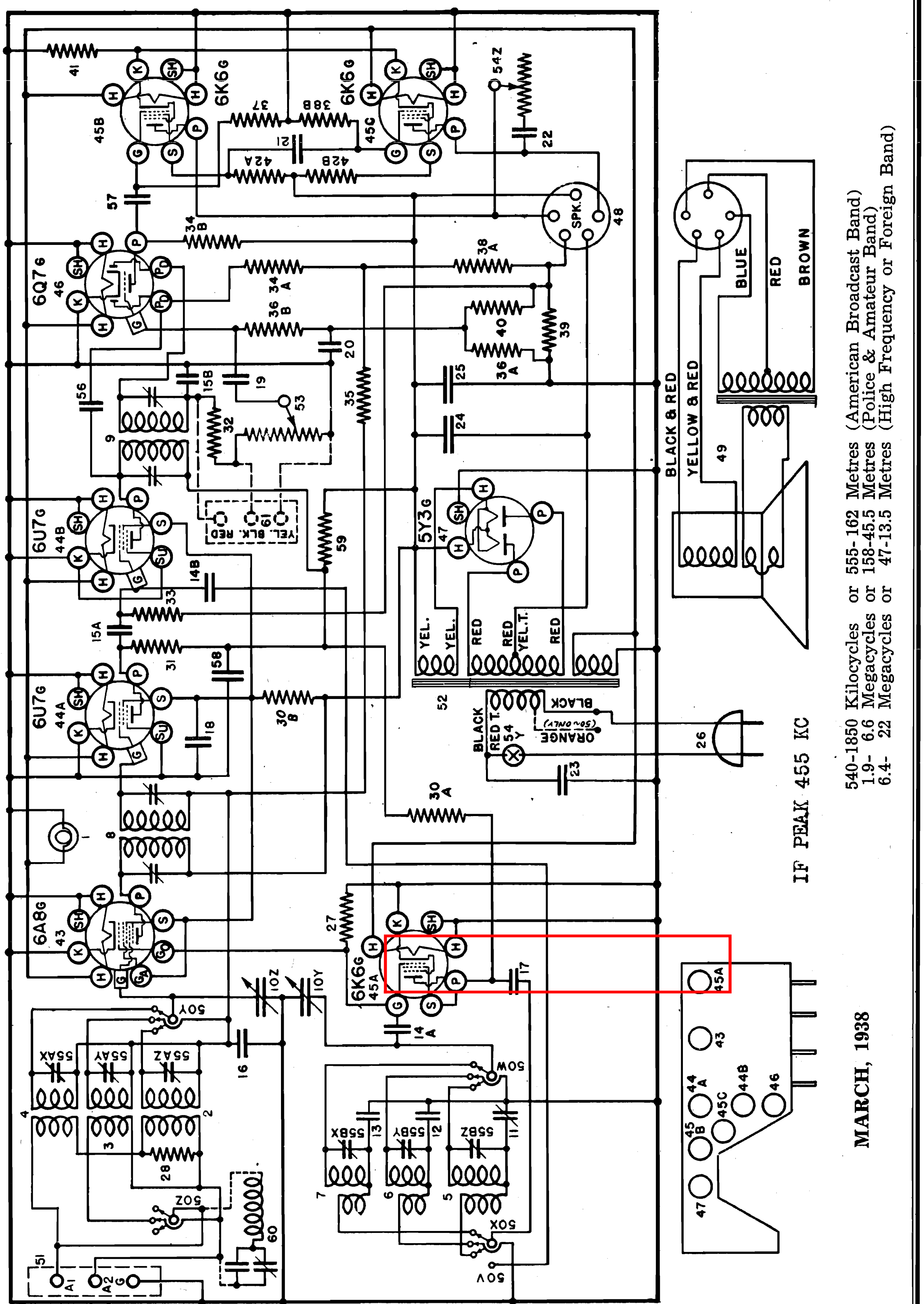


Fig. 3. Bottom View Model 818

MODEL 818
Schematic

CROSLEY CORP.



MODEL 818
Alignment, Notes, Parts

CROSLEY CORP.

ALIGNMENT PROCEDURE

Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

tube, leaving the tube's grid lead in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Turn the band selector switch to the High Frequency Band.

(d) Set the signal generator to 455 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F assm. for maximum output. (Item 9, Fig. 2).

(f) Adjust both trimmers located on top of the 1st I-F assm. for maximum output. (Item 8, Fig. 2).

(g) Check operations (e) and (f) for more accurate adjustment.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning The R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator is connected to the "ANT" terminal of the receiver. For the Broadcast and Police Bands a .00025 mfd. condenser should be connected in series with the output lead of the signal generator and for the High Frequenty band a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be SHUNT ALIGNED and then SERIES ALIGNED where provision is made for series alignment (Broadcast Band). The band selector switch should be set for the band being aligned and the station selector and signal generator should be set to the frequency indicated for each adjustment, ¶ (C) below.

(a) Adjust the "OSC" and "ANT" shunt trimmers in the order given for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and then check the adjustment of the "ANT" trimmer. DO NOT READJUST THE "OSC" TRIMMER.

NOTE: When shunt aligning the Police and High Frequency Bands care must be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this increase the output of the signal generator ten times, or more, to try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct frequency.

(b) To align the B. C. OSC. series trimmer (Fig 2), set the signal generator to the frequency indicated below and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer, it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output.

(C) SIGNAL INPUT FREQUENCIES

	Shunt Align.	Series Align.
American Broadcast Band	1700 Kilocycles	600 Kilocycles
Police & Amateur Band	6000 Kilocycles	
Foreign Band	18 Megacycles	

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil, a fixed condenser and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram (item 60).

The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a .00025 mfd. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser open and the volume control full on, adjust the trimmer condenser on the wave trap for MINIMUM output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then, instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver turned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

SETTING PUSH BUTTONS

The push buttons may be quickly and accurately set from the front of the receiver. It is not necessary that all the push buttons be set at the same time. Insert a small screw driver in the hole in the front of each push button and loosen (DO NOT REMOVE) the screw that is located in the bottom of each hole.

Determine the favorite broadcasting stations whose call letters are to be placed in the push buttons. By means of the conventional tuning knob, tune-in AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is, the station nearest the 1500 kilocycle end of the dial. COMPLETELY DEPRESS AND HOLD No. 1 push button and SECURELY TIGHTEN THE SET SCREW. No. 1 push button is the one toward the high frequency end of the dial.

The push button system is now set for the first station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles).

If the receiver has been re-aligned it may be necessary to reset the push button system.

REPLACING DIAL DRIVE CORD

To replace the dial drive cord, the following procedure should be carefully followed.

(1) Remove the chassis from the cabinet.

(2) Remove the dial glass, pointer and dial mounting bracket.

(3) Remove the broken cord and the tension spring.

(4) Double a 48″ length of drive cord. Insert the doubled end through the eyelet (from the outside) in the pulley on the end of the tuning condenser gang. Tie a knot in the cord so as to form a loop about 3/4″ long. Close the gang so that the eyelet in the pulley will be "down." Hook the looped cord over the catch provided in the pulley opposite the eyelet.

(5) Bring one end of the cord forward and over the top idler pulley. Continue the cord under and around to the top of the pulley on the pointed shaft (3/4 turn). With the pointer shaft pulley set so that its eyelet is in the "up" position, thread the cord through the eyelet.

(6) Bring the other end of the cord back and over the condenser gang pulley. Continue it down and over the lower idler pulley to the left-hand side of the rubber grommet and then over the top of the pointer shaft pulley. This lead should cross behind the down lead to the rubber grommet. Make one complete loop around the pointer shaft pulley and back to the eyelet. Thread the lead through the eyelet and tie a knot in the two ends of the cord so that it will be about 1/2″ from the eyelet when the cord is drawn taught. Hook one end of the tension spring over the knot and hook the other end to the catch provided opposite the eyelet. Cut off the excess cord and if bees' wax is available, apply a small amount to the knot as an added protection against slipping.

PARTS LIST—MODEL 818

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	W —43567	Bulb, Dial Light, 6-8 V.
	G4 —45398	Bracket, for Dial Light
2	G138—32000	Ant. Coil, 535-1850 Kc.
3	G139—32000	Ant. Coil, 1900-6600 Kc.
4	G140—32000	Ant. Coil, 6.5-22 Mc.
5	G139—32002	Osc. Coil, 535-1850 Kc.
6	G171—32002	Osc. Coil, 1900-6600 Kc.
7	G172—32002	Osc. Coil, 6.5-22 Mc.
8	G153—32004	1st I-F. Assy.
9	G154—32004	2nd I-F. Assy.
10ZY	G41 —33001	2 Section Gang Cond.
	D —44080C	Glass Dial Face
	W —44085B	Dial Mask (Paper)
	W —44084A	Dial Support Ring
	C —44082E	Support Brkt., Dial Glass
	G10 —43564	Pulley and Hub Assy. (Pointer Shaft)
	G11 —43564	Pulley and Hub. Assy. (Cond. Gang)
	—41582	Drive Cord
	MG29—45607	Drive Mtg. Bracket and Pulley Assy.
	W —45644	Pointer Shaft
	W —50325A	Retaining Ring (Pointer Shaft)
	W —44299	Dial Pointer
	W —40486	Screw (Pointer Mtg.)
	W —43561	Cord Tension Spring
	W —45716	Drive Shaft (Manual)
	W —43549	Retaining Ring (Drive Shaft)
	W —43542B	Drive Shaft Mtg. Bracket
	W —44701C	Grommet for Drive Shaft
11	—40769	B-C. Osc. Series Trimmer
12	G23 —34000	Condenser, 1560 Mmf.
13	G20 —34000	Condenser, 4910 Mmf.
14AB	G13 —34002	Condenser, 35 Mmf.
15AB	G2 —34002	Condenser, 100 Mmf.
16	W —35936	Condenser, .05 Mf. 200 V.
17	W —35139	Condenser, .004 Mf. 400 V.
18	W —22688	Condenser, .1 Mf. 400 V.
19	W —27652	Condenser, .003 Mf. 200 V.
20	W —28621	Condenser, .02 Mf. 200 V.
21	W —30488	Condenser, .02 Mf. 400 V.
22	W —23615	Condenser, .05 Mf. 400 V.
23	W —30805	Condenser, .01 Mf. 400 V.
24	W —44054	Condenser, 30 Mf. 350 V.
25	W —36057	Condenser, 40 Mf. 300 V.
26	B —33906A	Power Cord and Plug
27	—21237A	Resistor, 60,000 Ohm 1/4W.
28	—22196	Resistor, 20,000 Ohm 1/4W.
30A	—23616	Resistor, 15,000 Ohm 1W.
30B	—23616	Resistor, 15,000 Ohm 1W.
31	—24814	Resistor, 7,000 Ohm 1/4W.
32	—35600	Resistor, 100,000 Ohm 1/4W.
33	—21875	Resistor, 100,000 Ohm 1/4W.
34AB	—21455C	Resistor, 300,000 Ohm 1/4W.
35	—21454	Resistor, 1 Megohm 1/4W.
36AB	—26577	Resistor, 3 Megohm 1/4W.
37	—36322C	Resistor, 500,000 Ohm 1/4W.
38AB	—23785	Resistor, 500,000 Ohm 1/4W.
39	W —23012A	Resistor, 40 Ohm 3/4W. Flex.
40	—34883	Resistor, 2 Megohm 1/4W.
41	W. —21965	Resistor, 375 Ohm 1W. Flex
42AB	—44009	Resistor, 3,000 Ohm 1/4W.
43	G156—36400	Socket, Type 6A8

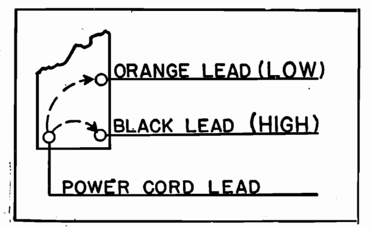
Item No.	Part No.	Description
44AB	G171—36400	Socket, Type 6U7
45ABC	G172—36400	Socket, Type 6K6
46	G160—36400	Socket, Type 6Q7
47	G173—36400	Socket, Type 5Y3
48	G103—28807	Socket, Type Speaker
	W —40911	Tube Shield
	W —27981A	Base, Tube Shield
49	465BP—12"M"	Speaker Spec., 1-D-1049 "M"
	—44272	V. C. and Cone Assy. for 465BP12"M" Spkr.
	—44273	Field Coil for 465BP12"M" Spkr.
	—44274	Output Trans. for 465BP12"M" Spkr.
	W —43552	Spk. Plug Clamp
50	—44049	Band Selector Switch
51	G27 —26719	A1-A2-G. Terminal Assy.
52	—44057	Power Trans., 100 V. 60 Cy.
	—44058	Power Trans., 110 V. 50 Cy.
	—44059	Power Trans., 220 V. 50 Cy.
	—44060	Power Trans., 110 V. 25 Cy.
	—44061	Power Trans., 220 V. 25 Cy.
53	—44081	Volume Control, 1 Meg.
54Z, 54Y	—44024B	Tone Control, 100,000 Ohm; Line Switch
55	W —35951A	3 Sect. Ant. Shunt Trimmer Assy.
	W —45714	3 Sect. Osc. Shunt Trimmer Assy.
56	W —32741	Condenser, 500 Mmf.
57	W —34647	Condenser, .006 Mf. 400 V.
58	W —32378	Condenser, .01 Mf. 400 V.
59	W —23013	Resistor, 2,000 Ohm 1 1/4W. Flex.
		PUSH BUTTON PARTS
	G4 —45683	Push Button Unit Assy. Complete
	G30 —45683	Key and Toggle Assy.
	W —50542A	Key Clip (Lock Clamp)
	—45718	Adjusting Screw
	G31 —45683	Rocker Plate Assy.
	W —50561	1/8″—6 x 40 Screw (Rocker Plate Bearing)
	W —50547	Key Plate (Rear Guide)
	W —45646A	Adjust. Clip (Hooked Tear Drop)
	W —50588	Adjust. Clip (Plain Tear Drop)
	—43882	1/4″ No. 8 P. K. Screw (Clip Mtg.)
	W —50607	Spring (Key Return)
	W —45711	Felt
	W —45658	Push Button
	W —45668	P. B. Support Bracket
	S —132	Screw (P. B. Brkt. Mtg.)
	W —44088	Knob, Vol. and Tuning
	W —50164A	Knob, Tone and Band Change
	W —43553	Rubber Mtg. Foot
	W —44225	Grille Bar (2)
	—44092	Grille Cloth
	—7CA	Cabinet
	B —44226B	Escutcheon
	B —45626A	Push Button Escutcheon
	—50549	Call Letter Sheet
	W —50551A	Celluloid Cover
60	G165—32004	Wave Trap

50 CYCLE POWER TRANSFORMER ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal stripe near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections



CROSLEY CORP.

MODEL 828
Schematic
Phono.

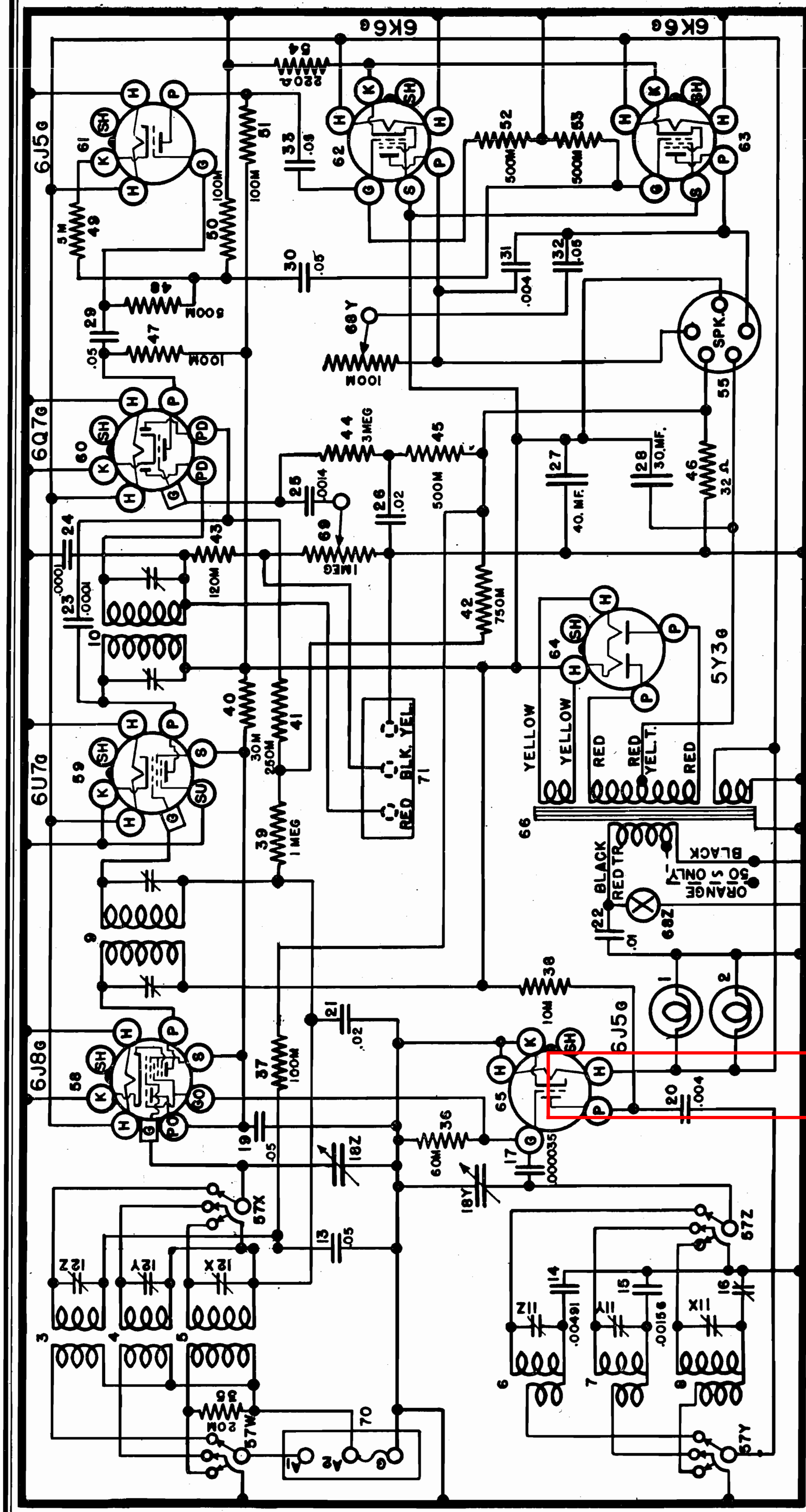


FIG. 1

MODEL 828
455 K.C. I.F.

DECEMBER, 1938

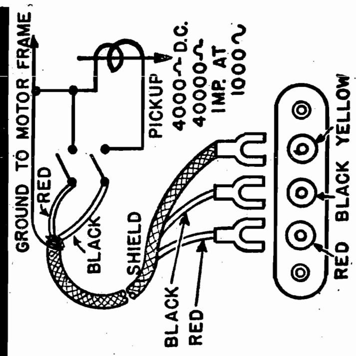
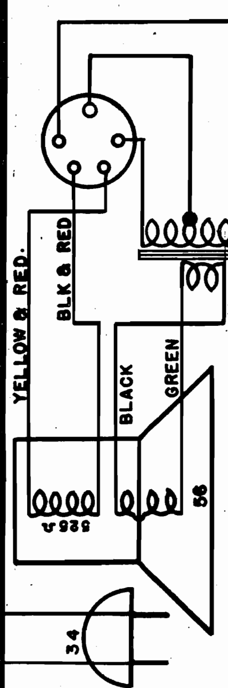
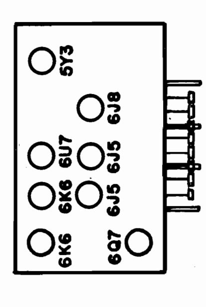


Fig. 4 Phonograph Pickup





This model Crosley is an eight-tube receiver designed for operation on A.C. circuits as specified on the model and license label. Features include; large sloping rectangular dial, three tuning ranges, continuous variable tone control, separate oscillator, bass compensation, push pull pentode output, phase inversion and the famous CROSLEY mechanical push button tuning system.

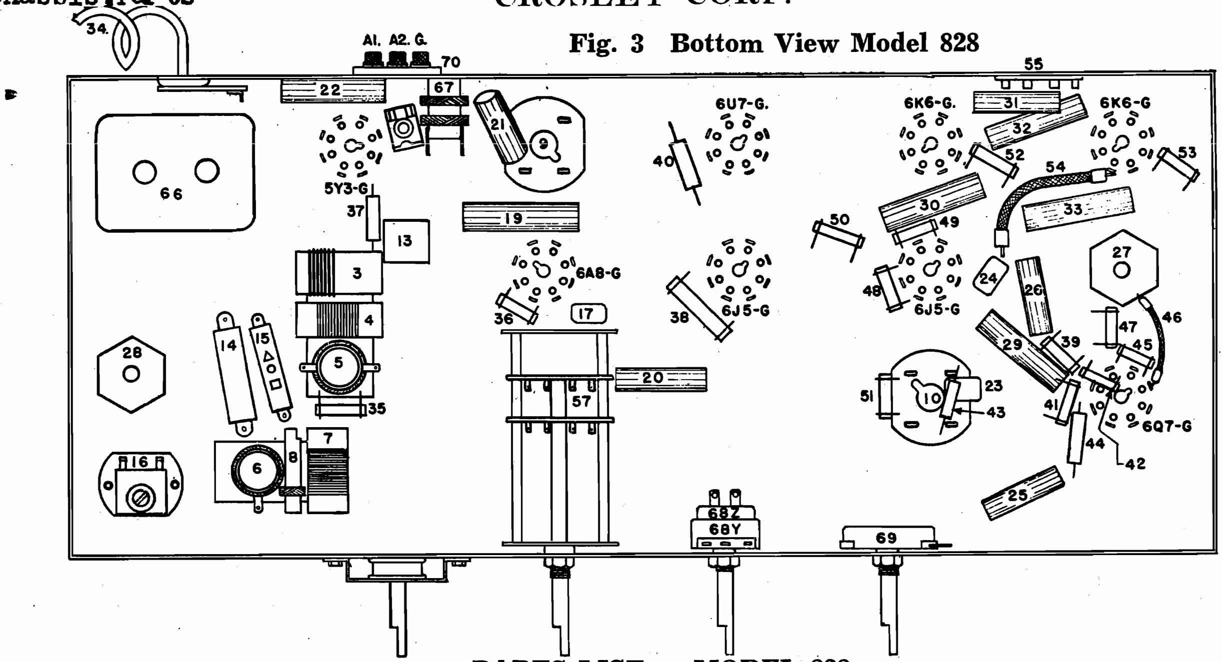
The tuning range is from 540 kilocycles to 20 megacycles and divided into three bands as follows:

540-1725 Kilocycles or 555-173 Meters (American Broadcast Band)
1.9- 6.4 Megacycles or 158-46.8 Meters (Police and Amateurs)
6.2- 20 Megacycles or 48.4-15 Meters (Foreign or High Frequency Band)

MODEL 828
Chassis Parts

CROSLEY CORP.

Fig. 3 Bottom View Model 828



PARTS LIST — MODEL 828

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	W —37922	Dial Light—6-8 Volt
2	W —37922	Dial Light—6-8 Volt
	G16 —45398	Socket and Brkt. Assy., Dial Light
3	G170—32000	Antenna Coil—H-F.
4	G168—32000	Antenna Coil—Pol.
5	G169—32000	Antenna Coil—B-C.
6	G170—32002	Oscillator Coil—H-F.
7	G168—32002	Oscillator Coil—Pol.
8	G169—32002	Oscillator Coil—B-C.
9	G175—32004	1st I-F. Assy., 455 Kc.
10	G176—32004	2nd I-F. Assy., 455 Kc.
11	W —45713	3 Section Trimmer (Osc. Shunt)
12	W —35951A	3 Section Trimmer (Ant. Shunt)
13	W —35936	Condenser, .05 Mf. 200 V.
14	G20 —34000	Condenser, .004910 Mf. Mica
15	G23 —34000	Condenser, .001560 Mf. Mica
16	—40769	B-C. Osc. Series Trimmer
17	G13 —34002	Condenser, .000035 Mf. Molded
18	G59 —33001	2 Section Gang Condenser
	D —46317	Calibrated Dial Glass—Domestic
	D —46749	Calibrated Dial Glass—International
	C —46275B	Dial Support—Flocked Mask
	W —46941	Rubber Cushion—Dial Glass
	W —46099	Dial Class Clip—(2 Req.) Mtg.
	W —46096	Dial Class Clip—(R. H.) Mtg.
	W —46095	Dial Class Clip—(L. H.) Mtg.
	—46203	Dial Pointer
	W —46097	Guide—Pointer
	G13 —43564	Pulley and Hub Assy. on Gang
	MG17—46287	Small Brass Idler Pulley and Brkt. Assy.
	MG20—46287	Idler Pulley Assy. (2 Pulleys)
	—45877B	Drive Shaft and Pulley (Manual)
	W —45878	Bracket—Drive Shaft Mounting
	—46087	Tension Spring—Drive Cord
	G9 —41582	Drive Cord (61 Inches)
	W —46290	Clamp—Drive Cord
19	W —23615	Condenser, .05 Mf. 400 V.
20	W —35139	Condenser, .004 Mf. 400 V.
21	W —28621	Condenser, .02 Mf. 200 V.
22	W —30805	Condenser, .01 Mf. 400 V.
23	G2 —34002	Condenser, .0001 Mf. Molded
24	G2 —34002	Condenser, .0001 Mf. Molded
25	W —41461	Condenser, .0014 Mf. 200 V.
26	W —28621	Condenser, .02 Mf. 200 V.
27	W —36057B	Condenser, 40 Mf. 300 V.
28	W —44054	Condenser, 30 Mf. 350 V.
29	W —23615	Condenser, .05 Mf. 400 V.
30	W —23615	Condenser, .05 Mf. 400 V.
31	W —35139	Condenser, .004 Mf. 400 V.
32	W —23615	Condenser, .05 Mf. 400 V.
33	W —23615	Condenser, .05 Mf. 400 V.
34	B —33906A	Power Cord and Plug
35	—22196	Resistor, 20,000 Ohm $\frac{1}{3}$W.
36	—21237A	Resistor, 60,000 Ohm $\frac{1}{3}$W.
37	—35600	Resistor, 100,000 Ohm $\frac{1}{4}$W.
38	—4921C	Resistor, 10,000 Ohm 1W.
39	—21454	Resistor, 1 Megohm $\frac{1}{3}$W.
40	—36952	Resistor, 30,000 Ohm 1W.
41	—34020	Resistor, 250,000 Ohm $\frac{1}{3}$W.
42	—37590	Resistor, 750,000 Ohm $\frac{1}{3}$W.
43	—36320	Resistor, 120,000 Ohm $\frac{1}{4}$W.
44	—36688	Resistor, 3 Megohm $\frac{1}{4}$W.
45	—23785	Resistor, 500,000 Ohm $\frac{1}{3}$W.
46	W —37631	Resistor, 32 Ohm $\frac{1}{2}$W.
47	—21875	Resistor, 100,000 Ohm $\frac{1}{3}$W.

Item No.	Part No.	Description
48	—23785	Resistor, 500,000 Ohm $\frac{1}{3}$W.
49	—27121	Resistor, 5,000 Ohm $\frac{1}{3}$W.
50	—21875	Resistor, 100,000 Ohm $\frac{1}{3}$W.
51	—21875	Resistor, 100,000 Ohm $\frac{1}{3}$W.
52	—23785	Resistor, 500,000 Ohm $\frac{1}{3}$W.
53	—23785	Resistor, 500,000 Ohm $\frac{1}{3}$W.
54	W —22873	Resistor, 220 Ohm $2\frac{1}{2}$W.
55	G103—28807	Socket—(5 Prong Spkr.)
	W —43552	Spkr. Plug Clamp
56	583-CP-18"K"	Speaker, Spec. No.
		V. C. and Cone Assy.
		Field Coil—(525 Ohm)
		Output Transformer
		Cardboard Ring
	583-CP-18"H"	Speaker, Spec. No. S-4893N3
	—46786	V. C. and Cone Assy.
	—46787	Field Coil (525 Ohm)
	—46788	Output Transformer
	—46789	Cardboard Ring
	583-CP-18"Z"	Speaker, Spec. No. E10K326
	—46758	V. C. and Cone Assy.
	—46759	Field Coil (525 Ohm)
	—46760	Output Transformer
	—46761	Cardboard Ring
57	B —46276	Band Selector Switch
58 to 65	G178—36400	8 Prong Socket
66	—46318	Power Transformer, 60 Cy.—110 V.
	—46307	Power Transformer, 50 Cy.—110 V.
	—46308	Power Transformer, 50 Cy.—220 V.
	—46309	Power Transformer, 25 Cy.—110 V.
	—46310	Power Transformer, 25 Cy.—220 V.
	—46311	Power Transformer, 40-100 Cy.—95-267 V
67	MG41—46287	Wave Trap—455 Kc.
	G188—32000	Coil—Only—Wave Trap
68Y	—44024B	Tone Control
68Z		Line Switch
69	~~—44773~~	~~Volume Control~~
70	G27 —26719	Ant. and Gnd. Terminal Assy.
71	G41 —26719	Phono Terminal Assy.
	G10 —45683	Push Button Unit Assy.
	G29 —45683	Key and Toggle Assy.
	—45717	Screw—Key Adjusting
	W —50607C	Spring—Key Return
	W —50542C	Clamp—Toggle Lock
	W —50588B	Adjusting Clip—(Heart Shaped)
	W —45646B	Adjusting Clip—(Hooked)
	W —46278	Guide Plate—Key
	G18 —45683	Rocker Plate and Gear Sector Assy.
	W —50561	Screw—Rocker Plate Bearing
	W —45976	Bronze Spring—Bearing Thrust
	W —50273	Rubber Band—Used on Keys
	8R	Cabinet
	—46360A	Knob—4 Req.
	8T	Cabinet (Lowboy Style)
	—46360A	Knob—Tuning—Volume
	—46784A	Knob—Tone Control—Band Sw.
	C —46228C	Escutcheon
	—46417	Push Button
	—50841	Station Call List
	W —50551A	Celluloid Call Letter Cover
	—46329	Instruction Booklet
	—46306	Carton for 8R Cabinet
	—46640	Carton for 8T Cabinet

CROSLEY CORP.

MODEL 828
Socket, Trimmers, Voltage Alignment, Drive Data

CHASSIS MODEL 828

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	K	Go	Po
6 J5G	Oscillator	6.3	145	—	—	0	—	—
6A8G	Modulator	6.3	265	82	-3	0	—	82
6U7G	I-F Amplifier	6.3	265	82	-3	0	—	—
6Q7G	Detector A.V.C. 1st A-F	6.3	200	—	-3	0	—	—
6 J5G	Phase Inverter	6.3	165	—	-4	78	—	—
6K6G(2)	Output	6.3	260	265	—	17	—	—
5Y3G	Rectifier	5.0	A. C.					

Max. power output approx. 10 watts.
Power consumption at 117.5 line 85 watts.
Voltage across speaker field 62 volts.

CIRCUIT DESCRIPTION

The tubes used and their functions are as follows; one 6J5 G as oscillator, one 6A8 G (early models have a 6J8 G) as modulator, one 6U7 G as I-F amplifier, one 6Q7 G as diode detector, A.V.C. and first A-F amplifier, one 6J5 G as phase inverter, two 6K6 G's as push pull pentode output and one 5Y3 G as rectifier.

The fixed bias for the 6A8 G, 6U7 G and 6Q7 G is obtained from the drop across item No. 46 a 32 ohm resistor. The voltage is measured from the chassis to the low side of the speaker field. Bias for the 6J5 G phase inverter is measured across item No. 49 a 5,000 ohm resistor. The bias for the output tubes is measured across item No. 54 a 220 ohm resistor.

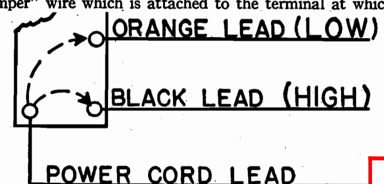
The speaker field (525 ohm) is in the negative leg of the power supply.

50 CYCLE POWER TRANSFORMER ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one



side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits may be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to the plates of the two 6K6G Output tubes. Be certain that the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning I-F Amplifier to 455 Kilocycles.

(a) Connected the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid lead in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Turn the band selector switch to the Broadcast Band. Right.

(d) Set the signal generator to 455 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F assm. for maximum output. (Item 10, Fig. 2)

(f) Adjust both trimmers located on top of the 1st I-F assm. for maximum output. (Item 9, Fig. 2)

(g) Check operations (e) and (f) for more accurate adjustment. ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

Aligning R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator is connected to the "ANT" terminal of the receiver. For the Broadcast and Police Bands a .00025 mfd. condenser should be connected in series with the output lead of the signal generator and for the High Frequency band a 250 ohm carbon resistor should be used in place of the condenser.

Each band should first be shunt aligned and then series aligned where provision is made for series alignment (Broadcast Band). The band selector switch should be set for the band being aligned and the station selector and signal generator should be set to the frequency indicated for each adjustment, paragraph (c) below.

(a) Adjust the "OSC" and "ANT" shunt trimmers in the order given for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and then check the adjustment of the "ANT" trimmer. DO NOT READJUST THE "OSC" TRIMMER.

NOTE: When shunt aligning the Police and High Frequency Bands care must be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times, or more, to try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct frequency.

(b) To align the B. C. OSC. series trimmer (Fig. 2), set the signal generator to the frequency indicated below and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer, it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output.

(C) SIGNAL INPUT FREQUENCIES

	Shunt Alignment	Series Align.
American Broadcast Band	1400 Kilocycles	600 Kilocycles
Police and Amateur Band	6000 "	
Foreign Band	18 Megacycles	

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil, a fixed condenser and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram (item 60).

The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a .00025 mfd. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser open and the volume control full on, adjust the trimmer condenser on the wave trap for minimum output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then, instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

REPLACING THE DIAL DRIVE CORD

1—Remove the chassis from the cabinet.

2—Remove the broken drive cord, first from the pointer then from the pulleys. Remove the cord tension spring and cable clamp.

3—Remove the dial (glass and mask) and the manual tuning shaft bracket.

4—Cut a piece of dial cord 58 inches in length (G9-41582)

5—Tie the cord tension spring approximately 1½ inches from one end of the cord. Open the gang condenser, this should place the eyelet in the pulley up. Insert the cord through the eyelet, from the inside of pulley. Hook end of tension spring on the catch in the pulley opposite eyelet.

6—Bring the cord forward and down, over small brass idler pulley to the manual shaft pulley, wrap two turns around the manual shaft pulley in a counter clockwise direction. Continue cord up and over small brass idler pulley to the top idler pulley (bracket mounted on the gang) then over to the left hand idler, around idler and over to lower right hand idler pulley, over pulley and down and around (counter clockwise) the large pulley on the gang. Insert end of cord through eyelet. Stretch tension spring until it is approximately one inch in length, tie ends of cord securely. Place cable clamp (W-46290) on the cable approximately ⅛ inch from the inside of the pulley rim.

7—Replace manual drive shaft bracket, dial mask and dial.

8—Close the gang condenser, place pointer at 540 on dial then insert drive cord in pointer. Check pointer travel before cementing cord to pointer.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1,000 ohm per volt, 500-volt D. C. voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.

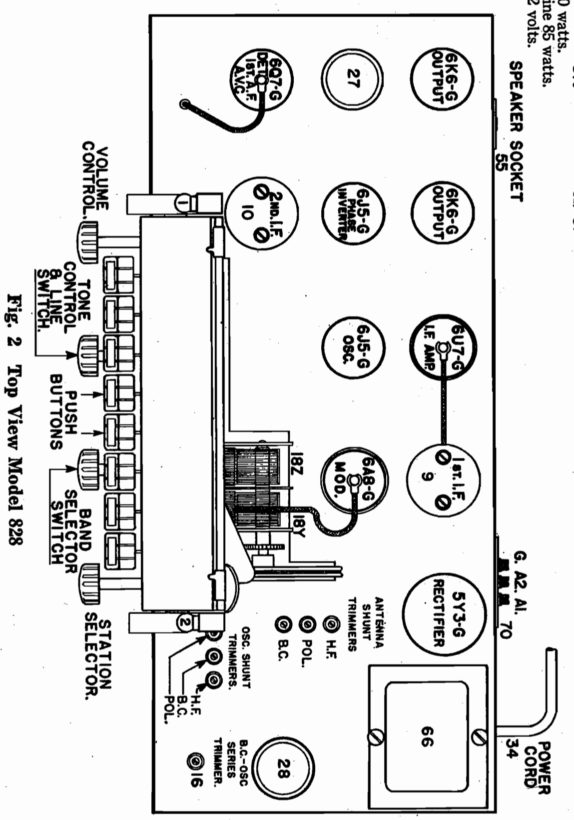


Fig. 2 Top View Model 828

MODEL 1018
Voltage, Alignment
Drive Data, Notes, Tuner

CROSLEY CORP.

Circuit Description

The circuit consists of separate oscillator and modulator tubes, two stages of I-F amplification—the second of which is resistance coupled, separate AVC and detector diodes, two stages of audio amplification and power supply. The speaker field is located in the negative leg of the power supply. The bias for all tubes except the output is developed across a 52 ohm resistor, item 40, located between the speaker field and ground. Phase inversion is obtained in the output circuit by the voltage developed across a 3000 ohm resistor, item 27A, located in the screen circuit of one of the output tubes, item 42B.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with 1000 ohm per volt, 500 volt D. C. voltmeter (except filaments) with the receiver in operating condition and no signal input. The volume control should be turned full on, the tone control should be turned to the TREBLE position (counter-clockwise) and the tuning condenser should be turned to the minimum capacity position. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	K	Go	Ga
6K6G	Oscillator	6.3	147	147	-36	0	—	—
6A8G	Modulator	6.3	224	110	—	0	-36	110
6U7G	1st I-F Amplifier	6.3	174	110	—	0	—	—
6U7G	2nd I-F Amplifier	6.3	270	110	—	0	—	—
6C5G	Diode Detector	6.3	0	—	—	0	—	—
6C5G	AVC Diode	6.3	0	—	—	0	—	—
6K5G	1st A-F Amplifier	6.3	190	—	—	0	—	—
6K6G	Output	6.3	263	250	0	22	—	—
6K6G	Output	6.3	263	270	0	22	—	—
5Y3G	Rectifier	5.0	—	—	—	270	—	—

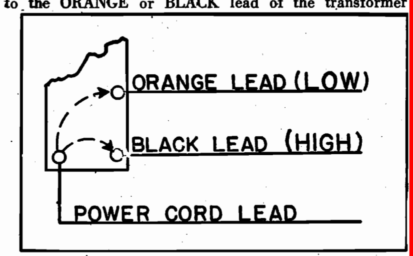
Power consumption approximately 85 watts at 117.5 volts.
Power output approximately 10 watts.
Voltage drop across speaker field 60 volts.

50 CYCLE POWER TRANSFORMER ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer



primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits may be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to the plates of the two 6K6G output tubes. Be certain that the meter is protected from D. C. by a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning I-F Amplifier To 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Set the band selector switch on the Broadcast Band.

(d) Set the signal generator to 455 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output.

(f) Adjust both trimmers located on top of the 1st I-F transformer for maximum output.

(g) Check operations (e) and (f) for more accurate adjustment.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

Aligning R. F. Amplifier

When aligning the R-F amplifier the output lead from the signal generator is connected to the "ANT" terminal of the receiver. For the Broadcast Band a .00025 mfd. condenser should be connected in series with the output lead of the signal generator and for the High Frequency and Police Bands a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be SHUNT ALIGNED and then SERIES ALIGNED where provision is made for series alignment (Broadcast Band). The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated for each adjustment, ¶ (d) below.

(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh, adjust the "OSC" shunt trimmer until the MINIMUM CAPACITY SIGNAL (d) is heard (it is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT SIGNAL (d) is tuned-in with maximum output. Then adjust the "ANT" shunt trimmer for maximum output. Readjust the station selector slightly so that the generaator signal is tuned-in with maximum output and check the adjustment of the "ANT" trimmer. DO NOT READJUST THE OSCILLATOR TRIMMER.

NOTE: When shunt aligning the Police and High Frequency Bands care must be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times, or more, and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct frequency.

(c) To align the series trimmer (See Fig. 2), set the signal generator to the frequency indicated below (d) and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer, it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output. Minor tolerance variations in series alignment at 2500 kilocycles in the Police Band and a 6000 kilocycles in the High Frequency Band may be compensated for by slight repositioning of the grid lead of the antenna coil in the Band affected.

If the various circuits of this receiver have to be adjusted it may be necessary to reset the push button tuning system, after the adjustments have been made.

The push buttons are set from the front of the receiv-ed. To reset a push button remove the call letter and celluloid protector from the front of the button.

Loosen the set screw at the bottom of the hole.

Tune-in with the manual tuning knob AS ACCURATELY AS POSSIBLE the station whose call letters were in that button.

Push the button all the way down and while you hold it in that position securely tighten the set screw.

Replace station call letter and celluloid protector in button.

Repeat the above procedure for the rest of the push buttons that have to be set.

Remember—The accuracy of the push buttons depend entirely upon HOW ACCURATE YOU TUNE-IN THE STATION WHILE SETTING THEM.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil, a fixed condenser and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram. Item 63, Fig. 1.

The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a .00025 mfd. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser open and the volume control full on, adjust the trimmer condenser on the wave trap for minimum output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then, instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

REPLACING DIAL DRIVE CORD

To replace the dial drive cord the following procedure should be carefully followed:

1—Remove the chassis from the cabinet.

2—Remove the dial glass, the pointer, then the dial mounting bracket.

3—Remove the broken cord and the tension spring.

4—Double a 48" length of drive cord. Tie a knot in the cord to form a loop about ¾" long. Insert the two ends through the eyelet in the pulley on the gang from the inside. Hook the small loop over the catch in the pulley opposite the eyelet, then close the gang.

5—Bring one end of the cord forward and down over the top of the lower idler pulley. Continue the cord on down to the left of the manual drive shaft, then under and around to the top of the pointer shaft pulley, crossing in front of cord to manual drive shaft. Make one and one half turns around pulley in a counter-clockwise direction. Insert end of cord through eyelet in pulley rim, eyelet should be to the left and in line with the pointer shaft.

6—Bring the other end of drive cord back and under pulley on the gang, then up and over the top idler pulley. Continue down and under pointer drive pulley for ½ turn, insert end through eyelet. Tie ends in a secure knot, then hook one end of tension spring through knot and hook the other end on catch in pulley. The tension spring should be stretched to approximately ¾" length. Retie knot if necessary to give proper tension on drive cord.

Cut off excess cord and if any bees wax is available apply a small amount to the knot as an added precaution against slipping.

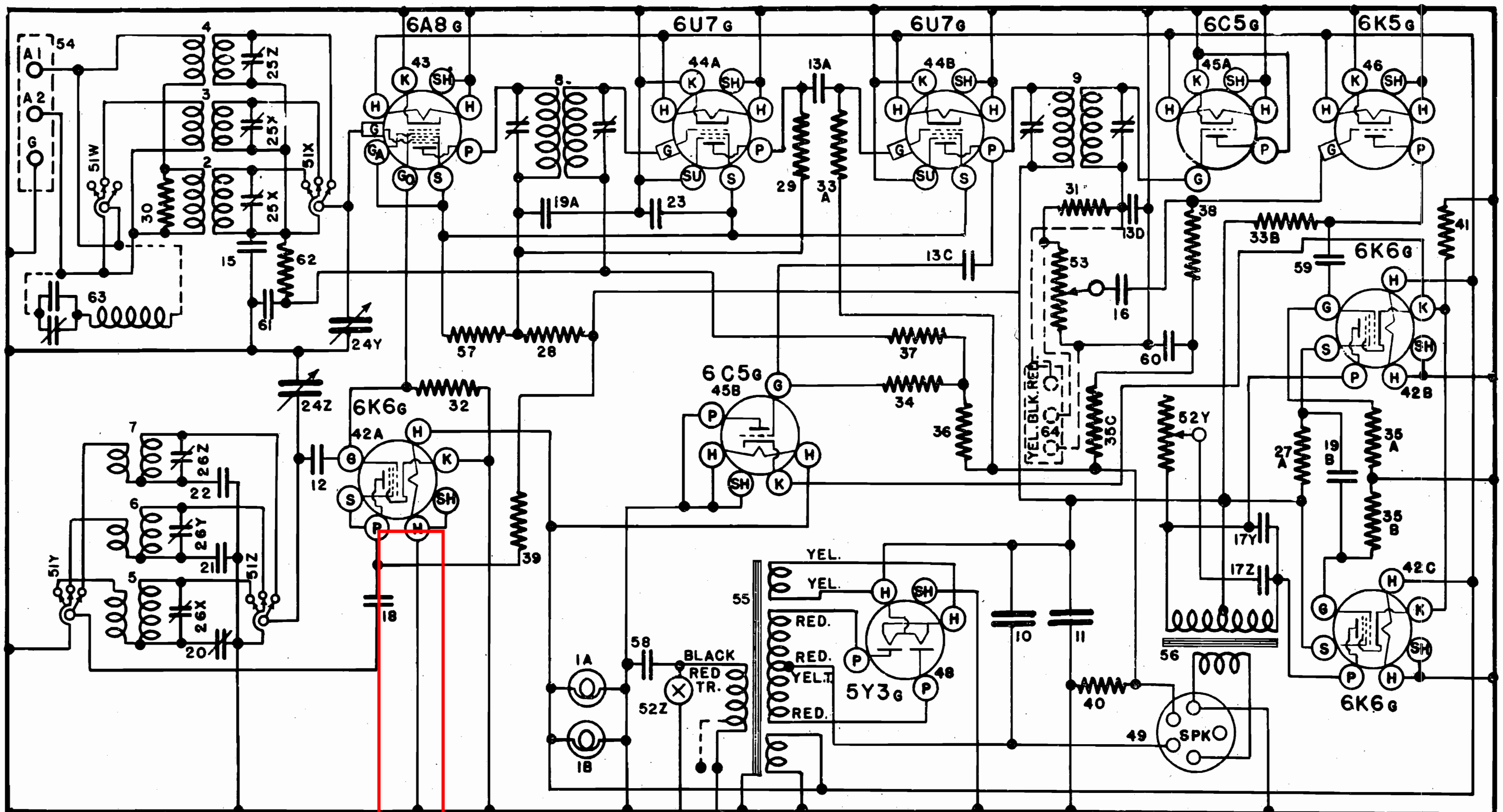
MODEL 1018

(D) SIGNAL INPUT FREQUENCIES

	Min. Cap. Signal	Shunt Align.	Series Align.
American Broadcast Band	1725 Kilocycles	1400 Kilocycles	600 Kilocycles
Police & Amateur Band	6400 "	6000 "	
High Frequency Band	20 Megacycles	18 Megacycles	

MODEL 1018
Schematic, Notes

CROSLEY CORP.



MODEL _ _1018

455 K.C. I.F.

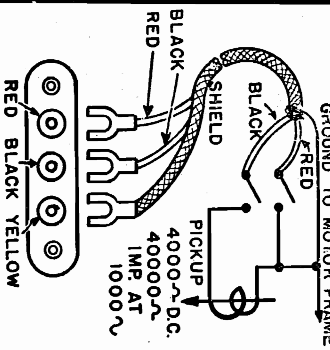


Fig. 4 Phonograph Pickup

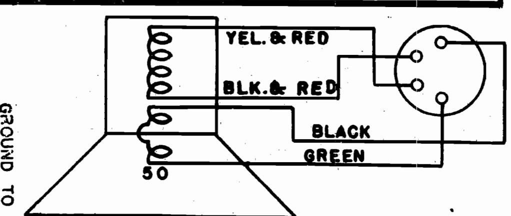


FIG. 1—WIRING DIAGRAM

OCTOBER, 1938

SPECIFICATIONS

This model Crosley is a ten-tube superheterodyne receiver featuring Push Button Tuning, temperature compensated B-C oscillator, (to prevent station drift) push pull output and many of the latest improvements in circuit design. It is designed for operation on A. C. circuits as specified on the model label.

The tuning range is from 535 to 20,000 kilocycles and is divided into three bands as follows:

535-1725 Kilocycles or 560-174 Meters (American Broadcast Band)
1900-6400 Kilocycles or 158-46.8 Meters (Police & Amateur Band)
6.2-20.0 Megacycles or 48.8-15.0 Meters (Foreign Band)

MODEL 1018
Socket, Trimmers, Parts

CROSLEY CORP.

PARTS LIST — MODEL 1018

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1AB	W —43567	Dial Light Bulb
	G6 —45398	Dial Light Socket Assy.
2	G169—32000	Ant. Coil—535—1850 Kc.
3	G168—32000	Ant. Coil—1850—6600 Kc.
4	G170—32000	Ant. Coil—6.2—22 Mc.
5	G169—32002	Osc. Coil—535—1850 Kc.
6	G168—32002	Osc. Coil—1850—6600 Kc.
7	G170—32002	Osc. Coil—6.2—22 Mc.
8	G162—32004	1st I-F Assembly—455 Kc.
9	G155—32004	2nd I-F Assembly—455 Kc.
10	W —44054	Condenser, 30 Mf. 350 V.
11	W —36057B	Condenser, 40 Mf. 300 V.
12	G13 —34002	Condenser, .000035 Mf. Molded
13ACD	G2 —34002	Condenser, .0001 Mf. Molded
14		NONE
15	W —35936	Condenser, .05 Mf. 200 V.
16	W —41461	Condenser, .0014 Mf. 200 V.
17Z	W —31052	Condenser, .05 Mf. 400 V.
17Y		Condenser, .004 Mf. 400 V.
18	W —35139	Condenser, .004 Mf. 400 V.
19AB	W —23615	Condenser, .05 Mf. 400 V.
20	—40769	B-C. Osc. Series Trimmer (520 Mmf.)
21	G23 —34000	Pol. Osc. Series Cond. (1560 Mmf.)
22	G20 —34000	H-F. Osc. Series Cond. (4910 Mmf.)
23	W —22688	Condenser, .1 Mf. 400 V.
24	G51 —33001	2 Sect. Gang Cond.
	—45593A	Dial Face (Glass)
	W —44262	Ring—Dial Support (Cardboard)
	W —44263	Arc—Dial Support (Cardboard)
	W —45587A	Mask—Dial (Metal)
	C —44110C	Dial Mtg. Bracket
	W —44127	Pointer (Dial Hand)
	— 2045	Shake Proof Washer (Pointer)
	W —40486	Screw—Pointer Mtg.
	W —45630	Shaft—Pointer
	W —50325A	Retaining Ring (Pointer Shaft)
	G10 —43564	Pulley and Hub Assy. (Pointer Shaft)
	G11 —43564	Pulley, Gear and Hub Assy.

Item No.	Part No.	Description
	W —45632	Gear—Take-up Spring
	W —44500A	Bearing Plate (Drive Shaft)
	W —43542B	Bracket—Drive Shaft
	W —45716	Drive Shaft
	W —43549	Retaining Ring (Drive Shaft)
	W —44701C	Rubber Grommet
	G16 —41582	Drive Cord (38 Inches)
	W —50573A	Tension Spring (D. Cord)
	MG34—45584	Bracket and Pulley Assy. (Cond. Mtg.)
	W —46290	Cord Clamp
25	W —35951A	3 Sect. Ant. Shunt Trimmer Assy.
26Z	W —45713	H-F. Osc. Shunt Trimmer
26Y		Pol. Osc. Shunt Trimmer
26X		B-C Osc. Shunt Trimmer (Temp. Compensated)
27A	—44009	Resistor, 3,000 Ohm ¼W. Carb.
28	W —23013	Resistor, 2,000 Ohm 1¼W. Flex.
29	—44165	Resistor, 5,000 Ohm ½W. Carb.
30	—22196	Resistor, 20,000 Ohm ¼W. Carb.
31	—36320	Resistor, 120,000 Ohm ¼W. Carb.
32	—21237A	Resistor, 60,000 Ohm ¼W. Carb.
33AB	—21875	Resistor, 100,000 Ohm ¼W. Carb.
34	—34020	Resistor, 250,000 Ohm ¼W. Carb.
35ABC	—23785	Resistor, 500,000 Ohm ¼W. Carb.
36	—37590	Resistor, 750,000 Ohm ¼W. Carb.
37	—21454	Resistor, 1 Megohm ¼W. Carb.
38	—26577	Resistor, 3 Megohm ¼W. Carb.
39	—44008	Resistor, 10,000 Ohm 2W. Carb.
40	W —37631	Resistor, 32 Ohm ½W. Flex.
41	W —22873	Resistor, 220 Ohm 2½W. Flex.
42ABC	G172—36400	Socket, Type 6K6
43	G156—36400	Socket, Type 6A8
44AB	G171—36400	Socket, Type 6U7
45AB	G152—36400	Socket, Type 6C5
46	G9 —43900	Socket, Type 6K5
47		NONE
48	G173—36400	Socket, Type 5Y3
49	G103—28807	Socket for Speaker
	W —27981A	Tube Shield Base
	W —40911	Tube Shield

Item No.	Part No.	Description
50	566BP18 "M"	Speaker, Spec. No. 1-D-1052
	—44275	V. C. and Cone Assy. for 566BP18 "M" Spkr.
	—44276	Field Coil Assy. for 566BP18 "M" Spkr.
51	—44049A	Band Selector Switch
52Z	—44024B	Line Switch
52Y		Tone Control (100,000 Ohm)
53	—44081	Volume Control—1 Meg.
54	G27 —26719	Ant. and Gnd. Term. Assy.
55	—44101	Power Trans., 110 V. 60 Cy.
	—44104	Power Trans., 110 V. 50 Cy.
	—44105	Power Trans., 220 V. 50 Cy.
	—44102	Power Trans., 110 V. 25 Cy.
	—44103	Power Trans., 220 V. 25 Cy.
56	G77 —24628	Output Transformer
57	—4921C	Resistor, 10,000 Ohm 1W.
58	W —30805	Condenser, .01 Mf. 400 V.
59	W —30488	Condenser, .02 Mf. 400 V.
60	W —34712	Condenser, .25 Mf. 160 V.
61	W —28621	Condenser, .02 Mf. 200 V.
62	—35600	Resistor, 100,000 Ohm ¼W.
63	G164—32004	Wave Trap
		PUSH BUTTON PARTS
	G1 —45683	Push Button Unit Assy.
	G32 —45683	Key and Toggle Assy.
	W —50542A	Key Clip (Lock Clamp)
	W —50607	Spring (Key Return)
	—45717	Adj. Screw (Lock Clamp)
	W —50547	Key Plate (Rear Guide)
	W —45646A	Clip (Front Guide) 1 Req.
	G31 —45683	Rocker Plate Assy.
	W —50561	⅛"—6-40 Screw (R. Plate Bearing)
	W —45711	Felt Strip (Unit Front)
	W —45589A	Push Button
	W —45763	Celluloid Covers
	—43882	Screw P.K. (Adj. Clip Mtg.)
	W —50588	Clip (Front Guide) 4 Req.
	—50841	Station Call List
	—45605	Instructions (60 Cycle)
	W —43553	Rubber Mtg. Foot
	W —44380B	Knob (2)
	W —44426A	Knob (2) (Pointer)
	W —43552	Spkr. Plug Clamp
	B —44207B	Escutcheon—Dial
	—7WB	Cabinet
	B —45626C	Push Button Escutcheon
	W —45623A	P. B. Support Brkt.
	W —45580	Grommet (P. B. Sup. Brkt.)
	—45620	Headed Bushing (P. B. Sup. Brkt.)
	W —23880A	Thumb Screw

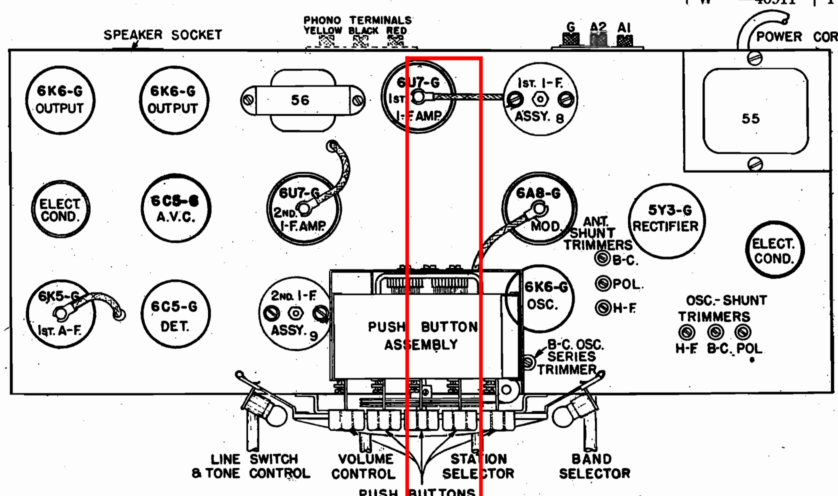


Fig. 2 Top View Model 1018

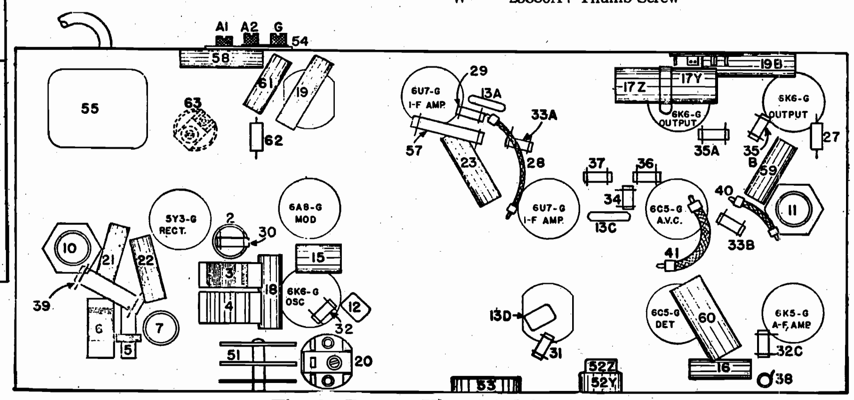
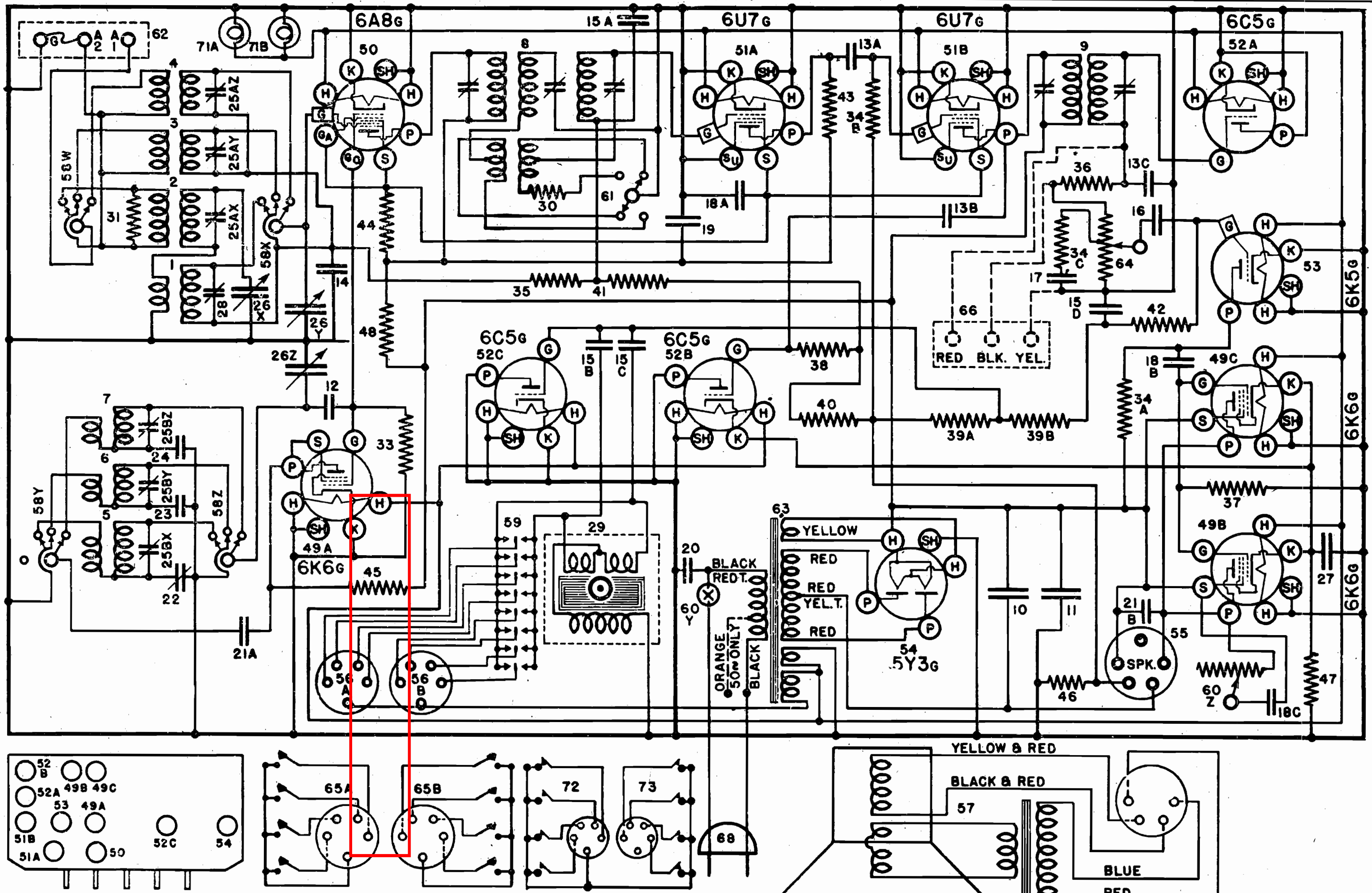


Fig. 3 Bottom View Model 1018

MODELS 1118,1128
Schematic

CROSLEY CORP.



455 Kc. I.F.

NOVEMBER, 1938

SPECIFICATIONS

This model Crosley radio is an 11-tube AC receiver designed for American and Foreign broadcast reception. It incorporates such features as push-button electric tuning, automatic volume control Local-Distance switch and parallel pentode output. The tuning range is from 540 kilocycles to 22 megacycles and is divided into three bands as follows:

CHASSIS MODEL 1118 AND 1128

540-1850 Kilocycles	or	555-162 Metres
1.9- 6.6 Megacycles	or	158-45.5 Metres
6.4- 22 Megacycles	or	47-13.5 Metres

MODELS 1118,1128
Parts List

CROSLEY CORP.

PARTS LIST — MODEL 1118

Figures in first column refer to parts in Diagrams.

Item	Part No.	Description
1	G97 —32001	Pre-Selector Coil, B.C.
2	G138—32000	Antenna Coil, B.C.
3	G151—32000	Antenna Coil, Police
4	G150—32000	Antenna Coil, H.F.
5	G139—32002	Oscillator Coil, B.C.
6	G154—32002	Oscillator Coil, Police
7	G153—32002	Oscillator Coil, H.F.
8	G161—32004	1st I-F., 455 Kc. Assy.
9	G154—32004	2nd I-F., 455 Kc. Assy.
10	W —44054	Condenser, 30 Mf. 350 V.
11	W —36057B	Condenser, 40 Mf. 300 V.
12	G1 —44886	Condenser, Bimetal Temp. Control
13A	G2 —34002	Condenser, .0001 Mf. Molded
13B	G2 —34002	Condenser, .0001 Mf. Molded
13C	G2 —34002	Condenser, .0001 Mf. Molded
14	W —35936	Condenser, .05 Mf. 200 V.
15A	W —28621	Condenser, .02 Mf. 200 V.
15B	W —28621	Condenser, .02 Mf. 200 V.
15C	W —28621	Condenser, .02 Mf. 200 V.
15D	W —28621	Condenser, .02 Mf. 200 V.
16	W —41461	Condenser, .0014 Mf. 200 V.
17	W —28619	Condenser, .006 Mf. 200 V.
18A	W —22688	Condenser, .1 Mf. 400 V.
18B	W —22688	Condenser, .1 Mf. 400 V.
18C	W —22688	Condenser, .1 Mf. 400 V.
19	W —23615	Condenser, .05 Mf. 400 V.
20	W —30805	Condenser, .01 Mf. 400 V.
21A	W —35139	Condenser, .004 Mf. 400 V.
21B	W —35139	Condenser, .004 Mf. 400 V.
22	—40769	Condenser, B.C. Osc. Series Trimmer
23	G23 —34000	Condenser, .001560 Mf. Pol. Osc. Fixed Trimmer
24	G20 —34000	Condenser
25	W —35951A	3 Section Shunt Trimmer Assy.
26	G60 —33002	3 Section Var. Tuning Cond. (1118)
26	G62 —33002	3 Section Var. Tuning Cond. (1128)
	—44891B	Dial Face (Glass) (1118)
	W —45587A	Mask (Polished Metal) (1118)
	C —44110C	Support Bracket (Dial Glass) (1118)
	W —44262	Ring (Glass Support) (1118)
	W —44263	Arc (Glass Support) (1118)
	W —44127	Pointer (1118)
	W —40486	Screw—Pointer Mtg. (1118)
	G5 —43564	Pulley and Hub Assy. (1118)
	—41582	Drive Cord (1118)
	W —45448	Drive Belt (1118)
	W —44907A	Idler Pulley (1118)
	W —44908	Idler Mtg. Stud (1118)
	D —46239	Dial Face (Glass) (1128)
	C —46094	Dial Glass Support (1128)
	W —46099	Dial Glass Clip (2) (1128)
	W —46096	Dial Glass Clip, R.H. (1128)
	W —46095	Dial Glass Clip, L.H. (1128)
	—46203	Dial Pointer (1128)
	W —46097	Dial Pointer Guide (1128)
	G —41582	Drive Cord (50-Inch) (1128)
	W —46941	Dial Glass Cushion (1128)
	G13 —43564	Pulley and Hub Assy. (1128)
	MG44—46080	Idler Pulley and Brkt. Assy. (1128)
	W —44989	Cord Tension Spring (1128)
	W —46477	Tubing—Drive Shaft (1128)
	W —45448	Drive Belt (1128)
	W —44907B	Idler Pulley (Dual) (1128)
	W —44908	Idler Stud (1128)
	D —46949	Dial Glass (Foreign Only) (1128)
	W —46290	Drive Cord Clamp (1128)
27	W —41598	Condenser, 50 Mf. 25 V.
28	—44516	Condenser, Pre-Select Shunt
29	MG105—44879	Motor Assembly (50-60 Cycle)
	—45168	Motor
	W —45165	Motor Foot
	W —45164	Motor Mounting Bracket
	W —20800	Shakeproof Washer
	—6875	W. H. Machine Screw, $\frac{3}{16}$" Long
	—6876	W. H. Machine Screw, ¼" Long
	—44497	Headed Bushing—Brkt. Mtg.
	W —36180	Rubber Sleeve—Brkt. Mtg.
30	—42401A	Resistor, 99 Ohm ¼W. Ins.
31	—22196	Resistor, 20,000 Ohm ⅓W. Carb.
33	—21237A	Resistor, 60,000 Ohm ⅓W. Carb.
34A	—21875	Resistor, 100,000 Ohm ⅓W. Carb.
34B	—21875	Resistor, 100,000 Ohm ⅓W. Carb.
34C	—21875	Resistor, 100,000 Ohm ⅓W. Carb.
35	—35600	Resistor, 100,000 Ohm ¼W. Carb.
36	—36320	Resistor, 120,000 Ohm ¼W. Carb.
37	—34018	Resistor, 200,000 Ohm ⅓W. Carb.
38	—34020	Resistor, 250,000 Ohm ⅓W. Carb.
39A	—23785	Resistor, 500,000 Ohm ⅓W. Carb.
39B	—23785	Resistor, 500,000 Ohm ⅓W. Carb.
40	—37590	Resistor, 750,000 Ohm ⅓W. Carb.
41	—21454	Resistor, 1 Megohm ⅓W. Carb.
42	—26577	Resistor, 3 Megohm ⅓W. Carb.
43	—44165	Resistor, 5,000 Ohm ½W. Carb.
44	—4921C	Resistor, 10,000 Ohm 1W. Carb.
45	—44008	Resistor, 10,000 Ohm 2W. Carb.
46	W —37631	Resistor, 32 Ohm ½W. Flex.
47	W —45381	Resistor, 300 Ohm 2W. Flex.
48	W —23013	Resistor, 2,000 Ohm 1¼W. Flex.
49 to 54	G178—36400	Socket, 8 Prong Octal.
55	G103—28807	Socket, Speaker
56	G16 —28807	Socket, Push Button Cable
	W —41007	Cable Clamp, P. B. Cable
	W —40911	Tube Shield
57	671BP-18-"M"	Speaker, Spec. No. 1-D-1180
	—45184	V. C. and Cone Assembly
	—45185	Field Coil (515 Ohm)
	—44678	Output Transformer
	—43680	Cone Mounting Ring
	W —24715	Elastic Mounting Nuts
	W —22985	Rubber Washer
	W —46804	Spacer
	W —24865	Steel Washer
58	—44049	Band Selector Switch
59	G1 —44628	Switch, Discriminator, Assy. Complete
	G2 —44628	Flexible Coupling
60	—44024B	Tone Control (300,000 Ohm) and Line Switch
61	—46086	Switch, Local Distance (1128)
61	—44665A	Switch, Local Distance (1118)
62	G27 —26719	Ant. and Gnd. Terminal Assy.
63	—44910	Power Transformer, 110 V. 60 Cycle
	—44915	Power Transformer, 110 V. 50 Cycle
	—44916	Power Transformer, 220 V. 50 Cycle
	—45527	Power Transformer, Universal
64	—44702	Volume Control, 1 Megohm Tapped
65A	G8 —45228	Push Button—Cable and Plug Assy. (R.H.) (1118)
65B	G9 —45228	Push Button—Cable and Plug Assy. (L.H.) (1118)
	W —45478	Trip Bar and Connecting Link (P. B. Switch) (1118)
66	G37 —26719	Phono Terminal Assy.
68	B —33960A	Line Cord and Plug
71	W —43567	Dial Light Bulb, 6-8 Volt (1118)
71	W —37922	Dial Light Bulb, 6-8 Volt (1128)
	G9 —44363	Dial Light Socket Assy.
72	MG45—46081	Push Button—Cable and Plug Assy. (1128)
73	7P	Cabinet (1118)
	B —45652A	Escutcheon (Dial) (1118)
	—45667	Escutcheon (Push Button) L.H. (1118)
	—45666	Escutcheon (Push Button) R.H. (1118)
	W —44380B	Knob, Vol. Cont. and Tuning (2) (1118)
	W —44426A	Knob, T. C.—L. D. Sw. and B. C. Sw. (3) (1118)
	W —44871A	Push Button (Bakelite) (1118)
	B —44876A	Switch (Push Button) Only (1118)
	8Q	Cabinet (1128)
	8QA	Cabinet (1128)
	C —46228C	Escutcheon (1128)
	—46360A	Knob, Vol. Cont. and Tuning (2) (1128)
	—46362A	Knob, T. C.—L. D. Sw. and B. C. Sw. (3) (1128)
	W —45171	Push Button (Bakelite) (1128)
	B —46221	Switch (Push Button) Only (1128)
	W —44876A	Celluloid Cover (Button)
	—44902	Call Letter Sheet
	W —43553	Rubber Mounting Foot
	W —43552	Clamp (Speaker Plug)
	—45604	Instructions (1118)
	—43093	Instructions (1128)

CROSLEY CORP.

MODEL 1118 AND 1128

CIRCUIT DESCRIPTION

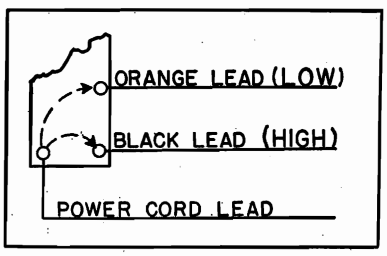
Eleven tubes are employed in a superheterodyne circuit which consists of separate oscillator and modulator tubes, 455 kilocycle I-F amplifier—one stage of which is resistance coupled, separate AVC and detector diodes, two stages of audio amplification and power supply. The 1st I-F transformer is a triple-tuned unit, which in conjunction with the Local-Distance switch, controls the selectivity of the receiver. Inter-station noise suppression is accomplished while tuning by means of the push buttons due to the action of the 6C5-G "squelch" tube. When a push button is depressed, this tube supplies sufficient voltage to the cathodes of the output tubes to bias them beyond "cut-off." It also supplies voltage to the AVC circuit through a 250,000 ohm resistor, item 38. The speaker field is located in the negative leg of the power supply. The bias for all tubes except the three type 6C5-G and the two output tubes is developed across a 32 ohm resistor, item 46, located between the speaker field and ground. The bias for the output tubes is developed across a 220 ohm resistor, item 47.

SPECIAL POWER TRANSFORMER ADJUSTMENT

In localities where the voltage variation on 50 or 60 cycle power supply lines is greater than customary commercial limits, special 50-60 cycle power transformers are available. These transformers have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the



terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits may be properly aligned with the use of a modulated signal generator and an output meter.

Connecting Output Meter

Connect the output meter to the plate and screen of one of the 6K6G output tubes. Be certain that the meter is protected from D.C. by a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier To 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6U7G 1st I-F Amp. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Set the band selector switch on the Broadcast Band.

((d) Turn the Local-Distance Switch to the "Distance" position.

(e) Set the signal generator to 455 kilocycles.

(f) Adjust both trimmer condensers located on top of the 2nd I-F transformer for maximum output. DO NOT ADJUST THE TRIMMER CONDENSERS LOCATED ON THE 2ND I-F TRANSFORMER WITH THE SIGNAL GENERATOR LEAD CONNECTED TO THE 6A8G TUBE.

(g) Transfer the signal generator lead to the top cap of the 6A8G tube, leaving the tube's grid clip in place.

(h) Close the middle trimmer of the 1st I-F transformer. (Do not force adjustment screw).

(i) Adjust the top and then the bottom trimmers of the 1st I-F transformer for maximum output.

(j) Adjust the middle trimmer of the 1st I-F transformer for maximum output.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

Aligning The R-F Amplifier

When aligning the R-F amplifier the output lead from the signal generator is connected to the "ANT" terminal of the receiver. For the Broadcast Band a 200 mmf. condenser should be connected in series with the output lead of the signal generator and for the High Frequency and Police Bands a 400 ohm carbon resistor should be used in placed of the condenser.

Each band should first be SHUNT ALIGNED and then SERIES ALIGNED where provision is made for series alignment (Broadcast Band). The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated for each adjustment, ¶ (D) below.

(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh, adjust the "OSC" shunt trimmer until the MINIMUM CAPACITY SIGNAL (D) is heard (it is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT SIGNAL (D) is tuned-in with maximum output. Then adjust the "R-F" and "ANT" shunt trimmers for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and check the adjustment of the "R-F" and "ANT" trimmers. DO NOT READJUST THE OSCILLATOR TRIMMER.

NOTE: When shunt aligning the Police and High Frequency Bands care must be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times, or more, and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct frequency.

(c) To align the series trimmer (See Fig. 2), set the signal generator to the frequency indicated below (D) and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer, it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output. Minor tolerance variations in series alignment at 2500 kilocycles in the Police Band and at 7000 kilocycles in the High Frequency Band may be compensated for by slight reposition of the grid lead of the antenna coil in the Band affected.

PUSH BUTTON TUNING SYSTEM

The push button electric tuning system employed in this receiver incorporates eight push buttons on the Model 1118 and nine on the Model 1128, a selector switch and a motor. The discriminator switch, item 59—also Figs. 5 and 6, incorporates eight metallic discs, each of which operates in conjunction with a different push button to tune-in some favorite station. That is, the 1st push button on the left as you face the front of the cabinet works with No. 1 disc, and the 2nd push button works with No. 2 disc, etc.

SETTING PUSH BUTTONS

To set the electric tuning system, turn the receiver "ON" and depress No. 1 push button. When the dial pointer stops rotating, the key slot in No. 1 disc on the selector switch will be in the "UP" position. Remove the key from its mounting and place it (knob up) through No. 1 hole in the disc identification bracket. If it does not drop into the slot in the disc, push it in with the fingers.

Turn the Local-Distance switch to the "Distance" position. By means of the station selector knob, tune-in AS ACCURATELY AS POSSIBLE, the station whose call letters have been placed in No. 1 push button. Then remove the key.

NOTE: On Model 1128 the push button on the extreme right (manual) serves as a release for all other push buttons and should be depressed before operating the manual tuning control.

NOTE: On Model 1118 the push button which will ordinarily be used for Police calls does not lock in the depressed position. It serves as a release for all other buttons and should be depressed before operating the manual tuning control.

By means of the manual tuning knob, turn the dial pointer to some other position. Then check the setting by pressing the button which has been set. If the pointer stops too soon or goes too far, a second setting will be necessary.

To make the second setting, observe how far the pointer stops from the correct position for that station. Replace the key in the disc and tune far enough to one side of the correct position to make allowance for the difference noted in the first setting.

The electric tuning system is now correctly set for the 1st station. Follow through with this same procedure until the proper adjustments have been made for all eight of the favorite stations. When tuning the receiver by means of the push buttons, the Local-Distance switch should be turned to the "Local" position.

Selector Switch

Should the selector switch become inoperative in the field, it should not be dissembled for repair, but should be returned to the factory via an authorized Crosley Distributor.

REPLACING DRIVE CORD ON THE 1128

To replace the dial drive cord, the following procedure should be carefully followed.

1.—Remove the knobs, plugs, and hold down screws from the chassis then remove the chassis from the cabinet.

2.—Remove the drive cord from the pointer, the dial light sockets from the dial bracket, then the complete dial assembly.

3.—Remove the broken cord and tension spring.

4.—Cut a piece of drive cord exactly 50 inches in length. Fold double then tie the tension spring approximately one inch from the end, this gives you a loop 24 inches long.

5.—Close the condenser gang, this should place the eyelet in the pulley on top.

6.—Insert the cord through the eyelet in the large pulley from the inside. Hook the loose end of tension spring on catch in pulley.

7.—Remove double brass pulley from front of chassis.

8.—Take one side of drive cord and make one half turn in a counter-clockwise direction around large pulley.

9.—Hold brass pulley in left hand and make two complete turns in a clockwise direction around small end. While keeping tension on cord mount pulley to chassis. Then continue cord up and over the right hand idler pulley in a counter clockwise direction (¼ turn). Continue across to left hand idler pulley and on around and down to bottom of large pulley. Stretch tension spring and snap cord over pulley rim. Place cord clamp (W-46290) on drive cord approximately ⅛ inch from inside edge of pulley rim.

10.—Replace drive belt, dial assembly and dial lights.

11.—Place pointer at extreme left end of dial, close condenser gang. Hook drive cord in pointer, check pointer travel before cementing cord to pointer.

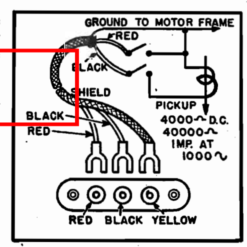


Fig. 4 Phonograph Pickup

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500 volt D. C. voltmeter (except filaments) with the receiver in operating condition and no signal input. The volume control should be turned full "ON," the tone control should be turned to the "TREBLE" position (counter-clockwise), the Local-Distance switch should be turned to the "Distance" position and the condenser gang should be rotated to the minimum capacity position. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.

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MODELS 1118,1128
Voltage,Socket,Trimmers
Chassis,Drive Data

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(D) SIGNAL INPUT FREQUENCIES

	Min. Cap. Signal	Shunt Align.	Series Align.
American Broadcast Band	1850 Kilocycles	1700 Kilocycles	600 Kilocycles
Police & Amateur Band	6600 Kilocycles	6000 Kilocycles	
High Frequency Band	22 Megacycles	18 Megacycles	

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	K	Go	Ga
6K6G	Oscillator	6.3	147	147	-36	0	—	—
6A8G	Modulator	6.3	224	110	—	0	-36	110
6U7G	1st I-F Amplifier	6.3	174	110	—	0	—	—
6U7G	2nd I-F Amplifier	6.3	270	110	—	0	—	—
6C5G	Diode Detector	6.3	0	—	—	0	—	—
6C5G	AVC Diode	6.3	0	—	—	0	—	—
6K5G	1st A-F Amplifier	6.3	190	—	—	0	—	—
6K6G	Output	6.3	263	270	0	22	—	—
6K6G	Output	6.3	263	270	0	22	—	—
6C5G	"Squelch"	6.3	0	—	—	0	—	—
5Y3G	Rectifier	5.0	—	—	—	270	—	—

Power consumption approximately 90 watts at 117.5 volts.
Power output approximately 10 watts.
Voltage drop across speaker field 60 volts.

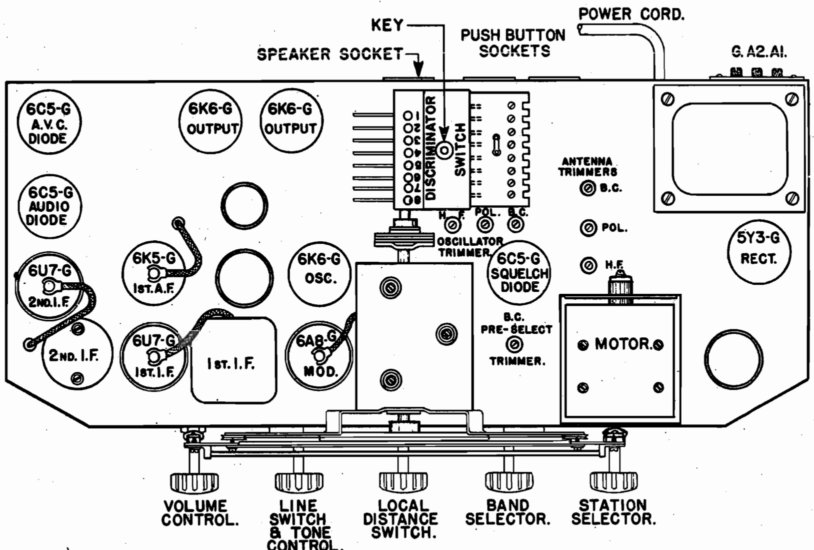

Fig. 2 Top View Model 1118 and 1128

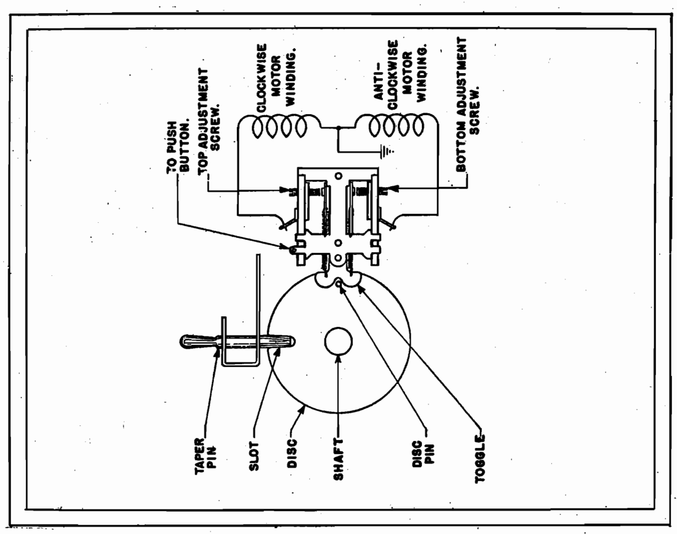

Fig. 5

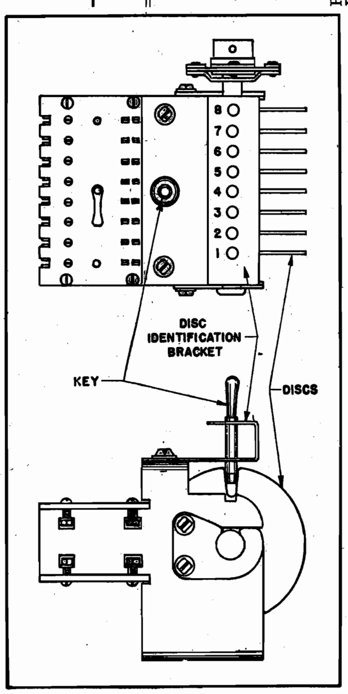

Fig. 6

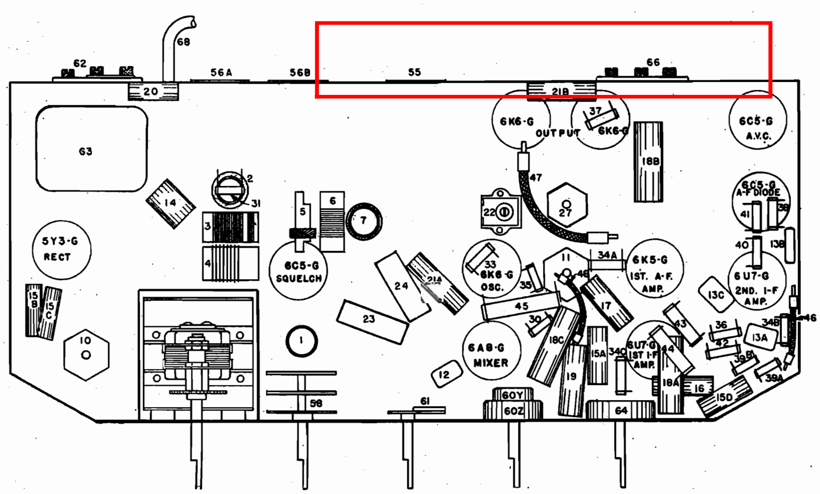

Fig. 3 Bottom View Model 1118 and 1128

MODELS 1217,1227
Schematic

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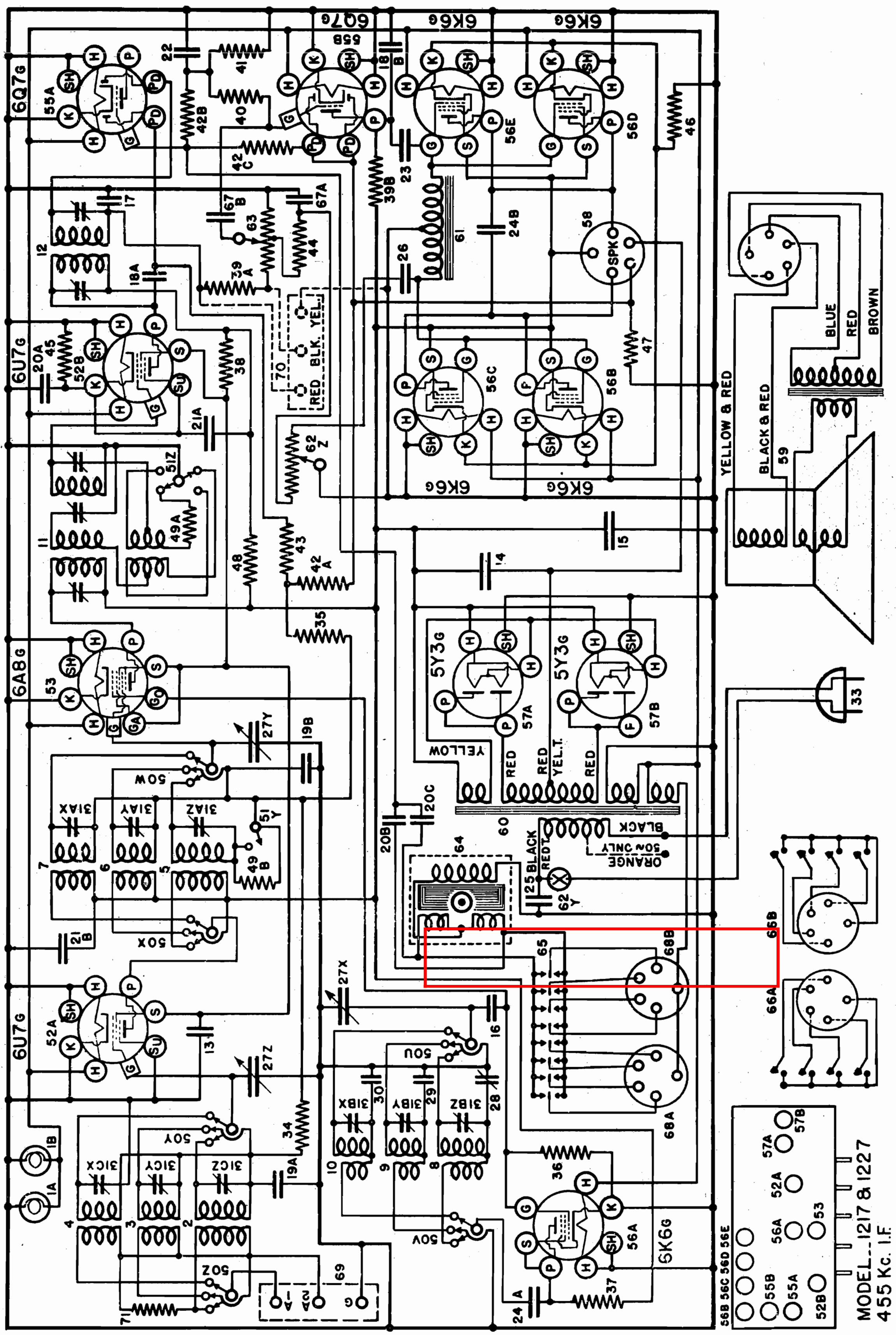

MODELS 1217,1227
Tuner,Parts List

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INTERLOCKING PUSH BUTTONS

Part No.	Description
G4 —45228	R. H. Push Button Assy. (1) (1217)
B —45477	Push Button Escutcheon R. H.
G5 —45228	L. H. Push Button Assy. (1) (1217)
W —44873B	Push Button Escutcheon L. H.
W —45478	Trip Bar Connecting Link (1) (1217, 1227)
R —77	Screw—Trip Bar Mtg. (1217 and 1227)
W —44877A	P. B. Cable and Plug (1217 and 1227)
B —45475	R.H. Push Button Switch only (1217, 1227)
B —45476	L.H. Push Button Switch only (1217, 1227)
W —45171A	Push Button only (8) (1217)
G6 —45228	R. H. Push Button Assy. (1) (1227)
G7 —45228	L. H. Push Button Assy. (1) (1227)
W —44871A	Push Button only (8) (1227)
W —44875	Celluloid Covers (8) (1217 and 1227)
W —45483	Shock Pad—P. B. Sw. (8) (1217 and 1227)

PUSH BUTTON TUNING SYSTEM

The push button electric tuning system employed in this receiver incorporates eight push buttons, a selector switch and an electric motor. The discriminator switch, item 65 — also Fig. 5, incorporates eight metallic discs, each of which operates in conjunction with a different push button to tune-in some favorite station. That is, the 1st push button on the left as you face the front of the cabinet work with No. 1 disc, and the 2nd push button works with No. 2 disc, etc.

SETTING PUSH BUTTONS

To set the electric tuning system, turn the receiver "ON" and depress No. 1 push button. When the dial pointer stops rotating, the key slot in No. 1 disc on the selector switch will be in the "UP" position. Remove the key from its mounting and place it (knob up) through No. 1 hole in the disc identification bracket. If it does not drop into the slot in the disc, push it in with the fingers.

Turn the Local-Distance switch to the "Distance" position. By means of the station selector knob, tune-in AS ACCURATELY AS POSSIBLE, the station whose call letters have been placed in No. 1 push button. Then remove the key.

NOTE: The push button which will ordinarily be used for POLICE calls does not lock in the depressed position. It serves as a release for all other push buttons and should be depressed before operating the manual tuning control. (The first sets of this model were built with non-lock type push buttons).

By means of the manual tuning knob, turn the dial pointer to some other position. Then check the setting by pressing the button which has been set. If the pointer stops too soon or goes too far, a second setting will be necessary.

To make the second setting, observe how far the pointer stops from the second position for that station. Replace the key in the disc and tune far enough to one side of the correct position to make allowance for the difference noted in the first setting.

The electric tuning system is now correctly set for the 1st station. Follow through with this same procedure until the proper adjustments have been made for all eight of the favorite stations. When tuning the receiver by means of the push buttons, the Local-Distance switch should be turned to the "Local" position.

Tuning Motor

Should the clutch on the tuning motor fail to operate satisfactorily, either by not engaging or not releasing when it should, the two tension springs located on the back of the motor should be readjusted.

With the receiver sitting in its normal operating position, bend both tension springs until the clutch will not engage. Slowly decrease the tension on both springs until the clutch engages and releases satisfactorily. Check the operation of the motor several times to be certain that the tension is correct.

Selector Switch

Should the selector switch become inoperative in the field, it should not be dissembled for repair, but should be returned to the factory via an authorized Crosley distributor.

PARTS LIST—MODELS 1217 and 1227

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1AB	W —43567	Dial Light Bulb
	G8 —45398	Dial Light Socket Assy.
2	G145—32000	Ant. Coil, B-C.
3	G146—32000	Ant. Coil, Pol.
4	G147—32000	Ant. Coil, H-F.
5	G94 —32001	R-F. Coil, B-C.
6	G95 —32001	R-F. Coil, Pol.
7	G96 —32001	R-F. Coil, H-F.
8	G148—32002	Osc. Coil, B-C.
9	G149—32002	Osc. Coil, Pol.
10	G150—32002	Osc. Coil, H-F.
11	G161—32004	1st I-F. Assy.
12	G166—32004	2nd I-F. Assy.
13	W —44672	Condenser, 40 Mf. 125 V.
14	W —44054	Condenser, 30 Mf. 350 V.
15	W —36057B	Condenser, 40 Mf. 300 V. (1217 only)
15	W —44438A	Condenser, 40 Mf. 300 V. (1227 only)
16	G1 —44886	Condenser, Temp. Compensating
17	G5 —34002	Condenser, .00005 Mf. Molded
18A	G1 —34002	Condenser, .00025 Mf. Molded
18B	G1 —34002	Condenser, .00025 Mf. Molded
19A	W —35936	Condenser, .05 Mf. 200 V.
19B	W —35936	Condenser, .05 Mf. 200 V.
20A	W —28621	Condenser, .02 Mf. 200 V.
20B	W —28621	Condenser, .02 Mf. 200 V.
20C	W —28621	Condenser, .02 Mf. 200 V.
21A	W —32378	Condenser, .01 Mf. 400 V.
21B	W —32378	Condenser, .01 Mf. 400 V.
22	W —29910A	Condenser, .25 Mf. 200 V.
23	W —24049C	Condenser, .1 Mf. 200 V.
24A	W —35139	Condenser, .004 Mf. 400 V.
24B	W —35139	Condenser, .004 Mf. 400 V.
25	W —30805	Condenser, .01 Mf. 400 V.
26	W —37988	Condenser, .017 Mf. 400 V.
27	G58 —33002	3 Section Var. Tun. Condenser
	B —44815B	Dial Face (Glass)
	W —44146B	Dial Mask (Metal)
	C —44814A	Dial Support Bracket
	W —45417	Ring—Dial Glass Support
	W —44127	Dial Hand (Pointer)
	W —40486	Screw (Hand Mtg.)
	G1 —43564	Pulley and Hub Assy. (Drive Cord)
	—41582	Drive Cord (23 in.)
	W —44908	Idler Stud
	W —44989	Spring—Drive Cord Tension
	W —44907A	Idler Pulley
	W —45448	Drive Belt
	—45449	Friction Tubing—Motor Shaft
28	—40769	B-C Osc. Series Trimmer (.00052 Mf.) Variable
29	G23 —34000	Pol. Osc. Fixed Series Condenser (.00156 Mf.)
30	G24 —34000	H-F. Osc. Fixed Series Condenser (.005525 Mf.)
31	W —35951A	3 Section Shunt Trimmer Assy.
32		
33	B —33906A	Power Cord and Plug
34	—35930	Resistor, 200,000 Ohm ¼W. Ins.
35	—34883	Resistor, 2 Megohm ⅓W. Carb.
36	—21237A	Resistor, 60,000 Ohm ⅓W. Carb.
37	—44008	Resistor, 10,000 Ohm 2W. Carb.
38	—23616	Resistor, 15,000 Ohm 1W. Carb.
39A	—35600	Resistor, 100,000 Ohm ¼W. Ins.
39B	—35600	Resistor, 100,000 Ohm ¼W. Ins.
40	—37583	Resistor, 2.5 Megohm ⅓W. Carb.
41	—37245	Resistor, 1.5 Megohm ⅓W. Carb.
42A	—23785	Resistor, 500,000 Ohm ⅓W. Carb.
42B	—23785	Resistor, 500,000 Ohm ⅓W. Carb.
42C	—23785	Resistor, 500,000 Ohm ⅓W. Carb.
43	—21455	Resistor, 300,000 Ohm ⅓W. Carb.
44	—37472	Resistor, 50,000 Ohm ⅓W. Carb.
45	W —28589	Resistor, 350 Ohm ½W. Flex.
46	W —44456	Resistor, 250 Ohm 3W. Flex.
47	W —37630	Resistor, 21 Ohm ½W. Flex.
48	W —23013	Resistor, 2,000 Ohm 1¼W. Flex.
49A	—42401B	Resistor, 99 Ohm ¼W. W. W. Ins.
49B	—42401B	Resistor, 99 Ohm ¼W. W. W. Ins.
50	—44532A	Band Selector Switch
51	—44771	Local-Distance Switch
52AB	G171—36400	Socket, Type 6U7
53	G156—36400	Socket, Type 6AB
55AB	G160—36400	Socket, Type 6Q7
56A BCDE	G172—36400	Socket, Type 6K6
57AB	G173—36400	Socket, Type 5Y3
58	G103—28807	Socket Speaker
	W —40911	Tube Shield
59	668BP18"M"	Speaker, Mfg. Spec. 1-D-1134
	—45180	V. C. and Cone Assy.
	—45181	Field Coil (450 Ohms—125 M. A.)
	—45182	Output Trans.
	—44682	Speaker Plug
	—43680	Cardboard Ring—Cone Mtg.
60	—44705	Power Trans., 110 V. 60 Cy.
	—44793	Power Trans., 110 V. 50 Cy.
	—44791	Power Trans., 110 V. 25 Cy.
	—44794	Power Trans., 220 V. 50 Cy.
	—44792	Power Trans., 220 V. 25 Cy.
61	G20 —29535	Audio Input Choke
62	—44704A	Tone Control (1 Meg.) and Line Switch
63	—44773	Volume C't'l (1 Meg. Tap-275,000 Ohm)
64	—45168	Motor—1217 only (50-60 Cy.)
	—45169	Motor—1227 only (50-60 Cy.)
	W —45165	Mtg. Foot—Motor
	W —45164	Bracket—Motor Mtg.
65	G1 —44628	Discriminator Switch Assy.
	W —44898	Pin. Switch Adjust.
66AB	W —44877	Cable and Plug—Push Button
67A	W —28619	Condenser, .006 Mf. 200 V.
67B	W —28619	Condenser, .006 Mf. 200 V.
68AB	G16 —28807	Socket—Push Button Plug
69	G27 —26719	Ant. and Gnd. Terminal Assy.
70	G37 —26719	Phono Terminal Assy.
71	—22196	Resistor, 20,000 Ohm ⅓W. Carb.
	7R	Cabinet (1227 only)
	7PF	Cabinet (1217 only)
	W —43552	Spk. Plug Clamp
	W —43553	Rubber Mtg. Foot (5-1217) (2-1227)
	B —44207B	Escutcheon (Dial)
	W —44724	Extruded Rub. Spacer—Brkt. Mtg. 1227
	B —45477	Escutcheon (2 Req.) Push Button
	B —44876A	Push Button Switch only
	W —44877A	Push Button Cable
	W —44871A	Push Button (1227)
	W —45171	Push Button (1217)
	W —44380B	Knob—V. Cont.—Tuning (1227)
	W —44426A	Knob—T. Cont.—Loc. Dist. (1227)
	W —44751A	Knob—Band Sel. (1227)
	W —45105	Knob—V. Cont.—Tuning (1217)
	W —45104	Knob—T. Cont.—Loc. Dist. (1217)
	W —45103A	Knob—Band Sel. (1217)
	W —44875	Celluloid Cover
	—44902	Station Call Letter Sheet
	C —44404	Chassis Mtg. Bracket (1227)
	— 7662	Screws—Brkt. Mtg. (1227)

NON-INTERLOCKING PUSH BUTTONS

Part No.	Description
G2 —45228	Push Button Assy. Complete (2) (1217)
B —44876A	Push Button Switch only (1217)
W —44877A	Push Button Cable and Plug only (1217)
W —45171	Push Button only (1217)
G1 —45228	Push Button Assy. Complete (1227)
B —44876H	Push Button Switch only (1227)
W —44877A	Push Button Cable and Plug only (1227)
W —44871A	Push Button only (1227)
W —44873B	Push Button Escutcheon (2) (1217 and 1227)

CROSLEY CORP.

MODELS 1217,1227
Socket,Trimmers,Chassis
Drive Data,Phono.

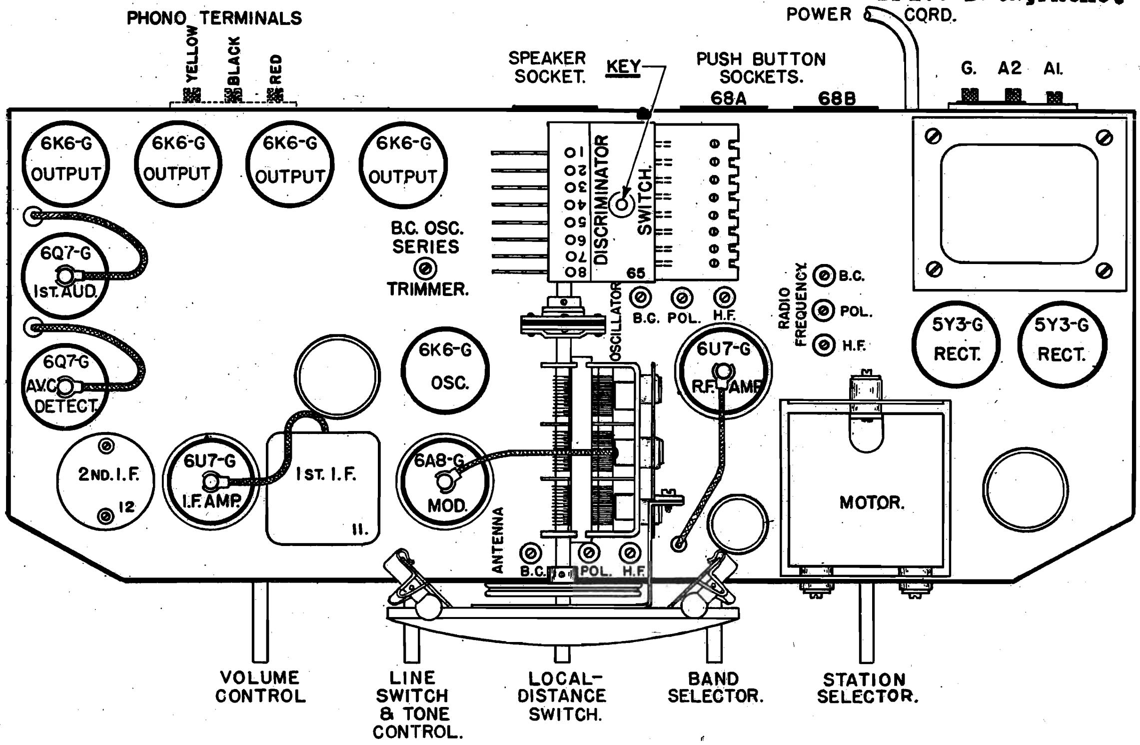


Fig. 2. Top View Models 1217 and 1227

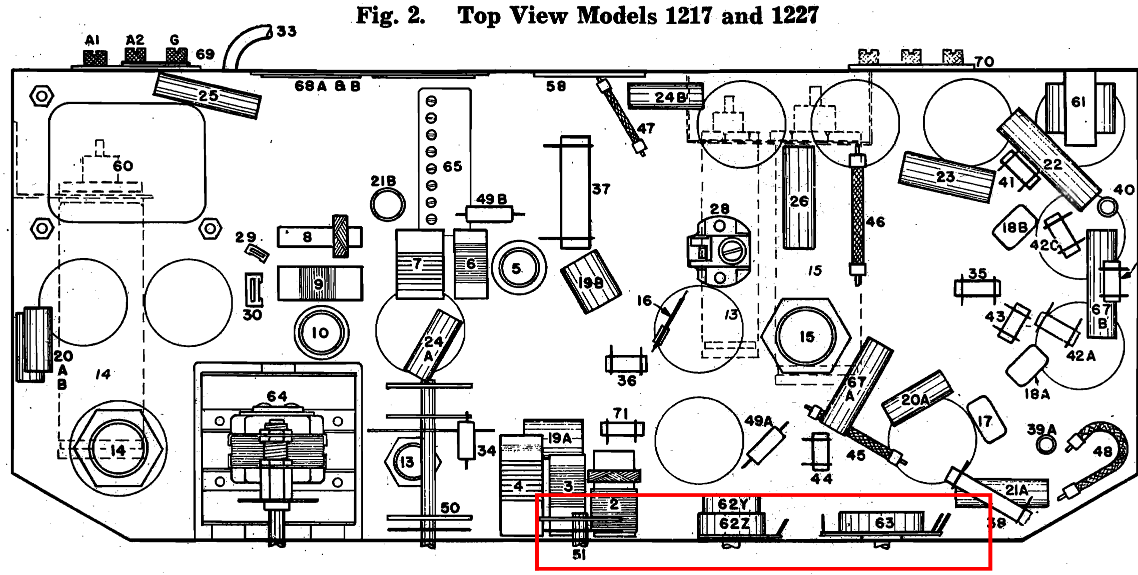


Fig. 3. Bottom View Models 1217 and 1227

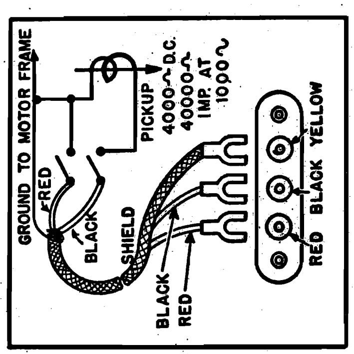
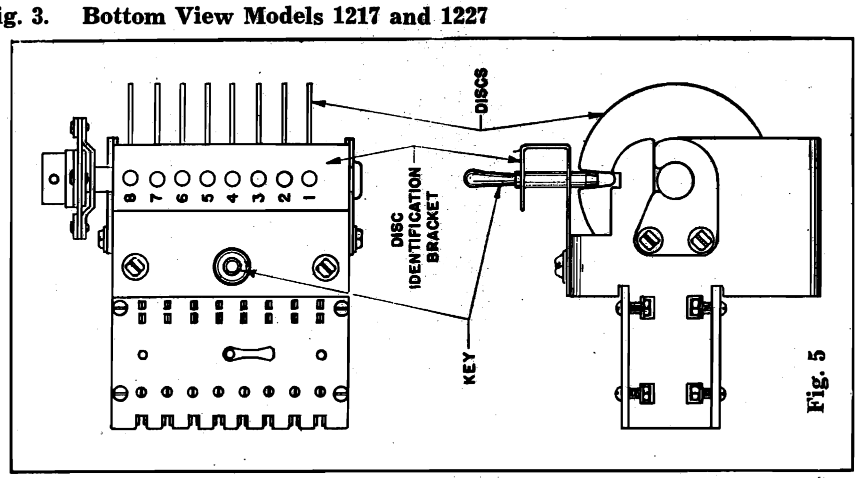


Fig. 4. Phonograph Pickup



MODELS 1217,1227
Voltage,Alignment
Notes

CROSLEY CORP.

These model Crosley radios are 12-tube AC receivers designed for Standard Broadcast and Short Wave reception. They incorporate such features as push button electric tuning, automatic volume control, Local-Distance switch and push pull parallel output. The tuning range is divided into three bands as follows:

535-1725 Kilocycles or 555-173 Metres (American Broadcast Band)
2.0- 6.8 Megacycles or 150-44.5 Metres (Police & Amateur Band)
6.6- 22 Megacycles or 45.5-13.5 Metres (High Frequency or Foreign Band)

CIRCUIT DESCRIPTION

Twelve tubes are employed in a superheterodyne circuit which consists of an R. F. amplifier, separate oscillator and modulator tubes, 455 kilocycle I. F. amplifier, a composite detector, AVC and quiet or "squelch" tube, two stage audio amplifier—the output of which uses four pentode tubes in push pull parallel and power supply.

The 1st I. F. transformer is a triple-tuned unit, which in conjunction with the Local-Distance switch, controls the selectivity of the receiver. Quiet tuning is accomplished while tuning by means of the push buttons due to the action of the 6Q7G tube, item 55A, on the audio amplifier. When any push button is depressed, A. C. voltage is impressed upon the control grid of this tube through one or the other of condensers 20B or 20C. A portion of this voltage is rectified and passed on to the control grid of the 6Q7G A. F. tube through resistors 42B and 40, the effect being to bias the tube beyond cutoff.

The diode plates of the 6Q7G A. F. tube have no effect upon the circuit and the socket terminals for these two elements are only used for junction blocks. The 450 ohm field of the speaker is located in the negative leg of the power supply.

The bias voltage for the 6U7G I. F. amplifier tube is obtained across a 250 ohm resistor, item 47, located between the speaker field and ground.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500 volt D. C. voltmeter (except filaments) with the receiver in operating condition and no signal input. The volume control should be turned full "ON," the tone control should be turned to the "TREBLE" position (counter-clockwise), the Local-Distance switch should be turned to the "Distance" position and the condenser gang should be rotated to the minimum capacity position. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Go	Ga
6U7G	R. F. Amplifier	6.3	255	95	0	0	—	—
6A8G	Modulator	6.3	255	95	—	0	95	95
6K6G	Oscillator	6.3	125	125	—	0	—	—
6U7G	I. F. Amplifier	6.3	255	95	3	3	—	—
6Q7G	Det., AVC & "Squelch"	6.3	0	—	—	0	—	—
6Q7G	1st A. F. Amplifier	6.3	185		—	0	—	—
6K6G	(4) Output	6.3	245	255	—	22	—	—
5Y3G	(2) Rectifier	5.0	—	—	—	255	—	—

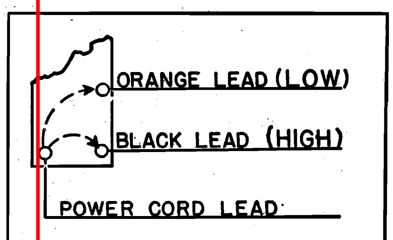
Power consumption approximately 120 watts at 117.5 volts.
Power output approximately 12 watts.
Voltage drop across speaker field 72 volts.

SPECIAL POWER TRANSFORMER ADJUSTMENT

In localities where the voltage variation on 50 or 60 cycle power supply lines is greater than customary commercial limits, special 50-60 cycle power transformers are available. These transformers have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.



NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits may be properly aligned with the use of a modulated signal generator and an output meter.

Connecting Output Meter.

Connect the output meter to the plates of the two 6K6G output tubes. Be certain that the meter is protected from D. C. by a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6U7G 1st I-F Amp. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Set the band selector switch on the Broadcast Band.

(d) Turn the Local-Distance Switch to the "Distance" position (Right).

(e) Set the signal generator to 455 kilocycles.

(f) Adjust both trimmer condensers located on top of the 2nd I-F transformer for maximum output.

(g) Transfer the signal generator lead to the top cap of the 6A8G tube, leaving the tube's grid clip in place.

(h) Close the middle trimmer of the 1st I-F transformer. (Do not force adjustment screw).

(i) Adjust the top and then the bottom trimmers of the 1st I-F transformer for maximum output.

(j) Adjust the middle trimmer of the 1st I-F transformer for maximum output.

DO NOT ADJUST THE TRIMMER CONDENSERS LOCATED ON THE 2ND I-F TRANSFORMER WITH THE SIGNAL GENERATOR LEAD CONNECTED TO THE 6A8G TUBE.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

Aligning The R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator is connected to the "ANT" terminal of the receiver. For the Broadcast Band a 200 mmf. condenser should be connected in series with the output lead of the signal generator and for the High Frequency and Police Bands a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be SHUNT ALIGNED and then SERIES ALIGNED where provision is made for series alignment (Broadcast Band). The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated for each adjustment, ¶ (D) below.

(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh, adjust the "OSC" shunt trimmer until the MINIMUM CAPACITY SIGNAL (D) is heard (it is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT SIGNAL (D) is tuned-in with maximum output. Then adjust the "R-F" and "ANT" shunt trimmers for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and check the adjustment of the "R-F" and "ANT" trimmers. DO NOT READJUST THE OSCILLATOR TRIMMER.

NOTE: When shunt aligning the Police and High Frequency Bands care must be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times, or more, and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct frequency.

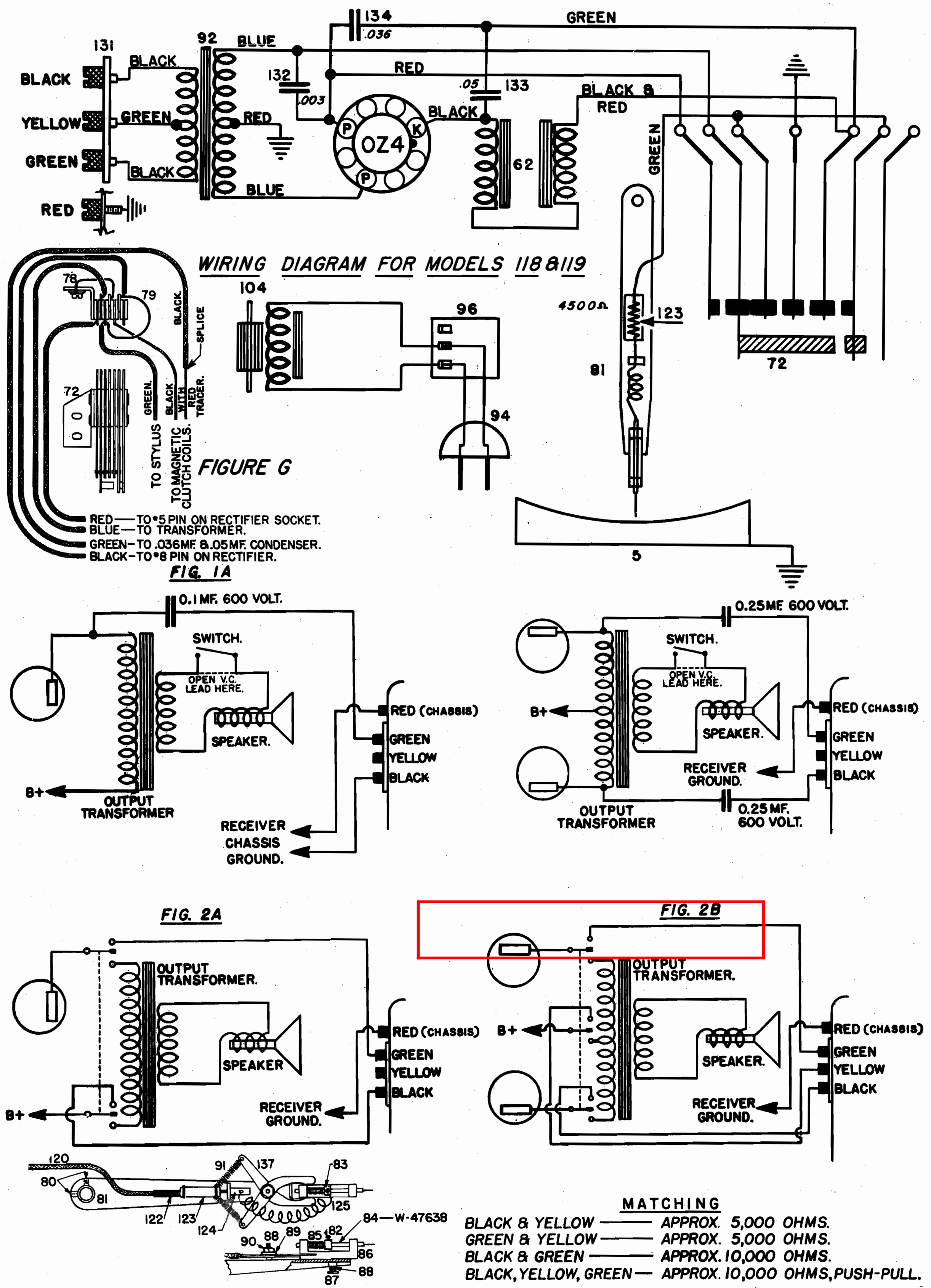
(c) To align the series trimmer (See Fig. 2), set the signal generator to the frequency indicated below (D) and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer, it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output. Minor tolerance variations in series alignment at 2500 kilocycles in the Police Band and at 7000 kilocycles in the High Frequency Band may be compensated for by slight repositioning of the grid lead of the antenna coil in the Band affected.

(D) SIGNAL INPUT FREQUENCIES

	Min. Cap. Signal	Shunt Align.	Series Align.
American Broadcast Band	1850 Kilocycles	1700 Kilocycles	600 Kilocycles
Police & Amateur Band	6600 Kilocycles	6000 Kilocycles	
High Frequency Band	22 Megacycles	18 Megacycles	

CROSLEY CORP.

MODELS 118,119
Reado Printers
Schematic, Connections
Stylus Details



MATCHING

BLACK & YELLOW	APPROX. 5,000 OHMS.
GREEN & YELLOW	APPROX. 5,000 OHMS.
BLACK & GREEN	APPROX. 10,000 OHMS.
BLACK, YELLOW, GREEN	APPROX. 10,000 OHMS, PUSH-PULL.

MODELS 118,119
Reado Printers
Assembly,Chassis Views

CROSLEY CORP.

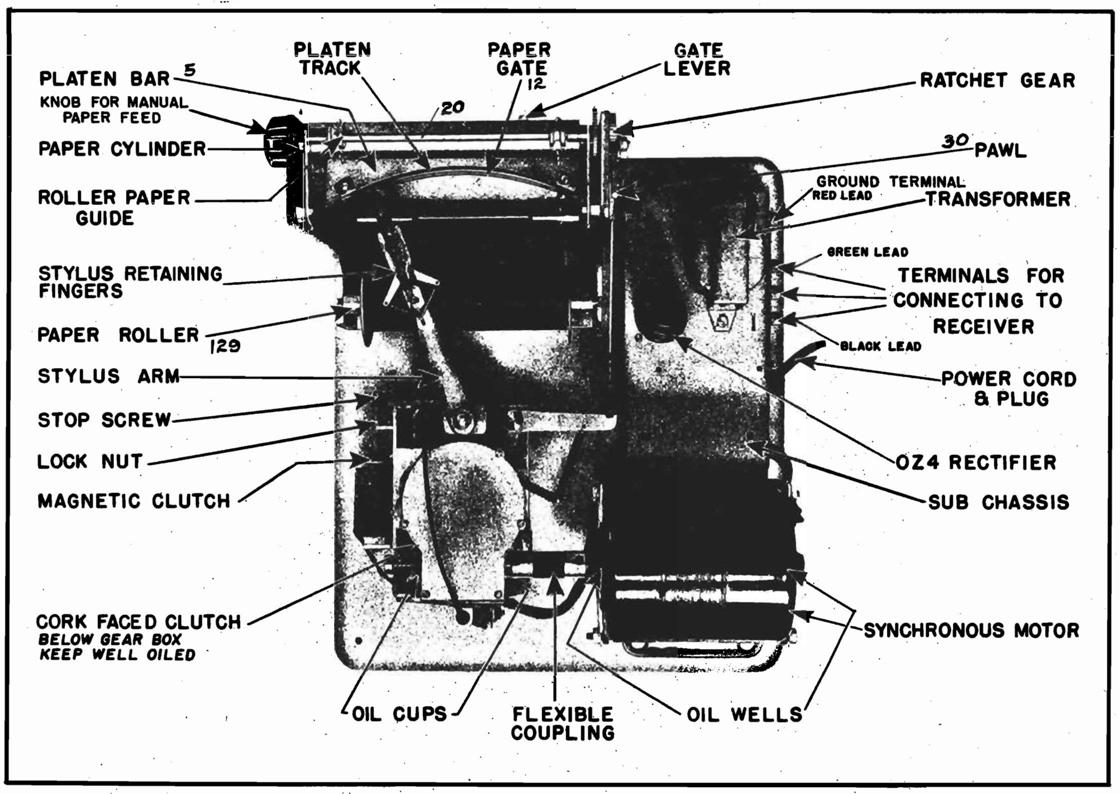


FIGURE J

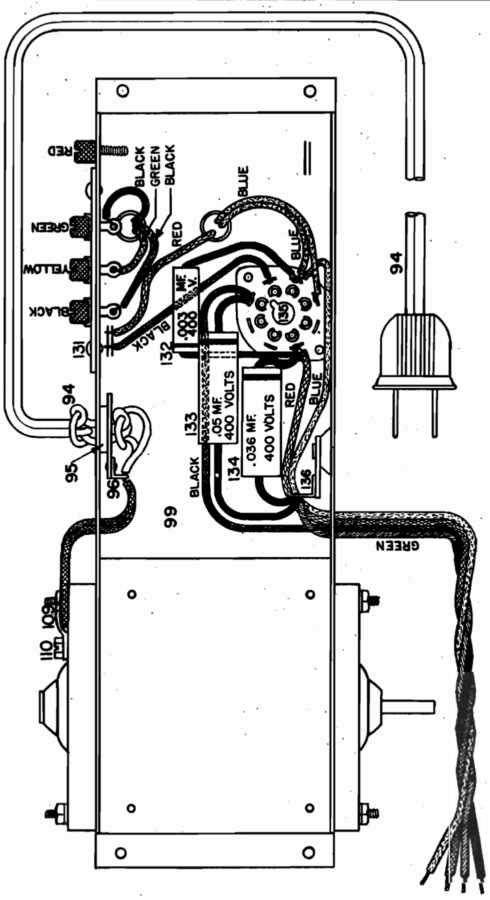
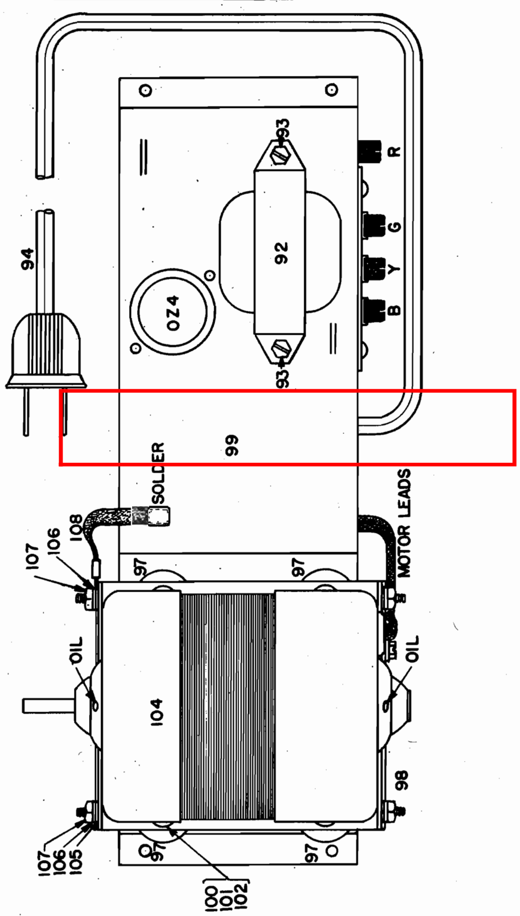


FIGURE K.



MODELS 118,119
Reado Printers
Operating and
Service Data

CROSLEY CORP.

INSTRUCTIONS FOR ELECTRICALLY CHECKING
MODELS 118 AND 119 CROSLEY READO PRINTERS.

To electrically check the operation of the 118 and 119 printer, it should be connected to a receiver as shown in attached bulletin. Connect a signal generator modulated with any audio frequency less than 500 cycles to the antenna of the receiver and switching the output from the receiver to the printer, with the motor running, turn up the level control on the receiver slowly until sufficient voltage appears across the synchronizing coils on printer to actuate the clutch release. This will release the stylus arm at this same level setting and the modulation should mark lightly on the paper. Increasing the level setting should bring up the blackness of printing to the point just below where the paper begins to smoke which is the desirable printing level. As the level of the receiver is reduced the printing should become lighter and lighter and as the level is further reduced the clutch pawl will hold in and the arm should stop over at the left side of the paper.

Measuring across the relay solenoid with a 1000 ohm per volt D.C. meter synchronization should occur between 45 and 55 volts. In cases where this does not hold true the 0Z4 rectifier should be checked as it will be noted from circuit diagram this tube is switched in the circuit only for synchronization, that is, to rectify the 500 cycle pulse for the relay coils If the trouble is not found in the tube, the circuit should be checked for opens or shorts and the switch points inspected and cleaned. If circuit and voltages are found okay and printer still refuses to operate properly, the clutch arm should be adjusted according to instructions.

To measure the printing signal, connect a 1000 ohm per volt A.C. meter across the stylus to ground at the switch and advance the level control of the receiver until the stylus is sweeping back and forth across the paper. When printing at desired level on average paper, the voltage reading should pick up to between 200 and 250 volts. If the paper is in doubt, turn the stylus so that it does not touch the paper and connect 18000 ohms from stylus to ground, turn motor off and rotate shaft by hand until stylus arm is half way across on its way from left to right and measure the voltage across this resistor. The voltage should read between 200 and 250 volts as above.

Wherever possible it is advisable to check the operation with a phonograph and a record containing facsimile copy. Such a record may be obtained from The Crosley Corporation for operation on a 33-1/3 R.P.M. turntable.

TO PREPARE FOR OPERATION

1. INSERTING PAPER

(a) The roll of paper should be placed on the roller (129) so that if you were to pull on the end, it would unroll toward you.

(b) Insert paper between the lower roller and the base (white surface up).

(c) Push lever, on back of platen bar (5), to the left. (Platen is the center bar that supports paper for the stylus.) This springs open the paper gate (12) Pull paper up between gate and platen.

(d) Lift bar (20) with the roller paper guides.

(e) Place paper over paper cylinder. Be sure the paper is lined up and fits over pins in cylinder.

(f) Release catch holding lever on platen bar, then push roller guides down on the paper.

(g) Place cleaning brush so that the bristles just bear lightly on the paper, with the bristles toward the stylus.

2. STYLUS

VERY CAREFULLY, spread metal fingers (137) and turn the stylus assembly (86) so that the point is toward the paper (BE SURE NOT TO BEND POINT) then release fingers (137). The metal fingers should hold the stylus assembly in line with the stylus arm.

(a) Turn the motor over by hand. To do this, turn the rubber coupling away from you (clockwise direction) until stylus comes to rest at the left hand side of the paper.

(b) While turning the motor by hand, depress the magnetic clutch. The stylus will move across the paper. Check the stylus pressure against paper by listening for a slight rub as stylus crosses paper. The correct pressure is indicated by a slight rub but not sufficient to leave a mark on the paper.

3. RATCHET AND PAWL

By turning the motor over by hand the operation of the ratchet and pawl (which moves the paper cylinder) can be checked.

(a) While turning motor by hand and depressing the magnetic clutch as before; turn motor until the stylus arm is at the right hand side of the paper. While the arm is traveling back to the left side of paper, the ratchet moves up ONE tooth and is locked by the pawl (30). This movement of one tooth acts through the gear train and turns the paper cylinder, so that the paper moves up 1/100 of an inch.

If everything checks normal up to this point, plug the power cord into a convenient receptacle (110 volts, 60 cycles).

With motor running, listen carefully for any excessive mechanical vibrations. If present they may be minimized by adjusting the four bolts that mount the motor bracket and the four bolts that mount the sub-chassis to the base.

CONNECTING TO RECEIVER

For best results from the READO, (Model 119), the receiver or source of A-F. supply should be designed to give the required electrical characteristics that are necessary for the correct operation of the READO, namely:

1. At least 5 watts output (clean audio).

2. A very good A.V.C. circuit.

3. Good sensitivity and selectivity.

4. A well filtered power supply (NO HUM).

Figures 1 A & B and 2 A & B show how to connect 119 Printer to Receiver. The switching arrangement is up to the individual, likewise the connection may be varied as in Figure 1 or 2, use the connection that gives the best results.

CAUTION: NEVER WORK ON PRINTER CONNECTIONS WITH RECEIVER TURNED ON.

We recommend the Crosley Model 758 Receiver as an exceptional radio receiver, in that the circuit incorporates many new developments that are essential for producing the excellent job of printing of which this READO is capable.

OPERATION

If the preceding instructions have been carefully followed, the operation of the READO is practically automatic with the exception of turning ON and OFF.

TUNING-IN FACSIMILE SIGNAL

The IMPORTANCE OF ACCURATE tuning of the radio receiver to the station broadcasting Facsimile signal cannot be emphasized enough. Good copy cannot be realized unless the station is tuned-in right on the nose, as the form of printing depends almost entirely on the READO being synchronized with the transmitting equipment.

The procedure for accurate tuning is as follows: Locate desired station on the dial, then tune to each side, then bring pointer back to the exact center of that portion of the dial the station covers. It will be found much easier to tune-in accurately (Facsimile signals) by tuning to the station that is to broadcast Facsimile signals, WHILE THE STATION IS BROADCASTING A REGULAR RADIO PROGRAM.

ADJUSTING THE DENSITY OF PRINTING (Blackness)

First, the receiver must have sufficient output (5 watts or more). The blackness of the printing is regulated by increasing or decreasing the setting of the volume or level control.

MAINTENANCE

1. Care of the Stylus.
The stylus may tend to bind in the bakelite block after considerable service due to small particles of carbon collecting on shaft. If this occurs, loosen collar and remove shaft and clean. Replace and adjust as stated in paragraph under "Stylus"

2. Care of the Platen Track.
The platen track is a strip of spring steel that is back of paper gate and is between paper and the platen bar. Due to the method of printing this track collects deposits of carbon after quite a few hours of service and will cause the stylus to stick or the printing density to vary in shade for one sweep. To clean, carefully turn stylus assembly at right angles with the stylus arm. This is done so as to prevent possible damage to the stylus point when removing paper gate. Then push lever back on platen bar and carefully remove paper gate. With a VERY fine sand paper using a wiping motion from one side to the other, polish the platen track. Replace paper gate. Replace stylus to printing position.

MOTOR

The motor should be oiled (each bearing) about once in every three hundred hours of service with a high grade of light lubricating oil.
Motor will not run properly on less than 105V.

CLUTCH

It is essential that the clutch plate be thoroughly lubricated at all times, check at least once a week. Use a high grade of machine oil for this purpose.

SERVICE HINTS

Variations in density or blackness of printing may be due to:
(a) Receiver may not have the A.V.C. circuit capable of keeping the output constant ~~over wide variations of incoming signal strength.~~
(b) Receiver may not have sufficient output.
(c) Stylus may be stuck in bakelite bracket.
(d) Stylus may be worn.
(e) Platen track may have small deposits of carbon on it.

WOBBLY PRINTING --
(a) Receiver not tuned properly (Printer not synchronized with transmitter).
(b) Bent or loose stylus point.
Definite vertical light streaks uniformly spaced across the printer matter is an indication of insufficient filtering in the receiver, permitting hum voltage to reach printer.

NOT PRINTING --
(a) Power off.
(b) Loose or open connection between receiver and printer.
(c) Stylus stuck.

STYLUS ARM KEEPS MOVING --
The stylus arm should come to rest at the left hand side of paper when the volume or level control is reduced appreciably. If it keeps moving back and forth, the end of the magnetic clutch arm that engages the dog on the clutch plate may be slightly worn. If this is the case it may be compensated for by a slight adjustment of the magnetic clutch stop screw. (See illustration) Loosen the stop screw lock nut, then turn screw to the left (counter-clockwise) about a quarter turn or just enough to cause the magnetic clutch arm to engage dog on clutch plate.

MODELS 118,119
Reado Printers
Trouble Chart

CROSLEY CORP.

MODEL 118 READO TROUBLE CHART

TROUBLE	CAUSE	REMEDY
A. Uneven density of print. Light streaks through copy, particularly noticeable on solid black areas.	A1. Gate not holding paper against platen properly.	A1.(a) Check gate latch making sure gate is closed.
		A1(b) Check gate hold-down lugs on left and right side of platen holder which should prevent gate from crawling up as paper goes through machine.
		A1(c) Gate should not be kinked or twisted.
	A2. Stylus pressure too light.	A2.Adjust collar on stylus holder.
	A3. Platen carbonized.	A3. Clean with light emery paper. To prevent carbonizing do not print too black.
	A4.Stylus does not move freely in holder.	A4. Burnish stylus lengthwise with fine emery paper.
	A5.Paper	A5.Try new paper.
B. Fuzzy printing. Characters lined up straight and of correct height, but with staggered outline.	B1. Carbonized stylus.	B1. Clean stylus; lighten pressure, adjust blackness.
	B2. Platen carbonized.	B2. See A3.
	B3.Not synchronizing cleanly.	B3(a) Adjust clutch arm and air gap. B3(b)Check clutch arm point for squareness.
	B4. See A4.	B4. See A4.
C. Height of characters varies from line to line.	C1.Paper not feeding through gate and platen properly.	C1.See A1(a) and A1(b)
	C2.Ratchet not working properly.	C2(a) Check ratchet assembly for binding.
		C2(b) Adjust ratchet push rod so that pawl has from 1 to 1 1/2 tooth movement each stroke.
D. Stylus sticks in holes in side of paper.	D1.Stylus arm not centered.	D1.Re-center stylus arm by adjusting arm on shaft by two set screws.
E.Light or no printing with horizontal lines or streaks, usually accompanied by a black vertical line on one or both sides.	E1.Weak signal or interference from local sources or other stations.	E1.Use better antenna remove local interference.
F.Wavy characters; some leaning to the right, others to the left.	F1. Poor synchronizing.	F1.Adjust clutch arm and air gap.Tighten clutch.
	F2.Weak OZ4 tube.	F2. Replace tube.
G.Short dash lines of increasing and then decreasing length appear across paper accompanied by stylus arm not stopping when volume control is turned down.	G1.Clutch arm not stopping stylus.	G1.Adjust clutch arm and air gap.
H.Paper tears.	H1.Paper not set up properly.	H1.Reset paper.
	H2.Paper creased or torn at edges.	H2.Remove creased or torn portion.
	H3.Too much pressure on gate.	H3.See that gate is free to reset lightly but firmly on paper.
I. Paper burns.	I.Printing too black due to volume being too high.	I.Decrease volume control.

MODEL 494 RECORD PLAYER TROUBLE CHART

A.Prints light on records, but O.K. on air.	A1.Needle too soft.	A1.Use new hard needle.
	A2.Record worn out.	A2.Use new record.
	A3.Paper	A3.Change paper.
B.Prints uneven on record,but O.K. on air.	B1.Uneven velocity of turntable.	B1.Lap thrust bearing washer with a rotary motion until all radial marks are erased.Lap thrust bearing on turntable same as thrust washer.
C.Motor will not start.	C.Motor mounted too rigidly.	C.Loosen mounting nuts under turntable one turn.

TO ADJUST CLUTCH AND AIR GAP

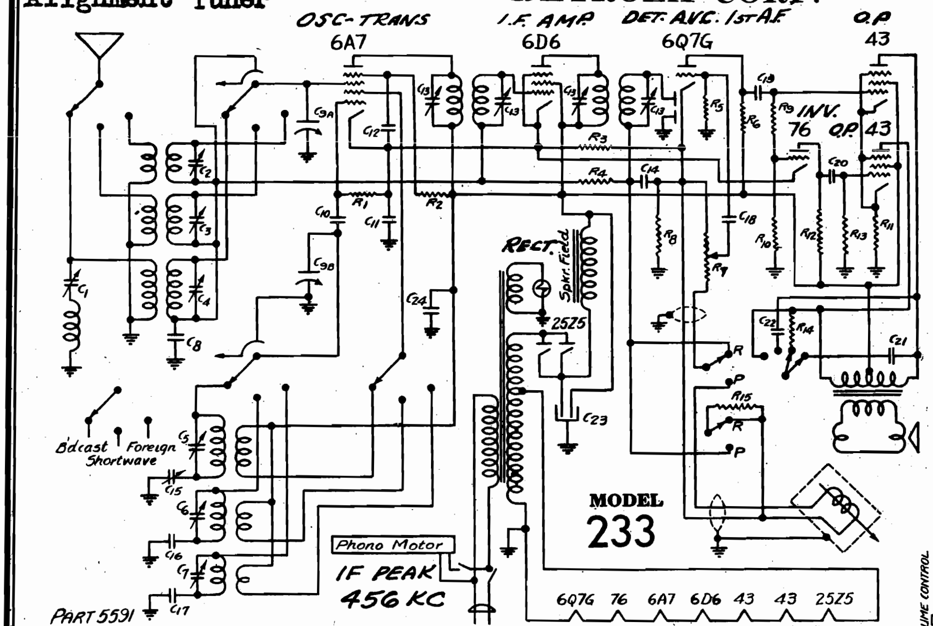
Turn motor coupling by hand in direction of normal rotation while holding clutch arm against magnet pole pieces, until stop on lower clutch plate is just completely under clutch arm. Loosen mounting screws for magnet bracket and slide bracket and coils forward until the pole pieces come within the thickness of a piece of writing paper of touching the magnetic armature on clutch arm.Tighten bracket screws.

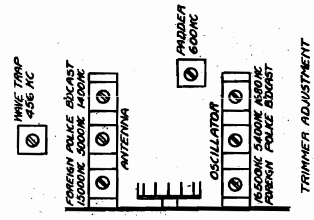
Plug motor in and adjust armature adjustment screw until clutch arm just stops lower clutch plate. Repeat to make sure that clutch arm engages just enough to stop clutch, as more movement of armature than is necessary only requires more power to synchronize. Tighten lock nut, being careful not to change adjustment while so doing.

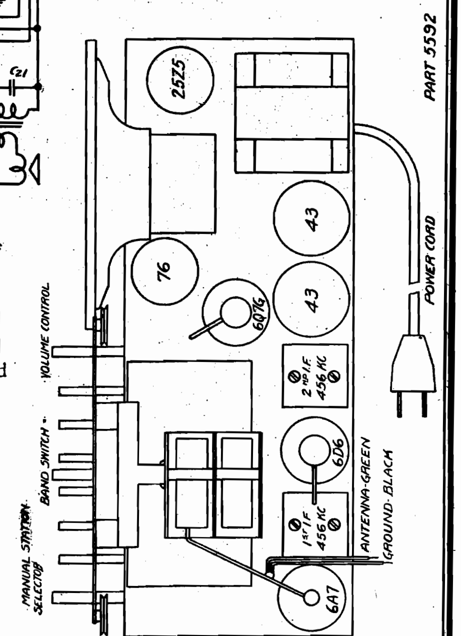
MODELS 251,256
Alignment Tuner

DETROLA CORP.

MODEL 233
Schematic,Socket
Trimmers,Alignment







No orders for parts will be accepted unless PART NUMBER, DESCRIPTION and CHASSIS MODEL NUMBER are given.

Symbol	Part No.	Description
C-1	3272	30-140 mmf Trimmer
C-2, 5, 7	1611	3-35 mmf Trimmer
C-3, 4, 6	2597	1-10 mmf Trimmer
C-8, 11	572	.1 200 V.
C-9a, b	5377	Tuning Condenser
C-10	2780	50 mmf Mica
C-12	580	.05 200 V.
C-13		IF Trimmer
C-14	4810	.0005 400 V.
C-15	2560	220-500 mmf Padder
C-16	2741	1330 mmf 5%
C-17	3871	.006 600 V. 5%
C-18	568	.01 400 V.
C-19, 20		.02 400 V.
C-21	581	.005 600 V.
C-22, 23	2600	.02 600 V.
		Electrolytic
C-24	5272	8 MF. 150 V.
		Electrolytic
C-25	5420	8 MF. 150 V.
		Electrolytic
C-26	5419	8/8 MF. 250 V.
		Electrolytic
R-1, 10	631	50M 1/3 W.
R-2	617	20M 1/3 W.
R-3	2605	200 ohm 1/3 W. 10%
R-4, 5	624	1 Meg. 1/3 W.
R-6	598	200M 1/3 W.
R-7	5332	500M Volume Control
R-8	2698	100 ohm 1/3 W. 10%
R-9	2881	400M 1/3 W. 10%
R-11	5395	500 ohm wire wound 10%
R-12, 15	603	100M. 1/3 W.
R-13	615	500M 1/3 W.
R-14	4529	10M 1/3 W. 10%
R-15A, B, C	5421	30 ohm, 10 ohm, 20 ohm Wire Wound
	3463-10	1st IF Transformer
	3463-4	2nd IF Transformer
	5096	Oscillator Coil
	5392	Antenna Coil
	5390	Band Switch
	5394	Tone Control Switch
	5390	Band Switch
	5394	Tone Control Switch
	5422	AC-DC Switch
	5397	Button escutcheon
	5353	Tuning Buttons
	5357	Call Letter Sheets
	5388	Speaker
	3904	Knobs
	5234	Phono Pick Up
	5233	Turn Table
	5240	Radio-Phono Switch
	5232	Phono Motor
	530	Pilot Light Bulb
	5387	Dial Chart
	5396	Escutcheon

ALINEMENT PROCEDURE MODELS 233,251,256.

Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments.

I.F.: Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 456 kc. signal to grid of 6D6 I.F. amplifier tube, and aline transformer No. 2. Connect generator to grid of 6A7 tube and aline transformer No. 1.

RF. (See above diagram for location of trimmers.)

Using a 200 MMF. condenser in series with the high side of the generator, turn band selector switch to left hand position and the tuning condenser to about 600 kc. Feed a 456 kc. signal to the antenna and adjust wave trap trimmer for minimum response. With the tuning condenser at minimum capacity feed 1660 kc. signal to the antenna and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at about 1400 kc. Adjust broadcast antenna trimmer. Set generator for 600 kc. tune receiver to signal and adjust the padder. The tuning condenser should be rocked back and forth through the signal while varying the padder in order to assure perfect alinement.

Using 400 ohm resistor in series with generator, set band selector in center position, set generator to 5400 kc and adjust oscillator trimmer for top frenquency. Set generator to 5000 kc, tune receiver to signal and adjust antenna trimmer.

Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 16,500 kc—screw trimmer down tight, then unscrew to *second* peak. Set generator to 15,000 kc, tune receiver to signal and adjust antenna trimmer—Screw trimmer down tight, then unscrew to *first* peak, rocking the tuning condenser back and forth through the signal while the adjustment is being made. **Above procedure for alinement at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.**

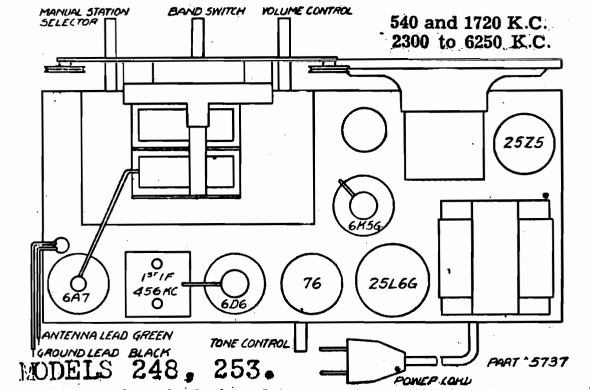
Adjustment of Mechanical Automatic Tuning System

Any of your favorite stations may be set up on any button, but it is recommended that they be set up in the same sequence as they are received on the dial. Loosen one of the buttons by turning it to the LEFT. A slot is provided in the button into which a coin may be inserted to facilitate turning. After turning the button a few turns to the LEFT, press it in as far as it will go. While holding the button in this position, tune in the station desired very carefully in the usual manner with the manual tuning knob. While still holding the button if, fix the adjustment by turning the button to the RIGHT until tight. Thereafter the station set up on this button will be received whenever this button is pressed in AS FAR AS IT WILL GO.

MODELS 248,253
MODELS 249,254
MODEL 250 MODEL 257

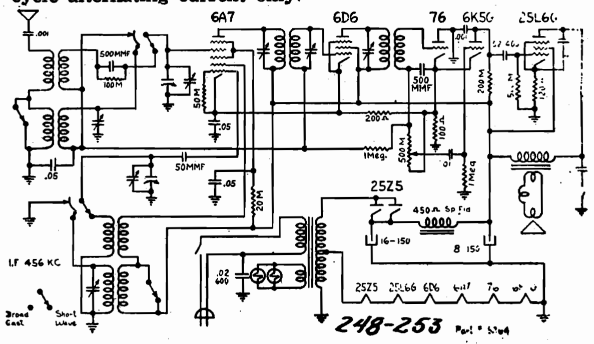
DETROLA CORP.

Schematics, Socket Trimmers

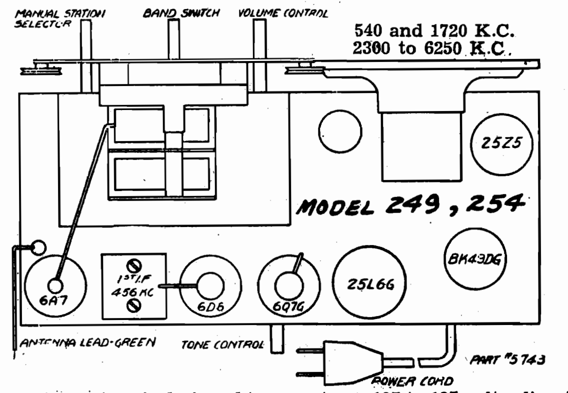


MODELS 248, 253.

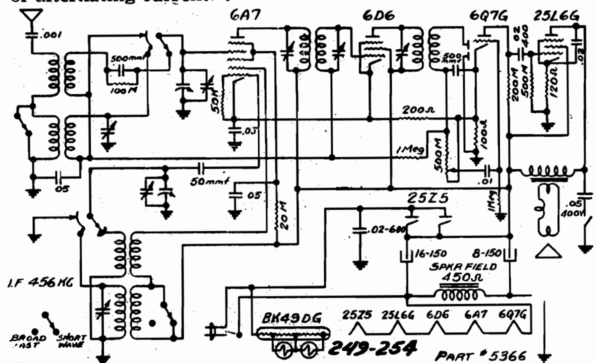
This receiver is designed to operate on 105 to 125 volts, 60 cycle alternating current only.



6A7—Oscillator, Translator
6D6—I.F. Amplifier
76—Detector
6K5G—Audio Amplifier
25L6G—Power Output
25Z5—Rectifier



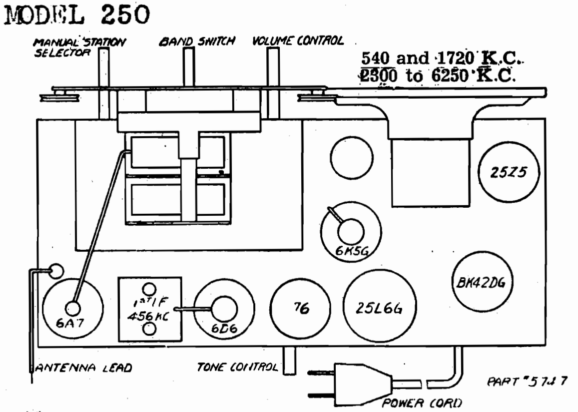
This receiver is designed to operate on 105 to 125 volts, direct or alternating current.



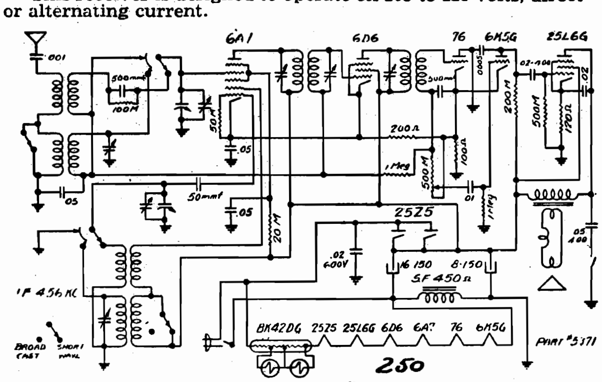
DO NOT CONNECT A GROUND TO THIS RECEIVER.

6A7—Oscillator, Translator
6D6—I.F. Amplifier
6Q7G—Detector, Audio Amplifier
25L6G—Power Output
25Z5—Rectifier
BK49DG—Ballast

MODEL 250



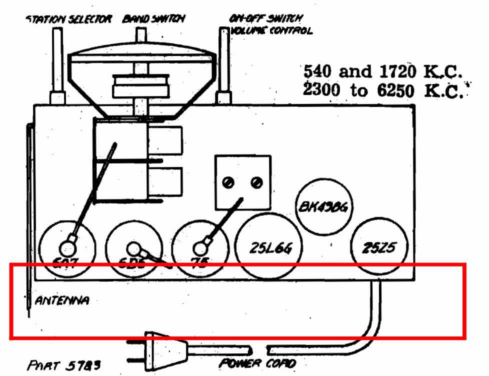
This receiver is designed to operate on 105 to 125 volts, direct or alternating current.



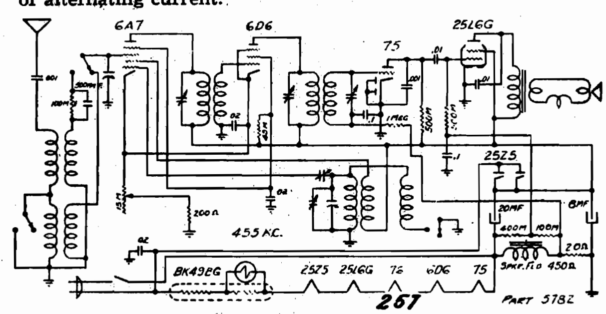
DO NOT CONNECT A GROUND TO THIS RECEIVER.

6A7—Oscillator, Translator
6D6—I.F. Amplifier
76—Detector
6K5G—Audio Amplifier
25L6G—Power Output
25Z5—Rectifier
BK42DG—Ballast

MODEL 257.



This receiver is designed to operate on 105 to 125 volts, direct or alternating current.



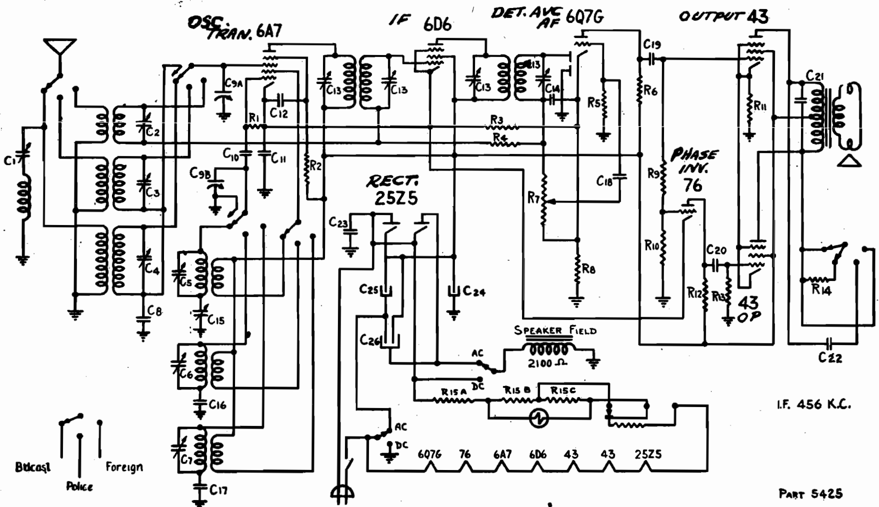
DO NOT CONNECT A GROUND TO THIS RECEIVER.

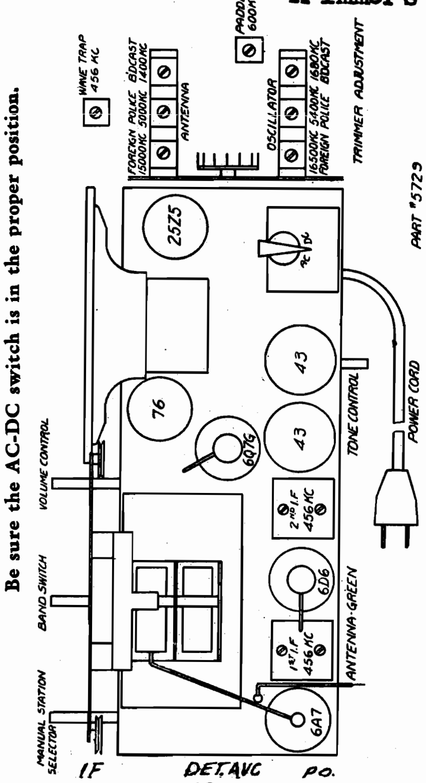
25L6G—Power Output
25Z5—Rectifier
BK49BG—Ballast
6A7—Oscillator Translator
6D6—I.F.
75—Detector

MODEL 262 Schematic, Socket Trimmers, Alignment

DETROLA CORP.

MODELS 251, 256 Schematic, Socket Trimmers





Be sure the AC-DC switch is in the proper position.

This receiver is designed to operate on 105 to 125 volts AC or DC.

No orders for parts will be accepted unless PART NUMBER, DESCRIPTION and CHASSIS MODEL NUMBER are given.

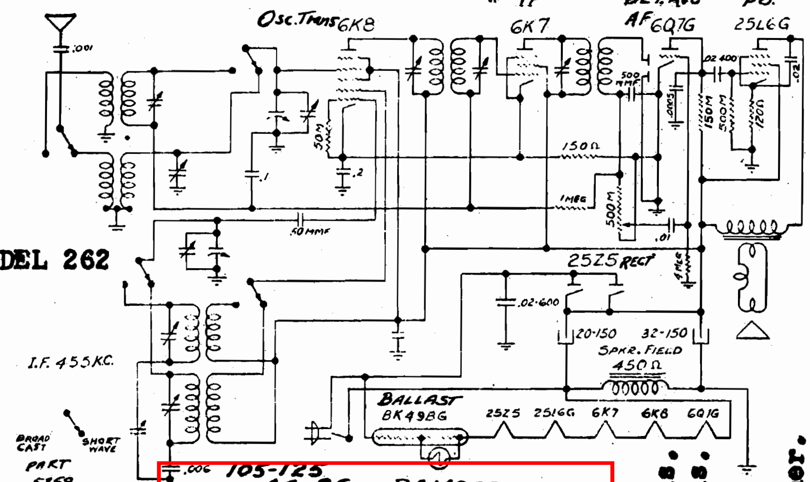
Symbol	*Part No.*	*Description*
C-1	3272	30-140 mmf Trimmer
C-2, 5, 7	1611	3-35 mmf Trimmer
C-3, 4, 6	2597	1-10 mmf Trimmer
C-8, 11	572	.1 200 V.
C-9a, b	5724	Tuning Condenser
C-10	2780	50 mmf Mica
C-12	580	.05 200 V.
C-13		IF Trimmer
C-14	4810	.0005 400 V.
C-15	2560	220-500 mmf Padder
C-16	2741	1330 mmf 5%
C-17	3871	.006 600 V. 5%
C-18	568	.01 400 V.
C-19, 20		.02 400 V.
C-21	581	.005 600 V.
C-22, 23	2600	.02 600 V. Electrolytic
C-24	5272	8 MF. 150 V. Electrolytic
C-25	5420	8 MF. 150 V. Electrolytic
C-26	5419	8/8 MF. 250 V. Electrolytic
R-1, 10	631	50M ⅓ W.
R-2	617	20M ⅓ W.
R-3	2605	200 ohm ⅓ W. 10%
R-4, 5	624	1 Meg. ⅓ W.
R-6	598	200M ⅓ W.
R-7	5332	500M Volume Control
R-8	2698	100 ohm ⅓ W. 10%
R-9	2881	400M ⅓ W. 10%
R-11	5395	500 ohm wire wound 10%
R-12	603	100M. ⅓ W.
R-13	615	500M ⅓ W.
R-14	4529	10M ⅓ W. 10%
R-15A, B, C	5421	30 ohm, 10 ohm, 20 ohm Wire Wound
	3463-10	1st IF Transformer
	3463-4	2nd IF Transformer
	5096	Oscillator Coil
	5392	Antenna Coil

5390	Band Switch
5394	Tone Control Switch
5422	AC-DC Switch
530	Pilot Light Bulb
5728	Dial Chart
5739	Escutcheon
5388	Speaker
2663	Knobs

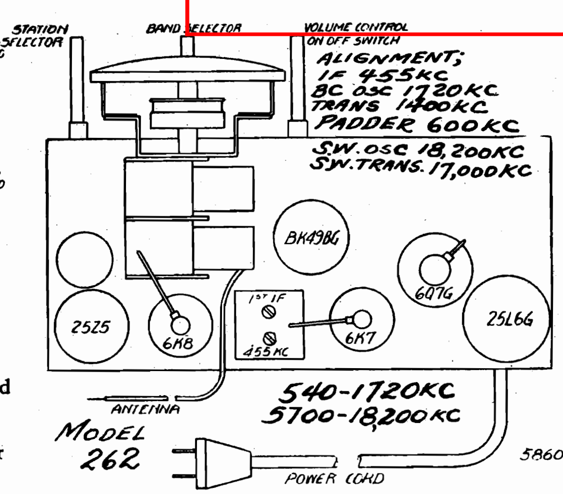
FOR ALIGNMENT SEE INDEX

Model 251-256

MODEL 262



105-125 AC-DC RANGES:



MODEL 262

LOCATION OF TRIMMERS MODEL 262.
2nd. IF Trans. beneath chassis.
BC osc., osc. coil beneath chassis.
BC trans., trans coil top chassis.
BC padder on the chassis.
SW osc, next to BC osc trimmer.
SW trans. next to BC trans trimmer.

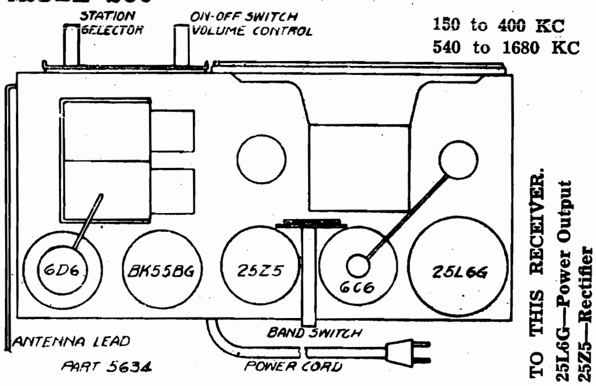
MODEL 260
MODEL 266
MODEL 268
MODEL 272

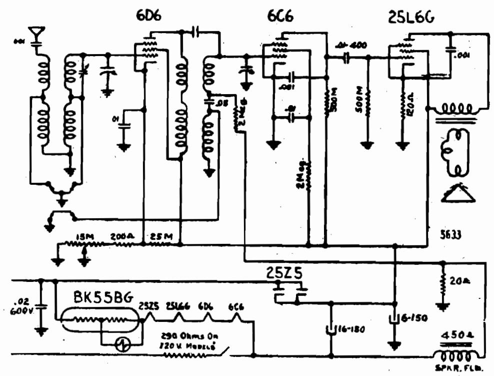
DETROLA CORP.

Schematics, Socket Trimmers

MODEL 260

150 to 400 KC
540 to 1680 KC





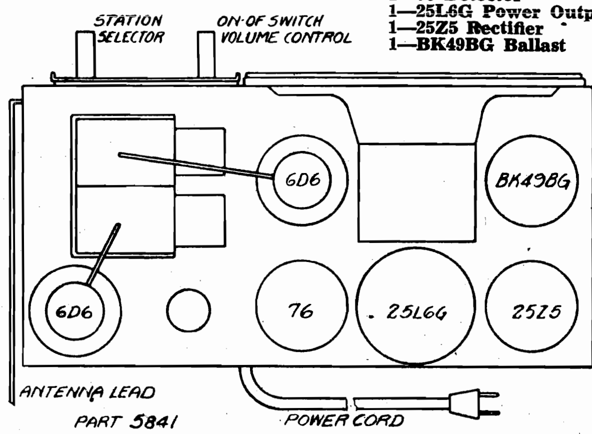
This receiver is designed to operate on 220 volts, direct or alternating current.

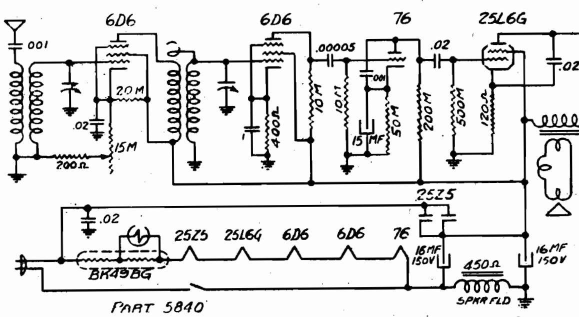
DO NOT CONNECT A GROUND TO THIS RECEIVER.

25L6G—Power Output
25Z5—Rectifier
BK55BG—Ballast
6D6—RF Amplifier
6C6—Detector

MODEL 266

2—6D6 R. F. Amplifiers
1—76 Detector
1—25L6G Power Output
1—25Z5 Rectifier
1—BK49BG Ballast



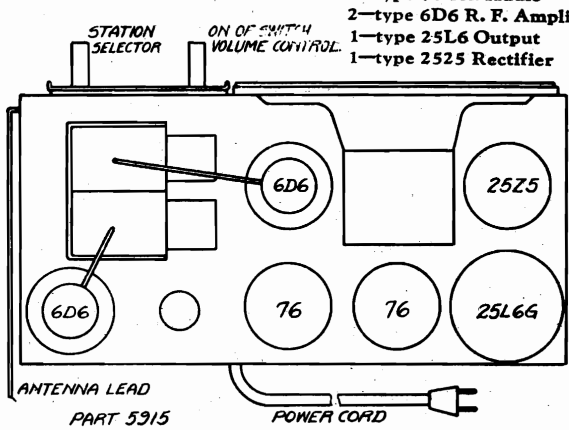


This receiver is designed to operate on 105 to 125 volts, or alternating current.

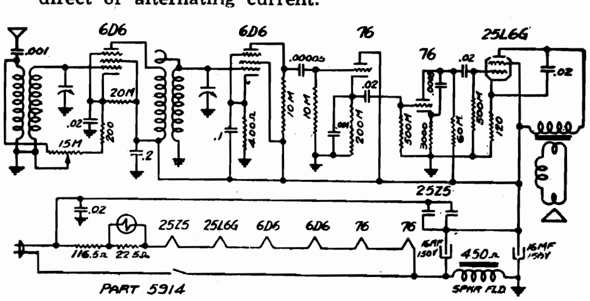
540 K.C. and 1600 K.C.
1600 K.C. and 1712 K.C.

MODEL 268

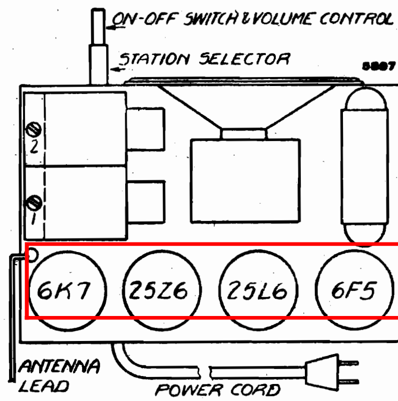
1—type 76 Detector
1—type 76 1st. Audio
2—type 6D6 R. F. Amplifiers
1—type 25L6 Output
1—type 2525 Rectifier



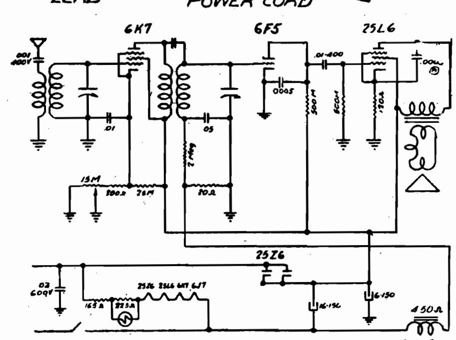
This receiver is designed to operate on 105 to 125 volts, direct or alternating current.



Model 272



1—25Z6 Rectifier
1—25L6 Output

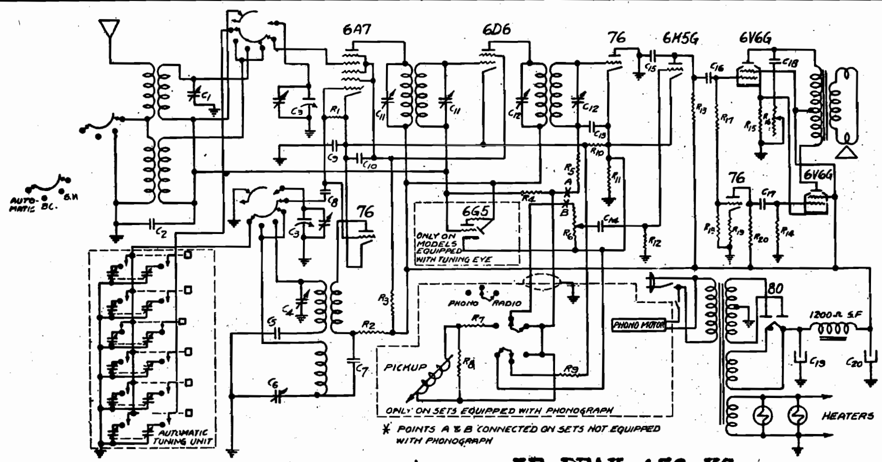


1—6K7 R. F. Amplifier
1—6F5 Detector

This receiver is designed to operate on 105 to 125 volts direct or alternating current

MODEL 258
MODEL 259
Schematics

DETROLA CORP.



Model 259

IF PEAK 456 KC

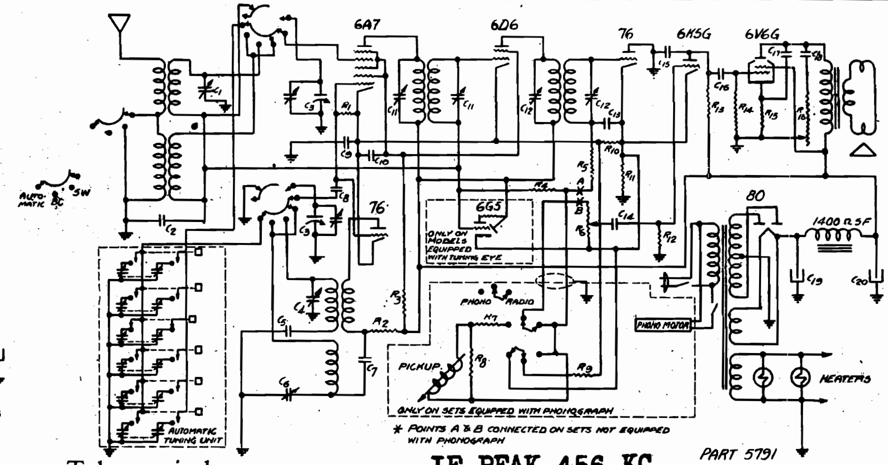
Tubes required are:

1—76 Oscillator
1—6A7 Translator
1—6D6 I.F. Amplifier
1—76 Detector, A.V.C.
1—6K5G Audio Amplifier
1—76 Phase Invertor, driver
2—6V6G Power Output
1—80 Rectifier

No orders for parts will be accepted unless PART NUMBER, DESCRIPTION and CHASSIS MODEL NUMBER are given.

Symbol	Part No.	Description	Symbol	Part No.	Description
C-1	1611	5-35 mmf Trimmer	R-15	3353	250 ohm 2W
C-2, 7, 10	580	.05-200V	R-16	5511	100M T. C.
C-3	5654	Tuning Condenser	R-17	2881	400M 10% ⅓W
C-4	2597	1-10 mmf Trimmer	R-18	2880	100M 10% ⅓W
C-5	2741	1330 mmf Mica +5%	R-19	2883	5M 10% ⅓W
C-6	2560	300-500 mmf padder		5802	Power Transformer
C-8	2780	50 mmf mica		5656	Dial Chart
C-9	2792	.2-200V		5447	Pointer
C-11 12		IF Trimmers		5657	1st I.F. Transformer
C-13	4810	.0005-400V		5658	2nd I.F. Transformer
C-14	565	.01-200V		5659	Antenna Coil
C-15	1285	100 mmf mica		5660	Oscillator Coil
C-16, 17	576	.02-400V		5789	Band Switch
C-18	563	.05-400V		5790	Automatic Tuning Unit
C-19	3375	16MF 400V		5240	Radio-Phono Switch
C-20	3113	16MF Reg.		5232	Phono Motor
R-1, 5, 20	631	50M ⅓W		5233	Turn Table 10"
R-2, 3	617	20M ⅓W		5234	Phono Pickup
R-4, 12	624	1 Meg ⅓W		5798	Automatic Tuning Buttons
R-6	5100	5 meg V.C.			
R-7	2106	3 Meg ⅓ W		5672	Dial Escutcheon
R-8	615	5 Meg. ⅓ W		5797	Button Escutcheon
R-9, 11	2689	100 ohm 10% ⅓W		5800	Tuning Eye Escutcheon
R-10	600	10M ⅓W		5799	Call Letter Sheets
R-13	598	200M ⅓W		5912	Speaker.
R-14	615	.5 Meg ⅓W			

Note: R-7, 8, 9 omitted and R-10 changed to 100 ohm 10% ⅓W on sets not equipped with phonograph.



Model 258

IF PEAK 456 KC

Tubes required are:

1—76 Oscillator
1—6A7 Translator
1—6D6 I.F. Amplifier
1—76 Detector, A.V.C.
1—6K5G Audio Amplifier
1—6V6G Power Output
1—80 Rectifier
*1—6G5 Tuning Tube

*Only on those sets equipped with tuning eye.

Do not use tubes of types different from those shown above.

No orders for parts will be accepted unless PART NUMBER, DESCRIPTION and CHASSIS MODEL NUMBER are given.

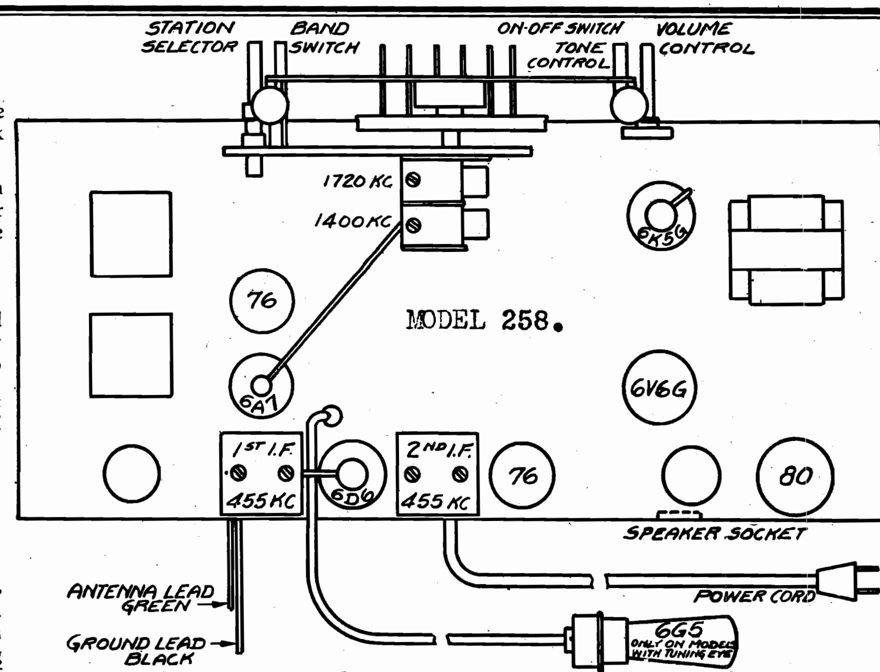
Symbol	Part No.	Description	Symbol	Part No.	Description
C-1	1611	5-35 mmf Trimmer	C-6	2560	300-500 mmf padder
C-2, 7, 10	580	.05-200V	C-8	2780	50 mmf mica
C-3	5654	Tuning Condenser	C-9	2792	.2-200V
C-4	2597	1-10 mmf Trimmer	C-11, 12		IF Trimmers
C-5	2741	1330 mmf Mica +5%	C-13	4810	.0005-400V
	5447	Pointer	C-14	565	.01-200V
	5657	1st I.F. Transformer	C-15	1285	.100 mmf mica
	5658	2nd I.F. Transformer	C-16, 17	576	.02-400V
	5659	Antenna Coil	C-18	563	.05-400V
	5660	Oscillator Coil	C-19	3375	16MF 400V
	5789	Band Switch	C-20	3113	16MF Reg.
	5790	Automatic Tuning Unit	R-1, 5	631	50M ⅓W
	5240	Radio-Phono Switch	R-2, 3	617	20M ⅓W
	5232	Phono Motor	R-4, 12	624	1 Meg ⅓W
	5233	Turn Table 10"	R-6	5100	.5 Meg V.C.
	5234	Phono Pickup	R-7	2106	3 Meg ⅓ W
	5798	Automatic Tuning Buttons	R-8	615	.5 Meg ⅓ W
			R-9, 11	2689	100 ohm 10% ⅓W
	5672	Dial Escutcheon	R-10	600	10M ⅓W
	5797	Button Escutcheon	R-13	598	200M ⅓W
	5800	Tuning Eye Escutcheon	R-14	615	.5 Meg ⅓W
	5799	Call Letter Sheets	R-15	3353	250 ohm 2W
	5668	Speaker	R-16	5511	100M T. C.
				5091	Power Transformer
				5656	Dial Chart

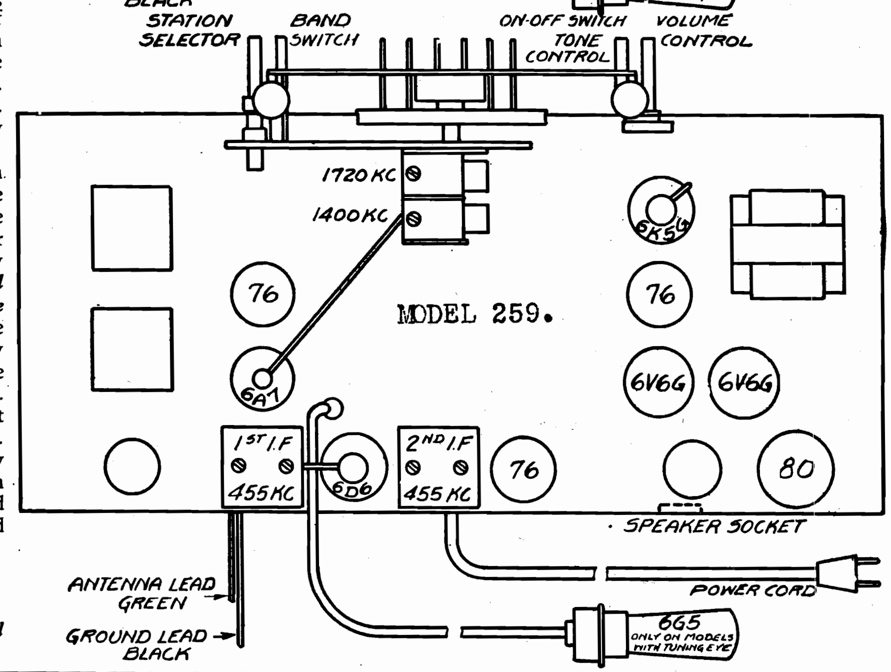
Note: R-7, 8, 9 omitted and R-10 changed to 100 ohm 10% ⅓W on sets not equipped with phonograph.

MODEL 258
MODEL 259
Socket,Trimmers
Alignment,Tuner

DETROLA CORP.

MODEL 270
Alignment,Tuner





MODELS 258,259,270.

ALINEMENT PROCEDURE

Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments.

I.F.: Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 456 kc. signal to grid of 6D6 I.F. amplifier tube, and aline transformer No. 2. Connect generator to grid of 6A7 tube and aline transformer No. 1.

RF. (See above diagram for location of trimmers.)

Using a 200 MMF. condenser in series with the high side of the generator, turn band selector switch to center (B) position and the tuning condenser at minimum capacity feed 1720 kc. signal to the antenna and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at about 1400 kc. Adjust broadcast antenna trimmer. Set generator for 600 kc. tune receiver to signal and adjust the padder. The tuning condenser should be rocked back and forth through the signal while varying the padder in order to assure perfect alinement.

Using 400 ohm resistor in series with generator, set band selector in right hand (F) position, set generator to 6300 kc. and adjust oscillator trimmer for top frequency. Set generator to 5000 kc., tune receiver to signal and adjust antenna trimmer.

Setting Up the Push Button Station Selector

First select six favorite local or strong nearby stations, listing them according to frequency or position on the dial. Setting up weak or distant stations is not recommended. Call the station nearest the left hand end of the dial (nearest 1600 kc.) the No. 1 station and number the other five stations consecutively as they are tuned in on the dial, tuning from left to right. For example assume your selected stations operate on frequencies of 1500 kc., 1300 kc., 1100 kc., 900 kc., 700 kc., and 600 kc. The 1500 kc. station should be listed as No. 1, the 1300 kc. station would be No. 2, and so on through the list with the 600 kc. station becoming No. 6. In setting up the buttons, the 1500 kc. station should be set up on No. 1 button, or the first button from the left, the 1300 kc. station on the second button from the left, and so on until the 600 kc. station is finally set up on the button farthest to the right.

With the band selector set at "B," or the second position from the left, tune in station No. 1. Observe the program in progress, then turn the band selector knob to the extreme left position (A). Push the No. 1 button in as far as it will go; when the proper operating position is reached the button will lock in. Then insert the screw driver through the opening directly above the No. 1 button and turn the larger headed screw until the same program is heard. ***Do not force this screw. It should turn very easily and if the station is not heard when the screw is turned all the way in one direction, reverse the direction of rotation until the station is found.*** When the station is located, turn the screw back and forth through the station slowly and observe when the station is accurately tuned in, indicated by a minimum of noise or hiss, or by watching the tuning eye on the models so equipped. Inserted in one side of the larger screw head is a smaller screw. This screw is for fine adjustment, and should be turned in and out until position of least hiss is found, or until the tuning eye, on models so equipped, shows the least shadow. It will not be necessary to turn this small screw more than one full turn from the factory adjusted position. As a definite check that the desired station has been tuned in, listen for the station announcement. Set up the remaining buttons in the same manner, and after all stations have been set up, locate the call letters of the stations on the printed sheets supplied with the receiver. Remove the desired call letter blocks from the sheets and insert them in the escutcheon according to the directions on the envelope.

On Sets Equipped with Phonograph

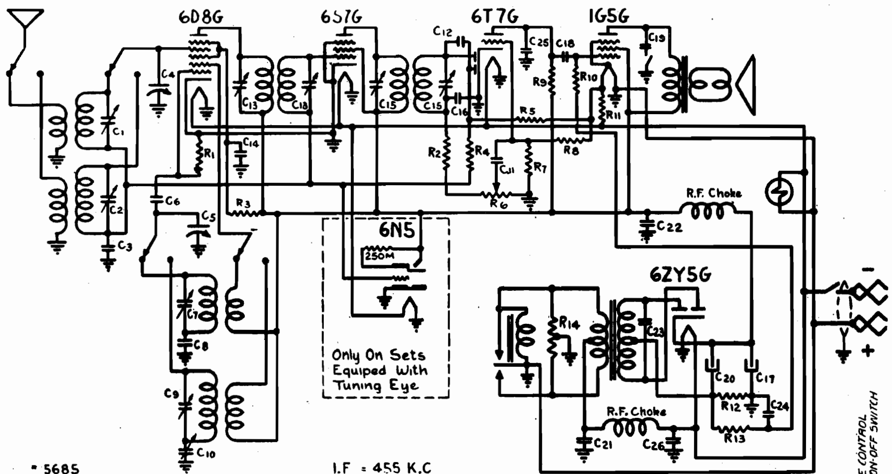
Phono Radio Switch: The ***Left Hand Position is for Radio Only.*** The ***Right Hand Position*** connects the pick-up and turns on the power for the phonograph motor.

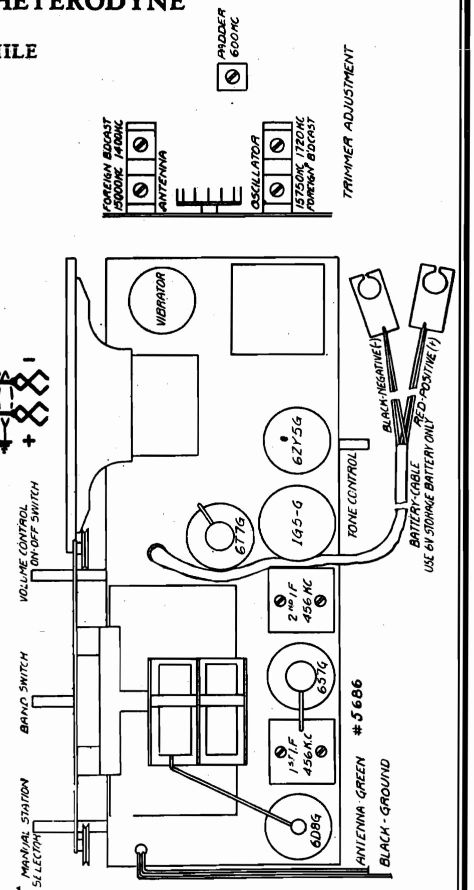
MODEL 267
Schematic, Socket
Trimmers, Alignment

DETROLA CORP.

5-TUBE STORAGE BATTERY POWERED SUPERHETERODYNE

WARNING! DO NOT CONNECT A CHARGER TO THE BATTERY WHILE THE SET IS IN USE. DO NOT GROUND EITHER SIDE OF THE BATTERY.





540 KC and 1725 KC
5.5 to 15.5 megacycles

Symbol	Part No.	Description	Symbol	Part No.	Description
C1	1611	3—35 mmf Trimmer	R3	609	15 M 1/3 W
C2, 7, 9	2597	1—10 mmf Trimmer	R4, 5	624	1 Meg 1/3 W
C3, 14	572	.1—200 v.	R6	5690	500 M Volume
C4, 5	5724	350 mmf Variable		control	and switch
C6	2780	50 mmf Mica	R7, 8	630	2 Meg 1/3 W
C8	2740	3850 mmf padder	R9, 13	603	100 M 1/3 W
C10	2560	350 mmf padder	R10	615	500 M 1/3 W
C11	565	.01—200 v.	R11	4474	35 ohm 1 W
C12	1285	100 mmf Mica	R12	2881	400 ohm 1/3 W
C13, 15		I. F. Trimmers	R14	4475	200 ohm center tapped
C16	4810	.0005—400 v.		3412	No. 1 IF Transformer
C17, 20	5273	16mf 150 v.		4457	No. 2 IF Transformer
C18, 19, 22	576	.02—400 v.		5682	Power transformer
C21	3003	.5—160 v.		5333	Band switch
C23	5684	.03—1000 v.		5679	Antenna Coil
C24	580	.05—200 v.		5678	Oscillator Coil
C25	3190	1000 mmf Mica		5766	Vibrator
C26	4171	.2—160 v.		5680	Battery cable
R1, 2	631	50 M 1/3 W		4463	6" Speaker

MODEL 267

ALINEMENT PROCEDURE

Connect a high impedance AC voltmeter across loud speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments.

IF. Connect generator ground to receiver ground. Using .1 mfd condenser in series with "high" side of generator, apply 456 kc signal to grid of 6S7G and adjust second IF transformer; same for first IF, applying signal to grid of 6D8G. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using 200 mmf condenser in series with generator, feed 1725 kc signal to antenna lead and adjust oscillator top frequency. Set generator at 1400 kc, tune receiver to signal and adjust broadcast antenna trimmer. Set generator to 600 kc. tune receiver and adjust padder. The tuning condenser should be rocked back and forth through the signal while the padder is being adjusted in order to obtain perfect alinement.

Using 400 ohm resistor in series with generator, set band selector in short wave (right) position, feed 15,600 kc signal to antenna and adjust oscillator trimmer—screw trimmer down tight and unscrew to SECOND peak. Set generator to 15,000 kc, tune receiver and adjust antenna trimmer—screw trimmer down tight and unscrew to FIRST peak, rocking the condenser back and forth through the signal while the adjustment is being made. **Above procedure for alinement at 15,000 kc must be followed exactly to insure proper tracking. A "dead spot" at about 12,000 kc will result if antenna and oscillator are not set in proper relation to each other.**

Tubes

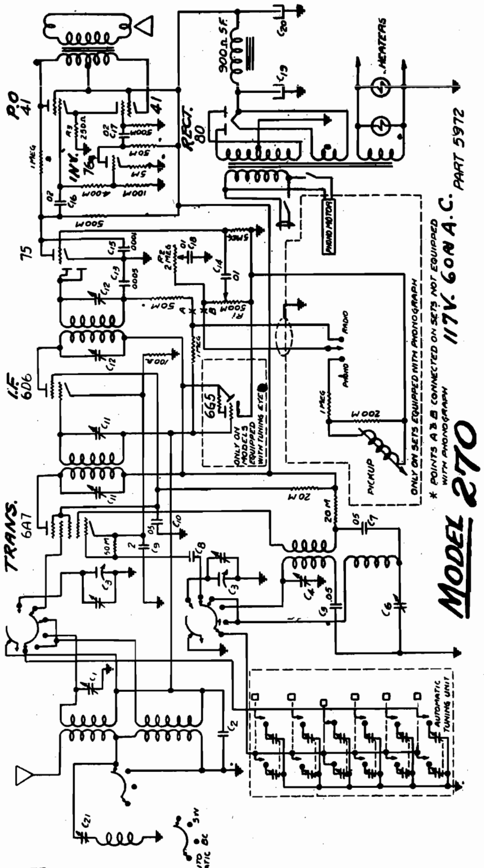
Tubes required are:
1—6D8G Oscillator-Translator.
1—6S7G Intermediate frequency amplifier.
1—6T7G Detector—automatic volume control—first audio amplifier.
1—1G5G Power output
1—6ZY5G Rectifier

Do not use tubes of types different from those shown above.

MODEL 270
MODELS 282,288
MODEL 286

DETROLA CORP.

Schematics, Socket
Trimmers, Alignment

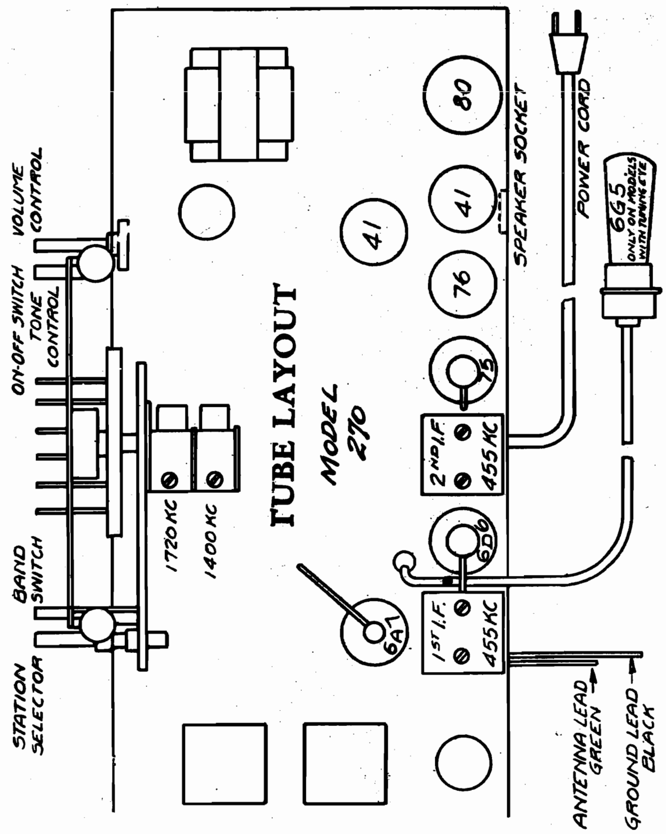


MODEL 270

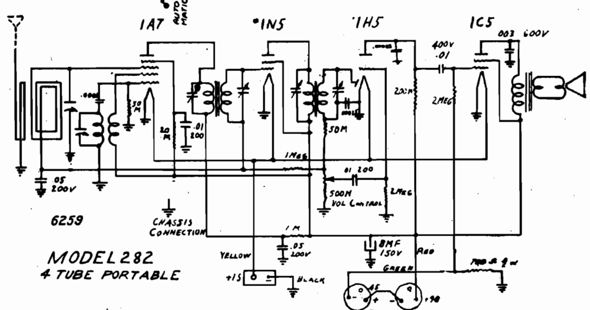
FOR ALIGNMENT SEE INDEX

117V. 60∿ A.C. PART 5972

IF PEAK 456 KC

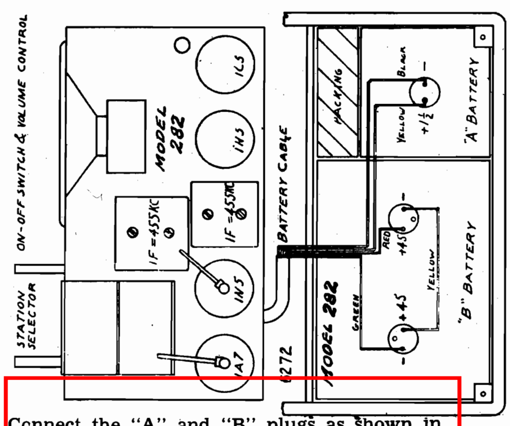


TUBE LAYOUT MODEL 270



MODEL 282
4 TUBE PORTABLE

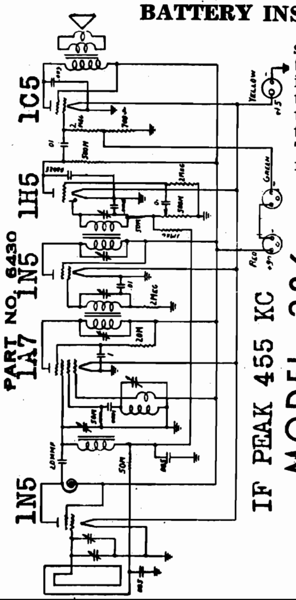
Models 282 — 288
550 to 1600 kilocycles.



Connect the "A" and "B" plugs as shown in the illustration. It makes no difference which socket on the "B" pack, the three prong "B" plugs are inserted.

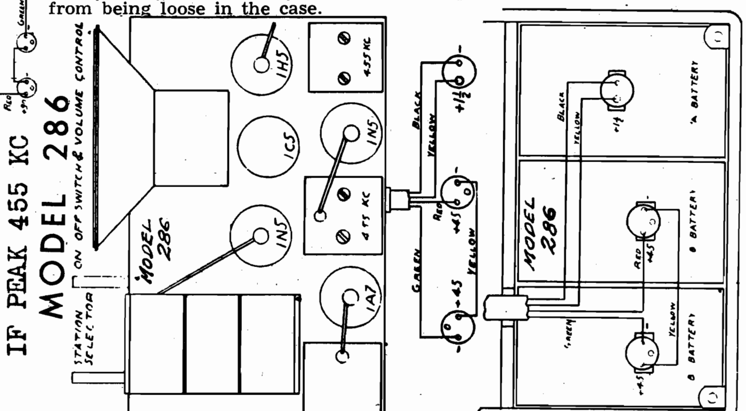
BATTERY INSTALLATION

Remove the batteries from the shipping carton, save the small piece of cardboard packing. Place the "B" pack in the cabinet as shown in the illustration. Then put in the "A" pack. Take the small piece of cardboard packing and fold to a size that will wedge the "A" pack between the shelf and bottom of case. (See illustration.) The packing is used to prevent the "A" pack from being loose in the case.



PART NO. 6430

IF PEAK 455 KC
MODEL 286



MODELS 282,286,288.
ALIGNMENT PROCEDURE

I.F. Frequency 455 KC. Set Range 540-1580 KC.

Connect the test oscillator, or signal generator, to the set as follows: Connect the "hot" side of the signal generator to the grid of the 1A7 tube, and the ground side to the terminal on the back of the chassis. An output meter should be connected across the voice coil leads of the speaker to indicate resonance. Align the I.F. trimmers at 455 KC for maximum meter reading.

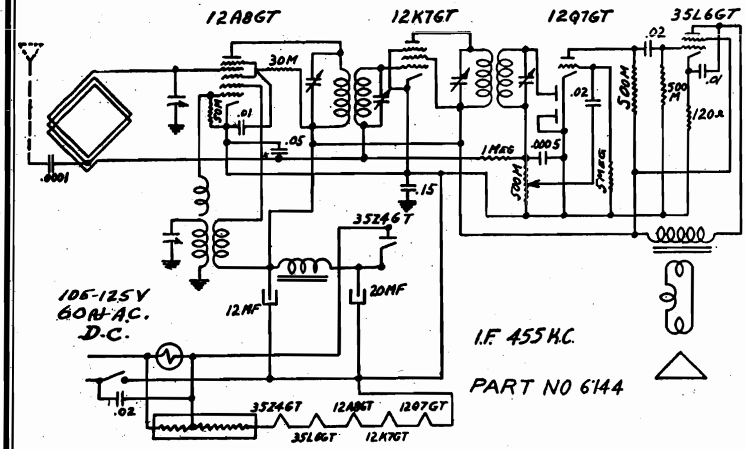
Adjust the trimmer on the back of the variable condenser at or near 1400 KC at full volume on a weak broadcast signal. When aligning the set do not set the receiver on or near a metal work bench or other large metal object, as it will affect the tracking of the receiver.

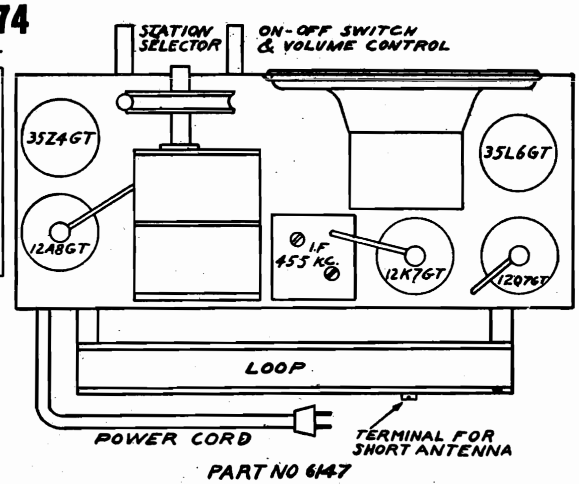
Schematics, Socket Trimmers, Alignment

DETROLA CORP.

MODEL 274
MODEL 276U, Super Pee Wee
MODEL 2742

Model 274

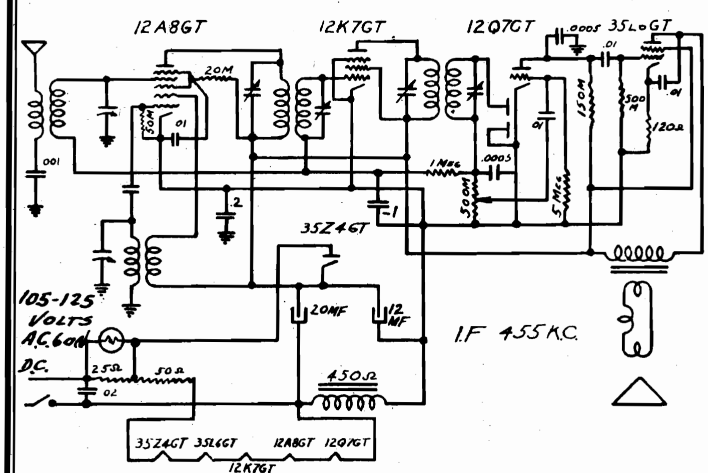


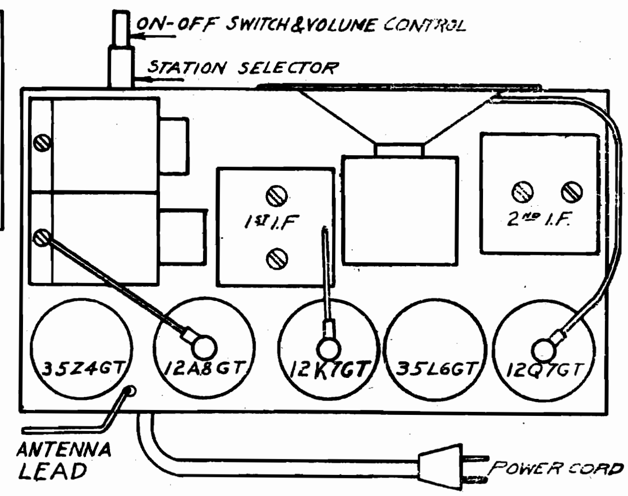


12A8GT Translator
12K7GT IF Amplifier
12Q7GT Detector AVC
35L6GT Output
35Z4GT Rectifier

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME V111

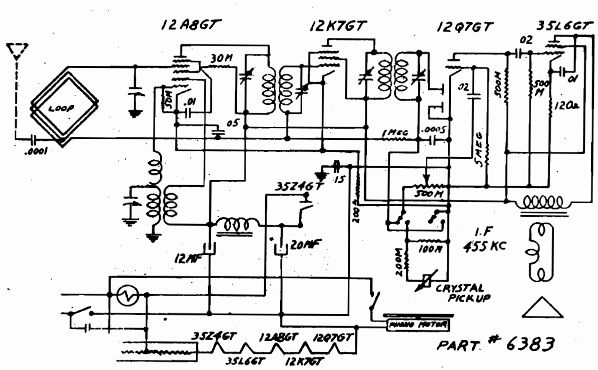
Super Pee-Wee Model 276-U

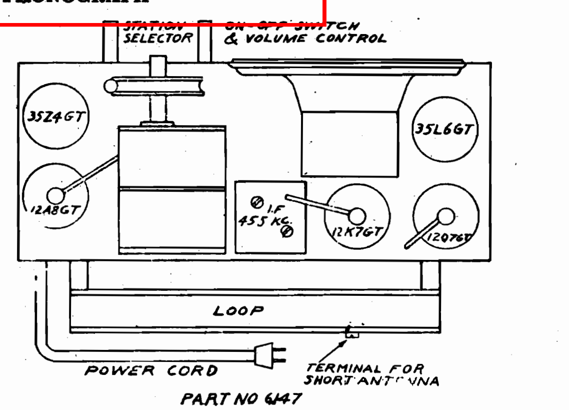




12A8GT Translator
12K7GT IF Amplifier
12Q7GT Detector AVC
35L6GT Output
35Z4GT Rectifier

MODEL 2742—A.C.-D.C.—PHONOGRAPH





This receiver is designed to operate on 105 to 125 volts, 60 cycle, alternating or direct current. Do not connect to any other source.

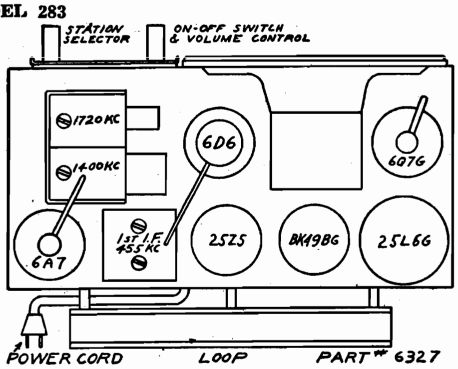
For phonograph operation turn the Radio Phono switch to the Phono position. THE A.C.-D.C. SWITCH MUST BE SET IN THE PROPER POSITION. (This switch is on the phonograph panel.) The radio volume control also serves as the phonograph volume control.

MODEL 280, Jr. PeeWee
MODEL 283
MODEL 284, Super Pee-Wee
MODEL 2741

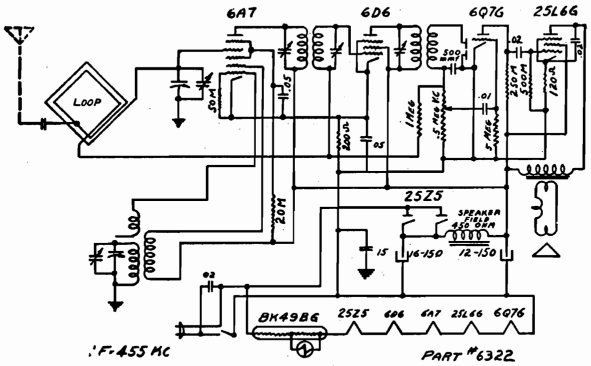
DETROLA CORP.

Schematics, Socket
Trimmers Alignment

MODEL 283

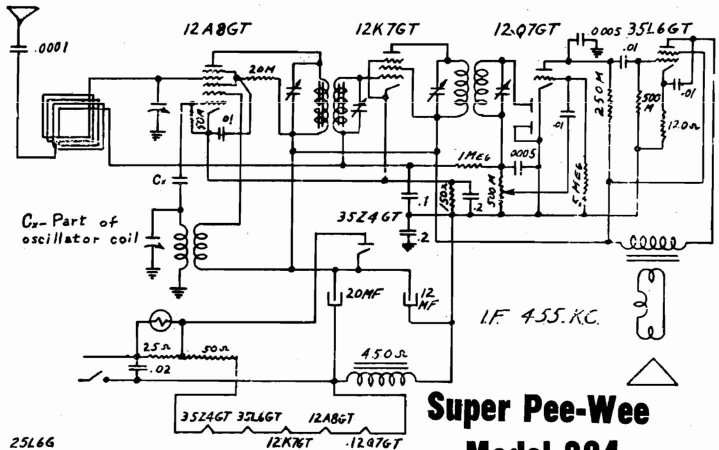


DO NOT CONNECT A GROUND TO THIS RECEIVER.

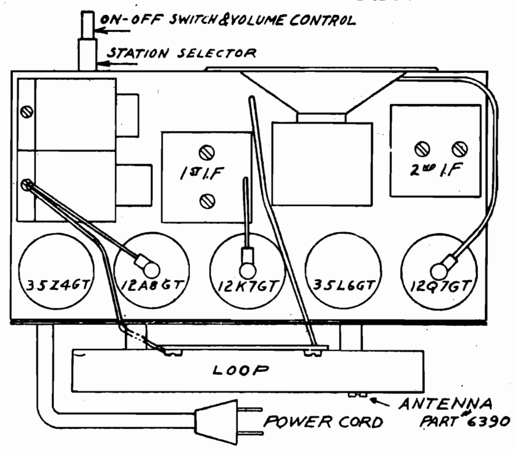


Part No. 6337

This receiver is designed to operate on 105 to 125 volts, direct or alternating current.



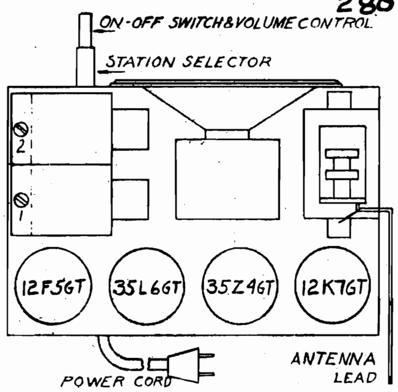
Super Pee-Wee Model 284



12A8GT Translator
12K7GT IF Amplifier
12Q7GT Detector AVC
35L6GT Output
35Z4GT Rectifier

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. V111

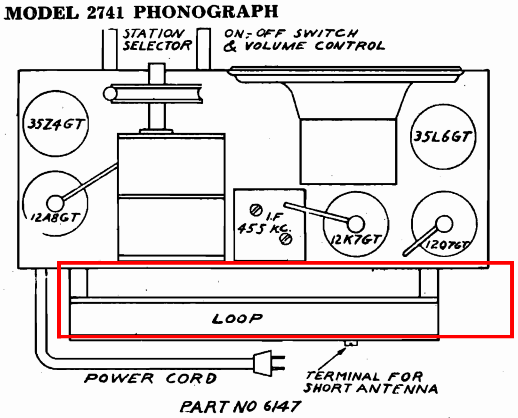
TUBE LOCATION CHART—MODEL 280



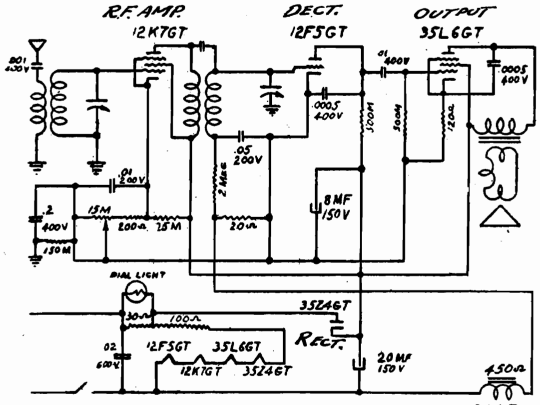
DETROLA JR. PEE-WEE

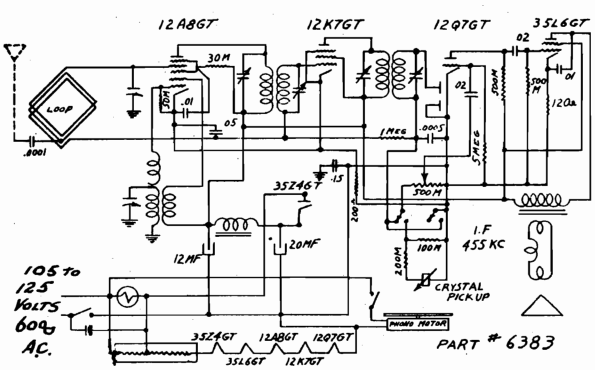
This receiver is designed to operate on 105 to 125 volts, direct or alternating current. Do not connect to any other source.

MODEL 2741 PHONOGRAPH



SCHEMATIC DIAGRAM—MODEL 280

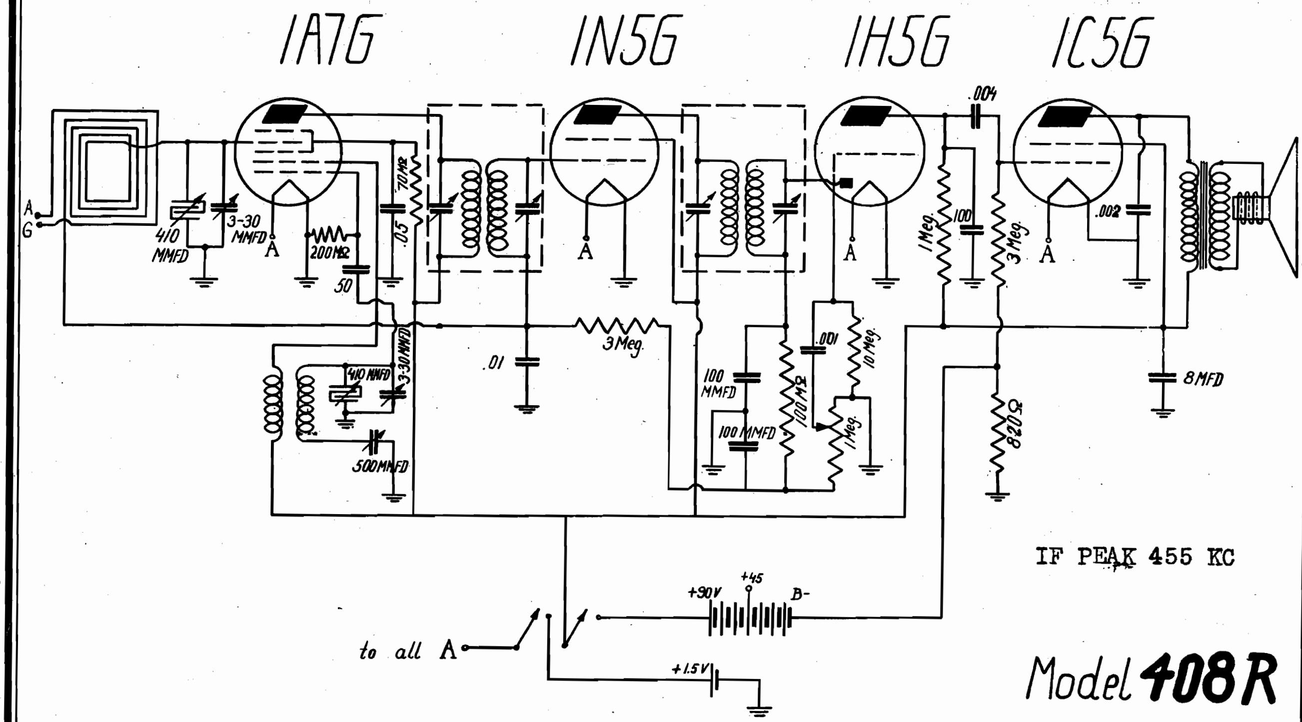




MODELS 406R,412
MODEL 408R
Schematics

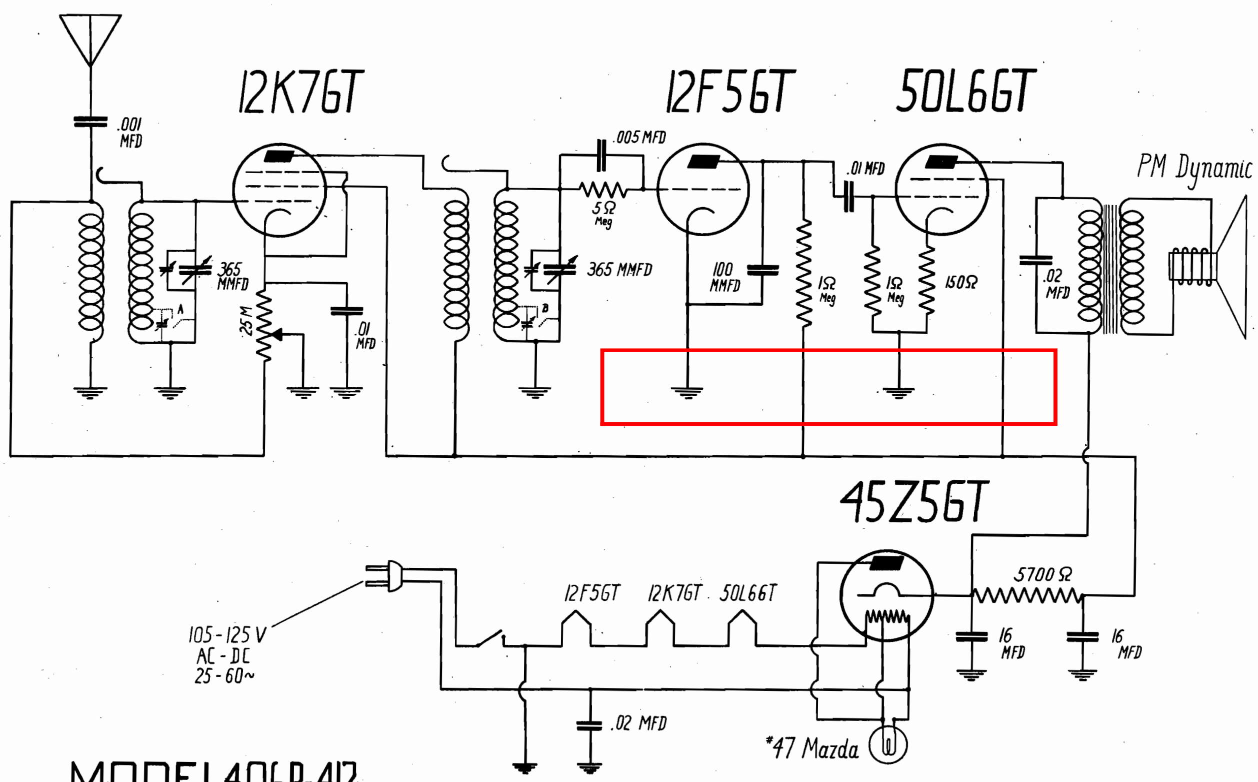
DEWALD RADIO MFG. CORP.

This is a battery operated superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. It is designed to function with an "A" supply of 1.5 volts and a "B" supply of 90 volts. The broadcast range coverage is 540-1600 kilocycles.



IF PEAK 455 KC

Model 408R

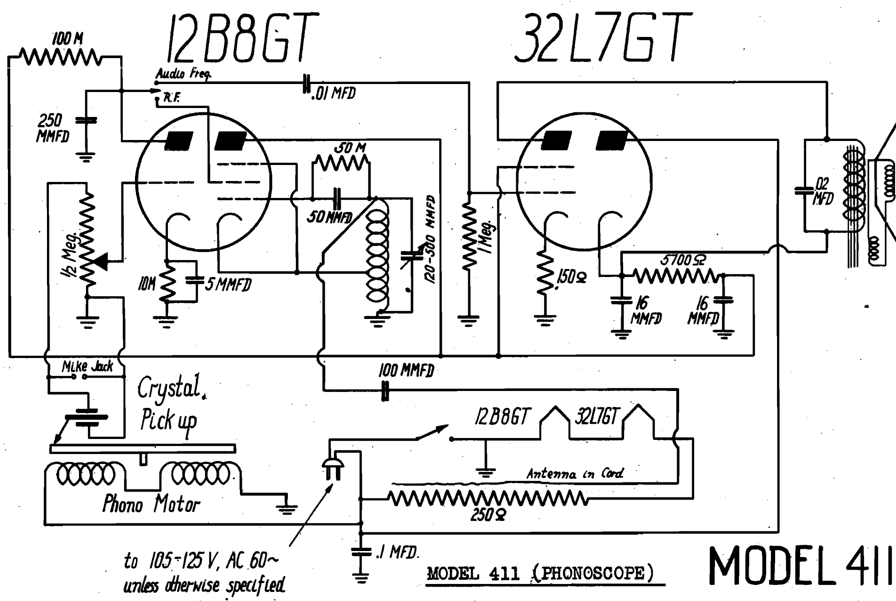


MODEL 406R-412

When used as LW model see "AB"

MODEL A Phono. Converter
MODEL 411 Phonoscope
Schematics, Data

DEWALD RADIO MFG. CORP.



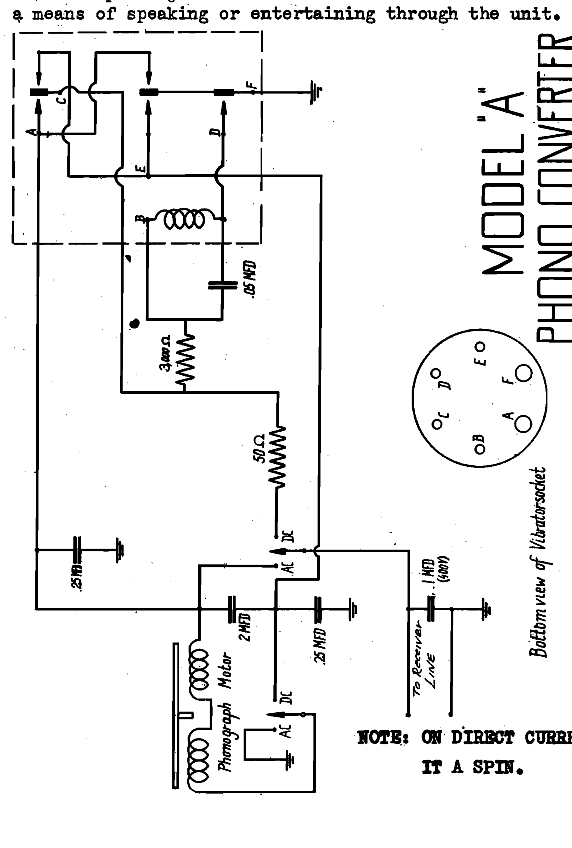
MODEL 411 (PHONOSCOPE)

The "PHONOSCOPE" is a combination audio and wireless playback. Disc recordings may be played directly through this unit, or may be reproduced through a remote radio receiver. A microphone may also be used instead of disc recordings. The unit has been designed to operate on 105-125 volts 60 cycles A.C. unless otherwise specified.

PHONOGRAPH OPERATION The phonograph motor and unit is turned "on" by rotating the knob on the right in a clockwise direction. Further rotation in this direction increases the volume. Turn the knob on the left side to the clockwise position. Allow about a minute for the tubes to become sufficiently heated. Disc recordings may now be played through the speaker in the PHONOSCOPE.

MICROPHONE OPERATION A high impedance magnetic or crystal microphone may be used in place of phonograph recordings. The two pin tips should be inserted in the microphone jack in the rear of the cabinet. The microphone may be used as a means of speaking or entertaining through the unit.

WIRELESS REPRODUCTION Wireless reproduction is a method by which signals from the PHONOSCOPE may be picked up in a remote radio receiver. This is accomplished by rotating the knob on the left in the counterclockwise position. The receiver through which the recordings or microphone reproduction is to be heard must be turned "on". The volume control should be turned to nearly maximum position; and the dial should be adjusted for approximately 550 K.C. The tuning trimmer which is located under the motor board of the cabinet of the PHONOSCOPE should be adjusted until the loudest "swish" or "hiss" noise is heard through the remote radio receiver speaker. After this adjustment has been made any form of reproduction in the PHONOSCOPE will be heard in the remote unit. Once the trimmer has been adjusted it is advisable to tune the remote receiver in order to pick-up the signals being reproduced. This unit when reproducing through the radio receiver will operate at a distance of fifty feet.



MODEL "A" PHONO. CONVERTER

This converter is used with radio and phonograph combinations. The purpose of the unit is to enable the phonograph motor to operate on direct current. Although the radio receiver will operate A.C or D.C., care must be taken when operating the phonograph, that the converter switch is in the proper position.

ALTERNATING CURRENT Operation

Push the slide button switch to the position marked A.C. The phonograph turn table will spin when the phonograph switch is turned to the phonograph position.

DIRECT CURRENT Operation

Push the slide button switch to the position marked D.C. The phonograph turn table will spin when the phonograph switch is turned to the phonograph position.

NOTE

When operating the receiver on D.C. and no signals are heard after it has been "on" for about a minute, reverse the line plug in the outlet.

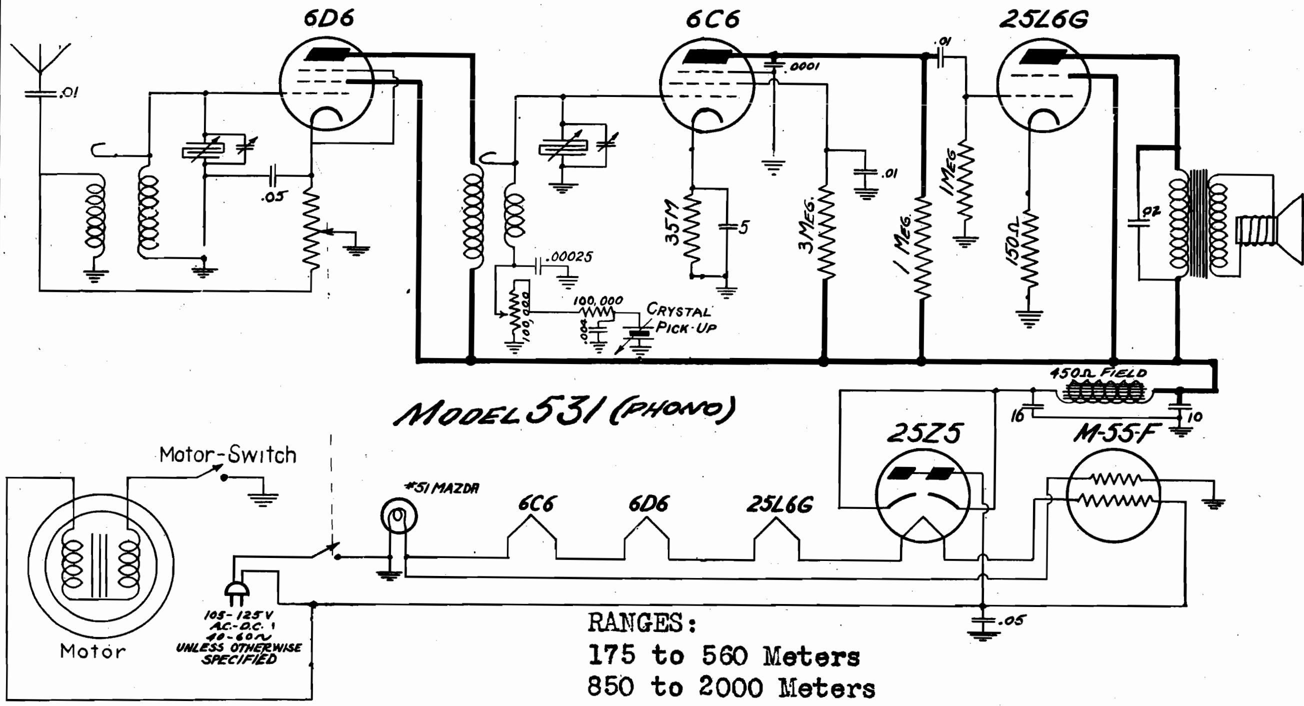
WARNING

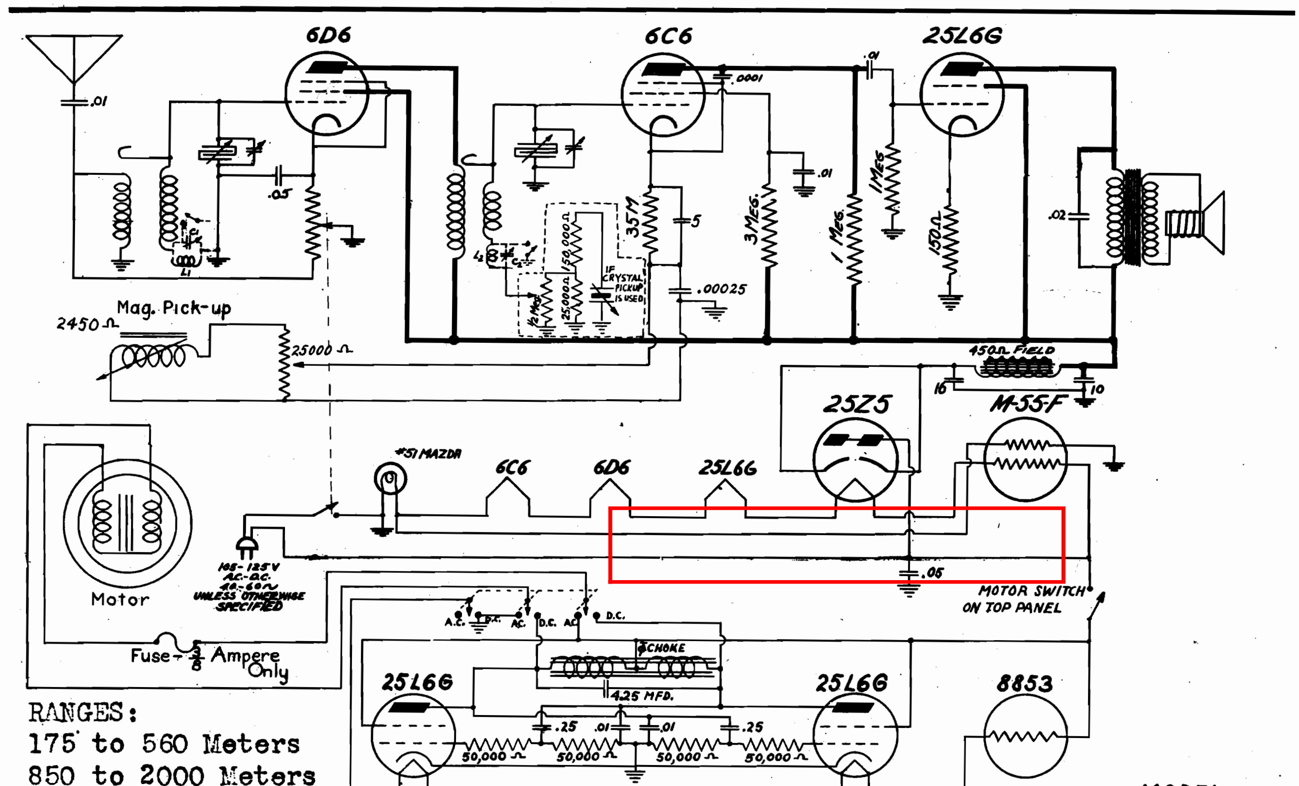
ALWAYS BE SURE THAT THE POSITION OF THE CONVERTER SLIDE SWITCH IS IN THE POSITION CORRESPONDING TO THE LINE CURRENT AT THE OUTLET. FOR INSTANCE, IF THE OUTLET IS A.C. THE SLIDE SWITCH MUST BE ON THE A.C. SIDE. FAILURE TO OBSERVE THIS WHILE OPERATING THE PHONOGRAPH MOTOR, MAY RESULT IN DAMAGE TO THE UNIT.

NOTE: ON DIRECT CURRENT IT MAY BE NECESSARY TO START THE MOTOR BY GIVING IT A SPIN.

DEWALD RADIO MFG. CORP.

MODEL 531 Phono.
MODELS 532,532LW
Schematics





MODEL
532 - 532 L.W.
RADIO-PHONOGRAPH COMBINATION

In Model 532 L.W.
L1, C1, L2 & C2 are in circuit.

In Model 532
L1. L2. C1. & C2 are omitted.

MODEL 532-532 L.W. LIST PRICES OF REPLACEMENT PARTS

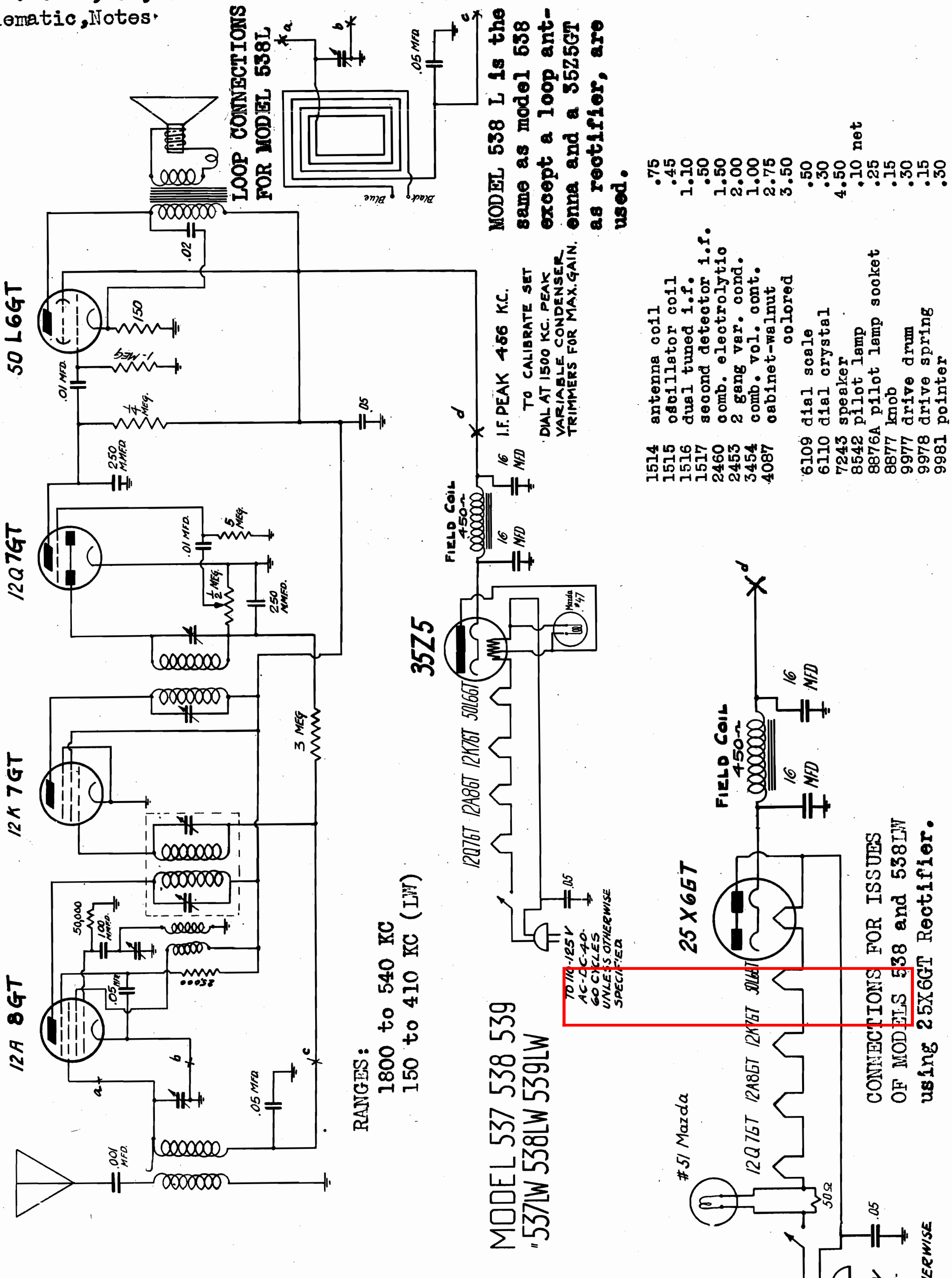
1481	antenna coil	.50	8542	pilot lamp	.15
1482	detector coil	.50	8777	knob	.10
1488	cent. tap choke	1.50	8852	AC-DC switch	.75
2422	2 gang var. cond.	2.00	8854	pointer knob	.15
2423	comb. electrolytic	1.00	9799	drum	.15
2433	4.25 mfd. cond.	2.00	9914	drive shaft	.10
3420	comb. vol. cont.	1.00	9911	pointer	.10
6079	scale-	.10		cabinet	12.50
6080	crystal	.25		phono. vol. cont.	1.00
7233	speaker	3.50		phono. pickup	11.50
				phono. motor	17.50

TO CALIBRATE

Connect external Oscillator 's hot lead to reel antenna of receiver. Connect oscillator cold lead in series with a ¼ or .I MFD condenser to receiver chassis. Set oscillator at I500 KC and peak Variable Condenser trimmers for Maximum signal with condenser set approximately where I500 comes in on scale.

MODELS 537,537LW,538,
538L,538LW,539,539LW
Schematic,Notes

DeWALD RADIO MFG. CORP.



These models are five tube superheterodyne receivers with full automatic volume control. The range coverage of the model 538 is 1800 l.c. to 540 k.c. The model 538 L.W. has a long wave band added (150 k.c.-410 k.c.) They have been designed to operate on 105-125 volts, 40-60 cycles AC or DC unless otherwise specified.

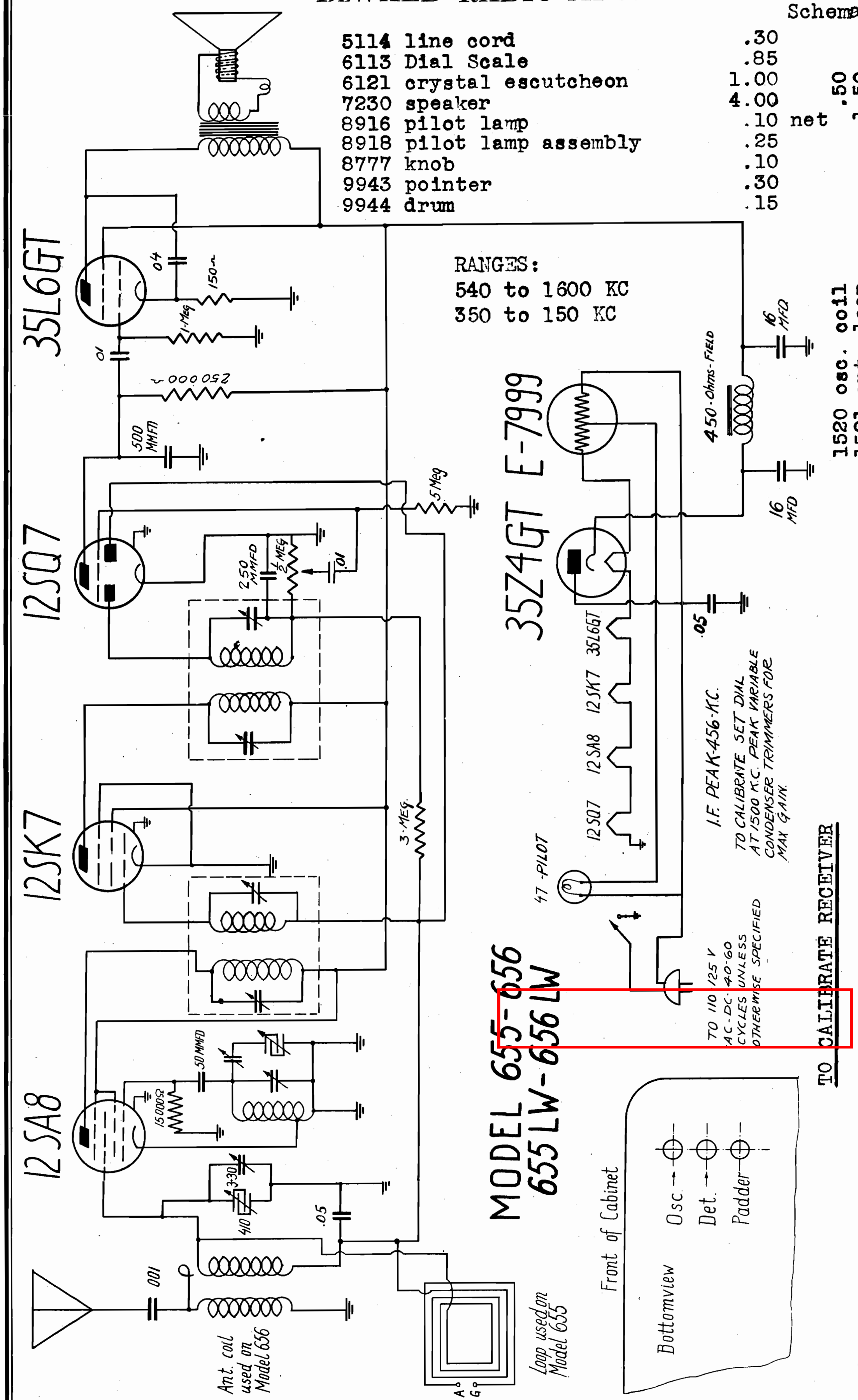
MODELS 655,655LW, 656,656LW
Schematic,Alignment

DEWALD RADIO MFG. CORP.

5114	line cord	.30
6113	Dial Scale	.85
6121	crystal escutcheon	1.00
7230	speaker	4.00
8916	pilot lamp	.10 net
8918	pilot lamp assembly	.25
8777	knob	.10
9943	pointer	.30
9944	drum	.15

1520	osc. coil	.50
1521	ant. loop	1.50
1531	dual tuned I.F.	1.25
1532	ant. coil	.65
2443A	2 gang var. cond.	2.00
2460	comb. elect	1.50
2466	trimmer assembly	.75
3439	comb. vol cont.	1.00
	cabinet	5.25

RANGES:
540 to 1600 KC
350 to 150 KC



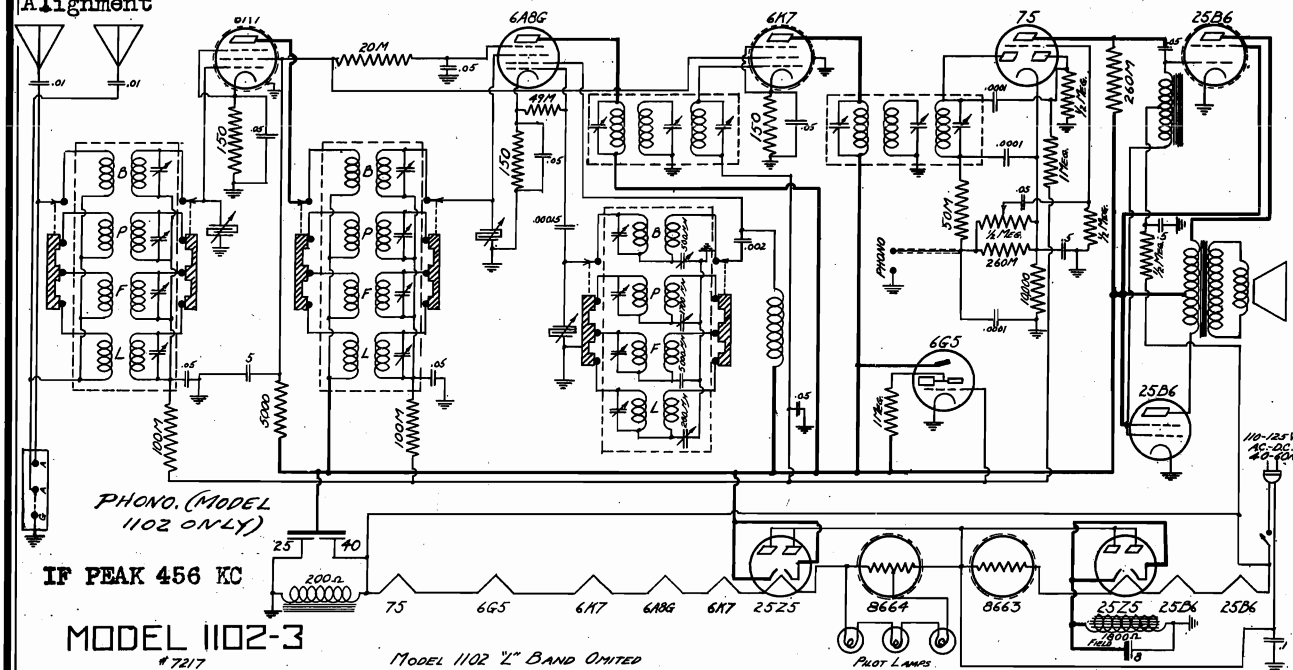
TO CALIBRATE RECEIVER

Adjust the signal generator at 456 K.C. and peak the I.F. trimmers for maximum signal. Connect the "hot" lead from the signal generator to antenna of receiver and ground to ground of receiver. Adjust the generator and receiver to 1500 K.C. and peak the trimmers for maximum signal. Adjust generator and receiver to 600 K.C. and peak the padder for maximum signal. The model 655 should have the back attached to the cabinet when peaking 1500 K.C. and 600 K.C. The trimmers and padder on these models are shown in a sketch on the wiring diagram.

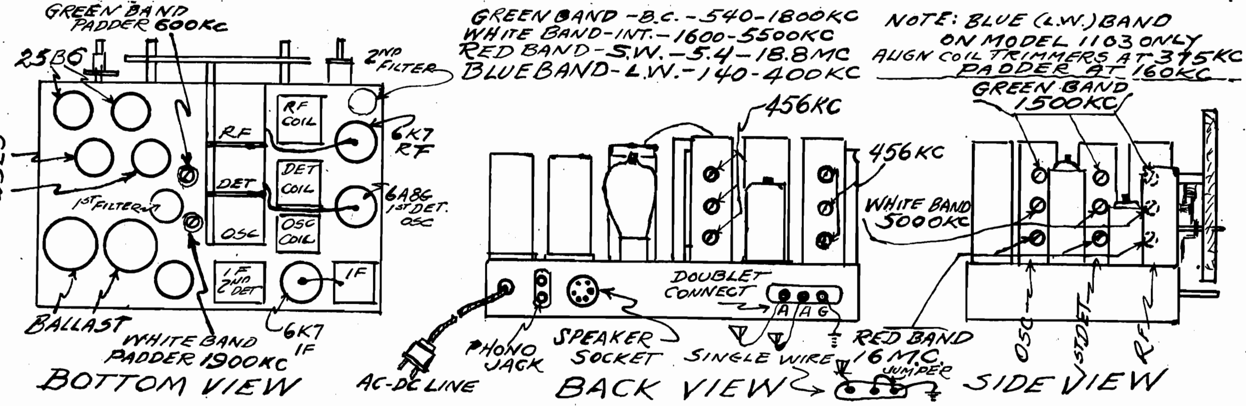
MODEL 1102-3
Schematic, Socket, Trimmers
Alignment

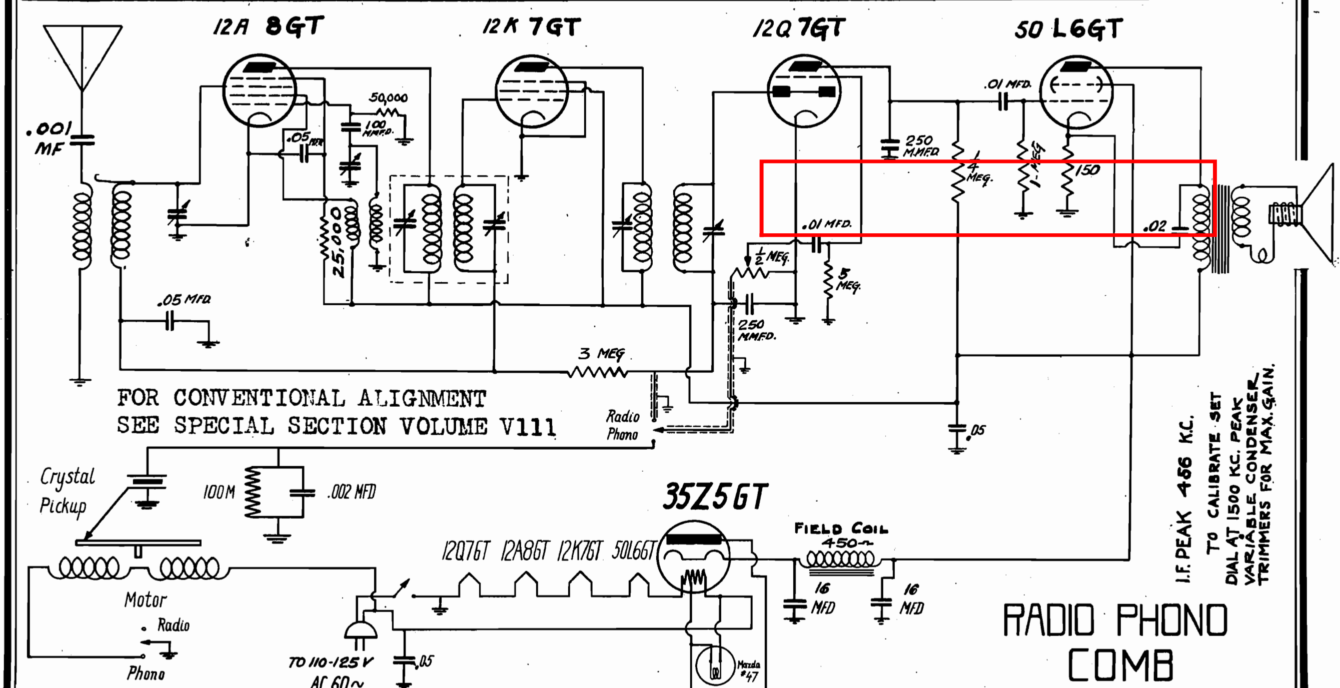
DeWALD RADIO MFG. CORP.

MODEL Radio-Phono.Combin.
Schematic, Alignment



MODEL 1102-3





FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME V111

RADIO PHONO
COMB

ALLEN B. DUMONT LABS., INC.

MODELS 180,181,182,183
Circuit Data,Controls
Trouble Chart

GENERAL FEATURES

These receivers are classed as "Electrostatic and Direct Vision." Electrostatic indicates that the entire deflection system is electrostatic and since the picture is viewed direct, without the use of a mirror, lens or other device, it is referred to as Direct Vision. The latter ensures clarity, brilliance and the widest angle of vision. Steady, clear cut, black and white pictures that are large enough for all the family to enjoy at one time are secured by the use of a fourteen inch cathode-ray tube which furnishes a picture eight by ten inches. A separate high fidelity section brings superb reproduction of the sound channel which is associated with the picture. A single control tunes both the sight and the sound channels so the receiver is no more difficult to operate than an ordinary broadcast receiver. To the above features add its compact size, minimum number of controls and simple straight forward layout and you will have an idea of the first commercial television receiver which we believe you will find easy to install and service in spite of the apparent complexity of the subject Television.

CIRCUIT ARRANGEMENT

A simple straight line layout is used in these receivers that should prove extremely helpful to the serviceman. Viewed from the front the video receiver is on the left side of the chassis and the sound receiver is on the right. Fig. No. 1 shows the front controls and the sound receiver while Fig. No. 2 shows the rear adjustments and the video receiver. The top portion of the chassis contains both sweep circuits along with the modulating circuits of the cathode-ray tube. To prevent confusion each side is considered separately, half appearing in Fig. No. 1 and the remainder in Fig. No. 2. The seven auxiliary controls shown in Fig. No. 2 are provided for the use of the installer and serviceman. These controls are necessary to make the final alignment of picture size and positioning when the receiver is installed under the operating conditions imposed by the earth's magnetic field and the power supply line voltages. Once properly set these controls do not need adjustment and since they were not provided for the owner's use we suggest that the dealer or serviceman seal the back of the cabinet as it is not possible to tamper with the controls when the back is in place. The use of the parts and tubes shown in Fig. No. 1 and Fig. No. 2 can be checked by comparing the "V" numbers, etc., with the schematic drawings

Operating Controls of the Receiver (Front)

First, become familiar with the controls on the front of the receiver. Since the receiver has been tested before shipment, probably only a few minor adjustments will be necessary. Therefore before touching the adjustments in the rear attempt to operate the set according to the instruction sheet supplied the purchaser and make only the adjustments required. These instructions are repeated here to cover the possible loss of this sheet. Figure No. 1 shows the front of the receiver with the controls numbered and the use and the purpose of these controls is as follows.

1. Marked CONTRAST, ON and OFF

This is a power switch for starting and stopping a set. It also is the volume control of the picture signal. It should be adjusted in conjunction with the intensity control (No. 4) to produce a picture of pleasing contrast to the user. If the location is such that the signal received is very small, it may be necessary to use the full gain of this control, while in a good location it may have to be retarded considerably. If the picture is not satisfactory the rear controls must be adjusted as covered in a following section.

2. Marked SELECTOR

This control is a four position switch provided for covering four television channels.

3. Marked TUNING

Only one control is necessary to properly tune both the sight and sound channels. Simply adjust this control until the best reception of the sound is secured and at this point the picture signal will be correctly tuned.

4. Marked INTENSITY

The intensity or brightness of the picture is controlled by this knob. It should be adjusted in conjunction with Control No. 1 to get the best picture. Note: It is a good plan to retard (turn to the left) this control when starting the set. If about 15 seconds is allowed to elapse before advancing this control it will prevent a small bright spot from appearing on the screen which might eventually darken the screen.

5. Marked FOCUS

This control is used to sharpen the individual lines of the pattern and once set seldom requires further adjustment.

6. Marked VOLUME

This volume control adjusts the audio volume and has no effect whatever upon the picture.

Rear Controls of the Receiver

As previously stated, the adjustment of these controls is necessary for the final alignment of picture size and positioning, as the earth's magnetic field and power supply line voltages vary with locations. The location of these controls is shown in Figure No. 2 and their use will be covered in numerical order. Proceed as follows: remove the wood screws holding in the back of the cabinet and pull out the back. The safety switch will open, turning the set off and since it is necessary to have the set in operation while making these adjustments the switch can be made temporarily inoperative. (A large battery clip is convenient for this purpose.) Do not reach into the set with the voltages on. (See Cautions and Warning.) There is one adjustment that cannot be made by these controls, that of rotating the Cathode-ray tube to cause the picture to properly line up with the viewing opening. To remedy this, turn the set off, remove the elastic band that grips the rear support and rotate the tube by hand in the correct direction.

The function of the seven rear controls are as follows:

1. Vertical Frequency Control

This controls the frequency of the vertical sweep. If the picture is not steady and slips past at intervals, vertically, this control should be adjusted until a steady picture is secured.

2. Vertical Size Control

If the picture is too narrow and out of proportion vertically this control will remedy the trouble.

3. Vertical Positioning Control

As its name indicates, this control will move the pattern vertically, allowing the picture to be placed directly in the center of the opening.

4. Astigmatic Positioning Control

This is adjusted in conjunction with Control No. 5 to give the best possible focus on the corners of the picture.

5. Horizontal Positioning Control

This control positions the picture horizontally.

6. Horizontal Size Control

The width of the picture is adjusted by this control.

7. Horizontal Frequency Control

If no picture can be secured but modulation (dark and light spaces) can be seen on the screen, the setting of the horizontal frequency control is probably incorrect. Adjust this control until the picture forms.

With the adjustment of these controls the installation should be satisfactory. However, if the signal is weak or if ghosts or noise is present, return to the dipole antenna and make changes as previously suggested until the best position for it is secured.

LOCATION OF TROUBLE

FAULT	POSSIBLE CAUSES
No picture.	1. Power supply trouble in any or all three sources. 2. Too much bias on modulator electrode. 3. Defective cathode-ray tube.
No scanning.	1. Trouble in 1500 volt power source. 2. Poor connections to deflection plates. 3. Defective scanning circuits. 4. Defective cathode-ray tube.
No modulation.	1. Defective or shorted antenna. 2. Defect in video receiver. 3. Too much bias on modulator electrode. 4. Defective cathode-ray tube.
Poor focus.	1. Improper voltages supplied cathode-ray tube. (check entire divider circuit) 2. Defective video receiver. 3. Poor adjustments. 4. Defective cathode-ray tube.
Uneven brilliance.	1. Hum from power source. 2. Defective scanning circuits. 3. Scanning picked up by modulator circuits. 4. Screen burnt or discolored.
Distorted picture.	1. Poor synchronizing (circuit or adjustment). 2. Overloading (contrast control advanced too far) 3. Defective video receiver. 4. A.C. hum. 5. External interference.
Unsteady picture or flickers.	1. Poor synchronizing action. 2. Leakage. 3. Varying voltages to cathode-ray tube or receiver. 4. Unsteady receiver. 5. Antenna loose or shorting.
Double image.	1. Scanning circuits incorrectly adjusted. 2. Ghost images due to reflection of signals.
Cathode-ray tube controls effect the picture and scanning.	1. Cathode-ray tube defective, probably leaking and going soft.
Superimposed pattern on the picture.	1. Oscillation probably in the receiver.
Streaks across picture.	1. Usually local interference such as ignition or diathermy.

MODELS 180,181,182,183
Chassis Views

ALLEN B. DUMONT LABS., INC.

CONTROLS

Operating Controls 6
Adjustment Controls 7

Types 181, 182, 183
These receivers have the same operating controls as the type 180 and therefore will not be covered separately.

MECHANICAL SPECIFICATIONS

Cabinet Dimensions
Height .... 24 inches
Width .... 15¾ inches
Depth .... 25 inches

Chassis Dimensions
Height .... 20¾ inches
Width .... 13¼ inches
Depth .... 24¼ inches

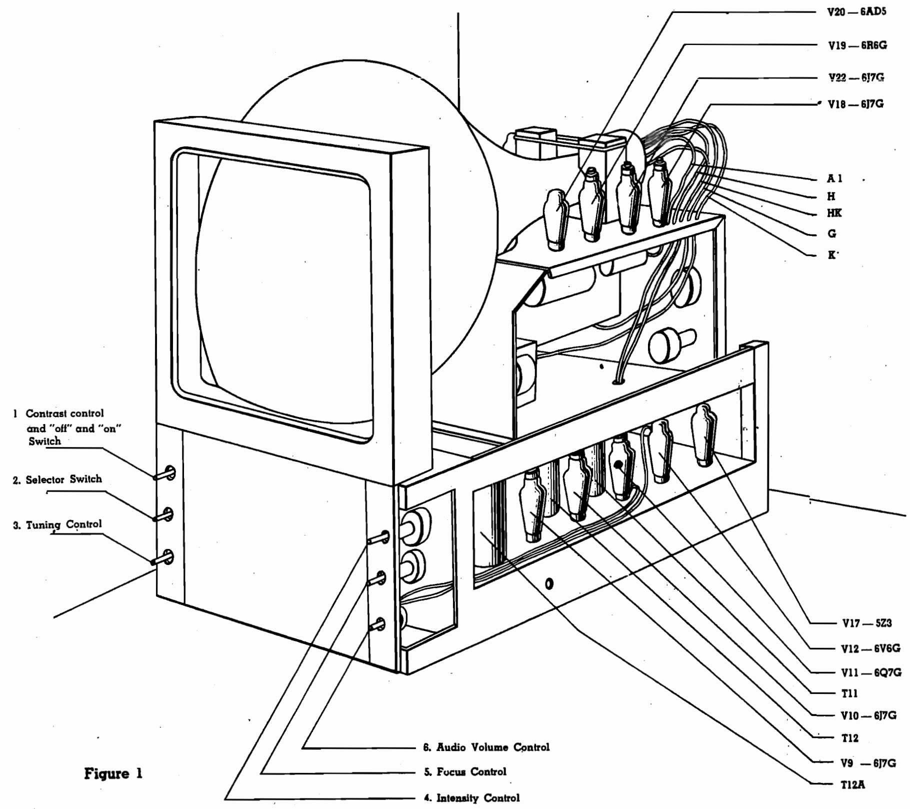


Figure 1

TUBE COMPLEMENT

Type	Purpose
1853	R.F. Amplifier
6J5M	R.F. Oscillator
1852	First Detector
1853	1st Video I.F. Amplifier
1852	2nd Video I.F. Amplifier
6H6M	Video 2nd Detector
1851	1st Video Amplifier
6V6G	Video Power Amplifier
6J7G	1st Sound I.F. Amplifier
6J7G	2nd Sound I.F. Amplifier
6Q7G	Sound 2nd Detector and Amplifier
6V6G	Sound Power Amplifier
6J7G	Horizontal Synch Separator
6AD5G	Horizontal Sweep Oscillator
6R6G	Horizontal Sweep Amplifier
6J7G	Vertical Synch Separator
6AD5G	Vertical Sweep Oscillator
6R6G	Vertical Sweep Amplifier
2Y2	4100 Volt Rectifier
5X3	1600 Volt Rectifier
5Z3	350 Volt Rectifier
114-9-T	Cathode-ray Tube (14")

Frequency Ranges — Four Television Channels provided, present alignment as follows:

STEP	STATION	SIDE BAND	AUDIO CARRIER	VIDEO CARRIER
A	NBC	Single	49.75	45.25
B	CBS	Single	55.75	51.25
C	....	....	....	....
D	NBC	Double	49.75	46.5

Power Ratings

Power supply 110 to 120 volts, 50 to 60 cycles, 250 watts.
Audio output, maximum 4.25 watts.

Twenty-two Tube, AC, Superhetrodyne, Television Receiver

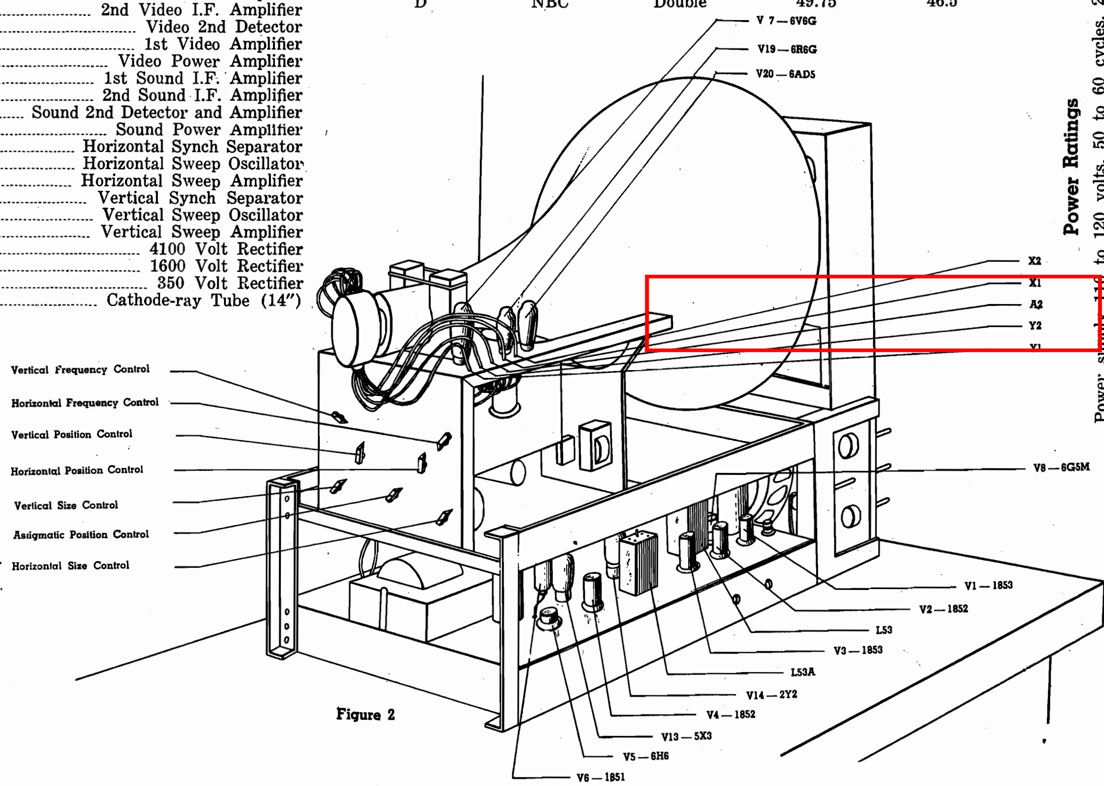


Figure 2

ALLEN B. DUMONT LABS., INC.

MODELS 180,181,
182,183
Video and A-F
Receivers
Schematic
Early Production

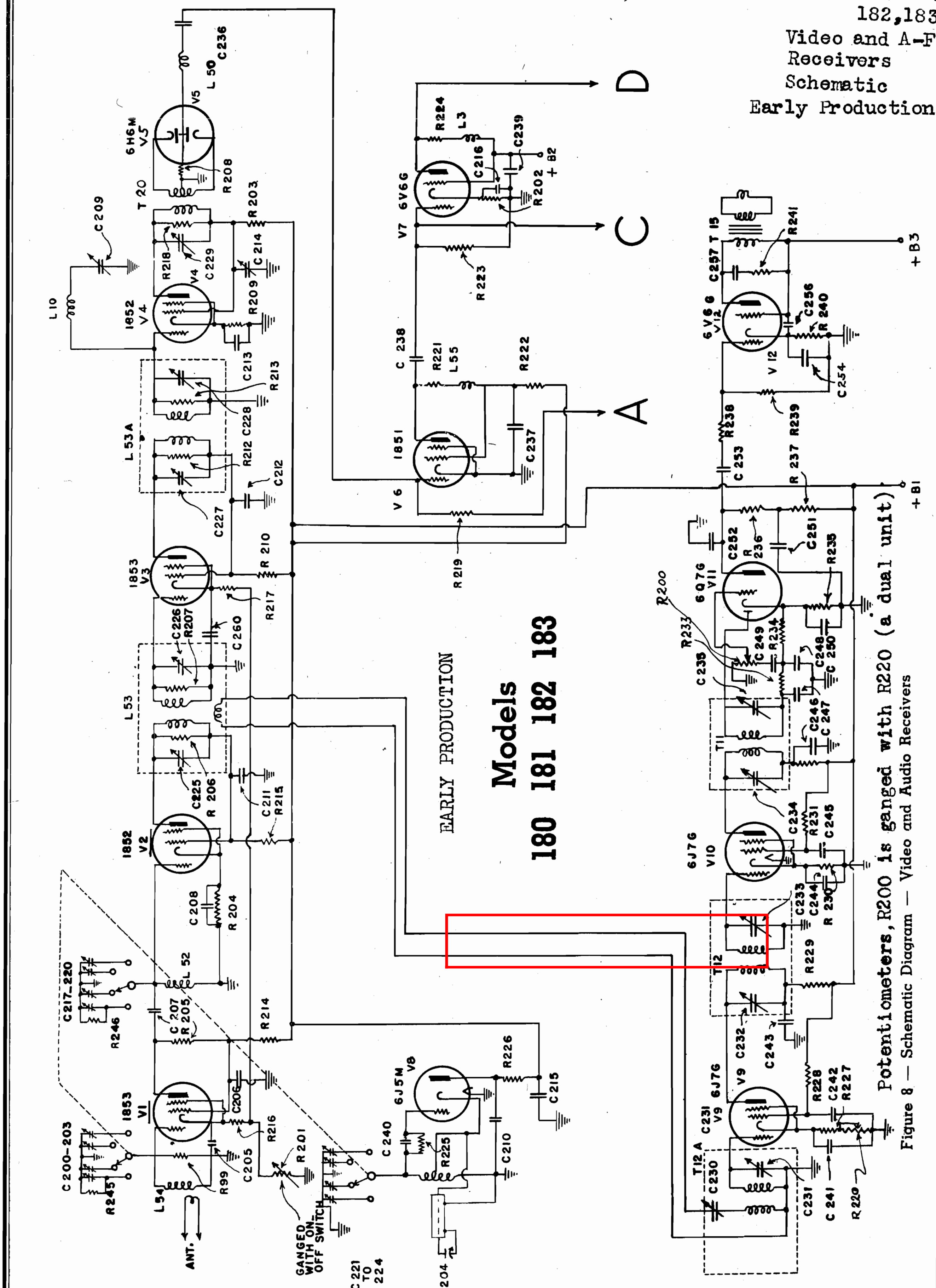


Figure 8 — Schematic Diagram — Video and Audio Receivers

MODELS 180,181,182,183
Separator and Sweep
Voltage Divider
Schematics,Notes

ALLEN B. DUMONT LABS., INC.

Early Production

EARLY PRODUCTION **Models** **180 181 182 183**

It is better to shut the set completely off between adjustments than to suffer a painful or even a dangerous burn.

The set is equipped with a safety switch which automatically opens upon the removal of the back of the cabinet. This protects the operator from dangerous high voltages which would otherwise be exposed.

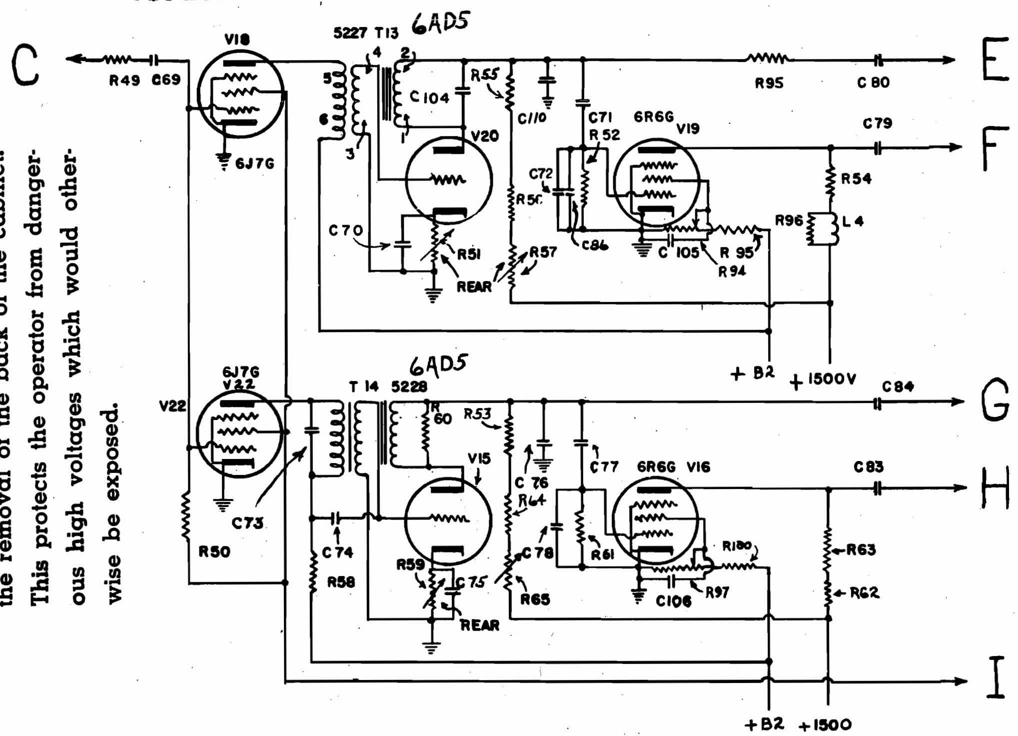


Figure 5 — Schematic Diagram, Separator and Sweep Circuits

The high voltages that are necessary in this type of equipment are very dangerous and should not be approached in a careless manner.

The serviceman that is engaged in installing or servicing television receivers is urged to take all precautions and run no unnecessary risks.

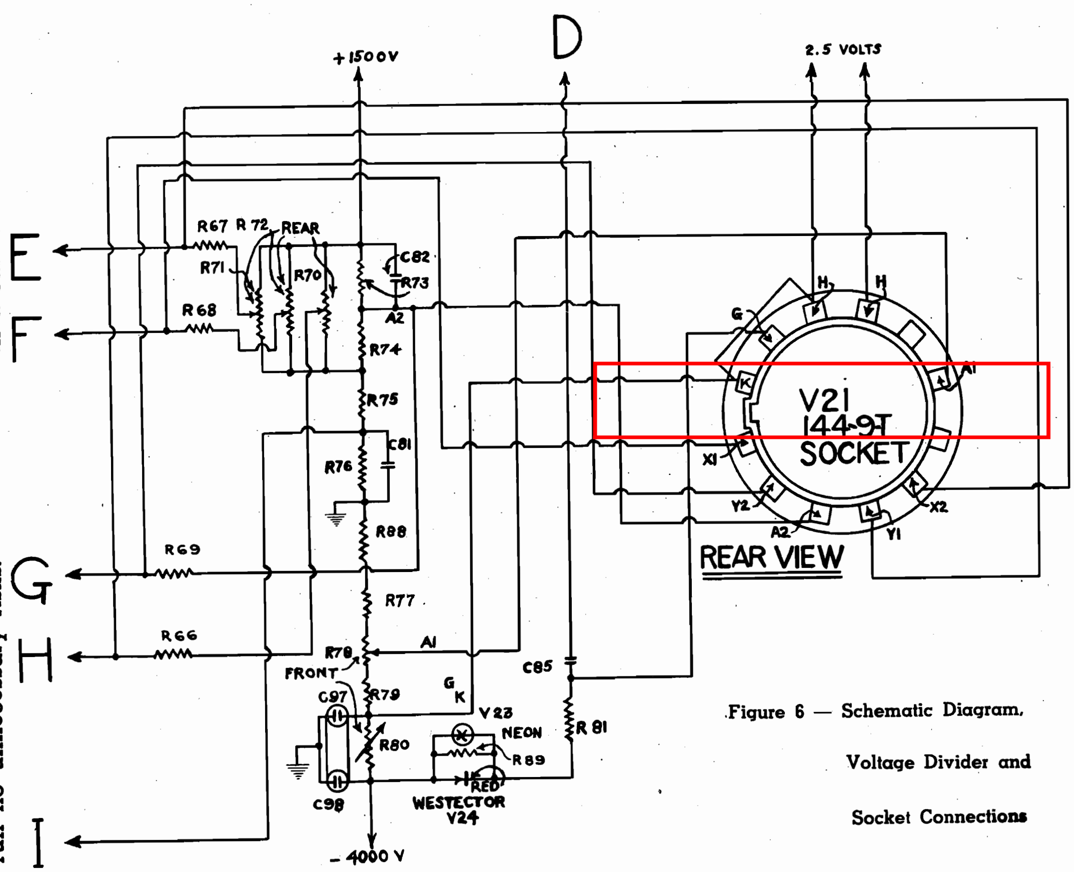


Figure 6 — Schematic Diagram, Voltage Divider and Socket Connections

MODELS 180,181,182,183
S.P.U. Schematic
Voltage,Notes

ALLEN B. DUMONT LABS., INC.

CAUTION AND WARNING

Large cathode-ray tubes operate at high voltages and hence are evacuated to a very high degree of vacuum. Therefore the atmospheric pressure on the glass can run into tons depending on the size of the tube. A collapse therefore is as bad as an explosion and all cathode-ray tubes should be handled with care. The Du Mont Laboratories have gone to great expense to provide a cathode-ray tube that is safe for the home and the structural design results in its ability to stand tests nearly twice as severe as usually employed. The serviceman, however, should observe the following rules as he will probably be the only one to handle the average tube.

1. Be careful in handling the tube.
2. Watch the use of tools near the tube.
3. Don't scratch the surface of the glass.
4. Don't stand the tube on a metal surface or in any other way cause certain parts to be quickly heated or cooled.

TERMINAL VOLTAGES

Using Weston Model 772 20,000 Ohms per Voltmeter
(with Televerter)

Tube	Plate	Screen	Grid (Control)	Notes
V9	240	150	— 4.3	
V10	240	155	— 4.3	
V11	190	......	— 2.2	
V12	275	290	—11.5	Cathode to ground.
V8	115	......	....	
V1	140	190	— 2.	Contrast on full.
V2	190	190	— 3.5	
V3	180	180	— 2.25	
V4	170	170	— 2.25	
V6	170	185	— 2.0	Cannot be measured at the grid of V6. Should read —4 volts at center tap of 5Z3 high voltage winding to ground.
V7	140	225	— 7.5	

V17 5Z3 filament to ground = 310 volts
V13 5X3 filament to ground = 1600 volts
(output after L7 = 1550)
V14 2Y2 output = 3950 to 4200 (ground is positive)
(output after R83 = 3800 to 4100 volts)
The above measurements were taken with respect to ground, the following are point to point.

V21 From cathode to grid —60 to —160
From cathode to first anode +800 to +1600
From cathode to second anode +5000

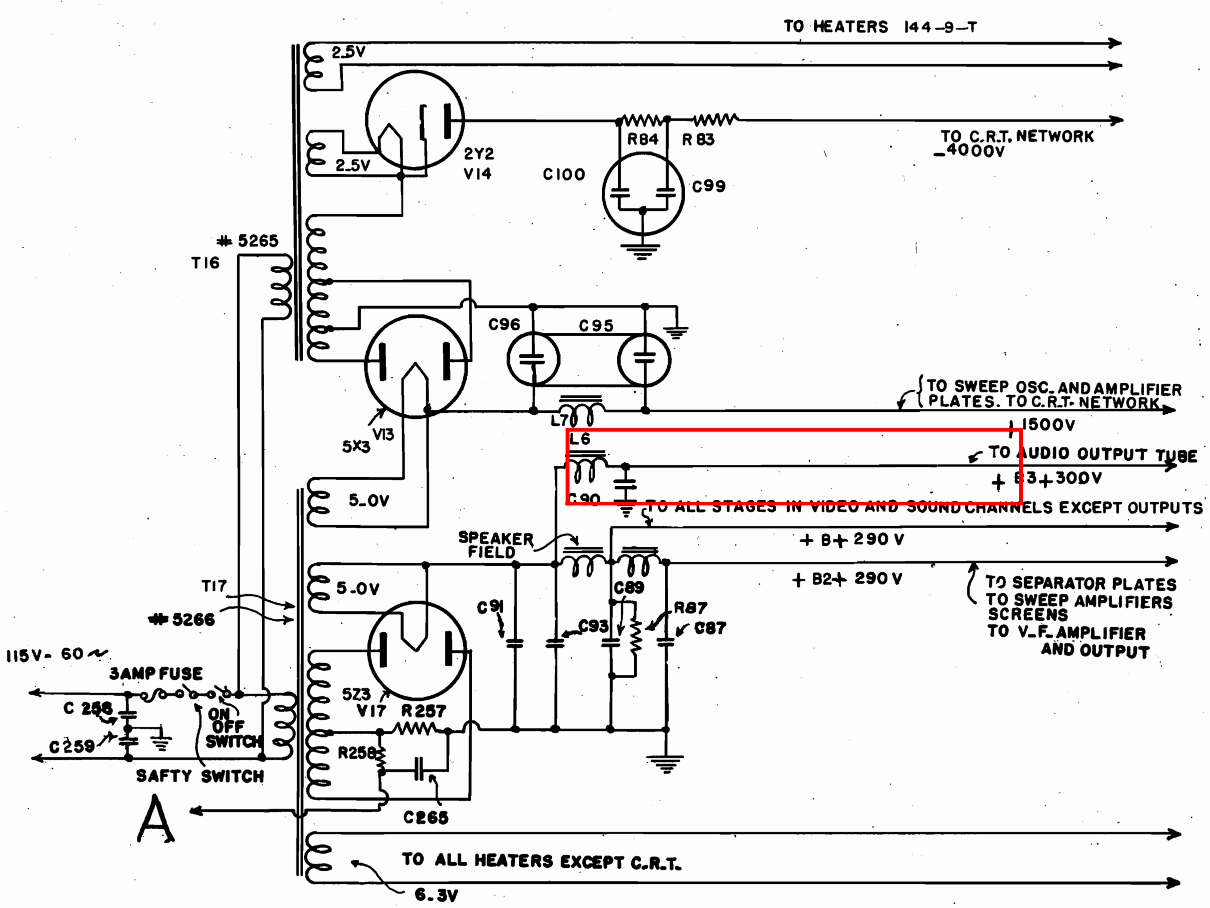


Figure 7 — Schematic Diagram, Power Supplies

MODELS 180,181,182,183
Service Data, Parts

ALLEN B. DUMONT LABS., INC.

RESISTOR VALUES

EARLY PRODUCTION

R — Regular
S — Special
W — Wire

R	Ohms	Watt	Class	R	Ohms	Watt	Class
49	10,000	½	R	200	500,000	pot	S
50	10 meg	½	R	201	2,000	pot	R
51	6,000	pot	W	202	150	½	R
52	1 meg	½	R	203	5,000	1	R
53	200,000	2	S	204	400	½	R
54	80,000	20	W	205	3,000	½	R
55	100,000	2	S	206	3,000	½	R
56	100,000	2	S	207	3,000	½	R
57	500,000	pot	S	208	3,000	½	R
58	15,000	½	R	209	150	½	R
59	6,000	pot	W	210	5,000	1	R
60	50,000	½	R	212	3,000	½	R
61	25 meg	1	R	213	3,000	½	R
62	1.5 meg	1	R	214	5,000	1	R
63	1.5 meg	1	R	215	5,000	1	R
64	200,000	2	S	216	150	½	R
65	1 meg	pot	S	217	150	½	R
66	5 meg	½	R	218	5,000	½	R
67	5 meg	½	R	219	1 meg	½	R
68	5 meg	½	R	220	100,000	pot	S
69	5 meg	½	R	221	1,500	1	R
70	2 meg	pot	R	222	5,000	1	R
71	2 meg	pot	R	223	1 meg	½	R
72	2 meg	pot	R	224	1,000	2	R
73	300,000	½	R	225	25,000	½	R
74	300,000	½	R	226	25,000	½	R
75	750,000	2	R	227	400	½	R
76	15,000	½	R	228	100,000	½	R
77	1 meg	2	S	229	4,000	½	R
78	1 meg	pot	S	230	1,000	½	R
79	750,000	2	R	231	100,000	½	R
80	100,000	pot	R	232	4,000	½	R
81	10,000	½	R	233	50,000	½	R
82	35,000	10	W	234	1.5 meg	½	R
83	100,000	1	R	235	2,000	½	R
84	100,000	1	R	236	50,000	½	R
87	100,000	2	R	237	10,000	½	R
88	1 meg	2	S	238	50,000	½	R
89	1 meg	½	R	239	250,000	½	R
90	50,000	½	R	240	160	1	R
94	250,000	pot	S	241	10,000	1	R
95	40,000	½	R	245	10,000	½	R
96	50,000	½	R	246	10,000	½	R
97	50,000	pot	R	257	20	1	R
99	3,000	½	R	258	500,000	½	R
100	200,000	½	R				

CONDENSER VALUES

C.	Mfd.	Volts	C.	Mfd.	Volts
69	.1	400	214	.01	400
70	.05	400	215	.01	400
71	.000075	1500	216	.001	400
72	.0025	400	217	3-30	trimmer
73	.0025	400	218	3-30	trimmer
74	.005	500	219	3-30	trimmer
75	25.	50	220	3-30	trimmer
76	.04	1600	221	3-30	trimmer
77	.0005	1500	222	3-30	trimmer
78	.25	400	223	3-30	trimmer
79	.01	1200	224	3-30	trimmer
80	.04	1600	225	L53	
81	.1	400	226	L53	
82	.25	600	227	L53A	
83	.1	1000	228	L53A	
84	.1	1000	229	T-20	
85	.05	4500	230	T12A	
86	.0005	400	231	T12A	
87	16.	450	232	T12	
89	8.	450	233	T12	
90	8.	450	234	T11	
91	16.	450	235	T11	
93	16.	450	236	.04	400
95	4.	1500	237	8.	450
96	4.	1500	238	.04	400
97	.2	4000	239	.01	400
98	.2	4000	240	.000050	400
99	.2	4000	241	.02	400
100	.2	4000	242	.10	400
104	.0003	400	243	.25	400
105	.02	400	244	.02	400
106	25.	50	245	.10	400
110	.0002	1500	246	.25	400
200	3-30 mmf.	trimmer	247	.0002	400
201	3-30 mmf.	trimmer	248	.000050	400
202	3-30 mmf.	trimmer	249	.01	400
203	3-30 mmf.	trimmer	250	25.	25
204	3-5	variable	251	4.	450
205	.0006	400	252	.0006	400
206	.0006	400	253	.1	400
207	.0006	400	254	50.	25
208	.01	400	256	.0005	400
209	3-30 mmf.	trimmer	257	.01	400
210	.0006	400	258	.0006	400
211	.01	400	259	.0006	400
212	.01	400	260	.01	400
213	.01	400	265	25.	25

SERVICE

While the technique employed in servicing television receivers is similar to ordinary radio practice, there is a greater need for basic knowledge and the time will be well spent that is used to study the fundamental principles of television before attempting actual service work. For obvious reasons it will be impossible to include fundamental theory in this manual, however, since very little data concerning the form of sweeps used in these receivers is available, the following description may be helpful.

Fig. 5 is a schematic diagram showing synchronizing, signal separation and sweep circuits used in this receiver. The two 6J7G tubes (V18 & V22) function as the synchronizing signal separators. The outputs of the two plates are fed their respective synchronizing windings of the horizontal and vertical oscillation transformers. Linear sawtooth deflection is effected using a 6AD5G triode as an oscillator and a 6R6G pentode as an amplifier. Oscillations are generated as follows:

Let us consider first the low frequency vertical circuit. Condenser C76 is charged from the power supply through the resistor consisting of R64 R65 and R53. R65 functions mainly as an amplitude or size control, although it has some effect upon the frequency of operation. Condenser C76 charges to practically full power supply potential. As a result of previous oscillations, a charge on condenser C75 is held on the cathode, which gradually decreases to zero through R59 as C76 is charging. This charge on C75 is high enough to hold the tube at cutoff. The grid of the tube is at D.C. ground potential. As the cathode approaches ground potential due to the discharge of C75 the 6AD5G triode becomes conducting. As plate current flows C76 is discharged producing the return trace of the sawtooth. The surge of plate current through the winding of the oscillation transformer induces a voltage in the grid winding, of proper polarity to drive the grid more positive, thereby reducing the plate circuit impedance and therefore the return trace time. At the same time that C76 is discharging, C75 is charging to its initial value to cut off the flow of plate current. As this action takes place, the plate current surge decreases, thereby applying less positive voltage to the grid and increasing its cutoff action. Ultimately, the tube is completely cut off, the cathode is at its full positive potential, and the charging cycle again begins. Resistance R59 functions as both an amplitude and a frequency control since it determines the breakdown potential and the frequency of recurrence of the oscillations in the plate circuit of the triode. Synchronizing pulses are injected into the grid of the oscillator tube through the winding of the oscillation transformer. These synchronizing pulses are polarized so that they drive the grid in a positive direction with respect to the cathode and therefore hasten the "breaking down" of the oscillator tube and effect synchronization. Since condenser C76 is charged to nearly full power supply voltage, the signal which is taken from the plate circuit of the triode is extremely non-linear. It is applied, however, to one plate of the defecting pair in the cathode-ray tube. At the same time it is divided by a capacity-resistance network and is applied to the grid of the 6R6G pentode. This triode section is so operated that its output is distorted in a manner opposite to that distortion introduced by the non-linear operation of the oscillator triode. The output of the 6R6G is applied to the other deflection plate of the pair and the deflection from this signal is such that the resultant deflection is linear.

Since the high frequency or horizontal sweep operates in the same manner it will be unnecessary to repeat the above description. The horizontal circuit is, however, a little more critical than the vertical and it is absolutely essential to keep the stray circuit capacities of the horizontal oscillator and amplifier at a minimum in order to keep the return trace time at a minimum. Therefore, if repairs are ever necessary on this circuit care must be taken not to increase the capacity of the circuit.

In Fig. 6 the use of a copper oxide rectifier and neon lamp can be explained as follows. The D.C. component necessary for background level, is introduced by the action of the copper oxide (Westector) V24. The neon lamp V23 is provided to protect the rectifier from high voltage surges when the equipment is first turned on.

Assuming that the controls are properly set and handled, the first step will be to determine the location of the trouble and isolate the defective portion. In this you will be aided by the design of the receiver, for, as previously pointed out, the various sections are separately located.

The following brief outline, while by no means complete will serve to point out possible causes and location.

While no fast rule can be laid down, once the section failing has been decided on it will generally be found that a systematic check correctly interpreted will locate the fault. A voltage check of the suspected circuit along with the checking of the tubes employed will probably be the next step. Then, if the voltages are correct and a cathode-ray oscillograph is available it can be used to trace the source of the trouble

It is quite probable that the majority of service problems will fall within this range in spite of this limitation, as the correct adjustment of the regular control knobs along with the replacement of tubes and parts will provide the answer to nearly all troubles.

MODELS 180,181,182,183
Antenna Data

ALLEN B. DUMONT LABS., INC.

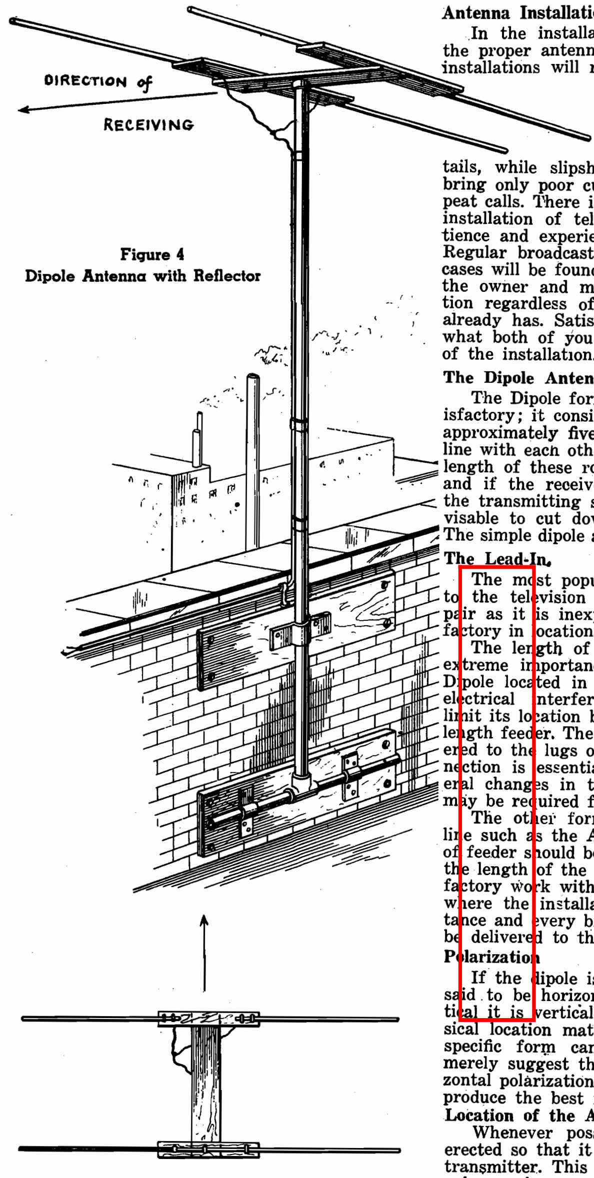


Figure 4
Dipole Antenna with Reflector

Antenna Installation

In the installation of television receivers the proper antenna is a necessity. Successful installations will result from attention to details, while slipshod and careless work will bring only poor customer satisfaction and repeat calls. There is nothing difficult about the installation of television aerials, a little patience and experience is all that is required. Regular broadcast aerials in the majority of cases will be found useless. Impress this upon the owner and make a satisfactory installation regardless of what other equipment he already has. Satisfactory picture reception is what both of you require for the completion of the installation.

The Dipole Antenna

The Dipole form of aerial is generally satisfactory; it consists of two metal rods, each approximately five feet long and placed on a line with each other. Extreme accuracy in the length of these rods is usually not necessary and if the receiver is located very close to the transmitting station it may be found advisable to cut down the length of each rod. The simple dipole aerial is shown in Fig. No. 3.

The Lead-In.

The most popular lead-in from the dipole to the television receiver will be a twisted pair as it is inexpensive and generally satisfactory in locations where the signal is strong.

The length of this lead is usually not of extreme importance. It is better to get the Dipole located in the clear and as far from electrical interference as possible than to limit its location by using a theoretical, exact length feeder. The twisted pair should be soldered to the lugs on the Dipole as a good connection is essential and necessary since several changes in the position of the antenna may be required for best results.

The other form of lead-in is the coaxial line such as the Amphenol No. 72. This form of feeder should be used in installations where the length of the lead-in is too long for satisfactory work with the twisted pair and again where the installation is at an extreme distance and every bit of energy picked up must be delivered to the receiver.

Polarization

If the dipole is mounted horizontally it is said to be horizontally polarized, and if vertical it is vertically polarized. Since the physical location materially affects the aerial no specific form can be advised and we can merely suggest that you start by using horizontal polarization and change if necessary to produce the best results.

Location of the Antenna

Whenever possible the Dipole should be erected so that it is in line of sight with the transmitter. This does not mean that no signals can be secured where a direct view of the transmitter cannot be obtained. Surprising results are often secured on these high frequencies and no concise rules can be assigned to this work. If the location is on a street having heavy traffic there may be considerable noise level due to automobile ignition systems. In this case, locate the Dipole to the rear of the building and away from the source of the noise as far as possible. In the case of electrical machinery over which you have no control, the same method can be employed along with the utilization of the directional effects of the aerial which will be covered later.

Room Illumination

Wherever possible the receiver should be so placed in the home that a direct glare from either natural or artificial light does not fall upon the face of the cathode-ray tube. The received pictures may be viewed under a variety of conditions where it is not always convenient to darken the room completely. Adjustments made to meet these conditions will not cause damage to the receiver. Viewing the pictures in as dark a room as possible is always at an advantage as it permits the setting of the Intensity and Contrast controls in a manner that will give picture tone values more correctly relating to those actually used in the studio from which the picture is transmitted.

Installation Process

It is a good plan to proceed as follows with the installation.

1. Erect the Dipole antenna in the clear. Start by using horizontal polarization (mount the rods horizontally) and turn them until their plane is at right angles with the location of the transmitter.
2. Adjust the receiver to produce a picture.
3. Return to the antenna and make final adjustments for best signal strength and removal of ghosts, etc.

Ghost Effects

Where the picture appears to be duplicated and slightly displaced, the additional picture is referred to as a ghost. This effect is usually due to the reflection of the signals and can be cured by the slanting or rotating of the Dipole or the use of a reflector or reflectors. If, after all possible positions have been tried, the ghost still exists it will be necessary to change the location of the antenna and try again.

Directional Effects

In the simple Dipole, directional effects are not very pronounced, but it does have a rather sharp no-signal radius and it is possible in some instances to materially reduce interference by placing the offending source in this area. If the installation of the receiver is being made at quite a distance from the transmitter or if the signal level is very low due to local conditions, it is well to consider the use of a reflector. This is done by placing a rod, about ten feet long, parallel with the Dipole and about five feet in back of it. The directional effect of the Dipole remains the same, namely at right angles to the plane. Signals coming from the front will be greatly increased. In using reflectors it is well to bear in mind, however, that any signal approaching from the rear (where the reflector is located) will be greatly attenuated. Fig. No. 4 shows the reflector added to the simple Dipole.

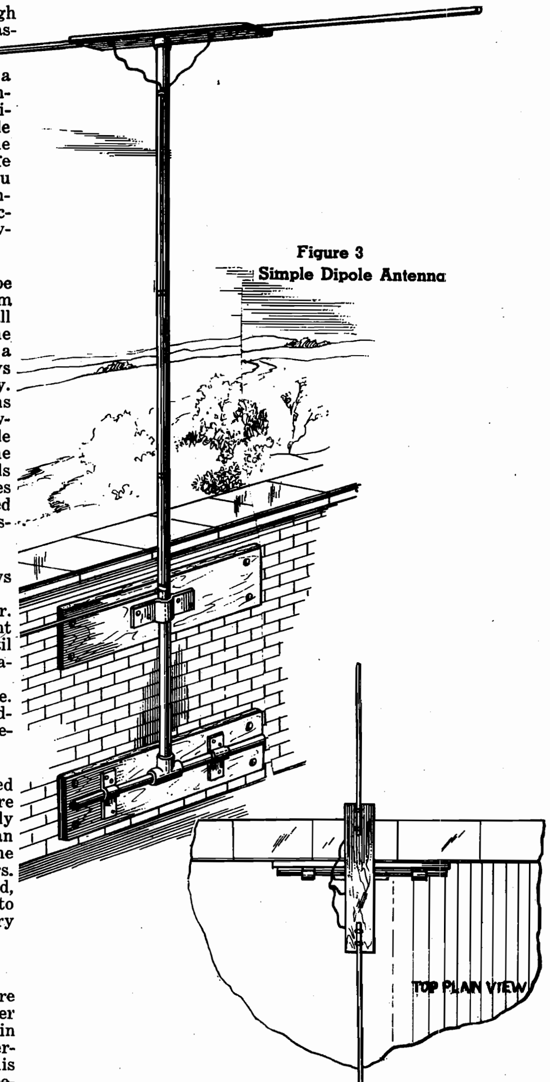
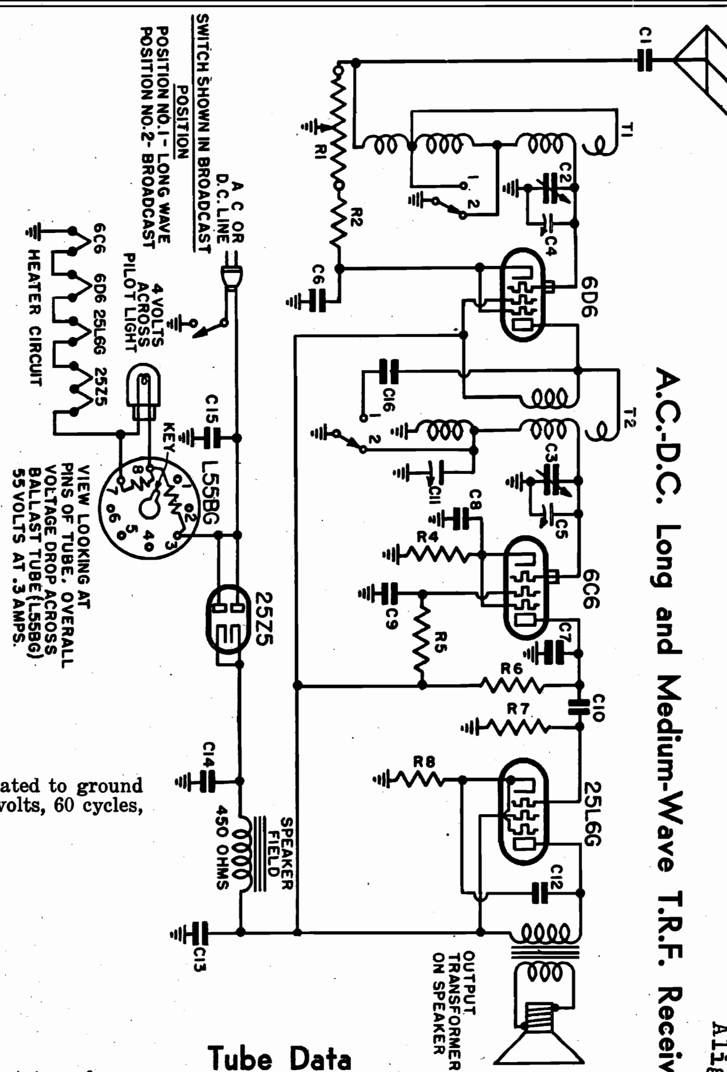


Figure 3
Simple Dipole Antenna

EMERSON RADIO & PHONOGRAPH CORP.

A.C.-D.C. Long and Medium-Wave T.R.F. Receiver



Voltage rating ...... 105 to 125 volts
Power consumption .. 45 watts
Frequency range .... 535 to 1650 kc
366 to 143 kc

MODEL CD-206
CD-215
CHASSIS MODEL CD

When ordering replacement parts specify part number

*Item number locates the article on the schematic diagram.

List Price ea. Effective as of Nov. 1st, 1938 (Subject to change without notice.)

*Item	Part No.	DESCRIPTION	PRICE
T1	3TT-409	Two-band antenna coil	$ .65
T2	3TT-410	Two-band detector coil	.65
R1	2VR-219E	Volume control, 75,000 ohms, with line switch	.90
R2	3CR-294	240 ohm, ½ watt wire-wound resistor	.16
	L55-BG	Plug-in ballast tube	.55
R4	KR-63U	15,000 ohm, ¼ watt carbon resistor	.16
R5	HR-42U	2 megohm, ¼ watt carbon resistor	.16
R6, R7	KR-56U	500,000 ohm, ¼ watt carbon resistor	.16
R8	3QR-297	110 ohm, ½ watt wire-wound resistor	.16
C1	KC-58	0.01 mf, 400 volt tubular condenser	.20
C2, C3	5MC-399	Two-gang variable condenser	3.55
C4, C5		Trimmers, part of variable condenser, not supplied separately.	
C6, C9	AC-6	0.1 mf, 200 volt tubular condenser	.20
C7	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C8	5AC-388	0.25 mf, 100 volt tubular condenser	.20
C10	LC-65	0.02 mf, 400 volt tubular condenser	.20
C11	3AC-278	Trimmer for long-wave interstage coil	.15
C12	LC-64	0.05 mf, 400 volt tubular condenser	.20
C13, C14	4DC-345A	Dual 16 mf, 150 volt dry electrolytic condenser	1.20
C15	EEC-132	0.1 mf, 400 volt tubular condenser	.20
C16	NC-70A	0.0002 mf mica condenser	.20
	5BS-333	5" dynamic speaker	3.90
	3TS-223A	Wave-band switch	.55
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44	.20
	4XM-367	Drive pulley	.10
	5MZ-829	Dial crystal	.10
	5MZ-830	Drive shaft and pulley	.10
	4MZ-588B	Dial pointer	.20
	4YZ-772	Drive cord	.02
	5JZ-824	Drive cord spring	.05
	6DD-63	Dial face	.15

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale.

Tube	*Plate*	*Screen*	*Cathode*	*Fil.*
6D6	100	100	2.3	6.3
6C6	20	15	2.1	6.3
25L6G	93	100	6	25.0

Voltage across speaker field—26 volts.

25Z5 cathode to ground—126 volts.

ALIGNMENT PROCEDURE

An oscillator with frequencies of 1500 kc and 350 kc is required.

Use as weak a test signal as possible. An output meter should be used across the voice coil or output transformer for observing maximum response.

Rotate variable condenser to the maximum capacity position and set the pointer at the next calibration mark beyond 550. Rotate band-switch clockwise to broadcast (medium-wave) position. Then rotate the variable condenser until the pointer is at 200 and feed 1500 kc to the antenna through a .0001 mf mica condenser and adjust both trimmer condensers on the variable condenser for maximum response.

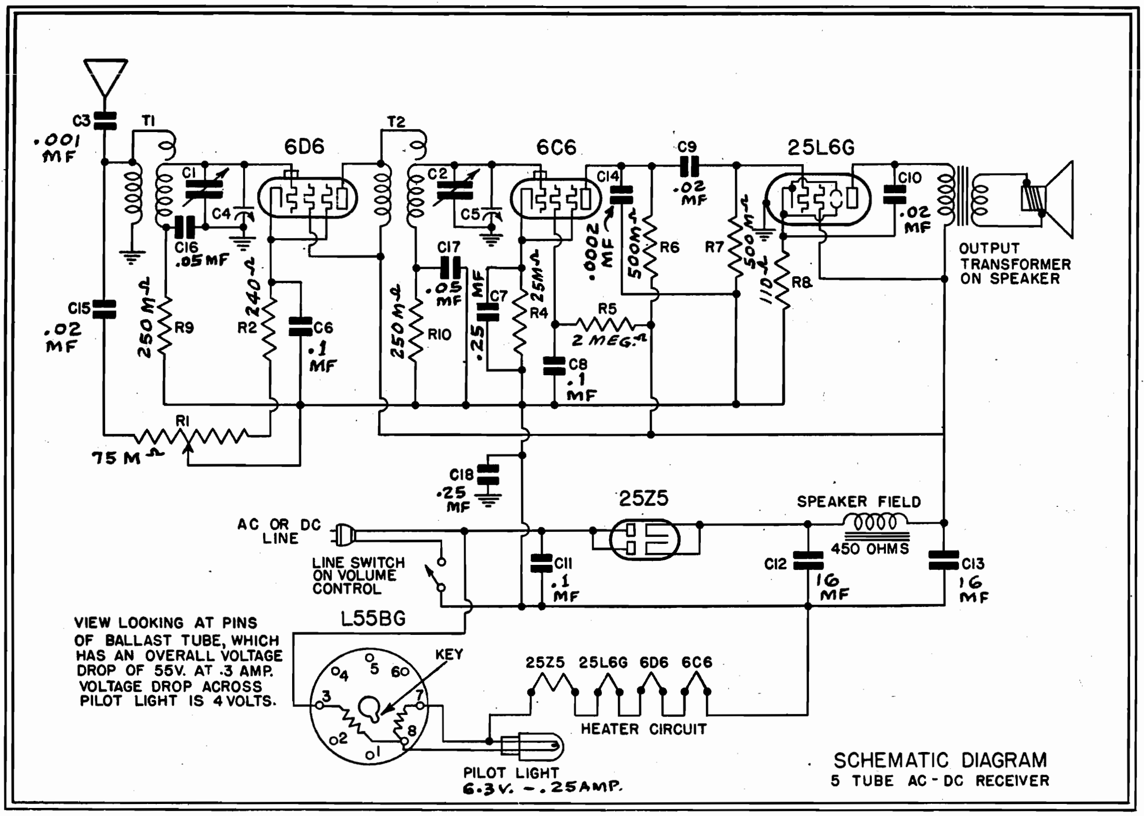
Turn wave-band switch counter-clockwise to long-wave position. Rotate variable condenser until pointer is at 350 and feed 350 kc to antenna. Adjust the long-wave interstage coil trimmer for maximum output. Return to broadcast and repeat entire procedure. The long-wave trimmer is located beneath the chassis and is reached from the right end of the chassis.

Tube Data

The tube complement is as follows:
1—6D6, r-f amplifier.
1—6C6, biased detector.
1—25L6G, beam power output.
1—25Z5, dual half-wave rectifier.
1—L55BG, ballast tube.
Note: Octal-base tubes may be replaced with either metal tubes or equivalent octal-base glass tubes.

MODELS BX208, BX209
Chassis BX
Schematic, Voltage
Alignment

EMERSON RADIO & PHONOGRAPH CORP.



SCHEMATIC DIAGRAM FOR MODELS BX-208 and BX-209

PREADJUSTMENT OF STATION BUTTONS

For complete instruction for "Preadjustment of Station Buttons" see MODEL CA-208

TUBE DATA

The tube complement is as follows:

1—6D6, r-f amplifier.
1—6C6, biased detector.
1—25L6G, beam power output.
1—25Z5, dual half-wave rectifier.
1—L55BG, ballast tube.

Voltage rating ....105 to 125 volts, a.c. or d.c.
Power consumption .... 45 watts.
Frequency range ....540 to 1730 kc.

Note: Octal-base tubes may be replaced with either metal tubes or equivalent octal-base glass tubes.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale.

Tube	*Plate*	*Screen*	*Cathode*	*Fil.*
6D6	100	100	2.3	6.3
6C6	20	15	2.1	6.3
25L6G	93	100	6.0	25.0

Voltage across speaker field—26 volts.
25Z5 cathode to ground—126 volts.
Voltage across ballast tube (pins 3, 7)—55 volts.
Voltage across pilot light section (pins 7, 8)—4 volts.

The ballast resistor (L55BG on schematic) is in a special tube at the rear of the chassis. In normal operation this tube will become quite hot. For voltage drop specifications, see "Voltage Analysis" above.

ALIGNMENT PROCEDURE

An oscillator with a frequency of 1400 kc is required.

Use as weak a test signal as possible. An output meter should be used across the voice coil or output transformer for observing maximum response.

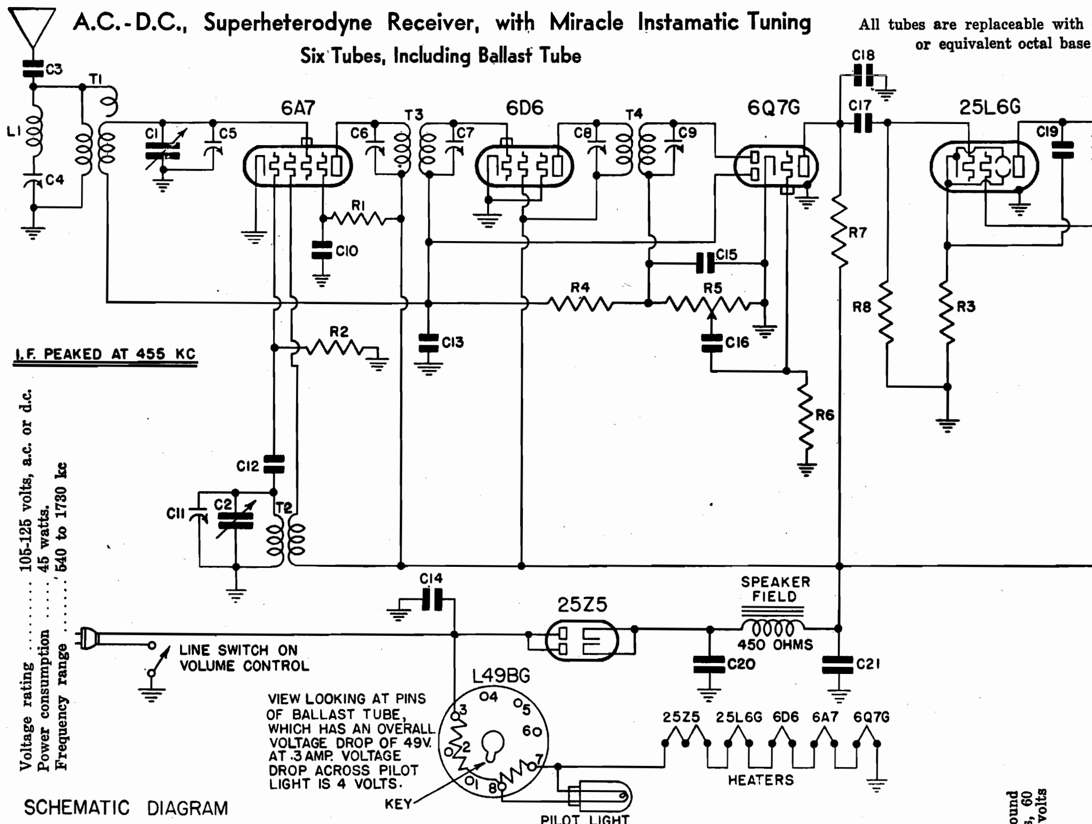
Rotate variable condenser to the maximum capacity position and set the pointer at the next calibration mark beyond 55. Then rotate the variable condenser until the pointer is at 140 and feed 1400 kc to the antenna through a .0001 mf mica condenser and adjust both trimmer condensers on the variable condenser for maximum response.

Schematic, Voltage
Alignment, Notes

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CA208
CA209, CA234
Chassis CA

All tubes are replaceable with either metal or equivalent octal base glass tubes.



SCHEMATIC DIAGRAM

Voltage rating .... 105-125 volts, a.c. or d.c.
Power consumption ...... 45 watts.
Frequency range .... 540 to 1730 kc.

Tube Data

The tube complement is as follows:
1—6A7, pentagrid oscillator modulator.
1—6D6, first i-f amplifier.
1—6Q7G, diode detector, a-f amplifier, a.v.c.
1—25L6G, beam power output.
1—25Z5, dual half-wave rectifier.
1—L49BG, ballast tube.

MODELS CA-208, CA-209 and CA-234

CHASSIS MODEL CA

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
4. The color coding of the i-f transformer leads is as follows:
   Grid—green — Plate—blue
   Grid return—black — B plus—red.
5. In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
   Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector.
6. The wave-trap in the receiver has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.
An output meter should be used across the voice coil or output transformer for observing maximum response.
Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil on the top of the chassis beside the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the side of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

I-f and Wave-Trap Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid cap of the 6A7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response. (See General Notes, paragraph No. 6.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathode and heaters were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7	100	55	0	100	6.3
6D6	100	100	0	—	6.3
6Q7G	43	—	0	—	6.3
25L6G	92	100	5.5	—	25.0

Voltage at 25Z5 cathode—128 volts.
Voltage across speaker field—28 volts.
Voltage drop across ballast tube L49BG (pins 3, 7)—49 volts.
Voltage drop across pilot light section of ballast tube (pins 7, 8)—4 volts.

MODELS CA208, CA209
CA234 Chassis CA
Tuner Data, Parts

EMERSON RADIO & PHONOGRAPH CORP.

REPLACEMENT PARTS

List Price ea.
Effective as of
Sept. 15th, 1938
(Subject to change without notice)

*Item	Part No.	DESCRIPTION	PRICE
L1, T1	5YT-444	Antenna coil with adjustable 455 kc wave-trap	$ .90
T2	4XT-433	Oscillator coil	.35
T3	3RT-320C	Double-tuned 455 kc first i-f transformer	1.10
T4	3RT-321C	Double-tuned 455 kc second i-f transformer	1.10
R1	ZZR-196	30,000 ohm 1/4 watt carbon resistor	.16
R2	KR-53	50,000 ohm 1/4 watt carbon resistor	.16
R3	3FR-293	140 ohm 1/2 watt wire-wound resistor	.16
R4	KR-57	1 megohm 1/4 watt carbon resistor	.16
R5	2NR-214F	Volume control .25 megohm with line switch	.90
R6	4XR-327	15 megohm 1/4 watt carbon resistor	.16
R7	KR-55	250,000 ohm 1/4 watt carbon resistor	.16
R8	KR-56	500,000 ohm 1/4 watt carbon resistor	.16
	L49-BG	Ballast resistor tube. (Interchangeable with L-49B)	.55
C1, C2	6AC-407	Two-gang variable condenser	2.35
C3	NNC-199	0.001 mf, 600 volt tubular condenser	.20
†C4		Trimmer, part of wave-trap assembly.	
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	4XC-393A	0.00006 mf mica condenser	.20
C13	AC-6	0.1 mf, 200 volt tubular condenser	.20
C14	EEC-132	0.1 mf, 400 volt tubular condenser	.20
C15, C18	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C17	LC-65	0.02 mf, 400 volt tubular condenser	.20
C19	3FC-336	0.025 mf, 400 volt tubular condenser	.20
C20, C21	4HC-348A	Dual 20 mf, 150 volt dry electrolytic condenser	1.00
	5BS-333	5" dynamic speaker	3.90

4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44	.20
6AD-59	Dial face	.70
4YZ-772	Drive cord	.02
5JZ-824	Drive cord spring	.05
4MZ-588A	Dial pointer	.20
3CZ-350B	Escutcheon with crystal	1.25
6AM-414	Four-button mechanical tuning unit (complete with variable condenser)	6.15
5BZ-835	Push-buttons	.05
4VZ-763B	Celluloid push-button caps (set of 4)	.05
4VZ-725	Station name-tab cards (complete set)	.65

*Item number locates the article on the schematic diagram.

†These condensers cannot be supplied separately.

When ordering replacement parts specify part number

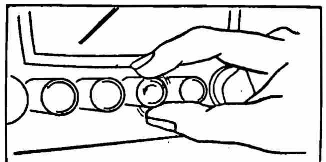


FIG.2 Loosen button by rotating counter-clockwise from 1/4 to 1/2 turn.

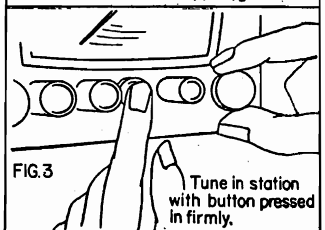


FIG.3 Tune in station with button pressed in firmly.

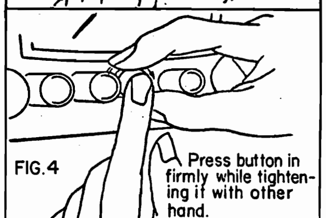


FIG.4 Press button in firmly while tightening it with other hand.

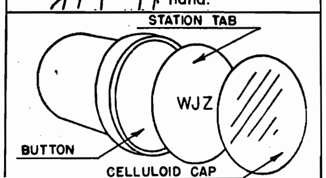


FIG.5 Insert station tab in button with celluloid cap over tab.

PREADJUSTMENT OF STATION BUTTONS

Select four nearby stations desired for automatic tuning. Choose one of these stations and any button to be adjusted for it. Follow the procedure outlined below.

1. Loosen the push-button to be adjusted by rotating it counter-clockwise from 1/4 to 1/2 turn. See Fig. 2.

2. Push the button in as far as it will go and, holding it in firmly, tune in the desired station by means of the selector knob. See Fig. 3.

3. Hold button in with finger of one hand and tighten securely with the other hand. Release the button and tighten it further if possible. See Fig. 4.

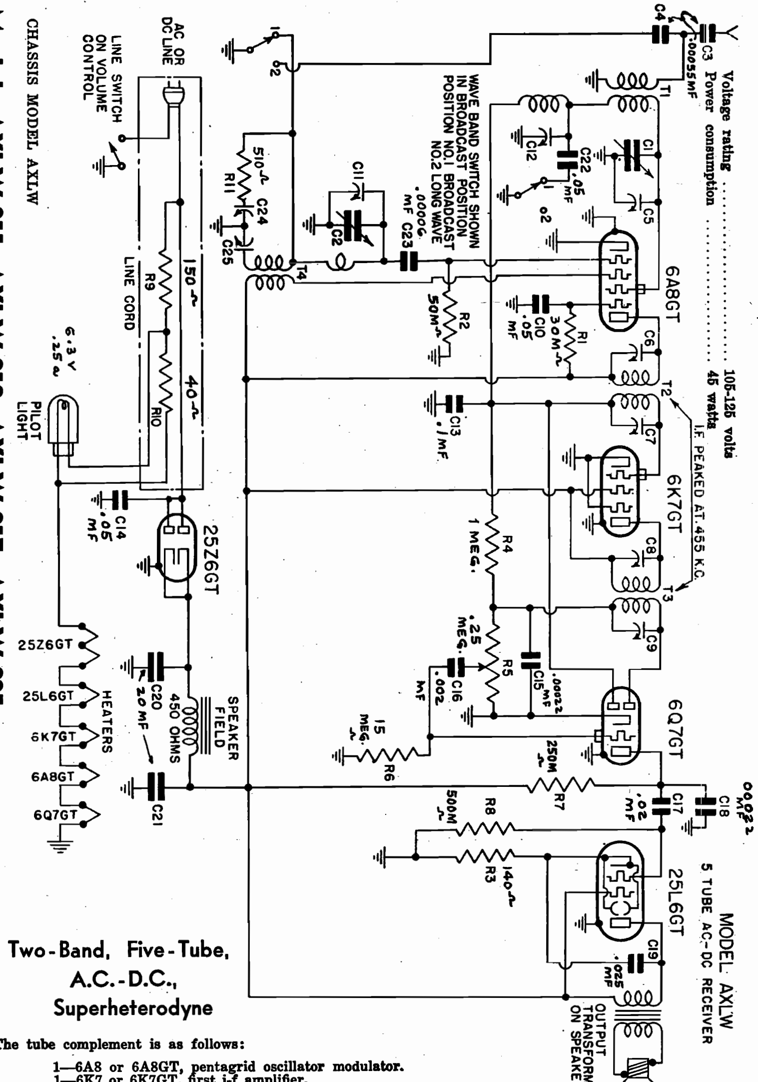
4. Remove the tab bearing the station call letters from one of the cards supplied in a separate envelope with the receiver. Insert the tab in the button, pressing it in firmly. Four celluloid caps are supplied in a separate envelope with the receiver. Snap one of these caps into the button over the station tab.

Check the adjustment of the button by detuning the station by means of the selector knob and then pressing the push-button in as far as it will go. The station should come back in clearly and with maximum volume.

Schematic, Voltage Alignment, Notes

EMERSON RADIO & PHONOGRAPH CORP.

MODELS AXLW211 -212, -217, -235 -237, -238, -239 -257. Chas. AXLW



Models AXLW-211, AXLW-212, AXLW-217, AXLW-235, AXLW-237, AXLW-238, AXLW-239 and AXLW-257

Frequency range
540 to 1650 kc (555 to 182 meters)
157 to 370 kc (1910 to 810 meters)

Two-Band, Five-Tube, A.C.-D.C., Superheterodyne

The tube complement is as follows:

1—6A8 or 6A8GT, pentagrid oscillator modulator.
1—6K7 or 6K7GT, first i-f amplifier.
1—6Q7 or 6Q7GT, diode detector, a-f amplifier a.v.c.
1—25L6 or 25L6GT, beam power output.
1—25Z6 or 25Z6GT, dual half-wave rectifier.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R-9—see schematic is a resistance wire in the special line cord. The cord will, therefore, become warm under normal operating conditions. To insure good heat radiation stretch out the line cord to its full length. Do not attempt to shorten it by cutting.
4. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
5. The color coding of the i-f transformer leads is as follows:
   Grid—green — Plate—blue
   Grid return—black — B plus—red.
6. In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
   Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector.
7. To remove the 6A8 tube from its socket, push up on itscenter pin from beneath the chassis.

TUBE DATA

All tubes are replaceable with either metal or equivalent bantam glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a bantam size glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A8	100	55	0	100	6.3
6K7	100	100	0	—	6.3
6Q7	48	—	0	—	6.3
25L6	92	100	5.5	—	25.0

Voltage at 25Z6 cathode—125 volts.

Voltage across speaker field—28 volts.

ADJUSTMENTS

An oscillator with frequencies of 455, 1500, 350 and 172 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The two-band antenna coil is located directly behind the speaker. The trimmer for the broadcast antenna coil is located on the front section of the variable condenser. The trimmer for the long wave antenna coil is mounted on the top of the antenna coil form. The two-band oscillator coil is located underneath the chassis below the first i-f transformer. The trimmer for the broadcast oscillator coil is located on the rear section of the variable condenser. The trimmer and series padder (condensers C24 and C25 resp.) for the long wave oscillator coil are located beneath the chassis and can be reached from the bottom only. The section toward the rear of the chassis is C24, the shunt trimmer. The section toward the front of the chassis is C25, the series padding condenser.

I-f Alignment

Turn the band switch clockwise to broadcast position and swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 6A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Broadcast Alignment

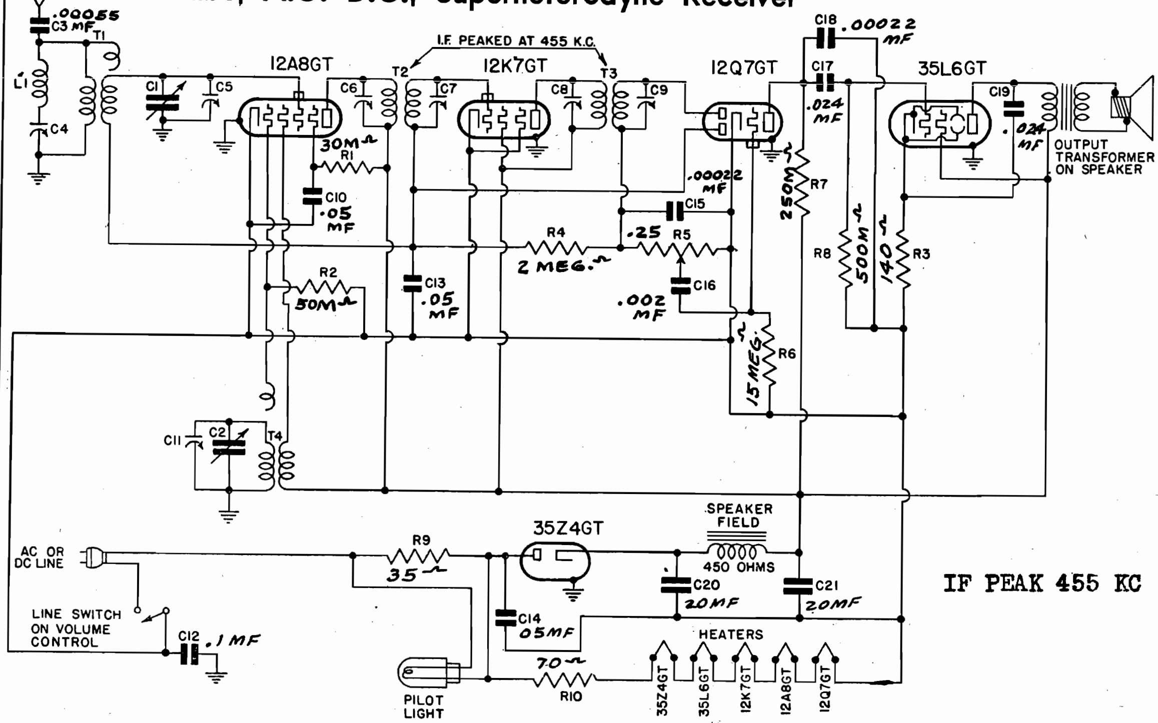
With the band switch in broadcast position set the dial pointer at 200. Feed 1500 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

Long Wave Alignment

Turn the band switch counter-clockwise to the long wave position. With the dial pointer set at 850, feed 350 kc through a .0001 mf condenser to the antenna and adjust first the oscillator trimmer (rear trimmer beneath the chassis), then the antenna trimmer (on antenna coil) for maximum response. Move the pointer to 1750, feed 172 kc, and adjust the series padder (front trimmer beneath the chassis), rocking the variable condenser back and forth while adjusting for maximum response. Return to 350 kc and repeat alignment.

MODELS CJ211,CJ217,CJ235
CJ257 Chassis CJ EMERSON RADIO & PHONOGRAPH CORP. Alignment. Schematic,Voltage

Five-Tube, A.C.-D.C., Superheterodyne Receiver



IF PEAK 455 KC

Voltage rating .... 105-125 volts, a.c. or d.c.
Power consumption .... 30 watts
Frequency range .... 540 to 1730 kc.

SCHEMATIC DIAGRAM FOR MODELS CJ-211, CJ-217, CJ-235 AND CJ-257 CHASSIS MODEL CJ

The tube complement is as follows:

1—12A8 or 12A8GT, pentagrid oscillator modulator.
1—12K7 or 12K7GT, first i-f amplifier.
1—12Q7 or 12Q7GT, diode detector, a-f amplifier a.v.c.
1—35L6 or 35L6GT, beam power output.
1—35Z4 or 35Z4GT, half-wave rectifier.

The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black
Plate—blue
B plus—red.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil directly behind the speaker. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

I-f and Wave-Trap Alignment

Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 12A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response. (See General Notes)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
12A8	94	50	0	94	12
12K7	94	94	0	—	12
12Q7	40	—	0	—	12
35L6	87	94	5.2	—	35

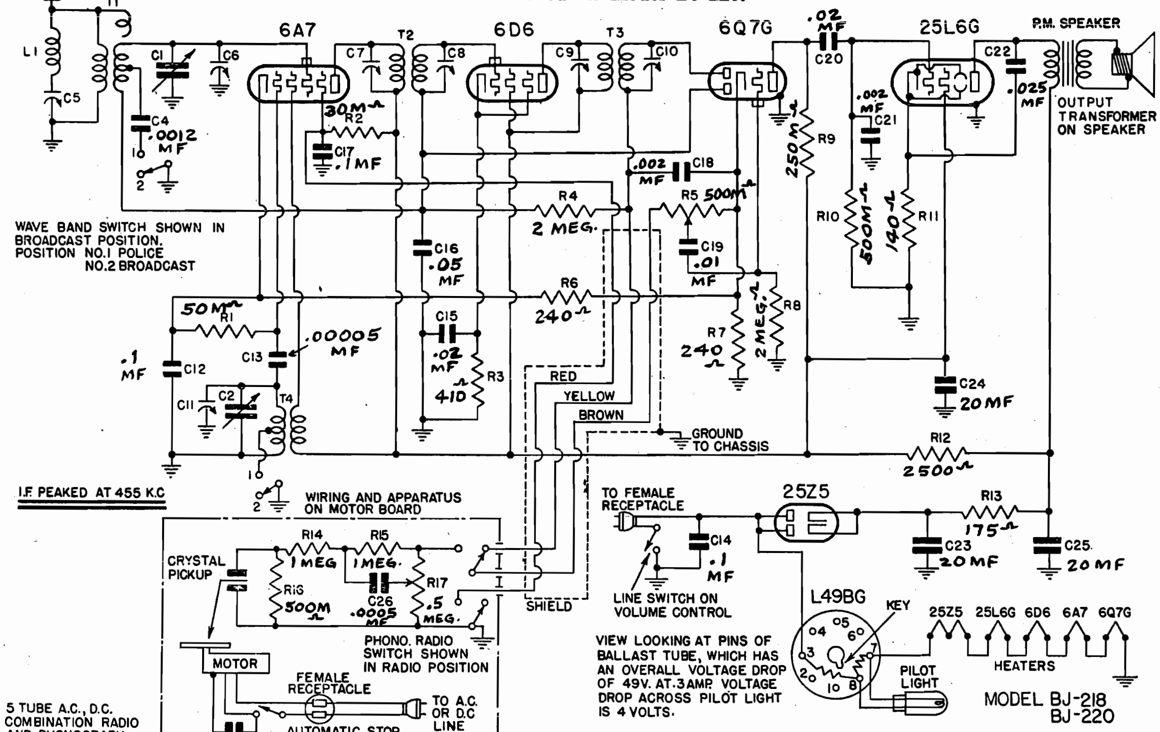
Voltage at 35Z4 cathode—121 volts.
Voltage across speaker field—27 volts.
Voltage across pilot light section of ballast resistor (R9)—3.5.
Voltage drop across entire ballast resistor (R9 and R10)—13.5.

MODELS BJ218,BJ220
Chassis BJ
Schematic,Voltage
Changes,Alignment

EMERSON RADIO & PHONOGRAPH CORP.

PRODUCTION CHANGES

1. Ballast resistor tube L-49B must be ordered for replacement in Models BJ-218 and BJ-220.
2. Condenser C27 is not used on Model BJ-220.



SCHEMATIC DIAGRAM

Voltage rating .... 105 to 125 volts, a.c. or d.c.
Power consumption .... 43 watts for receiver. 30 watts for phonograph motor.
Frequency ranges .... 540 to 1580 kc and 1580 to 4200 kc.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f transformer is the one directly behind the variable condenser. The trimmers for the two i-f transformers are available through holes in the tops of the cans.

The trimmers for the antenna and oscillator are located on the variable condenser. The trimmer on the front section is for the antenna.

The 455 kc wave-trap is mounted on the front chassis wall beneath the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

The color coding of the i-f transformer leads is as follows:
Grid—green Plate—blue
Grid return—black B plus—red

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A7 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for *minimum* response. (See General Note No. 7.)

R-f Alignment

With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

The police band is self-tracking and does not require any adjustment.

NOTE: The Model BJ-200 should be aligned with the chassis bottom plate in place.

The tube complement is as follows:
1—6A7 pentagrid oscillator-modulator.
1—6D6 first i-f amplifier.
1—6Q7G diode detector, a-f amplifier, a.v.c.
1—25L6G beam power output.
1—25Z5 dual half-wave rectifier.
1—L-49B

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale.

MODELS BJ-218 and 220

Plate	*Screen*	*Cathode*	*Osc. Plate*	*Heaters*	
84	46	2.0	84	6.3	Voltage at 25Z5 cathode—130 volts.
84	84	2.8	—	6.3	Voltage across speaker field (Models BJ-200, 210 and 214)—28 volts.
35	—	1.0	—	6.3	Voltage drop across ballast tube L-49BG (pins nos. 3, 7)—49 volts.
115	84	5.5	—	25	Voltage drop across pilot light section (pins nos. 7, 8)—4 volts.

MODELS BL218,BL220
Chassis BL
Schematic,Voltage

EMERSON RADIO & PHONOGRAPH CORP.

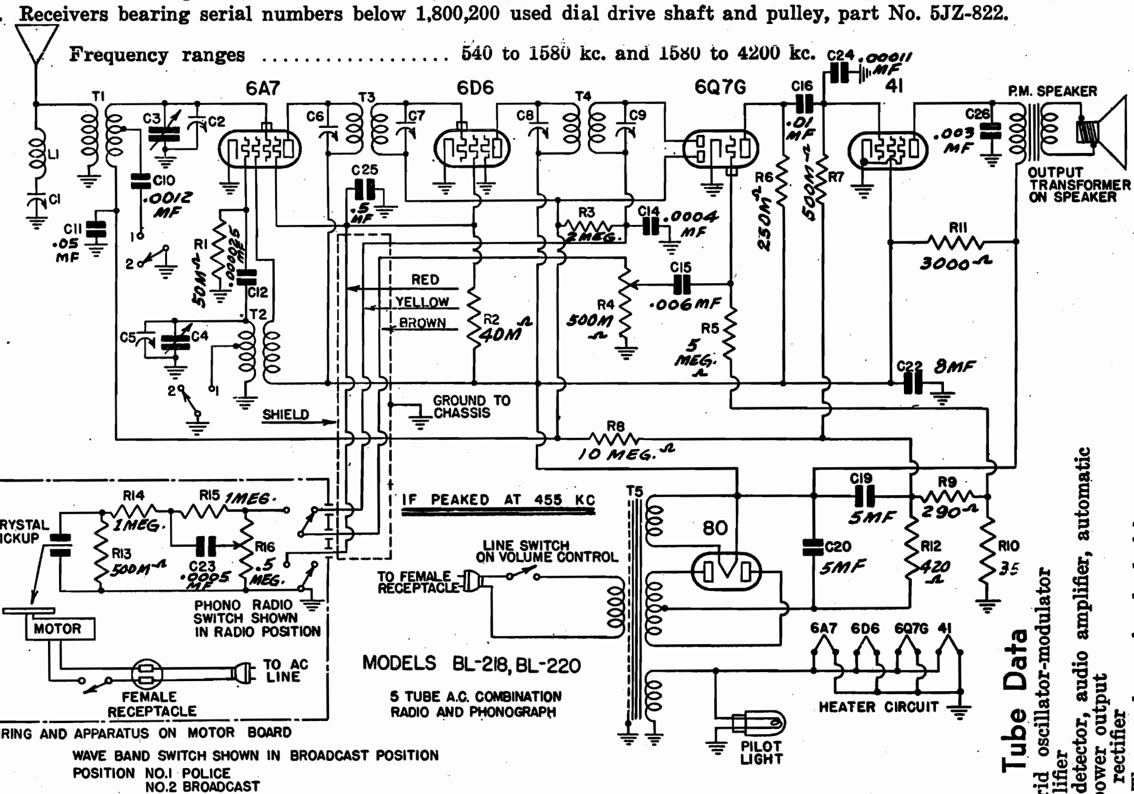
Changes,Alignment

PRODUCTION CHANGES

1. In receivers used in phonograph combinations:
   R2 is 40,000 ohms 1 watt, part No. 2NR-217.
2. Receivers bearing serial numbers below 1,802,875 used a 0.00006 mf mica condenser, part No. 4XC-393A, at C12.
3. Receivers bearing serial numbers below 1,800,200 used dial drive shaft and pulley, part No. 5JZ-822.

Frequency ranges .... 540 to 1580 kc. and 1580 to 4200 kc.

Power consumption
45 watts for receiver,
20 watts for phonograph motor.



Tube Data

1—6A7 pentagrid oscillator-modulator
1—6D6 i-f amplifier
1—6Q7G diode detector, audio amplifier, automatic
1—41 pentode power output
1—80 full-wave rectifier

Voltage rating
105-125 volts, 60 cycles, a.c.

The phonograph motor has been adjusted at the factory to turn at a speed of 78 r.p.m. The speed may be checked by counting the turns per minute or by using a stroboscope disc and a neon light. To readjust the speed remove the turn-table and turn the speed adjusting screw (located near the turn-table shaft). A clockwise rotation of the screw decreases the speed. The speed should be checked with the pick-up and record in playing position. The stroboscope method will work only when the neon lamp is connected to a 60 cycle, a.c. supply.

The color coding of the leads of the i-f transformers, is as follows:

Grid—green | Plate—blue
Grid return—black | B plus—red

The color coding of the power transformer leads is as follows:

Primary—two black leads | 6.3 v. sec.—two heavy green leads
High voltage sec.—two red leads | 5 v. sec.—two heavy yellow leads
High voltage sec. center tap—red and yellow lead

With a few exceptions, the color coding of the general wiring is as follows:

Plate—blue | A.v.c. and cathode—white or yellow
B plus—red | Grid—green
Screen—brown | Filament and ground—black

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f transformer is the one directly behind the variable condenser. The trimmers for the two i-f transformers are available through holes in the tops of the cans.

The trimmers for the antenna and oscillator are located on the variable condenser. The trimmer on the front section is for the antenna.

The 455 kc wave-trap is mounted on the front chassis wall beneath the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A7 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for *minimum* response. (See General Note No. 1.)

R-f Alignment

With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

The police band is self-tracking and does not require any adjustment.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters were taken on 250 volt scale.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7	182	70	0	182	6.3 a.c.
6D6	182	70	0	—	6.3 a.c.
6Q7	87	—	0	—	6.3 a.c.
41	*165	182	0	—	6.3 a.c.

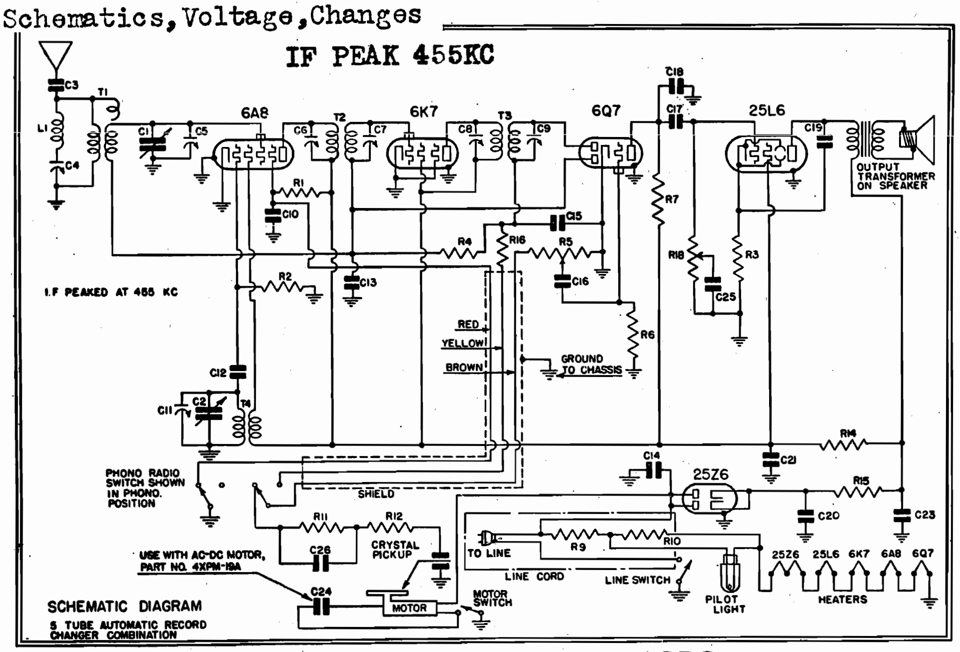
Voltage across speaker field (Models 200, 210 and 214)—70 volts.
Voltage from B minus to chassis (Models 200, 210 and 214)—80 v
Voltage from B minus to chassis (Models 218 and 220)—54 volts.
B plus at 80 tube filament (Models 200, 210 and 214)—182 v
B plus at 80 tube filament (Models 218 and 220)—232 volts.
*Voltage at 41 tube plate in Models 218 and 220 is 220 volts

MODELS AX221 AC
AX221 AC-DC
AX222, AX232 AC
AX232 AC-DC

Chassis AX
Schematics, Voltage, Changes

EMERSON RADIO & PHONOGRAPH CORP.

IF PEAK 455KC

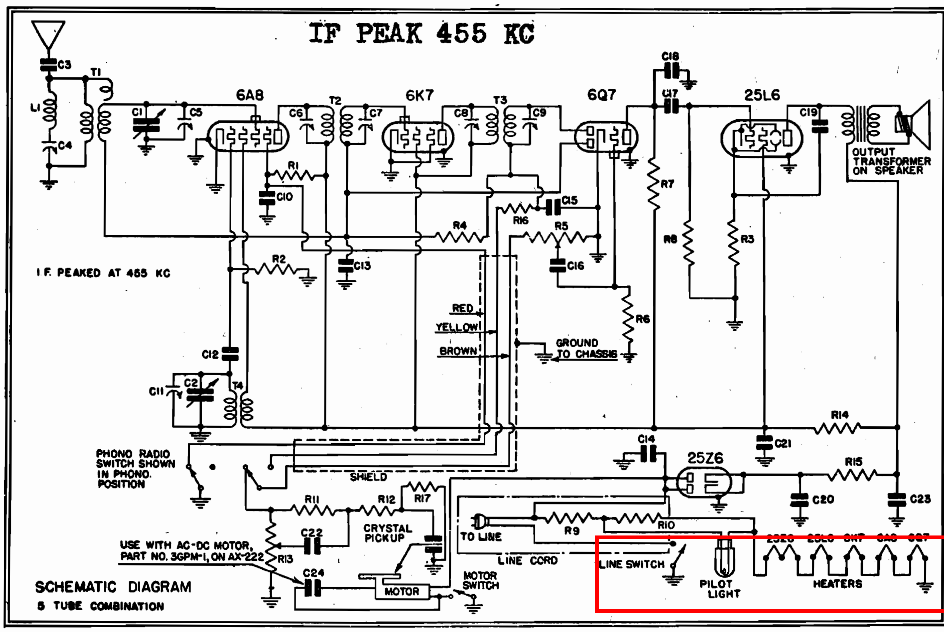


MODELS AX-232 AC and AC-232 AC-DC

CHASSIS MODEL AX

FOR RECORD CHANGER DATA SEE INDEX

IF PEAK 455 KC



MODELS AX-221 AC, AX221 AC-DC and AX-222

CHASSIS MODEL AX

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. Measurements made with 117.5 volts d.c. will be lower than those given below.

MODELS AX-221, AX-222, and AX-232

Plate	*Screen*	*Osc.*	*Cathode*	*Heaters*
82	44	82	0	6.3
82	82	—	0	6.3
35	—	—	0	6.3
115	82	—	5.5	25

Voltage at 25Z6 cathode—135.

Voltage rating	105-125 volts
Power consumption	45 watts for receiver
	10 watts for 219 motor
	20 watts for 221 a.c. or 232 a.c. motors
	30 watts for 221 a.c.-d.c., 222, and 232 a.c.-d.c. motors
Frequency range	540-1730 kc.

Tube Data

The tube complement is as follows:

1—6A8 or 6A8GT, pentagrid oscillator modulator.
1—6K7 or 6K7GT, first i-f amplifier.
1—6Q7 or 6Q7GT, diode detector, a-f amplifier, a.v.c.
1—25L6 or 25L6GT, beam power output.
1—25Z6 or 25Z6GT, dual half-wave rectifier.

All tubes are replaceable with either metal or equivalent bantam glass tubes.

PRODUCTION CHANGES

AX-221 and AX-222 chasses bearing serial numbers below 1,890,976 do not have R16, 100,000 ohm resistor, connected in series with the yellow lead to phono-radio switch.
AX-221 and AX-222 chasses bearing serial numbers below 1,914,451 do not contain resistor R17.
On model AX-222 a 0.01 mf, 400 volt condenser is connected from B plus to the speaker frame. Another 0.01 mf condenser is connected from the motor mounting plate to ground.
AX-221 and AX-222 chasses below serial number 1,921,165 have a 210 ohm, ½ watt wire-wound resistor at R15.

MODELS AX221 AC
AX221 AC-DC
AX222, AX232 AC
AX232 AC-DC

EMERSON RADIO & PHONOGRAPH CORP.

Chassis AX
Alignment, Notes
Parts

Combination Phonograph and Five-Tube Superheterodyne

MODEL AX-221AC (For Operation on AC Only)
MODEL AX-221AC-DC (For Operation on Either AC or DC)
MODEL AX-222 (AC-DC Portable)
MODEL AX-232AC (Automatic Record Changer—For AC Only)
MODEL AX-232AC-DC (Automatic Record Changer—For AC or DC)

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.
†Not supplied separately.

REPLACEMENT PARTS

List Price ea. Effective as of Aug. 1st, 1938 (Subject to change without notice)

*Item	Part No.	DESCRIPTION	PRICE
L1, T1	4XT-432	Antenna coil with adjustable 455 kc wave-trap	$ .90
T2	4XT-434	Double-tuned 455 kc first i-f transformer	1.10
T3	4XT-435	Double-tuned 455 kc second i-f transformer	.85
T4	4XT-433	Oscillator coil	.35
R1	2CR-193	30,000 ohm ½ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R4, R17	KR-57	1 megohm ¼ watt carbon resistor	.16
R5	4XR-335	Volume control .25 megohm with line switch	.90
R6	4XR-327	15 megohm ¼ watt carbon resistor	.16
R7	KR-55	250,000 ohm ¼ watt carbon resistor	.16
R8	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R9, R10	4XW-112	Resistance line cord with pilot light ballast section. R9—150 ohms; R10—40 ohms	.85
R13	4LR-312B	Tone control .5 megohm with motor line switch	1.05
R14	4XR-334	2,500 ohm 1 watt carbon resistor	.16
R15	4ZR-325	175 ohm 1 watt metallized resistor. (See prod. change No. 4.)	.16
R16	KR-54	100,000 ohm ¼ watt carbon resistor. (See prod. change No. 1.)	.16
R18	4XR-342	Tone control .5 megohm	.70
C1, C2	4XC-391A	Two-gang variable condenser (for 219 and 221)	2.40
C1, C2	4XC-412	Two-gang variable condenser (for 222 and 232)	2.75
C3	4XC-401	0.00055 mf mica condenser	.20
†C4		Trimmer, part of wave-trap assembly.	
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	4XC-393A	0.00006 mf mica condenser	.20
C13	AC-6	0.1 mf, 200 volt tubular condenser	.20
C14	EEC-132	0.1 mf, 400 volt tubular condenser	.20
C15, C18	4XC-394A	0.00022 mf mica condenser	.20
C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C17	LC-65	0.02 mf, 400 volt tubular condenser	.20
C19	3FC-336	0.025 mf, 400 volt tubular condenser	.20
C20, C21	4HC-348B	Dual 20 mf, 150 volt dry electrolytic condenser	.90
C22	IC-47A	0.0005 mf mica condenser	.20
C23	4XC-404	20 mf, 135 volt dry electrolytic condenser	.65
C24	3LC-297A	0.01 mf, 400 volt molded condenser (used only with ac-dc motors)	.20
C25	HC-34	0.006 mf, 600 volt tubular condenser	.20
C26	4VC-371A	0.0003 mf mica condenser	.20
	TTS-111S	Phono-radio switch	.55
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44	.20
	4YZ-772	Drive cord	.02
	5JZ-824	Drive cord spring	.05
	4XZ-811A	Drive shaft	.05
	4XZ-816	Dial face fasteners	.01
	3LM-253	Needle cup (for 219 and 221)	.20
	3GM-251	Needle cup (for 222)	.75
	4MZ-588B	Dial pointer (for 221, 222 and 232)	.20
	4XE-3	Dial crystal (for 221, 222 and 232)	.20
	4XD-51	Dial face (for 221, 222 and 232)	.55
	4PS-303A	6½" permanent magnet dynamic speaker (used on 221, 222 and 232)	6.70

ADDITIONAL PARTS USED ON AX-219

R11, R12	KR-56	500,000 ohm ¼ watt carbon resistor	.16
	4XPM-15 or	A.C. synchronous motor	12.20
	4XPM-20	A.C. self-starting motor	12.65
	4XZ-850 or	Crystal pick-up (metal tone arm)	9.85
	4XC-411	Crystal pick-up (wooden tone arm)	9.30
	4XS-324A	4" dynamic speaker	3.70
	4XE-1	Dial crystal	.10
	4XZ-810B	Dial face	.20
	4XZ-812B	Dial pointer	.02

ADDITIONAL PARTS USED ON AX-221 and AX-222

R11, R12	KR-57	1 megohm ¼ watt carbon resistor	.16
	3LPM-3	110 volt, a.c. motor (for 221-AC)	21.35
	3GPM-1	AC-DC motor (for 221AC-DC and 222)	43.20
	4RZ-733A	Crystal pick-up	11.35

ADDITIONAL PARTS USED ON MODEL AX-232

R11, R12	KR-56	.5 megohm ¼ watt carbon resistor	.16
	4XPM-19A	117 volt, ac-dc phonograph motor (for AX-232 AC-DC)	66.00
	4XPM-19	117 volt, ac phonograph motor (for AX-232 AC)	42.60
	4XW-130	Record holder block	.60

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R-9—see schematic) is a resistance wire in the special line cord. The cord will, therefore, become warm under normal operating conditions. To insure good heat radiation stretch out the line cord to its full length. Do not attempt to shorten it by cutting.
4. In operating the a.c.-d.c. combinations on d.c. it may be necessary to reverse the line plug for correct polarity.
5. The color coding of the i-f transformer leads is as follows:
   Grid—green — Plate—blue
   Grid return—black — B plus—red.
6. In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
   Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector.
7. The wave-trap in the receiver has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
8. The receivers in these combinations are of the a.c.-d.c. type. The motors, however, in models 219, 221AC and 232AC are of the AC ONLY type and will be damaged if the combination is used on direct current.
9. To remove the 6A8 tube from its socket, push up on its center pin from beneath the chassis.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same from as the antenna coil directly behind the speaker. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

I-f and Wave-Trap Alignment

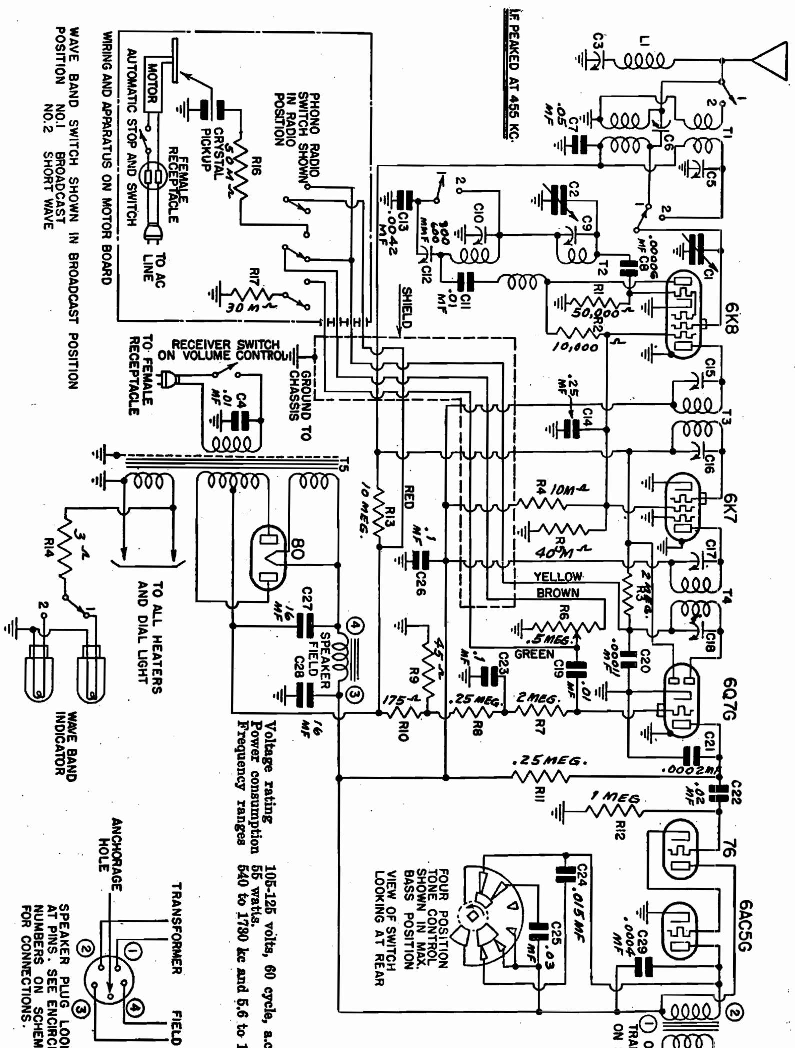
Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 6A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response. (See General Notes, paragraph No. 7.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

EMERSON RADIO & PHONOGRAPH CORP

MODEL BQ223
Chassis BQ
Schematic, Voltage
Changes, Alignment



THE TUBE COMPLEMENT IS AS FOLLOWS:
1—6K8, triode hexode oscillator-modulator.
1—6K7, i-f amplifier.
1—6Q7G, diode detector, audio amplifier and a.v.c.
1—76, audio amplifier.
1—6AC5G, power output.
1—80, full-wave rectifier.

FOR PREADJUSTMENT OF STATION PUSHBUTTONS SEE MODEL BR 224.

PRODUCTION CHANGE

The colors of leads in the cable to the phono-radio switch on chasses bearing serial numbers below 1876210 are as follows:

blue to diode; red to high side of volume control; green to arm of volume control; black to B minus. These changes are easily distinguishable by the presence of a blue lead in the cable.

The color coding of the i-f transformers is as follows:

Grid—green	Grid return—black
B plus—red	Plate—blue.

The color coding of the power transformer is as follows:
Primary—two black leads
High-voltage secondary—two red leads
High-voltage secondary center tap—red and yellow lead
6.3 volt secondary—two green leads
5 volt secondary—two yellow leads.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the wave-band switch) with the screw adjustment accessible through a hole in the top of the chassis. The short-wave band has a fixed padder, C13 on schematic. When replacing this fixed padder be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.

The phonograph motor has been adjusted at the factory to turn at a speed of 78 r.p.m. The speed may be checked by counting the turns per minute or by using a stroboscope disc and a neon light. To readjust the speed remove the turntable and turn the speed adjusting screw (located near the turntable shaft). A clockwise rotation of the screw decreases the speed. The speed should be checked with the pick-up and record in playing position.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6K8	215	100	0	75	6.3 a.c.
6K7	215	100	0	—	6.3 a.c.
6Q7G	100	—	0	—	6.3 a.c.
76	215	—	11	—	6.3 a.c.
6AC5G	195	—	0	—	6.3 a.c.

Voltage at 80 filament to B minus (center tap of high voltage winding on power transformer)—300 volts.
Voltage across speaker field—70 volts.
The grid bias for all tubes is developed across resistors R-9 and R-10 (see schematic). The total voltage measured across R-9 and R-10 should be 12 volts.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The second i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in front of the 76 tube) with the screw adjustment accessible through a hole in the top of the chassis.

The antenna coils for the broadcast and short-wave bands and the 455 kc wave-trap are wound on one form and mounted underneath the chassis deck near the 76 tube socket. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the short-wave antenna trimmer. The central trimmer is the broadcast antenna trimmer. The trimmer nearest the rear of the chassis is the 455 kc wave-trap.

The oscillator coils for the broadcast and short-wave bands are wound on one form and are mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through holes in the rear of the chassis. The trimmer farthest from the end of the chassis is for short-wave and trimmer closest to the end of the chassis is for broadcast.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6K8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a 0.0002 mica condenser may be substituted) and adjust the wave-trap trimmer (farthest from front on right side of the chassis) for *minimum* response. (See General Note No. 6.)

Short-wave Alignment (Alignment of the short-wave band should precede broadcast alignment.)

Since the dial indicator is fastened to the cabinet, a piece of stiff wire should be fastened to the dial assembly plate and bent over to form a dial pointer when the chassis is removed from the cabinet. Set pointer at extreme low-frequency end of dial with condenser closed.

Use a 400 ohm dummy antenna (a 400 ohm non-inductive resistor in series with the test oscillator antenna lead) when aligning the short-wave coils. Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial exactly at 16 megacycles. Feed 16,000 kc to the antenna and adjust the short-wave oscillator trimmer (farthest from end on rear chassis wall) for maximum response, and then adjust the short-wave antenna trimmer (nearest the front on the right side of the chassis) for maximum response. Be very careful to choose the minimum capacity peak on the oscillator trimmer.

Broadcast Alignment

By adding a cipher to each figure on the broadcast band calibration, this scale can be made to read directly in kilocycles.

Use a standard dummy antenna in aligning the broadcast coils. (A .0002 condenser may be substituted.) Rotate the wave-band switch to the broadcast (clockwise) position. Set the dial at 60 and feed 600 kc. Adjust the broadcast series padder (in corner near 76 tube) for maximum response. Move the dial to 160 and feed 1600 kc. Adjust the broadcast oscillator trimmer (closest to end on rear chassis wall) for maximum response and then adjust the broadcast antenna trimmer (central trimmer at right side of chassis). Return dial to 60, feed 600 kc and readjust the broadcast series padder, rocking the variable condenser (rotate the variable condenser shaft back and forth through a small arc) for maximum response.

MODELS BR224
BR224A.Ch.BR
Voltage
Alignment

EMERSON RADIO & PHONOGRAPH CORP.

MODEL BQ223
Chassis BQ
Tuner Data

CHASSIS BR

VOLTAGE ANALYSIS

†Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control full on, band-switch in short-wave position (counter-clockwise) and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings below 250 volts, except heaters and cathodes, were taken on 250 volt scale.

Tube	Plate	Screen	Osc. Plate	Cathode	Fil.
6K7 r-f amplifier	230	‡100	—	5	6.3 a.c.
6K8 oscillator-modulator	225	‡100	100	4.2	6.3 a.c.
6K7 i-f amplifier	215	‡100	—	4.5	6.3 a.c.
6Q7 diode detector, a.v.c. first audio	170	—	—	2.1	6.3 a.c.
6J5 phase inverter	130	—	—	4.2	6.3 a.c.
6J5 first audio driver	280	—	—	9	6.3 a.c.
6J5 inverted audio driver	280	—	—	9	6.3 a.c.
4—6AC5G's output	275	—	—	0	6.3 a.c.

Voltage across speaker field—65 volts.
Voltage at 80 filament—350.

†Model BR chasses using 3XS-237 speaker will have voltages approximately 10 percent lower. Voltage across this speaker field is 80 volts.

‡When band-switch is in broadcast and police positions the screen voltages will read 65 volts. Bias readings on these tubes will be slightly lower.

Location of Coils and Trimmer Adjustments

The i-f transformers are located at the back of the chassis. The first i-f transformer is the one near the electrolytic condenser. The six trimmers for i-f alignment are available through holes in the tops of the cans.

The antenna coils for the three bands are wound on one form located on the front wall of the chassis with the trimmers accessible through holes in the chassis. The right-hand trimmer is for the broadcast band, the left-hand trimmer is for the short-wave band and the central trimmer is for the police band.

The r-f interstage coils are wound on one form and are mounted underneath the chassis to the left of the wave-band switch. The trimmers are available through holes in the top of the chassis. The trimmer closest to the front of the chassis is for the broadcast band. The trimmer farthest from the front is for the short-wave band. The central trimmer is for compensating the short-wave band at 6 mc.

The oscillator coils are wound on one form and mounted underneath the chassis directly behind the wave-band switch. The trimmers are accessible through holes in the top of the chassis. The trimmer closest to the band-switch is for the broadcast band, the trimmer farthest from the band-switch is for the short-wave band and the central trimmer is for the police band.

The oscillator series padder for the broadcast and police bands are mounted underneath the chassis near the interstage coils. The adjusting screws are available through holes in the top of the chassis. The padder nearest the front of chassis is for the police band. The padder for the short-wave band is a fixed mica condenser, C9 on the schematic diagram. If this condenser is to be replaced use a condenser with a value within 2% of that specified.

I-f Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the variable condenser at minimum capacity. Feed 455 kc to the grid of the 6K7 i-f amplifier tube through a .02 mf condenser. (Do not remove the grid clip from the tube.) Examine the trimmer screws and locate the screw which is painted red. Screw this trimmer down as far as it will go. Adjust the other two trimmers for maximum response and then adjust the red trimmer for maximum response. Do not readjust the other two trimmers. Now feed 455 kc to the grid of the 6K8 tube and repeat same procedure on the first i-f transformer. Do not touch the adjustment of the second i-f transformer. Failure to follow this procedure may result in impairment of the fidelity of the receiver.

Broadcast Alignment

Since the indicator is fastened to the cabinet, a piece of stiff wire should be fastened to the dial drive assembly-plate and bent over to form an indicator when the chassis is removed from the cabinet. Set indicator at extreme low frequency end of dial with condenser closed.

Set the wave-band switch at the broadcast (clockwise) position, and the dial at 60. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series padder for maximum response. Move the dial to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the interstage and antenna coil trimmers for maximum response. Reset the dial at 60, feed 600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

Police Alignment

Set the wave-band switch at the police-band (central) position and the dial at 1.8. Feed 1800 kc to the antenna (using a .0001 mf dummy antenna) and adjust the police-band series padder for maximum response. Move the dial to 6.0, feed 6000 kc and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. Note the interstage coil on this band has no trimmer adjustment. Return the dial to 1.8, feed 1800 kc to the antenna and rock the variable condenser while readjusting the series padder for maximum response. Return to 6000 kc and check alignment. If readjustment is necessary return to 1800 kc and repeat entire procedure.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the dial to 20 and feed 20,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the interstage and antenna coil trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak. Move the dial to 6 mc, feed 6000 kc to the antenna and adjust the r-f interstage trimmer (central trimmer at left of band-switch) for maximum response.

MIRACLE INSTAMATIC TUNING

Preadjustment of Station Push-buttons

FOR CHASSIS BQ

The six push-buttons provide a choice of six favorite broadcast stations for Miracle Instamatic Tuning. Adjustments for any particular station must be made by means of the small cross-slotted button immediately below the chosen push-button. The following procedure must be carefully observed in making these adjustments:

1. Insert the line plug in the electrical outlet. Turn the receiver on by rotating the tone control knob clockwise until the switch is heard to click and then rotate this knob to the extreme clockwise position. Wait about a minute for the tubes to warm up. Turn the wave-band switch to the broadcast position, clockwise. Turn the volume control clockwise to about half of its full rotation.

2. Select six nearby stations desired for automatic tuning. Choose one of these stations and any button to be adjusted for it. Find the station call letters on one of the four cards supplied in an envelope with the receiver. Push out the circular tab bearing the station call letters from the card and press it in the depression in the front face of the push-button. Insert one of the clear celluloid discs, which are supplied in a separate envelope, over the station tab in the push-button. Press this disc in firmly. See Fig. 4.

3. Push in the manual selector knob (second from right). When pushing in the selector knob or one of the push-buttons best results are obtained by using a firm rapid action.

4. With the selector knob depressed tune in the desired station. Rotate the selector knob until the mark on the dial face corresponding approximately to the frequency of the station appears at the black indicator line on the conical escutcheon window. Identify the station and note the approximate position of the dial face.

5. Push in the button to be adjusted for this station. See Fig. 1.

6. Insert a small thin coin in one of the slots of the adjusting button immediately below the push-button. Turn the adjusting button until the mark on the dial face corresponding approximately to the frequency of the station again appears at the black indicator line on the conical escutcheon window. Once the station is heard, tune it in carefully by turning the adjusting button back and forth slowly. From the standpoint of performance it is of paramount importance to tune in the station accurately. See Fig. 2.

7. It is very important, when tuning in a station by means of the adjusting button, that the last turning motion of the adjusting button be in the counter-clockwise direction, as indicated in Fig. 3.

8. Check the results by moving the dial face, using the selector knob, to a different position and then pushing in the button. The station should be received clearly and with maximum volume.

9. Adjust the remaining buttons, one at a time, following the procedure outlined above.

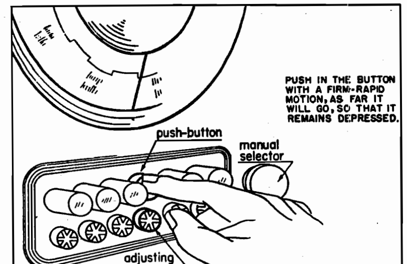


FIGURE 1

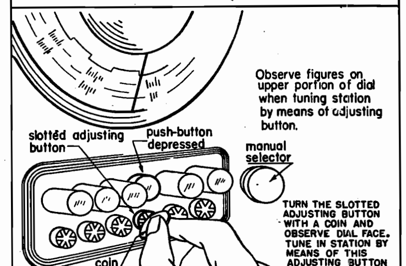


FIGURE 2

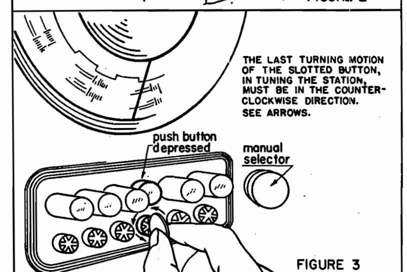


FIGURE 3

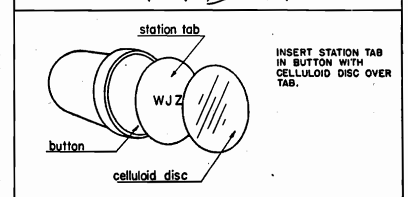
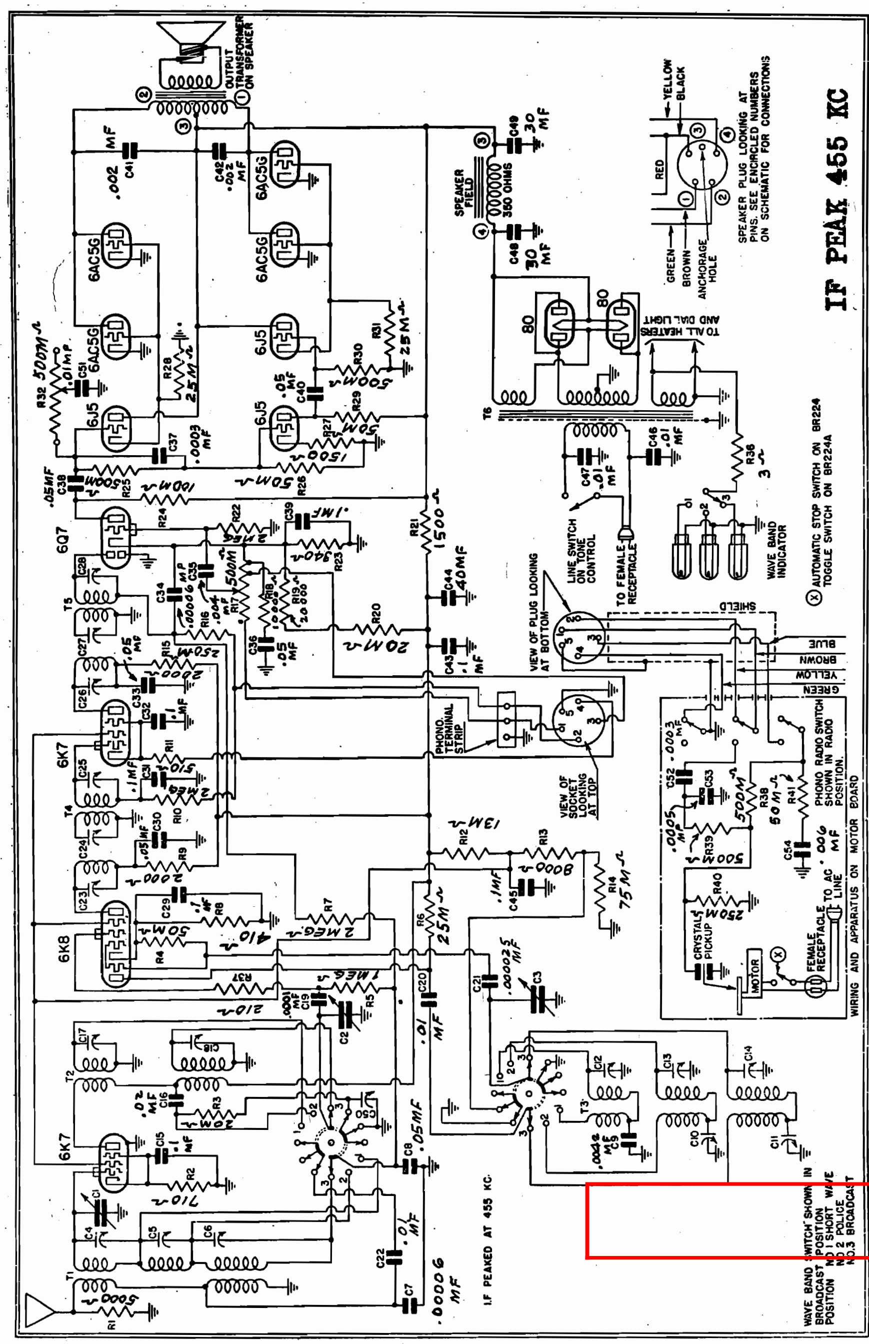


FIGURE 4

EMERSON RADIO & PHONOGRAPH CORP.

MODELS BR224
BR224A
Chassis BR
Schematic, Notes



GENERAL NOTES

1. In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not float freely, and do not allow any part of the dial assembly to touch the cabinet. Do not push control knobs on so far that they touch the cabinet front panel. If these precautions are not observed the receiver may become microphonic.
2. The color coding of the power transformer leads is as follows:
   - Primary—two black leads
   - High voltage sec.—two red leads
   - High voltage secondary center tap—red and yellow leead
   - 6.3v sec.—two heavy green leads
   - 5v sec.—two heavy yellow leads
3. The phonograph motor has been adjusted at the factory to turn at a speed of 78 r.p.m. The speed may be checked by counting the turns per minute or by using a stroboscope disc and a neon light. The stroboscope method will work only when the neon bulb is lighted from a 60 cycle a.c. supply. To readjust the speed on Model BR-224, remove the turntable and turn the speed adjusting screw (located near the turntable shaft). A clockwise rotation of the screw decreases the speed. The speed should be checked with the pick-up and record in playing position.

   To readjust the speed on Model BR-224A, remove the record and set the turntable by turning it slowly to give access to the speed regulator screw through a hole in the turntable. Adjust in same manner as BR-224.

Voltage rating	105-125 volts, 60 cycles, a.c.
Power consumption	135 watts at 117.5 volts. 20 watts for phonograph motor.
Frequency ranges	540 to 1800 kc, 1800 to 6,250 kc and 5.8 to 22.0 megacycles.

TUBE DATA

1—6K7, R-f amplifier (behind right-hand section of variable condenser).
1—6K8, Triode-hexode, oscillator-modulator (behind left-hand section of variable condenser).
1—6K7, I-f amplifier (between the two i-f transformers).
1—6Q7, Diode detector, audio amplifier, a.v.c. (left rear corner of chassis).
1—6J5, Phase inverter (left side of chassis, third from rear).
2—6J5, Second audio amplifiers (left side of chassis, second from rear, and right side of chassis beside electrolytic condensers).
4—6AC5G, Dynamic coupled, power output (two are in front of power transformer; other two are alongside power transformer near variable condenser).
2—80, Rectifiers (beside power transformer, at rear of chassis).

MODEL BR224A
MODELS AX232 AC, AX232 AC-DC
Record Changer Data

EMERSON RADIO & PHONOGRAPH CORP.

MODEL AX-232, A.C.

Five-tube A.C. Portable Combination

Part No. 4XPM-18A used with

MODEL AX-232, A.C.-D.C.

Five-tube A.C.-D.C. Portable Combination

Part No. 4XPM-18 used with

MODEL BR-224A

Thirteen-tube A.C. Radio-Phonograph Combination

AUTOMATIC OPERATION

1. Turn the receiver "on" in the usual way.
2. Rotate the phono-radio switch knob counter-clockwise to the phonograph position. Wait about a half-minute for the tubes in the receiver to warm up.
3. See that the pick-up is over the needle gauge plate with needle properly in place. If not, complete a *cycle* as follows: Throw the turntable switch "on." The turntable will start to revolve and the cycle of motion on the pick-up arm will follow through. When the pick-up arm comes down (and it can be moved by hand) the cycle is completed. Turn off the turntable switch.
4. The Index and Record Reject Lever are located near the right front corner of the motor board. With this lever at "Manual" position place the records on the record holder shelves. The records should be arranged in the desired order with the desired selection face up and the last selection on top. The first record to be played will rest directly on the shelves. The turntable should be empty.
5. Throw the turntable switch to the "on" position. The turntable should start to revolve.
6. While the turntable is revolving, push the Index and Record Reject Lever to the "Reject" position and let go. When the lever is released, after it has been pushed to "Reject," it will return automatically to the "10" position. If all the records to be played are 12 inch, return the lever to the "12" position. The changer will then begin to go through its cycle and the first record will drop on the turntable. The entire series of records will then be played automatically in sequence.
7. Adjust to the desired volume by means of the regular receiver volume control.
8. Close the cabinet lid to eliminate normal mechanical noises due to needle vibration.

The whole series of records will now play without further attention, and the last record will repeat until the turntable switch is turned off. Allow the record-changing mechanism to complete its cycle before the turntable is stopped. Then lift the pick-up, swing the arm to the right beyond the edge of the record and lower it onto the pick-up rest with pick-up over needle gauge plate. The record player is then ready for reloading, or for manual operation.

MANUAL OPERATION

1. Proceed as in steps 1, 2 and 3 under Automatic Operation.
2. Place record on turntable with desired selection upwards.
3. Set Index and Record Reject Lever to "Manual" position. The lever should be kept in this position when not actually playing records automatically.
4. Throw the turntable switch on and when turntable has attained speed, lift pick-up and gently lower onto the record, so that the needle point enters the outside groove.
5. Proceed as in steps 7 and 8 under Automatic Operation.

SPECIAL PRECAUTIONS

1. This instrument is not recommended for playing 10 inch and 12 inch records in mixed sequence. If the user desires this service he must be positive that all records are perfectly flat and free from warp. The Index and Record Reject Lever must be set at "10" and after playing the last selection the pick-up will come down in position for a 10 inch record and repeat the playing of the record on a 10 inch diameter unless the turntable switch is turned off. Any jamming of the mechanism under these conditions indicates that the records used are not perfectly flat or that their edges are not sufficiently smooth to permit normal operation of the separators in dropping each record in sequence onto the turntable.
2. Do not handle or move manually the pick-up or any part of the mechanism while it is going through the record-changing operation.
3. Do not use force in handling the mechanism at any time.
4. Warped or thick records should not be used for automatic operation.
5. Do not leave records on record holder posts except when needed for immediate operation, as they will warp and sag if left in this manner for a long period of time. Records can be straightened, however, by placing them on a flat surface and resting heavy flat articles, such as books, over them.
6. During automatic operation, the needle is fed automatically into the starting groove of the next record. If the needle fails to enter the starting groove, this is an indication that the cabinet is not level. Raise the right hand side of the cabinet, by inserting several thin spacers beneath it on that side. If the needle slides over a few grooves, raise the left hand side of the cabinet in a similar manner.
7. Never leave pick-up with needle resting on a record or on the turntable. When finished playing, be sure that the turntable has stopped and the pick-up is in the rest position over needle gauge plate.

Replacements should be made with genuine Emerson parts for best results.

Record Changer Adjustments

EMERSON RADIO & PHONOGRAPH CORP.

MODEL BR224A
MODELS AX232 AC, AX232 AC-DC

Automatic Record Changer

GENERAL INFORMATION

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc. are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving with a standard pin punch.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

ADJUSTMENTS

A. **Main Lever.**—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch

B. **Friction Clutch.**—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. **Pickup Lift Cable Screw.**—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. **Needle Landing on Record.** — The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17". Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D".

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. **Record Separating Knife.** — The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained The spacing for the 10 inch record is nominally .055 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .052—.058 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. **Record Support Shelf.**—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustments be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H".

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. **Tone Arm Rest Support (not shown).**—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. **Trip Pawl Stop Pin.**—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

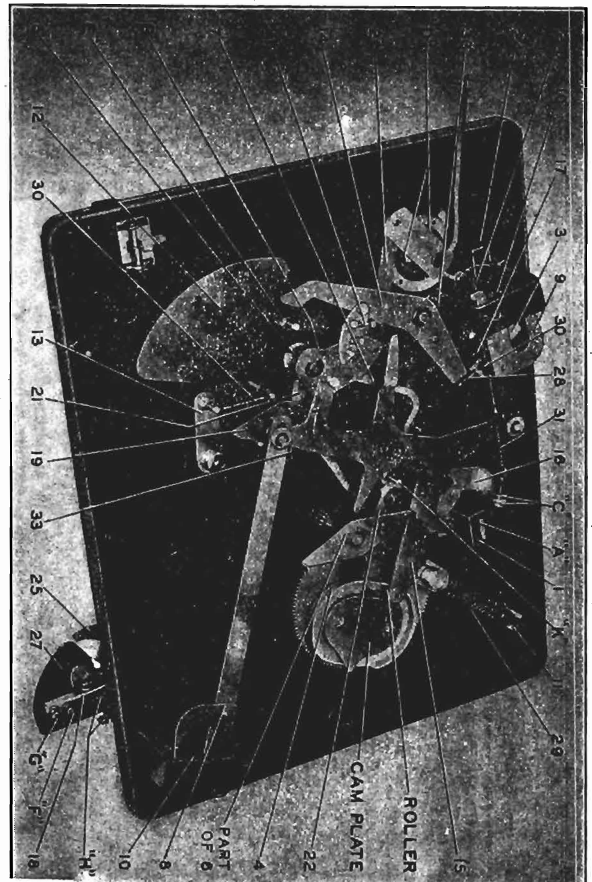
MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual mis-adjustments will enable ready adjustment in most cases.

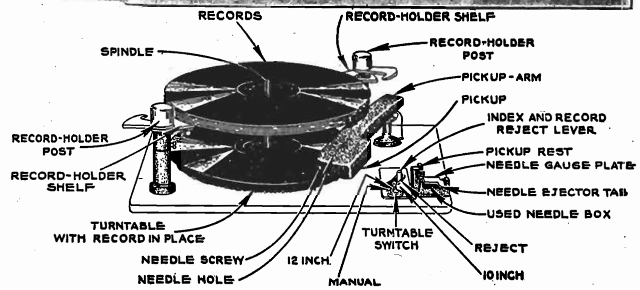
1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A".
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E".
3. Needle does not land properly on 12 inch record but correct on 10 inch. Effect adjustment "E".
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B". Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C".
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; flexible coupling between motor and changer mechanism not correctly assembled; or instrument is not being operated at normal room temperature (65° F)
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H"
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring "30"

MODEL BR224A
MODELS AX232 AC, AX232 AC-DC
Record Changer, Diagrams, Notes

EMERSON RADIO & PHONOGRAPH CORP.



Bottom View of Automatic Record Changer



Top View of Automatic Record Changer

AUTOMATIC RECORD CHANGER

GENERAL NOTES

1. The pick-up must be over the needle gauge plate to insert or change needles. To insert a needle initially, loosen the needle screw on the front of the pick-up, place needle in hole at the top so that it drops down against the needle gauge plate and then tighten up the needle screw.
2. The phonograph motor has been adjusted at the factory to turn at a speed of 78 r.p.m. The speed may be checked by counting the turns per minute or by using a stroboscope disc and a neon light. (The stroboscope method will only work when neon bulb is lighted from a 60 cycle a.c. supply.) To readjust the speed lift off the record and set the turntable by turning it slowly to give access to the speed regulator screw through one of the three holes in the turntable. Insert a screw-driver through the hole in the turntable into the groove in the speed regulator screw and turn to right (clockwise) to decrease speed, or to the left (counter-clockwise) to increase speed. Replace and replay record and adjust until speed is checked at 78 r.p.m.
3. A few drops of good quality light machine oil should be applied in the oil holes at regular intervals, about once every six months. The three holes in the top of the turntable give access to the oil holes in the motor mechanism beneath. Revolve the turntable slowly until the oil holes can be seen through the turntable, then apply the oil.
4. Model AX-232, AC-DC portable automatic combination carries an a.c.-d.c. switch at the left of the turntable to switch the motor for a.c. or d.c. supply. It is important that this switch be in the proper position for the power-supply available.

CONTROLS AND MOVING MECHANISM

INDEX and RECORD REJECT LEVER.—This lever is located near the right front corner of the motorboard with its index plate marked for four positions—*"Manual,"* "12," "10," and *"Reject."* When you desire to change record selections manually, this lever should be set in the *"Manual"* position. With the lever in the "12" position, the mechanism is set to play a series of 12-inch records automatically. To play either a series of 10-inch records, or 10- and 12-inch records mixed, the lever should be set at the "10" position.

To reject a record being played, or to start the record-changing cycle in case the record just played does not have the standard eccentric or spiral stopping groove, simply push the lever to the *"Reject"* position and let go. The pick-up will raise up and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If you are playing a series of 12-inch records, the lever should be returned to the "12" position after rejecting a record. Keep the lever in its *"Manual"* position when not actually playing records automatically.

TURNTABLE SWITCH.—The toggle switch located just in front of the Index and Record Reject Lever controls the current to the turntable motor. To start the turntable, throw the switch to the "ON" position. To stop the turntable throw the switch to the "OFF" position.

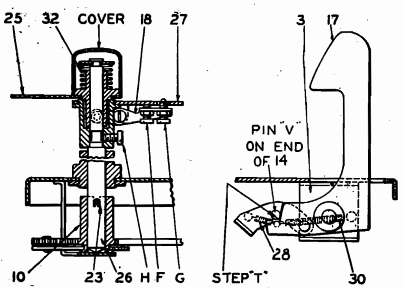
PICK-UP and TOP-LOADING NEEDLE SOCKET.—The pick-up is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pick-up arm should be moved out to the right beyond the turntable and placed at rest on the support with the edge of the pick-up arm in the groove and the pick-up over the needle gauge plate. The pick-up must be in this position to change needles.

To insert a needle initially, loosen the needle screw on the front of the pick-up, place needle in hole at top so that it drops down against the needle gauge plate and then tighten up the needle screw.

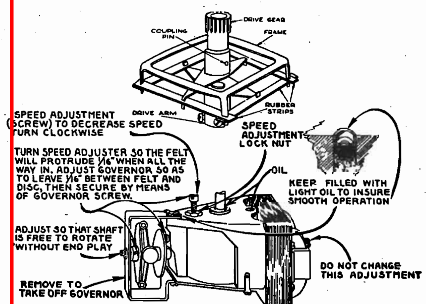
NEEDLE EJECTOR.—The extending tab on the needle gauge plate of the needle box operates the needle ejector. To change a needle, place pick-up in rest position, loosen needle screw and press the extending tab on the needle gauge plate to drop the used needle into the box below. Release tab, allowing the needle gauge plate to swing back, and then insert a new needle in the pick-up as described above.

RECORD HOLDER SHELVES.—To place a record on the turntable or to remove records, raise the record holder shelves, by lifting with the fingers under the shelf, and swing clear of outer edge of record. Also push back vertical lever adjacent to the rear record holder post. You now have clear access to the turntable. Before loading the magazine for Automatic Operation swing the record holder shelves back into position.

Note: Numbers refer to parts—letters refer to adjustments.



Details of Record Shelf Posts, and Locating Lever Assemblies



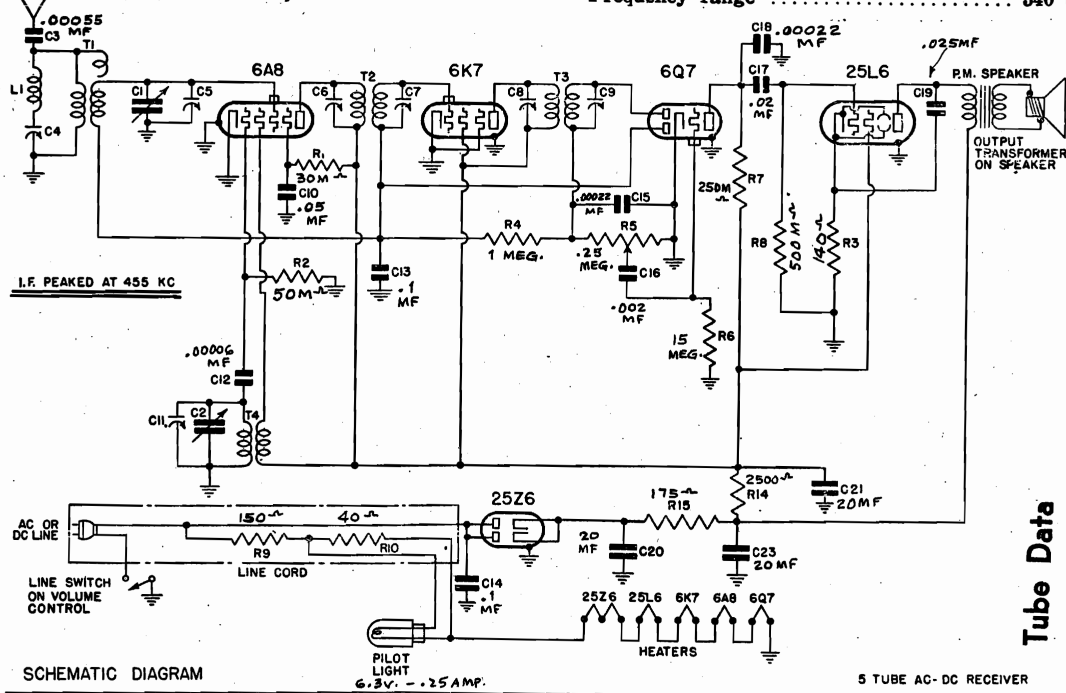
Motor Data and Coupling

MODEL AX240
Chassis AX
Schematic, Voltage
Alignment, Changes

EMERSON RADIO & PHONOGRAPH CORP.

Five-Tube, A.C.-D.C., Superheterodyne Receiver

Voltage rating	105-125 volts
Power consumption	45 watts
Frequency range	540 to 1730 kc.



SCHEMATIC DIAGRAM FOR MODEL AX-240
(*See Production Change, No. 1*)

Tube Data

The tube complement is as follows:
1—6A8 or 6A8GT, pentagrid oscillator modulator.
1—6K7 or 6K7GT, first i-f amplifier.
1—6Q7 or 6Q7GT, diode detector, a-f amplifier, a.v.c.
1—25L6 or 25L6GT, beam power output.
1—25Z6 or 25Z6GT, dual half-wave rectifier.

All tubes are replaceable with either metal or equivalent bantam glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a bantam size glass envelope. In all other respects it is exactly the same as the metal tube bearing the same number without the "GT."

PRODUCTION CHANGE

1. A resistor 100,000 ohms, part no. KR-54, (not shown in schematic for AX-240) is connected in series with the high side of the volume control.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A8	100	55	0	100	6.3
6K7	100	100	0		6.3
6Q7	43	—	0	—	6.3
25L6	92	100	5.5	—	25.0

Voltage at 25Z6 cathode—128 volts.
Voltage across speaker field—28 volts.

The color coding of the i-f transformer leads is as follows:
Grid—green; Grid return—black; Plate—blue; B plus—red.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil directly behind the speaker. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

I-f and Wave-Trap Alignment

Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 6A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response. (See General Notes, paragraph No. 7.)

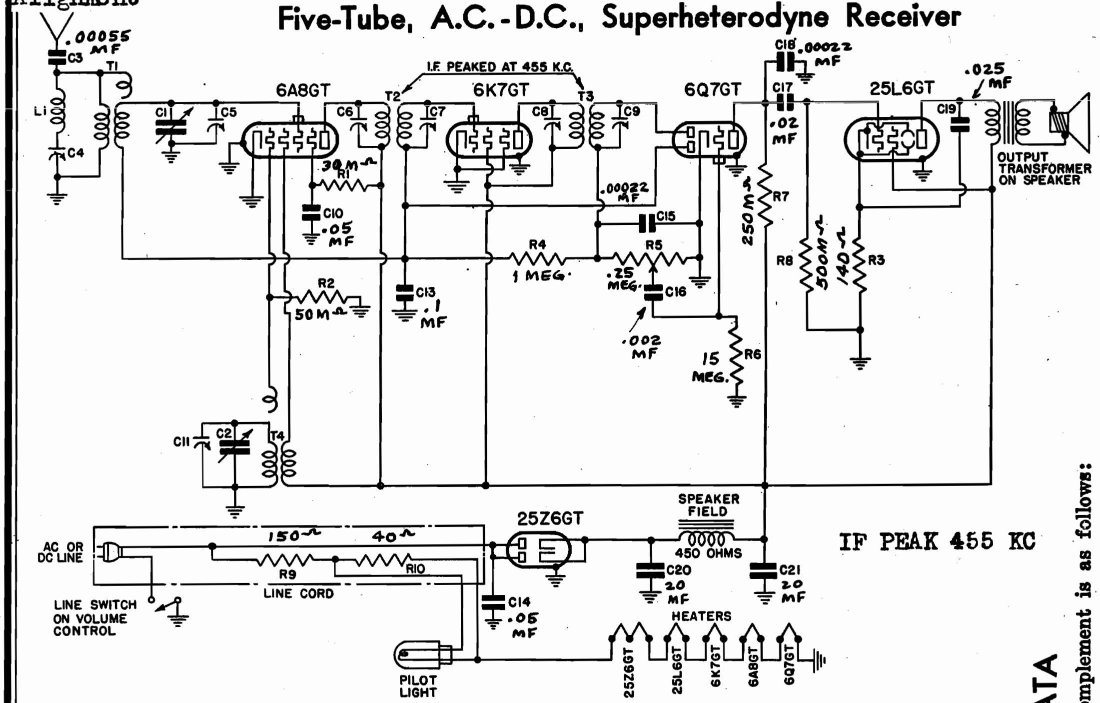
R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

MODELS CH243,CH246,CH256
Chassis CH
Schematic,Voltage
Alignment

EMERSON RADIO & PHONOGRAPH CORP.

Five-Tube, A.C.-D.C., Superheterodyne Receiver



TUBE DATA

The tube complement is as follows:

1—6A8 or 6A8GT, pentagrid oscillator modulator.
1—6K7 or 6K7GT, first i-f amplifier.
1—6Q7 or 6Q7GT, diode detector, a-f amplifier a.v.c.
1—25L6 or 25L6GT, beam power output.
1—25Z6 or 25Z6GT, dual half-wave rectifier.

All tubes are replaceable with either metal or equivalent bantam glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a bantam size glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

MODELS CH-243, CH-246 and CH-256

CHASSIS MODEL CH

Voltage rating	105-125 volts, a.c. or d.c.
Power consumption	45 watts
Frequency range	540 to 1730 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A8	100	55	0	100	6.3
6K7	100	100	0	—	6.3
6Q7	43	—	0	—	6.3
25L6	92	100	5.5	—	25.0

Voltage at 25Z6 cathode—125 volts. **Voltage across speaker field—28 volts.**

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil directly behind the speaker. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

I-f and Wave-Trap Alignment

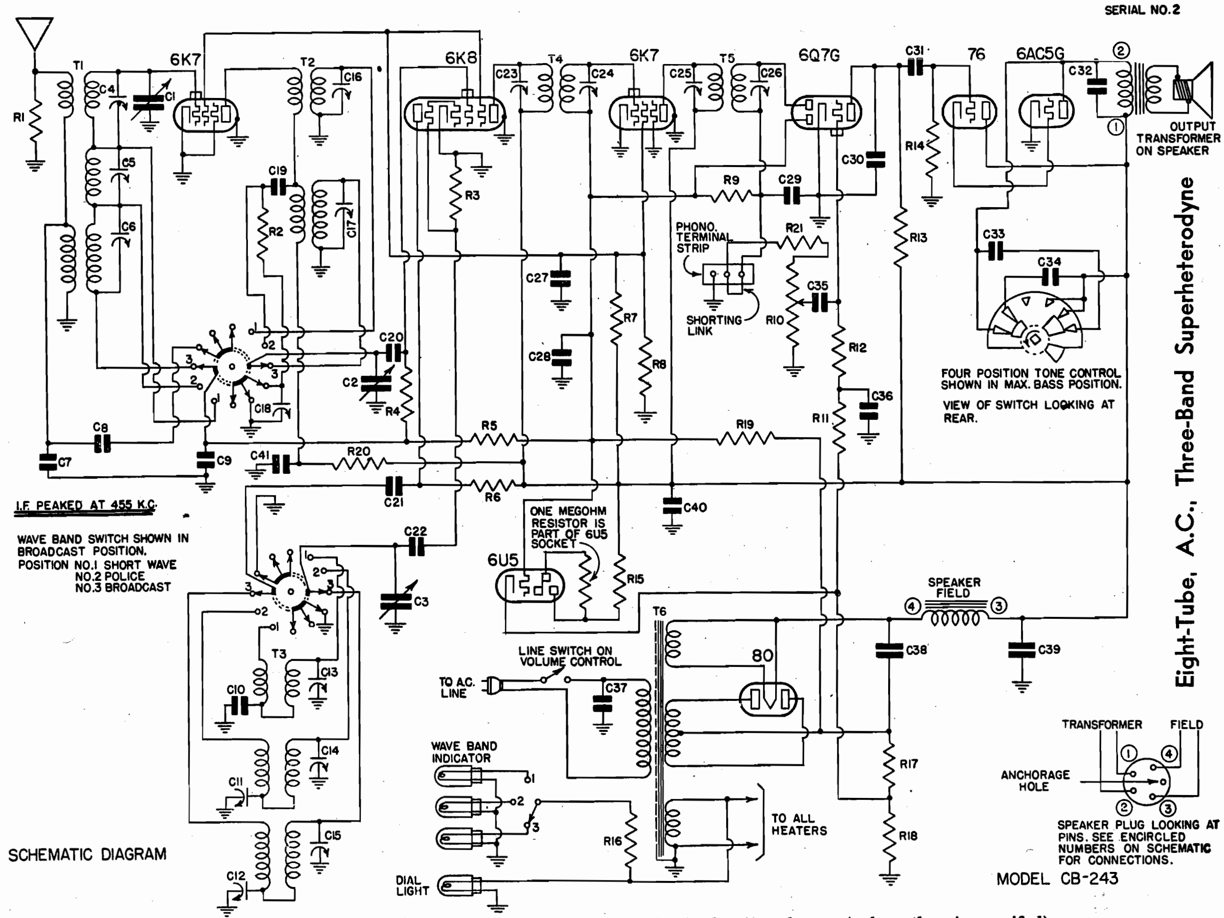
Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 6A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response. (See General Notes, paragraph No. 7.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

MODEL CB243
Chassis CB
Schematic, Voltage
Notes

EMERSON RADIO & PHONOGRAPH CORP



Eight-Tube, A.C., Three-Band Superheterodyne

Voltage rating	105-125 volts, 60 cycle, a.c. (unless otherwise specified)
Power consumption	60 watts
Frequency ranges	540 to 1800 kc, 1800 to 6250 kc and 5.8 to 22 megacycles

GENERAL NOTES

1. The receiver should never be turned on with either the speaker plug or the 6AC5G tube out of their respective sockets, since the rapid rise in rectifier voltage will damage the electrolytic condenser.
2. When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism will result.
3. The color coding of the i-f transformers is as follows:
   Grid—green
   B plus—red
   Grid return—black
   Plate—blue.
4. The color coding of the power transformer is as follows:
   Primary—two black leads
   High-voltage secondary—two red leads
   High-voltage secondary center tap—red and yellow lead
   6.3 volt secondary—two green leads
   5 volt secondary—two yellow leads.
5. The adjustable padding condensers for the broadcast and police bands are mounted on the rear chassis wall with the screw adjustment accessible through holes in the rear of the chassis. The short-wave band has a fixed padder, C10 on schematic. When replacing this fixed padder be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.
6. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.

   In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

Tube Data

The tube complement is as follows:
1—6K7, r-f amplifier (to left of variable condenser)
1—6K8, triode-hexode oscillator-modulator
1—6K7, i-f amplifier (behind variable condenser)
1—6Q7G, diode detector, audio amplifier and a.v.c.
1—76, audio amplifier
1—6AC5G, power output
1—6U5, electron-ray tuning indicator
1—80, full-wave rectifier.

Note: The following special voltage transformers are also available:
6BT-455 Universal power transformer: 110, 130, 210 and 225 volts, 40-60 cycles.
6BT-456 Power transformer: 110 and 127 volts, 50 cycles.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 110 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

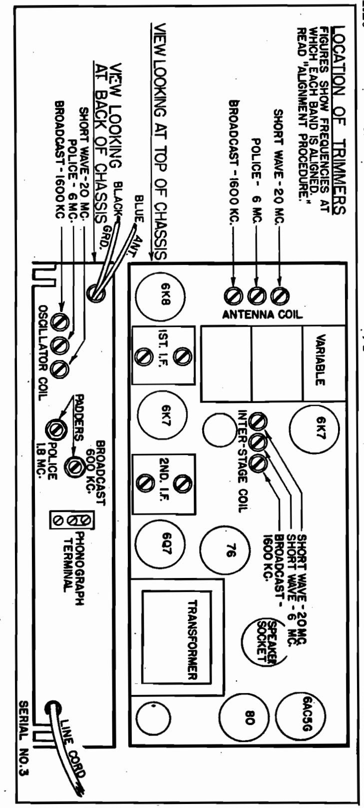
Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6K7 (r-f)	170	85	0	—	6.3 a.c.
6K8	206	85	0	77	6.3 a.c.
6K7 (i-f)	206	85	0	—	6.3 a.c.
6Q7G	100	—	0	—	6.3 a.c.
76	206	—	10.3	—	6.3 a.c.
6AC5G	195	—	0	—	6.3 a.c.

Voltage at 80 filament to B minus (center tap on high voltage winding)—300 volts.
Voltage across speaker field—86 volts.
The grid bias for all tubes is developed across resistors R17 and R18. This voltage should measure 10.8 volts.

MODEL CB243
Alignment, Socket
Trimmers, Parts

EMERSON RADIO & PHONOGRAPH CORP.

* Item	Part No.	DESCRIPTION	List Price Ea. Effective as of Oct. 15th, 1938 PRICE
T1	4BT-396	Three-band antenna coil	$2.05
T2	4BT-397	Three-band interstage coil	1.80
T3	5RT-447	Three-band oscillator coil	1.75
T4	4ZT-425A	455 kc first i-f transformer	1.20
T5	3RT-321C	455 kc second i-f transformer	1.10
T6	6BT-451	Power transformer, 117.5 V, 50-60 cycle (See note below)	4.50
R1	LR-64	5000 ohm 1/4 watt carbon resistor	.16
R2	LR-60	20,000 ohm 1/4 watt carbon resistor	.16
R3, R5, R21	KR-53	50,000 ohm 1/4 watt carbon resistor	.16
R4, R14	KR-57	1 megohm 1/4 watt carbon resistor	.16
R6, R8	3LR-265	40,000 ohm 1/2 watt carbon resistor	.16
R7	3BR-246	10,000 ohm 2 watt carbon resistor	.28
R9, R12	HR-42	2 megohm 1/4 watt carbon resistor	.16
R10	3XR-277	Volume control 500,000 ohm, with line switch	1.00
R11, R13	KR-55	250,000 ohm 1 watt carbon resistor	.16
R15	GR-31	20,000 ohm 1 watt carbon resistor	.16
R16	4ZR-326	3 ohm 1/2 watt wire wound resistor	.16
R17	6BR-344	145 ohm 1 watt metallized resistor	.16
R18	4CR-320	35 ohm 1/2 watt wire wound resistor	.16
R19	3RR-275	10 megohm 1/4 watt carbon resistor	.16
R20	6BR-345	5000 ohm 1/2 watt carbon resistor	.16



ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600, 1800, 6000 and 20,000 kc should be used.

An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Use a dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for broadcast band dummy antenna, a .0001 mf condenser for the police band dummy antenna and a 400 ohm non-inductive resistor for the short-wave band dummy antenna.

Always use as weak a test signal as possible during alignment.

The set's oscillator is higher in frequency than the signal on *all three bands*, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, *not* a loosening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a sure source of noise, drifting, and microphonism.

In aligning antenna trimmers on the high-frequency signals there is always a tendency for the oscillator to drift, due to interlocking. To compensate for this always keep tuning the variable condenser as the trimmers are being adjusted.

I-f Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid cap of the 6K8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response.

Broadcast Alignment

Since the indicator is fastened to the cabinet, a piece of stiff wire should be fastened to the variable condenser and bent over to form an indicator when the chassis is removed from the cabinet. Set indicator at extreme low frequency end of dial with condenser closed.

Set the wave-band switch at the broadcast (clockwise) position, and the dial at 60. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series padder for maximum response. Move the dial to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the interstage and antenna coil trimmers for maximum response. Reset the dial at 60, feed 600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

Police Alignment

Set the wave-band switch at the police-band (central) position and the dial at 1.8. Feed 1800 kc to the antenna (using a .0001 mf dummy antenna) and adjust the police-band series padder for maximum response. Move the dial to 6.0, feed 6000 kc and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. Note the interstage coil on this band has no trimmer adjustment. Return the dial to 1.8, feed 1800 kc to the antenna and rock the variable condenser while readjusting the series padder for maximum response. Return to 6000 kc and check alignment. If readjustment is necessary return to 1800 kc and repeat entire procedure.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the dial to 20 and feed 20,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the interstage and antenna coil trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak. Move the dial to 6 mc, feed 6000 kc to the antenna and adjust the r-f interstage trimmer for maximum response.

Replacements should be made with genuine Emerson parts for best results.

C1, C2, C3	6BC-413	Three-gang variable condenser	5.55
†C4, C5, C6		Trimmers, part of antenna coil assembly	
C7, C20	4XC-393A	0.00006 mf mica condenser	.20
C8, C21, C35	KC-58	0.01 mf, 400 volt tubular condenser	.20
C9	BC-12	0.05 mf, 200 volt tubular condenser	.20
C10	3EC-267	0.0042 mf mica condenser	.40
C11	2NC-231B	Single adjustable padding condenser, range: 750-1500 mmf	.45
C12	2NC-231A	Single adjustable padding condenser, range: 300-600 mmf	.30
		(If dual padding condenser is used, order 5SC-409)	
	5SC-409	Dual adjustable padding condenser	.95
†C13, C14, C15		Trimmers, part of oscillator coil assembly	
†C16, C17, C18		Trimmers, part of interstage coil assembly	
C19, C31	LC-65	0.02 mf, 400 volt tubular condenser	.20
C22	4HC-395A	0.000026 mf mica condenser	.20
†C23, C24		Trimmers, part of first i-f transformer	
†C25, C26		Trimmers, part of second i-f transformer	
C27	BC-13	0.25 mf, 200 volt tubular condenser	.20
C28	FC-29	0.02 mf, 200 volt tubular condenser	.20
C29	5LC-410A	0.00011 mf mica condenser	.20
C30	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C32	3RC-373	0.0004 mf, 600 volt tubular or mica condenser	.20
C33	3XC-331	0.015 mf, 400 volt tubular condenser	.20
C34	EC-23	0.03 mf, 400 volt tubular condenser	.20
C36	AC-6	0.1 mf, 200 volt tubular condenser	.20
C37	3LC-297A	0.01 mf, 400 volt molded condenser	.20
C38	4ZC-379	16 mf, 375 volt wet electrolytic condenser	.95
C39	4ZC-380	16 mf, 285 volt wet (regulating type) electrolytic condenser	.80
C40, C41	EEC-132	0.1 mf, 400 volt tubular condenser	.20

REPLACEMENT PARTS LIST

MODEL CB-243

CHASSIS MODEL CB

5WS-352	8" dynamic speaker	7.50
6BS-356	Wave-band switch	1.95
4ZS-317	Tone-control switch	.80
4BL-94	Pilot light 6.3 volt .25 amp Mazda No. 44	.20
6BD-62	Conical dial face	1.70
4YZ-844A	Conical crystal and escutcheon	1.50
5SE-4	Molded escutcheon for electron ray indicator tube	.05
3XZ-684	Electron ray tube socket and cable assembly	.80
4YZ-772	Dial drive cord	.02
5JZ-824	Dial drive cord spring	.05
4XM-367	Dial drive pulley	.10

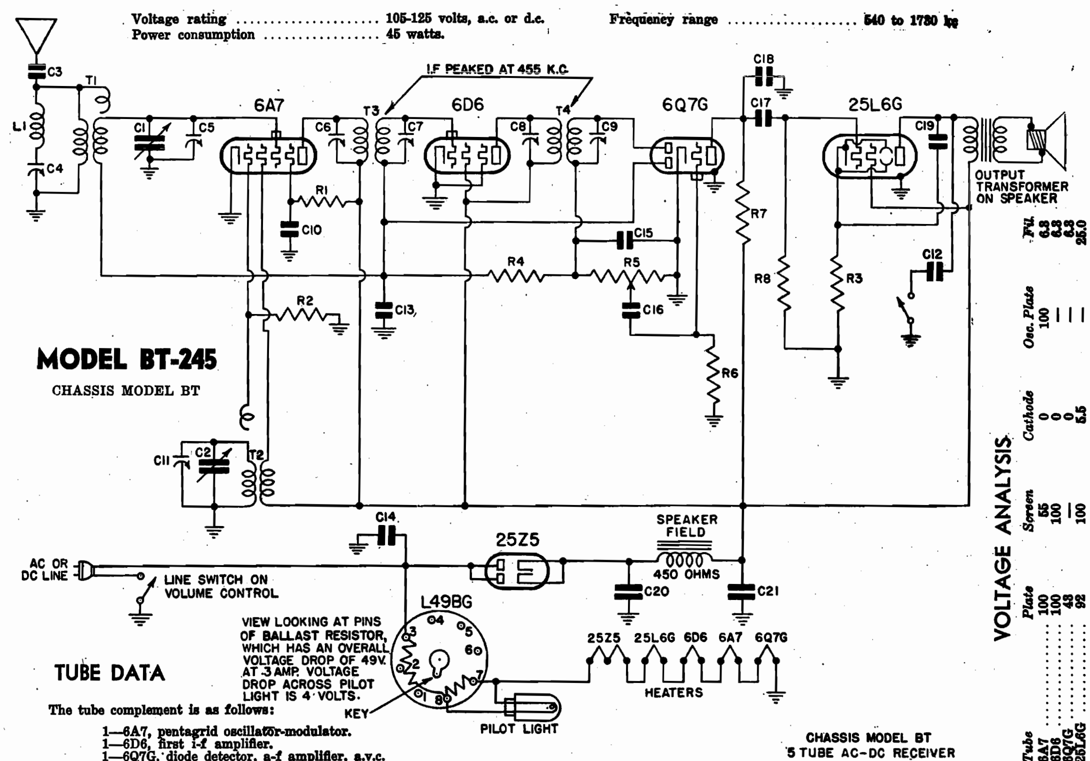
*Item number locates the article on the schematic diagram.

†These trimmer condensers are part of the coil assemblies and cannot be supplied separately.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL BT245
Chassis BT
Schematic, Voltage
Alignment, Parts

Voltage rating .... 105-125 volts, a.c. or d.c.
Power consumption .... 45 watts.
Frequency range .... 540 to 1730 kc



MODEL BT-245

CHASSIS MODEL BT

TUBE DATA

The tube complement is as follows:

1—6A7, pentagrid oscillator-modulator.
1—6D6, first i-f amplifier.
1—6Q7G, diode detector, a-f amplifier, a.v.c.
1—25L6G, beam power output.
1—25Z5, dual half-wave rectifier.

All octal-base tubes are replaceable with either metal or equivalent octal-base glass tubes. The letter "G" at the end of the tube number indicates that the tube has a glass envelope. In all other respects it is exactly the same as the metal tube bearing the same number without the "G."

VOLTAGE ANALYSIS

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	55	0	100	6.3
6D6	100	100	0	—	6.3
6Q7G	43	—	0	—	6.3
25L6G	92	100	5.5	—	25.0

Voltage at 25Z5 cathode—128 volts.
Voltage across speaker field—28 volts.
Voltage drop across ballast resistor L49BG (pins 3, 7)—49 volts.
Voltage drop across pilot light section of ballast resistor (pins 7, 8)—4 volts.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. Measurements made with 117.5 volts d.c. will be lower than those given below.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
4. The color coding of the i-f transformer leads is as follows:
   Grid—green Plate—blue
   Grid return—black B plus—red.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first and second i-f transformers are mounted on the left hand inside wall of the chassis. The trimmers for the first i-f transformer are accessible through the lower pair of holes in the side of the chassis. The trimmers for the second i-f transformer are accessible through the upper pair of holes in the chassis.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible through a hole in the right side of the chassis.

I-f and Wave-Trap Alignment

Rotate the variable condenser to the minimum capacity position. Feed 455 kc to the grid-cap of the 6A7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap trimmer for *minimum* response. (See General Notes, paragraph No. 6.)

R-f Alignment

Set the dial pointer at 140, feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

REPLACEMENT PARTS LIST

List Price as: Effective as of Mar. 1st, 1939 (Subject to change without notice)

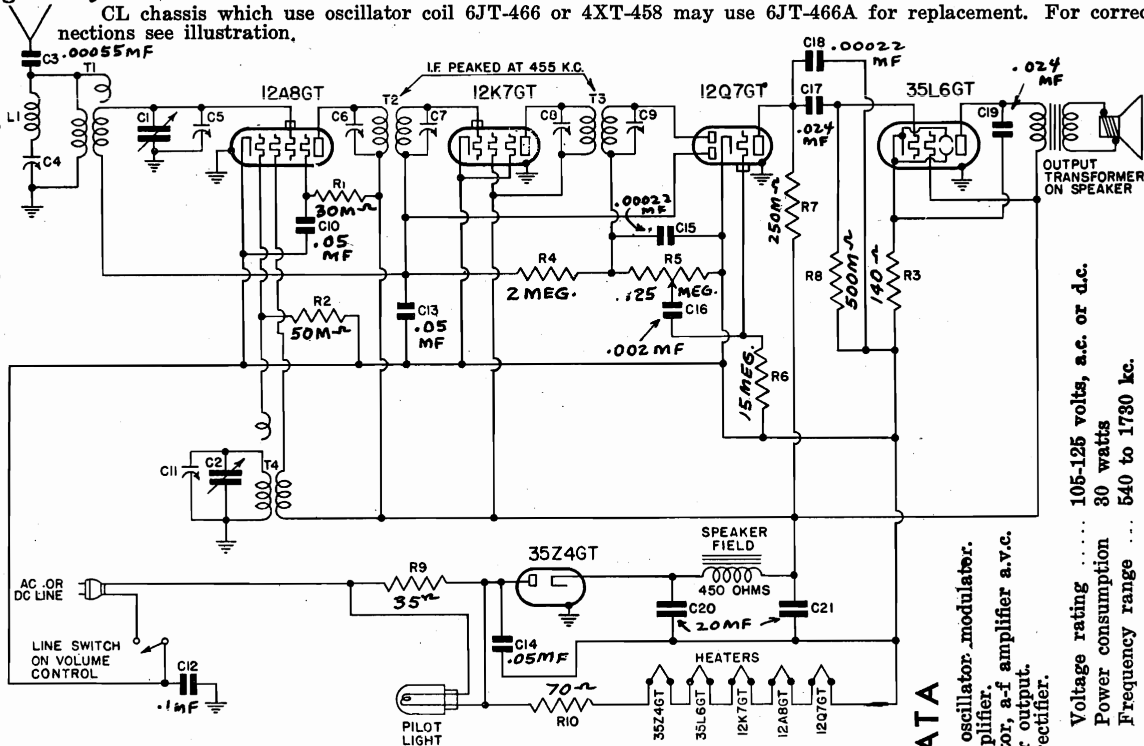
Item	Part No.	DESCRIPTION	Price
L1, T1	5YT-444	Antenna coil with adjustable 455 kc wave-trap	$ .90
T2	4XT-458	Oscillator coil	.35
T3	5TT-463	Double-tuned 455 kc first i-f transformer	.90
T4	4XT-435A	Double-tuned 455 kc second i-f transformer	.80
R1	ZZR-196	30,000 ohm ¼ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R4	KR-57	1 megohm ¼ watt carbon resistor	.16
R5	2NR-214	Volume control .25 megohm with line switch	1.20
R6	4XR-327	15 megohm ¼ watt carbon resistor	.16
R7	KR-55	250,000 ohm ¼ watt carbon resistor	.16
R8	KR-56	500,000 ohm ¼ watt carbon resistor	.16
	L-49BG	Plug-in ballast resistor. (Interchangeable with L-49B)	.55
C1, C2	5TC-423	Two-gang variable condenser	2.40
C3	4XC-401	0.00055 mf mica condenser	.20
C4		Trimmer, part of wave-trap assembly.	
C5, C11		Trimmers, part of variable condenser.	
C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10	BC-12	0.05 mf, 200 volt tubular condenser	.20
C13	AC-6	0.1 mf, 200 volt tubular condenser	.20
C12, C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C15, C18	4XC-394A	0.00022 mf mica condenser	.20
C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C17	LC-65	0.02 mf, 400 volt tubular condenser	.20
C19	3FC-336	0.025 mf, 400 volt tubular condenser	.20
C20, C21	4HC-348D	Dual 20 mf, 150 volt dry electrolytic condenser	.90
	3QS-257B	5" dynamic speaker	4.45
	4DS-264A	Tone control switch	.25
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44	.20
	5TD-68	Dial face	.20
	3RZ-484	Drive cord	.02
	3RZ-519	Drive cord spring	.02
	4UZ-700A	Dial pointer	.15
	4UZ-842	Dial crystal	.10

MODELS CL246, CL253
CL256 Chassis CL
Schematic, Voltage
Alignment, Data

PRODUCTION CHANGE

CL chassis which use oscillator coil 6JT-466 or 4XT-458 may use 6JT-466A for replacement. For correct lug connections see illustration.

Five-Tube, A.C.-D.C., Superheterodyne



TUBE DATA

12A8 or 12A8GT, pentagrid oscillator modulator.
12K7 or 12K7GT, first i-f amplifier.
12Q7 or 12Q7GT, diode detector, a-f amplifier a.v.c.
35L6 or 35L6GT, beam power output.
35Z4 or 35Z4GT, half-wave rectifier.

Voltage rating . . . . . 105-125 volts, a.c. or d.c.
Power consumption . . . 30 watts
Frequency range . . . 540 to 1730 kc.

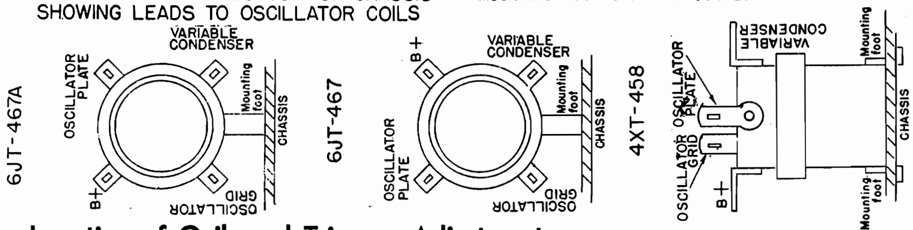
The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black

Plate—blue
B plus—red.

VIEW LOOKING AT BOTTOM OF CHASSIS SHOWING LEADS TO OSCILLATOR COILS

MOUNTING FOOT IS GROUND CONNECTION FOR ALL COILS



Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil directly behind the speaker. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

I-f and Wave-Trap Alignment

Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 12A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for *minimum* response. (See General Notes, paragraph No. 5.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

VOLTAGE ANALYSIS

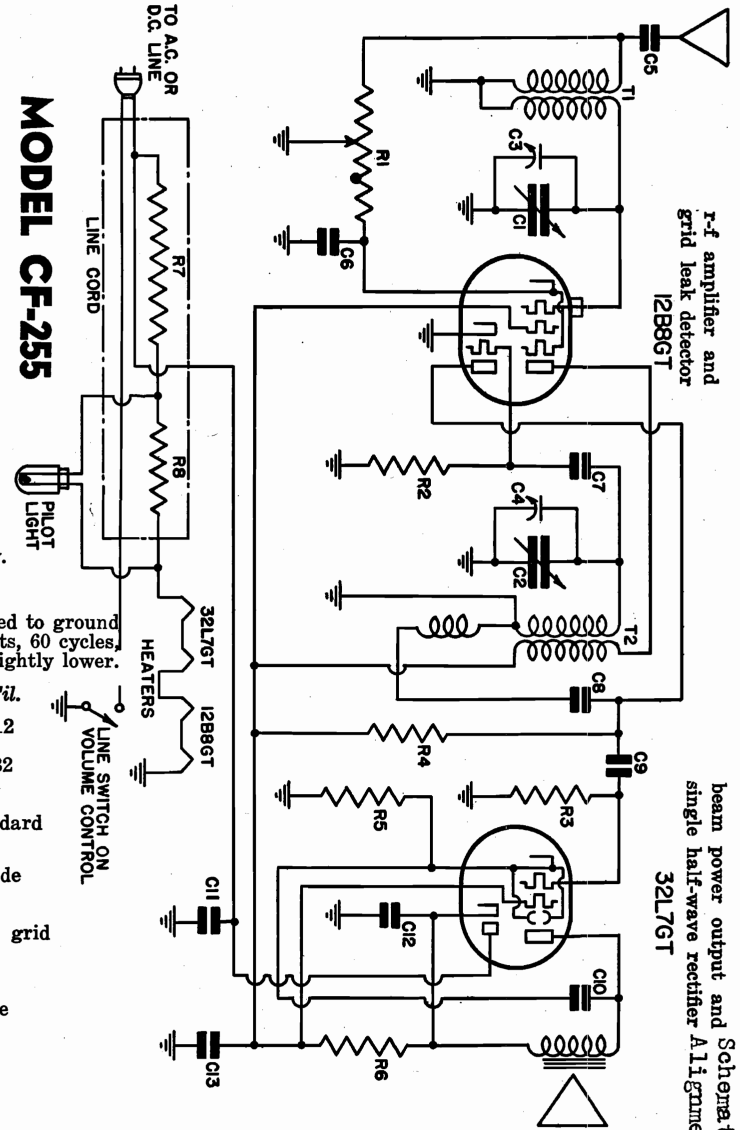
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
12A8	94	50	0	94	12
12K7	94	94	0	—	12
12Q7	40	—	0	—	12
35L6	87	94	5.2	—	35

Voltage at 35Z4 cathode—121 volts.
Voltage across speaker field—27 volts.

Voltage across pilot light section of ballast resistor (R9)—3.5.
Voltage drop across entire ballast resistor (R9 and R10)—13.5.

EMERSON RADIO & PHONOGRAPH CORP.



A.C.-D.C. T.R.F. Receiver—Two Tubes

Voltage rating ..... 105 to 125 volts, a.c. or d.c.
Power consumption 40 watts.
Frequency range ... 540 to 1730 kc.

MODEL CF-255

CHASSIS MODEL CF

*Item	Part No.	DESCRIPTION	Effective as of March 1st, 1939 (Subject to change without notice)
T1	6FT-461	Broadcast antenna coil	$ .50
T2	6FT-462	Broadcast detector coil	.50
R1	6FR-346	Volume control 75,000 ohms with 200 ohm bias stop and line switch	.90
R2	3RR-275	10 megohm 1/4 watt resistor	.16
R3, R4	KR-56	500,000 ohm 1/4 watt carbon resistor	.16
R5	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R6	6FR-348	2,400 ohm ½ watt carbon resistor	.16
R7, R8	6FW-142	Resistance line cord with pilot light section	.80
C1, C2	6FC-422	Two-gang variable condenser	2.30
†C3, C4		Trimmers, part of variable condenser.	
C5	4XC-401	0.00055 mf mica condenser	.20
C6	BC-12	0.05 mf, 200 volt tubular condenser	.20
C7	CCC-127	0.01 mf, 200 volt tubular condenser	.20
C8	4XC-394A	0.00022 mf mica condenser	.20
C9	LC-65	0.02 mf, 400 volt tubular condenser	.20
C10	XXC-207	0.005 mf, 400 volt tubular condenser	.20
C11	LC-64	0.05 mf, 400 volt tubular condenser	.20
C12, C13	4HC-348B	Dual 20 mf, 150 volt dry electrolytic condenser	.90
	6FS-364	4" magnetic speaker	2.80
	6FD-67	Dial pointer	.05
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44	.20
	3RZ-519	Drive cord spring	.02
	4YZ-772	Dial drive cord	.02

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram. †These condensers cannot be supplied separately.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

Tube		*Plate*	*Screen*	*Cathode*	*Fil.*
12B8GT	Pentode	95 (pin no. 3)	95 (pin no. 4)	2.1 (pin no. 1)	12
	Triode	40 (pin no. 5)		0.0 (pin no. 6)	
32L7GT	Output	125 (pin no. 3)	95 (pin no. 4)	4.5 (pin no. 8)	32

Voltage at rectifier cathode—130 (pin no. 1)

The socket connections of the tubes used in the CF chassis are as follows, the numbering following standard designation R.M.A.

Tube 12B8GT: pin 1—r-f amplifier cathode
pin 2—heater
pin 3—r-f amplifier plate
pin 4—r-f amplifier screen grid
pin 5—detector plate
pin 6—detector cathode
pin 7—heater
pin 8—detector grid

Tube 32L7GT: pin 1—rectifier cathode
pin 2—heater
pin 3—output plate
pin 4—output screen grid
pin 5—output grid
pin 6—rectifier plate
pin 7—heater
pin 8—output cathode

R-f amplifier grid connection is made to grid cap.

ALIGNMENT PROCEDURE

An oscillator with a frequency of 1600 kc is required.

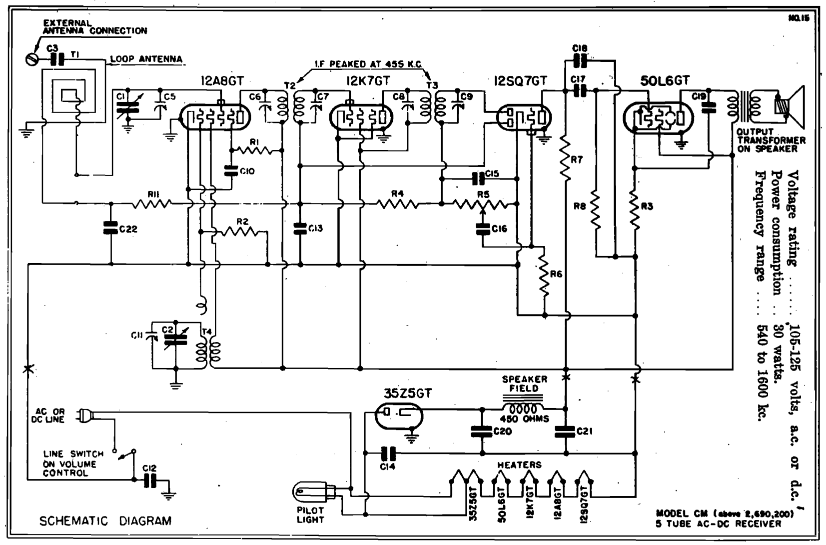
Use as weak a test signal as possible. An output meter should be used across the voice coil or output transformer for observing maximum response.

Examine the condenser drive assembly bracket and locate five dots embossed along the front. Rotate the variable condenser to maximum capacity and set the pointer just below the bottom dot. Then rotate the condenser until the pointer is just below the second dot from the top. Feed 1600 kc to the antenna through a .0001 mf condenser and adjust both trimming condensers for maximum response.

MODELS CM260,CM266
CM267 Early,Late
Chassis CM.
Above and Below Serial 2690200

EMERSON RADIO & PHONOGRAPH CORP.

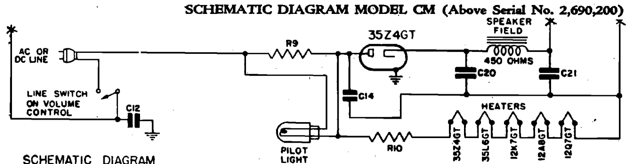
Schematics
Voltage
Alignment,Changes
Parts list



Voltage rating ...... 105-125 volts, a.c. or d.c.
Power consumption .. 30 watts.
Frequency range .... 540 to 1600 kc.

SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM MODEL CM (Above Serial No. 2,690,200)



NOTE: A 35L6GT output tube is used for sets of lower serial numbers.

SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM MODEL CM (Below Serial No. 2,690,200)

THE TUBE COMPLEMENT IS AS FOLLOWS:

For serial numbers below 2,690,200:		*For serial numbers above* 2,690,200:
1—12A8 or 12A8GT	pentagrid oscillator modulator	1—12A8 or 12A8GT
1—12K7 or 12K7GT	first i-f amplifier	1—12K7 or 12K7GT
1—12Q7 or 12Q7GT	diode detector, a-f amplifier, a.v.c.	1—12SQ7 or 12SQ7GT
1—35L6 or 35L6GT	beam power output	1—50L6 or 50L6GT
1—35Z4 or 35Z4GT	half-wave rectifier	1—35Z5 or 35Z5GT

All tubes are replaceable with either metal or equivalent bantam glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a bantam size glass envelope. In all other respects it is the same as tl metal tube bearing the same number without the "GT."

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

For serial numbers below 2,690,200:

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
12A8	94	50	0	94	12
12K7	94	94	0	—	12
12Q7	40	—	0	—	12
35L6	87	94	5.2	—	35

Voltage at 35Z4 cathode—121 volts.
Voltage across speaker field—27 volts.
Voltage across pilot light section of ballast resistor (R9)—3.5.
Voltage drop across entire ballast resistor (R9 and R10)—13.5.

For serial numbers above 2,690,200:

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
12A8	88	45	0	88	12
12K7	88	88	0	—	12
12SQ7	40	—	0	—	12
50L6	82	88	5.7	—	50

Voltage at 35Z5 cathode—115 volts.
Voltage across speaker field—27 volts.
Voltage across pilot light—4.5 volts.

PRODUCTION CHANGES

1. Chassis bearing serial numbers below 2,690,200 use R7—250,000 ohm ¼ watt carbon resistor .... .16
2. Resistor R9—R10, part no. 6JR-353, is not used on chassis bearing serial numbers above 2,690,200.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.
2. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
3. The color coding of the i-f transformer leads is as follows:
   Grid—green　　Plate—blue
   Grid return—black　　B plus—red
4. Models CM-260, 266 and 267 have self-contained antennas and do not require additional antenna connections. For permanent home installations of either model, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a terminal screw is provided in the cabinet for antenna connection. It is not necessary to remove the chassis from the cabinet to make this connection. The screw is easily reached through a hole in the bottom of the cabinet.
5. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. *It is important, therefore, once the station is tuned in, rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.*
6. On some models the bottom of the chassis is covered with a metal bottom plate. To reach the internal chassis parts, this plate must be unsoldered and removed.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis behind the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The oscillator coil is located underneath the chassis, beneath the speaker. The loop antenna acts as the antenna coil.

I-f and Wave-Trap Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid-cap of the 12A8 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

*Item	Part No.	DESCRIPTION	PRICE (Subject to change without notice)
T1	6MW-155	Loop antenna assembly	$1.45
T4	6JT-467A	Oscillator coil	.35
T2	6JT-466U	Double-tuned 455 kc first i-f transformer	1.10
T3	6MT-472U	Double-tuned 455 kc second i-f transformer	1.05
R1	2CR-193	30,000 ohm ⅓ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	3FR-293	140 ohm ⅓ watt wire-wound resistor	.16
R4	HR-42	2 megohm ¼ watt carbon resistor	.16
R5	4XR-335	Volume control .25 megohm with line switch (for CM-266)	.90
R5	4XR-335A	Volume control .25 megohm with line switch (for CM-260 and CM-267)	.85
R6	4XR-327	15 megohm ¼ watt carbon resistor	.16
R7, R8	KR-56	500,000 ohm ¼ watt carbon resistor (see production change no. 1)	.16
R9, R10	6JR-353	Tapped metal-clad wire-wound resistor (see production change no. 2) R9—35 ohms; R10—70 ohms (Each section—2 watts)	.25
R11	KR-54	100,000 ohm ¼ watt carbon resistor	.16
C1, C2	4XC-391C	Two-gang variable condenser	2.40
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10, C13, C22	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	AC-6	0.1 mf, 200 volt tubular condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C15, C18	4XC-394A	0.00022 mf mica condenser	.20
C16, C3	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C17, C19	6JC-425	0.024 mf, 400 volt tubular condenser	.20
C20, C21	6JC-426	Dual 20 mf, 150 volt dry electrolytic condenser	.90

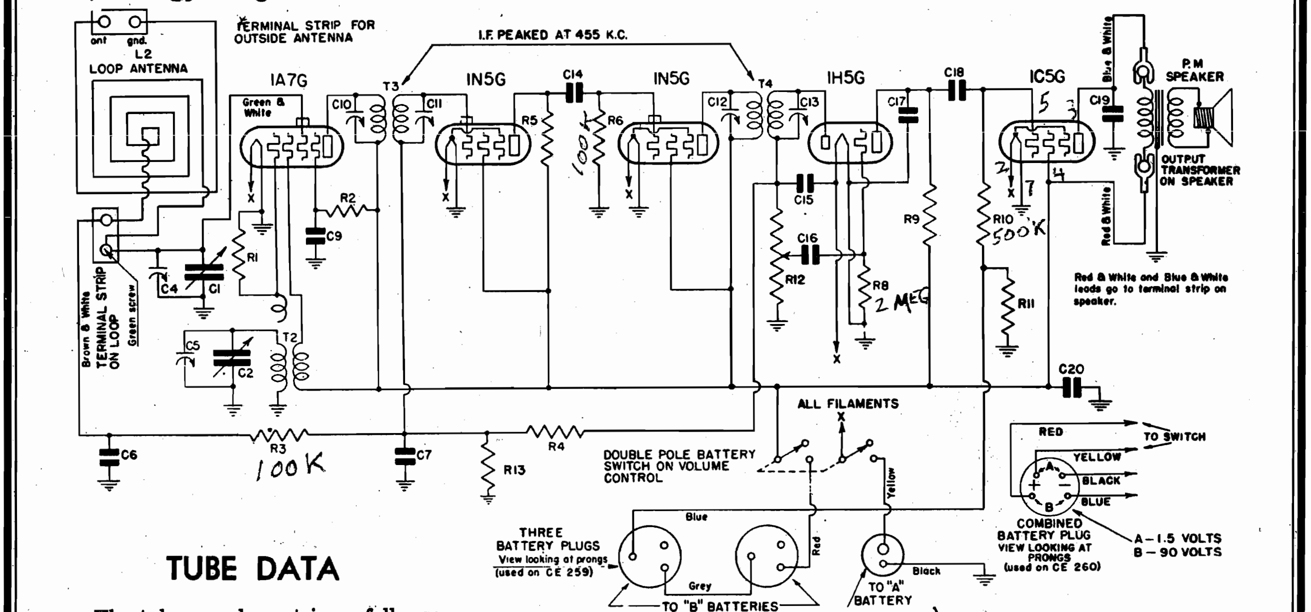
Part No.	Description	Price
6JS-368U	4" dynamic speaker (for CM-266)	3.85
6MS-384	4" dynamic speaker (for CM-267)	4.15
6MS-395	5" dynamic speaker (for CM-260)	4.45
6JL-104	Pilot light, 6.3 volt, .15 amp., Mazda No. 47	.20
6ED-73	Dial face (for CM-260 and CM-267)	.25
6MD-75	Dial face (for CM-266)	.20
4YZ-772	Drive cord	.02
5JZ-824	Drive cord spring	.05
6JH-24	Drive shaft (for CM-266)	.05
6JH-24A	Drive shaft (for CM-260 and CM-267)	.05
4XZ-812B	Dial pointer (for CM-266)	.02
4MZ-588B	Dial pointer (for CM-260 and CM-267)	.20
4XZ-815A	Dial crystal (for CM-266)	.10
4XE-3	Dial crystal (for CM-260 and CM-267)	.20
4XM-367	Drive pulley	.10

* Item number locates the article on the schematic diagram.
† Not supplied separately.

Schematic, Voltage
Batt, Wiring, Changes

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CE259, CE260
Chassis CE



TUBE DATA

The tube complement is as follows:

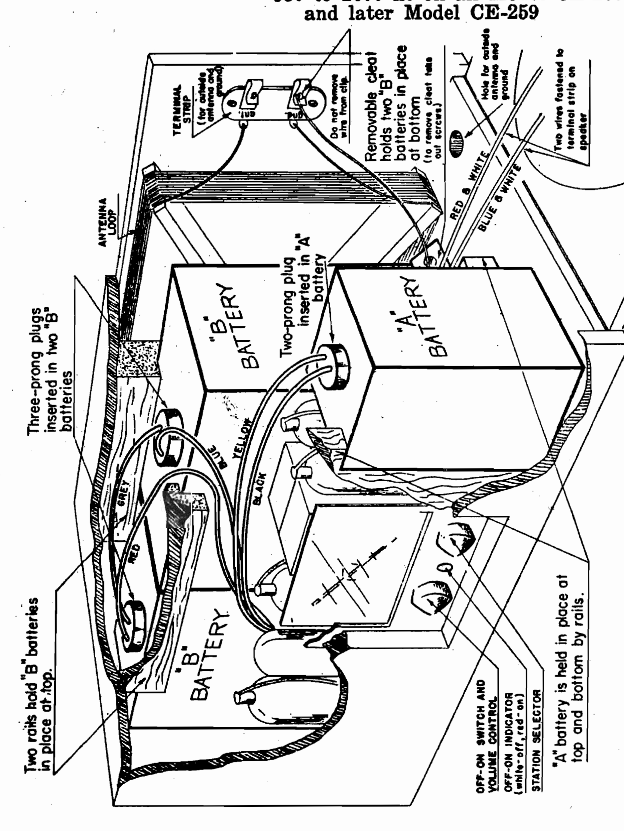
1—1A7G, oscillator-modulator
1—1N5G, 1st i-f amplifier
1—1N5G, 2nd i-f amplifier
1—1H5G, 2nd detector, a.v.c., a-f amplifier
1—1C5G, pentode output

Five-Tube Battery-Operated Superheterodyne

MODELS CE-259 and CE-260

CHASSIS MODEL CE

Current drain	"A" battery—0.3 amps. "B" battery—0.010 amps. with no signal
Frequency range	540 to 1730 kc on early Model CE-259 530 to 1600 kc on all Model CE-260 and later Model CE-259



MODEL CE-259
CUT-AWAY VIEW SHOWING BATTERY LOCATIONS AND WIRE CONNECTIONS

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

Tube	*Plate*	*Screen*	*Osc. Plate*	*Fil.*
1A7G	82	52	82	1.5 .05a
1N5G 1st i-f	70	70	—	1.5 .05a
1N5G 2nd i-f	82	82	—	1.5 .05a
1H5G	25	—	—	1.5 .05a
1C5G	77	82	—	1.5 .1a

Bias for the 1C5G tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.8 volts. 1.5V@

PRODUCTION CHANGES

1. Chassis bearing serial numbers below 2,319,650 use:
   (a) Double-tuned 455 kc first i-f transformer, part no. 4XT-434A 1.00
   (b) Double tuned 455 kc diode i-f transformer, part no. 4XT-435B .... .80
   (c) Oscillator coil, Part No. 4XT-433 .... .35
   (d) The low side of the volume control (R12) is connected to A plus instead of A minus (chassis) as shown in the schematic.
   (e) Condenser C19 is connected from plate to B plus instead of from plate to ground as shown in the schematic.
   (f) Resistor R2 is 50,000 ohms, Part No. KR53, instead of 30,000 ohms.
2. Chassis bearing serial numbers below 2,408,049 use dial face, part no. 4XD-51 .... .55
3. On Model CE-260 the antenna trimming condenser (C4) is mounted on the loop antenna frame instead of on the variable condenser.
4. In chassis bearing serial numbers above 2,319,650 condenser C15 is connected from the high side of the volume control to ground instead of to A plus as shown in the schematic.

MODELS CE259,CE260
Chassis CE
Socket,Trimmers
Alignment,Parts

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CE-259 AND CE-260

GENERAL NOTES

1. Batteries: The Models CE-259 and CE-260 are designed to house the complete set of batteries within the cabinet. The battery complement should be as follows:

FOR MODEL CE-259 (Portable)

Type Battery	*No. Req.*	*Eveready Part No.*	*Ray-o-vac Part No.*	
1½ volt "A"	1	742 (plug-in type)	P-94A (plug-in type)	
45 volt "B"	2	762 (plug-in type)	P-5303 (plug-in type)	
FOR MODEL CE-260				
Combined "A" and "B" Pack	1	748 (plug-in type)	AB82 (plug-in type)	(Also Burgess No. 17G-D60)

2. The color coding of the i-f transformer leads is as follows:

Grid—green; Grid return—black; Plate—blue; B plus—red

3. The color coding of the battery cable is as follows:

Red—B plus, 90 volts; Blue—B minus; Yellow—A plus, 1.5 volts; Black—A minus

4. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.

5. Models CE-259 and CE-260 have self-contained antennas and do not require additional antenna or ground connections. For permanent home installations of either model, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a terminal strip is provided in the cabinet for antenna and ground connections. (*See diagram on next page.*)

6. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. *It is important, therefore, once the station is tuned in, rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.* This procedure is not necessary for receivers with outside antennas.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.
An output meter should be used across the voice coil or output transformer for observing maximum response.
Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the rear section of the variable condenser.

The loop antenna acts as the antenna coil. The trimmer for the loop, when provided, is on the front section of the variable condenser.
(See Production Change No. 3)

I-f Alignment

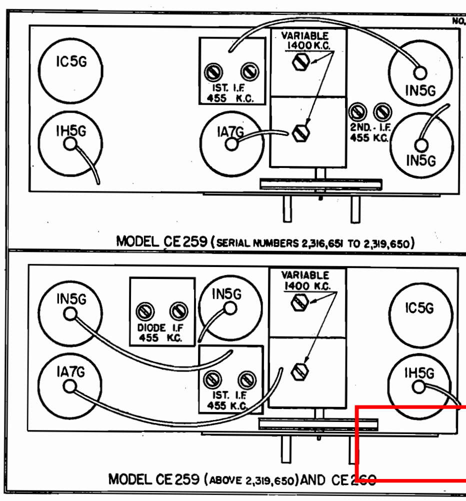
Model CE-259 (below serial number 2,319,-650). Swing variable condenser to maximum capacity position.

Model CE-259 (above serial number 2,319,-650) and CE-260. Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7G tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.



LOCATION OF TUBES AND TRIMMING CONDENSERS
MODELS CE-259 AND CE-260
(See Production Change No. 3)

Battery Installation for Model CE-259

(*See diagram on inside page*)

To install and connect the batteries in the portable cabinet observe the following procedure:

1. Open the end side of the cabinet (side with speaker grille) by removing the two wood screws in the top corners of the panel. The panel is hinged at the bottom. Open the panel by pulling the small leather tab at the top edge.
2. A small wood cleat is fastened to the bottom of the cabinet directly below the two large wood rails. Remove this cleat by taking out the small wood screws.
3. The three-prong plugs on the battery cable from the receiver should be plugged into the two "B" batteries.
4. Slide the "B" batteries, one at a time, in an upright position between the two wood rails in the cabinet, as indicated in the diagram.
5. Replace the small wood cleat in front of the second battery and fasten it securely with the wood screws.
6. The small two-prong plug in the battery cable should be plugged into the "A" battery. Place the "A" battery in the front corner of the cabinet, as shown in the diagram.
7. Be sure that all of the cable wires are free and clear of the receiver. Care should be taken also to keep the wires from jamming between the wood rails and the batteries.
8. Close the end panel and replace the wood screws, fastening them securely.

Battery Installation for Model CE-260

The cabinet for this model is designed to house completely the combined "A" and "B" pack. Place the battery pack in the cabinet at the rear of the receiver and insert the four-prong plug of the battery cable into the socket on the top of the battery.

If it is desired to use separate "A" and "B" plug-in type batteries, a special cable harness is available for connecting the batteries together. The receiver battery cable then may be plugged into the socket on the special cable harness.

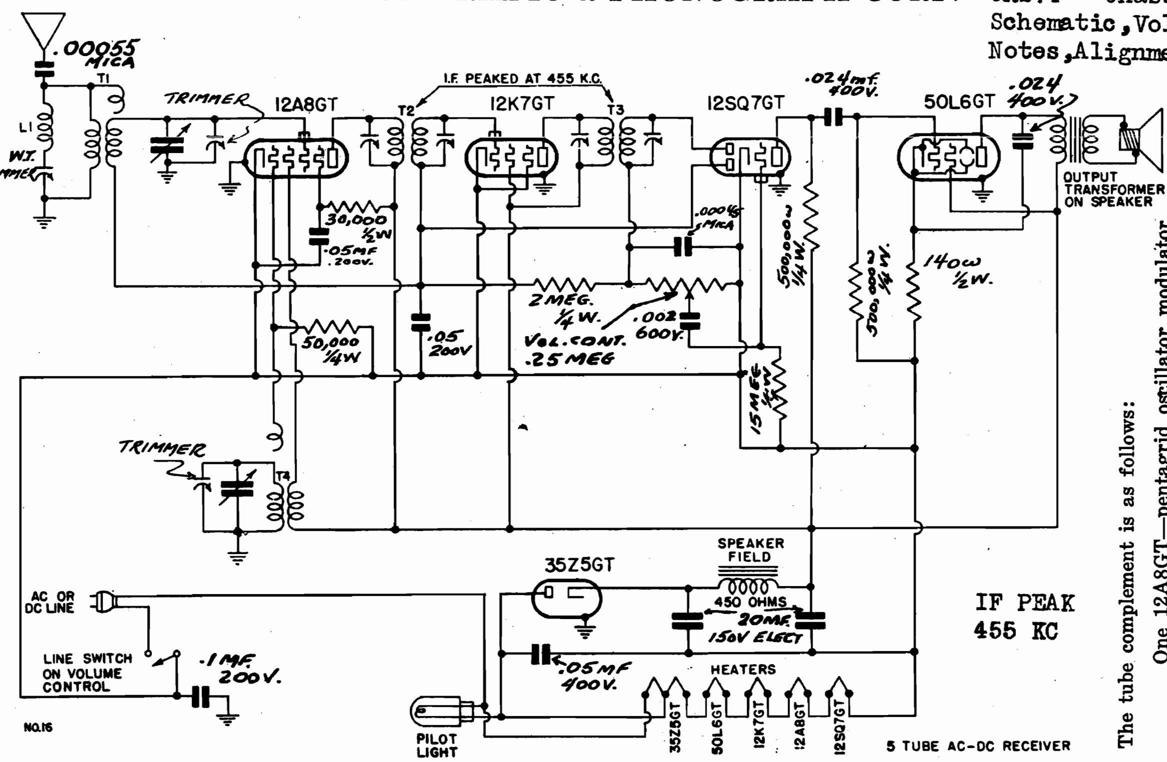
When ordering replacement parts specify part numbers.

*Item	Part No.	DESCRIPTION	List Price Ea. Effective as of Feb. 15th, 1939 (Subject to change without notice)
L2	6EW-146	Loop antenna assembly (for CE-259 only)	$1.45
L2	6EW-152	Loop antenna assembly (for CE-260 only)	1.60
T2	6JT-467A	Oscillator coil (see Production Change No. 1c)	.35
T3	6JT-466B	Double-tuned 455 kc first i-f transformer (see production change no. 1a)	1.10
T4	6ET-470	Double tuned 455 kc diode i-f transformer (see production change no. 1b)	1.10
R1	LR-61	200,000 ohm ¼ watt carbon resistor	.16
R2	ZZR-196	30,000 ohm ¼ watt carbon resistor (see Production Change No. 1f)	.16
R3, R6	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R4, R8, R13	HR-42	2 megohm ¼ watt carbon resistor	.16
R5	LR-65	10,000 ohm ¼ watt carbon resistor	.16
R9, R10	KR-56	.5 megohm ¼ watt carbon resistor	.16
R11	6ER-350	740 ohm ½ watt wire wound resistor	.16
R12	3HR-240B	Volume control 500,000 ohms with double pole line switch (for CE-259)	1.05
R12	3HR-240C	Volume control 500,000 ohms with double pole line switch (for CE-260)	1.05
C1, C2	4XC-391B	Two-gang variable condenser	2.50
†C4, C5		Trimmer, part of variable condenser (see Production Change No. 3)	
C6, C7	BC-12	0.05 mf, 200 volt tubular condenser	.20
C9, C18	LC-65	0.02 mf, 400 volt tubular condenser	.20
†C10, C11, C12, C13		Trimmer, part of i-f transformer	
C14	5AC-384	0.0002 mf, 600 volt tubular or mica condenser	.20
C15, C17	4XC-394A	0.00022 mf mica condenser (see Production Change No. 4)	.20
C16	KC-58	0.01 mf, 400 volt tubular condenser	.20
C19	NNC-199	0.001 mf, 600 volt tubular condenser	.20
C20	6EC-414	8 mf, 100 volt dry electrolytic condenser	.60
	6ES-367	5" permanent magnet dynamic speaker	6.25
	6ED-78	Dial face (see production change no. 2)	.25
	6ED-69	Indicator dial	.10
	4MZ-538B	Dial pointer	.20
	4XE-3	Dial crystal	.20
	5JZ-824	Drive cord spring	.05
	4YZ-772	Dial drive cord	.02
	6EW-135	Battery cable (for CE-259)	.65
	6EW-148	Battery cable (for CE-260)	.75

† Not supplied separately.
* Item number locates the article on the schematic diagram.

MODELS CR261,CR262
CR274 Chassis CR
Schematic,Voltage
Notes,Alignment

EMERSON RADIO & PHONOGRAPH CORP.



The tube complement is as follows:
One 12A8GT—pentagrid oscillator modulator
One 12K7GT—first i-f amplifier
One 12SQ7GT—diode detector, a-f amplifier, a.v.c.
One 50L6GT—beam power output
One 35Z5GT—half-wave rectifier

MODELS CR-261, CR-262 and CR-274

Voltage rating .... 105-125 volts, a.c. or d.c.
Power consumption .... 30 watts.
Frequency range .... 540 to 1730 kc.

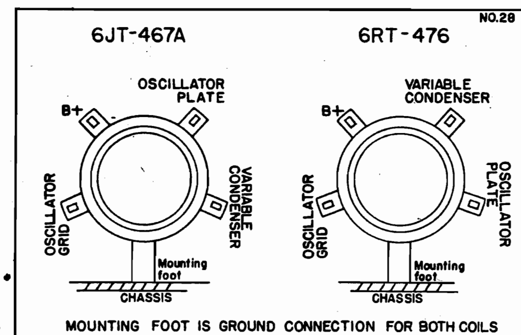
CHASSIS MODEL CR

ALIGNMENT AND LOCATION OF TRIMMERS

IF. 455kc through .01 mf. cond. to grid of 12A8G 1st IF, top of chassis right of speaker;2nd IF under chassis beneath variable, holes provided in top of chassis.-Variable max. cap. Adjust trimmers to max. response.

Wave Trap(see GENERAL NOTES) Feed 455kc through .0001 mf. cond. to ant. lead. Adjust for minimum response.

RF. Dial at 140. Feed 1400kc through .0001 mf. cond. to ant. lead. Adjust osc. trimmer(rear section of variable), then ant. trimmer (front section of variable) for maximum response.



MOUNTING FOOT IS GROUND CONNECTION FOR BOTH COILS
CR chassis may use either oscillator coil
VIEW LOOKING AT LUG END OF COILS
SHOWING LEADS TO OSCILLATOR COILS

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.
2. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
3. The color coding of the i-f transformer leads is as follows:
   Grid—green Plate—blue
   Grid return—black B plus—red
4. The wave-trap in the receiver has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

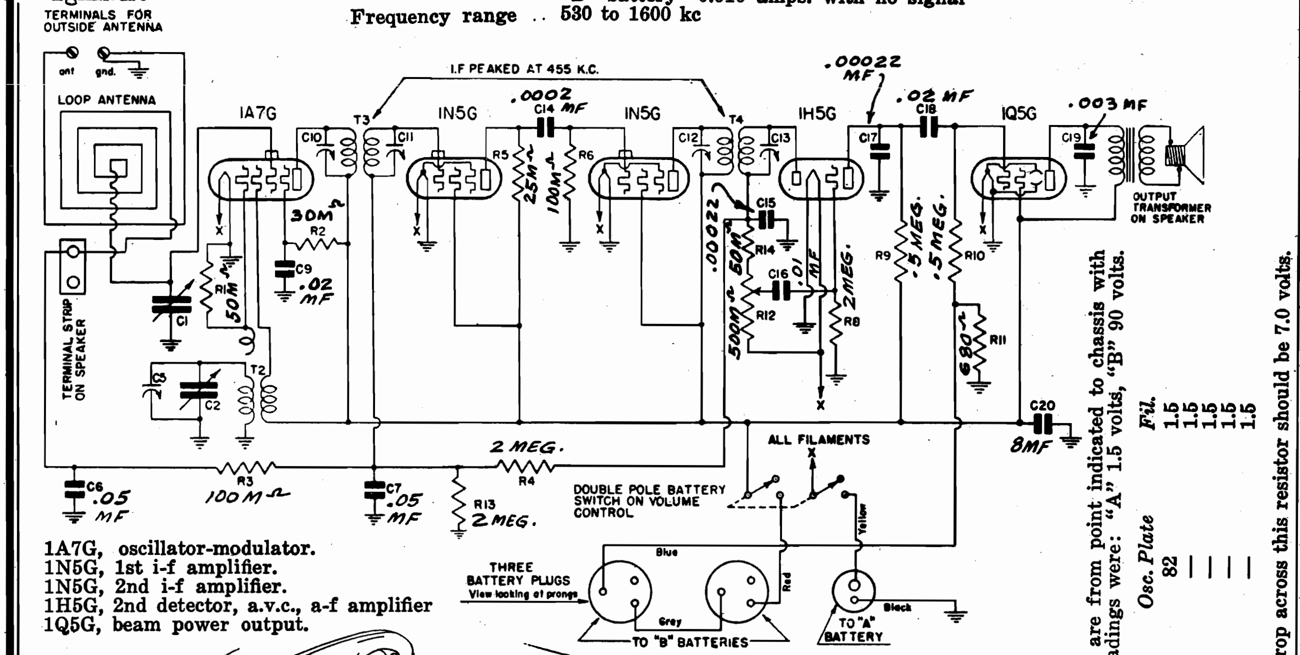
Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
12A8GT	88	45	0	88	12
12K7GT	88	88	0	—	12
12SQ7GT	40	—	0	—	12
50L6GT	82	88	5.7	—	50

Voltage at 35Z5 cathode—115 volts. Voltage across speaker field—27 volts. Voltage across pilot light—4.5 volts.

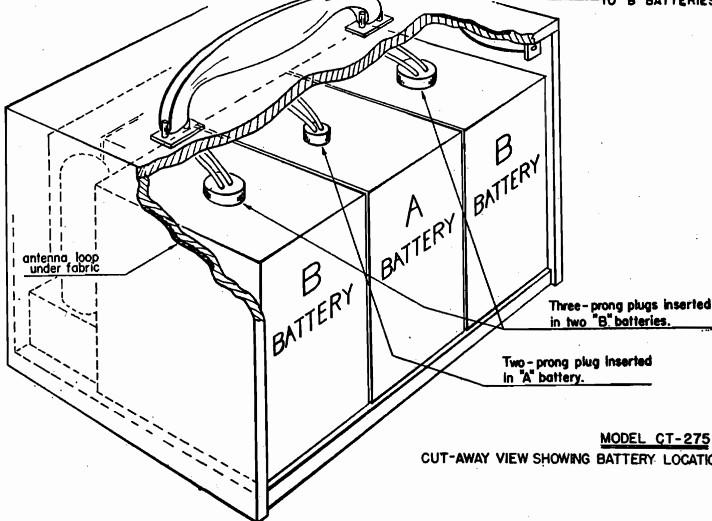
MODEL CT275
Chassis CT
Schematic, Voltage
Alignment

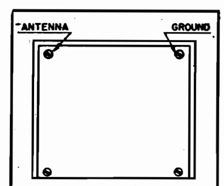
EMERSON RADIO & PHONOGRAPH CORP.

Current drain .... "A" battery—0.3 amps.
"B" battery—0.010 amps. with no signal
Frequency range .. 530 to 1600 kc



1A7G, oscillator-modulator.
1N5G, 1st i-f amplifier.
1N5G, 2nd i-f amplifier.
1H5G, 2nd detector, a.v.c., a-f amplifier
1Q5G, beam power output.





VIEW LOOKING AT BACK, SHOWING EXTERNAL ANTENNA AND GROUND CONNECTIONS. (with back in place)

MODEL CT-275
CUT-AWAY VIEW SHOWING BATTERY LOCATIONS AND WIRE CONNECTIONS

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7G	82	52	82	1.5
1N5G 1st i-f	48	82	—	1.5
1N5G 2nd i-f	82	82	—	1.5
1H5G	25	—	—	1.5
1Q5G	77	82	—	1.5

Bias for the 1Q5G tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.0 volts.

Batteries: The Model CT-275 is designed to house the complete set of batteries within the cabinet.

The battery complement should be as follows:

Type Battery	No. Req.	Eveready Part No.	Rayovac Part No.	Burgess Part No.
1½ volt "A"	1	741 (plug-in type)	—	8F (plug-in type)
45 volt "B"	2	762 (plug-in type)	P-5303 (plug-in type)	B30-P1 (plug-in type)

The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black
Plate—blue
B plus—red

The color coding of the battery cable is as follows:

Red—B plus, 90 volts
Blue—B minus
Yellow—A plus, 1.5 volts
Black—A minus

Location of Coils and Trimmer Adjustments

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is the one between the speaker and the variable condenser. The diode i-f transformer is the one behind the speaker. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the rear section of the variable condenser.

I-f Alignment

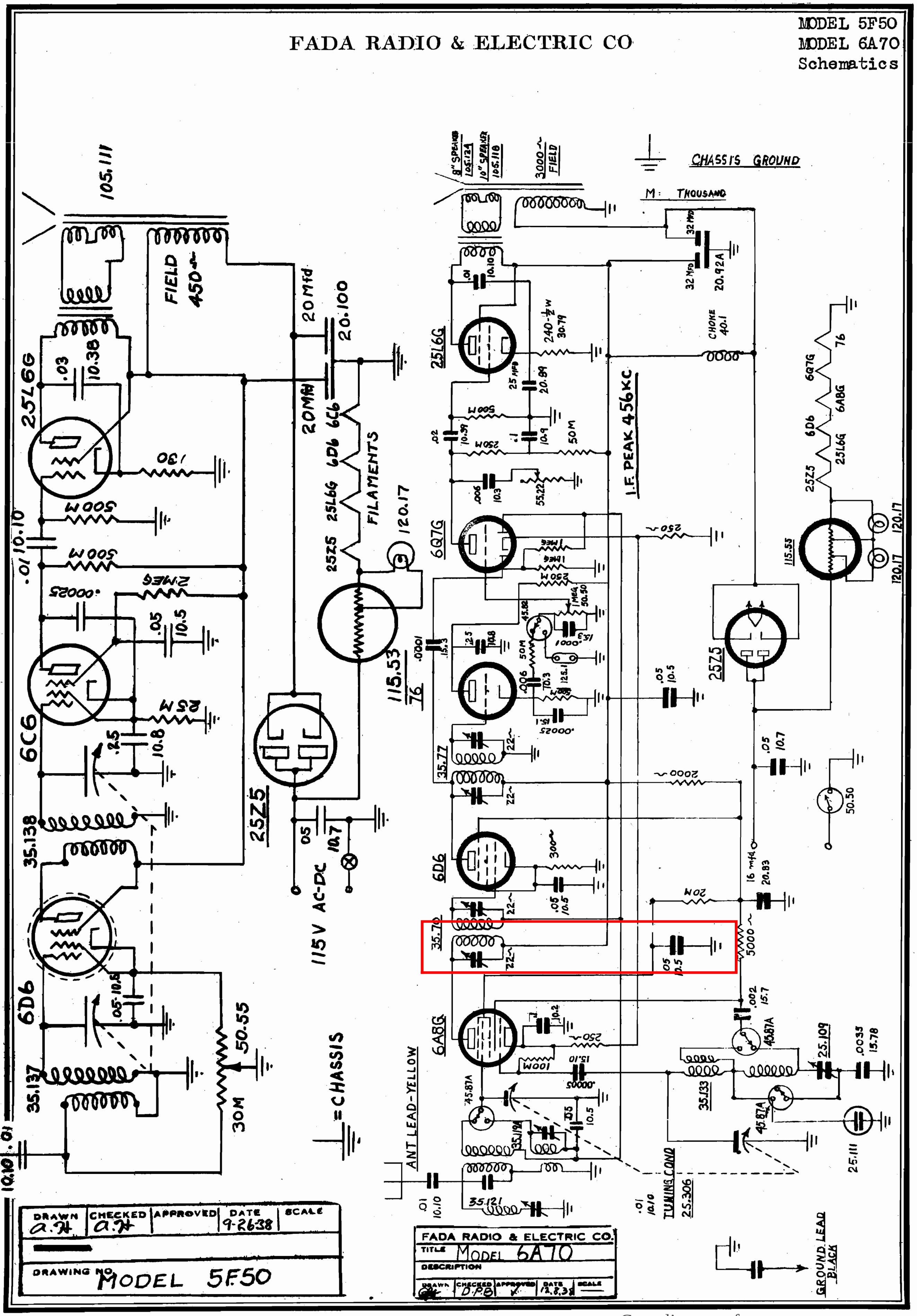
Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7G tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust the oscillator trimmer (on rear section of variable condenser) for maximum response. No alignment necessary on antenna circuit.

MODEL 5F50
MODEL 6A70
Schematics



MODEL 5F60
MODEL 460
MODEL 461

FADA RADIO & ELECTRIC CO

Alignment, Socket
Trimmers, Voltage

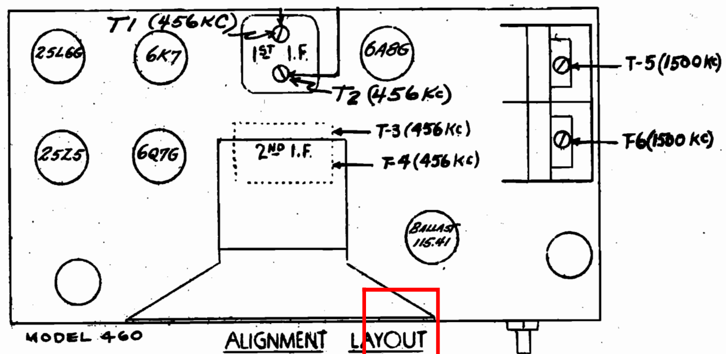
FOR OTHER DATA SEE INDEX

MODEL 5F60 MODEL 460 - 115 VOLTS AC-DC - Tuning Range 540-1720 K.C. - 6 Tube Superheterodyne. Tubes required - 6A8G-6K7-6Q7G-25L6G-25Z5-115.41.

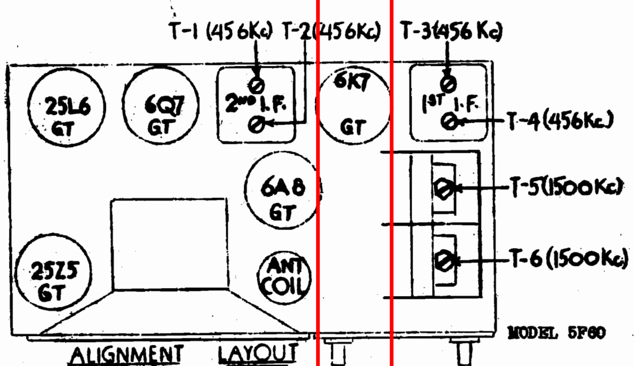
Alignment Instructions: Do not attempt to align receiver until all other causes of trouble are checked then proceed as follows:--Remove chassis from case and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Connect modulated oscillator to grid of 6A8G tube in series with a.1 condenser. Adjust trimmers 1-2-3-4 for maximum reading at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 to give maximum output. Check sensitivity at 1000 and 600 K.C. with magic wand.

MODEL 460 THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

	Plate	Screen	Cathode	Anode
6A8G	110	50	2.5	105
6K7	110	110	2.5	-
6Q7G	45	-	1.1	-
25L6G	110	110	7.	-
25Z5	120 AC	-		133



MODEL 460 ALIGNMENT LAYOUT

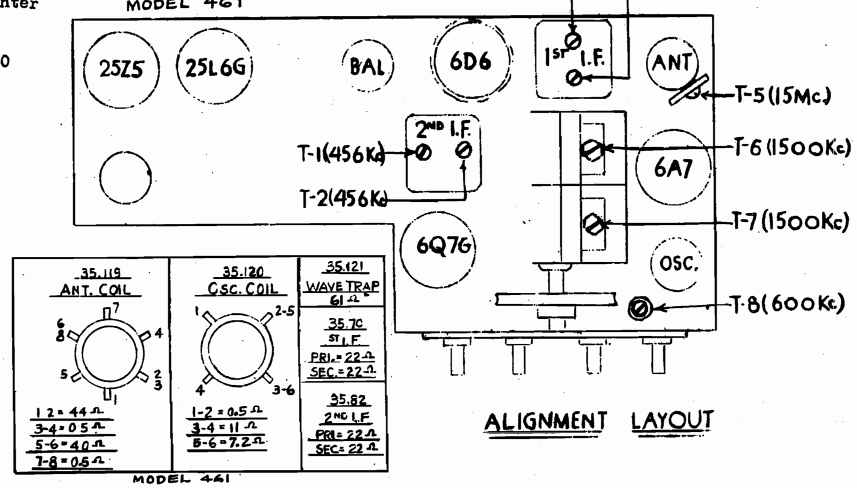


ALIGNMENT LAYOUT MODEL 5F60

MODEL 5F60 THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

	Plate	Screen	Cathode	Anode
6A8GT	103	60	0	103
6K7GT	102	104	0	
6Q7GT	45	-	0	
25L6GT	95	104	7	
25Z6GT	120	-	135	

MODEL 461



ALIGNMENT LAYOUT

FADA RADIO MODEL 461 - 115 VOLTS - AC-DC - Tuning Range 545-1720 K.C. and 5.8-18.4 Megacycles-6 Tube Superheterodyne. Tubes required-6A7-6D6-6Q7G-25L6G-25Z5-115.41.

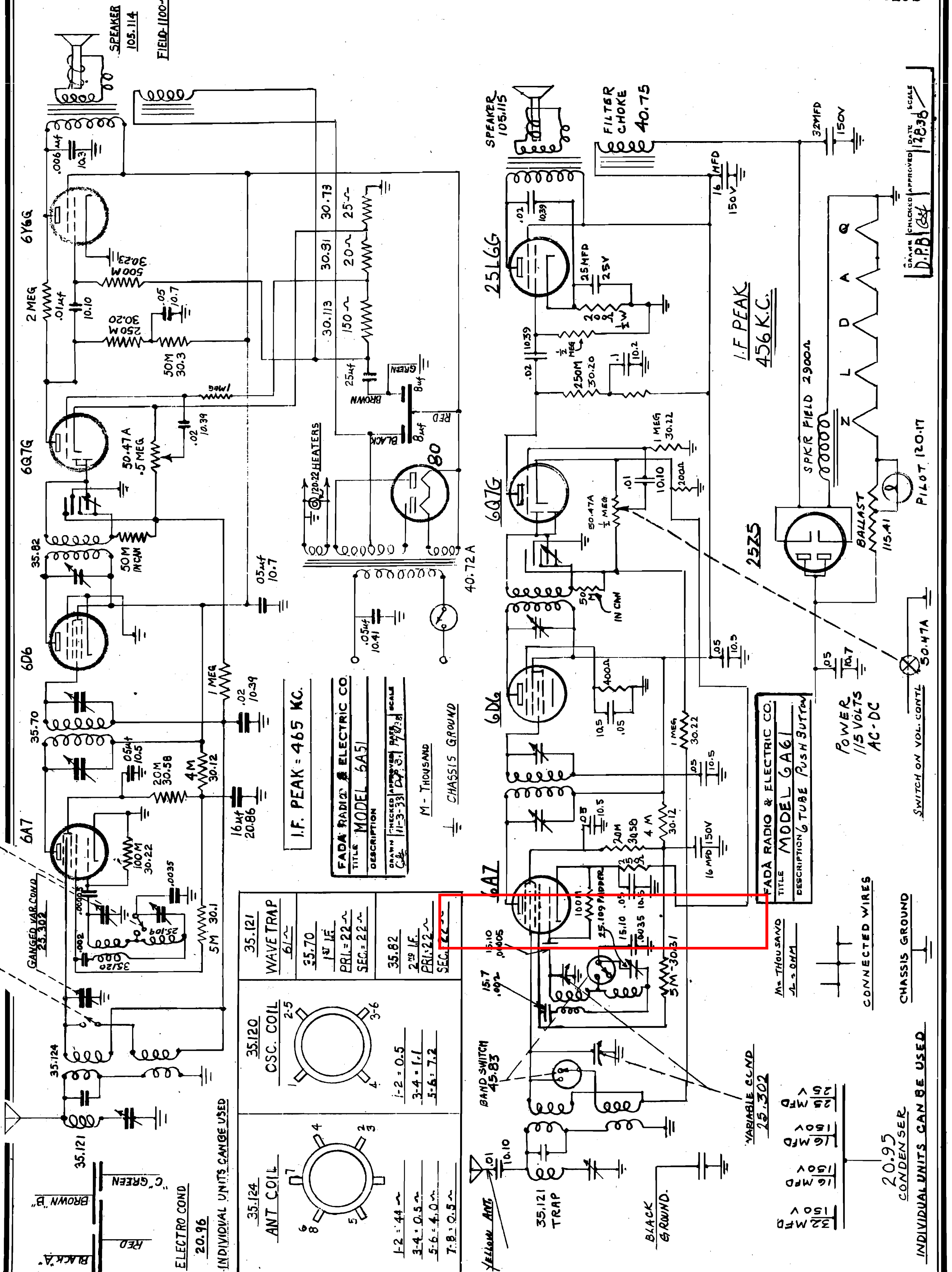
Alignment Instructions: Do not attempt to align receiver until all other causes of trouble are checked, then proceed as follows:--Remove chassis and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Tone control to high end. Band switch to broadcast position. Connect modulated oscillator to grid of 6A7 tube in series with a .1 condenser and adjust trimmers 1-2-3-4 for maximum output at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 for maximum output. Turn dial pointer to 600 K.C. Adjust padder T8 rocking gang condenser for maximum output. Recheck alignment at 1500 K.C. Shift oscillator to 456 K.C. and set trimmer on wave trap for minimum signal. Check sensitivity at 1000 K.C. using magic wand. Turn band switch to Short Wave position. Set dial at 15 M.C. Use a 400 ohm resistor for dummy antenna. With a 15 M.C. signal adjust T-5 for maximum output. Check image at 14.1 M.C. increasing input signal if necessary. Check sensitivity at 10 M.C. and 6 M.C.

MODEL 461 THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

	Plate	Screen	Cathode	Anode
6A7	104	52	2.1	75
6D6	104	104	3.0	-
6Q7G	45	-	1.1	-
25L6	98	104	6.7	-
25Z5	120 A.C.		133	-

FADA RADIO & ELECTRIC CO

MODEL 6A51
MODEL 6A61
Schematics



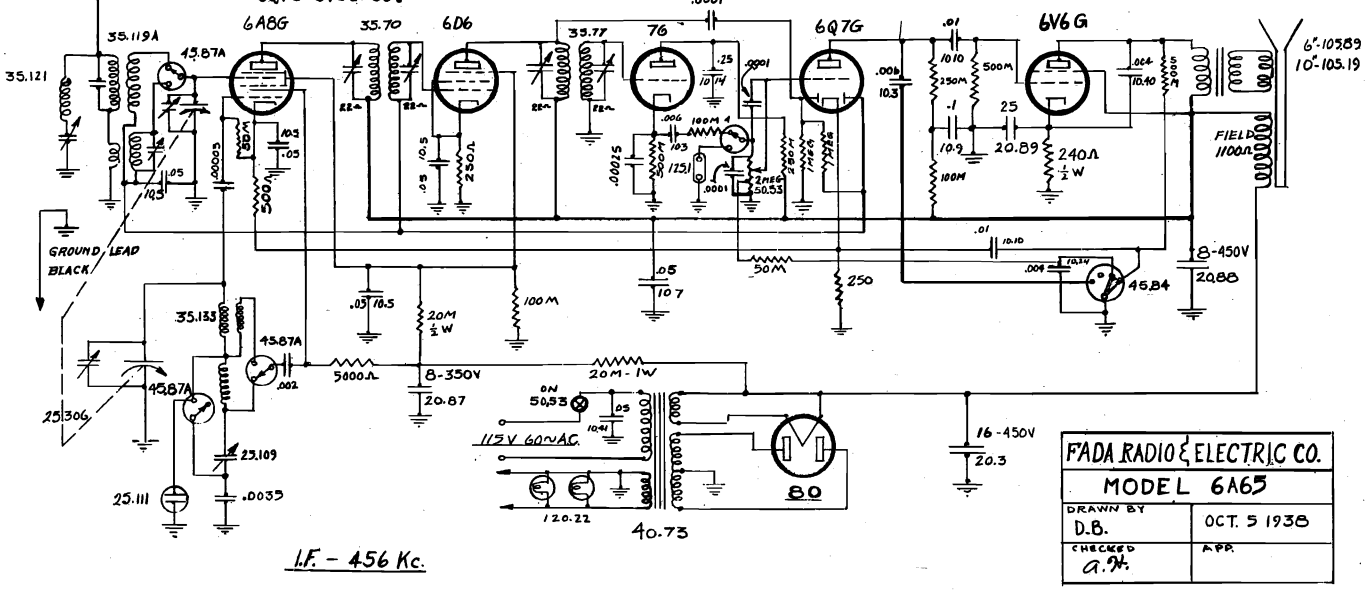
MODEL 6A65
Schematic, Voltage
Alignment, Socket
Trimmers

FADA RADIO & ELECTRIC CO

THESE READINGS TAKEN WITH LINE VOLTAGE 120 A. C.

	Plate	Screen	Cathode	Anode
6A8G	258	70	4.	150
6D6	258	70	2.	
6Q7G	150	-	1.9	
6V6G	250	258	11.4	
80	630 A.C.PLATE TO PLATE-330 D.C.Fil.to Ground			
76	250	-	19.	

FADA RADIO MODEL 6A65 - 115 VOLTS - 50-60 CYCLES A.C. - Tuning Range 545-1720 K.C. and 5.8-18.4 Megacycles - 6 Tube Superheterodyne. Tubes required - 6A8G-6D6-76-6Q7G-6V6G-80.

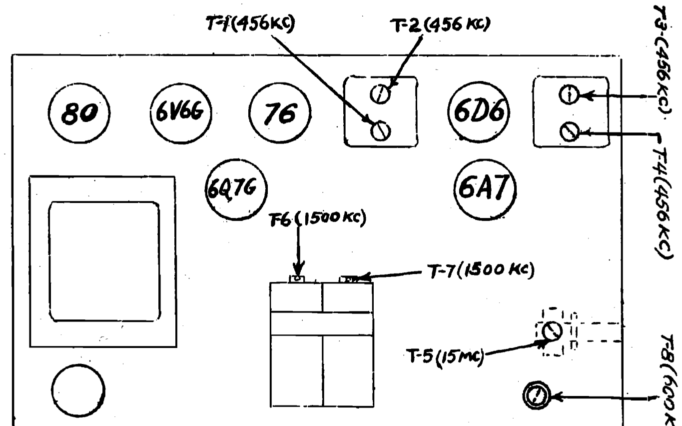


I.F. - 456 Kc.

Alignment Instructions: Do not attempt to align receiver until all other causes of trouble are checked, then proceed as follows:---Remove chassis and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Tone control to high end. Band switch to broadcast position. Connect modulated oscillator to grid of 6A8G tube in series with a .1 condenser and adjust trimmers 1-2-3-4 for maximum output at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 for maximum output. Turn dial pointer to 600 K.C. Adjust padder T8 rocking gang condenser for maximum output. Recheck alignment at 1500 K.C. Shift oscillator to 456 K.C. and set trimmer on wave trap for minimum signal. Check sensitivity at 1000 K.C. using magic wand. Turn band switch to Short Wave position. Set dial at 15 M.C. Use a 400 ohm carbon resistor for dummy antenna. With a 15 M.C. signal adjust T-5 for maximum output. Check image at 14.1 M.C. increasing input signal if necessary. Check sensitivity at 10 M.C. and 6 M.C.

		List			List
50.53	Volume Control	.85	35.70	I.F. Input	1.20
45.84	Tone Switch	.65	35.77	I.F. Output	1.20
45.87A	Band Switch	.70	35.121	I.F. Trap	.45
40.73	Power Transformer	3.60	25.306	Variable Cond.	2.60
35.119A	Antenna Coil	1.35	105.123	Speaker (8")	6.30
35.133	Oscillator Coil	.60	105.119	" (10")	7.75

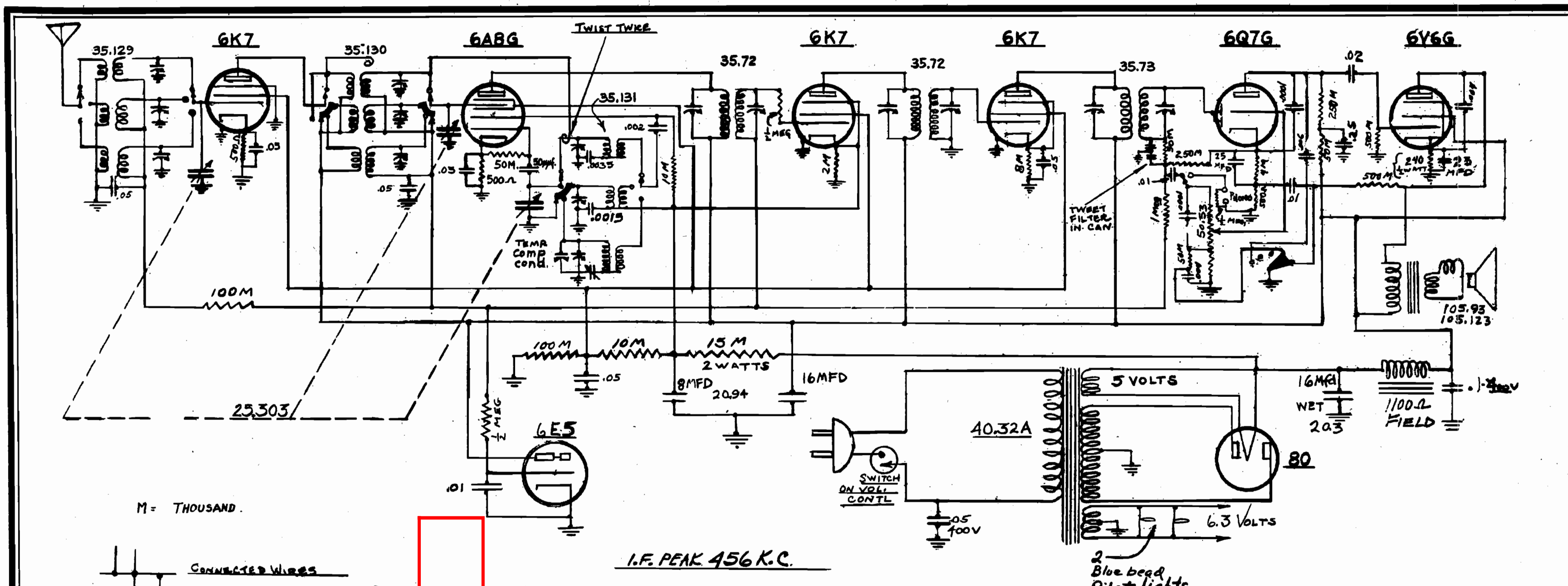
Prices subject to change without notice.



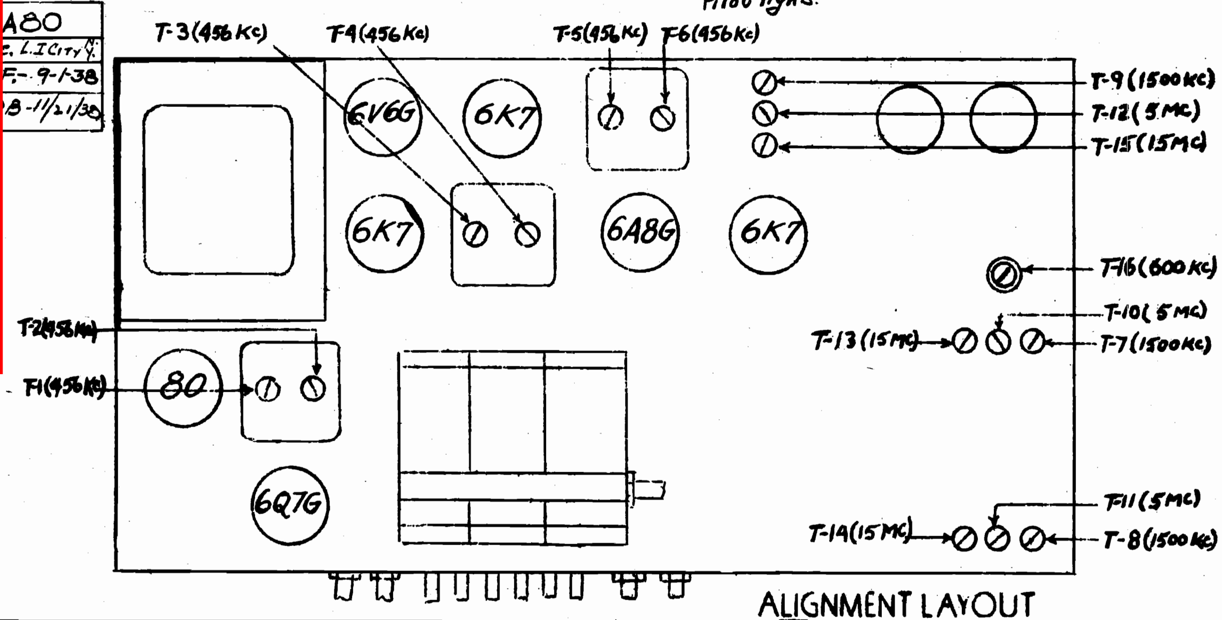
ALIGNMENT LAYOUT

FADA RADIO & ELECTRIC CO

MODEL 6A80
Schematic, Socket, Voltage
Trimmers,



MODEL 6A80
FADA RADIO & ELEC. L.I.CITY
DRAWN BY - H.F. - 9-1-38
CHECKED BY D.A.B - 11/21/38



	6K7G	6A8G	6K7G	6K7G
Plate	265	265	265	265
Screen	95	95	95	95
Cathode	3.8	5.2	7.2	9
Anode	-	136	-	-

	6Q7	6V6G	80
Plate	83	255	(710AC-plate to plate
Screen	-	265	
Cathode	1.9	13	(356DC Fil. to ground
Anode	-		

THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C. 1000 OHM PER VOLT METER.

MODEL 6A80
Alignment
MODELS 366,366PT
Flash-O-Matic Data

FADA RADIO & ELECTRIC CO

FADA FLASH-O-MATIC SIX

INTRODUCTION: FADA Flash-o-Matic Six is an electrical type automatic tuning system that, once adjusted, will automatically "tune in" any one of six local broadcast stations operating between 540 and 1500 kilocycles (K. C.). While the Flash-o-Matic is not confined to local reception, it should be adjusted for stations affording the best reception and most frequently "tuned in."

ALIGNING PROCEDURE: It is advisable that the receiver remain in operation for fifteen minutes or more before attempting any adjustments. Now that the receiver has reached constant temperature the following adjustments are to be made to the trimmer condenser set screws located on the Flash-o-Matic tuning panel at the rear of the receiver.

(a) Select six local broadcast stations whose programs are preferred; then, detach the station call letters from the station call letter tab sheets, which are supplied with each receiver.

(b) The six Flash-o-Matic positions are numbered and arranged according to frequency limits.

There are number tabs (1 to 6) in the Flash-o-Matic escutcheon as shipped from the factory. These tabs show the relation between the Flash-o-Matic escutcheon and the Flash-o-Matic tuning panel positions and are to be removed, one at a time (with the aid of a pin) when inserting the station call letters.

The six call letter tabs corresponding to the six broadcast stations which have been chosen, must be arranged in the Flash-o-Matic escutcheon so that the frequency in kilocycles of each station will fall within the frequency limits of the proper group.

If one of the chosen stations has an operating frequency of 550 K.C., it should be placed in the No. 1 (530 to 710 K.C.) group, a station of 600 K.C. should be placed in the No. 2 group, etc.

Each group has considerable overlap to allow for the selection of six stations which may have frequency assignments comparatively close together.

Having inserted the call letter tabs, cover each tab with a celluloid disc furnished with your receiver.

(c) Two trimmer condenser set screws are provided for each one of the six station positions and are accessible at the rear of the receiver. All trimmer condenser set screw adjustments are marked as to their group number and frequency range coverage.

(d) Tune in the station in the usual manner, using manual tuning, and determine the program.

(e) Turn the wave band switch completely to the right (clockwise).

(f) Turn the Flash-o-Matic selector switch to the position that corresponds to the group in which the desired station falls. This can be readily determined, for as the Flash-o-Matic selector switch is turned the various call letters will light up.

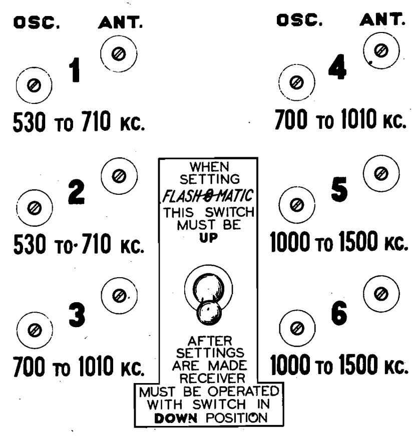
(g) The toggle switch *(SEE ILLUSTRATION)* near the center of the Flash-o-Matic tuning panel should be thrown to the "UP" position during the following adjustments.

(h) With the aid of a screwdriver adjust (by turning clockwise or counter-clockwise) the OSC. trimmer condenser set screw *(SEE ILLUSTRATION)* corresponding to the proper station, until the same station that was tuned in manually is heard. Turn the volume control down so that any variation in sound output can be noted and readjust set screw for maximum sound output. *TAKE PARTICULAR CARE WHILE MAKING THIS ADJUSTMENT THAT THE SAME STATION IS HEARD AND NOT A NETWORK STATION BROADCASTING THE SAME PROGRAM.*

(i) Now adjust the ANT. trimmer condenser set screw *(SEE ILLUSTRATION)* having the same position number, for maximum sound output.

(J) Repeat the same procedure as outlined above for each of the remaining five stations.

(k) To insure accurate adjustment, it may be found advisable to repeat the operations outlined in paragraphs (h), (i) and (J).



(l) Having completed the adjustments for the desired stations throw the toggle switch *(SEE ILLUSTRATION)* to "DOWN" position. The receiver is now ready for Flash-o-Matic operation and any one of the six stations to which the Flash-o-Matic has been adjusted, may be instantly "tuned in" by merely rotating the Flash-o-Matic selector knob to the desired station position.

(m) In order to reset one or more positions of the Flash-o-Matic tuning to other stations, it is merely necessary to follow the instructions outlined above; additional celluloid discs are supplied for this purpose.

OPERATING PROCEDURE: For Flash-o-Matic tuning turn the wave band switch completely to the right (clockwise): this will reduce the illumination of the station selector dial. Then, turn the Flash-o-Matic selector switch until the call letters of the desired station are illuminated. To return to standard or manual tuning simply turn the wave band selector switch toward the left (counter-clockwise) to the desired wave band.

ALIGNMENT MODEL 6A80

Tuning ranges 533-1730 K.C., 1.71-5.7 M.C. and 5.67 and 18.1 M.C. Tubes 3-6K7G-6A8G-6E5-6V6G-80.

Remove chassis and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. Turn volume control to maximum. Tone switch to high end. Band switch to broadcast. Connect modulated oscillator to grid of 6A8G in series with a .1 condenser and adjust trimmers 1-2-3-4-5-6 for maximum output at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 signal adjust trimmers 7-8-9 for maximum output, reducing input signal as required. Turn pointer to 600 K.C. Shift oscillator to 600 K.C. and adjust padder 16 for maximum while rocking gang condenser. Check alignment at 1000 K.C. Turn band switch to position 2- turn pointer to 5 M.C. Use a 400 ohm carbon resistor for dummy antenna. Adjust trimmers 10-11-12 for maximum output. Check output at .8 and 2.4. Make sure 5 M.C. was aligned on fundamental and not image. Turn band switch to position 3 - turn pointer to 15 M.C. Adjust trimmers 13-14-15 for maximum. Check image at 14.1. Check sensitivity at 6 M.C.

Alignment, Voltage
Socket, Trimmers

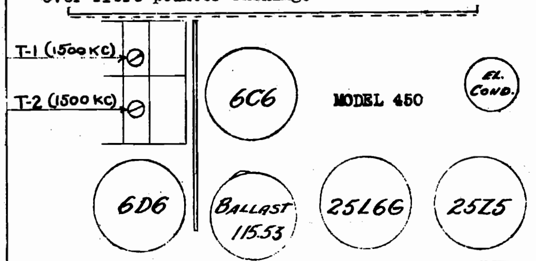
FADA RADIO & ELECTRIC CO

MODELS 20, 20A, 20B, 20T (Late)
MODEL 450
MODEL 451
MODELS 454, 454T

FADA RADIO MODEL 450 - 115 AC-DC - Tuning Range 545-1720 K.C. - 5 Tube Tuned Radio Frequency. Tubes required-6D6-6C6-25L6G-25Z5-115.53.

Alignment Instructions: --Turn volume control to maximum position. Connect a modulated oscillator to antenna hank using a .0001 condenser as a dummy antenna. Turn condenser to minimum position. Roughly adjust to 1720 K.C. Set oscillator at 1500 K.C. Turn condenser until signal is loudest, then adjust trimmers 1 & 2 for maximum signal reducing output of oscillator as required. Check alignment at 600 & 1000 K.C. using magic wand. Slight adjustments can be made at 600 K.C. by adjusting rotor plates.

Late production has a brass collar reinforcement over fibre pointer bushing.



MODEL 450
THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.
1000 OHM PER VOLT METER

	Plate	Screen	Cathode
6D6	103	104	1.8
6C6	15	10	1.5
25L6G	96	104	6.8
25Z5	120 A.C.	-	130.

MODEL 454, 454T. READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

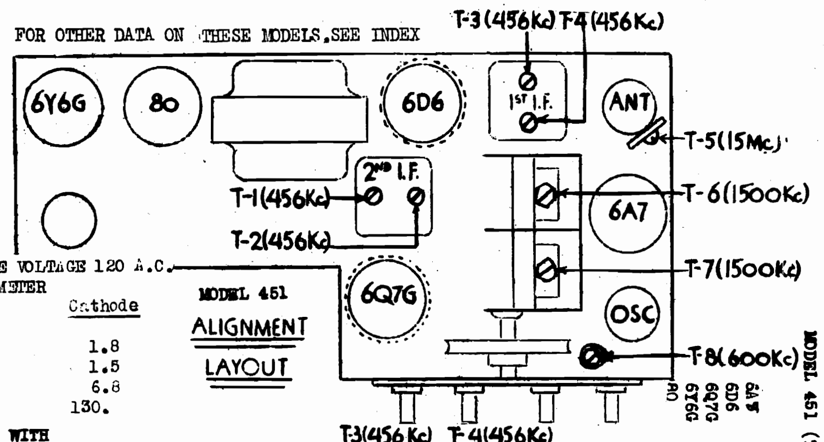
	Plate	Screen	Cathode	Anode
6A8G	112	62	2.7	112
6K7	112	62	2.7	-
6Q7G	50	-	1.1	-
6Y6G	105	112	11.5	-
80	414 AC Plate to Plate			-

FADA RADIO MODEL 451 - 115 VOLTS - 50-60 CYCLES A.C. - Tuning Range 545-1720 K.C. and 5.8-18.4 Megacycles - 5 Tube Superheterodyne. Tubes required-6A7-6D6-6Q7G-6Y6G-80. Alignment instructions: Do not attempt to align receiver until all other causes of trouble are checked, then proceed as follows:---Remove chassis and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Tone control to high end. Band switch to broadcast position. Connect modulated oscillator to grid of 6A7 tube in series with a .1 condenser and adjust trimmers 1-2-3-4 for maximum output at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 for maximum output. Turn dial pointer to 600 K.C. Adjust padder T8 rocking gang condenser for maximum output. Recheck alignment at 1500 K.C. Shift oscillator to 456 K.C. and set trimmer on wave trap for minimum signal. Check sensitivity at 1000 K.C. using magic wand. Turn band switch to Short Wave position. Set dial at 15 M.C. Use a 400 ohm carbon resistor for dummy antenna. With a 15 M.C. signal adjust T-5 for maximum output. Check image at 14.1 M.C. increasing input signal if necessary. Check sensitivity at 10 M.C. and 6 M.C.

FADA RADIO MODELS 454, 454T

FADA MODELS 20, 20A, 20B, 20T. - 115 VOLTS AC-DC - Tuning Range 540-1720 K.C. - 6 Tube Superheterodyne. ---Remove chassis from case and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Connect modulated oscillator to grid of 6A7 tube in series with a .1 condenser. Adjust trimmers 1-2-3-4 for maximum reading at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 to give maximum output. Check sensitivity at 1000 and 600 K.C. with magic wand.

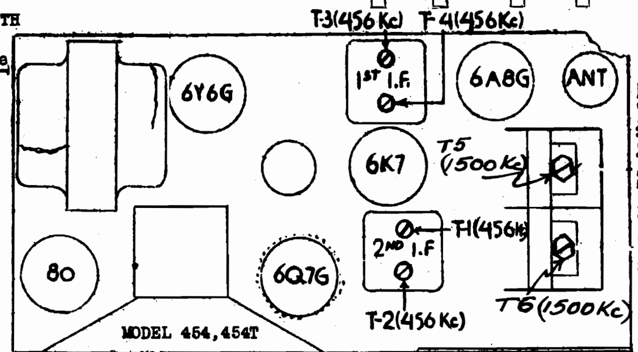
FOR OTHER DATA ON THESE MODELS, SEE INDEX

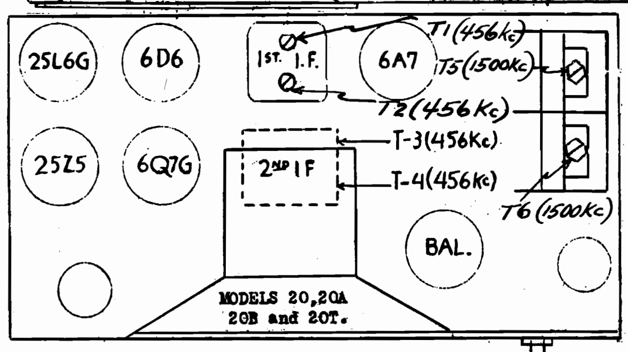


MODEL 451 ALIGNMENT LAYOUT

MODEL 451 (TAKEN WITH LINE VOLTAGE 120 A.C.)

	Plate	Screen	Cathode	Anode
6A7	107	52	1.4	78
6D6	107	107	1.4	
6Q7G	55	-	1.2	
6Y6G	100	107	11	
80	414 A.C. Plate to Plate			





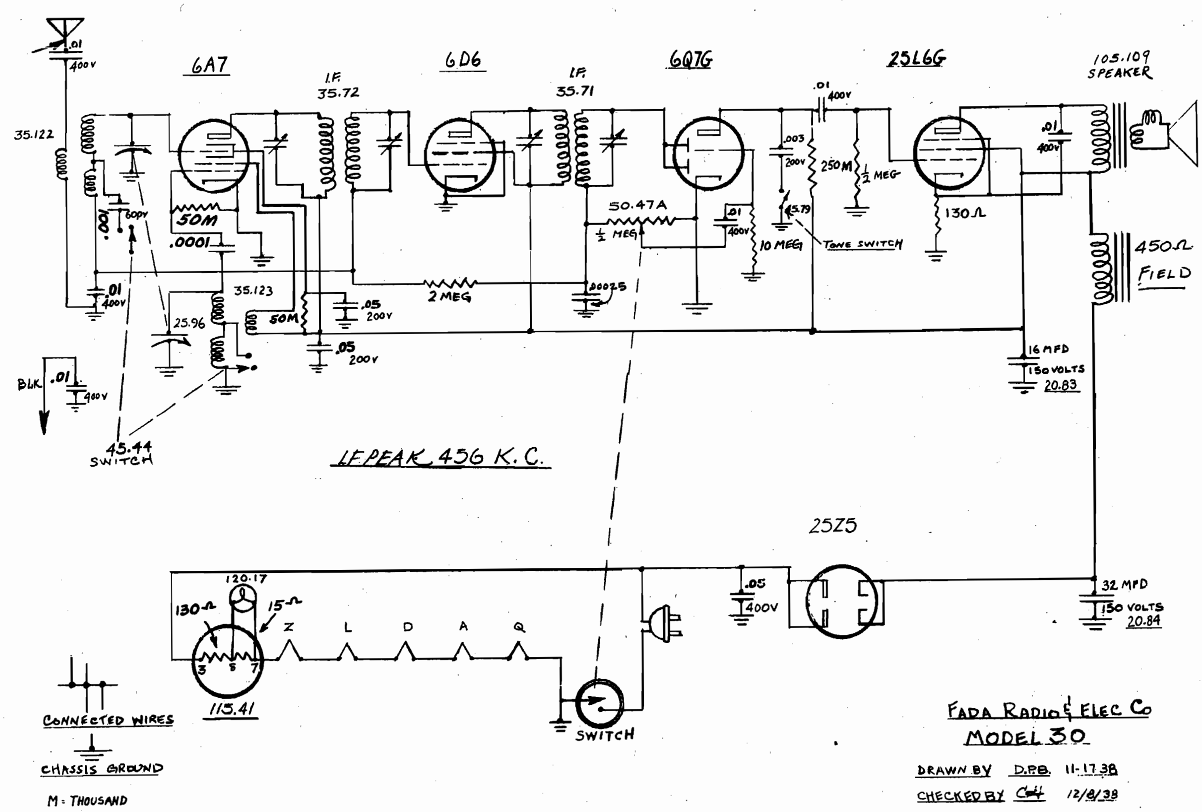
MODELS 20, 20A, 20B, 20T. VOLTAGE DATA
THESE READINGS TAKEN WITH LINE VOLTAGE 120 AC

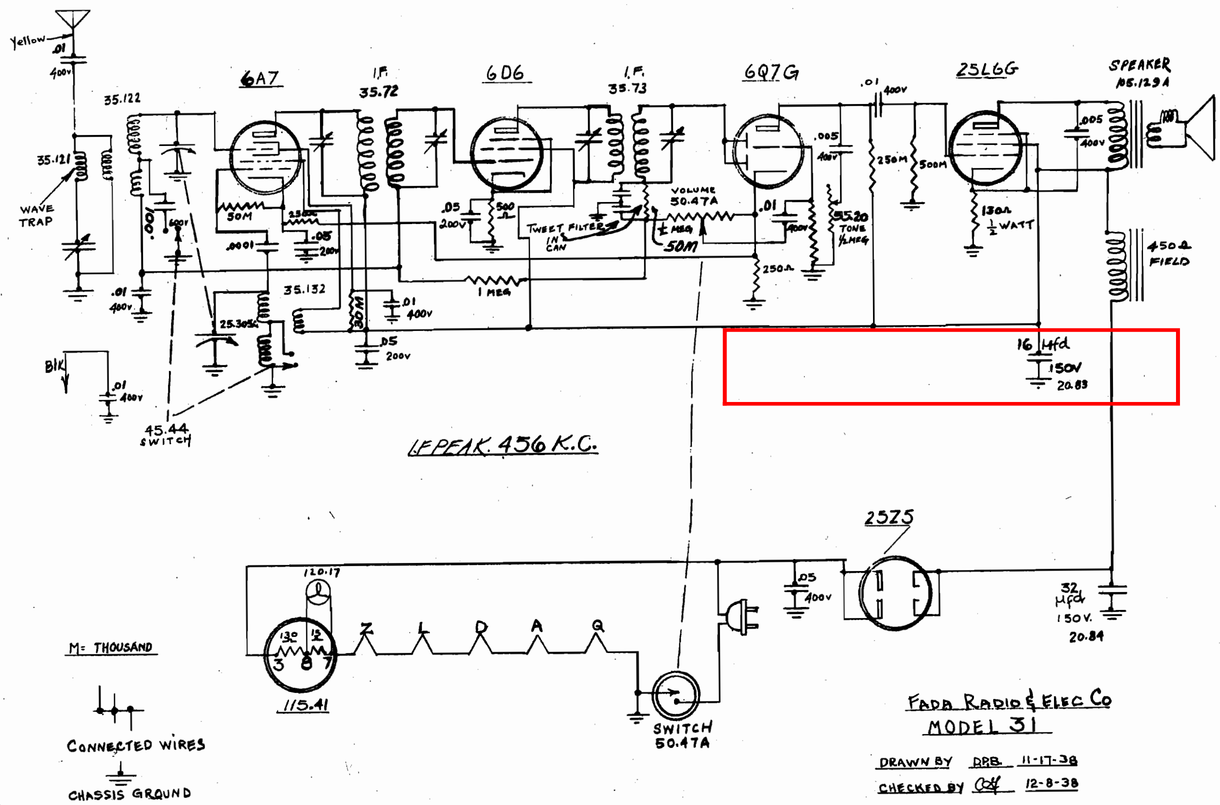
	PLATE	SCREEN	CATHODE	ANODE
6A7	110	50	2.5	105
6D6	110	110	2.5	
6Q7G	45	-	1.1	
25L6G	110	110	7	
25Z5	120 AC	-	133	

NOTE:-MODEL 20T DIFFERS FROM MODEL 20A IN THAT IT HAS A SEPERATE SPEAKER AND A LONGER VOLUME CONTROL SHAFT. MODEL 20B DIFFERS IN THAT A 76 TUBE IS SUBSTITUTED FOR THE 6Q7G TO ACCOMMODATE AUTOMATIC VOLUME CONTROL.

MODEL 30 Late
MODEL 31 Late
Schematics

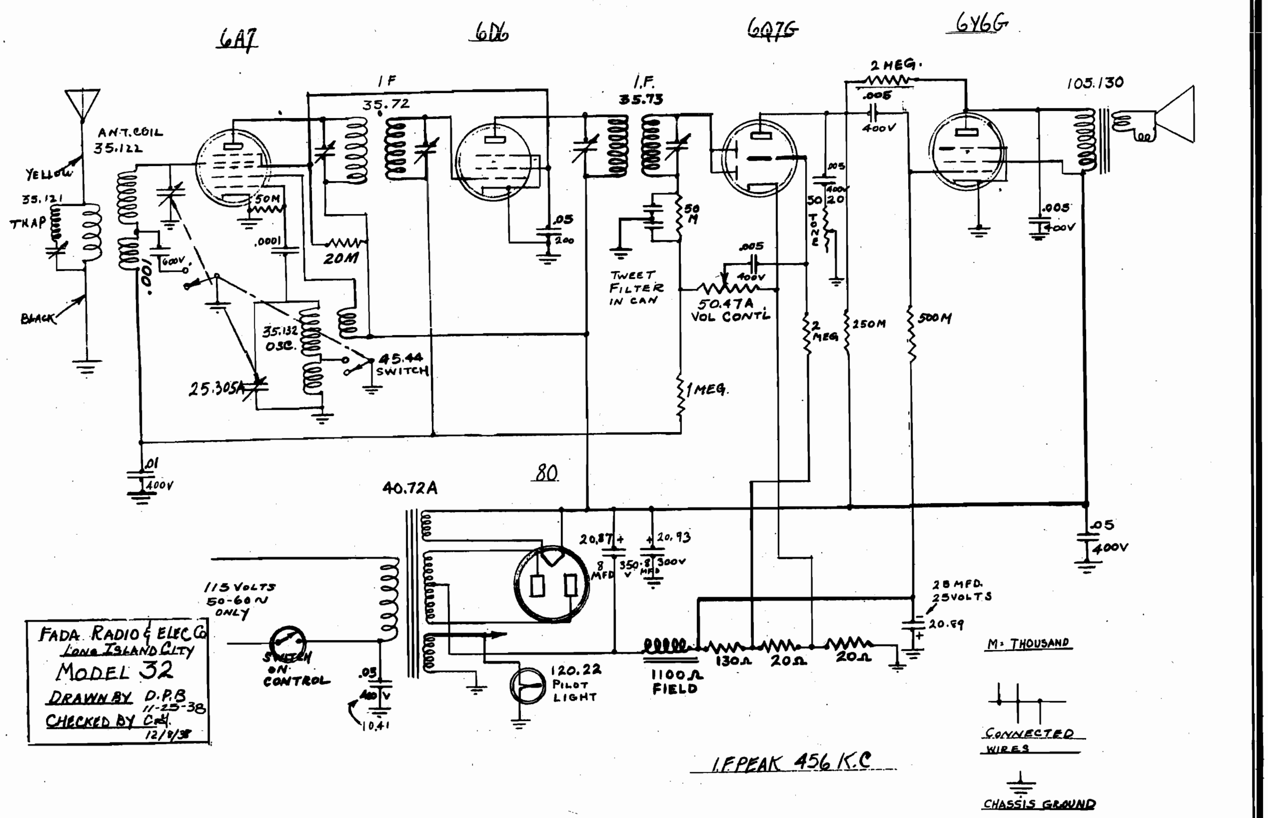
FADA RADIO & ELECTRIC CORP.

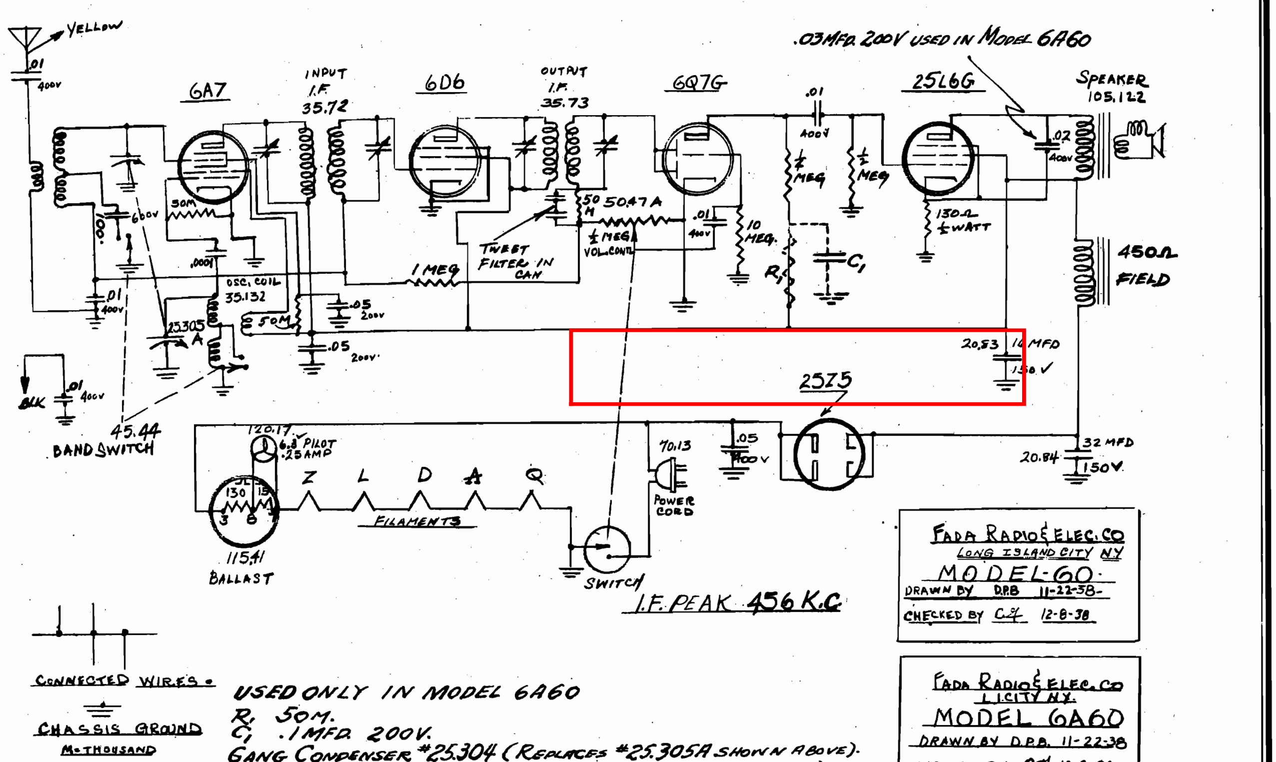




FADA RADIO & ELECTRIC CORP.

MODEL 32 Late
MODEL 6A60
MODEL 60
Schematics



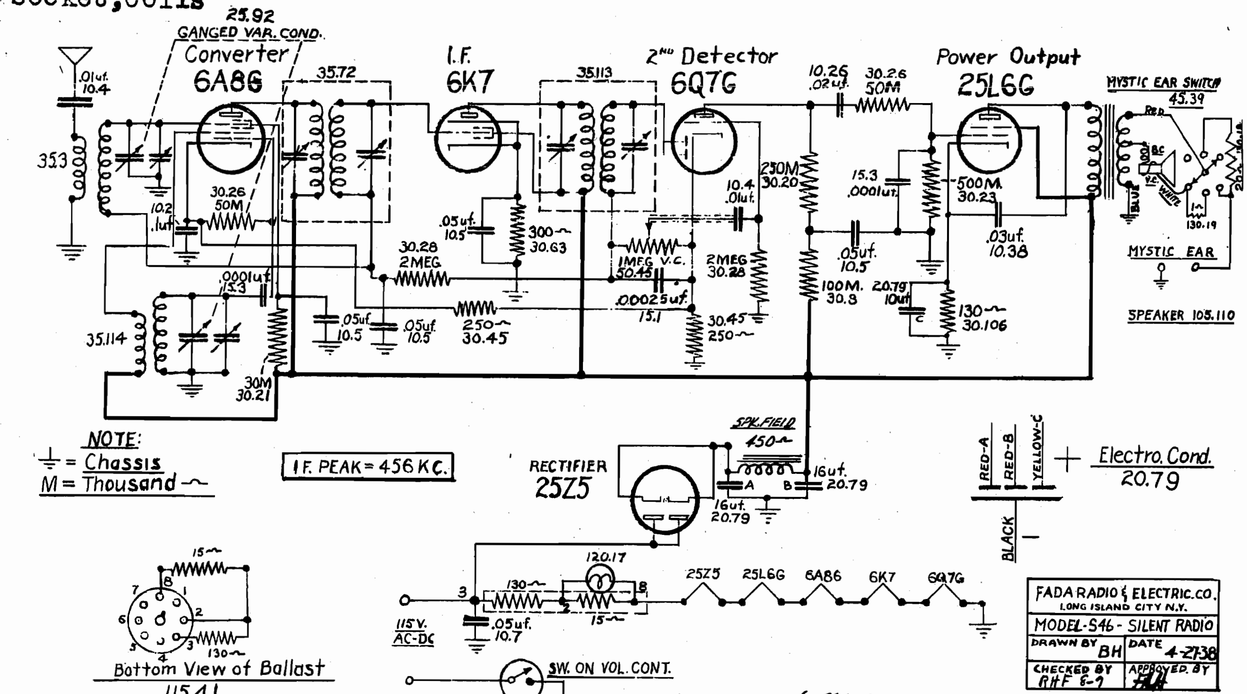


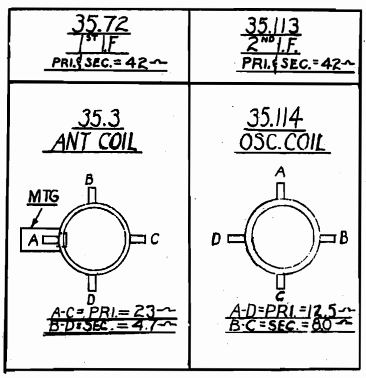
USED ONLY IN MODEL 6A60
R1 50M.
C1 .1MFD. 200V.
GANG CONDENSER #25304 (REPLACES #25.305A SHOWN ABOVE).
BAND SWITCH #45.83 (REPLACES #45.44 SHOWN ABOVE).

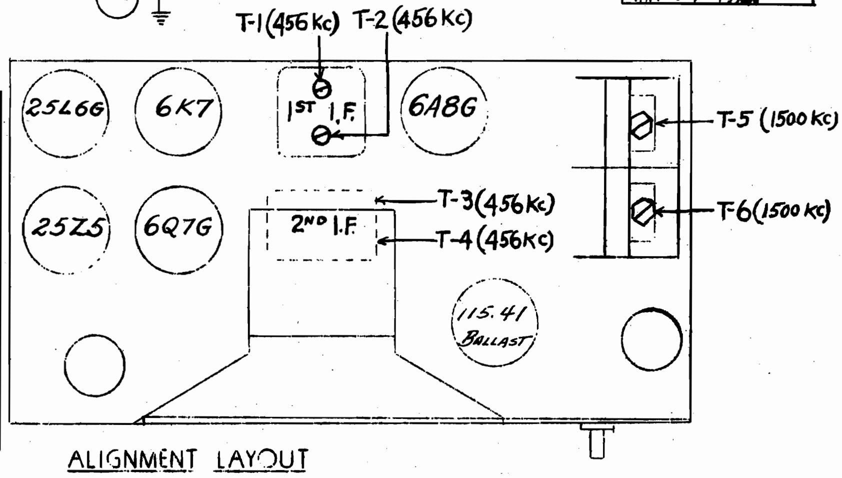
FADA RADIO & ELEC. CO
L.I. CITY, N.Y.
MODEL 6A60
DRAWN BY D.P.B. 11-22-38
CHECKED BY C.H. 12-8-38

MODEL S46
Schematic, Voltage
Alignment, Trimmers
Socket, Coils

FADA RADIO & ELECTRIC CO







ALIGNMENT LAYOUT

FADA RADIO MODEL S46 - 115 VOLTS AC-DC - Tuning Range 540-1720 K.C. - 6 Tube Superheterodyne. Tubes required - 6A8G-6K7-6Q7G-25L6G-25Z5-115.41.

Alignment Instructions: Do not attempt to align receiver until all other causes of trouble are checked then proceed as follows:---Remove chassis from case and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Connect modulated oscillator to grid of 6A8G tube in series with a.1 condenser. Adjust trimmers 1-2-3-4 for maximum reading at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 to give maximum output. Check sensitivity at 1000 and 600 K.C. with magic wand.

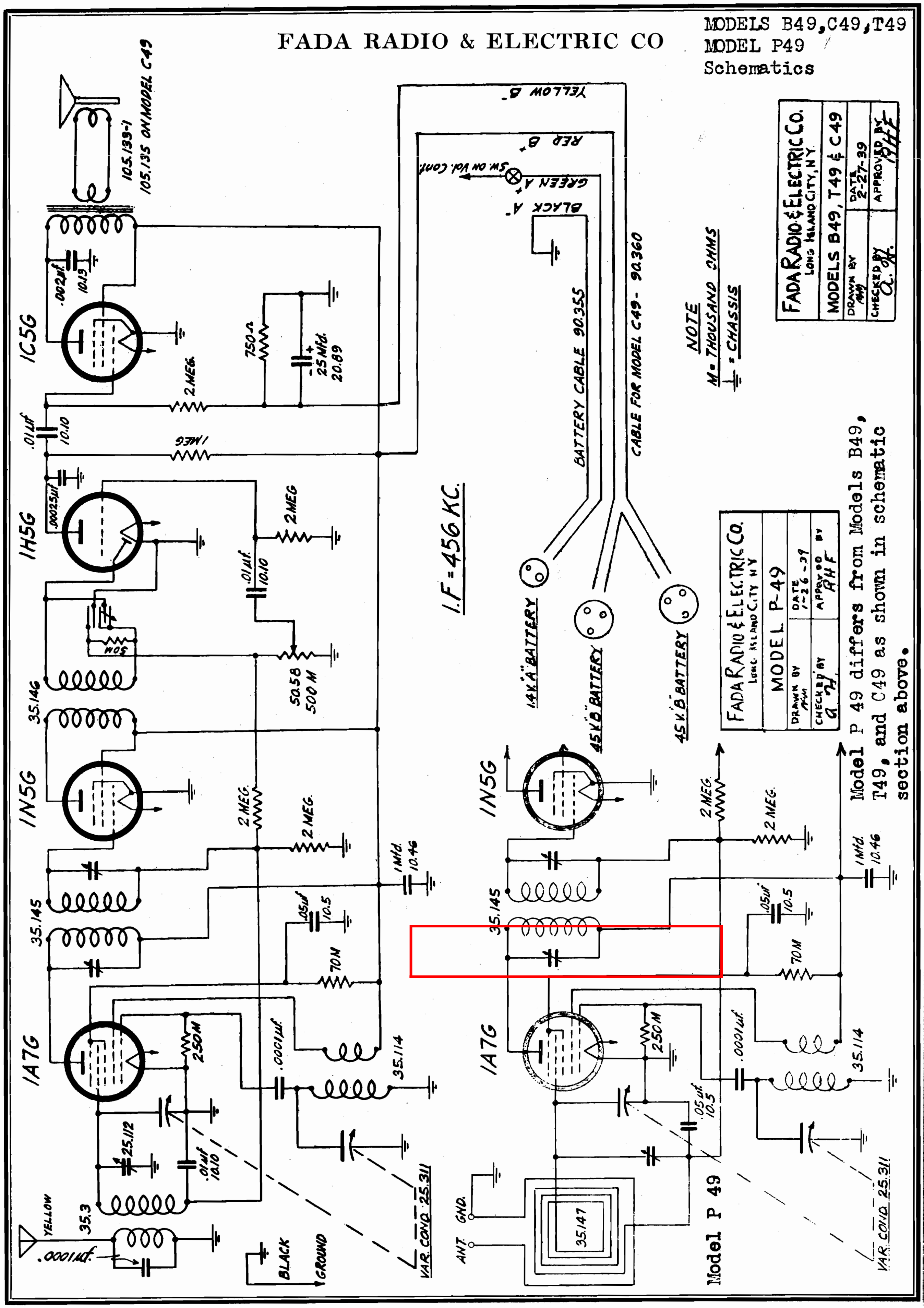
THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

	Plate	Screen	Cathode	Anode
6A8G	110	50	2.5	105
6K7	110	110	2.5	-
6Q7G	45	-	1.1	-
25L6G	110	110	7.	-
25Z5	120 AC	-		133

*** USE ONLY GENUINE FACTORY REPLACEMENT PARTS ***

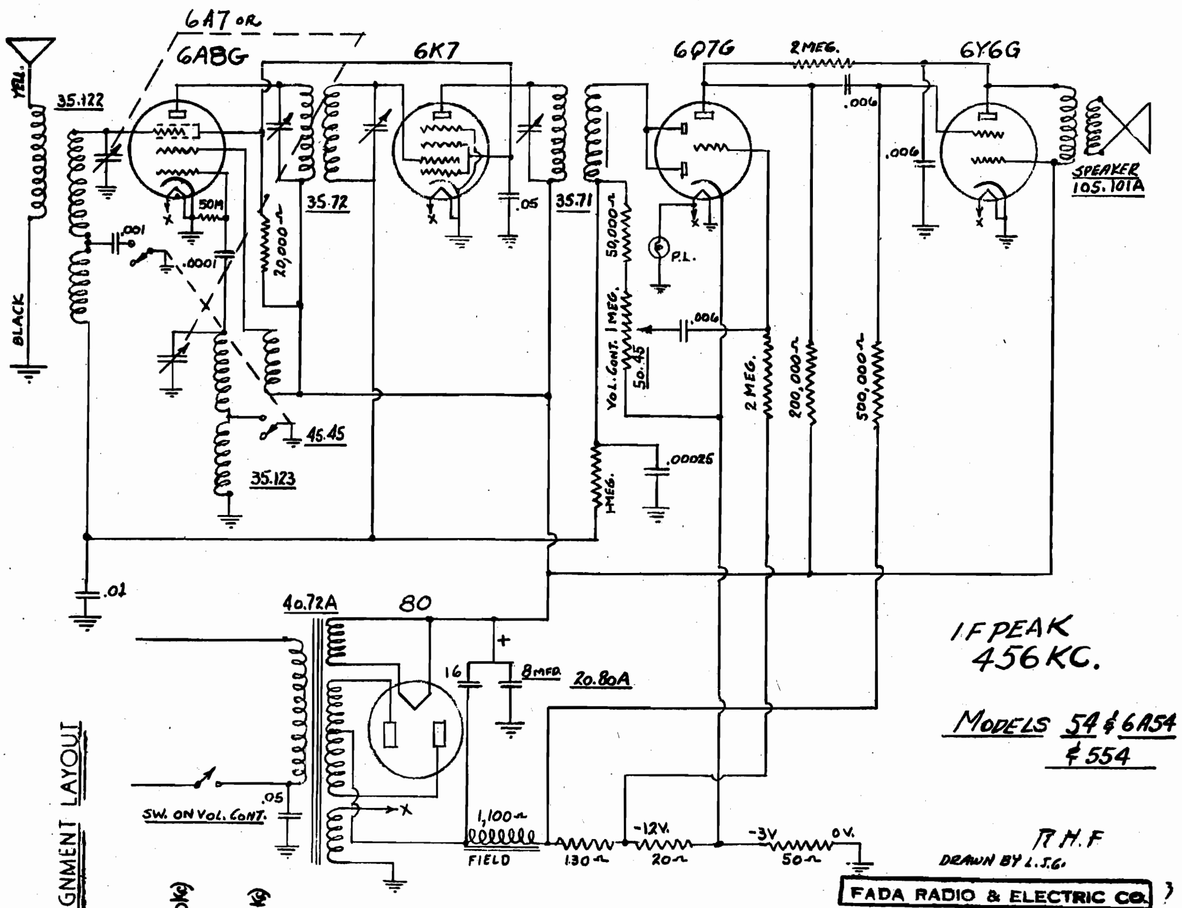
		List			List
75.207	Dial Assembly	1.75	20.79	Electrolytic Condenser	1.25
50.45	Volume Control	.80	105.110	Speaker	3.85
35.3	Antenna Coil	.60	120.27	Pilot Light Socket	.10
35.114	Oscillator Coil	.45	140.37	Knobs (walnut)	.10
35.72	Input I.F.	1.00		(ivory)	.20
35.113	Output I.F.	.90	75.245	Crystal	.25
25.92A	Variable Condenser	2.15			

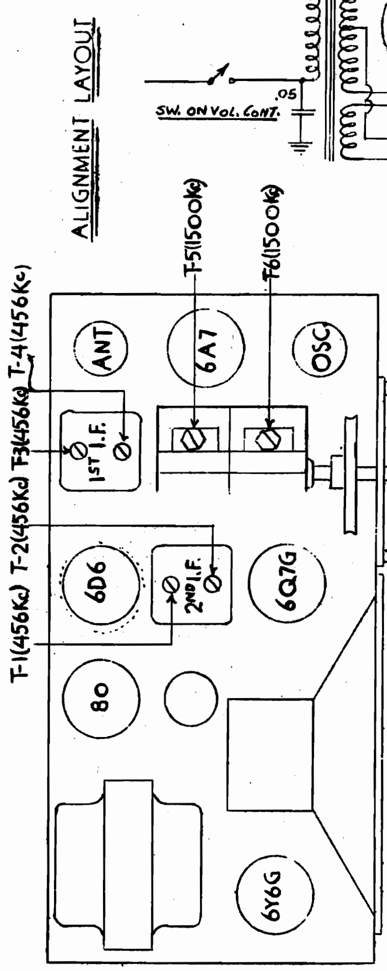
Prices subject to change without notice.


FADA RADIO & ELECTRIC CO
MODELS B49,C49,T49
MODEL P49
Schematics
FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y.
MODELS B49, T49 & C49
DATE 2-27-39
APPROVED BY RHF
CHECKED BY
DRAWN BY
FADA RADIO & ELECTRIC CO. LONG ISLAND CITY N.Y.
MODEL P-49
DATE 1-26-39
APPROVED BY RHF
NOTE
M = THOUSAND OHMS
= CHASSIS
Model P 49 differs from Models B49, T49, and C49 as shown in schematic section above.
YELLOW B-
RED B+
GREEN A+
BLACK A-
SW. ON VOL. CONT.
BATTERY CABLE 90.355
CABLE FOR MODEL C49 - 90.360
1.4 V. "A" BATTERY
45 V. "B" BATTERY
45 V. "B" BATTERY
I.F. = 456 KC.
105.135-1
105.135 ON MODEL C49
1C5G
1H5G
1N5G
1A7G
.002 µf. 10.13
750 Ω
25 Mfd. 20.89
2 MEG.
.01 µf 10.10
1 MEG
.00025 µf
2 MEG
.01 µf. 10.10
50 M
50.58 500 M
35.146
35.145
1 Mfd. 10.46
.05 µf 10.5
70 M
250 M
.0001 µf.
35.114
25.112
.01 µf 10.10
35.3
YELLOW
.0001 µf.
BLACK
GROUND
VAR. COND. 25.311
ANT.
GND.
35.147
Model P 49

MODELS 54,6A54,554
Schematic,Voltage
Alignment,Trimmers
Socket

FADA RADIO & ELECTRIC CO





FADA RADIO MODEL 54 - 115 VOLTS - 50-60 CYCLES A.C. - Tuning Range 540-1720 and 1550-4000 K.C. - 5 Tube Superheterodyne. Tubes required-6A7-6D6-6Q7G-6Y6G-80. Alignment Instructions: Do not attempt to align receiver until all other causes of trouble are checked, then proceed as follows:---Remove chassis and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Band switch in broadcast position. Connect modulated oscillator to grid of 6A7 tube in series with a .1 condenser. Adjust trimmers 1-2-3-4 for maximum reading at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 to give maximum output. Check sensitivity at 1000 and 600 K.C. ~~using magic wand. Set band switch in~~ police band position and check sensitivity at 2800 K.C. Do not disturb trimmers for this operation.

Prices subject to change without notice.

		List
50.47A	Volume Control	.85
45.44	Band Switch	.50
75.229	Vernier Drive	.25
35.122	Antenna Coil	.75
35.132	Oscillator Coil	.60
35.72	Input I.F.	1.00
35.73	Output I.F.	1.25
40.72A	Power Transformer	3.25

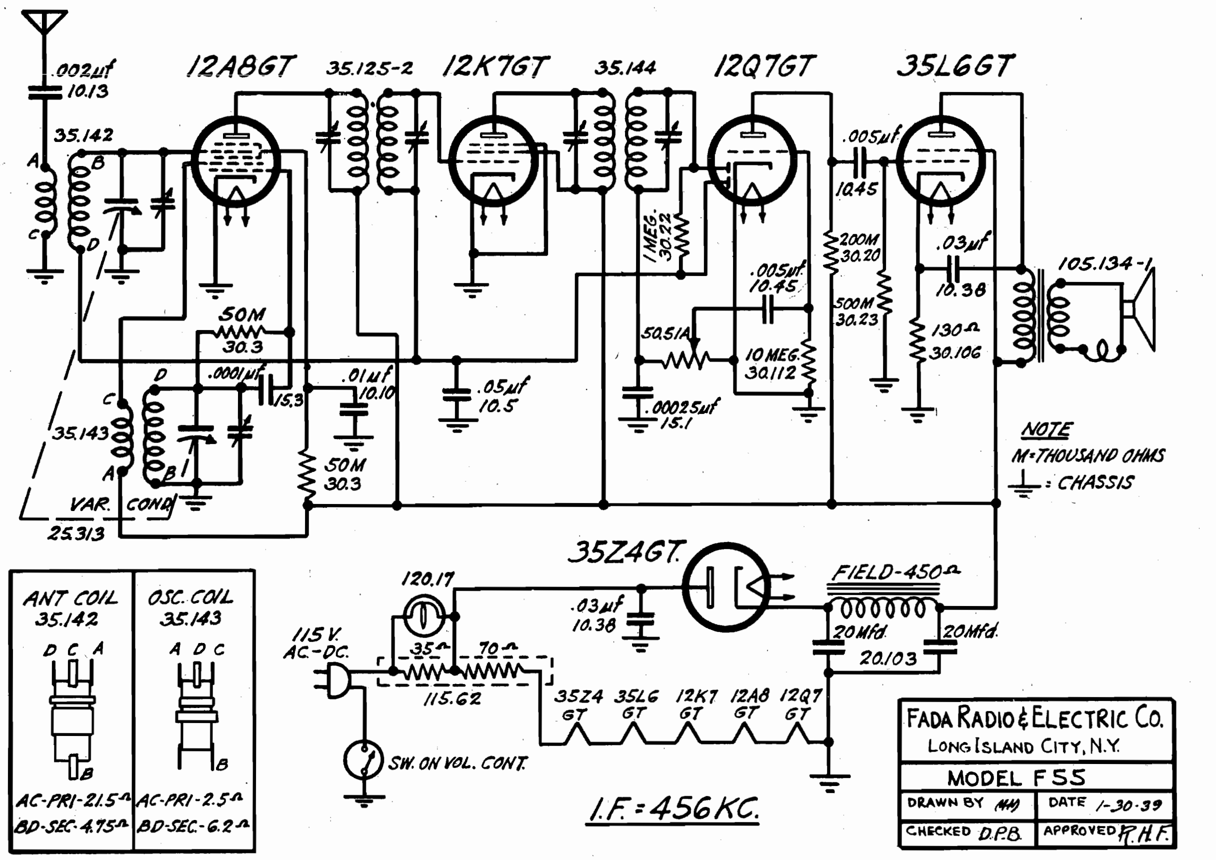
		List
25.305A	Variable Condenser	2.10
20.81A	Electrolytic "	1.35
75.267	Pulley	.20
75.290	Dial Plate	.20
75.223	Dial Pointer	.15
75.291	Dial Scale	.15
105.114	Speaker	4.25
75.230	Crystal	.40

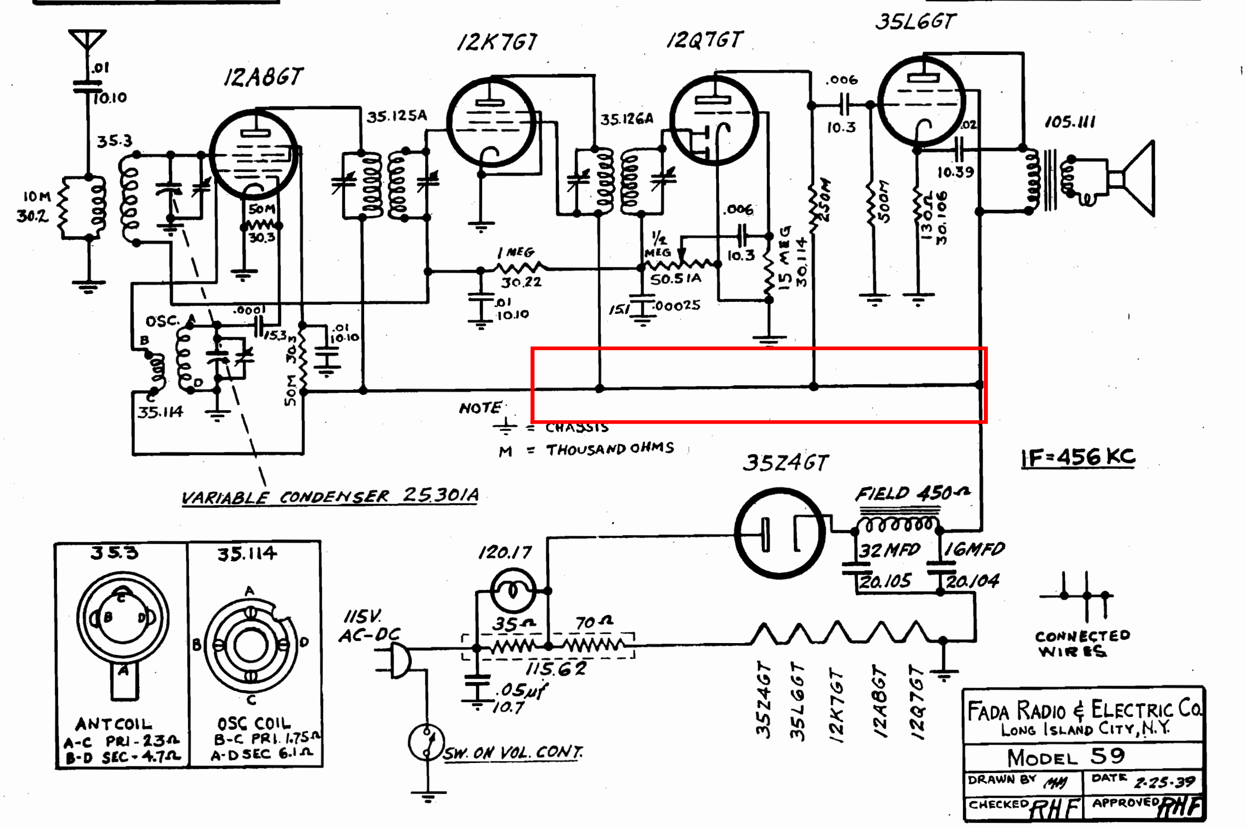
THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

	Plate	Screen	Cathode	Anode
6A7	112	62	2.7	112
6D6	112	62	2.7	-
6Q7G	50	-	1.1	-
6Y6G	105	112	11.5	-
80	414 A.C. Plate to Plate			

FADA RADIO & ELECTRIC CO

MODEL F55
MODEL 59
Schematics



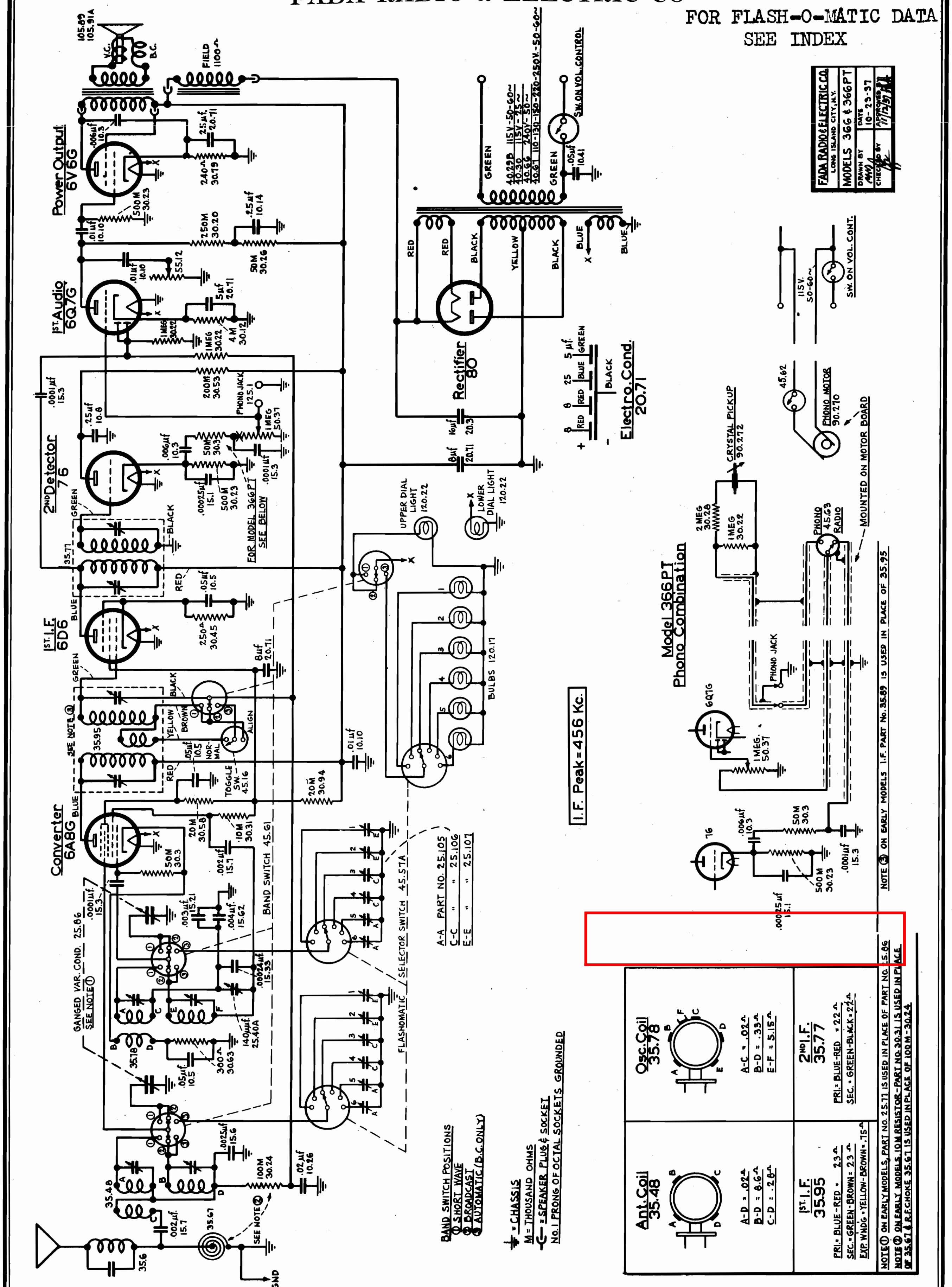


MODELS 366,366PT

FADA RADIO & ELECTRIC CO

Schematic,Coils

FOR FLASH-O-MATIC DATA
SEE INDEX



MODEL 365
MODELS 366,366PT
Alignment,Voltage
Socket,Trimmers

ALIGNMENT

1. VOLUME CONTROL .... MAXIMUM.
2. ATTENUATE SIGNAL TO CONTROL SIGNAL OUTPUT.
3. CONNECT PROPER DUMMY ANTENNA, FOR EACH ADJUSTMENT, IN SERIES WITH HIGH POTENTIAL SIDE OF SIGNAL GENERATOR. FOR .001 MFD. CONDENSER, USE PAPER TUBULAR TYPE (400V); FOR 200 MFD., MICA; 400 and 50,000 ohm resistors, CARBON 1/3 WATT.
4. GROUND LOW POTENTIAL SIDE OF SIGNAL GENERATOR.
5. FOR ADJUSTING THE I.F. TRIMMER CONDENSERS, THE CONTROL GRID SHOULD BE REMOVED AND A 50,000 OHM RESISTOR INSERTED IN SERIES WITH SAME. THEN CONNECT THE HIGH POTENTIAL LEAD OG THE SIGNAL GENERATOR THROUGH THE .001 MFD. CONDENSER DIRECTLY TO THE CONTROL GRID CAP OF THE TUBE.
6. REPEAT ALL ADJUSTMENTS.
7. TO DETERMINE THAT THE SHORT WAVE BAND SHUNT TRIMMER HAS NOT BEEN ADJUSTED TO THE IMAGE FREQUENCY, TURN THE DIAL TO THE FREQUENCY LISTED UNDER IMAGE FREQUENCY WHERE A SIGNAL WEAKER THAT THE FUNDEMENTAL SHOULD BE NOTED, HOWEVER, IF NO SIGNAL CAN BE HEARD AT THIS SETTING EVEN WITH GREATER SIGNAL GENERATOR OUTPUT, THE TRIMMER HAS BEEN IMPROPERLY ADJUSTED AND IT WILL BE NECESSARY TO READJUST TO THE PROPER PEAK.

ALIGNMENT TABLE

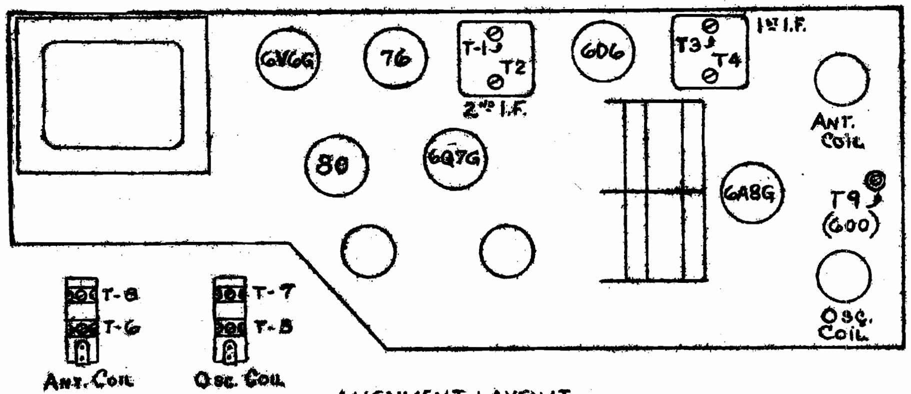
WAVE BAND	DIAL FREQUENCY	GENERATOR FREQUENCY	IMAGE FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMER
B.C.	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	Control grid of 6D6 tube	T-1,T-2
B.C.	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	Control grid of 6A8G tube	T-3,T-4
S.W.	15.0 MC	15.0 MC	15.9 MC	400 ohm resistor	Yellow antenna lead	T-5,T-6
S.W.	6.0 MC	6.0 MC	---	400 ohm resistor	Yellow antenna lead	Check Tracking
B.C.	1500 KC	1500 KC	---	200 mmfd. condenser	Yellow antenna lead	T-7,T-8
B.C.	600 KC	600 KC	---	200 mmfd. condenser	Yellow antenna lead	T-9*

*To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

VOLTAGE ACROSS ELECTROLYTIC CONDENSERS

1st Section	2nd Section	3rd Section
312	240	105

Voltage across speaker field - 73 volts



ALIGNMENT LAYOUT

CONTINUITY AND VOLTAGE READINGS ON

MODEL 365 & 366 SERIES

SEE INDEX FOR MODEL 365 SCHEMATIC

Line voltage 115 A.C. - Input watts - 58

(No signal input)

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTS	PLATE MA CURRENT	CATHODE VOLTS	SCREEN GRID VOLTS
6A8G	1st Detector	235	1.9	1.3	65
	Oscillator	86	2.2	---	---
6D6	Int. Freq.	235	9.4	3.0	105
76	2nd Detector	127	.1	13.0	---
6Q7G	A.V.C.	---	---	---	---
	1st Audio	67	.1	1.3	---
6V6G	Pwr. Pentode	220	41.0	10.5	229
80	Rectifier	---	66.0 TOTAL	---	---

These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages. Above readings taken with a 105.89 speaker in circuit.

SPEAKER D.C. RESISTANCE VALUES

PART NO.	FIELD COIL	AUDIO TRANS. PRI.	AUDIO TRANS. SEC.	V.C.
105.89	1,100*	210*	.5**	3.0
105.91A	1,100*	220*	.8**	3.0

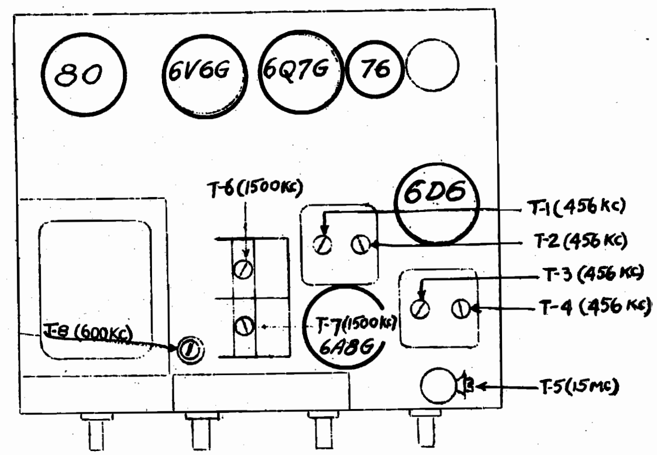
* These are cold D.C. resistance values.

**This reading includes resistance of hum bucking coil.

MODEL 465
Schematic, Voltage
Alignment, Trimmers
Socket

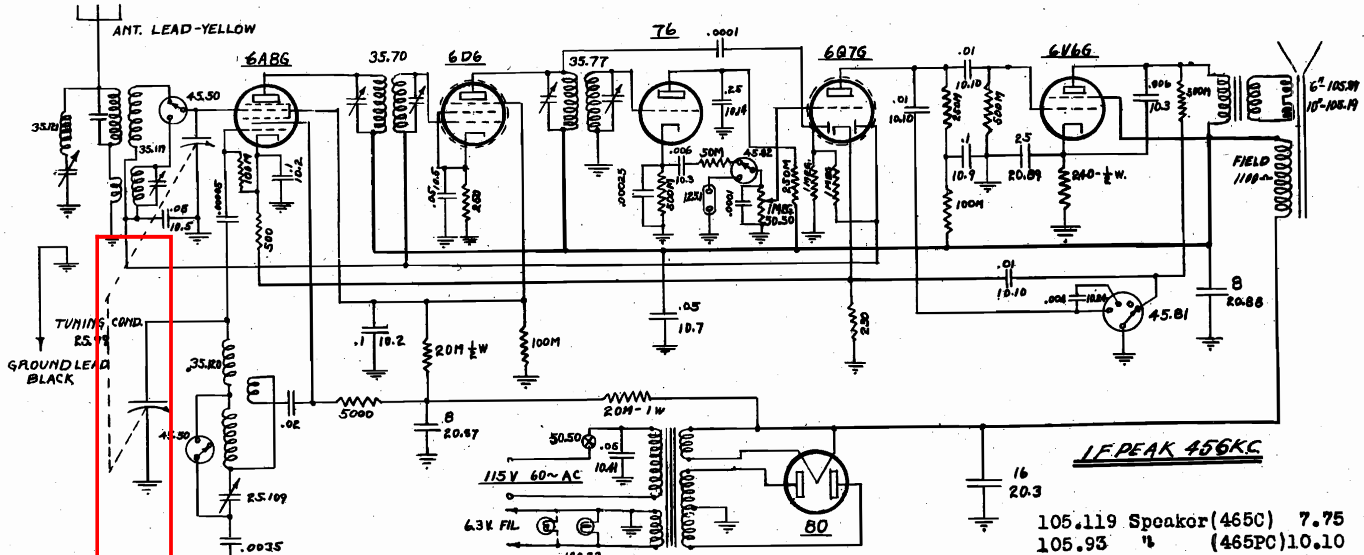
FADA RADIO & ELECTRIC CO

ALIGNMENT LAYOUT



FADA RADIO MODEL 465 - 115 VOLTS - 50-60 CYCLES A.C. - Tuning Range - 545-1720 K.C. and 5.8-18.4 Megacycles - 6 Tube Superheterodyne. Tubes required-6A8G-6D6-76-6Q7G-6V6G-80.

Alignment Instructions: Do not attempt to align receiver until all other causes of trouble are checked, then proceed as follows:---Remove chassis and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Tone control to high end. Band switch to broadcast position. Connect modulated oscillator to grid of 6A8G tube in series with a.1 condenser and adjust trimmers 1-2-3-4 for maximum output at 456 K.C. reducing input signal of oscillator as required. Check pointer with condensor fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 for maximum output. Turn dial pointer to 600 K.C. Adjust padder T8 rocking gang condenser for maximum output. Recheck alignment at 1500 K.C. Shift oscillator to 456 K.C. and set trimmer on wave trap for minimum signal. Check sensitivity at 1000 K.C. using magic wand. Turn band switch to Short Wave position. Set dial at 15 M.C. Use a 400 ohm carbon resistor for dummy antenna. With a 15 M.C. signal adjust T-5 for maximum output. Check image at 14.1 M.C. increasing input signal if necessary. Check sensitivity at 10 M.C. and 6 M. C.



I.F. PEAK 456KC

105.119 Speaker (465C) 7.75
105.93 " (465PC) 10.10

FADA RADIO & ELECTRIC Co.
LONG ISLAND CITY N.Y.
MODEL 465
DRAWN BY A.H. SEPT. 29, 1938
CHECKED R.H. APP.

		List			List
50.50	Volume Control	.85	35.70	I.F. Input	1.20
45.81	Tone Switch	.65	35.77	I.F. Output	1.20
45.50	Band Switch	.60	35.121	I.F. Trap	.45
40.73	Power Transformer	3.60	25.99	Variable Cond.	2.00
35.119	Antenna Coil	1.35	25.109	Padding Cond.	.25
35.120	Oscillator Coil	.75	105.89	Speaker (465T)	4.25

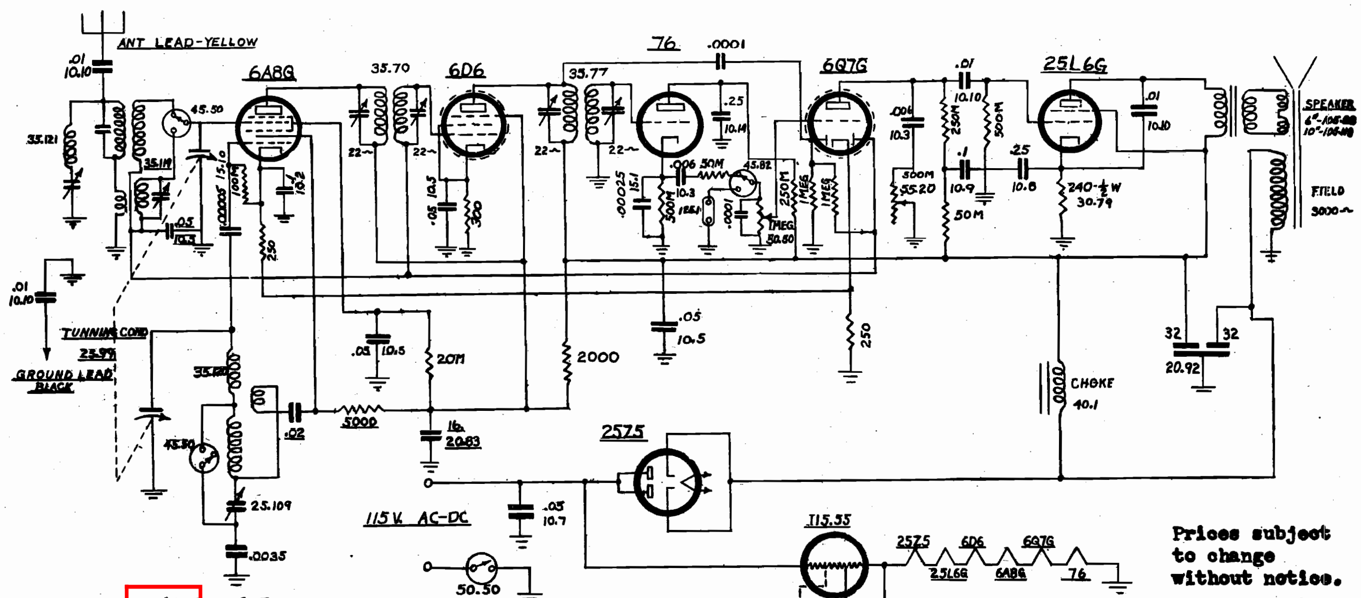
Prices subject to change without notice.

THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

	Plate	Screen	Cathode	Anode
6A8G	258	70	4	150
6D6	258	70	2	
6Q7G	150	-	2	
6V6G	250	258	11.4	
80	630 A.C. Plate to Plate			
76	250	-	19	

FADA RADIO & ELECTRIC CO

MODEL 470
Schematic, Voltage
Alignment, Trimmers
Socket

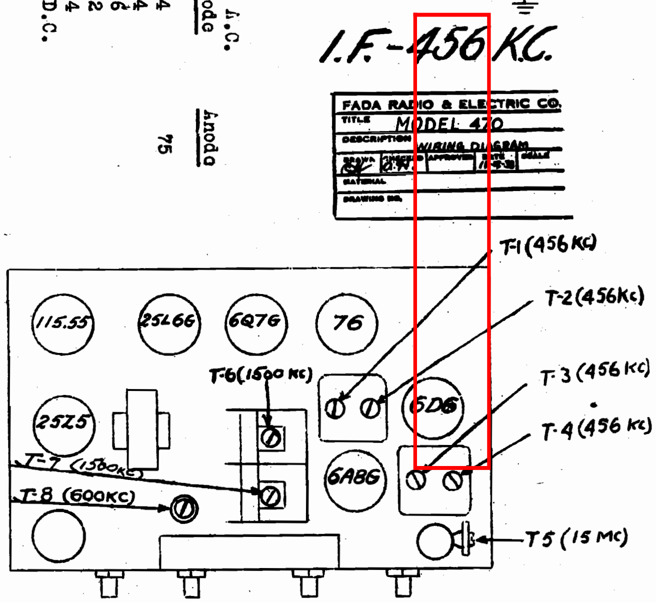


Prices subject to change without notice.

		List			List
50.50	Volume Control	.85	35.70	I.F. Input	1.20
55.20	Tone Control	.50	35.77	I.F. Output	1.20
45.50	Band Switch	.60	35.121	I.F. Trap	.45
40.1	Filter choke	.75	25.99	Variable Condenser	2.00
35.119	Antenna Coil	1.35	25.109	Padding "	.25
35.120	Oscillator Coil	.75	105.88	Speaker (6½")	4.50

FADA RADIO MODEL 470 - 115 VOLTS A.C.-D.C. - Tuning Range 545-1720 K.C. and 5.8-18.4 Megacycles - 7 Tube Superheterodyne. Tubes required -6A8G-6D6-76-6Q7G-25L6G-25Z5-115.55.

Alignment Instructions: Do not attempt to align receiver until all other causes of trouble are checked, then proceed as follows:--Remove chassis and connect output meter across voice coil of speaker. Set dial pointer at 1000 K.C. and turn volume control to maximum position. Tone control to high end. Band switch to broadcast position. Connect modulated oscillator to grid of 6A8G tube in series with a .1 condenser and adjust trimmers 1-2-3-4 for maximum output at 456 K.C. reducing input signal of oscillator as required. Check pointer with condenser fully meshed. Turn pointer to 1500 K.C. Connect oscillator to antenna lead using a .0002 condenser as dummy antenna. With a 1500 K.C. signal adjust trimmers 5 & 6 for maximum output. Turn dial pointer to 600 K.C. Adjust padder T8 rocking gang condenser for maximum output. Recheck alignment at 1500 K.C. Shift oscillator to 456 K.C. and set trimmer on wave trap for minimum signal. Check sensitivity at 1000 K.C. using magic wand. Turn band switch to Short Wave position. Set dial at 15 M.C. Use a 400 ohm carbon resistor for dummy antenna. With a 15 M.C. signal adjust T-5 for maximum output. Check image at 14.1 M.C. increasing input signal if necessary. Check sensitivity at 10 M.C. and 6 M.C.



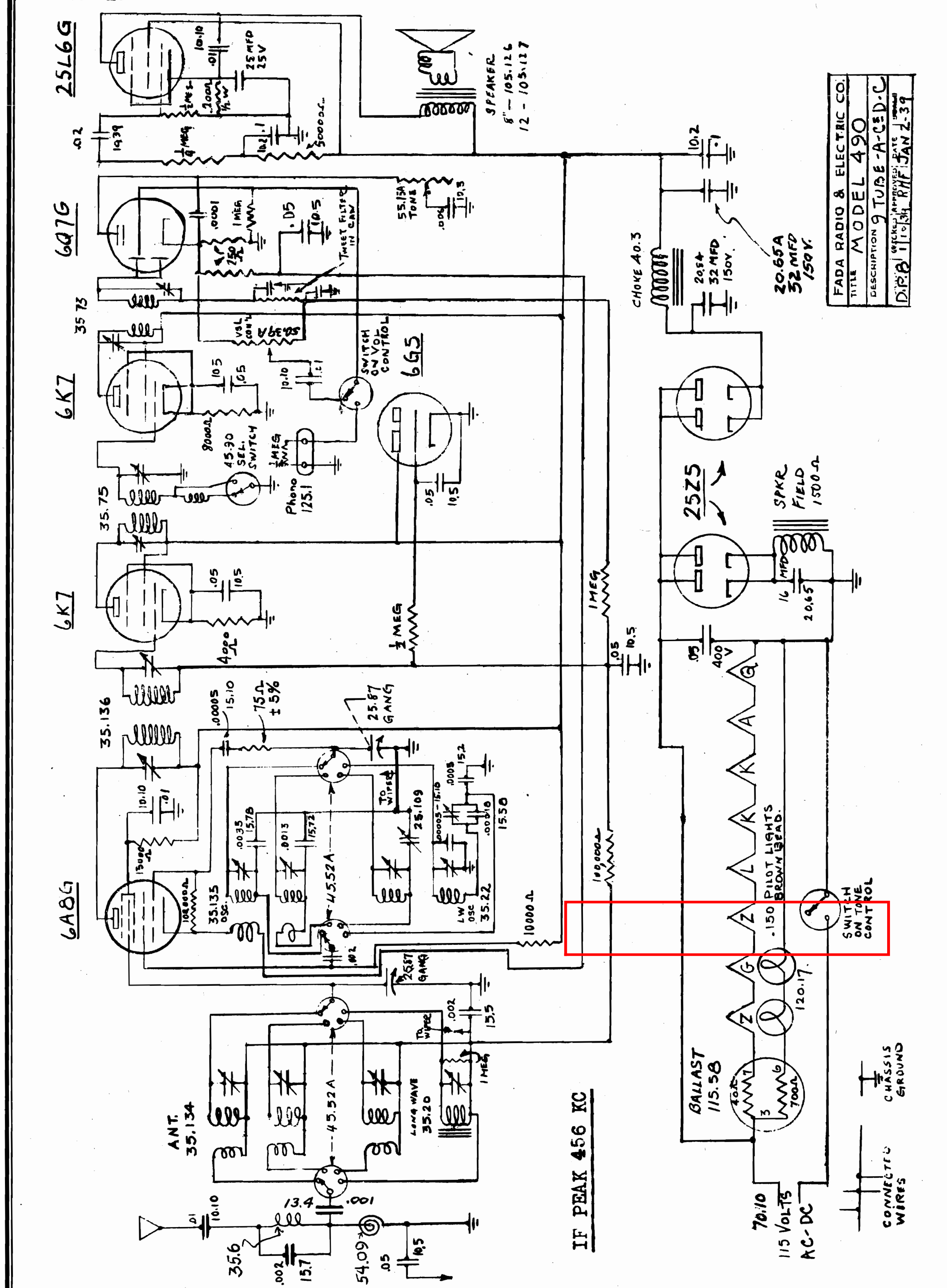
ALIGNMENT LAYOUT

THESE READINGS TAKEN WITH LINE VOLTAGE 120 A.C.

	Plate	Screen	Cathode	Anode
6A8G	92	54	2.4	75
6D6	107	96	2.4	
76	101	-	8.6	
6Q7G	75	-	1.2	
25L6G	105	109	8.4	
25Z5	120 A.C.		120 D.C.	

MODEL 490
Schematic

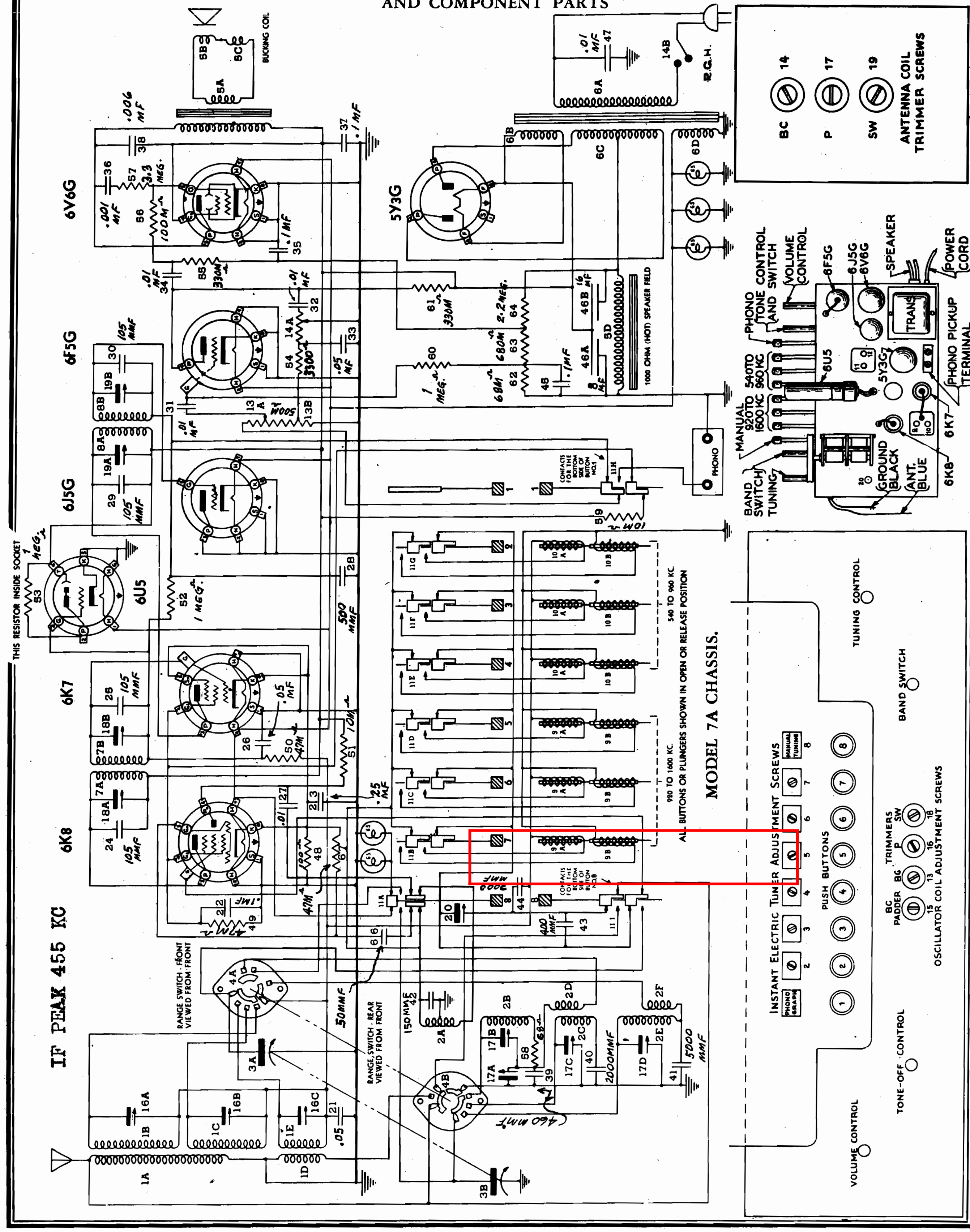
FADA RADIO & ELECTRIC CO



MODEL 7A
Schematic, Socket
Trimmers

FAIRBANKS, MORSE & CO.

SCHEMATIC WIRING DIAGRAM OF THE MODEL 7A CHASSIS.
FRONT, SIDE, AND TOP VIEWS OF THE CHASSIS SHOWING TRIMMER LOCATIONS, TUBE LOCATIONS AND COMPONENT PARTS



MODEL 7A
Alignment, Voltage
Tuner, Phono

FAIRBANKS, MORSE & CO.

The model 7A chassis is an AC operated superheterodyne with automatic volume control, audio inverse feedback, permeability push button tuning and tuning eye. It incorporates three wave bands, broadcast, police-amateur and short wave. It is also equipped with a phono connection which permits the use of an external phonograph pickup.

THE PUSH BUTTON TUNER

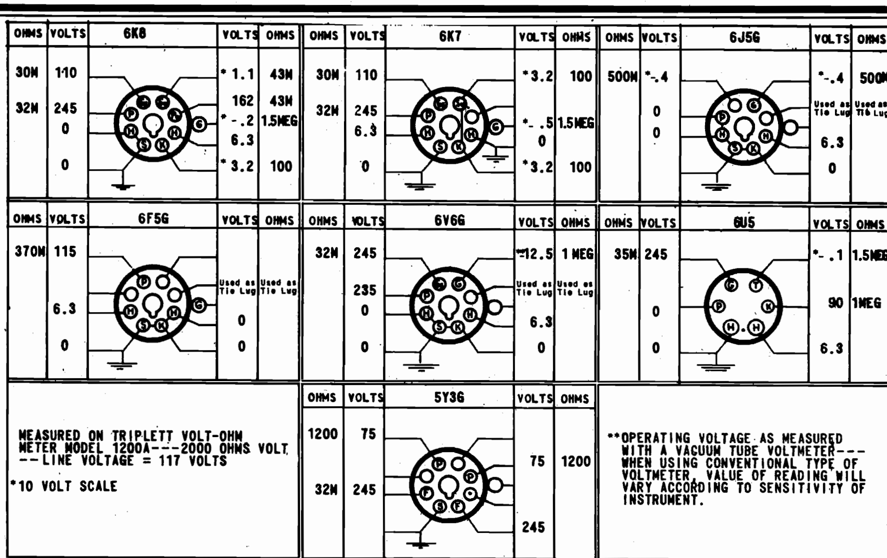
It will be noted that only one operation is required for the setting of each push button. This simplicity of operation is made possible by the use of permeability tuned coils which have been accurately tracked at the factory so that it is not necessary to adjust external trimmer condensers in order to "set" a station. Tracking is accomplished by the careful spacing of the iron cores on their common shaft so that for all settings of the adjusting screws the coils are in perfect alignment. The capacitance in the oscillator circuit is fixed and may not be adjusted. This condenser (corresponding to the tuning condenser in a manually tuned receiver) is shown as number 42 on the schematic diagram and has a value of 150 micro-microfarads. The capacitance in the antenna circuit consists of two condensers, number 20 and number 43. Condenser number 20 must be adjusted when the initial alignment is made, but does not have to be touched at the time the buttons are "set" for their individual stations. Its use is covered in the alignment instructions. Instructions for "setting-up" the push buttons are covered in detail in the instruction book which accompanies each receiver.

THE AUDIO CIRCUIT

The audio circuit is of conventional design with the exception of the inverse feedback circuit consisting of resistors number 56 and number 57 and condenser number 36. By means of this network a certain amount of the voltage present at the plate of the 6V6G tube is fed back to the grid circuit of that tube. This voltage is, of course, out of phase with the input voltage and degeneration is the result.

Any audio amplifier employing a loud speaker as the load will have a certain amount of distortion introduced due to the fact that the impedance varies with the audio frequency changes in the plate circuit of the output tube. This condition is more pronounced in amplifiers using an output tube of the high impedance type such as the beam pentodes. Inverse feedback effectively reduces the plate impedance of the tube and helps to smooth out these variations thus reducing distortion to a marked degree.

The subject cannot be treated more fully here due to space limitations and has been mentioned merely to give the serviceman a brief explanation of the feedback circuit.



VOLTAGE AND RESISTANCE DATA

Step No.	Connect Signal Generator To	Signal Generator Frequency	Dummy Antenna	Range Switch Position	Dial Setting	Section	Adjusting Screw No.	Peak For
1	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	2nd IF Trans.	9	Maximum
2	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	2nd IF Trans.	10	Maximum
3	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	1st IF Trans.	11	Maximum
4	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	1st IF Trans.	12	Maximum
5	Antenna	1500 KC	200 Mmfd. Condenser	Broadcast (A)	1500 KC	B.C. Osc.	13	Maximum
6	Antenna	1500 KC	200 Mmfd. Condenser	Broadcast (A)	1500 KC	B.C. Det.	14	Maximum
7	Antenna	600 KC	200 Mmfd. Condenser	Broadcast (A)	600 KC	B.C. Padder	15	Max.(1)
8	Antenna	1500 KC	200 Mmfd. Condenser	Broadcast (A)	Depress #7 Button	Instant Electric Tuner	7	Maximum
9	Antenna	1500 KC	200 Mmfd. Condenser	Broadcast (A)	Depress #7 Button	Instant Electric Tuner	20	Maximum (2)
10	Antenna	6.0 MC	400 Ohm Resistor	Police-Amateur (B)	6.0 MC	Police Oscillator	16	Maximum
11	Antenna	6.0 MC	400 Ohm Resistor	Police-Amateur (B)	6.0 MC	Police Detector	17	Maximum
12	Antenna	2.5 MC	400 Ohm Resistor	Police-Amateur (B)	2.5 MC	Police Padder	(3)	
13	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave Oscillator	18	Maximum (4)
14	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave Detector	19	Maximum (5)
15	Antenna	8.0 MC	400 Ohm Resistor	Short Wave (C)	8.0 MC	Short Wave Padder	(6)	

(1) While rocking, repeat 13, 14 and 15 until no change is noticed.
(2) The performance obtained with this adjustment when push button tuning is employed is suitable, as a rule, only when a conventional antenna system is used. The use of extremely long or short antennae, may necessitate a minor change in this adjustment for best results.
(3) Check calibration at 2.5 MC. Padder is fixed.
(4) Check for image at 19.1 MC approximately.
(5) Check for image response.
(6) Check calibration at 8.0 MC. Padder is fixed.

ALIGNMENT PROCEDURE CHART

PHONO CONNECTIONS

The input circuit for the phonograph section of this receiver is designed for the use of a pickup of the high impedance type, although fair success may be obtained by the use of a unit of fairly low impedance. Should any difficulty be encountered with hum in the set when a pickup is being used, it is probably due to the fact that the shield side of the lead is not connected to the ground side of the terminal strip. Reversing the leads (after making sure that one side of the phono lead is a shield) should remedy complaints of this kind.

ALIGNMENT PROCEDURE

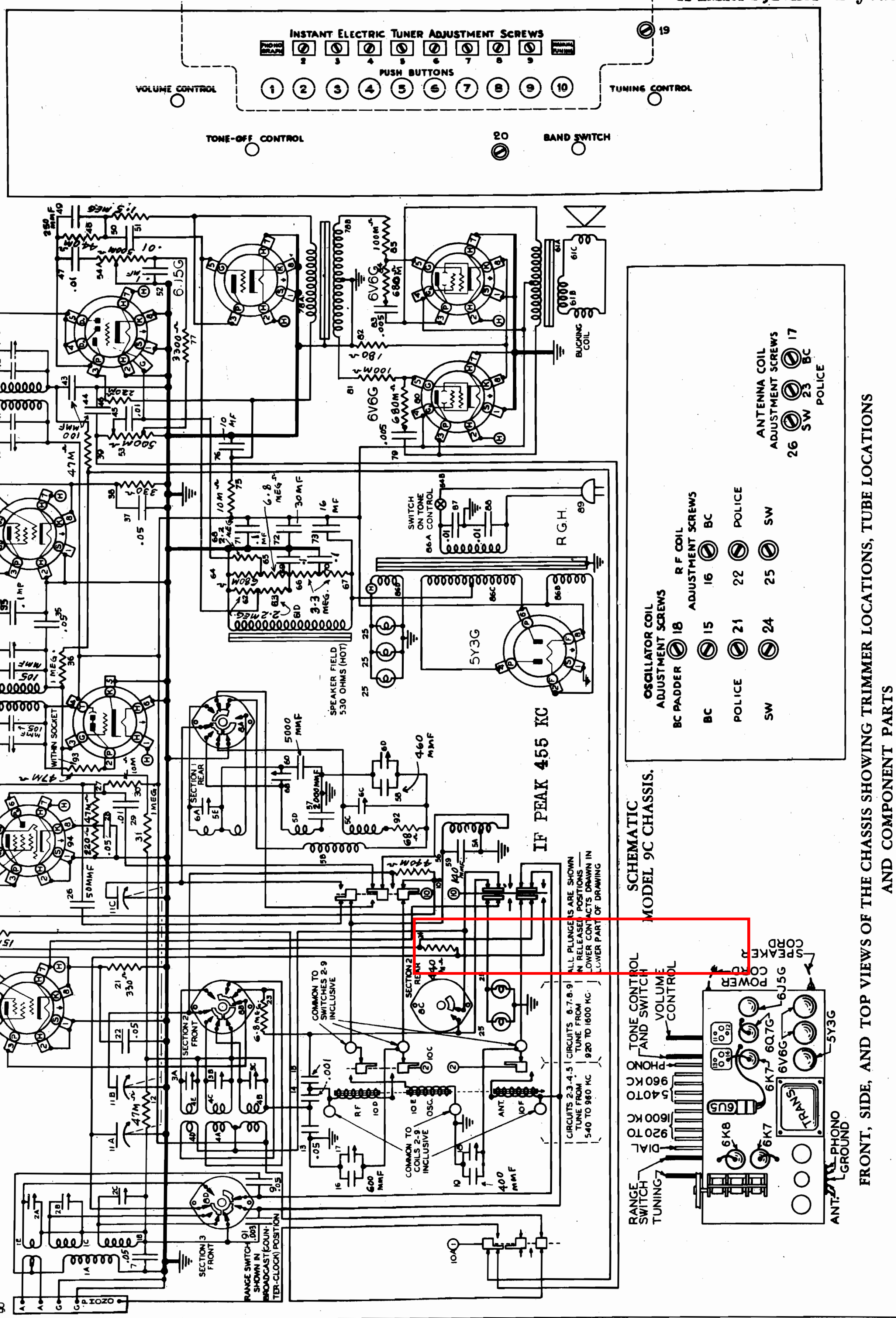
Alignment procedure is given in diagrammatic and chart form. Make adjustments in the order given. Any reliable low range AC voltmeter, preferably about 0-5 volts may be used as an output meter. It should be connected across the speaker voice coil for best results. The volume control should be set at maximum during the alignment and the output from the signal generator should be decreased as the meter pointer tends to go off scale. If too strong a signal is used and the volume control is used to keep the pointer on scale, the AVC will operate and inaccurate alignment will result.

When aligning the police and short wave bands, care must be taken to see that the trimmers are set on the proper frequency and not on the image. The image falls 910 kilocycles below the fundamental signal, so at 20 megacycles the image should be heard at 20 megacycles minus .910 megacycle or 19.1 megacycles approximately.

After setting the oscillator trimmer, increase the input from the signal generator and make sure that the image comes in at the proper point. When you can hear one signal at the frequency to which your generator is set, and one at about 1 megacycle below it, you are ready to finish the alignment. Go back to the fundamental frequency and start peaking the antenna trimmer, rocking the tuning condenser slightly as you do so. When you reach a peak, compare the strength of the fundamental signal and the image. If the image is the stronger, you have the wrong peak on the antenna trimmer. Find the other peak and again compare the two signals. You will probably find it necessary to increase the generator output greatly in order even to hear the image when you have found the right peak.

FAIRBANKS, MORSE & CO.

MODEL 9C
Schematic, Socket
Trimmers, Tuner Layout



MODEL 9C
Alignment, Voltage
Tuner, Phono.

FAIRBANKS, MORSE & CO.

ALIGNMENT PROCEDURE CHART

Step No.	Connect Signal Generator To	Signal Generator Frequency	Dummy Antenna	Range Switch Position	Dial Setting	Section	Adjusting Screw No.	Peak For
1	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	2nd IF Trans.	11	Maximum
2	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	2nd IF Trans.	12	Maximum
3	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	1st IF Trans.	13	Maximum
4	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	1st IF Trans.	14	Maximum
5	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	1500 KC	B.C. Osc.	15	Maximum
6	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	1500 KC	B.C. RF	16	Maximum
7	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	1500 KC	B.C. Antenna	17	Maximum
8	Antenna	600 KC	200 Mmfd.Condenser	Broadcast (A)	600 KC	B.C. Padder	18	Max.(1)
9	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	Depress #9 Button	Instant Electric Tuner	9	Maximum
10	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	Depress #9 Button	Instant Electric Tuner	19	Maximum (2)
11	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	Depress #9 Button	Instant Electric Tuner	20	Maximum (2)
12	Antenna	6.0 MC	400 Ohm Resistor	Police-Amateur (B)	6.0 MC	Police Oscillator	21	Maximum
13	Antenna	6.0 MC	400 Ohm Resistor	Police-Amateur (B)	6.0 MC	Police RF	22	Maximum
14	Antenna	6.0 MC	400 Ohm Resistor	Police-Amateur (B)	6.0 MC	Police Antenna	23	Maximum
15	Antenna	2.5 MC	400 Ohm Resistor	Police-Amateur (B)	2.5 MC	Police Padder		(3)
16	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave Oscillator	24	Maximum (4)
17	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave RF	25	Maximum (5)
18	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave Antenna	26	Maximum (5)
19	Antenna	8.0 MC	400 Ohm Resistor	Short Wave (C)	8.0 MC	Short Wave Padder		(6)

(1) While rocking, Repeat 5, 6, 7 and 8 until no change is noted.
(2) The performance obtained with this adjustment when push button tuning is employed is suitable, as a rule, only when a conventional antenna system is used. The use of extremely long or short antennae, may necessitate a minor change in this adjustment for best results.
(3) Check calibration at 2.5 MC. Padder is fixed.
(4) Check for image at 19.1 MC on dial approximately.
(5) Check for image response.
(6) Check calibration at 8.0 MC. Padder is fixed.

VOLTAGE AND RESISTANCE DATA

OHMS	VOLTS	6K7 RF	VOLTS	OHMS
3 MEG	110		3.2	330
3 MEG	258		USED AS	TIE LUGS
0	0		0	3 MEG
			6.3 AC	
0	0		3.2	330

OHMS	VOLTS	6K8 OSCILLATOR & MIXER	VOLTS	OHMS
3 MEG	110		1.1	47 M
3 MEG	253		170	3 MEG
0	0		0	3 MEG
			6.3AC	
0	0		3.6	220

OHMS	VOLTS	6K7 IF	VOLTS	OHMS
3 MEG	110		2.8	330
3 MEG	252		USED AS	TIE LUG
0	0		-.1	2 MEG
			6.3 AC	
0	0		2.8	330

OHMS	VOLTS	6Q7G 2nd DET. & 1st AUDIO	VOLTS	OHMS
500M	-.2		-.2	500M
3 MEG	130		USED AS	TIE LUG
0	0		-.3	3 MEG
			6.3AC	
0	0		0	0

OHMS	VOLTS	6J5G 2nd AUDIO	VOLTS	OHMS
			-.3	2MEG
3 MEG	210		USED AS	TIE LUG
	6.3AC		0	0
0	0		0	0

OHMS	VOLTS	6V6G OUTPUT AUDIO	VOLTS	OHMS
3 MEG	250		0	100M
3 MEG	240		USED AS	TIE LUG
	6.3 AC		0	0
0	0		13,5	180

OHMS	VOLTS	6V6G OUTPUT AUDIO	VOLTS	OHMS
3 MEG	250		0	100M
3 MEG	240		USED AS	TIE LUG
	6.3 AC		0	0
0	0		13.5	180

OHMS	VOLTS	5Y3G RECTIFIER	VOLTS	OHMS
700 WITH SPEAKER IN CIRCUIT	340AC		340AC	700 WITH SPEAKER IN CIRCUIT
3 MEG	260			
0	0		260	3 MEG

OHMS	VOLTS	6U5 TUNING INDICATOR	VOLTS	OHMS
2 MEG	-.3		258	3MEG
3 MEG	30		0	0
	6.3 AC		0	0

• WILL VARY ACCORDING TO CONDENSER LEAKAGE.

ALL READINGS MEASURED ON TRIPLETT VOLT OHM METER MODEL 1200A 2000 OHMS PER VOLT WITH LINE VOLTAGE OF 117 VOLTS ALL READINGS MADE AS NEAR HALF SCALE AS POSSIBLE.

ALL READINGS MEASURED WITH VOLUME CONTROL ADVANCED TO MAXIMUM VOLUME, NO ANTENNA, AND CHASSIS GROUNDED.

ALL RESISTANCE READINGS FROM MEASUREMENT POINT TO GROUND (CHASSIS PAN).

The model 9C chassis is an AC operated superheterodyne with automatic volume control, push-pull output with inverse feedback, permeability push button tuning, and tuning eye. It incorporates three wave bands, broadcast, police-amateur, and short wave. It is also equipped with a phono connection which permits the use of an external phonograph pickup.

THE PUSH BUTTON TUNER

It will be noted that only one operation is required for the setting of each push button. This simplicity of operation is made possible by the use of permeability tuned coils which have been accurately tracked at the factory so that it is not necessary to adjust external trimmer condensers in order to "set" a station. Tracking is accomplished by the careful spacing of the iron cores on their common shaft so that for all settings of the adjusting screws the coils are in perfect alignment. The capacitance in the oscillator circuit is fixed and may not be adjusted. This condenser (corresponding to the tuning condenser in a manually tuned receiver) is shown as number 59 on the schematic diagram and has a value of 140 micro-microfarads. The capacitance in the antenna and RF circuits consists in each case of two condensers, number 18 and 19 for the antenna, and number 16 and 17 for the RF. Condensers 17 and 18 must be adjusted when the initial alignment is made, but do not have to be touched at the time the buttons are "set" for their individual stations. Their use is covered in the alignment instructions. Instructions for setting-up the push buttons are covered in detail in the instruction book which accompanies each receiver.

THE AUDIO CIRCUIT

The audio circuit is of conventional design with the exception of the inverse feedback circuit consisting of resistors number 80 and 84, and condensers 79 and 83. By means of this network a certain amount of the voltage present at the plate of each 6V6G tube is fed back to the grid circuit of that tube. This voltage is, of course, out of phase with the input voltage and degeneration is the result.

Any audio amplifier employing a loud speaker as the load will have a certain amount of distortion introduced due to the fact that the impedance varies with the audio frequency changes in the plate circuit of the output tube or tubes. This condition is more pronounced in amplifiers using an output tube of the high impedance type such as the beam pentodes. Inverse feedback effectively reduces the plate impedance of the tube and helps to smooth out these variations thus reducing distortion to a marked degree.
The subject cannot be treated more fully here due to space limitations and has been mentioned merely to give the serviceman a brief explanation of the feedback circuit.

PHONO CONNECTIONS

The input circuit for the phonograph section of this receiver is designed for the use of a pickup of the high impedance type, although fair success may be obtained by the use of a unit of fairly low impedance. Should any difficulty be encountered with hum in the set when a pickup is being used, it is probably due to the fact that the shield side of the lead is not connected to the ground side of the terminal strip. Reversing the leads (after making sure that one side of the phono lead is a shield) should remedy complaints of this kind.

ALIGNMENT PROCEDURE

Alignment procedure is given in diagrammatic and chart form
Make adjustments in the order given. Any reliable low range AC voltmeter, preferably about 0-5 volts may be used as an output meter. It should be connected across the speaker voice coil for best results. The volume control should be set at maximum during the alignment and the output from the signal generator should be decreased as the meter pointer tends to go off scale. If too strong a signal is used and the volume control is used to keep the pointer on scale, the AVC will operate and inaccurate alignment will result.

When aligning the police and short wave bands, care must be taken to see that the trimmers are set on the proper frequency and not on the image. The image falls 910 kilocycles below the fundamental signal on the dial, so at 20 megacycles the image should be heard at 20 megacycles minus .910 megacycle or 19.1 megacycles approximately.

After setting the oscillator trimmer, increase the input from the signal generator and make sure that the image comes in at the proper point. When you can hear one signal at the frequency to which your generator is set, and one at about 1 megacycle below it, you are ready to finish the alignment. Go back to the fundamental frequency and start peaking the RF trimmer, rocking the tuning condenser slightly as you do so. When you reach a peak, compare the strength of the fundamental signal and the image. If the image is the stronger, you have the wrong peak on the RF trimmer. Find the other peak and again compare the two signals. You will probably find it necessary to increase the generator output greatly in order even to hear the image when you have found the right peak.

Repeat this operation for the antenna trimmer.

MODEL 12B
Schematic, Socket, Tuner
Trimmers, Voltage, Phono.

FAIRBANKS, MORSE & CO.

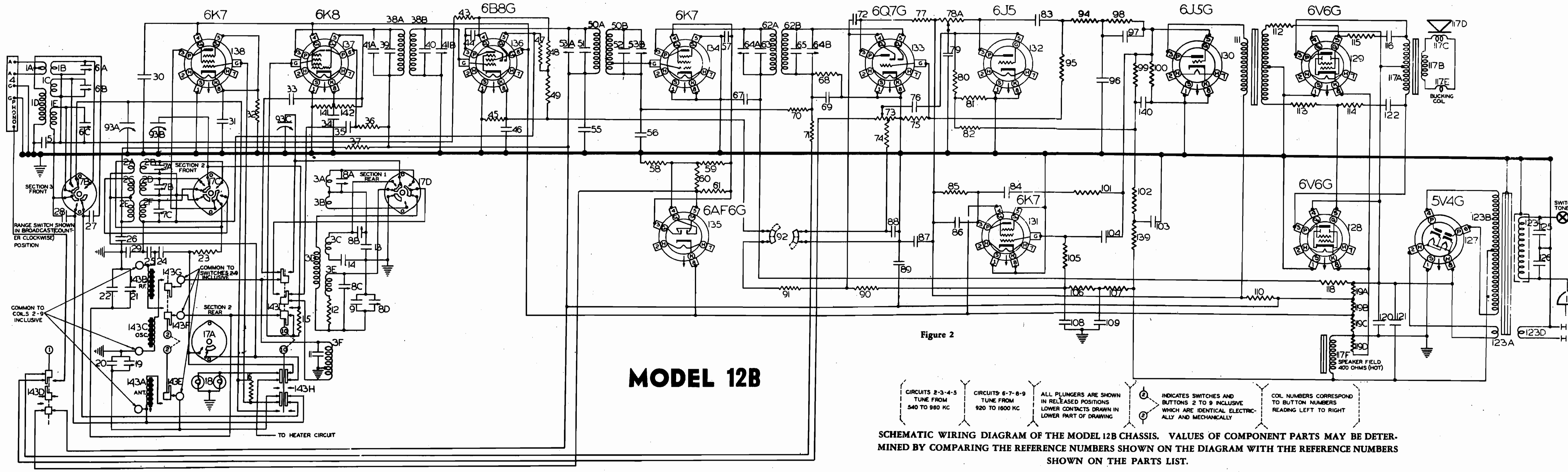


Figure 2

SCHEMATIC WIRING DIAGRAM OF THE MODEL 12B CHASSIS. VALUES OF COMPONENT PARTS MAY BE DETERMINED BY COMPARING THE REFERENCE NUMBERS SHOWN ON THE DIAGRAM WITH THE REFERENCE NUMBERS SHOWN ON THE PARTS LIST.

VOLTAGE AND RESISTANCE DATA

OHMS	VOLTS	6K7 RF	VOLTS	OHMS	OHMS	VOLTS	6K8 Oscillator & Mixer	VOLTS	OHMS	OHMS	VOLTS	6B8G 1st IF & 1st AVC Diode	VOLTS	OHMS
7M	120		9.0	1200	7M	120		6.0	46M	750M	+.3		+.1	3MEG
11500	250		USED AS	TIE LUG	10M	257		170	20M	10M	258		120	7M
0	0		0	3MEG	0	0		0	3MEG	0	0		0	14.0
			6.3AC					6.3AC					6.3AC	
0	0		9.0	1200	0	0		7.2	500	0	0		5.4	820

OHMS	VOLTS	6K7 2nd IF and tuning eye Control	VOLTS	OHMS	OHMS	VOLTS	6Q7G 2nd AVC and 2nd diode detector; volume naturalizer diode and driver.	VOLTS	OHMS	OHMS	VOLTS	6J5 1st Audio	VOLTS	OHMS
55M	110		0	0	1.5MEG	-.3		-.2	250M	USED AS	TIE LUG		-.5	3MEG
16500	260		USED AS	TIE LUG	230	80		USED AS	TIE LUG	120M	100		USED AS	TIE LUG
	6.3AC		-.3	3MEG	0	0		-.4	1 MEG		6.3AC			
			0	0				6.3AC					0	0
0	0		0	0	0	0		0	0	0	0		0	0

OHMS	VOLTS	6J5G 2nd Audio	VOLTS	OHMS	OHMS	VOLTS	6V6G Output Audio	VOLTS	OHMS	OHMS	VOLTS	6V6G Output Audio	VOLTS	OHMS
USED AS	TIE LUG		-.4	1.5MEG	11300	320		0	90M	11300	320		0	90M
16500	190		USED AS	TIE LUG	11500	310		USED AS	TIE LUG	11500	310		USED AS	TIE LUG
	6.3AC		0	0	0	0		6.3AC		0	0		6.3AC	
0	0		0	0	0	0		18	200	0	0		18	200

OHMS	VOLTS	5V4G Rectifier	VOLTS	OHMS	OHMS	VOLTS	6K7 Volume Naturalizer Feed Back	VOLTS	OHMS	OHMS	VOLTS	6AF6G Tuning Eye	VOLTS	OHMS
440	350AC				7M	120		0	0	1.5MEG	48		245	11M
			350AC	440	38M	100		USED AS	TIE LUG	50M	108			
11500	320					6.3AC		-5	4MEG		6.3AC		0	0
								0	0					
0	0		320	11500	0	0		0	0				120	7M

ALL READINGS MEASURED ON MODEL 1200A, 2000 OHMS PER VOLT, TRIPLETT VOLT OHMMETER, AS NEAR HALF SCALE AS POSSIBLE AND WITH 117 VOLTS, LINE VOLTAGE.

ALL READINGS FROM SPECIFIED POINT TO GROUND (CHASSIS PAN) WITH VOLUME AND TONE CONTROL ADVANCED TO MAXIMUM, VOLUME NATURALIZER "IN", RANGE SWITCH ON BC POSITION, GANG CONDENSOR IN FULL MESH, NO ANTENNA AND CHASSIS GROUNDED.

Figure 1

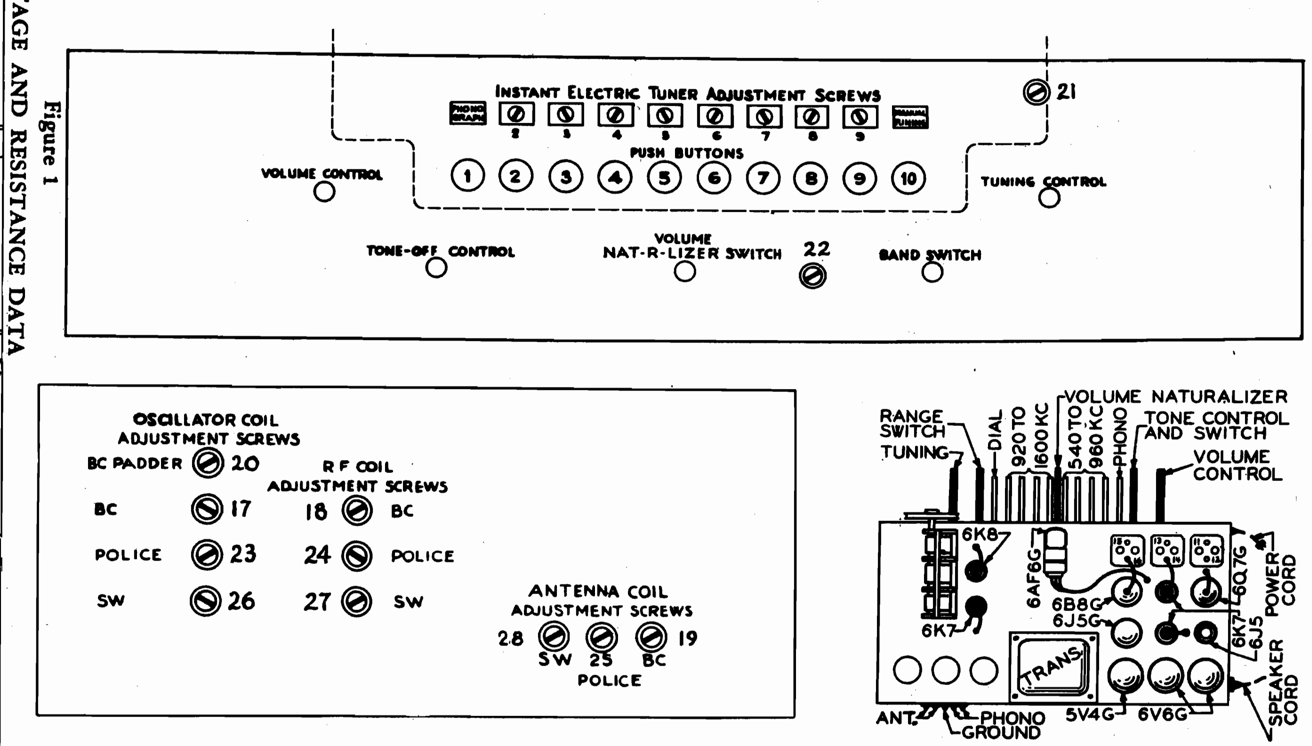


Figure 3

FRONT, SIDE, AND TOP VIEWS OF THE CHASSIS SHOWING TRIMMER LOCATIONS, TUBE LOCATIONS AND COMPONENT PARTS

IF PEAK 455 KC

The model 12B chassis is an AC operated superheterodyne with automatic volume control, push-pull output with inverse feedback, permeability push button tuning, volume naturalizer, and tuning eye. It incorporates three wave bands, broadcast, police-amateur, and short wave. It is also equipped with a phono connection which permits the use of an external phonograph pickup.

PHONO CONNECTIONS

The input circuit for the phonograph section of this receiver is designed for the use of a pickup of the high impedance type, although fair success may be obtained by the use of a unit of fairly low impedance. Should any difficulty be encountered with hum in the set when a pickup is being used, it is probably due to the fact that the shield side of the lead is not connected to the ground side of the terminal strip. Reversing the leads (after making sure that one side of the phono lead is a shield) should remedy complaints of this kind.

FAIRBANKS, MORSE & CO.

MODEL 12B
Alignment

ALIGNMENT PROCEDURE

Alignment procedure is given in diagrammatic and chart form (see figure 3 and 4). Make adjustments in the order given. Any reliable low range AC voltmeter, preferably about 0-5 volts may be used as an output meter. It should be connected across the speaker voice coil for best results. The volume control should be set at maximum during the alignment and the output from the signal generator should be decreased as the meter pointer tends to go off scale. If too strong a signal is used and the volume control is used to keep the pointer on scale, the AVC will operate and inaccurate alignment will result.

When aligning the police and short wave bands, care must be taken to see that the trimmers are set on the proper frequency and not on the image. The image falls 910 kilocycles below the fundamental signal on the dial, so at 20 megacycles the image should be heard at 20 megacycles minus .910 megacycle or 19.1 megacycles approximately.

After setting the oscillator trimmer, increase the input from the signal generator and make sure that the image comes in at the proper point. When you can hear one signal at the frequency to which your generator is set, and one at about 1 megacycle below it, you are ready to finish the alignment. Go back to the fundamental frequency and start peaking the RF trimmer, rocking the tuning condenser slightly as you do so. When you reach a peak, compare the strength of the fundamental signal and the image. If the image is the stronger, you have the wrong peak on the RF trimmer. Find the other peak and again compare the two signals. You will probably find it necessary to increase the generator output greatly in order even to hear the image when you have found the right peak.

Repeat this operation for the antenna trimmer.

Step No.	Connect Signal Generator To	Signal Generator Frequency	Dummy Antenna	Range Switch Position	Dial Setting	Section	Adjusting Screw No.	Peak For	Volume Nat-R-L Switch
1	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	3rd IF Trans.	11	Maximum	Off
2	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	3rd IF Trans.	12	Maximum	Off
3	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	2nd IF Trans.	13	Maximum	Off
4	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	2nd IF Trans.	14	Maximum	Off
5	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	1st IF Trans.	15	Maximum	Off
6	6K8 Grid	455 KC	.1 Mfd. Condenser	Broadcast (A)	540 KC	1st IF Trans.	16	Maximum	Off
7	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	1500 KC	B.C. Osc.	17	Maximum	Off
8	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	1500 KC	B.C. R.F.	18	Maximum	Off
9	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	1500 KC	B.C. Antenna	19	Maximum	Off
10	Antenna	600 KC	200 Mmfd.Condenser	Broadcast (A)	600 KC	B.C. Padder	20	Maximum (1)	(2)
11	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	Depress #9 Button	Instant Electric Tuning	9	Maximum	Off
12	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	Depress #9 Button	Instant Electric Tuning	21	Maximum (3)	Off
13	Antenna	1500 KC	200 Mmfd.Condenser	Broadcast (A)	Depress #9 Button	Instant Electric Tuning	22	Maximum (3)	Off
14	Antenna	6.0 MC	400 Ohm Resistor	Police Amateur (B)	6.0 MC	Police Oscillator	23	Maximum (3)	Off
15	Antenna	6.0 MC	400 Ohm Resistor	Police Amateur (B)	6.0 MC	Police RF	24	Maximum (3)	Off
16	Antenna	6.0 MC	400 Ohm Resistor	Police Amateur (B)	6.0 MC	Police Ant Antenna	25	Maximum	Off
17	Antenna	2.5 MC	400 Ohm Resistor	Police Amateur (B)	2.5 MC	Police Padder		(4)	Off
18	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave Oscillator	26	Maximum (5)	Off
19	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave RF	27	Maximum (6)	Off
20	Antenna	20.0 MC	400 Ohm Resistor	Short Wave (C)	20.0 MC	Short Wave Antenna	28	Maximum (6)	Off
21	Antenna	8.0 MC	400 Ohm Resistor	Short Wave (C)	8.0 MC	Short Wave Padder		(7)	Off

(1) While rocking. Repeat 7, 8, 9 and 10 until no change is noted.

(2) To check volume naturalizer operation, turn to "On" or "In" position. If functioning normally, volume level will drop quite noticeably, under normal output volume.

(3) The performance obtained with this adjustment when push button tuning is employed is suitable, as a rule, only when a conventional antenna system is used. The use of extremely long or short antennae, may necessitate a minor change in this adjustment per best results.

(4) Check calibration at 2.5 MC. Padder is fixed.

(5) Check for image at 19.1 MC on dial approximately.

(6) Check for image response.

(7) Check calibration at 8.0 M.C. Padder is fixed.

Figure 4

ALIGNMENT PROCEDURE CHART

MODEL 12B
Tuner Data, Parts
Naturalizer Notes

FAIRBANKS, MORSE & CO.

THE PUSH BUTTON TUNER

It will be noted that only one operation is required for the setting of each push button. This simplicity of operation is made possible by the use of permeability tuned coils which have been accurately tracked at the factory so that it is not necessary to adjust external trimmer condensers in order to "set" a station. Tracking is accomplished by the careful spacing of the iron cores on their common shaft so that for all settings of the adjusting screws the coils are in perfect alignment. The capacitance in the oscillator circuit is fixed and may not be adjusted. This condenser (corresponding to the tuning condenser in a manually tuned receiver) is shown as number 11 on the schematic diagram and has a value of 140 micro-microfarads. The capacitance in the antenna and RF circuits consists in each case of two condensers, number 19 and 20 for the antenna, and number 21 and 22 for the RF. Condensers 19 and 21 must be adjusted when the initial alignment is made, but do not have to be touched at the time the buttons are "set" for their individual stations. Their use is covered in the alignment instructions in Figure 4. Instructions for setting-up the push buttons are covered in detail in the instruction book which accompanies each receiver.

THE AUDIO CIRCUIT

The audio circuit is of conventional design with the exception of the inverse feedback circuit consisting of resistors number 114 and 115, and condensers 116 and 122. By means of this network a certain amount of the voltage present at the plate of each 6V6G tube is fed back to the grid circuit of that tube. This voltage is, of course, out of phase with the input voltage and degeneration is the result.

Any audio amplifier employing a loud speaker as the load will have a certain amount of distortion introduced due to the fact that the impedance varies with the audio frequency changes in the plate circuit of the output tube or tubes. This condition is more pronounced in amplifiers using an output tube of the high impedance type such as the beam pentodes. Inverse feedback effectively reduces the plate impedance of the tube and helps to smooth out these variations thus reducing distortion to a marked degree.

The subject cannot be treated more fully here due to space limitations and has been mentioned merely to give the serviceman a brief explanation of the feedback circuit.

PURPOSE AND OPERATION OF VOLUME NATURALIZER

In most transmitting stations, the operators attempt to keep the modulation percentage high at all times in order to increase the area in which acceptable reception of their programs is possible. In so doing, a considerable portion of the volume range present in the studio program may be lost due to the fact that the lower volume portions of the program are raised to maintain coverage and thus require that the higher volume portions be relatively attenuated to prevent over-modulation of the transmitter.

The volume naturalizer is designed to compensate, in part, for this evil that often exists under present broadcasting conditions but should not be used indiscriminately. In general, its use is not justified on oral programs although occasionally a listener may prefer it. On some popular musical selections, the volume range is so restricted that no appreciable difference will be noticed except as the frequency response is influenced by the naturalizer circuit. Of course the volume control should be reset, each time the naturalizer is switched in and out, to keep the reference volume approximately the same for more accurate comparison. This will not be necessary at relatively high volume, because the volume will not change appreciably as the naturalizer is switched in or out, under these conditions.

On modern phonograph records, its use is not often desirable as the volume range is generally acceptable. On older records, no definite recommendation can be made because great variations will be found, especially between recordings by different manufacturers.

The method by which the volume naturalizer operates, can be simply described as controlled degeneration, whereby a portion of the audio signal from the plate circuit of the 6J5 first audio tube, is used to vary the bias voltage of preceding and interconnected tubes, in such a manner as to increase the volume level on signals that were originally suppressed at the transmitting station, and to decrease the volume level on signals that were increased in intensity at the transmitter, thus restoring in part, the original volume range present, for example, during a symphonic orchestra broadcast.

PARTS AND PRICE LIST MODEL 12B

Part Number	Schematic Reference Number	Description	List Price
8506-40		Booklet - Instruction	
103-15		Bracket - Shipping	.01
103-13		Bracket - Gang Condenser Mtg.-Front	.08
103-14		Bracket - Gang Condenser Mtg.-Rear	.02
103-11		Bracket - Dial Drive Shaft	.04
805-3	18	Bulb - Dial Light - 6.8 V. - Bayonet Base	.15
72-1		Button - Push	.05
7712-1		Button - Cinch Plug	.06
44-3		Cabinet - Console Grand - 63	60.90
901-89		Carton - 63 Cabinet	2.95
108-12		Chassis End Plate Assembly - Left	1.75
108-11		Chassis End Plate Assembly - Right	1.50
501-8	1A,B,C,D,E	Coil Assembly - Antenna - Red Dot Color Code	3.00
502-4	2A,B,C,D,E,F	Coil Assembly - RF - Yellow Dot Color Code	3.00
503-10	3A,B,C,D,E,F	Coil Assembly - Oscillator - Green Dot Color Code	3.00
801-5		Clip - Grid - Octal - Small (Dozen .06)	.01
340-21	78A,B	Control - Tone and Switch	.75
340-20	73	Control - Volume	.60
875-1	124	Cord and Plug - AC Line	.35
203-4	93A,B,C	Condenser - Variable Tuning - 3 Gang	3.85
293-2	6,7A,B,C	Condenser - Variable Trimmer- 3 Gang	.30
294-2	8A,B,C,D	Condenser - Variable Trimmer- 4 Gang	.40
285-7	19,21	Condenser - Variable Trimmer- 1 Gang	.15
272-11	41,53,64 A&B	Condenser - Variable Trimmer- 2 Gang	.25
211-5	121	Condenser - Electrolytic - 16mfd.-500 Volt	.75
214-4	120	Condenser - Electrolytic - 30 mfd.-375 Volt	.75
235-1	87,89	Condenser - Electrolytic - Dual - 20 mfd.-300 Volt	.90
256-1	39,40,51,52, 63,66	Condenser - Moulded Mica - 100 mmfd.-5%	.15
255-3	9	Condenser - Moulded Mica - 460 mmfd.-3%	.25
255-4	11	Condenser - Moulded Mica - 140 mmfd.-3%	.25
260-5	33	Condenser - Moulded Mica - 50 mmfd.	.15
260-7	44,69	Condenser - Moulded Mica - 100 mmfd.	.15
262-2	20	Condenser - Moulded Mica - 400 mmfd.-5%	.15
260-13	96	Condenser - Moulded Mica-- 500 mmfd.	.20
262-6	22	Condenser - Moulded Mica - 600 mmfd.-5%	.30
262-4	14	Condenser - Moulded Mica-- 2000 mmfd.-5%	.18
262-1	13	Condenser - Moulded Mica - 5000 mmfd.-5%	.35
251-1	125,126	Condenser - Moulded Paper - .01 mfd. - 600 V.	.18
252-4	24,25,97	Condenser - Tubular Paper - .001 mfd. - 600 V.-10%	.18
252-6	84,86,104	Condenser - Tubular Paper - .002 mfd. - 600 V.-10%	.20
250-8	76	Condenser - Tubular Paper - .003 mfd. - 600 V.	.18
252-8	28	Condenser - Tubular Paper - .003 mfd. - 600 V.-10%	.20
252-12	116,122	Condenser - Tubular Paper - .01 mfd. - 400 V.-10%	.18
250-12	26,35,57,67, 72	Condenser - Tubular Paper - .01 mfd. - 400 V.	.15
250-14	79	Condenser - Tubular Paper - .02 mfd. - 400 V.	.18
250-39	5,27,29,31, 34,46,56,83	Condenser - Tubular Paper - .05 mf . - 200 V.	.15
250-21	30,103,109, 140	Condenser - Tubular Paper - .1 mfd. - 200 V.	.15
250-22	55	Condenser - Tubular Paper - .1 mfd. - 400 V.	.18
252-27	88,108	Condenser - Tubular Paper - .25 mfd. - 200 V.-10%	.15
64-13		Crystal - Station Tab - Plain - (8 to one sheet)	.05
64-8		Crystal - Station Chain Indicator - Red - (8 to one sheet)	.05
64-9		Crystal - Station Chain Indicator -Green- (8 to one sheet)	.05
64-10		Crystal - Station Chain Indicator -Yellow (8 to one sheet)	.05
64-11		Crystal - Station Chain Indicator -Blue - (8 to one sheet)	.05
152-2		Drive Shaft and Flywheel Assy.	.65
60-2		Escutcheon Assembly	2.00
700-8		Grommet - Rubber-Tuning Condenser Mtg.	.02
70-15		Knob - Tuning	.15
70-16		Knob - Band	.15
70-17		Knob - Tone - "Off"	.15
70-18		Knob - Volume	.15
70-19		Knob - Volume Nat-R-Lizr	.40
7444-3		Nut - HM - 8/32 (Doz. .05)	.01
7444-4		Nut - HM - 6/32 x 1/4" x 3/32" (Doz. .05)	.01
7428-3		Nut - Pal - 6/32 (Doz. .05)	.01
7444-8		Nut - HM - 10/32 (Doz. .05)	.01
7429-1		Nut - Pal - 3/8" x 32 (Doz. .05)	.01
128-3		Pulley - Dial Drive - Assy.	.35
7530-5		Rivet - Tubular - 1/8" x 1/4" (Doz. .05)	.01
7530-1		Rivet - Tubular - 1/8" x 1/8" (Doz. .05)	.01
7530-3		Rivet - Tubular - 1/8" x 3/16" (Doz. .05)	.01
112-3		Ring - Electrolytic Mtg.	.03
330-3	119A to D	Resistor - Candohm - Wirewound	1.00
306-11	12	Resistor - Carbon - 68 ohms - 1/2 watt - 10%	.15
306-21	141	Resistor - Carbon - 470 ohms - 1/2 watt - 10%	.15
306-24	45	Resistor - Carbon - 820 ohms - 1/2 watt - 10%	.15
306-26	32,37	Resistor - Carbon - 1200 ohms - 1/2 watt - 10%	.15
306-29	74	Resistor - Carbon - 2200 ohms - 1/2 watt - 10%	.15
307-34	110,118	Resistor - Carbon - 5600 ohms - 1 watt - 10%	.20
307-37	36	Resistor - Carbon - 10M ohms - 1 watt - 10%	.20
306-41	85,94	Resistor - Carbon - 22M ohms - 1/2 watt - 10%	.15
306-47	61,142	Resistor - Carbon - 47M ohms - 1/2 watt - 10%	.15
306-49	98,101,112, 113	Resistor - Carbon - 100M ohms - 1/2 watt - 10%	.15
306-53	48,77	Resistor - Carbon - 220M ohms - 1/2 watt - 10%	.15
306-56	49,68	Resistor - Carbon - 390M ohms - 1/2 watt - 10%	.15
306-57	71	Resistor - Carbon - 470M ohms - 1/2 watt - 10%	.15
301-29	15,16	Resistor - Carbon - 470M ohms - 1/2 watt - 20%	.15
306-59	114,115	Resistor - Carbon - 680M ohms - 1/2 watt - 10%	.15
306-61	75,105	Resistor - Carbon - 1 Megohm - 1/2 watt - 10%	.15
311-124	91	Resistor - Carbon - 1.3 Megohm - 1/2 watt - 5%	.18
306-63	81,100	Resistor - Carbon - 1.5 Megohm - 1/2 watt - 10%	.15
311-126	90	Resistor - Carbon - 1.6 Megohm - 1/2 watt - 5%	.18
306-65	80	Resistor - Carbon - 2.2 Megohm - 1/2 watt - 10%	.15
306-67	43,47,59,70, 99, 102, 139	Resistor - Carbon - 3.3 Megohm - 1/2 watt - 10%	.15
306-69	58	Resistor - Carbon - 4.7 Megohm - 1/2 watt - 5%	.18
311-141	106,107	Resistor - Carbon - 6.8 Megohm - 1/2 watt - 5%	.18
306-71	23,60,82,95	Resistor - Carbon - 6.8 Megohm - 1/2 watt - 10%	.15
7369-5		Screw - Slab Head - Set - 8/32 x 3/16" (Doz. .25)	.03
7368-1		Screw - S H H - Cup Point - Set (Doz. .20)	.02
7245-37		Screw - S H W H - Tap - 8/32 x 3/4" (Doz. .18)	.02
7123-5		Screw - R H M - 8/32 x 1/4" (Doz. .05)	.01
7123-19		Screw - R H M - 6/32 x 3/4" (Doz. .05)	.01
7123-9		Screw - R H M - 6/32 x 1/4" (Doz. .05)	.01
7123-7		Screw - R H M - 6/32 x 1/2" (Doz. .05)	.01
7113-1		Screw - Fillister Hd. M.-1/4" x 20 x 1½" (Doz. .30)	.03
7113-2		Screw - Fillister Hd. M.-10/32 x 5/8" (Doz. .06)	.01
7375-2		Screw - Oval C'sunk Hd. - #2 x 7/16" (Doz. .05)	.01
7223-1		Screw - Flat Wing Hd. - 8/32 x 1-1/8"	.01
151-4		Shaft - Range/Switch Jack	.20
664-7		Sheets - Station Letter Tabs (2 sheets to set)	.30
664-8		Sheets - Phono and Tuning Tab (1 sheet of 10 tabs)	.30
20-18	117A to F	Speaker - Electro-Dynamic - 12"	11.65
C20-18	117D	Cone and Voice Coil Assy.	4.00
T20-18	117A	Output Transformer	2.25
F20-18	117F	Field Coil	3.00
456-1	128 to 138	Socket - Octal Base - 8 Contact	.10
456-2	127	Socket - Octal Base - 5 Contact	.10
451-3		Socket - Speaker Base - 6 Contact	.10
465-13		Socket - For Dial Light - one lead	.10
118-1		Socket - With Bracket and Mtg. Bracket-Eyetube	.75
111-2		Shield Assy. - for tubes	.10
113-1		Shield Shell-half	.03
113-3		Shield Base Ring	.02
113-4		Shield Ground Clip (Doz. .08)	.01
113-7		Shield Cap Ring	.01
137-2		Shield Assy. for Coils	.20
7349-1		Snap - Condenser Mtg.	.02
470-18	4	Strip - Antenna - Phono Gnd.	.20
470-2		Strip - Terminal - 2 Lug	.03
470-19		Strip - Terminal - 3 Lug	.03
380-8	92	Switch - Volume Nat-R-Lizer	.40
373-3	17A,B,C,D	Switch - Range	1.65
400-23		Transformer - Power - 25 cycle-universal	9.25
400-20	123A to D	Transformer - Power	5.75
410-2	111	Transformer - Audio Coupling	1.60
550-24	38A,B	Transformer - IF Input	2.25
550-25	50A,B	Transformer - IF Intermediate	2.25
550-26	62A,B	Transformer - IF Output	2.00
8625-3		Tube - Eye Cover	.05
220-3		Tube - Paper - For Electrolytic	.05
221-1		Terminal - Cathode - For Electrolytic	.01
525-2	143A to I	Tuner - Push Button Assy. (Complete)	20.00
7491-3		Washer - Lock - #6 - Internal (Doz. 05)	.01
7496-1		Washer - Lock - #8 - External (Doz. 05)	.01
7496-5		Washer - Lock - 1/4 - External (Doz. 05)	.01
7496-2		Washer - Lock - # 6 - External (Doz. 05)	.01
7496-4		Washer - Lock - #10 - External (Doz. 05)	.01
7471-2		Washer - Flat - .260 x 11/16" x .051 (Doz. .05)	.01
7471-16		Washer - Flat - 7/32" x 1/2" x .051 (Doz. .05)	.01
7471-7		Washer - Flat - .130" I.D. (Doz. .05)	.01
7477-1		Washer - Felt - (Doz. .05)	.01
8004-9		Washer - Fibre - .140 I.D. (Doz. .05)	.01
7476-1		Washer - Spring (Doz. .05)	.01
7475-3		Washer - "C"-3/16 (Doz. .05)	.01
8545-2		Wrench - Tuner Adjusting Screw	.20
		DIAL PARTS	
600-7		Dial Assembly - Complete	5.50
625-7		Dial Mtg. Plate Assembly	.90
8036-1		Cord - Dial Drive - Specify 108" length	.15
157-1		Crank Lever - Band Indicator	.75
157-2		Crank Assembly - for Shifter Link & Range Sw.	.25
641-3		Disc Assembly - Band Indicator	.50
151-4		Jack Shaft - Range Switch	.20
709-1		Mask - Push Button Arm	.05
602-8		Pointer - Slider	.10
130-3		Pulley - Idler	.05
636-1		Pad - Dial Scale Glass - Bibre	.01
7531-1		Rivet - Special Shoulder - 1/8" x 1/8" (Doz. .05)	.01
7532-1		Rivet - FH - 1/8" x 1/8" (Doz. .05)	.01
601-13		Scale - Dial - Glass	.75
631-3		Slider Bar Assembly	.45
161-2		Shifter Link - To Range Switch	.01
7245-31		Screw - SHWH - Tap - 8/32 x 1/4" (Doz. .10)	.01
173-1		Shifter Linkage Assy. (2 levers, link, spring)	.45
127-6		Spring - Shifter Linkage	.10
127-1		Spring - Cord Tension	.02
141-1		Strip - Dial Scale Retainer	.01
7452-3		Washer - Spring (Doz. .05)	.01
7475-4		Washer - "C" 1/8" ID (Doz. .05)	.01
615-1		Washer - Dial Eyelet	.01

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

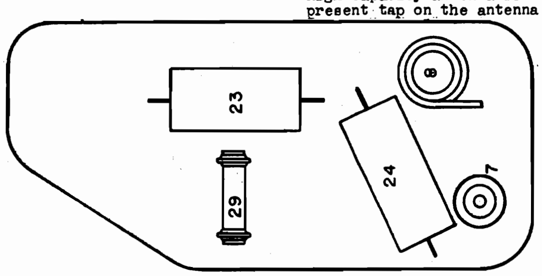
Schematic, Voltage
Socket, Trimmers
Chassis, Alignment

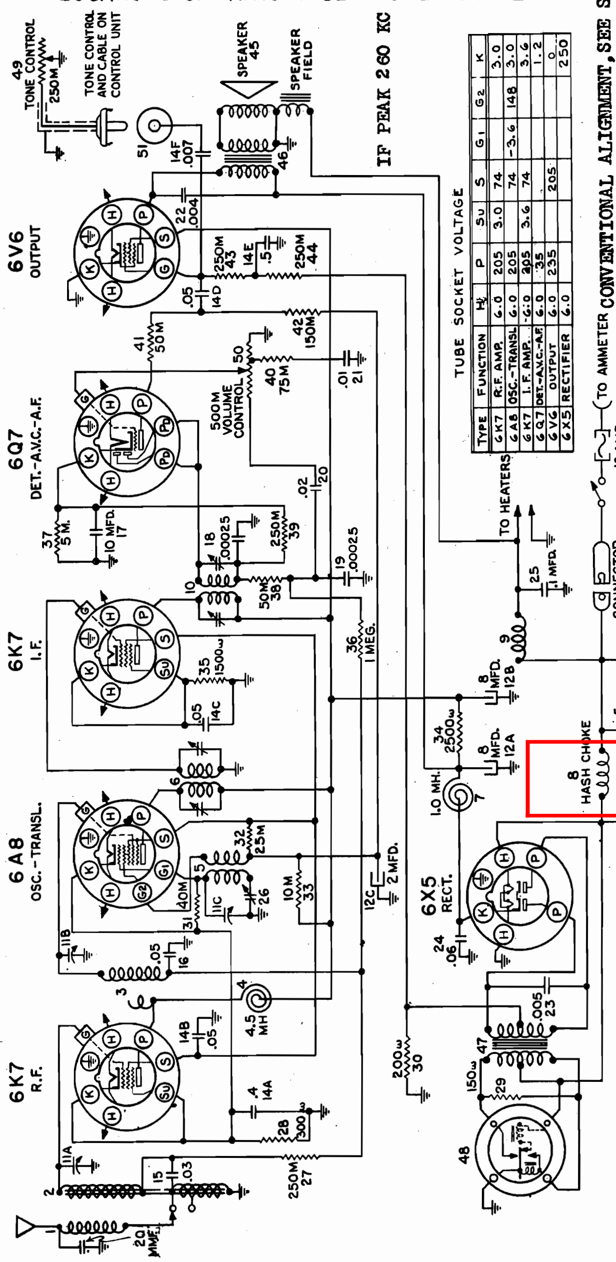
FIRESTONE TIRE & RUBBER CO.

MODEL 7407-3
Chassis 536

NOTE: VOLTAGE READING TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT. "A" BATTERY = 6 VOLTS. CURRENT DRAIN = 7.4 AMPERES

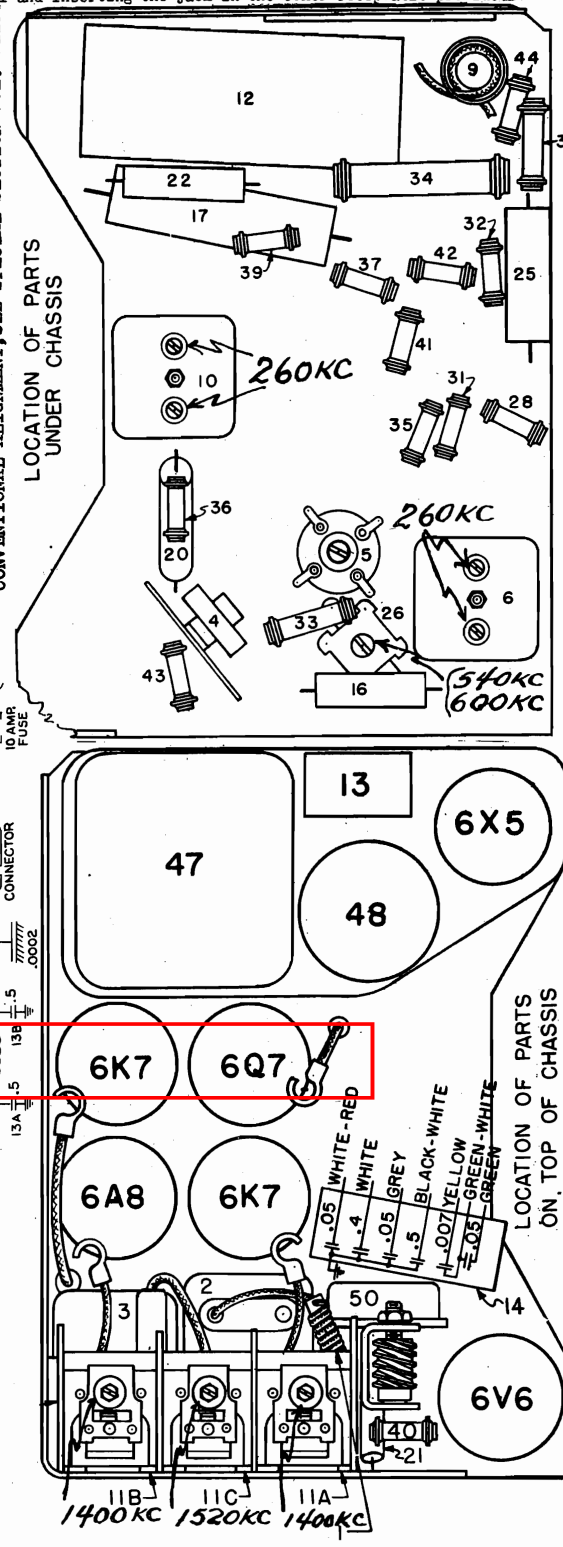
ANTENNA CIRCUIT: The antenna circuit is directly coupled to the antenna in contrast with the capacity coupled circuit used in some previous Firestone auto receivers. A small adjustable condenser is provided for adjusting the antenna circuit to the antenna. This adjustment is made near the high frequency end of the dial (1400 K.C.) instead of at the low frequency end, as with the capacity coupled sets. There are two taps provided on the antenna coil. One for use with whip or low capacity type antenna, and the other for running board or high capacity type antenna. The antenna coil is set at the low capacity tap at the factory and must be changed (by means of the small tip jack located in the receiver at the antenna coil) if a high capacity antenna is used. This is done by merely removing the small tip jack from its present tap on the antenna coil and inserting the jack in the other receptacle provided.





TUBE SOCKET VOLTAGE

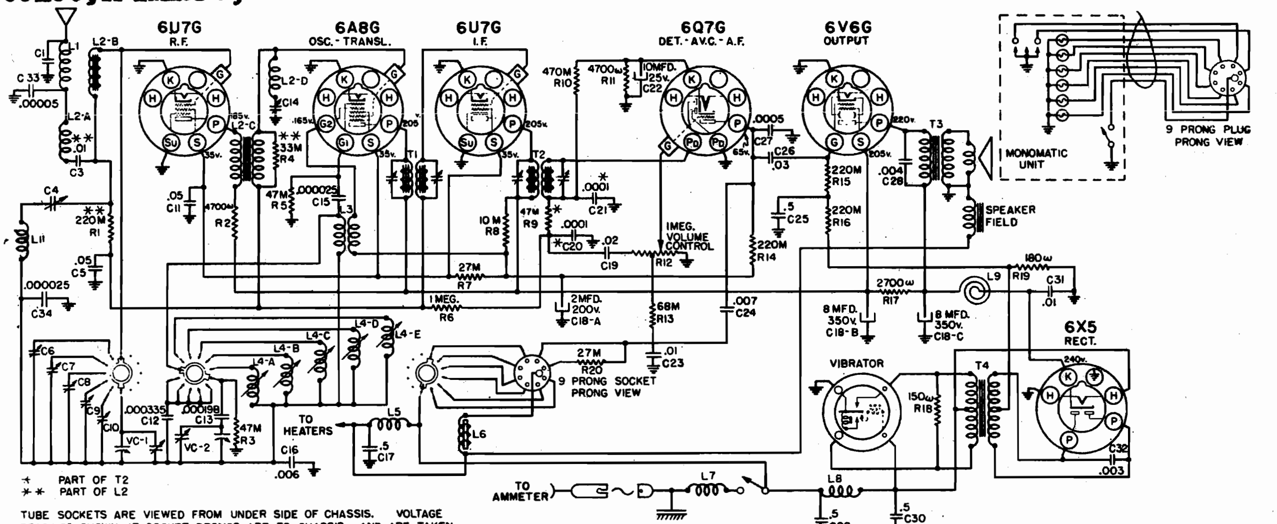
TYPE	FUNCTION	H	P	SU	S	G1	G2	K
6K7	R.F. AMP.	6.0	205	3.0	74			3.0
6A8	OSC.-TRANSL	6.0	205		74	-3.6	148	3.0
6K7	I.F. AMP.	6.0	205	3.6	74			3.6
6Q7	DET.-A.V.C.-A.F.	6.0	35					1.2
6V6	OUTPUT	6.0	235		205			0
6X5	RECTIFIER	6.0						250



IMPORTANT: Do not make any adjustments to this receiver with the chassis case removed from the receiver chassis or without the proper equipment.

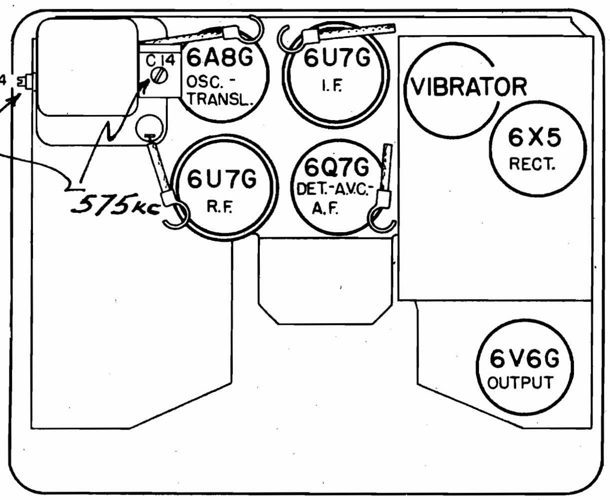
MODEL S7407-5
Schematic, Voltage, Socket, Trimmers, Alignment, Tuner

FIRESTONE TIRE & RUBBER CO.

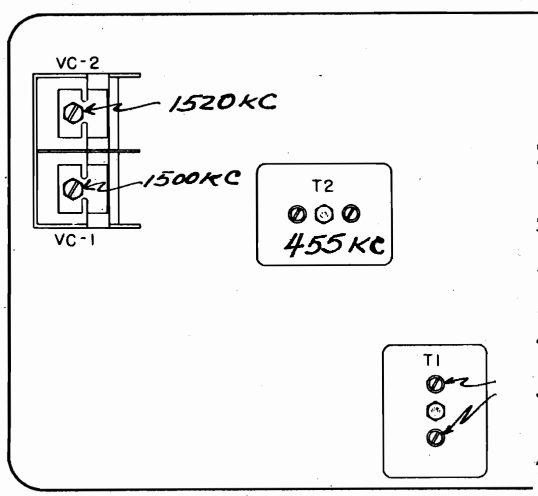


* PART OF T2
** PART OF L2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.
"A" BATTERY = 6 VOLTS CURRENT DRAIN = 7.1 AMPERES



LOCATIONS OF TUBES & TRIMMERS - BOTTOM COVER REMOVED



LOCATIONS OF TRIMMERS - TOP COVER REMOVED

SETTING UP THE MONOMATIC TUNING MECHANISM:

Remove the plate that covers the Monomatic tuning adjustments on the receiver case.

Operate the Monomatic button (marked "Push") until the dial becomes illuminated, indicating that the receiver is adjusted for Dial Tuning. Then tune in your #1 station, using the Station Selector knob.

Operate the Monomatic button until the #1 station indicator (furthest left of the five indicators) becomes illuminated.

Turn the #1 station screw marked "OSC" (see Fig. 3) until your #1 station is tuned in. Other stations may be heard during this operation. If in doubt whether you have your desired #1 station, compare it with the original station by operating the Monomatic button until the Dial Tuning position is reached.

After adjusting the "OSC" screw as carefully as possible, adjust the "ANT" screw for maximum volume and best reproduction. After having done so, it is advisable to re-check the adjustment of the "OSC" screw and then the "ANT" one again to insure greatest accuracy.

Tune in your #2 station and operate the Monomatic button until the #2 indicator becomes illuminated. Then proceed to adjust the two screws for this station in the same manner as was just done for the #1 station. Always adjust the "OSC" screw before adjusting the "ANT" one, and then repeat the adjustments for greater accuracy.

Proceed in the same manner for the remaining stations on your list. Then replace the cover in the receiver case. Insert the proper call letters, cut from the sheets supplied, in the indicator button slots.

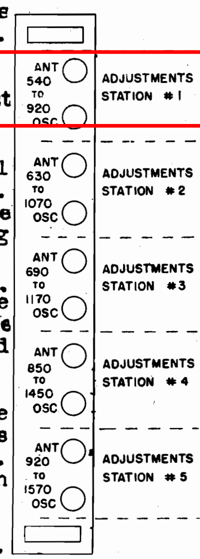
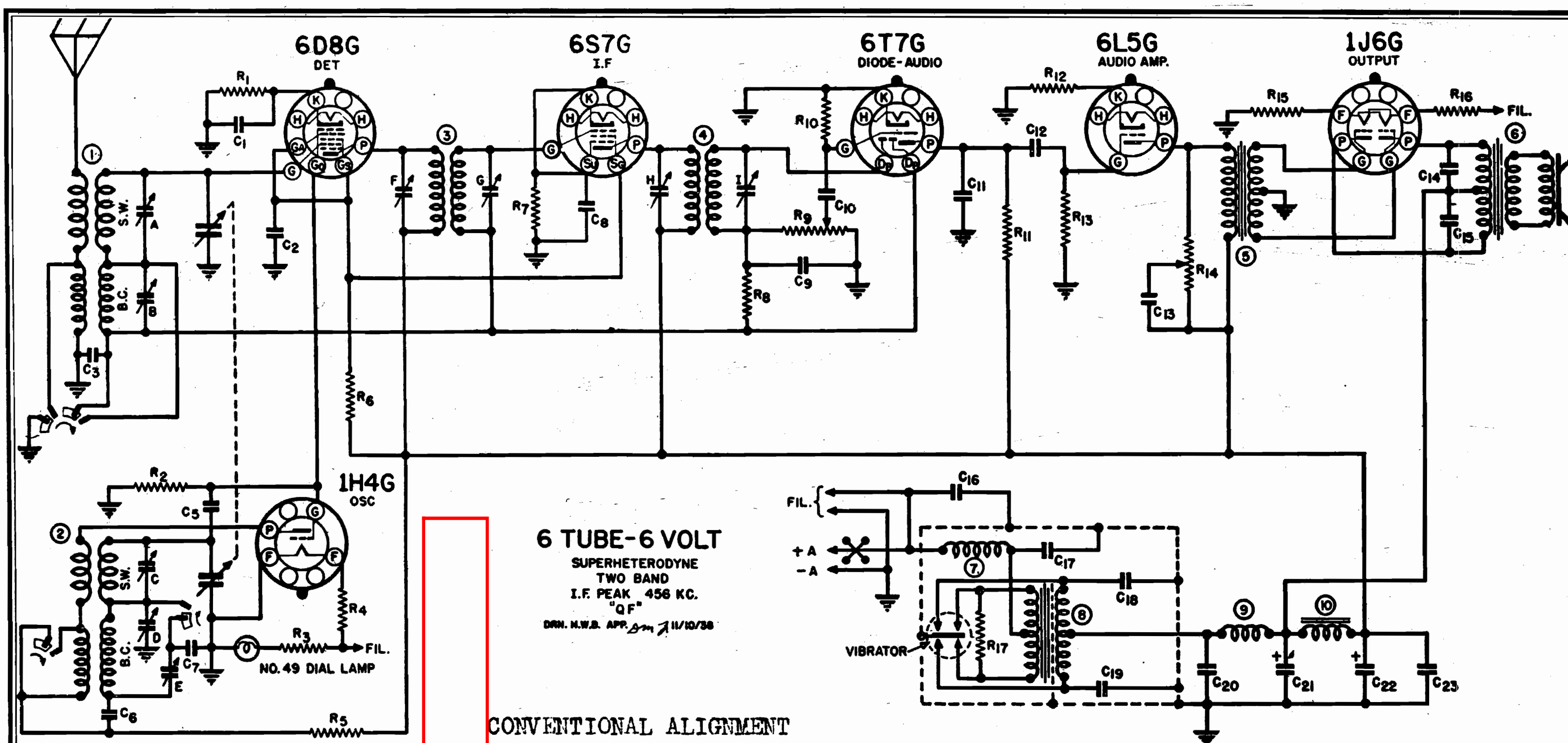


Fig. 3

MATCHING THE ANTENNA: An adjusting screw, accessible to a screw-driver through a hole in the side of the case is provided to match the receiver to the car antenna. Using the Station Selector knob, tune in a very weak station at about 600 kilocycles. Then turn the adjusting screw to the point affording maximum volume.

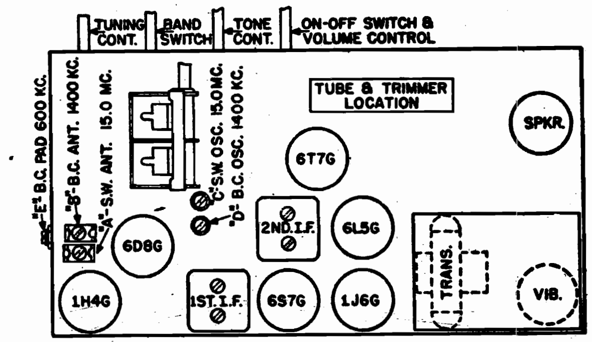
FIRESTONE TIRE & RUBBER CO.

MODEL S7424-3
Schematic, Socket
Alignment
Trimmers



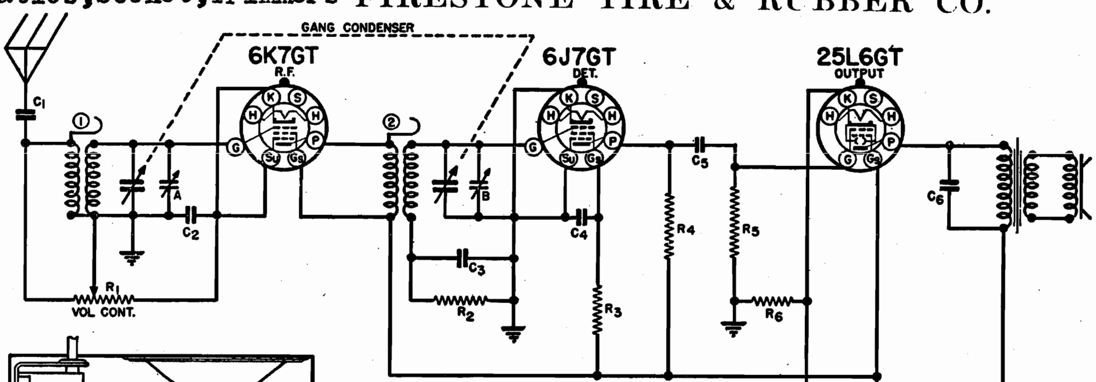
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

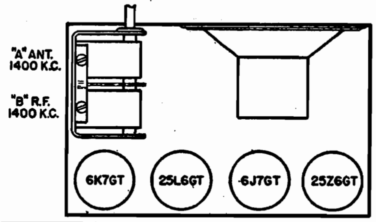
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	C-13	.05 MFD. 200 V.	C_{19}	C-7-1	.01 MFD. (OIL) 1,000 V.	R_9	V-20	1 MEG. VOLUME CONT.	1	L-72	ANTENNA COIL
C_2	C-1	.1 MFD. 200 V.	C_{20}	C-5	.01 MFD. 600 V.	R_{10}	R-55	10 MEGOHM .5 W.	2	L-63	OSCILLATOR COIL
C_3	C-13	.05 MFD. 200 V.	C_{21}	C-242	10 MFD. 250 V.	R_{11}	R-41	.25 MEGOHM .5 W.	3	I-38	1ST. I.F. TRANS.
			C_{22}		15 MFD. 250 V.	R_{12}	R-16	2,000 OHM .5 W.	4	I-39	2ND. I.F. "
C_5	C-115	50 MMFD.	C_{23}	C-1	.1 MFD. 200 V.	R_{13}	R-42	.5 MEGOHM .5 W.	5	T-103	AUDIO "
C_6	C-4	.01 MFD. 400 V.				R_{14}	V-112	75,000 Ω TONE CONT.	6	S-26	SPKR. "
C_7	C-109X	4,000 MMFD. 5%				R_{15}	R-510	8.3 OHM 5% .5 W.	7	H-208	"A" CHOKE
C_8	C-13	.05 MFD. 200 V.				R_{16}	R-510	8.3 OHM 5% .5 W.	8	T-26	POWER TRANS.
C_9	C-110	100 MMFD.				R_{17}	R-107	200 OHM .5 W.	9	H-207	R.F. CHOKE
C_{10}	C-27	.006 MFD. 800 V.							10	H-9	AUDIO CHOKE
C_{11}	C-111	250 MMFD.	R_1	R-12	500 OHM .5 W.				A		2-35 MMFD.
C_{12}	C-4	.01 MFD. 400 V.	R_2	R-33	50,000 OHM .5 W.				B		"
C_{13}	C-5	.01 MFD. 600 V.	R_3	R-511	67.0 OHM .5 W.				C		"
C_{14}	C-4	.01 MFD. 400 V.	R_4	R-511	67.0 OHM .5 W.				D		"
C_{15}	C-4	.01 MFD. 400 V.	R_5	R-25	10,000 OHM .5 W.		X-17	BAND SWITCH	E	P-3	300-600 MMFD
C_{16}	C-22	.5 MFD. 50 V.	R_6	R-26	15 000 OHM .5 W		G-20	GANG CONDENSER			
C_{17}	C-22	.5 MFD. 50 V.	R_7	R-10	400 OHM .5 W.		F-4	SYN. VIBRATOR			
C_{18}	C-7-1	.01 MFD. (OIL) 1000 V.	R_8	R-44	2 MEGOHM .5 W.		W-207	BATTERY CABLE			

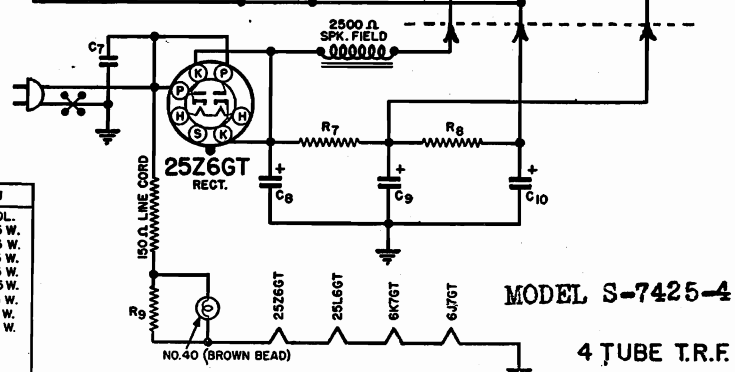


MODELS S7425-4, S7425-5, S7426-5
Schematics, Socket, Trimmers **FIRESTONE TIRE & RUBBER CO.**

Alignment







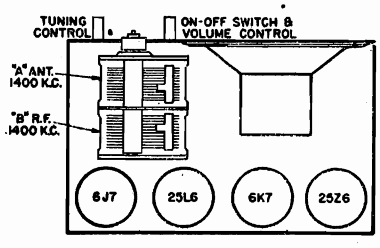
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	C-4	.01 MFD. 400 V.	R_1	V-6	25,000 OHM VOL.
C_2	C-13	.05 MFD. 200 V.	R_2	R-45	3.5 MEG. .25 W.
C_3	C-13	.05 MFD. 200 V.	R_3	R-46	6 MEG. .25 W.
C_4	C-4	.01 MFD. 400 V.	R_4	R-43	1 MEG. .25 W.
C_5	C-4	.01 MFD. 400 V.	R_5	R-42	.5 MEG. .25 W.
C_6	C-4	.01 MFD. 400 V.	R_6	R-105	125 OHM ±10% .5 W.
C_7	C-14	.05 MFD. 400 V.	R_7	R-1	30 OHM .25 W.
C_8	C-233	12 MFD. 150 W.V.	R_8	R-18	3,000 OHM .25 W.
C_9	C-233	8 MFD. 150 W.V.	R_9	R-250	30 OHM 1.0 W.
C_{10}	C-233	6 MFD. 150 W.V.	1	L-110R	ANTENNA COIL
			2	L-111R	R.F. COIL
	G-17	GANG CONDENSER		S-300	SPEAKER

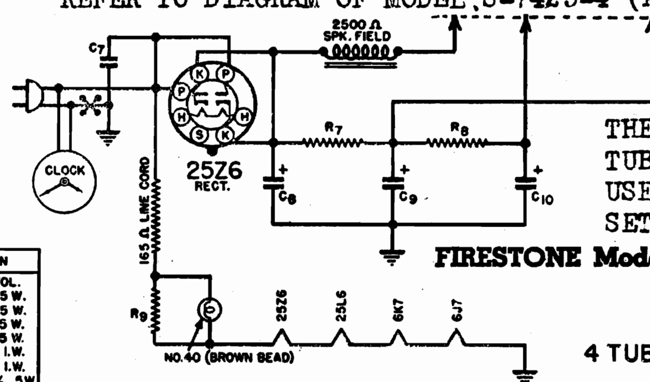
MODEL S-7425-4

4 TUBE T.R.F.

POWER SUPPLY. This receiver is designed to operate on any alternating current supply (A.C.) ranging from 110 to 120 volts, 50 to 60 cycles; or on any direct current supply (D.C.) ranging from 110 to 120 volts.

REFER TO DIAGRAM OF MODEL S-7425-4 (ABOVE)





THE "GT" TYPE TUBES ARE NOT USED IN THIS SET.

FIRESTONE Model S-7425-5

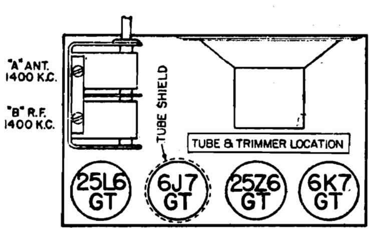
4 TUBE T.R.F.

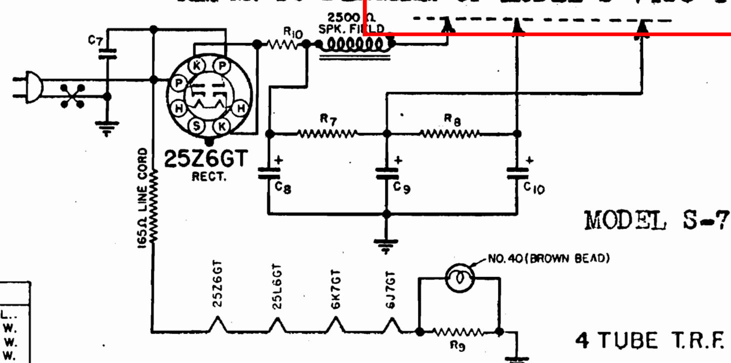
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	C-4	.01 MFD. 400 V.	R_1	V-24	25,000 OHM VOL.
C_2	C-13	.05 MFD. 200 V.	R_2	R-45	3.5 MEG. .5 W.
C_3	C-13	.05 MFD. 200 V.	R_3	R-46	6 MEG. .5 W.
C_4	C-4	.01 MFD. 400 V.	R_4	R-43	1 MEG. .5 W.
C_5	C-4	.01 MFD. 400 V.	R_5	R-42	.5 MEG. .5 W.
C_6	C-4	.01 MFD. 400 V.	R_6	R-105X	125 OHM ±10% 1. W.
C_7	C-14	.05 MFD. 400 V.	R_7	R-105X	125 OHM ±10% 1. W.
C_8	C-233	16 MFD. 150 W.V.	R_8	R-18X	3,000 OHM ±10% .5 W.
C_9	C-233	8 MFD. 150 W.V.	R_9	R-100	30 OHM 1. W.
C_{10}	C-233	6 MFD. 150 W.V.	1	L-110	ANTENNA COIL
	W-3	POWER CORD	2	L-111	R.F. COIL
	G-26	GANG CONDENSER		S-300A	SPEAKER & TRANS.

The clock will keep correct time only when connected to a 60 cycle, 110 to 120 volt A.C. power supply. **Never plug into a direct current circuit.**

4 Tube AC Tuned Radio Frequency Receiver With Electric Clock

REFER TO DIAGRAM OF MODEL S-7425-4 (ABOVE)





MODEL S-7426-5

4 TUBE T.R.F.

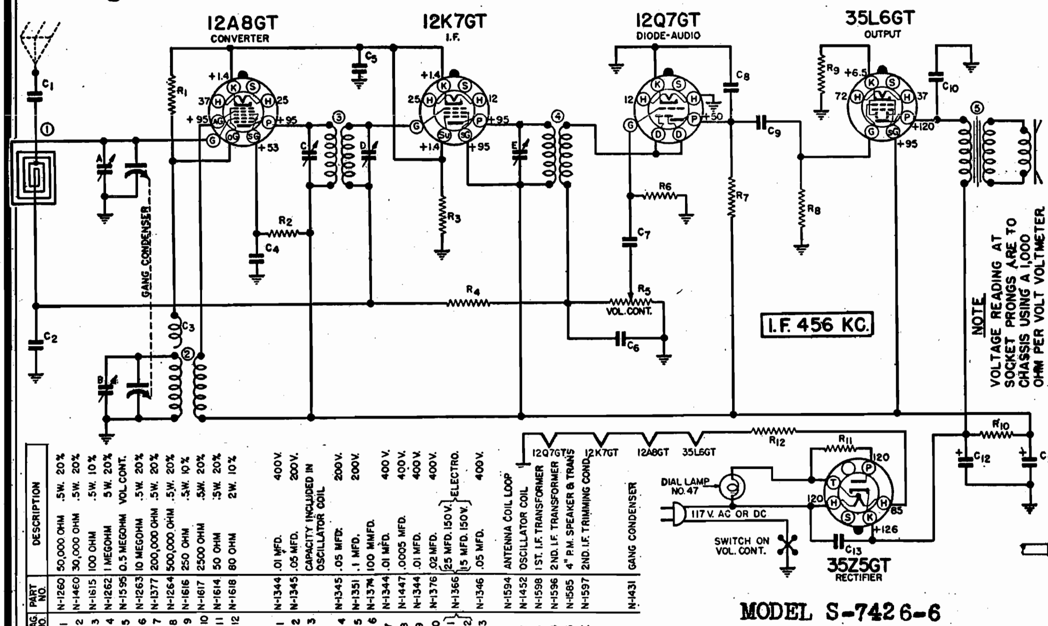
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400 V.	R_1	V-23	25,000 OHM VOL..
C_2	N-1345	.05 MFD. 200 V.	R_2	N-1418	3.5 MEG. .5 W.
C_3	N-1345	.05 MFD. 200 V.	R_3	N-1419	6 MEG. .5 W.
C_4	N-1344	.01 MFD. 400 V.	R_4	N-1262	1 MEG. .5 W.
C_5	N-1344	.01 MFD. 400 V.	R_5	N-1264	.5 MEG. .5 W.
C_6	N-1344	.01 MFD. 400 V.	R_6	N-1416	125 OHM ±10% .5 W.
C_7	N-1346	.05 MFD. 400 V.	R_7	N-1420	125 OHM 1 W.
C_8	C-233	16 MFD. 150 W.V.	R_8	N-1417	3,000 OHM .5 W.
C_9	C-233	8 MFD. 150 W.V.	R_9	N-1415	30 OHM 1.0 W.
C_{10}	C-233	6 MFD. 150 W.V.	R_{10}	N-1251	25 OHM 1 W.
	S-300	SPEAKER	1	L-110	ANTENNA COIL
	G-25	GANG CONDENSER	2	L-111	R.F. COIL

POWER SUPPLY. This receiver is designed to operate on any alternating current supply (A.C.) ranging from 110 to 120 volts, 50 to 60 cycles; or on any direct current supply (D.C.) ranging from 110 to 120 volts.

Schematics, Socket Trimmers, Alignment Voltage

FIRESTONE TIRE & RUBBER CO.

MODEL S7426-6.
MODEL S7427-6



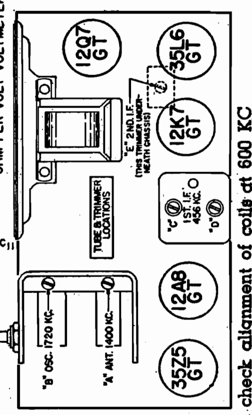
NOTE - VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS. "E" HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

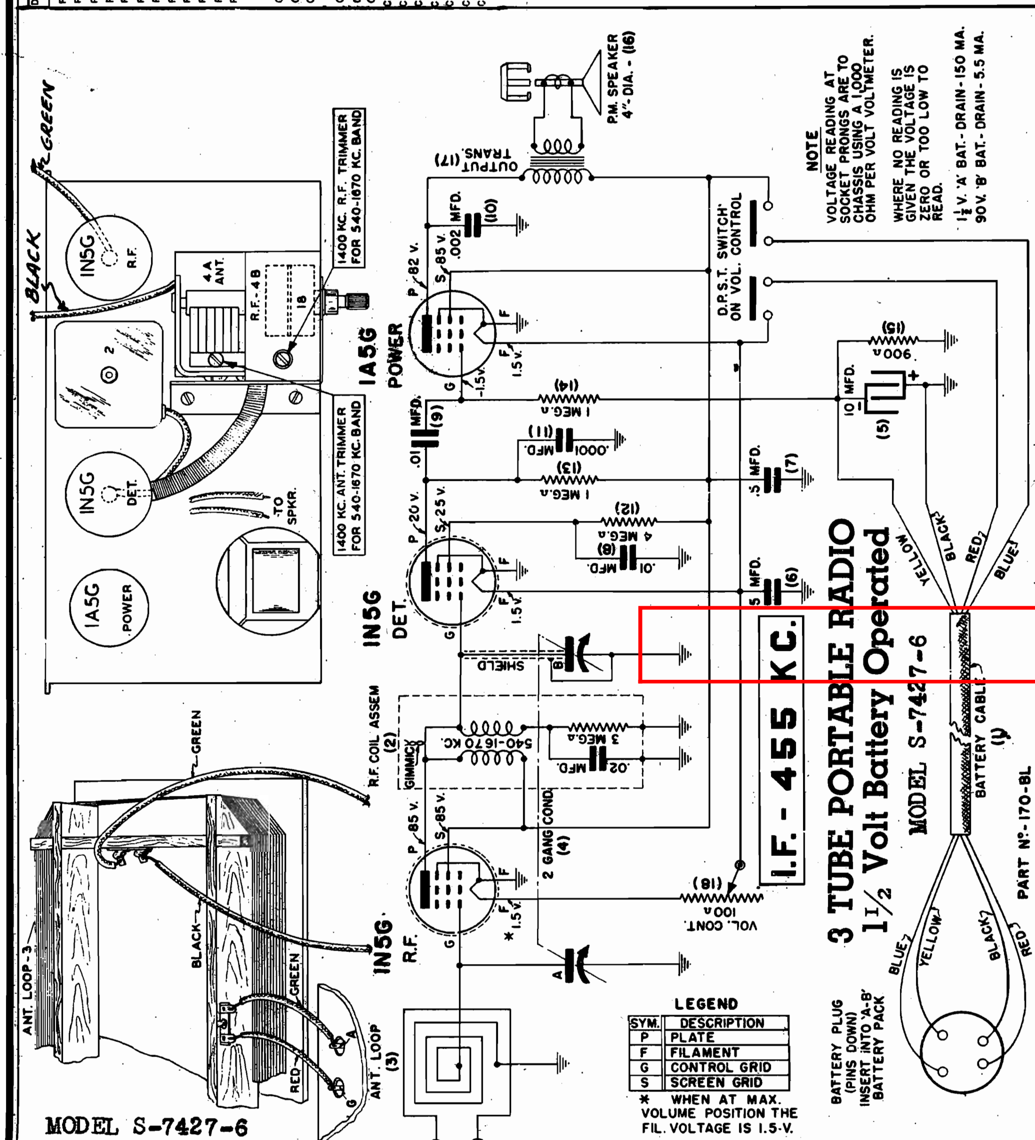
5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

535 to 1720 Kilocycles

NOTE
VOLTAGE READING AT SOCKET PRONGS ARE TO CHASSIS USING A 1,000 OHM PER VOLT VOLTMETER.

DIAG. NO.	PART NO.	DESCRIPTION	
R 1	N-1260	50,000 OHM .5W. 20%	
R 2	N-1460	30,000 OHM .5W. 20%	
R 3	N-1615	100 OHM .5W. 10%	
R 4	N-1262	1 MEGOHM .5W. 20%	
R 5	N-1595	0.5 MEGOHM VOL. CONT.	
R 6	N-1263	10 MEGOHM .5W. 20%	
R 7	N-1377	200,000 OHM .5W. 20%	
R 8	N-1264	500,000 OHM .5W. 20%	
R 9	N-1616	250 OHM .5W. 10%	
R 10	N-1617	2500 OHM .5W. 20%	
R 11	N-1614	50 OHM .5W. 20%	
R 12	N-1618	80 OHM 2W. 10%	
C 1	N-1344	.01 MFD.	400V.
C 2	N-1345	.05 MFD.	200V.
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL	
C 4	N-1345	.05 MFD.	200V.
C 5	N-1351	.1 MFD.	200V.
C 6	N-1374	100 MMFD.	
C 7	N-1344	.01 MFD.	400 V.
C 8	N-1447	.0005 MFD.	400V.
C 9	N-1344	.01 MFD.	400V.
C 10	N-1376	.02 MFD.	400V.
C 11	N-1366	25 MFD. 150V.	ELECTRO.
C 12	N-1366	15 MFD. 150V.	ELECTRO.
C 13	N-1346	.05 MFD.	400V.
1	N-1594	ANTENNA COIL LOOP	
2	N-1452	OSCILLATOR COIL	
3	N-1598	1ST. I.F. TRANSFORMER	
4	N-1596	2ND. I.F. TRANSFORMER	
5	N-1585	4" P.M. SPEAKER & TRANS	
E	N-1597	2ND. I.F. TRIMMING COND.	
	N-1431	GANG CONDENSER	





3 TUBE PORTABLE RADIO
$1\frac{1}{2}$ Volt Battery Operated
MODEL S-7427-6

NOTE
VOLTAGE READING AT SOCKET PRONGS ARE TO CHASSIS USING A 1,000 OHM PER VOLT VOLTMETER.

WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

$1\frac{1}{2}$ V. 'A' BAT.- DRAIN - 150 MA.
90 V. 'B' BAT.- DRAIN - 5.5 MA.

LEGEND

SYM.	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
*	WHEN AT MAX. VOLUME POSITION THE FIL. VOLTAGE IS 1.5 V.

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERIES IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

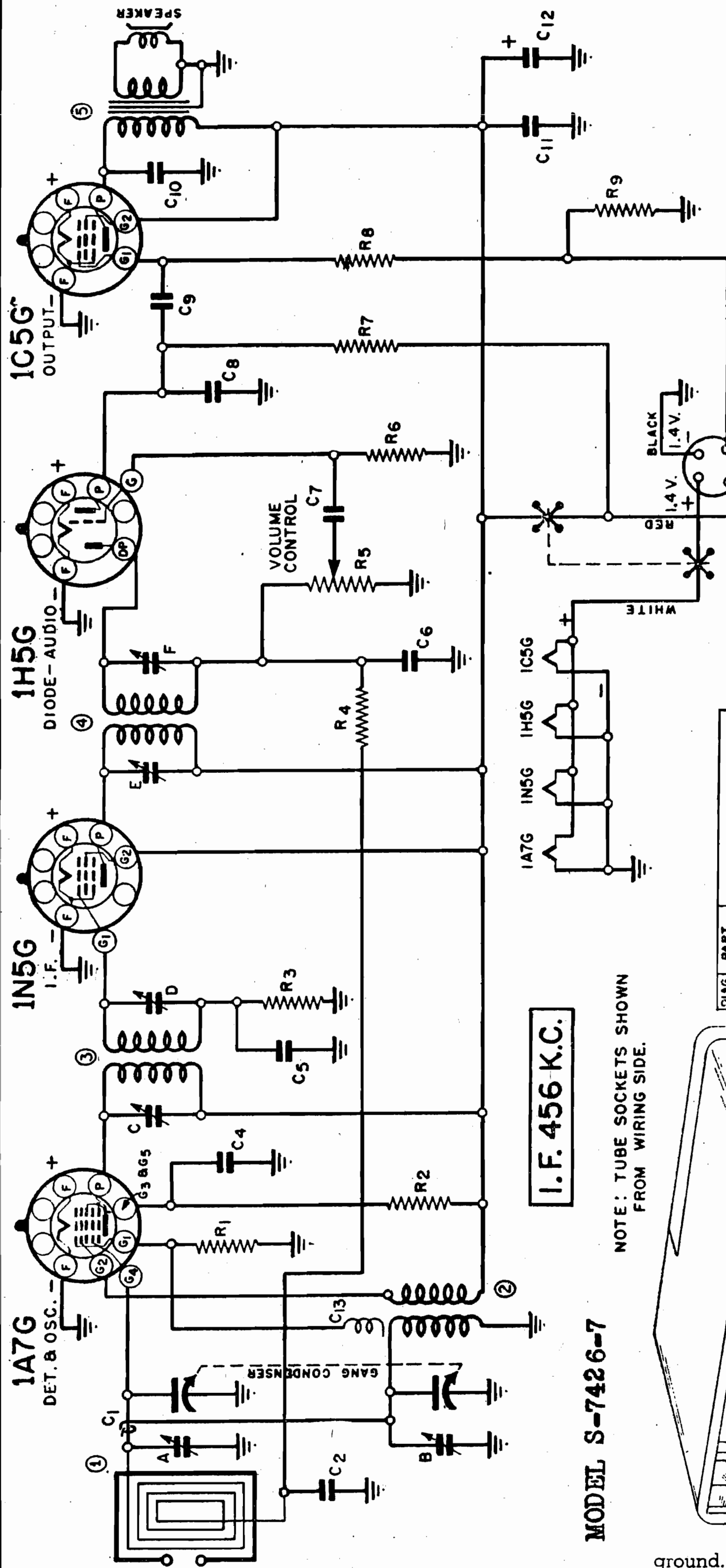
When adjusting 1400 kilocycle antenna and R. F. trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

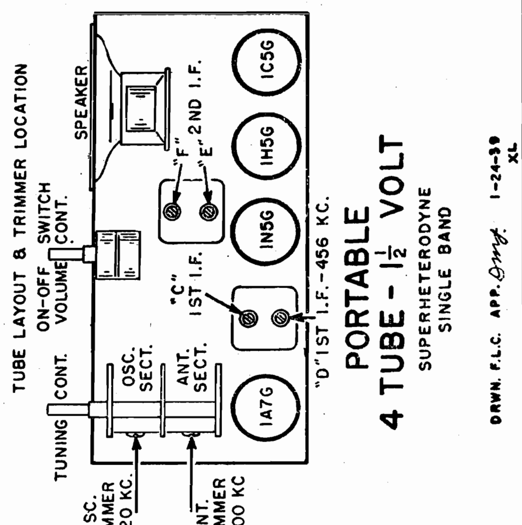
Couple test oscillator to receiver loop by:
- a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.
- b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

MODEL S7426-7, Roamer
(Jan. 1939)

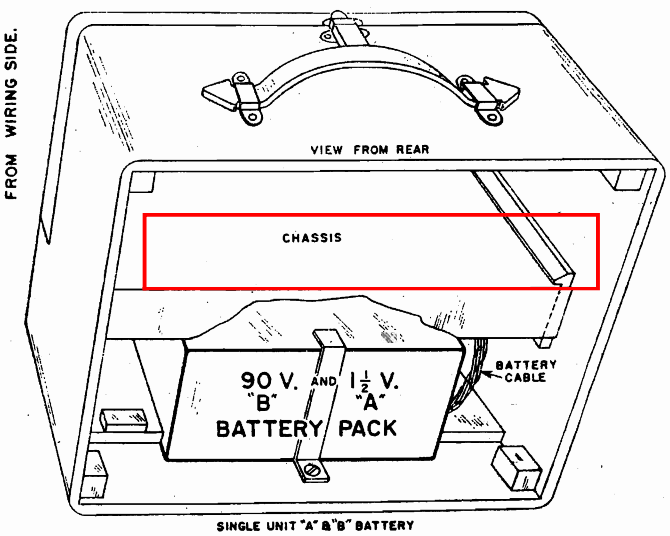
FIRESTONE TIRE & RUBBER CO.

Schematic, Socket
Alignment
Trimmers





DIAG. NO.	PART NO.	DESCRIPTION
R1	N-1377	.2 MEGOHM 20% .5W.
R2	N-1353	50,000 OHM 10% "
R3	N-1378	2 MEGOHM 20% "
R4	N-1262	1 MEGOHM " "
R5	N-1504	.5 MEG. VOLUME CONT.
R6	N-1378	2 MEGOHM 20% .5W
R7	N-1262	1 MEGOHM " "
R8	N- "	" " "
R9	N-1379	550 OHM 10% "
C1	—	GIMMIC
C2	N-1345	.05 MFD 200 V.
C4	N-1345	.05 MFD. 200 V.
C5	N-1376	.02 MFD. 400 V.
C6	N-1343	250 MMFD. 20%
C7	N-1344	.01 MFD. 400 V.
C8	N-1374	100 MMFD. 20%
C9	N-1344	.01 MFD 400 V.
C10	N-1347	.006 MFD. 600 V.
C11	N-1351	.10 MFD. 200 V.
C12	N-1367	6 MFD. ELECTROLYTIC
C13	-	CAPACITY INCLUDED IN OSCILLATOR COIL.
1	N-1508	LOOP ANTENNA
2	N-1532	OSCILLATOR COIL
3	N-1391	1ST I.F. TRANS.
4	N-1509	2ND I.F. TRANS.
5	N-1507	5" P.M. SPKR. & TRANS.
	N-1499	GANG CONDENSER
	N-1510	BATTERY CABLE



CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (1A7G) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the antenna terminal to the generator through a 200 MMF dummy and the ground terminal to the generator ground. Set the dial and generator at 1720 KC (gang at minimum capacity). Align the BC oscillator trimmer for maximum output. Set the test oscillator at 1400 KC and tune in the signal with the dial and adjust the antenna trimmer for maximum output. Check the sensitivity at 600 to determine if the gang or the coils have been damaged.

Schematics, Socket, Trimmers
Alignment, Voltage

FIRESTONE TIRE & RUBBER CO.

MODEL S7426-7 (Mar. 1939)
MODEL S7428-2

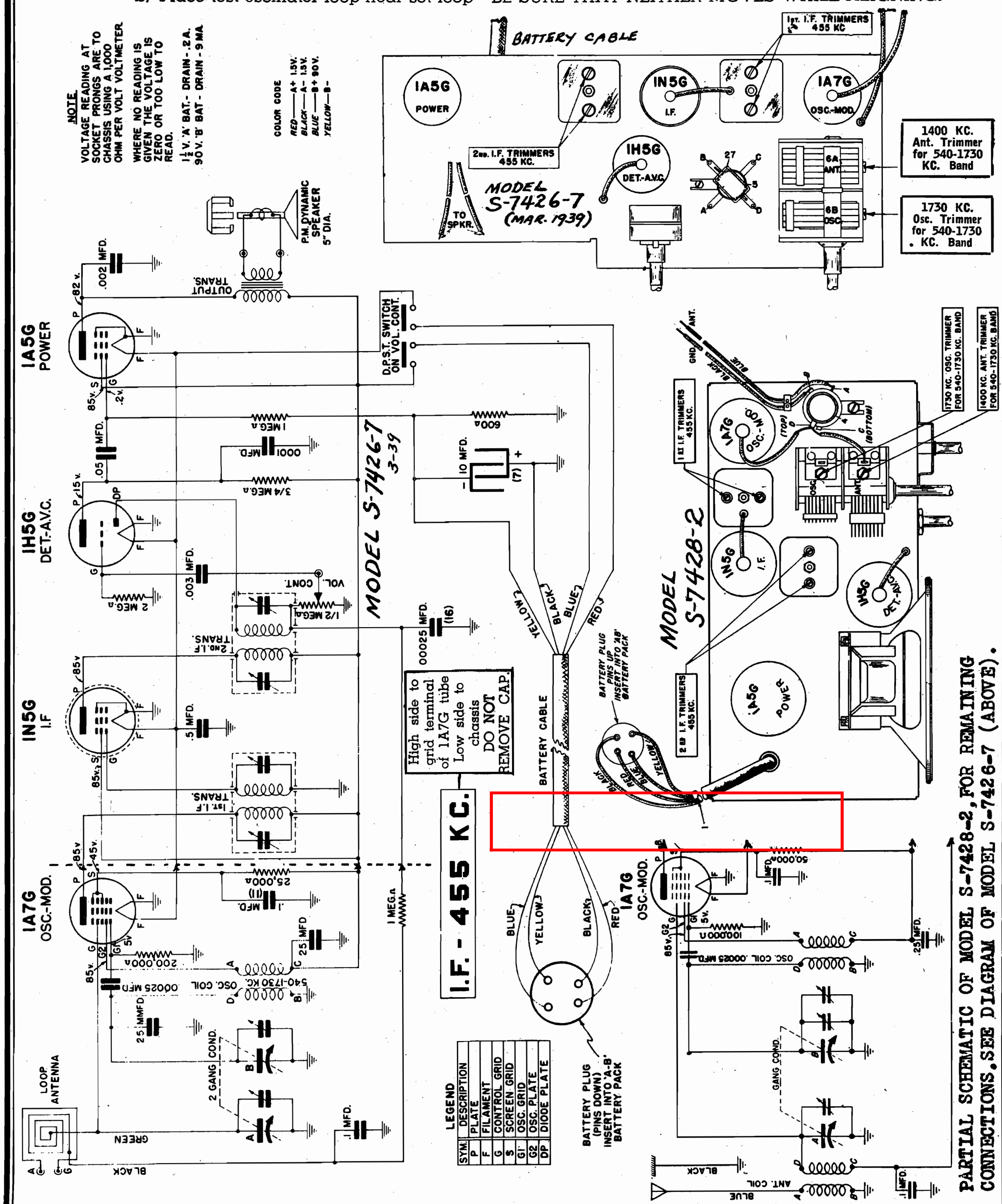
BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERIES IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

Couple test oscillator to receiver loop by:

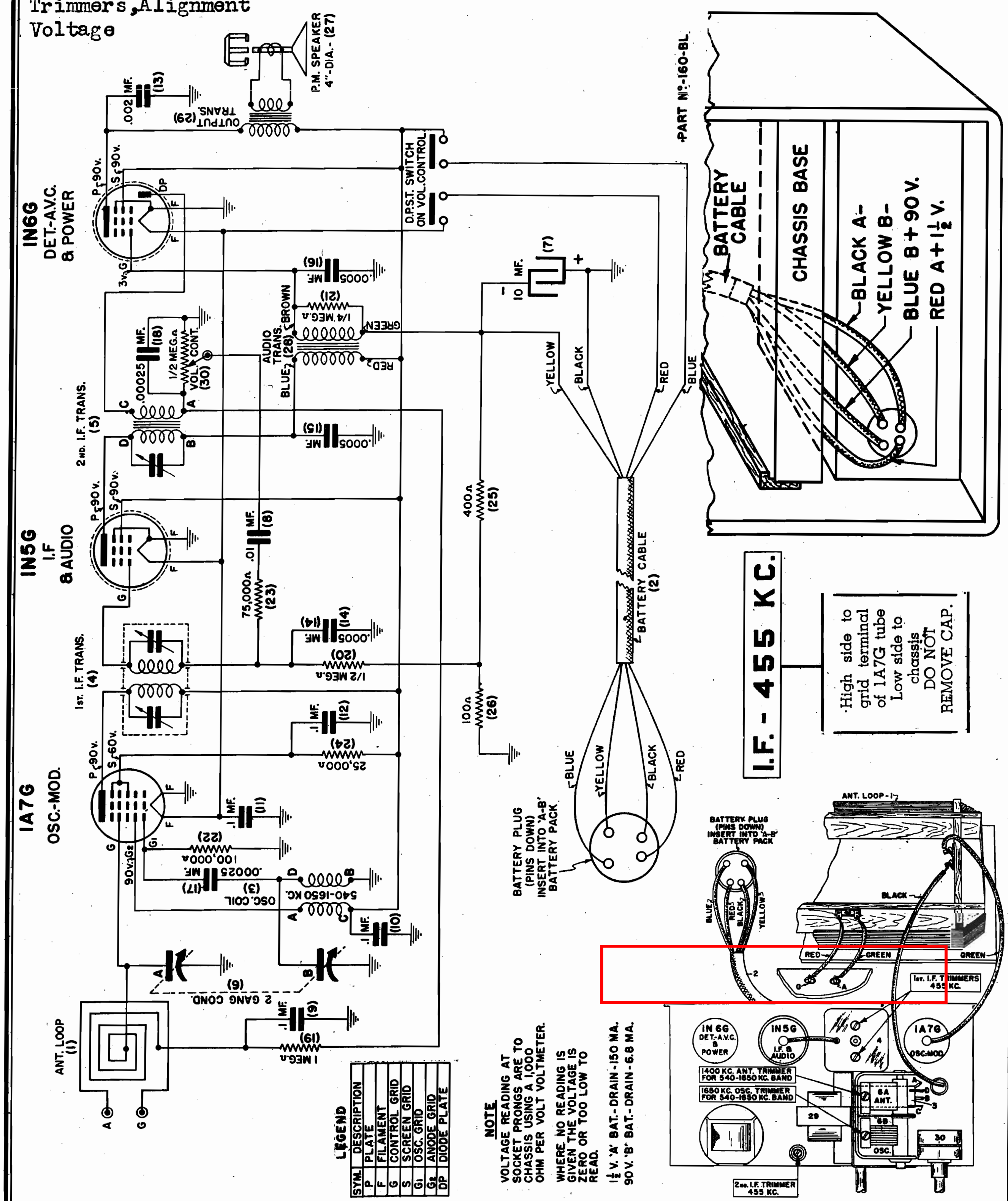
a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.



MODEL S7426-9
Schematic, Socket
Trimmers, Alignment
Voltage

FIRESTONE TIRE & RUBBER CO.



BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERY-PACK IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1650 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

Couple test oscillator to receiver loop by:

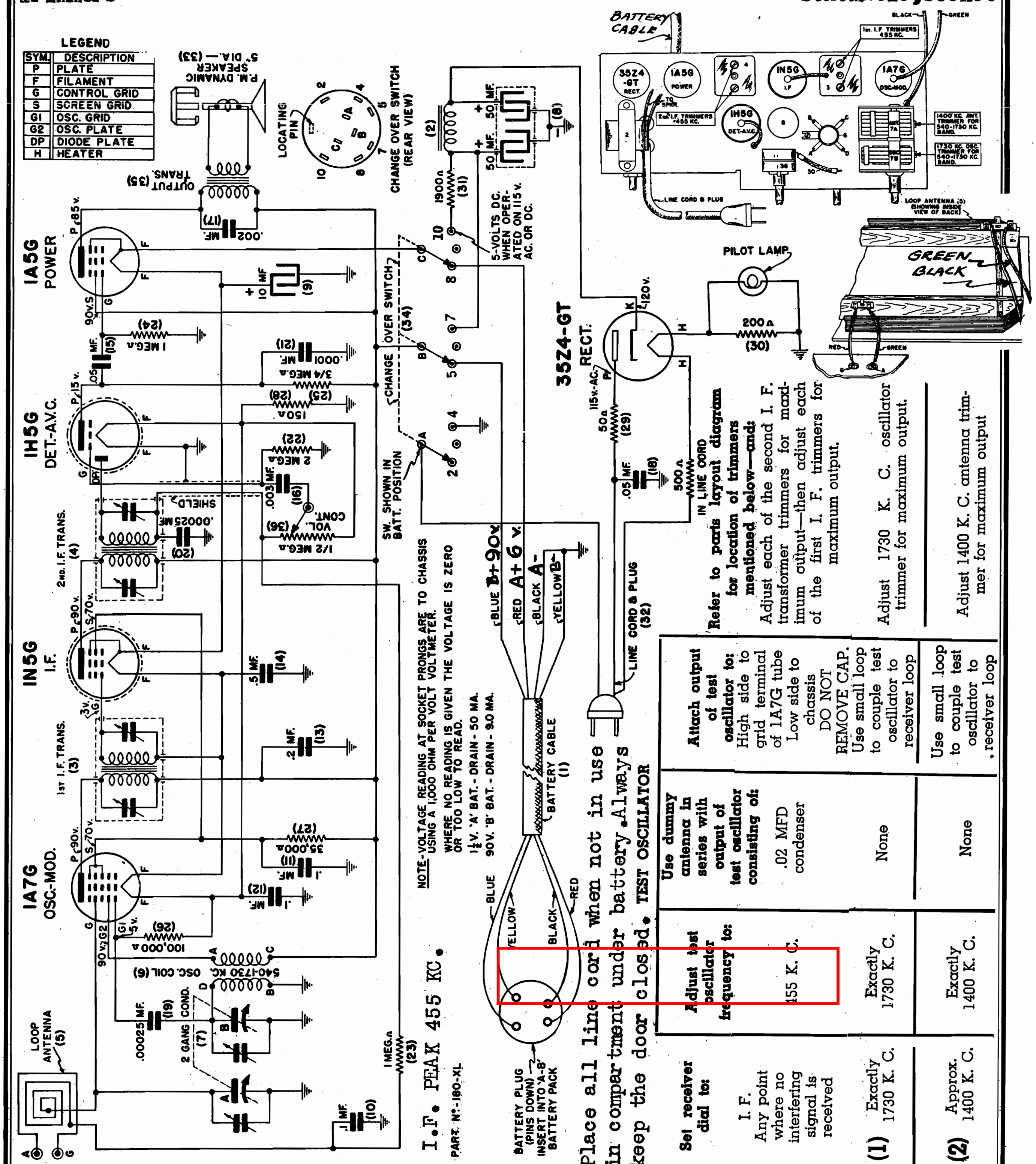
a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Alignment, Voltage Trimmers

FIRESTONE TIRE & RUBBER CO.

MODEL S7427-5 Schematic, Socket



TEST OSCILLATOR

	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
	I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7G tube Low side to chassis DO NOT REMOVE CAP.	Refer to parts layout diagram for location of trimmers mentioned below—and: Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1)	Exactly 1730 K. C.	Exactly 1730 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1730 K. C. oscillator trimmer for maximum output.
(2)	Approx. 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. antenna trimmer for maximum output

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE BATTERY IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

Couple test oscillator to receiver loop by:

a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

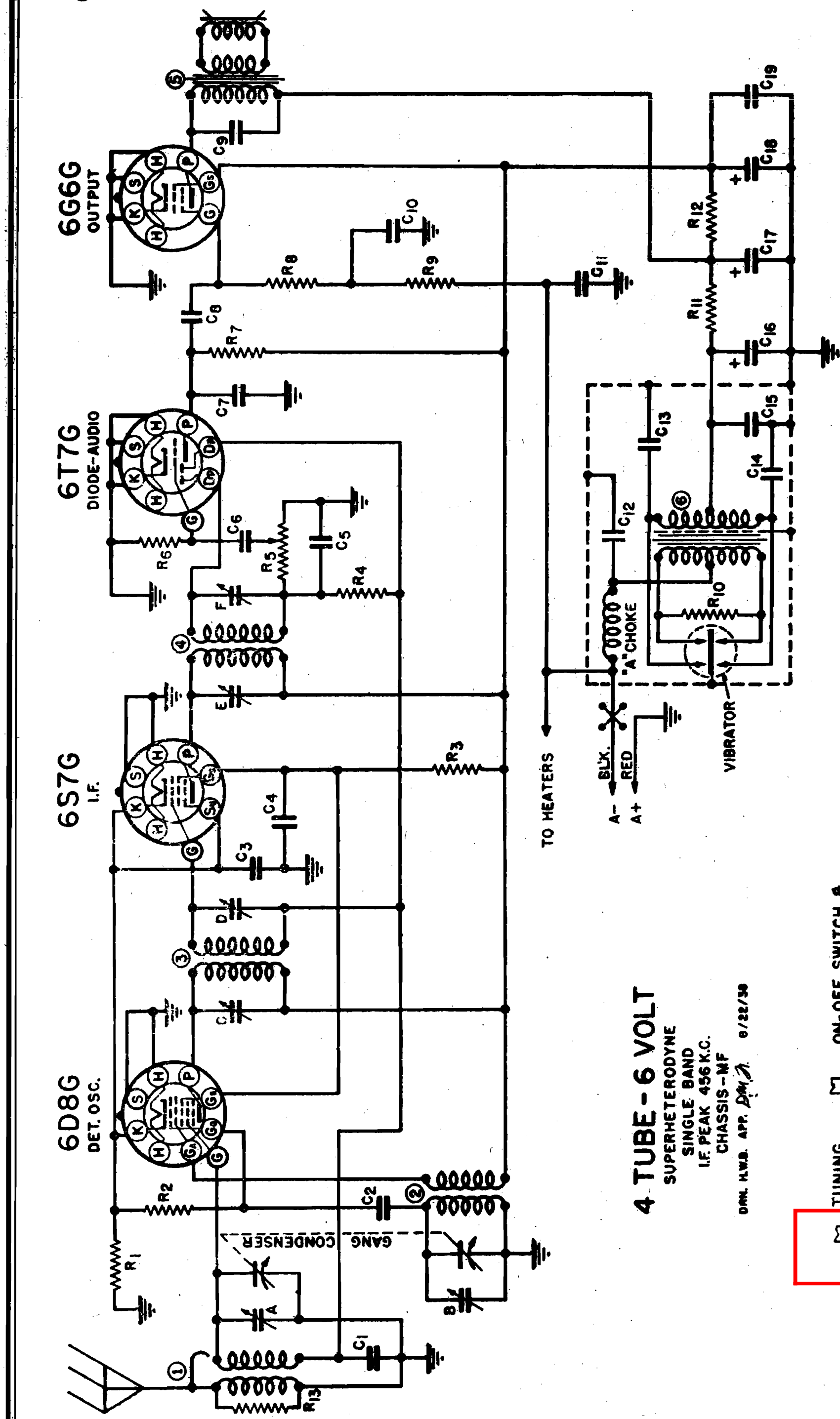
b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

MODEL S7428-1

FIRESTONE TIRE & RUBBER CO.

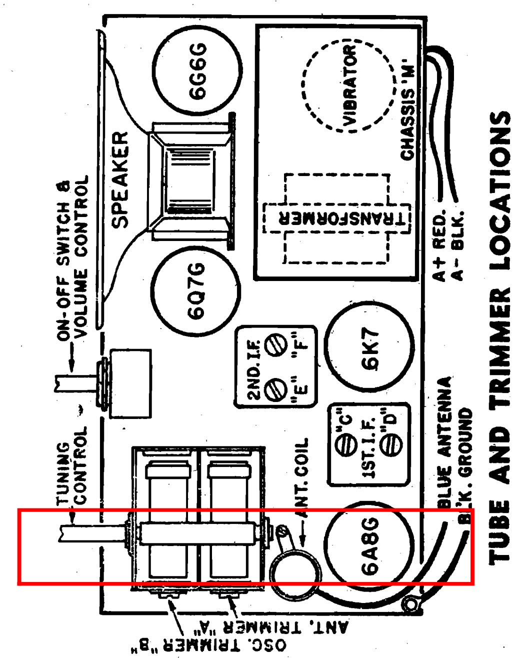
Schematic, Socket, Trimmers

Alignment



DIAG. NO.	PART NO.	DESCRIPTION	
R_1	R-6	200 OHM	.25 W.
R_2	R-33	50,000 OHM	"
R_3	R-28	25,000 OHM	"
R_4	R-44	2 MEGOHM	"
R_5	V-20	1 MEGOHM VOLUME CONTROL	
R_6	R-46	6 MEGOHM	.25 W.
R_7	R-41	250,000 OHM	"
R_8	R-42	.5 MEGOHM	"
R_9	R-33	50,000 OHM	"
R_{10}	R-107	200 OHM	.5 W.
R_{11}	R-7	250 OHM	.25 W.
R_{12}	R-12	500 OHM	"
R_{13}	R-26	15,000 OHM	"
C_1	C-13	.05 MFD.	200 V.
C_2	C-110	100 MMFD. 20%	
C_3	C-16	.25 MFD.	200 V.
C_4	C-1	.1 MFD.	200 V.
C_5	C-110	100 MMFD. 20%	
C_6	C-27	.006 MFD.	800 V.
C_7	C-111	250 MMFD. 20%	
C_8	C-4	.01 MFD.	400 V.
C_9	C-27	.006 MFD.	800 V.
C_{10}	C-13	.05 MFD.	200 V.

DIAG. NO.	PART NO.	DESCRIPTION	
C_{11}	C-22	.5 MFD.	50 V.
C_{12}	C-22	.5 MFD.	50 V.
C_{13}	C7-1	.01 MFD. (OIL)	1000 V.
C_{14}	C7-1	.01 MFD. (OIL)	1000 V.
C_{15}	C-5	.01 MFD.	600 V.
C_{16}	C-236	10 MFD.	250 V.
C_{17}	C-236	20 MFD.	150 V.
C_{18}	C-236	20 MFD.	"
C_{19}	C-1	.1 MFD.	200 V.
1	L-48	ANTENNA COIL	
2	L-49	OSCILLATOR COIL	
3	I-27	1ST. I.F. TRANSFORMER	
4	I-28	2ND. I.F.	"
5	S-24	SPEAKER &	"
6	T-22	POWER	"
	G-19	2 GANG VARIABLE CONDENSER	
	206	"A" CHOKE	
	F-4	SYNCHRONOUS VIBRATOR	



TUBE AND TRIMMER LOCATIONS

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600 and 1400 KC. and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should be aligned.

I.F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6D8G) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the antenna to the generator through a 200 MMF dummy and set the dial and generator at 1400 KC. Align the BC oscillator trimmer and BC antenna trimmer. Set the generator at 600 KC and tune in the signal to check sensitivity at this point to determine if coils or gang condenser have not been damaged.

Elec. Automatic Tuner
Data, Procedure, Assembly

GALVIN MFG. CORP.

MODEL 9-49 (E5T)
MODEL 9-69 (E5T)
MODEL 15-F (E6T)
MODELS 20-P, 21-L, 24-K
MODELS 22-S, 25-N (E6T)

ELECTRIC AUTOMATIC TUNER

Types E5T, E6T and E7T

NOTE: All three tuners are identical in construction, except for the condenser gang.

E5T has a 3-gang condenser and is used in Models 9-49 and 9-69.

E6T has a 2-gang condenser and is used in Models 15-F, 20-P, 21-L, 22-S, 24-K, and 25-N.

E7T has a special high frequency condenser gang and is used in Police Cruiser Model P-69-14.

SERVICE SUGGESTIONS

MOTOR DOES NOT RUN

1. MOTOR CONTACTS IN CONTROL HEAD NOT CLOSING. Open the control head and inspect the motor contacts. If the gap is too great, contact will not be made when the button is pressed. Adjust by bending carefully.
2. POOR CONTACT AT PUSH-BUTTON PLUG. Inspect the contacts between the plug and the receptacle on the chassis.
3. OPEN CIRCUIT IN MOTOR. Check all connections to motor and check motor winding for continuity.
4. MOTOR BRUSHES NOT MAKING CONTACT. Check contact between brushes and commutator. Clean dirty commutator with carbon tetrachloride.
5. LOW BATTERY VOLTAGE. A weak or defective battery in the car would not deliver sufficient voltage to run the motor.
6. FLEXIBLE TUNING SHAFT BINDS. Binding in the flexible tuning shaft places an additional load on the motor. If this load is too great, it will prevent the motor from turning the mechanism.
7. MAGNET FAILS TO RELEASE. If the magnet which has previously been energized, fails to release the latch bar for any reason, the motor cannot turn the mechanism.

MECHANISM RUNS SLUGGISHLY

1. LOW BATTERY VOLTAGE. A weak or defective battery will not deliver sufficient voltage to turn the motor at normal speed.
2. HIGH RESISTANCE CONTACT IN CONTROL HEAD. High resistance at the push-button contacts will cause a voltage drop which will prevent the motor from turning at normal speed.
3. POOR CONTACT BETWEEN PUSH-BUTTON PLUG AND RECEPTACLE. This will also result in voltage drop, and lessened motor power.
4. BINDING IN TUNING SHAFT. Binding in the flexible tuning shaft will place an additional load on the motor which can slow it down considerably. Install tuning shaft with minimum amount of bending and check alignment where the tuning shaft enters the receiver housing.
5. GEARS NOT PROPERLY MESHED. Check all gears in assembly for binding due to improper meshing.
6. DEFECTIVE MOTOR. - Replace.

MOTOR FAILS TO REVERSE

1. REVERSING SWITCH NOT PROPERLY ADJUSTED. See instructions elsewhere in this book.
2. OPEN CIRCUIT IN MOTOR. If one side of motor circuit is open, motor will run in one direction only.
3. OPEN MAGNET WINDING. An open magnet will not pull latch down; consequently will not cause motor switch to reverse.
4. LATCH BAR SPRING TOO TIGHT. If the latch bars operate under too much tension the magnet may not be able to pull the latch down.

FAILS TO RETAIN ORIGINAL SETTING

1. LATCH RINGS NOT LOCKED SECURELY. The locking screw must be pulled down securely, otherwise, the shock of the sudden stopping will tend to slide the rings away from the original setting.
2. ORIGINAL SETTING NOT ACCURATE. Resetting of magnets may be necessary after several days' use, during which time the mechanism goes through a "shaking down" process.
3. ELECTRICAL DRIFT. This is usually the result of a great change in temperature. Automatic compensation is provided in the circuit to take care of the normal operating temperature range. Before making original setting, turn the set on and permit it to play long enough to arrive at a constant operating temperature. In zero weather do not expect the set to tune "on the nose" until after a constant temperature has been reached. In severe cases of electrical drift occurring at normal operating temperature, change the compensating condenser.

IMPOSSIBLE TO SET UP STATIONS

1. TOO MUCH TENSION ON LOCKING LEVERS. When the automatic locking screw is loose, the station rings should move freely. If the levers still hold the station rings partially locked, the screws which hold the levers in position should be loosened one-quarter to one-half turn.
2. LATCH RINGS "OUT OF RANGE". If the loosened latch rings slip on the drum until the notch falls out of reach of the latch bar, they can be brought back to position by following exactly the "setting procedure" outlined elsewhere in this book.

FAILS TO STOP AT STATION

1. OPEN MAGNET WINDING. Check for continuity and replace if necessary.
2. MAGNET CONTACT IN CONTROL HEAD NOT CLOSING. Inspect contacts. Adjust or clean if necessary.
3. LATCH BAR DEFECTIVE. Inspect latch bar to make sure that it has not been damaged. Replace latch bar, if required.
4. POOR CONTACT AT PUSH BUTTON PLUG. A poor contact here means a voltage drop which reduces the pulling power of the magnet.
5. IMPROPER SPACING OF MAGNET. Check the spacing between the latch bar armature and the magnet pole. When the tip of the latch bar is seated all the way down in the notch in the latch ring, the armature should not quite touch the magnet pole. A hair line of light should be visible between them.
6. LATCH RINGS NOT LOCKED SECURELY. If the latch rings are very loose the motor will continue to turn the gang until the plates are completely meshed.

LATCH BAR STICKS IN NOTCH

1. MANUAL TUNING SHAFT BINDS. Binding in the tuning control shaft causes the latch bar to press hard against one side of the notch and may prevent it from releasing as the magnet is de-energized.
2. LATCH BAR SPRING WEAK. Check latch bar tension spring to make sure it is pulling away from the magnet with sufficient force. Spring tension is adjustable.
3. MAGNET CONTACT IN CONTROL HEAD STUCK. Check the magnet switch in the control head to make sure it breaks contact when pressure is released on the bottom. Check for frozen contact points, or for sticking button.
4. ARMATURE RIVET WORN. There is a brass rivet at the tip of the armature, to prevent the armature freezing to the magnet. If this rivet is worn down, permitting the steel armature to actually touch the magnet pole, it may freeze in that position.
5. BURR ON TIP OF LATCH. Latch tip should be smooth and shiny.
6. BINDING IN LATCH BEARINGS. Latch must move freely but not sloppy.
7. LATCH TIPS NOT CENTERED ON LATCH RINGS. Latch tips must not rub bakelite guide rings. The latch bar bearing shaft is adjustable.
8. FRICTION CLUTCH TOO TIGHT. A tension washer between the motor pinion and the brass pinion collar acts as a friction clutch to absorb the shock of stopping the motor quickly when a station is tuned. If the tension is too tight, the torque of the stopped motor will hold the latch bar tip in the notch.
9. MOTOR BRUSHES TOO TIGHT. Too much friction between the motor brushes and the commutator will cause the same thing.

TO SET AUTOMATIC TUNER

NOTE: Before setting any station, let the set warm up for not less than ten minutes. If you wish you can "set" the automatic tuner on the service bench before installing the radio in the car. Use a short aerial and peak the antenna trimmer to it. Then readjust the antenna trimmer after the installation in the car.

IMPORTANT—You will note that the 9-contact plug on the end of the control head cable has one pin that is shorter than the others. For the "setting up" procedure, this plug should be inserted in its receptacle on the receiver only half way. This will cause all of the magnet terminals to be connected, but will not permit the tuning motor to run during the adjustment, since the short pin will not make contact, thereby holding the motor circuit open. The motor should not run at any time during the "setting up" procedure.

1. From the set of call letter tabs provided, detach the proper ones for the six stations. The station tabs should then be inserted in the space provided in the fact of station tuning buttons. Cover the tab with a small rectangular piece of celluloid. Both tabs and celluloids snap into position.

2. Loosen the AUTOMATIC LOCKING SCREW. This screw should be turned counter-clockwise four or five revolutions—far enough to assure plenty of looseness.

3. Turn the dial all the way to the low frequency end (535 K.C.)

4. Press the first button and hold it down. A faint "click" should be heard, indicating that the tuning magnet has attracted the latch bar.

5. Holding the magnet energized, turn the dial manually all the way to the high frequency end (1550 K.C.) and then all the way back to the low frequency end (535 K.C.)

6. Still pressing on the button, tune in the station to be set on that button.

7. Proceed to set the remaining five stations. For each station follow steps 3, 4, 5, and 6, as outlined above. AT NO TIME IN THE SETTING UP PROCEDURE SHOULD THE TUNING MOTOR BE PERMITTED TO RUN.

8. Tighten the automatic locking screw very securely. Do not hold the tuning knob while locking the automatic, but allow the mechanism to turn to its natural stop.

9. Push the plug all the way into the receptacle on the receiver housing so the short motor pin will also make contact.

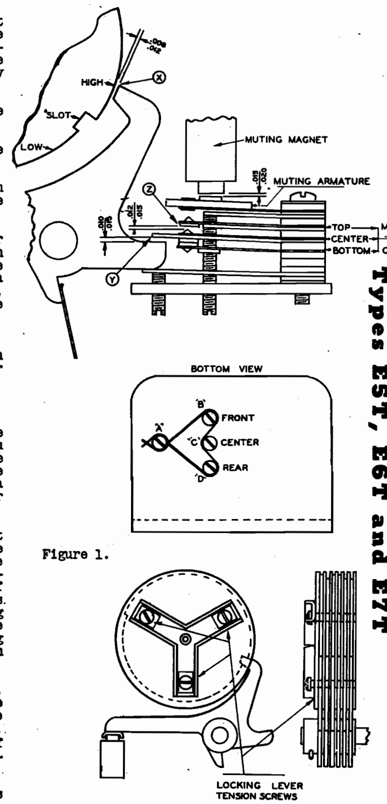


Figure 1.

REVERSING SWITCH AND MUTING RELAY ADJUSTMENT

NOTE: Four adjusting screws extend upward through the switch mounting plate, three of them in line, and one set off by itself. (See Fig. 1).

1. Turn the rotor assembly until the HIGH sides of all latch rings rest opposite the latch tips.

2. Turn screw "A" in until all latch bar tips touch HIGH side of ring and then turn the screw back one half turn. (Spacing between latch tip and high side of ring at point "X" should be 8 to 12 thousandths of an inch.)

MODEL 9-49
MODEL 9-69
MODEL 15-F
MODELS 20P,21L,24K

GALVIN MFG. CORP.

Procedure, Part 2
Schematic of Tuner
Assembly, Parts List

AUTOMATIC SERVICE PROCEDURE--Continued

3. Hold any latch bar tip down on HIGH side of ring and adjust screw "C" (center screw) until the bakelite insulator on the center switch leaf just barely misses touching the heel of the latch bar at point "Y". (Check adjustment by pressing other latch bars. The depressed latch bar must not lift the center contact even slightly.)

4. With latch bar at rest position adjust screw "B" (front screw) until top motor contact is lifted from center contact by 12 to 15 thousandths of an inch at point "Z". (15 thousandths = 1/64").

5. Turn rotor until LOW side of ring rests under latch tip. Press any latch bar down and make sure switch actually reverses. (Bottom contact must break and top contact make sufficiently to lift the top switch leaf slightly from the bakelite spacer.)

6. Turn screw "D" (rear screw) until muting relay armature rests 15 to 20 thousandths of an inch from the magnet pole. (Too close spacing will cause intermittent muting due to vibration.) (15 thousandths = 1/64").

TO REMOVE LATCH BAR ASSEMBLY

1. Back up on front switch adjustment screw (A) until latch tips rest outside the diameter of the bakelite ring separators.

2. Remove comb shaped latch tension spring. (E)

3. Remove the hex-head machine screw which extends through the small angle bracket into the brass latch bar bearing shaft underneath the tuner. (Screw not visible in photo.)

4. Pull out latch and shaft assembly. (F)

NOTE: To re-assemble, reverse the above procedure, and take particular care that:

1. Latch bar tips center on latch rings. They should not rub bakelite ring separators. (Spacing is adjustable through elongated hole in small bracket under tuner.)

2. When readjusting screw (A), turn it all the way in until latch tips touch high side of rings; then back screw up one-half turn (See reversing switch adjustment on Page .)

TO REMOVE LATCH RING ASSEMBLY

1. Back up on switch adjustment screw (A) until latch tips rest outside the diameter of the bakelite ring separators.

2. Remove locking screw. (G)

3. Remove the three locking levers. (H)

4. Lift the locking nut off the end of the rotor shaft.

5. Carefully loosen the three screws (J) which hold the ring assembly to the rotor hub, and remove all rings and separators as a unit, being careful to keep the three screws in position through the assembly.

NOTE: To reassemble, reverse the above procedure. Work carefully - do not let the rings and separators get off the screws.

TO REPLACE DEFECTIVE LATCH RING

1. Remove the entire latch ring assembly from the rotor hub. (See instructions above.)

2. Lay assembly on flat surface with screw heads down.

3. Remove rings, separators and brass spacing collars, one at a time, until the defective ring is exposed.

NOTE: Reassemble parts one at a time, being careful that rings, separators, and spacers are in the correct position.

CAUTION: Be careful to replace rings in original position. Turning the ring over will reverse the position of the notch and will result in faulty tuning.

TO REMOVE DEFECTIVE HUB AND GEAR

1. Remove the entire latch ring assembly from the rotor hub. (See instructions above.)

2. Loosen the four Bristo set screws in the rotor hub.

3. Loosen the one Bristo set screw in the bakelite flexible shaft coupling.

4. Pull the rotor hub off the gang shaft. The manual tuning gear and coupling will have to be removed at the same time. The brass collar on the motor shaft may also need to be removed.

NOTE: When installing a new hub, turn the gang to full mesh and the hub gear against its stop before tightening set screws.

3S7111	Set Screw (8-32x3/16 Bri. Hd.) Blk.	DOZ.	$0.85
3S7114	Set Screw (8-32x1/4 Slab Hd.)	PERC.	1.50
3S7243	Screw (5-40x7/8 Sl. Hdls. MS) CP.	PERC.	1.05
3S7244	Screw (5-40x5/8 Sl. Hdls. MS) CP.	PERC.	1.00
3S7245	Screw (5-40x3/8 Sl. Hdls. MS) CP.	PERC.	1.00
4S7616	Washer (5/16-.171-.016) Brass	DOZ.	.10
8A10306	Tub. Cond. & Strap (.03-100V.)		.15
64A11245	Switch Holding Plate	DOZ.	.25
8K11624	Muting Magnet Assembly (Black)		.45
4X11633	Spring Washer (.562-.190-.008)	DOZ.	.10
9A13298	Plug Receptacle (9 Prong)		.30
62B13302	Rotor Hub		.40
43B13303	Station Ring		.25
32A13310	Spacer Ring (.015)	DOZ.	.70
43A13311	Latch Collar		.10
49A13312	Clamping Screw Disc	DOZ.	.15
1X13313	E5T Tuner Assembly Complete with Gang		18.00
2A13314	Clamping Lever Nut	DOZ.	.75
41A13315	Latch Spring (6 Finger)		.05
45A13318	Clamping Lever	DOZ.	.35
45B13319	Latch Arm (No. 1)		.20
45K13320	Latch Arm (No. 6)		.20
45B13321	Latch Arm (No. 3)		.20
45K13322	Latch Arm (No. 4)		.20
45B13323	Latch Arm (No. 2)		.20
45K13324	Latch Arm (No. 5)		.20
32K13325	Spacer Ring (.031)		.10
4K13328	Idler Gear Assembly		.75
59B13330	Tuner Motor (6-8V.D.C.)		3.90
47A13331	Latch Shaft		.30
47A13332	Idler Shaft		.10
7A13334	Shaft Retainer Bracket		.05
44A13335	Motor Pinion (1/2" PD)		.20
43A13336	Clutch Collar		.10
41A13338	Clamp Tension Spring	DOZ.	.20
7K13341	Idler Shaft Support (.062)		.05
7A13342	Idler Shaft Support (.109)		.10
4A13343	Clutch Washer (.562-.189-.019)	DOZ.	.10
4A13344	Spacer Washer (.312-.169-.090)	DOZ.	.25
19B13348	Variable Condenser (3 Gang) For E5T		4.00
1X13350	Rotor Assembly Complete		3.00
1K13353	Tuner Magnet Assembly (Black)		.45
1X13356	Latch Assembly Complete		1.50
1X13357	Tuner Switch Assembly		.90
7A13362	Relay Bracket		.05
1X13413	E6T Tuner Assembly Complete with Gang		17.50
3A13731	Screw (8-32x7/8 Spec. MS) CP.	DOZ.	.10
3A13732	Screw (8-32x3/4 Spec. MS) CP.	DOZ.	.10
19B14154	Variable Condenser (2 Gang) for E6T		3.50
1X14214	E7T Tuner Assembly Complete with Gang		21.50
19B14653	Variable Condenser (Hi-Frequency) P-69-14		7.50

A. Switch adjustment screw
B. Switch adjustment screw
C. Switch adjustment screw
D. Switch adjustment screw
E. Latch tension spring
F. Latch and shaft assembly
G. Locking Screw
H. Locking lever
J. Latch ring assembly screw
K. Manual tuning gear and coupling
L. Motor pinion
M. Pinion collar
N. Tuning Motor
P. Muting relay coil
R. Reversing switch

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

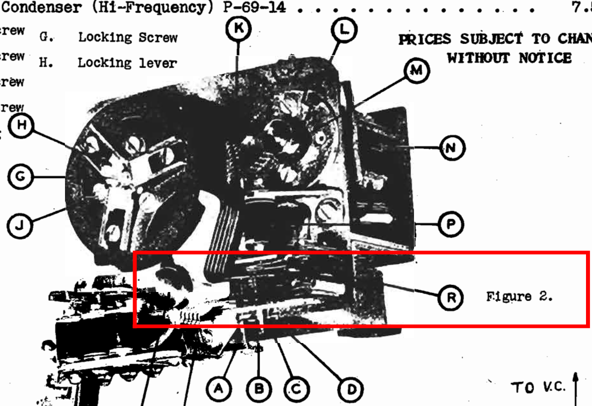


Figure 2.

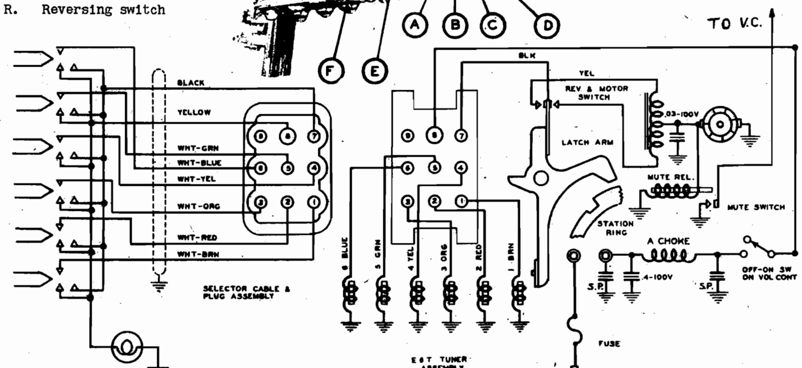
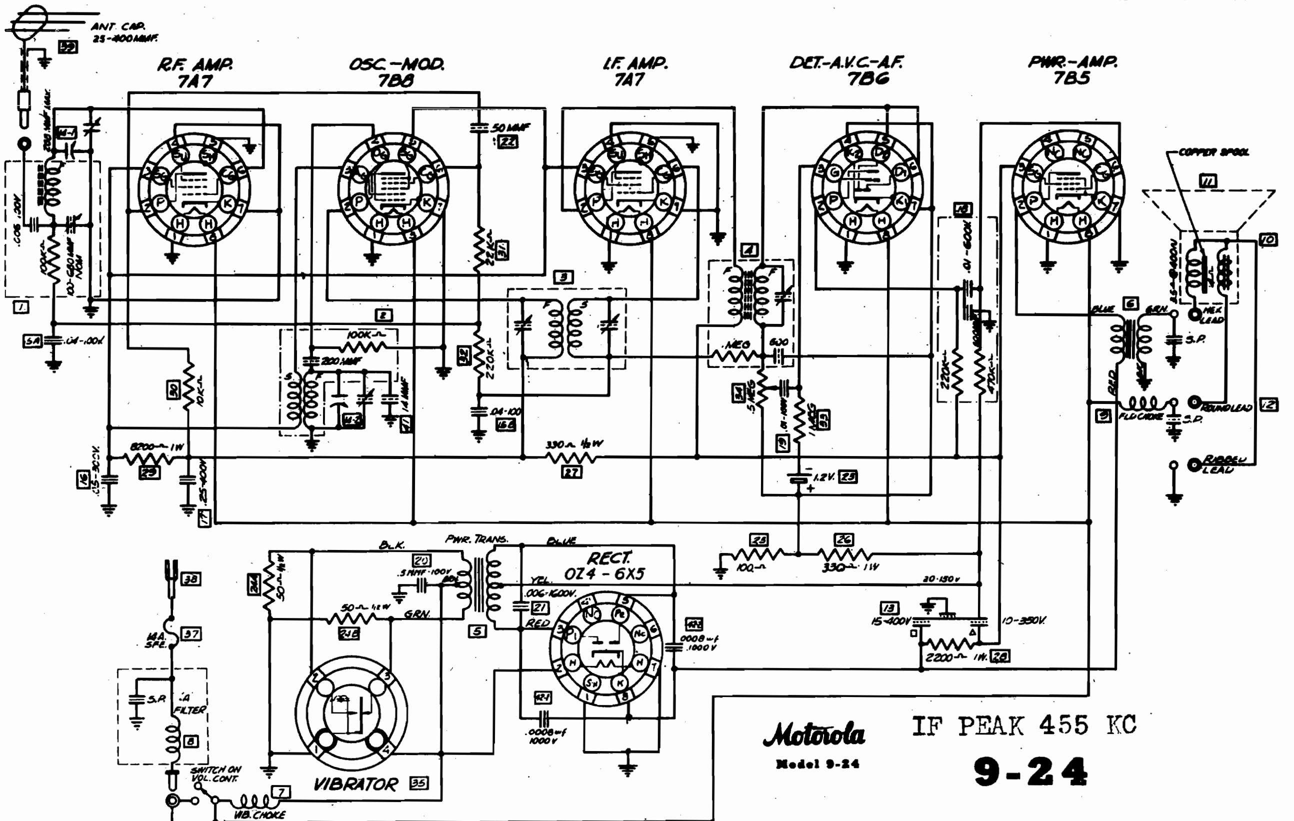


Figure 3 - Tuner Circuit Diagram.

MODEL 9-24
MODEL 9-24A
Schematics

GALVIN MFG. CORP.

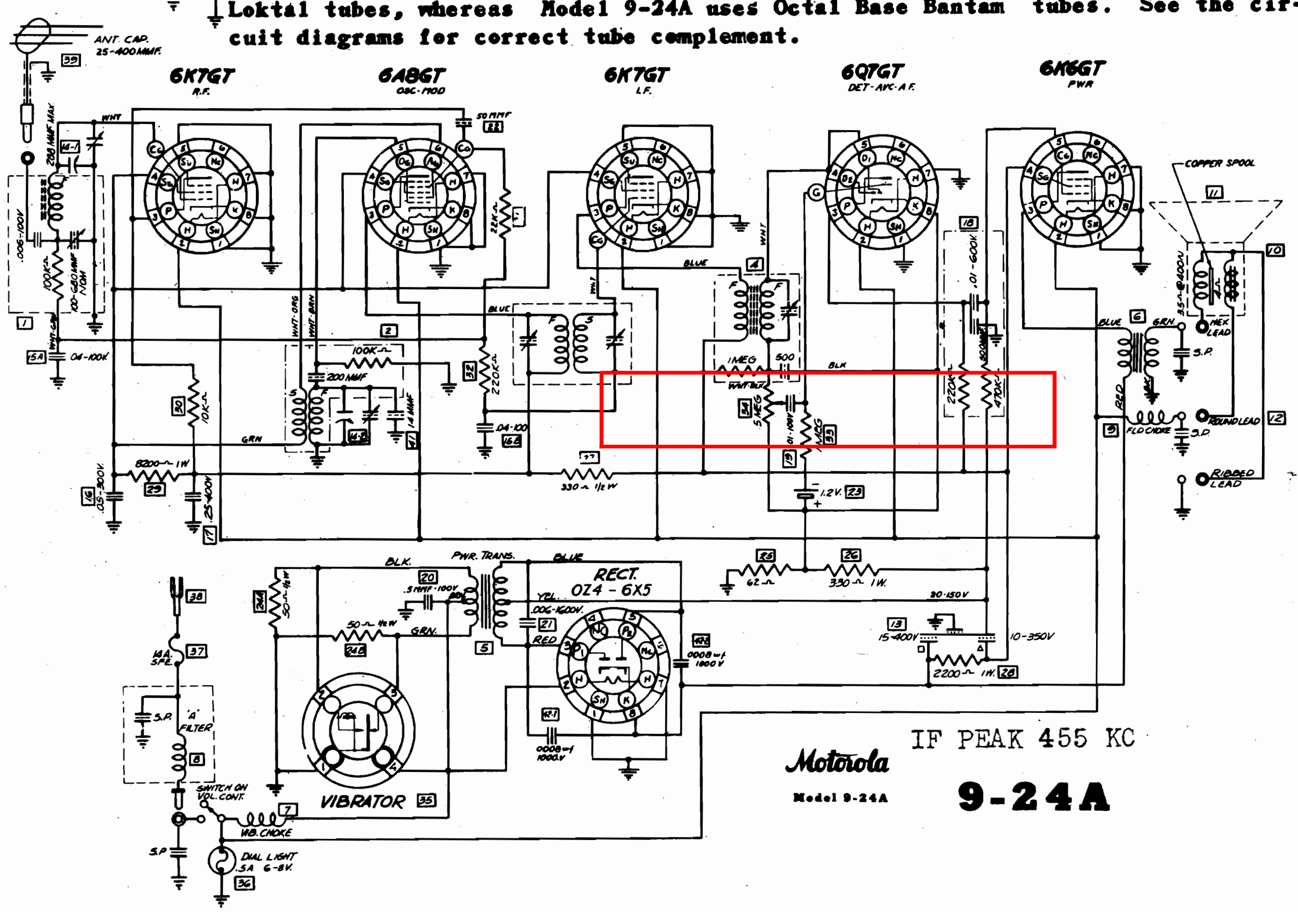


Motorola
Model 9-24

IF PEAK 455 KC

9-24

The only difference between these two is the tube complement. Model 9-24 uses Loktal tubes, whereas Model 9-24A uses Octal Base Bantam tubes. See the circuit diagrams for correct tube complement.



Motorola
Model 9-24A

IF PEAK 455 KC

9-24A

MODEL 9-24
MODEL 9-24A

GALVIN MFG. CORP.

Alignment, Socket, Trimmers
Voltage, Sensitivity, Gain
Dial Cord Data

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Connect the speaker and battery.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the antenna lead through a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator if necessary to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the pount showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. Change to 40 MMF condenser in signal generator lead. Set signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

2. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 600 K.C. and rock the pointer at the 600 K.C. position on the dial scale, while adjusting the antenna padder, until a combination is found which gives highest output reading.

NOTE: The antenna padder is reached through a hole in the bottom of the chassis base, directly under the antenna coil can.)

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
20,000	455 K.C.	IF Grid	.1 MF	.5 Meg	1.87 Volts
200	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.87 Volts
250	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.87 Volts
125	600 K.C.	RF Grid	.1 MF	.5 Meg	1.87 Volts
10	600 K.C.	Ant. Lead	40 MMF	None	1.87 Volts

* For one watt output.
** Meter connected across voice coil.

V.C. Resistance -3.5 ohms at 400 cycles.
1.87 Volts equals 1 watt output.

VOLTAGE CHART

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
7A7 or 6K7GT	RF	120	95	0	-
7B8 or 6A8GT	Osc.-Mod.	175	95	0	95
7A7 or 6K7GT	IF	175	95	0	-
7B6 or 6Q7GT	Det.Avc.	65	-	-2.5	-
7B5 or 6K6GT	Output	225	180	0	-
0Z4 or 6X5	Rect.	AC	-	230	-

All measurements from chassis ground to socket terminal using 1000 ohms per volt meter.
Battery voltage 6.3 V.
Current Consumption 6.5 Amps.
Maximum Power Output 5 Watts.

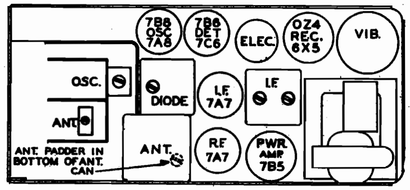


Figure 1 - Trimmer Locations

DIAL DRIVE CORD ASSEMBLY - PART NO. 1X14731

1. Remove broken cord, dial scale and dial pointer.

2. If exact Motorola assembly is not available, cut a piece of 30 lb. silk fish cord 32 inches long. CONDENSER GANG MUST BE MESHED.

3. Double the cord at a point 11 inches from one end and thread the loop through the hole in the drive raceway. See Fig.

4. Tie a large knot in the cord or use an eyelet large enough to prevent the cord from passing through the hole in the raceway. You will now have cord (A) 21 inches long, and cord (B) 11 inches long extending from the raceway as in Fig. 3.

5. Loop cord (A) under and over idler pulley No. 1, as shown in Fig. 4 and holding the end of the cord tight, turn the raceway 2½ turns to the right (clockwise), thereby winding 2½ turns of cord (A) on the raceway.

6. Use a common ordinary paper clip to clip the loose end of cord (A) to the front plate of the chassis, so you can work on cord (B) for a while.

7. Take cord (B) and bring it over the raceway and under idler pulley No.2 as shown in Fig.5.

8. Make one complete turn around drive pulley as shown in Fig. 5 and clip the end of cord (B) to the edge of the chassis with a paper clip.

9. Remove the paper clip holding cord (A) and continue its routing from idler pulley No. 1 over idler pulley No. 3 and 1/2 turn around the drive pulley as shown in Fig. 5.

10. Bring both loose ends of cord through the slot in the drive pulley and tie them together tightly inside the slot.

11. Then tie in one end of the tension spring, Part No. 41A12854 and hook the other end of the spring on the ear stamped out of the washer. Cut off surplus cord.

12. Replace pointer and dial scale.

13. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.

14. Secure pointer to string with a drop of shellac.

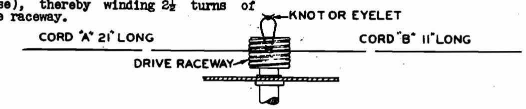


FIG.3

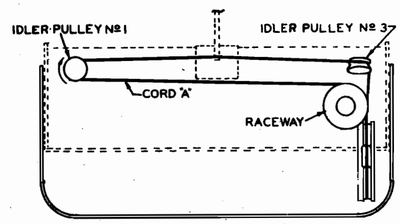


FIG. 4

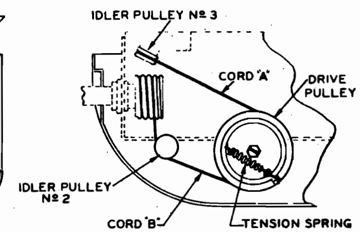


FIG. 5

DIAL CORD INSTRUCTIONS

BACKLASH CORD AND SPRING ASSEMBLY - PART NO. 1X14730

NOTE: If exact Motorola assembly is not available, use original spring and 30 lb. silk fish cord to make up assembly to dimensions as shown at the top of Fig. 2.

1. Turn gang to fully meshed position.

2. Loop long end of cord around set screw (A) in condenser gear and hook around third tooth of gear ahead of set screw.

3. Make one complete turn around condenser rotor shaft.

4. Stretch spring and loop other end around set screw (B) in tuner gear.

NOTE: Spring tension must be sufficient to take up all backlash in gear train. To increase tension, hook cord around fourth tooth in Step 2. To decrease tension, hook around second tooth.

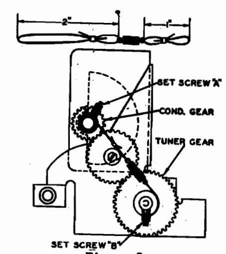
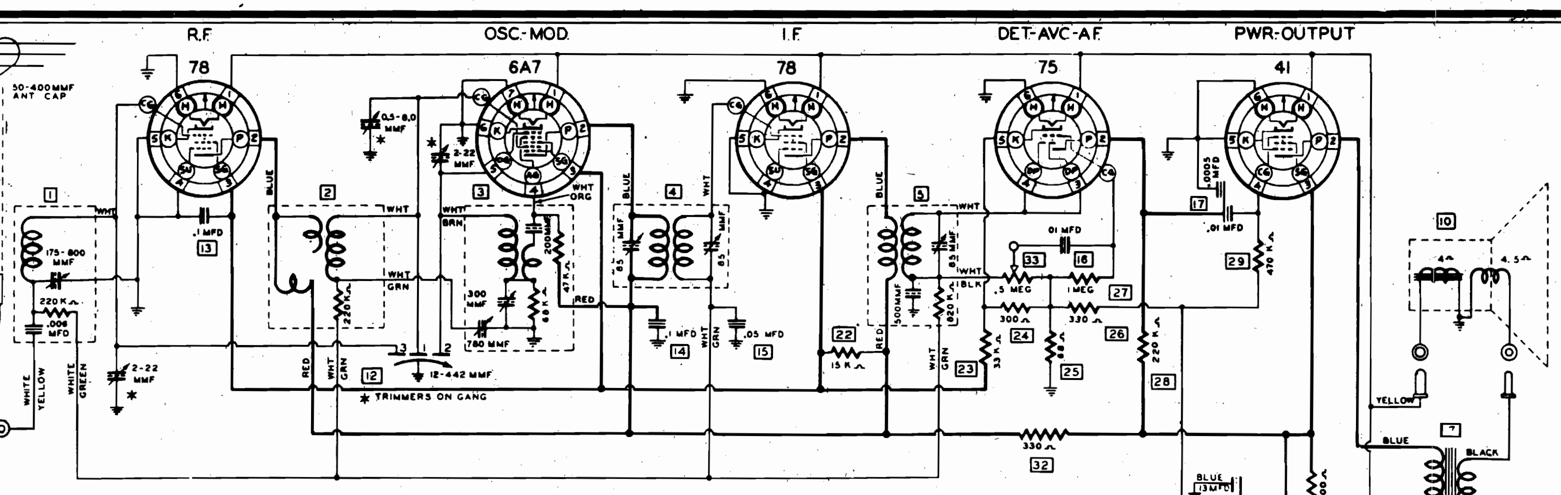
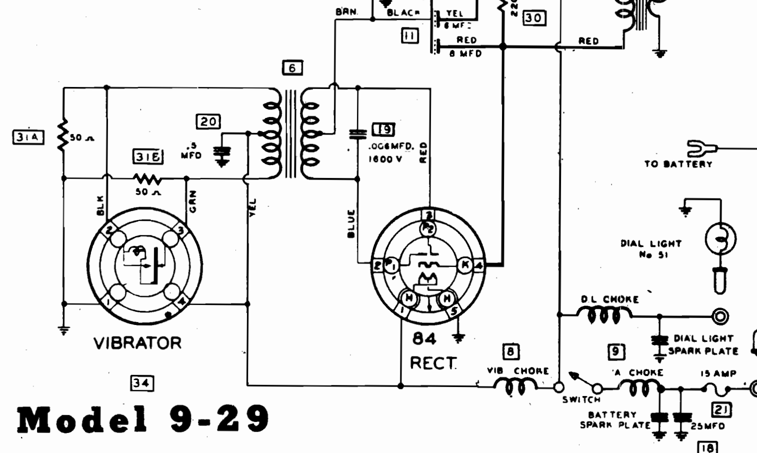


Figure 2.

Alignment
Trimmers

GALVIN MFG. CORP.





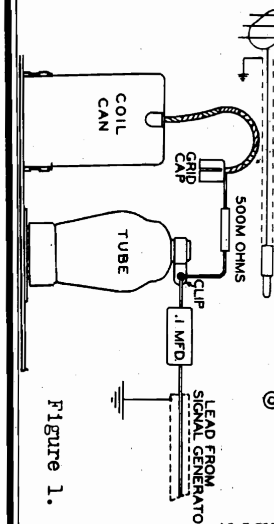


Figure 1.

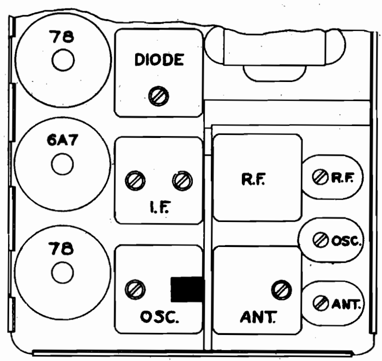


Figure 2. 9-29 TRIMMERS

Model 9-29

ALIGNMENT PROCEDURE

Place the radio on the service bench with the front cover removed, but with the speaker and battery connected to it.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

NOTE: Do not adjust the trimmer in the oscillator coil can that is covered with Scotch Tape. The original adjustment, made in the factory, should not be tampered with. (Fig. 2 below, shows all trimmer locations.)

I.F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6A7) through a .1 MF condenser, having first removed the grid cap from the top of the tube. Connect a 500,000 ohm leak resistor from the grid of the tube to the grid cap just removed from the tube. (See Fig. 1.) Turn the condenser gang completely out of mesh. Connect an output meter across speaker voice coil.

2. Set the signal generator at 262 K.C. and carefully adjust the single trimmer in the Diode coil can to he point showing the highest reading on the output meter.

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (78) using the same .1 MF condenser and the same 500,000 ohm leak resistance.

2. Set the signal generator at 1560 K.C. and with the condenser gang completely out of mesh adjust the trimmer on the oscillator section of the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 535 K.C. Turn the condenser gang completely in mesh and adjust the 600 K.C. trimmer in the Oscillator coil can for the highest output reading.

NOTE: The adjustments above set the range so the receiver will track with the calibrations in the control head.

R.F. AND ANTENNA ALIGNMENT

1. Connect the signal generator to the antenna lead through a 40 MMF condenser and to chassis ground. Set the signal generator at 600 K.C. and turn the condenser gang until the signal is heard. Adjust the trimmer on the antenna coil can for the maximum output reading.

2. Set the signal generator at 1400 K.C. Turn the condenser gang until the signal is heard. Adjust the trimmer on the antenna section of the condenser gang for maximum output reading.

3. Adjust the trimmer on the R.F. section of the condenser gang for maximum output reading.

4. Recheck steps 1, 2, and 3, for accuracy.

MODEL 9-29
Voltage, Sensitivity, Gain
MODEL 9-49
Alignment, Sensitivity
Socket Trimmers, Gain

GALVIN MFG. CORP.

AUTOMOBILE RECEIVER

Model 9-49

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage-gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
.25 Volts	400 cycles	7B6 Grid	.1 MF	.5 Meg	1.74 Volts
25,000	262 K.C.	7A7 Grid(I.F.)	.1 MF	.5 Meg.	1.74 Volts
700	262 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
800	600 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
45	600 K.C.	7A7 Grid(R.F.	.1 MF	.5 Meg	1.74 Volts
2	600 K.C.	Ant. Lead	40 MMF	None	1.74 Volts

* For one watt output.

** Meter connected across voice coil.

V.C. impedance - 3 ohms at 400 cycles.

1.74 volts equals 1 watt output.

CAUTION

If you use a screw driver to pry out Loktal tubes, be careful that you do not crack the glass bead around the tube pins.

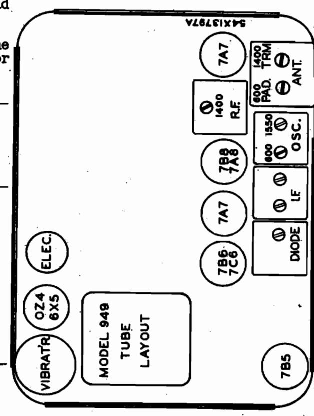


Figure 1 - Trimmers

ALIGNMENT:
For alignment, follow procedure as for Model 9-44.

AUTOMOBILE RECEIVER

Model 9-29

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage-gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the top grid terminal of the tube through a .1 MF condenser, with a 500M Ohm resistor connected as a leak resistance between the grid of the tube and the grid cap which has been removed. (See Fig. 1 on Page 1.)

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
.25 Volts	400 Cycles	75 Grid	.1 MF	.5 Meg	2.2 Volts
25,000	262 K.C.	78 Grid (I.F.)	.1 MF	.5 Meg	2.2 Volts
700	262 K.C.	6A7 Grid	.1 MF	.5 Meg	2.2 Volts
800	600 K.C.	6A7 Grid	.1 MF	.5 Meg	2.2 Volts
45	600 K.C.	78 Grid (R.F.)	.1 MF	.5 Meg	2.2 Volts
3	600 K.C.	Ant. Lead	40 MMF	None	2.2 Volts

* For one watt output.

** Meter connected across voice coil.

V.C. Resistance - 5 ohms at 400 cycles.

2.2 Volts equals 1 watt output.

VOLTAGE CHART - MODEL 9-29

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
78 *	RF	185	85	-	-
6A7 *	Osc.-Mod.	185	85	-	100
78 *	IF	185	85	-	-
75	Det.-Avc.	150	-	-2	-
41 **	Output	235	200	-	-
84	Rect.	AC	-	250	-

* Bias —3 V from B stick

** Bias —17 V from B stick

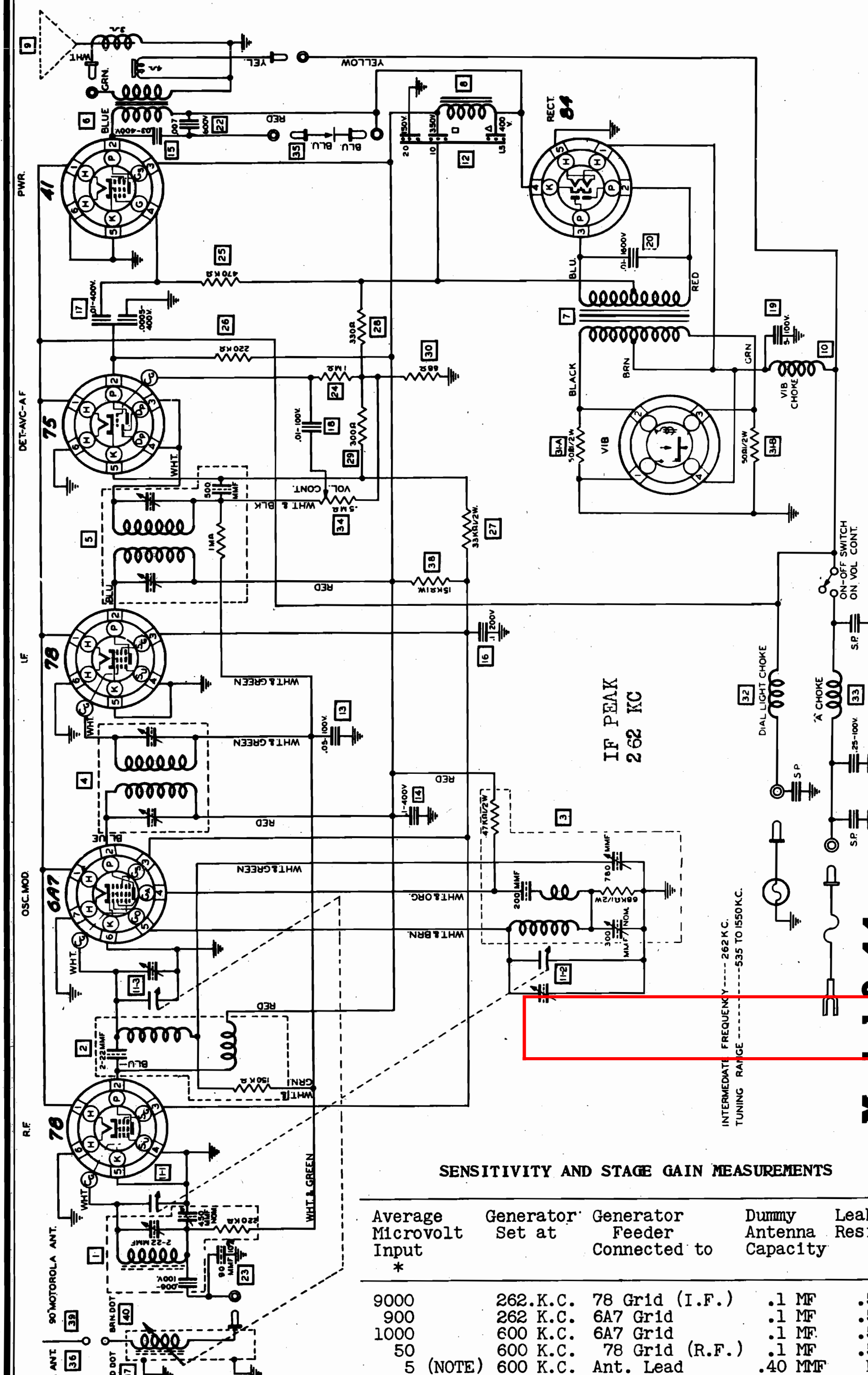
Current - 6.5 Amps. at 6.3 Volts

Maximum power output - 3.5 Watts

All readings from chassis ground with 1000 ohms per volt meter.

GALVIN MFG. CORP.

MODEL 9-44
Schematic, Voltage, Gain
Sensitivity



VOLTAGE CHART

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
78 *	RF	195	80	0	-
6A7 *	Osc. - Mod.	195	80	0	95
78	IF	195	80	0	-
75	Det. - Avc	75	-	-2	-
41 **	Output	200	200	0	-
84	Rect.	AC	-	210	-

* Bias -3. V from "B" stick.

** Bias -17.V from "B" stick.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
9000	262.K.C.	78 Grid (I.F.)	.1 MF	.5 Meg	1.74 Volts
900	262 K.C.	6A7 Grid	.1 MF	.5 Meg	1.74 Volts
1000	600 K.C.	6A7 Grid	.1 MF	.5 Meg	1.74 Volts
50	600 K.C.	78 Grid (R.F.)	.1 MF	.5 Meg	1.74 Volts
5 (NOTE)	600 K.C.	Ant. Lead	.40 MMF	None	1.74 Volts

* For 1 Watt output.
** Output meter connected across voice coil.

1.74 Volts equals 1 Watt output.
V.C. resistance - 3 ohms.
(NOTE:) Without Booster

MODEL 9-44
Socket, Trimmers, Drive
Alignment
MODEL 9-49
Alignment

GALVIN MFG. CORP.

MODEL 9-69
Sensitivity, Gain, Socket
Trimmers, Alignment, Voltage

SENSITIVITY AND STAGE GAIN MEASUREMENTS
MODEL 9-69

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the tables.

All stage-gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500 M Ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF.

It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
20,000	262 K.C.	7A7 Grid (IF)	.1 MF	.5 Meg	1.74 Volts
400	262 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
500	600 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
30	600 K.C.	7A7 Grid(RF)	.1 MF	.5 Meg	1.74 Volts
1	600 K.C.	Ant. Lead	40 MMF	None	1.74 Volts

1.74 Volts equals 1 Watt output.
V.C. resistance - 3 ohms.

* For 1 Watt output.
** Output meter connected across voice coil.

CAUTION

If you use a screw driver to pry out Loktal tubes, be careful that you do not crack the glass bead around the tube pins.

ALIGNMENT: To align, follow procedure of Model 9-44.

VOLTAGE CHART - MODEL 9-69

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
7A7	RF	240	85	4	-
7B8	Osc.-Mod.	240	85	4	110
7A7	I.F.	240	85	4	-
7A6	Det.Avc.	0	0	0	-
7B6	A.F.	140	-	0	-
7C5	Output	250	250	15	-
7C5	Output	250	250	15	-
0Z4	Rect.	AC	-	260	-

All voltages measured from socket terminal to chassis ground using 1000 Ohms per volt meter.

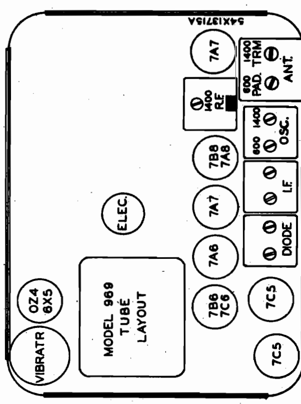


Figure 1 - Trimmers

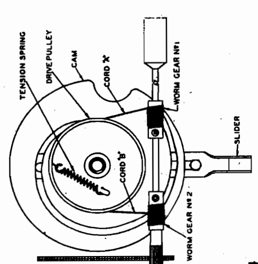


Figure 2

MODEL-9-44

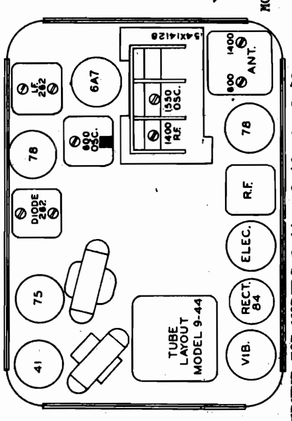


Figure 1 — Trimmers

ALIGNMENT FOR MODELS 9-44, 9-49 & 9-69

Place the radio on the service bench with the front cover removed, but with the speaker and battery connected to it.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output, if necessary.

NOTE: Do not adjust trimmer in the oscillator coil can that is covered with Scotch Tape. The original adjustment made in the factory should not be tampered with.

Fig. 1 shows all trimmer locations.

I.F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6A7). Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 262 K.C. and carefully adjust the two trimmers in the Diode coil can to the point showing the highest reading on the output meter.

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustments several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (78), using the same .1 MF condenser.

2. Set the signal generator at 1550 K.C. and with the condenser gang completely out of mesh adjust the oscillator trimmer on the middle section of the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 535 K.C. Turn the condenser gang completely in mesh and adjust the 600 K.C. padder in the oscillator coil can for the highest output reading.

NOTE: Adjustments above set the range so the receiver will track with the calibrations in the control head.

RF AND ANTENNA ALIGNMENT

1. Connect the signal generator to the antenna lead through a 40 MMF condenser and to chassis ground. Set the signal generator at 600 K.C. and turn the condenser gang until the signal is heard. Adjust the 600 K.C. padder in the antenna coil can for maximum output reading, while slightly rocking the condenser gang.

2. Set the signal generator at 1400 K.C. Turn the condenser gang until the signal is heard. Adjust the 1400 K.C. trimmer in the antenna coil can for maximum output reading.

3. Adjust the 1400 K.C. R.F. trimmer on the inside section of the condenser gang for maximum output reading.

4. Recheck steps 1, 2, and 3, for accuracy.

TO RESTRING BOOST-O-MATIC DRIVE
MODEL 9-44

1. Turn the condenser gang to the fully open position.

2. Turn the booster pulley and cam assembly until the forked slider has been drawn all the way in and the hole in the rim of the drive pulley is at the top, lining up with the pulley stud and the slider, as indicated in Fig. 2.

3. If the old string is broken, cut a new piece of 30 pound test silk fish cord, 31" long and tie knots or eyelets in both ends so the length between the knots is exactly 29½".

4. Double the cord at its exact center and push the loop through the hole in the rim of the drive pulley.

5. Tie the tension spring in the loop thus formed, but do not hook it under the ear stamped out of the pulley. You will now have two equal lengths of string extending from the hole in the pulley which we shall call Cord "A" and Cord "B" as indicated in Fig. 2.

6. Take Cord "A" and wind it clockwise one complete revolution around the drive pulley, continuing downward to worm gear #1.

7. Loosen the set screws in worm gear #1 and hook the knot in Cord "A" in the slot in the end of the worm drive.

8. Turn the worm drive towards you just enough to take up the slack in Cord "A" and tighten the set screws.

9. Hold Cord "B" in your left hand and turn the tuning shaft manually until the condenser gang is closed. This will wind Cord "A" on worm drive #1.

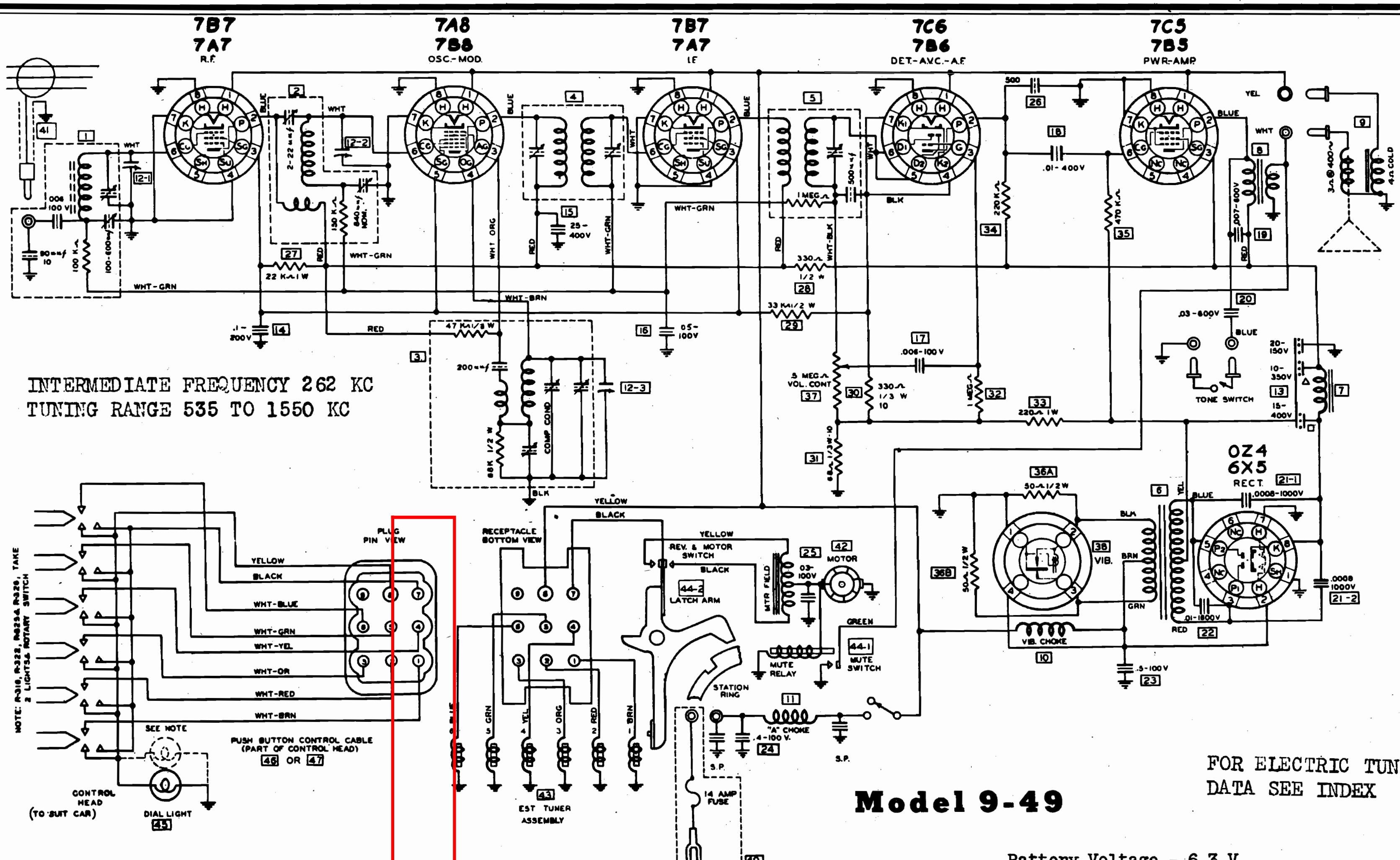
10. Loosen the set screws in worm drive #2 and hook the knot in Cord "B" in the slot in the end of worm drive #2.

11. Turn worm drive #2 away from you just enough to take up the slack in Cord "B" and tighten the set screws.

12. Hook the end of the cord tension spring under the ear stamped out of the pulley.
NOTE: You can see by studying Fig. 2 how Cord "A" passes over worm drive #1, whereas, Cord "B" passes under worm drive #2.

GALVIN MFG. CORP.

MODEL 9-49
Schematic, Voltage



INTERMEDIATE FREQUENCY 262 KC
TUNING RANGE 535 TO 1550 KC

FOR ELECTRIC TUNER DATA SEE INDEX

Model 9-49

VOLTAGE CHART - MODEL 9-49

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
7A7 or 7B7 *	R.F.	200	60	0	-
7B8 or 7A8 *	Osc.-Mod.	200	60	0	95
7A7 or 7B7 *	I.F.	200	60	0	-
7B6 or 7C6 **	Det.-Avc.	70	-	-2	-
7B5 ***	Output	200	205	0	-
0Z4 or 6X5	Rect.	AC	-	210	-

Battery Voltage - 6.3 V.

Current consumption - 6.2 Amps.

Maximum power output - 4.5 Watts

* Bias - -3.V Measured from "B" stick.

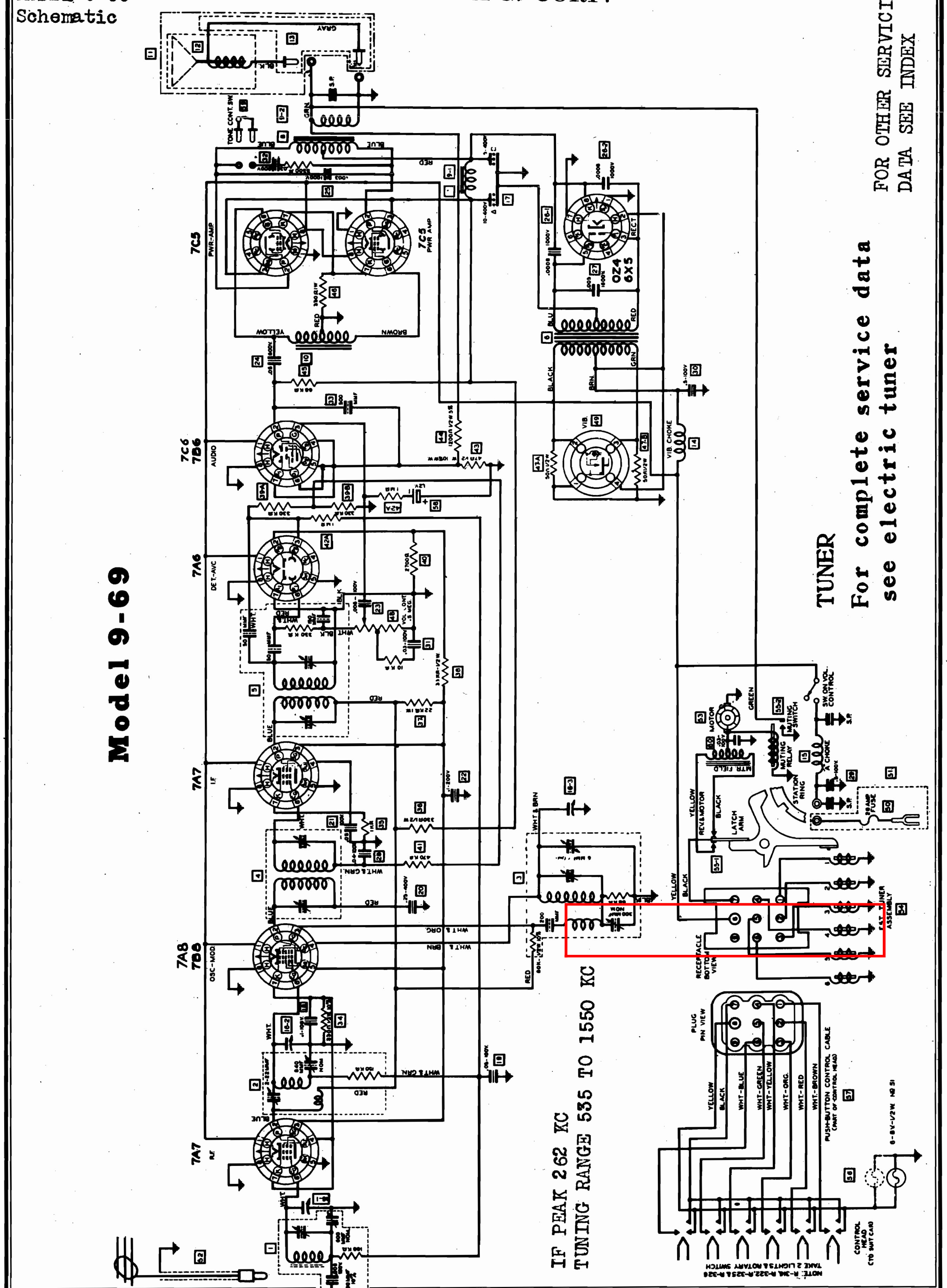
** Bias - -2.V Measured from "B" stick.

*** Bias - -15.V Measured from "B" stick.

All measurements from socket terminal to chassis ground, using 1000 ohms per volt meter.

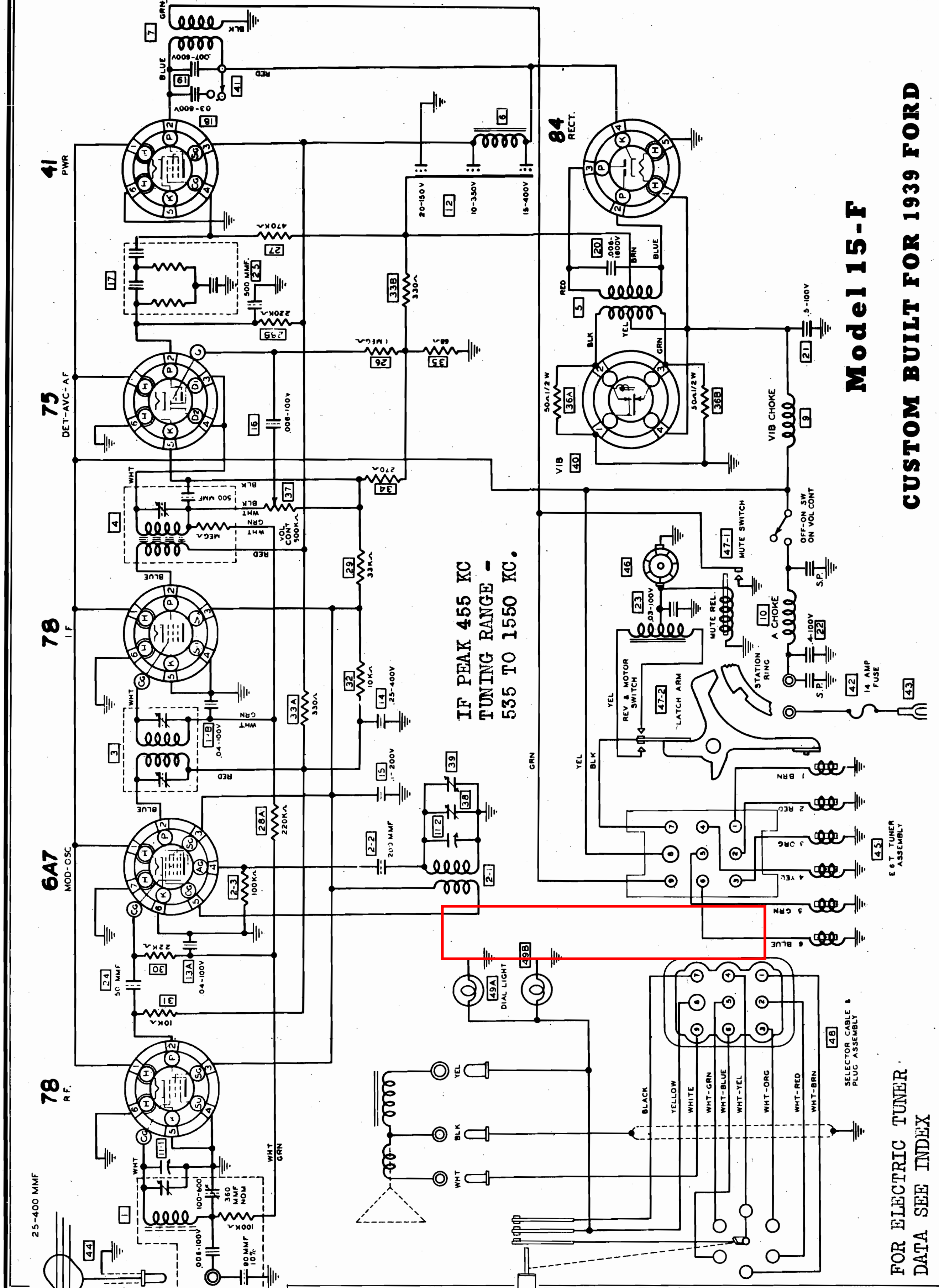
MODEL 9-69
Schematic

GALVIN MFG. CORP.



GALVIN MFG. CORP.

MODEL 15F
Schematic



MODEL 15F
Sensitivity, Gain, Voltage
Alignment, Socket, Trimmers

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Connect the speaker and battery.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the antenna lead through a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator if necessary to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. Change to 40 MMF condenser in signal generator lead. Set signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

2. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 600 K.C. and rock the pointer at the 600 K.C. position on the dial scale, while adjusting the antenna padder, until a combination is found which gives highest output reading.

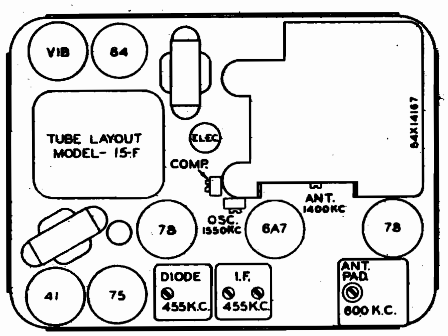


Figure 1 - Trimmers

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
20,000	455 K.C.	IF Grid	.1 MF	.5 Meg	1.74 Volts
200	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.74 Volts
250	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.74 Volts
125	600 K.C.	RF Grid	.1 MF	.5 Meg	1.74 Volts
10	600 K.C.	Ant. Lead	40 MMF	None	1.74 Volts

* For 1 Watt output. 1.74 Volts equals 1 Watt output.

** Output meter connected across voice coil. V.C. resistance - 3 ohms.

VOLTAGE CHART

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
78*	RF	145	85	0	-
6A7	Osc.-Mod.	200	85	0	90
78	IF	205	85	0	-
75**	Det.Avc.	85	-	-2.5	-
41***	Output	200	205	0	-
84	Rect.	AC	-	215	-

All measurements from chassis ground to socket terminal using 1000 ohms per volt meter.

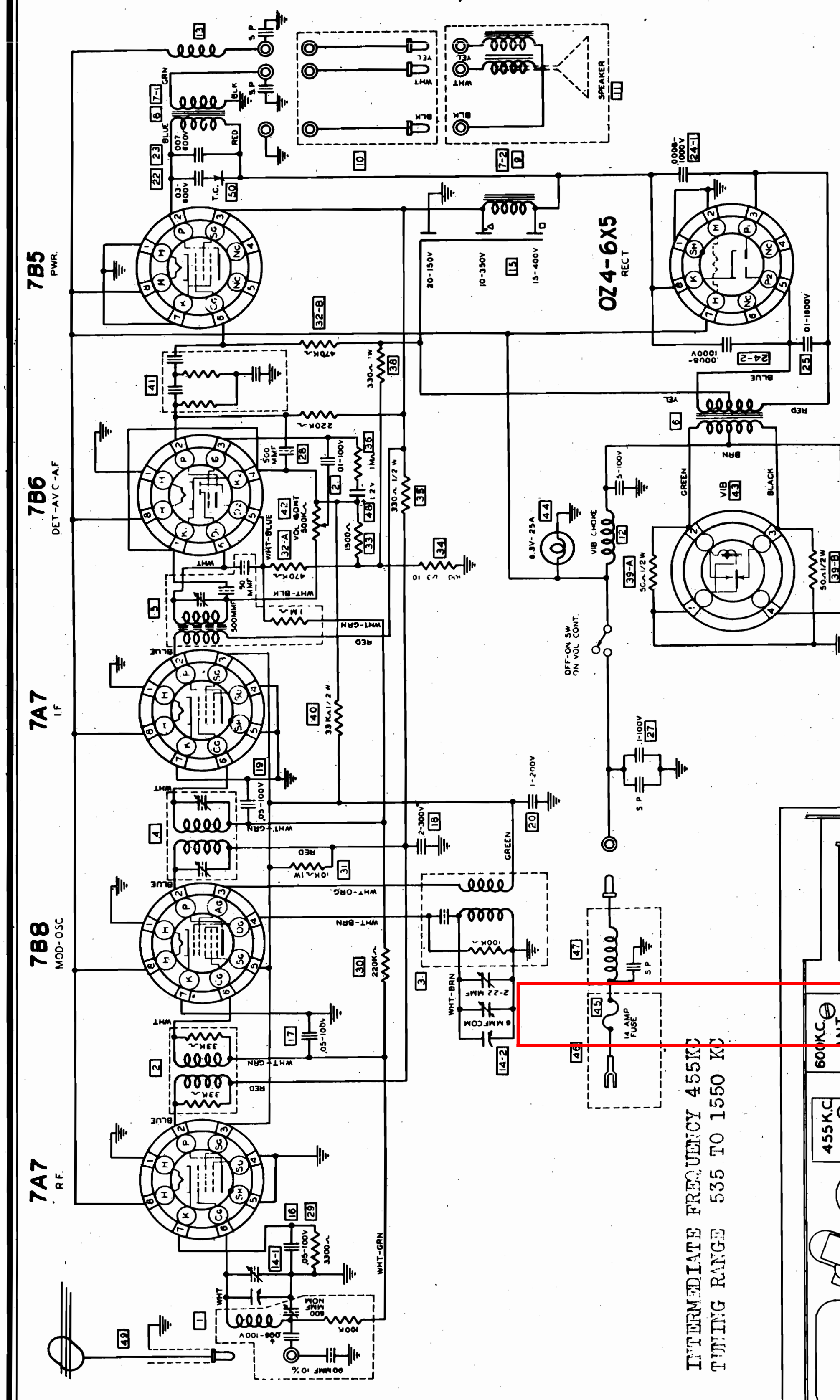
Battery voltage 6.3 V. * Bias- -3.V from "B" Stick.

Current Consumption 6.5 Amps. ** Bias- -2.V from "B" Stick.

Maximum Power Output 5 Watts. *** Bias- -17.V from "B" Stick.

GALVIN MFG. CORP.

MODEL 16C
Schematic, Socket
Trimmers



INTERMEDIATE FREQUENCY 455KC
TUNING RANGE 535 TO 1550 KC

Model 16-C

CUSTOM BUILT FOR 1939 CHEVROLET

CAUTION

When removing Loktal tubes from their sockets, do not pry them out with a screw driver unless you take extreme care not to break the glass seal around the pin terminals. To do so will render the tube worthless.

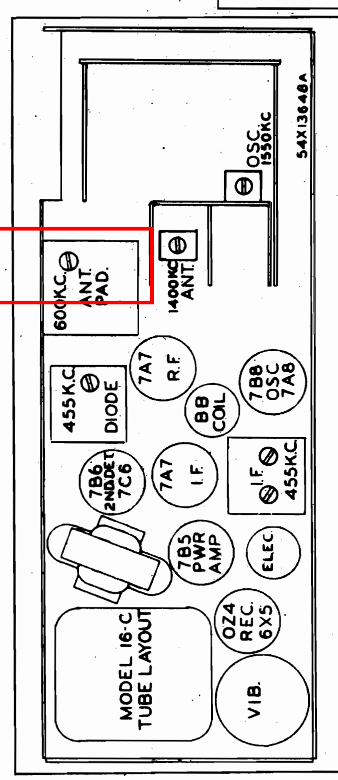


Figure 1 - Trimmers

MODEL 16C
Sensitivity, Gain, Voltage
Alignment, Drive Data

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Connect the speaker and battery.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the antenna lead through a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator if necessary to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

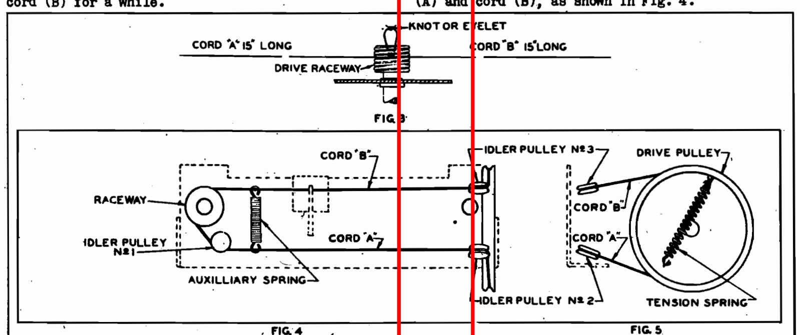
1. Change to 40 MMF condenser in signal generator lead. Set signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

2. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 600 K.C. and rock the pointer at the 600 K.C. position on the dial scale, while adjusting the antenna padder, until a combination is found which gives highest output reading.

DIAL DRIVE CORD ASSEMBLY

1. Remove broken cord.
2. If exact Motorola assembly is not available, cut a piece of 30 lb. silk fish cord 30 inches long. CONDENSER GANG MUST BE MESHED.
3. Double the cord in the middle and thread the loop through the hole in the drive raceway. See Fig. 3.
4. Tie a large knot in the cord or use an eyelet large enough to prevent the cord from passing through the hole in the raceway. You will now have cord (A) and cord (B) each 15 inches long extending from the raceway as in Fig. 3.
5. Loop cord (A) under idler pulley No. 1, and across the chassis to idler pulley No. 2.
6. Holding the end of cord (A) tight, turn the raceway two and one half turns to the right clockwise), thereby winding two and one half turns of cord (A) on the raceway. (Stop when the hole is at the top.)
7. Use a common paper clip to clip the loose end of cord (A) to the chassis, so you can work on cord (B) for a while.
8. Take cord (B) and bring it over to idler pulley No. 3, as shown in Fig. 4.
9. Continue cord (B) around the drove pulley to the hole and thread the end of the cord through the hole, after which it should be clipped to the chassis.
10. Remove the paper clip holding cord (A) and continue its routing around idler pulley No. 2 to the hole in the drive pulley. Thread the end of the cord through the hole.
11. Tie the loose ends of both cords tightly together inside the hole in the pulley. Then tie in the tension spring and hook the other end around the ear stamped out of the pulley. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
13. Secure pointer to string with a drop of shellac.
14. Add auxiliary tension spring between cord (A) and cord (B), as shown in Fig. 4.



Figures 3, 4 and 5

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
10,000	455 K.C.	IF Grid	.1 MF	.5 Meg	1.74 Volts
150	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.74 Volts
200	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.74 Volts
50	600 K.C.	RF Grid	.1 MF	.5 Meg	1.74 Volts
5	600 K.C.	Ant. Lead	40 MMF	None	1.74 Volts

* For 1 Watt output. 1.74 Volts equals 1 Watt output.

** Output meter connected across voice coil. V.C. resistance - 3 ohms.

VOLTAGE CHART — MODEL 16-C

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
7A7	RF	210	95	0	-
7B8	Osc.-Mod.	200	95	0	95
7A7	IF	210	95	0	-
7B6	Det.-Avc.	100	-	6	-
7B5	Output	210	205	0	-
0Z4 or 6X5	Rect.	AC	-	215	-

All measurements from chassis ground to socket terminal using 1000 ohms per vole meter.
Battery voltage 6.3 V. Current Consumption 6.8 Amps. Maximum Power Output 5 Watts.

DIAL CORD INSTRUCTIONS

BACKLASH CORD AND SPRING ASSEMBLY

NOTE: If exact Motorola assembly is not available, use original spring and 30 lb. silk fish cord to make up assembly to dimensions as shown at the top of Fig. 2.

1. Turn gang to fully meshed position.
2. Loop short end of cord around set screw (A) in condenser gear.
3. Make one complete turn clockwise around condenser gear hub.
4. Stretch spring and make one complete turn around the tuner gear hub with the long end of the backlash cord.
5. Loop the end of the cord around drive pin "B".

NOTE: Spring tension must be sufficient to take up all backlash in gear train.

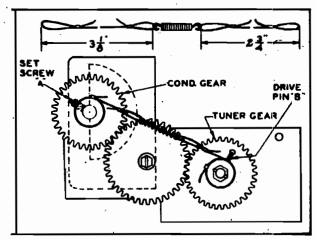
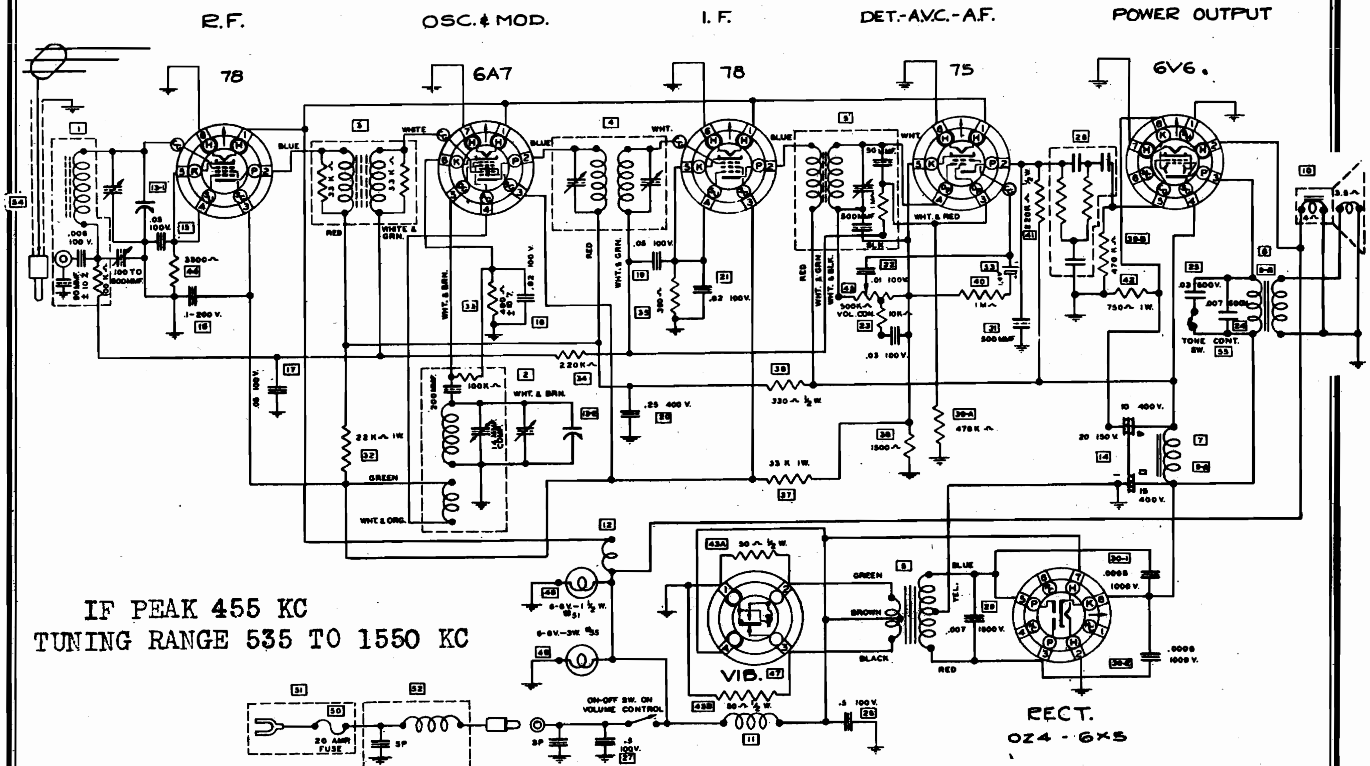


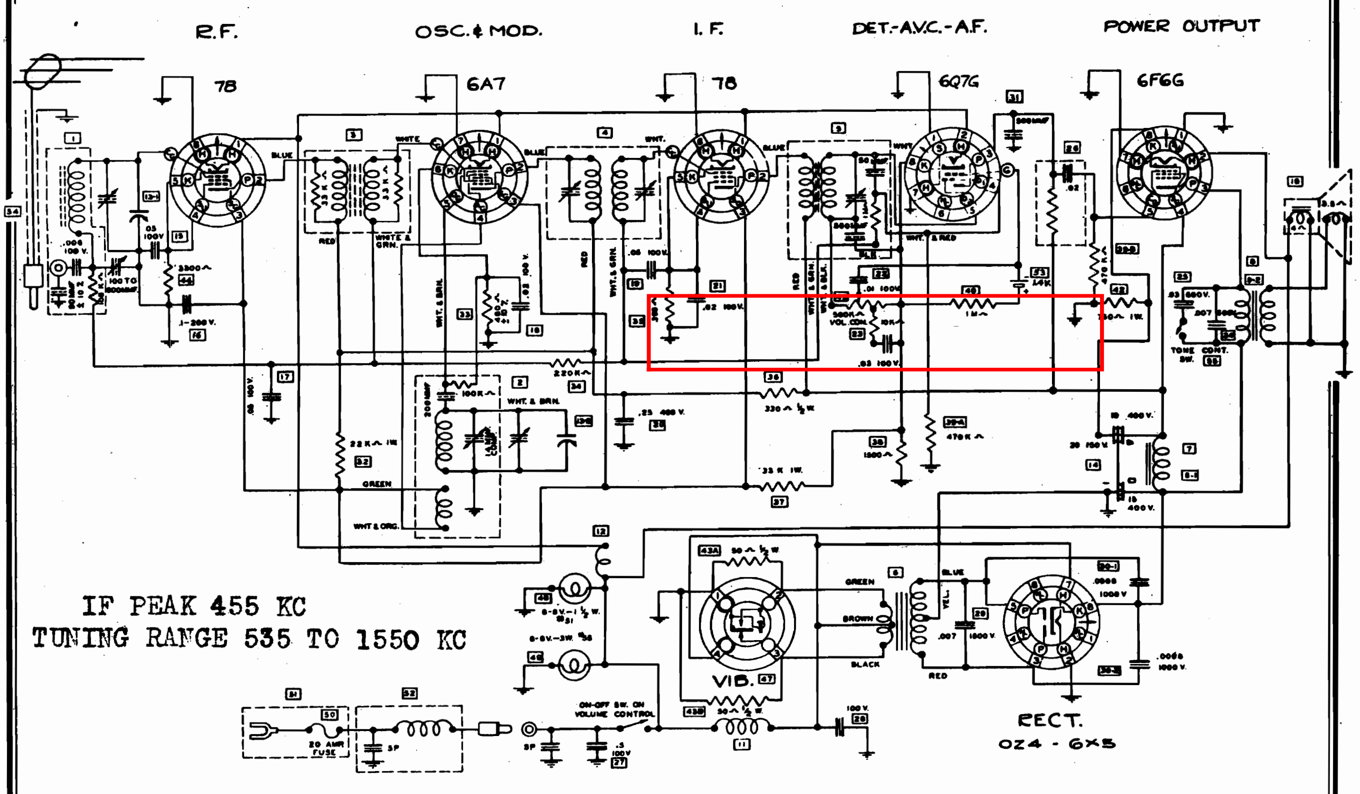
Figure 2

GALVIN MFG. CORP.

MODEL 17-D
MODEL 17-D-A
Schematics



MODEL 17-D



MODEL 17-D-A

MODEL 17-D
MODEL 17-D-A
Alignment, Voltage, Gain

GALVIN MFG. CORP.

Sensitivity, Drive Data
Socket, Trimmers

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Connect the speaker and battery.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the antenna lead through a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator if necessary to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

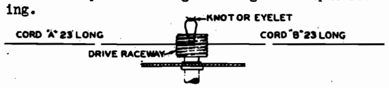


FIG. 3

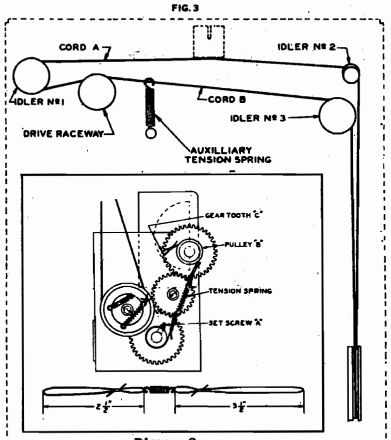


Figure 2

FIG. 4

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. Change to 40 MMF condenser in signal generator lead. Set signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

2. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 600 K.C. and rock the pointer at the 600 K.C. position on the dial scale, while adjusting the antenna padder, until a combination is found which gives highest output reading.

NOTE: The antenna padder is reached through a hole in the side of the chassis base, directly under the antenna coil can.

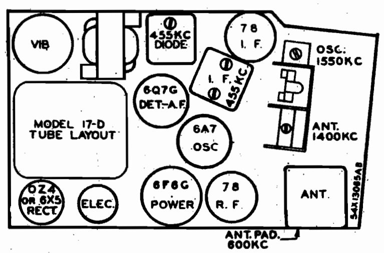


Figure 1 - Trimmers

DIAL DRIVE CORD ASSEMBLY - PART NO. 1X14744

1. Remove broken cord.
2. If exact Motorola assembly is not available, cut a piece of 30 lb. silk fish cord 46 inches long. CONDENSER GANG MUST BE MESHED.
3. Double the cord in the middle and thread the loop through the hole in the drive raceway. See Fig.
4. Tie a large knot in the cord or use an eyelet large enough to prevent the cord from passing through the hole in the raceway. You will now have cord "A" 23 inches long, and cord "B" 23 inches long extending from the raceway as in Fig. 3.
5. Loop cord "A" under and over idler pulley No. 1 and across the chassis to small idler pulley No. 2. (See Fig. 4).
6. Continue cord "A" around idler pulley No. 2, and use a paper clip to clip the cord to the chassis while you work on cord "B" for a while.
7. Wind three turns of cord "B" on the raceway, winding from the hole to the outside rim.
8. Continue cord "B" to idler pulley No. 3 and down to the drive pulley, making one-half turn around the pulley to the slot.
9. Clip cord "B" to the chassis and continue cord "A" around the drive pulley one complete turn to the slot.
10. Bring cord "A" and cord "B" both inside the slot and tie them together securely.
11. Then tie in the tension spring and hook it on the stud in the drive pulley as shown in Fig. 5.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
13. Secure pointer to string with a drop of shellac.
14. Connect auxilliary tension spring as shown in Fig. 4.

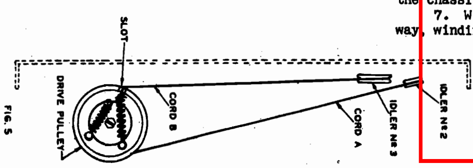


FIG. 5

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
25,000	455 K.C.	IF Grid	.1 MF	.5 Meg	1.87 Volts
200	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.87 Volts
250	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.87 Volts
75	600 K.C.	RF Grid	.1 MF	.5 Meg	1.87 Volts
5	600 K.C.	Ant. Lead	40 MMF	None	1.87 Volts

* For one watt output.
** Meter connected across voice coil.
V.C. Resistance -3.5 ohms at 400 cycles.
1.87 Volts equals 1 watt output.

VOLTAGE CHART - MODEL 17-D

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
78	RF	300	100	6.5	-
6A7	Osc.-Mod.	290	100	3	100
78	IF	300	100	3.5	-
75 or 6Q7G	Det.-Avc.	120	-	5	-
6V6 or 6F6G	Output	290	180	18	-
0Z4 or 6X5	Rect.	AC	-	300	-

All measurements from chassis ground to socket terminal using 1000 ohms per volt meter.
Battery voltage 6.3 V. Current Consumption 7.5 Amps.
Maximum Power Output 8 Watts.

DIAL CORD INSTRUCTIONS - MODEL 17-D
BACKLASH CORD AND SPRING ASSEMBLY - PART NO. 1X14743

NOTE: If exact Motorola assembly is not available, use original spring and 30 lb. silk fish cord to make up assembly to dimensions as shown at the bottom of Fig. 2.

1. Turn gang to open position.
2. Loop short end of cord around set screw "A" in tuner gear.
3. Make one complete turn counter-clockwise around tuner gear hub.
4. Stretch spring and make one complete turn counter-clockwise around pulley "B"
5. Hook the loop in the end of the cord on gear tooth "C" of condenser gear.

NOTE: Spring tension must be sufficient to take up all backlash in gear train. Regulate tension through selection of gear tooth in Step 5 above.

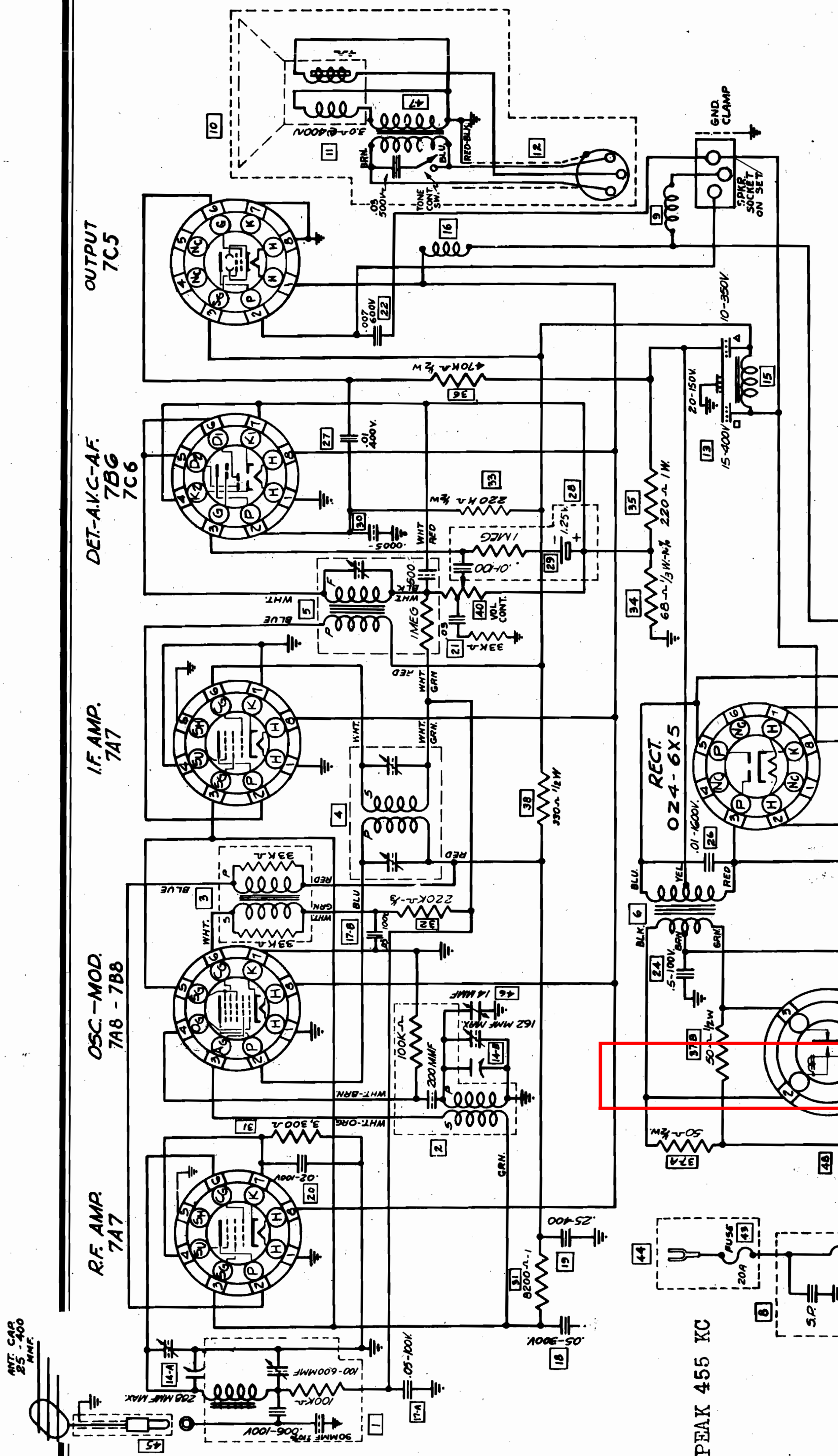
Model 17-D

CUSTOM BUILT FOR 1939

CHRYSLER DESOTO DODGE PLYMOUTH

GALVIN MFG. CORP.

MODEL 18-0
Schematic, Socket
Trimmers



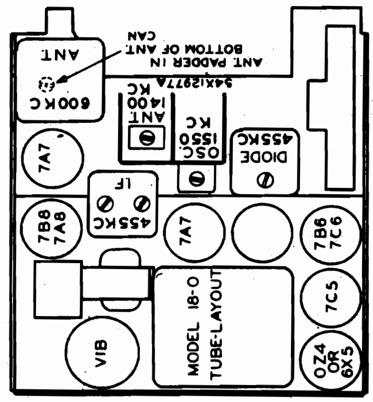


Figure 1 - Trimmers

Model 18-0

CUSTOM BUILT FOR 1939 OLDSMOBILE

IF PEAK 455 KC

CAUTION

When removing Loktal tubes from their sockets, do not pry them out with a screw driver unless you take extreme care not to break the glass seal around the pin terminals. To do so will render the tube worthless.

MODEL 18-0
Voltage, Sensitivity, Gain
Alignment, Drive Data

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Connect the speaker and battery.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the antenna lead through a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator if necessary to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. Change to 40 MMF condenser in signal generator lead. Set signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

2. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 600 K.C. and rock the pointer at the 600 K.C. position on the dial scale, while adjusting the antenna padder, until a combination is found which gives highest output reading.

NOTE: The antenna padder is reached through a hole in the bottom of the chassis base, directly under the antenna coil can.)

DIAL DRIVE CORD ASSEMBLY - PART NO. 1X14746

1. While not essential, you will find it easier to work if you remove the front plate from the chassis. This requires removal of the dial light bracket, the broad band coil bracket, the volume control, and the unsoldering of the ground connection of 8X14120 condenser.
2. If the exact Motorola assembly is not available, cut a piece of 30 lb. test silk fish cord 43 inches long.
3. The condenser gang must be open.
4. Double the cord in the middle and thread the loop through the hole in the drive raceway. See Fig. 3.
5. Tie a large knot in the cord or use an eyelet large enough to prevent the cord from passing through the hole. You will now have cord "A" and cord "B", each approximately 21 inches long, extending from the raceway as in Fig. 3.
6. Loop cord "A" over idler pulley No. 1 and across the chassis to idler pulley No. 2 and holding the end of the cord tight, turn the raceway 2½ turns to the right (clockwise), thereby winding 2½ turns of cord "A" on the raceway.
7. Use a paper clip to clip the loose end of cord "A" to the front plate so you can work on cord "B" for a while.
8. Loop cord "B" over idler pulley No. 3, and across the chassis to idler pulley No. 4.
9. Both cords should now be clipped to the front plate while the plate is reinstalled on the chassis.
10. Continue cord "B" down to the drive pulley and make 1½ turns around the pulley to the slot in the rim.
11. Continue cord "A" down to the slot in the rim of the drive pulley.
12. Bring both loose ends of cord through the slot in the drive pulley and tie them together tightly inside the slot.
13. Then tie in one end of the tension spring and hook the other end over the stud as shown in Fig. 4.
14. To set the pointer to correct frequency, tune in a station of known frequency and adjust the position of the pointer on the string, securing it with a drop of shellac.

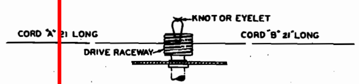


FIG. 3

DIAL CORD INSTRUCTIONS

BACKLASH CORD AND SPRING ASSEMBLY - PART NO. 1X14745

NOTE: If exact Motorola assembly is not available, use original spring and 30 lb. silk fish cord to make up assembly to dimensions as shown at the top of Fig. 2.

1. Turn gang to fully meshed position.

2. Loop long end of cord around set screw (A) in tuner gear.

3. Make one complete turn around tuner gear hub.

4. Stretch spring and loop other end around set screw (B) in condenser gear.

NOTE: Spring tension must be sufficient to take up all backlash in gear train.

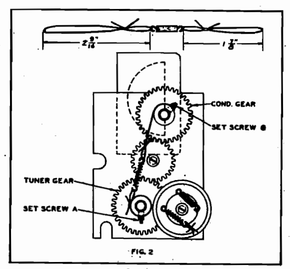


FIG. 2

Figure 2

VOLTAGE CHART — MODEL 18-0

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
7A7 or 7B7*	R.F.	185	100	7.7	-
7B8 or 7A8*	Osc.-Mod.	185	100	0	100
7A7 or 7B7*	I.F.	185	100	0	-
7B6 or 7C6	Det.-Avc.	75	-	0	-
7C5**	Output	195	190	0	-
0Z4 or 6X5	Rect.	AC	-	200	-

* Bias - —2.8 V. Measured from "B" stick. ** Bias - -13.V. Measured from "B" stick.

All measurements from socket terminal to chassis ground, using 1000 ohms per volt meter.

Battery Voltage - 6.3 V. Current Consumption - 6.5 Amps.

Maximum Power Output - 7.5 Watts.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage-gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characterisitcs, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
.25 Volts	400 cycles	7B6 Grid	.1 MF	.5 Meg.	1.74 Volts
10,000	455 K.C.	7A7 Grid(I.F.)	.1 MF	.5 Meg.	1.74 Volts
150	455 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
200	600 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
50	600 K.C.	7A7 Grid (R.F.)	.1 MF	.5 Meg	1.74 Volts
4	600 K.C.	Ant. Lead	40 MMF	None	1.74 Volts

* For one watt output. V.C. impedance - 3 ohms at 400 cycles.

** Meter connected across voice coil. 1.74 volts equals 1 watt output.

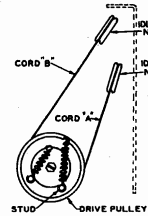


FIG. 4

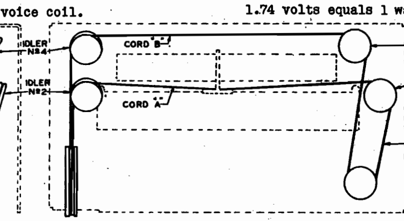
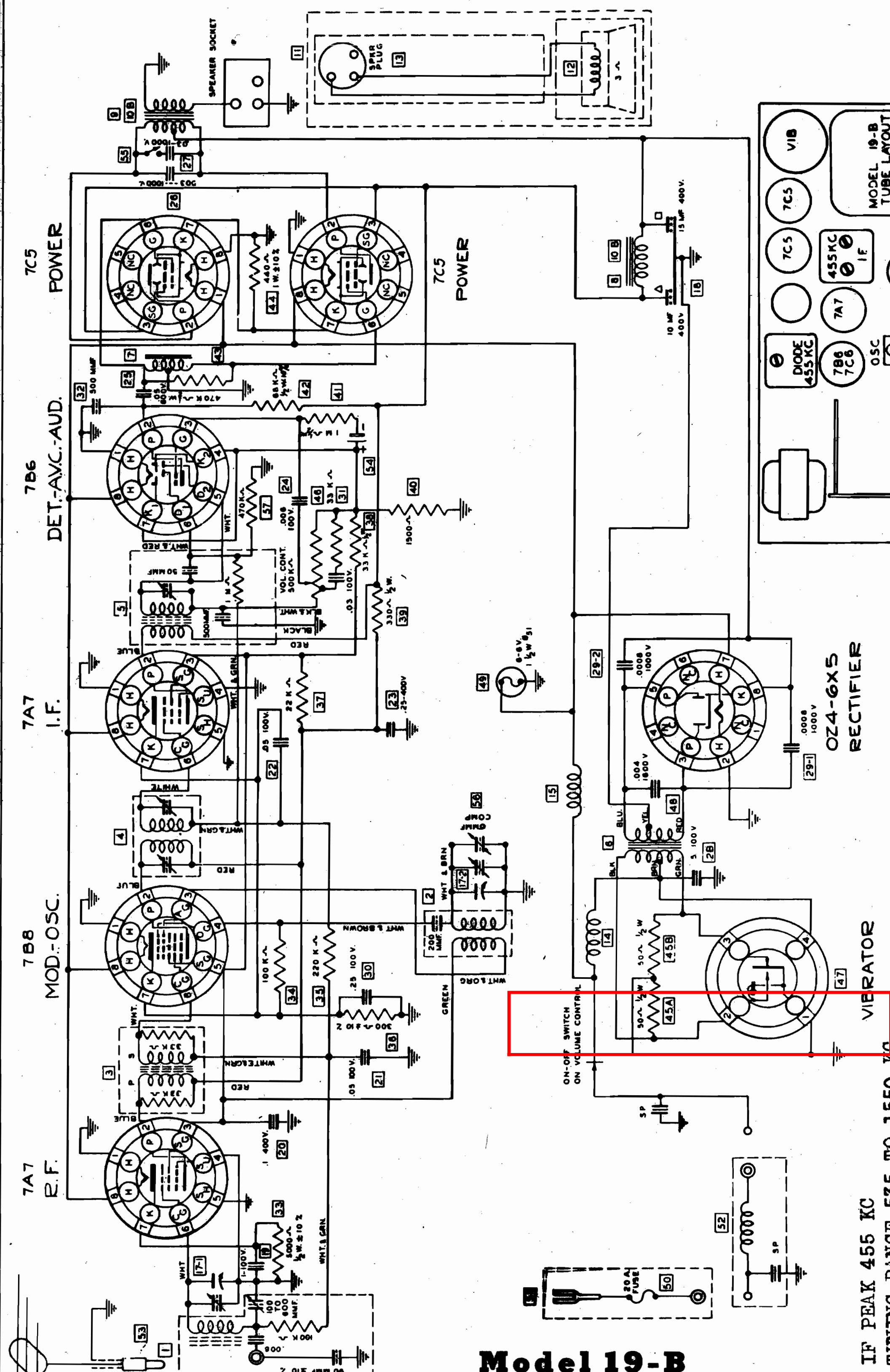


FIG. 5

FIG. 6

GALVIN MFG. CORP.

MODEL 19B
Schematic, Socket
Trimmers



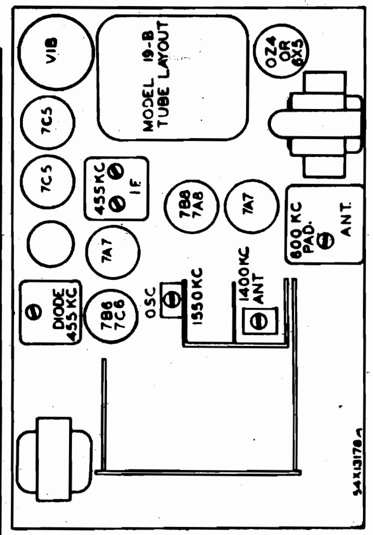


Figure 1 - Trimmers

IF PEAK 455 KC
TUNING RANGE 535 TO 1550 KC

CAUTION

When removing Loktal tubes from their sockets, do not pry them out with a screw driver unless you take extreme care not to break the glass seal around the pin terminals. To do so will render the tube worthless.

Model 19-B

CUSTOM BUILT FOR 1939 BUICK

MODEL 19B
Alignment, Voltage, Gain
Sensitivity, Drive Data

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Connect the speaker and battery.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the antenna lead through a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator if necessary to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. Change to 40 MMF condenser in signal generator lead. Set signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

2. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 600 K.C. and rock the pointer at the 600 K.C. position on the dial scale, while adjusting the antenna padder, until a combination is found which gives highest output reading.

DIAL DRIVE CORD ASSEMBLY - PART NO. 1X14731

1. Remove broken cord, and dial pointer.
2. If exact Motorola assembly is not available, cut a piece of 30 lb. silk fish cord 44 long. CONDENSER GANG MUST BE MESHED.
3. Double the cord in the middle and thread the loop through the hole in the drive raceway. See Fig.
4. Tie a large knot in the cord or use an eyelet large enough to prevent the cord from passing through the hole in the raceway. You will now have cord(A) 22 inches long, and cord(B) 22 inches long, extending from the raceway as in Fig. 3.
5. Loop cord (A) under idler pulley No. 1, as shown in Fig. 5 and holding the end of the cord tight, turn the raceway 2½ turns to the right (clockwise), thereby winding 2½ turns of cord (A) on the raceway.
6. Continue cord (A) across the front of the receiver, around idler pulley No. 2, and fasten the loose end of the cord to the edge of the chassis with a common paper clip, so you can work on cord (B) for a while.
7. Take cord (B) and bring it over the raceway and under idler pulley No. 3, as shown in Fig.
8. Continue cord (B) across the front of the chassis, around idler pulley No. 4, and make one complete turn around the drive pulley, after which the end of the cord should be clipped to the chassis.
9. Remove the paper clip holding cord (A) and continue its routing to the drive pulley, making 1/2 turn around it to the slot.
10. Bring both loose ends of cord through the slot in the drive pulley and tie them together tightly inside the slot.
11. Then tie in one end of the tension spring, Part No. 41A12968 and hook the other end of the spring on the small stud as shown in Fig. 6.
12. Replace dial pointer.
13. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
14. Secure pointer to string with a drop of shellac.

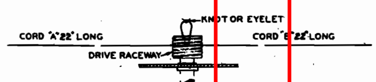


FIG. 3

DIAL CORD INSTRUCTIONS

BACKLASH CORD AND SPRING ASSEMBLY - PART NO. 1X14730

NOTE: If exact Motorola assembly is not available, use original spring and 30 lb. silk fish cord to make up assembly to dimensions as shown at the top of Fig. 2.

1. Turn gang to fully meshed position.
2. Loop long end of cord around set screw (A) in tuning unit.
3. Make one complete turn around gear hub.
4. Stretch spring and loop other end around set screw (B) in condenser gear.

NOTE: Spring tension must be sufficient to take up all backlash in gear train.

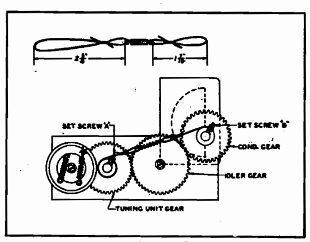


Figure 2.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc.-Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the tables.

All stage-gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500 M Ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF.

It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
7,000	455 K.C.	7A7 Grid (IF)	.1 MF	.5 Meg	1.74 Volts
100	455 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
150	600 K.C.	7B8 Grid	.1 MF	.5 Meg	1.74 Volts
15	600 K.C.	7A7 Grid (RF)	.1 MF	.5 Meg	1.74 Volts
1	600 K.C.	Ant. Lead	40 MMF	None	1.74 Volts

* For 1 Watt output. 1.74 Volts equals 1 Watt output.

** Output meter connected across voice coil. V.C. resistance - 3 ohms.

VOLTAGE CHART - MODEL 19-B

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
7A7	RF	250	75	7.5	-
7B8	Osc.-Mod.	250	75	3.5	75
7A7	IF	250	75	3.5	-
7B6	Det.-Avc.	150	-	4.5	-
7C5	Output	250	250	18	-
7C5	Output	250	250	18	-
0Z4	Rect.	AC	-	260	-

All voltages measured from socket terminal to chassis ground using 1000 Ohms per volt meter.

Current - 7.0 Amps. at 6.3 Volts. Maximum power output - 12 Watts.

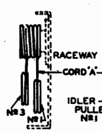


FIG. 4

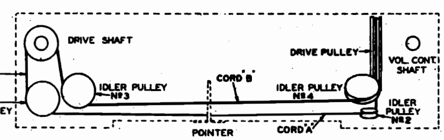


FIG. 5

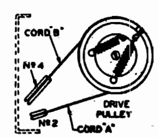
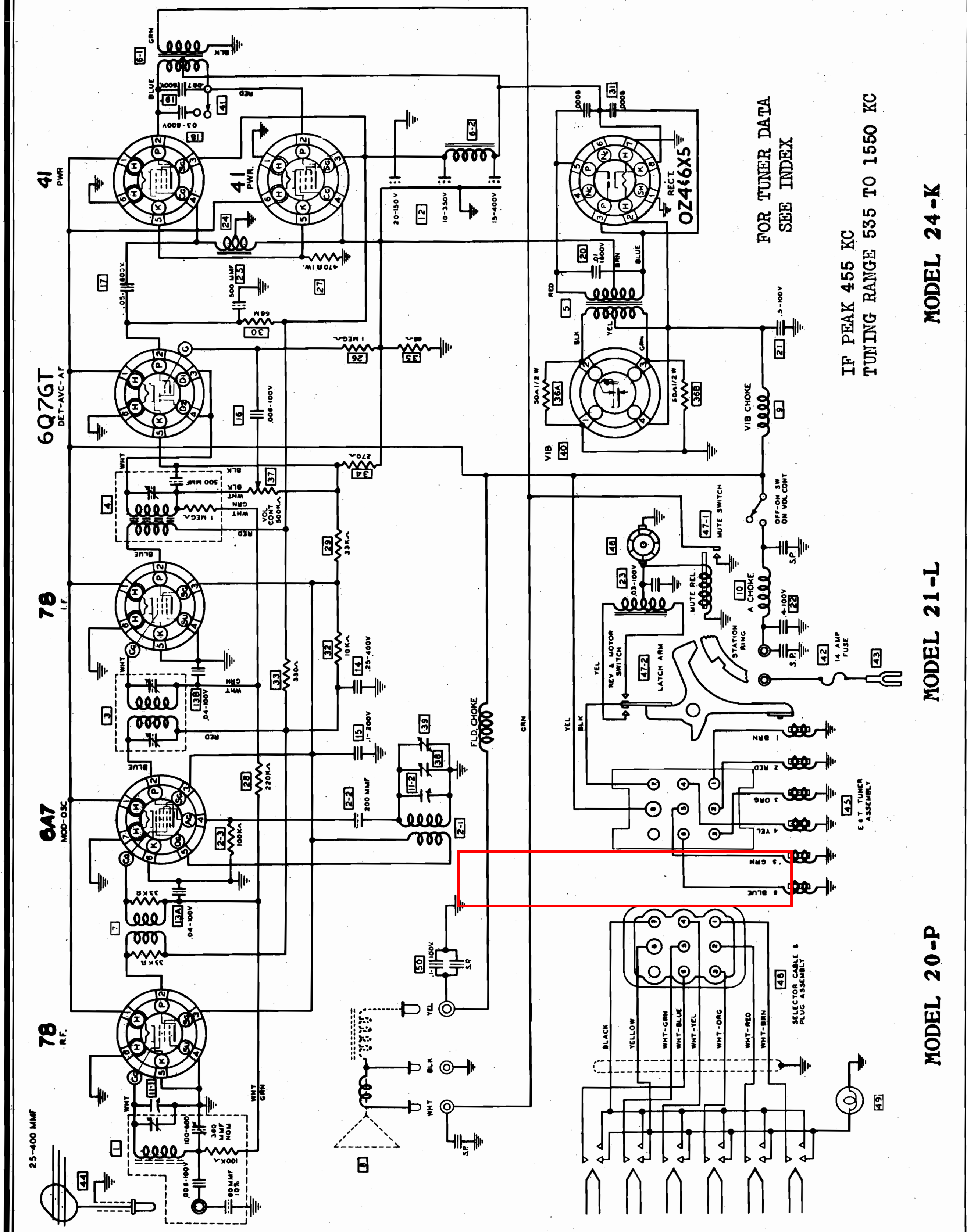


FIG. 6

GALVIN MFG. CORP.

MODELS 20P,21L,24K
Schematic



MODELS 20P,21L,24K
Alignment,Socket,Trimmers
Gain,Sensitivity

GALVIN MFG CORP.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

These stage gain measurements will, if properly used, enable you to localize trouble quickly. They are intended for use with a signal generator that is accurately calibrated in microvolts.

Starting with the second detector - first audio stage, and working back step by step to I.F., Osc. - Mod., R.F. and finally to the antenna terminal, the circuit in which the trouble exists will quickly be determined by evidence of low gain, when signal generator attenuation readings are compared to the normal values as shown in the table.

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 40 MMF condenser in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
15,000	455 K.C.	IF Grid	.1 MF	.5 Meg	1.74 Volts
400	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.74 Volts
450	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.74 Volts
25	600 K.C.	RF Grid	.1 MF	.5 Meg	1.74 Volts
2	600 K.C.	Ant. Lead	40 MMF	None	1.74 Volts

* For one watt output.
** Meter connected across voice coil.

V.C. impedance - 3 ohms at 400 cycles.
1.74 volts equal 1 watt output.

VOLTAGE CHART - MODELS 20-P, 21-L, AND 24-K

TUBE	POSITION	PLATE	SCREEN	CATHODE	OSC. PLATE
78*	RF	180	80	0	-
6A7*	Osc.-Mod.	180	80	0	80
78 *	IF	180	80	0	-
6Q7GT**	Det.-Avc.	80	-	-2.6	-
41	Output	190	180	15	-
41	Output	190	180	15	-
0Z4	Rect.	AC	-	190	-

* Bias -2.6 V. from B stick
** Bias -3.5 V. from B stick

Current - 6.5 Amps. at 6.3 Volts
Maximum power output 4.5 Watts
All readings from chassis ground with 1000 ohms per volt meter.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Connect the speaker and battery.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the antenna lead through a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.

2. Set the signal generator at 455 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator if necessary to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

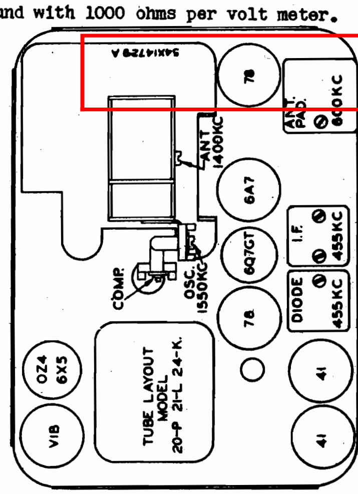


FIGURE 1. TRIMMERS

R. F. ALIGNMENT

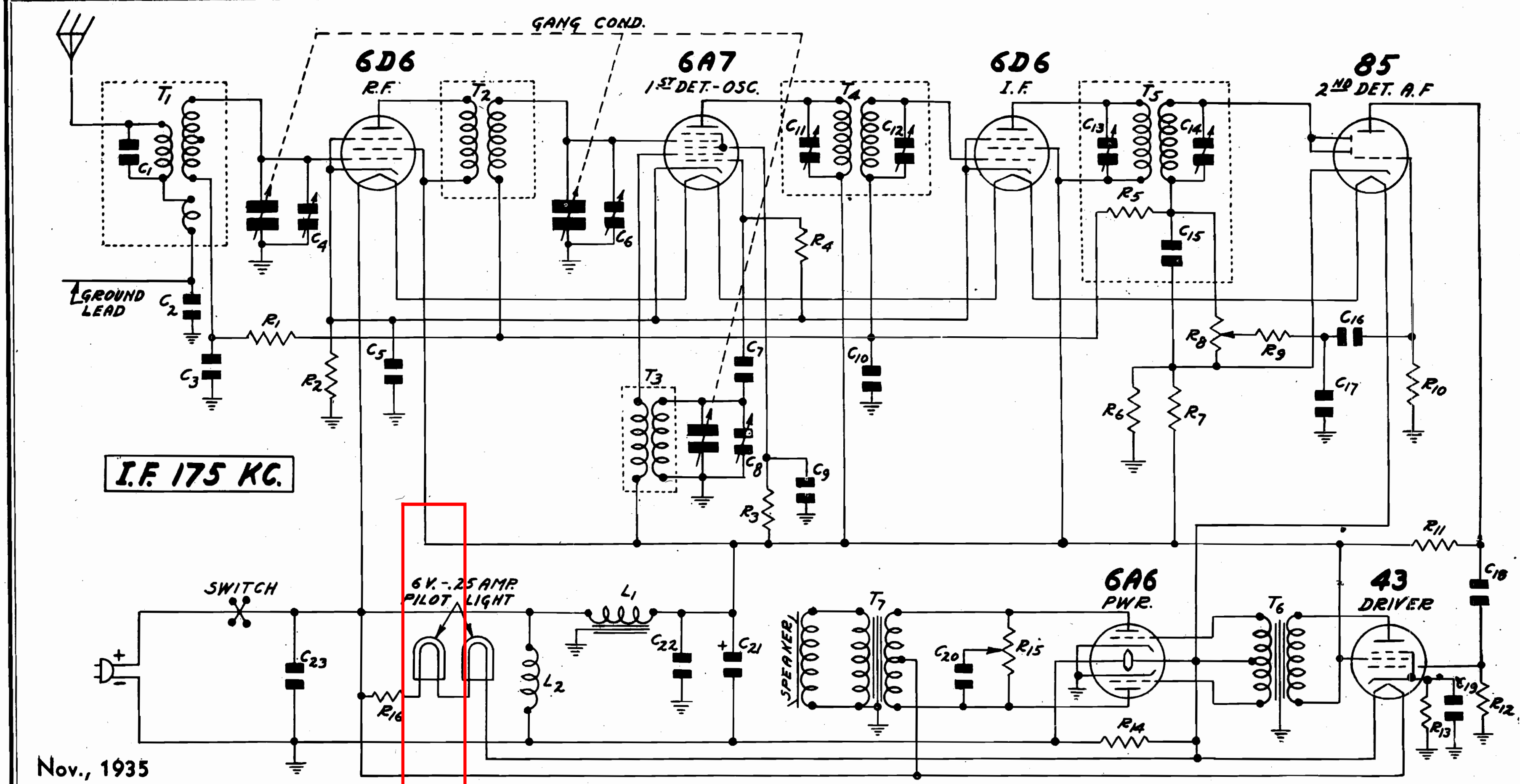
1. Change to 40 MMF condenser in signal generator lead. Set signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

2. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

3. Set the signal generator at 600 K.C. and rock the pointer at the 600 K.C. position on the dial scale, while adjusting the antenna padder, until a combination is found which gives highest output reading.

MODEL 6D
Schematic

GAMBLE SKOGMO, INC.



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

6 Tube - 32 Volt D. C.

Superheterodyne Receiver

C_6	GANG TRIMMER
C_7	.35 MMF MOULDED
C_8	GANG TRIMMER
C_9	.05 MF 180V.
C_{10}	.05 MF 180V.
C_{11}	40-100 MMF } DUAL P-17A39
C_{12}	40-100 MMF } DUAL P-17A39
C_{13}	40-100 MMF } DUAL P-17A39
C_{14}	40-100 MMF } DUAL P-17A39
C_{15}	100 MMF MOULDED
C_{16}	.01 MF 180V.
C_{17}	50 MMF MOULDED
C_{18}	.01 MF 180V.
C_{19}	12. MF 25V. DRY ELECTROLYTIC P-45X207
C_{20}	.10 MF 180V.

C_1	250 MMF MOULDED
C_2	.05 MF 180V.
C_3	.05 MF 180V.
C_4	GANG TRIMMER
C_5	.05 MF 180 V.

C_{21}	30 MF 50V. WET ELECTROLYTIC P-44X25
C_{22}	.25 MF 180V.
C_{23}	.25 MF 180V.
R_1	100 000 OHM .2 W
R_2	450 OHM .2 W.
R_3	30 000 OHM .2 W.
R_4	100 000 OHM .2 W.
R_5	1.0 MEGOHM .2 W.
R_6	350 OHM .2 W.
R_7	6000 OHM .2 W.
R_8	.50 MEGOHM VOL. CONTROL P-36X213
R_9	50 000 OHM .2 W.
R_{10}	2.0 MEGOHM .2 W
R_{11}	80 000 OHM .2 W.
R_{12}	1.0 MEGOHM .2 W.
R_{13}	400 OHM 2 W.

T_1	ANTENNA INTERSTAGE TRANS. P-3A452
T_2	INTERSTAGE R.F TRANS P-9A453
T_3	OSC. INDUCTORS
T_4	1ST I.F TRANS.
T_5	2ND I.F TRANS.
T_6	INPUT TRANS.
T_7	OUTPUT TRANS.
L_1	FILTER REACTOR P-52X33
L_2	SPEAKER FIELD 100. OHM.
R_{14}	180 OHM 1.0 W.
R_{15}	75000 OHM TONE CONTROL
R_{16}	• 67 OHM 4.0 W ARMORED WIRE WOUND

MODEL 6D
Alignment, Voltage
Trimmers, Voltage

GAMBLE SKOGMO, INC.

SPECIFICATIONS

Socket
Resistance
Coil Data

Power Consumption	1.2 Amperes at 32 Volts DC	Tuning Range	530 to 1750 KC
Power Output	.25 Watts Undistorted	Intermediate Frequency	175 KC
Selectivity	29 KC Broad at 1000 times Signal	Speaker	6" Dynamic
Sensitivity	10 Microvolts Absolute		

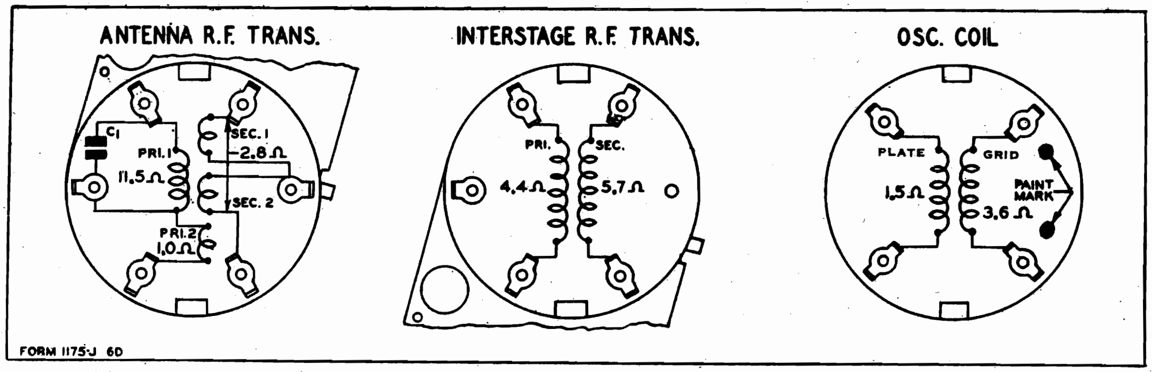


Fig. 3—R.F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Refer to Fig. 3

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A452	Antenna R.F. Transformer	T1	
	Primary No. 1		11.5
	Primary No. 2		1.0
	Secondary Windings in Series		2.8
P-9A453	Interstage R.F. Transformer	T2	
	Primary Winding		4.4
	Secondary Winding		5.7
P-9A454	Oscillator Coil	T3	
	Grid Coil		3.6
	Plate Coil		1.5
P-9A455	1st I.F. Transformer	T4	
	Primary Winding		102.0
	Secondary Winding		99.
P-9A456	2nd I.F. Transformer	T5	
	Primary Winding		101.
	Secondary Winding		102.
P-50X22	Audio Input Transformer	T6	
	Primary Winding		380.
	Secondary Winding		
	Center Tap to Inside		85.
	Center Tap to Outside		95.
P-12A219	Dynamic Speaker		
	Speaker Field	L2	100.
	Speaker Voice Coil		3.1
	Audio Output Transformer (51X23)	T7	
	Primary Winding		
	Center Tap to Inside		152.
	Center Tap to Outside		176.
	Secondary Winding		1.4
P-52X33	Filter Choke	L1	50.

I. F. Adjustment 175 KC.

Connect the output lead of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

1750 KC Adjustment

Connect the antenna lead of the signal generator to the antenna lead of the receiver through a 200 mmf. condenser. Adjust the trimmer of the oscillator section

1500 KC Adjustment

Loosen the pointer screw and set the pointer at the 1500 KC mark on the dial scale. Retighten the pointer screw.

Adjust the 1st detector and antenna trimmers for maximum output.

VOLTAGES AT SOCKETS
Volume Control at Maximum — Antenna Connected to Ground LEAD

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Normal Plate MA.
6D6	R.F.	6.4	31	31	2	1.5
6A7	1st Det. & Osc.	6.4	31 31(1)	18	2	.2 .65(1)
6D6	I.F.	6.4	31	31	2	1.5
85	2nd Det.	6.4	12.5		1.8	.20
43	1st Audio	25.6	28	31	3.5	7.
6A6	Output	6.4	31		0	11 (per plate)

(1) Anode Grid

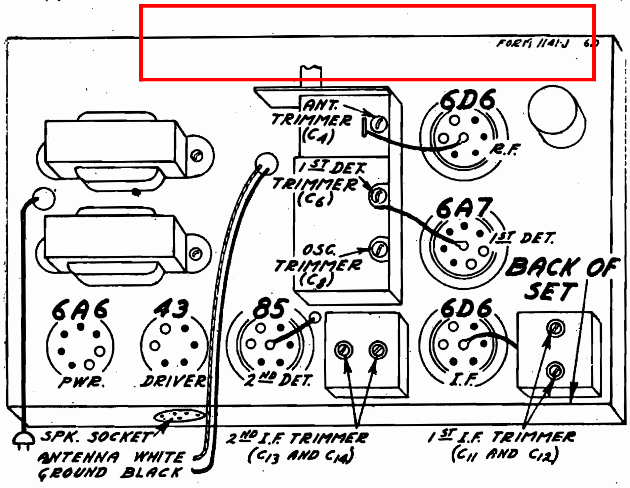


Fig. 4—Tube Arrangement

GAMBLE-SKOGMO, INC.

MODEL 15C6
Schematic
Voltage, Data

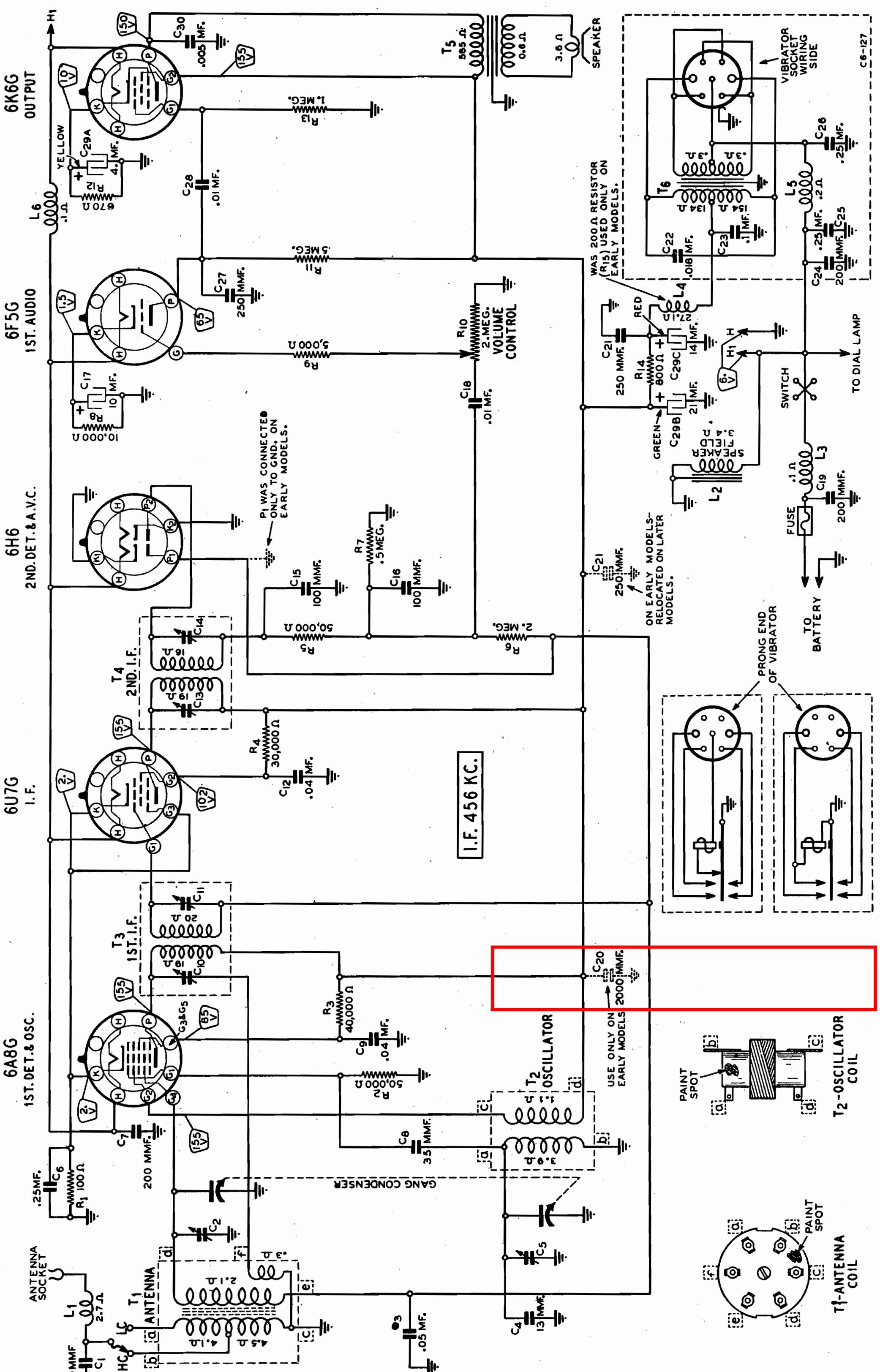


Fig. 1—Schematic Circuit Diagram

Power Consumption	5.5 Amperes at 6.3 Volts
Power Output	.8 Watt Undistorted
Sensitivity	10 Microvolts at .5 Watt Output
Selectivity	42.5 KC Broad at 1000 Times Signal
Tuning Frequency Range	528 to 1550 KC
Intermediate Frequency	456 KC
Speaker	6" Dynamic

15 C 6

APRIL, 1938

GAMBLE SKOGMO, INC.

Alignment Procedure

Remove the bottom and front chassis covers. Directions for removing the bottom cover are in the instruction book.

To remove the front cover, first pull the knobs and buttons off the shafts. Remove the 2 screws at the top and the 2 screws at the sides of the front cover. Press in the sides of the chassis case to release the lugs at the sides of the front cover. Pull outward on the bottom of the front cover and then push the cover up until the lugs at the top are released.

Do not remove the back of the chassis case. This back can be taken off of the No. 2 and later issue sets.

Set the signal generator for 456 KC and connect the output of the signal generator through a .05 mf. condenser to the control grid of the 1st Detector. Connect the ground lead of the signal generator to the chassis. Set the volume control at maximum. Attenuate the signal from the signal generator to prevent the leveling off action of the AVC.

Then adjust the 4 I.F. trimmers until maximum output is obtained. These trimmers can be reached through the 4 holes in the back wall of the chassis case. It will be necessary to pull out the fiber insulating sheet a slight amount.

Insert the antenna cable plug in the antenna socket on the chassis.

Rotating Pointer Models—If the antenna is connected at the HC terminal and the entire 60-inch shielded cable (70 mmf.) is being used, connect the antenna wire at the other end through a 120 mmf. condenser to the antenna post of the signal generator.

If the antenna is connected at the LC terminal, the antenna cable has been cut as explained in the instructions. If cut in half (30-inch length), the capacity of the antenna cable is approximately 35 mmf. Connect the antenna wire, in this case, through a 25 mmf. condenser to the antenna post of the signal generator.

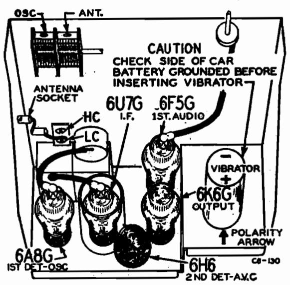


Fig. 4—Location of Tubes

Sliding Pointer Models—If the antenna is connected at the HC terminal and the 60-inch shielded cable (70 mmf.) is being used, connect the antenna wire at the other end through a 230 mmf. condenser to the antenna post of the signal generator.

If the antenna is connected at the LC terminal and the short shielded cable (19 mmf.) is being used, connect the antenna wire, in this case, through a 20 mmf. condenser to the antenna post of the signal generator. If the long cable has been cut to length and is being used, the total capacity of the cable and the series condenser should be 38 to 40 mmf.

Both Models—Set the signal generator for 1550 KC. Turn the rotor of the tuning condenser to the full open position. Adjust the trimmer of the oscillator section of the gang condenser until maximum output is obtained. See Fig. 4 for location of this trimmer.

Set the signal generator for 1400 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the trimmer of the antenna section of the gang condenser for maximum output.

Calibration—Rotating Pointer Models—To obtain dial scale calibration, tune in an 800 KC signal. Hold the tuning shaft and turn the pointer disc until the pointer is at the correct position when the chassis front cover is put back in place.

Calibration—Sliding Pointer Models—The pointer assembly is clamped to the drive cord and it is seldom necessary to reset it to obtain proper dial calibration. If re-calibration is required, loosen the clamps with a screw driver, bringing the pointer assembly first down to one end of the dial scale and then down to the other end. Tune in a signal of known frequency near one end of the dial scale. Move the pointer assembly to this frequency on the scale and tighten the clamps with long nose pliers.

Drive Cord Replacement—Rotating Pointer Models

Tie a knot with a small loop at one end of the new drive cord. The free end of the drive cord is tied to the tension spring. The distance between knots should be 23⅙ inches.

Turn the gang condenser to full open position.

Place the looped end of the drive cord over the hook on condenser drive drum A—See Fig. 2 (Shown with gang condenser half open). Bring the cord up through the slot in the drum rim and wind one-half turn to the rear (from front of chassis) around the drive drum. Pass cord around the pulley B as shown. Wind one turn clockwise (from front of chassis) around pointer disc pulley C. Loop cord through the notches on the outside rim of the pointer disc pulley as shown. Wind 2½ turns clockwise, progressing from a point midway between the bracket arms toward the chassis, on tuning control shaft D. Bring cord to the left under pointer disc pulley C and around pulley E as shown. Pass cord to top of drive drum A and wind one turn to the rear around the drum rim.

Pass the remaining drive cord and tension spring through the slot in the drum rim. Place free end of spring over the hook on the condenser drive drum.

Setting Pointer Disc—Tune in an 800 KC signal. Hold the tuning shaft and turn the pointer disc until the pointer is at the correct position when the chassis front cover is put back in place.

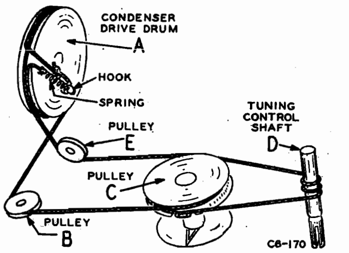


Fig. 2—Replacing Drive Cord—Rotating Pointer Models

Drive Cord Replacement—Sliding Pointer Models

Remove the celluloid dial scale. Open the clamps on the back of the dial pointer in order to remove the old drive cord.

It is not necessary to remove the dial and drive bracket assembly in order to replace the drive cord.

Tie a knot with a small loop at one end of the new drive cord. Slide a ½ inch length of fabric tubing on the cord. Tie the free end of the drive cord to the tension spring. The distance between knots should be 28⅝ inches.

Turn the gang condenser to full open position.

Place the looped end of the drive cord over the hook on condenser drive drum A—See Fig. 3. Bring the cord up through the slot in the drum rim.

Turn the drive drum to the position shown in Fig. 3.

Wind one turn down and around drive drum A and around pulley B as shown. Wind 3½ turns on tuning control shaft C, progressing from a point midway between the two bracket arms toward the chassis. Bring cord under pulley D and around pulleys E and F as shown. See that the fabric tubing is now between pulleys E and F. Bring the drive cord to the rear around drive drum A and through the slot in the drum rim as shown.

Turn the gang condenser to full open position and place the free end of the tension spring over the hook on drive drum A.

Dial Pointer Adjustment—Mount the celluloid dial scale on the dial bracket. Tune in a signal of known frequency near one end of the dial scale. Move the pointer assembly to this frequency on the dial scale and tighten the clamps with long nose pliers.

Inserting Vibrator Unit

IMPORTANT—The vibrator unit can be inserted in two ways. The proper method of insertion will depend on which terminal of the car battery is grounded. If the POSITIVE (+) terminal of the car battery is grounded, line up the + mark on the top of the vibrator with the arrow on the chassis base. If the NEGATIVE (—) terminal of the car battery is grounded, line up the — mark on the top of the vibrator with the arrow on the chassis base.

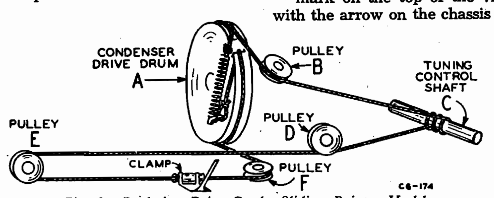


Fig. 3—Replacing Drive Cord—Sliding Pointer Models

Antenna Capacity

Rotating Pointer Models—The antenna coil is designed for car antennas with a capacity of 190 mmf. for the HC connection and 60 mmf. for the LC connection. This capacity is the total capacity of the antenna and the shielded lead.

Complete information regarding car antenna installation will be found in the instruction book packed with the radio.

Sliding Pointer Models—The information for this type of radio is the same as above except that the HC capacity is 300 mmf. and the LC capacity is 38 mmf.

Two Models

One model has a rectangular dial scale with a sliding pointer.

The other model has a circular dial scale with a rotating pointer disc.

The 2 models also differ in the capacities of the antennas which may be used. The values are shown in article "Antenna Capacity."

Issue No. 1

Mechanical Assembly—The 2 front mounting studs are attached to the top of the chassis case.

The I.F. coil cans have a spring clip by means of which they are secured to the chassis.

The back of the chassis case is not removable.

Electrical Assembly—See electrical changes under "Issue No. 2."

Issue No. 2

Mechanical Changes—The chassis case is supplied with a front mounting bracket and this bracket is secured to the instrument panel of the car by means of 2 separate bolts.

The I.F. cans use a threaded spade lug which extends through the chassis base and is secured in place with nuts and lock washers.

The back of the chassis case can be removed.

Electrical Changes—The following changes are all illustrated in the schematic—Fig. 1.

The 6H6 tube plate No. 1, which was connected originally to ground is removed from ground and connected as shown in the schematic.

Condenser C20 is removed.

The position of condenser C21 is changed as shown.

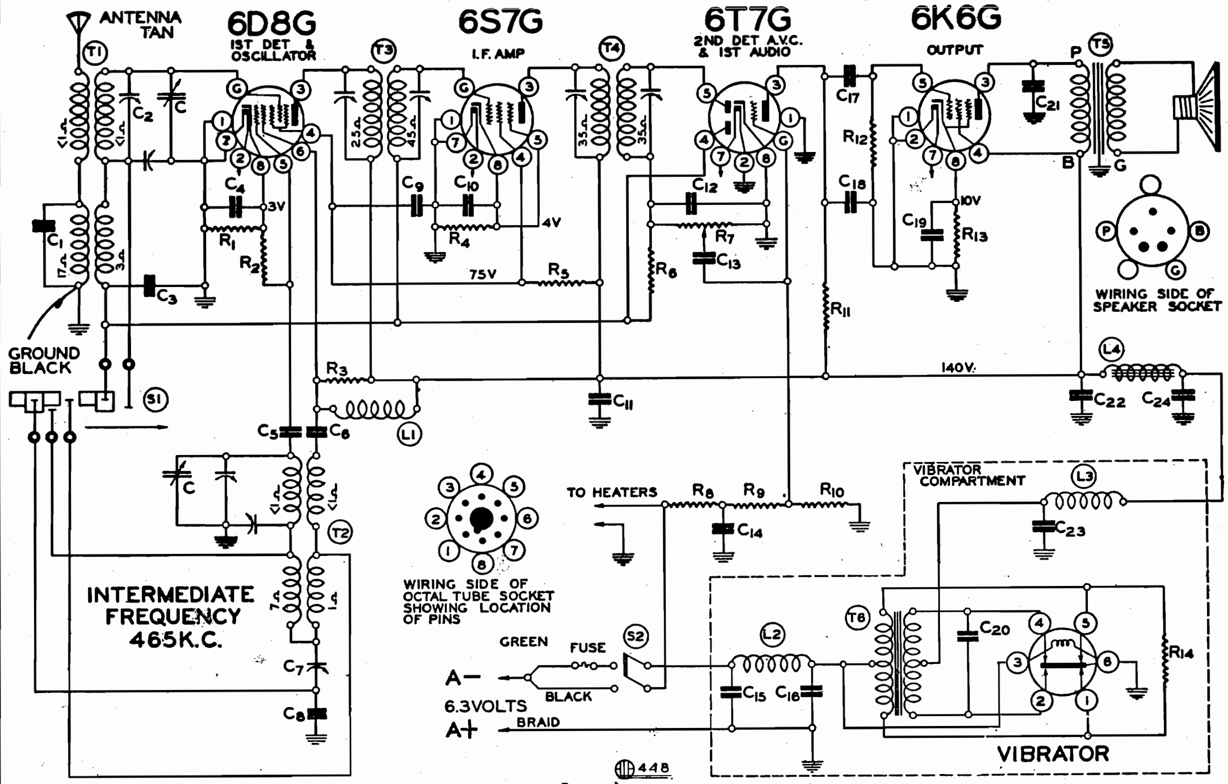
Resistor R15 (200 ohms) is removed and replaced by choke L4.

Trimmers, Voltage

GAMBLE-SKOGMO, INC.

MODEL 489
Schematic, Socket

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	535 to 1720 K.C. (Kilocycles)
Short Wave	Lower	5.5 to 18.1 M.C. (Megacycles)



2 Band 6-Volt Storage Battery Operated Superheterodyne Receiver

MODEL 489

REPAIR PARTS (Serial No. 7J852300 and up)

No.	Part No.	Description
		RESISTORS
R1	130-54	500 ohm - 1/3 w.
R2	130-12	50M ohm - 1/3 w.
R3	130-12	50M ohm - 1/3 w.
R4	130-26	1000 ohm - 1/3 w.
R5	130-149	15M ohm - 1/3 w.
R6	130-4	3 megohm - 1/3 w.
R7	101-91	1 meg volume control
R8	130-191	1.5 megohm - 1/3 w.
R9	130-4	3 megohm - 1/3 w.
R11	180-9	200M ohm - 1/3 w.
R12	130-3	500M ohm - 1/3 w.
R13	130-153	700 ohm - 1/3 w.
R14	130-84	200 ohm - 1/3 w.
R10	130-191	1.5 meg - 1/3 w.
		CONDENSERS
C	102-43	2 gang variable
C1	129-5	.0001 Mica
C2	124-39B	Adj. Cond. 2-25 mmf.
C3	100-22	.05 x 200
C4	100-20	.1 x 200
C5	129-39	.00005 Mica
C6	100-25	.002 x 600
C7	124-38	Series pad 600 mmf. W. C.
C8	129-54	.003 Mica
C9	100-20	.1 x 200
C10	100-20	.1 x 200
C11	100-11	.01 x 400
C12	129-5	.0001 Mica
C13	100-11	.01 x 400
C14	100-11	.01 x 400
C15	100-40	.5 x 200
C16	100-40	.5 x 200
C17	100-26	.02 x 400
C18	129-2	.0005 Mica
C19	119-22	10.0 mfd. 25 v. lytic
C20	100-34	.005 x 1200
C21	100-19	.006 x 600
C22	119-28B	5.0 mfd. lytic
C23	100-20	.1 x 200
C24	119-28B	5.0 mfd. lytic
		C22 C24 in same unit
		PARTS
T1	111-83	Antenna coil complete
T2	110-66B	Oscillator coil complete
T3	108-105B	Input I.F. complete 465 kc.
T4	108-106B	Output I.F. complete 465 kc.
T5	114-96	6" speaker (P.M.)
T6	104-62E	Power Transformer
L1	123-4	R. F. "B" Choke
L2	105-19	A Choke
L3	123-3	R. F. "B" Choke
L4	105-30E	"B" Filter Choke (400 ohms)
S1	125-39	Wave Band Switch
S2		Switch on volume control

BATTERY CONNECTIONS:

Referring to Fig. 1, connect the battery cable to the storage battery in the following manner:

(a) The storage battery should be located as far from the receiver as the battery cable will permit.

(b) Connect the lead (containing the fuse receptacle) marked A negative (—) to the negative (—) post of the storage battery.

(c) Connect the lead marked A positive (+) to the positive (+) post of the storage battery.

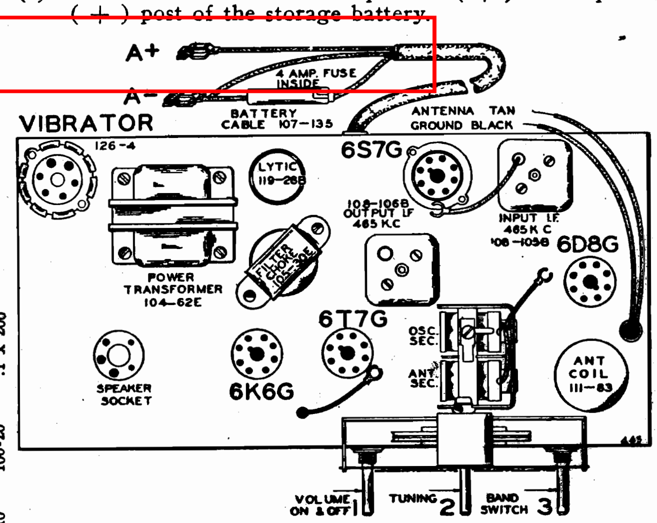


FIG. 1—TOP VIEW

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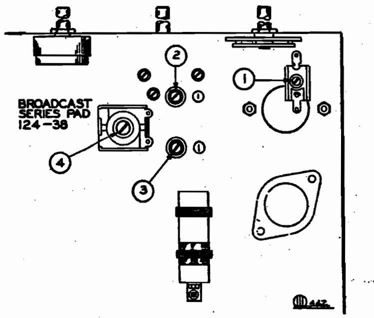
MODEL 489



SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION: No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as defective tubes, poor installations, open or ground antenna systems, defective condensers and resistors

In order to properly align this chassis, an oscillator (generator) is necessary.

All adjustments should be made with a non-metallic screw driver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 6K6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K. C.):

Part No. 108-106B Output I.F. Transformer
Part No. 108-105B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser in its minimum capacity position, plates entirely out of mesh, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-106B) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6S7G to grid cap of 6D8G and adjust input I.F. transformer (No. 108-105B) to resonance.

SHORT WAVE BAND ALIGNMENT:
5.5 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator trimmer to resonance.
   This adjustment is the trimmer mounted on the top of rear section of the variable gang condenser (see Fig. 1, top view).
   (b) Adjust short wave antenna trimmer (Adjustment Number 1), to resonance (see Fig. 3, bottom view).

BROADCAST BAND ALIGNMENT:
535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground leads make following adjustments:
   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 3, see bottom view of chassis, Fig. 3).
   (b) Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 2), to resonance.
   (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 4), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
   (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

MODEL 761A

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-106E Output I.F. Transformer
Part No. 108-105 Input I.F. Transformer

These I. F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view, Fig. 1).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-106E) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6A8 and adjust input I.F. transformer (No. 108-105) to resonance.

BROADCAST BAND ALIGNMENT:
540 to 1750 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
   (a) Set external oscillator to 1750 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment E'; see top view, Fig. 1).
   (b) Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment A') to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)
   (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (Adjustment F') to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained.
   (d) Repeat adjustments "a" and "c" until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1000 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

SHORT WAVE BAND ALIGNMENT:
5.5 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment G') and short wave antenna (Adjustment C') to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-set external oscillator and check set at 18.1 megacycles and 5.5 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 17 megacycle signal appears near 16.1 megacycles.

MIDDLE WAVE BAND ALIGNMENT:
1730 to 5800 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment D') and middle wave antenna (Adjustment B') to resonance.
   (b) Re-set external oscillator to 1900 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-check broadcast band alignment.

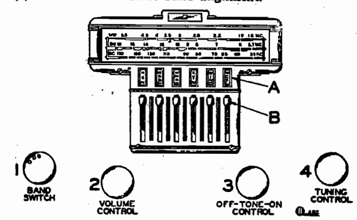


FIG. 2—FRONT VIEW

PROCEDURE FOR SETTING THE AUTOMATIC TUNER LEVERS:

There are six levers on the dial by means of which six stations may be selected, (See "B", Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including 6.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the escutcheon is provided for inserting the call letter tabs, (See "A" Fig. 2). Any order of grouping may be used, however, it is recommended that the left hand three automatic levers be used for high frequency stations (1750 to 1000 K.C.) and the right hand three automatic levers for low frequency stations (1000 to 540 K.C.).

Insert the call letter tabs in the rectangular openings in the escutcheon above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 4) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Rotate the tuning knob (No. 4) to the right (clockwise) as far as it will turn. Now remove from the right side of the cabinet the metal button, and, with a screw driver inserted through the hole, tighten the locking adjustment screw "C". It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" four or five complete turns; select the new station as explained. (Note: If the dial mechanism works hard when setting up a new station for one of the automatic tuner levers, it is due to the locking screw being too tight. Loosen the locking screw "C" until the dial mechanism works freely with the tuner lever pressed down.)

BE SURE TO RETIGHTEN the LOCKING SCREW; otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and—Presto!—your favorite station is selected.

MODEL 504
Schematic, Voltage, Socket, Trimmers Alignment

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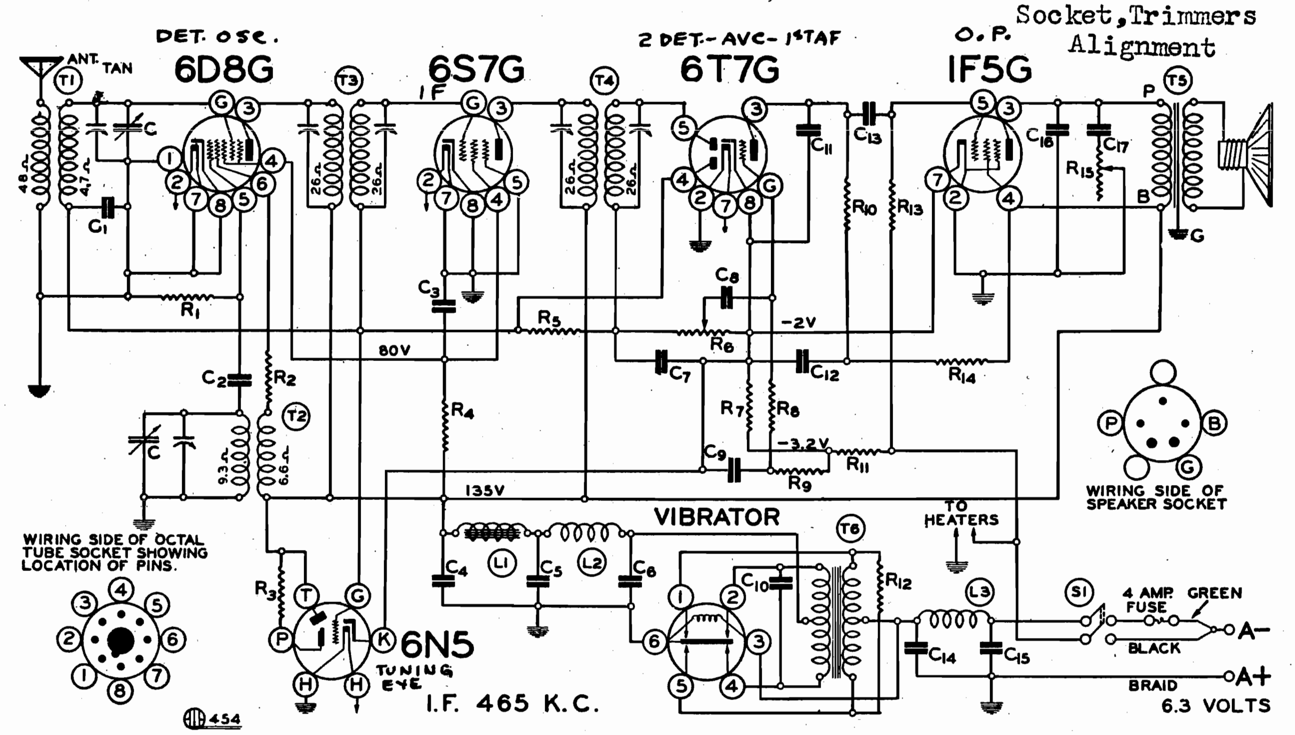


CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME V111

Sensitivity Check at
600 KC and 1000 KC

IF ALIGNMENT

ADJ. at 465 KC thru .1 mf cond.

RF ALIGNMENT

THRU 200 mmf cond. :
Adj. osc. trim. at 1720 KC -
Adj. Ant. trim. at 1400 KC -

Frequency Range — 535-1720 Kilocycles

REPAIR PARTS (Serial No. 7J852900 and up)

No.	Part No.	Description
		RESISTORS
R1	130-76	30M ohm - 1/3 w.
R2	130-23	2M ohm - 1/3 w.
R3	130-186	250M ohm - 1/10 w. - in tuning indicator
R4	130-123	15M ohm - 1/2 w.
R5	130-121	3.2 megohm - 1/3 w.
R6	101-56	1 megohm volume control
R7	106-36	10 ohms - resistor strip
R8	130-19	1 megohm - 1/3 w.
R9	130-19	1 megohm - 1/3 w.
R10	130-100	150M ohm - 1/3 w.
R11	106-36	25 ohms - resistor strip
R12	130-84	200 ohms - 1/3 w.
R13	130-19	1 megohm - 1/3 w.
R14	130-20	100M ohm - 1/3 w.
R15	101-72	300M ohm - tone control
		R7 and R11 in same unit
		CONDENSERS
C	102-38	2 gang variable
C1	100-9	.05 x 200 v.
C2	129-39	.00005 Mica
C3	100-33	.1 x 200 v.
C4	119-28	5.0 mfd. - 200 w. v. lytic
C5	119-28	5.0 mfd. - 200 w. v. lytic
C6	100-33	.1 x 200 v.
C7	129-5	.0001 Mica
C8	100-11	.01 x 400 v.
C9	100-11	.01 x 400 v.
C10	100-34	.005 x 1200 v.
C11	129-12	.00025 Mica
C12	100-33	.1 x 200 v.
C13	100-11	.01 x 400 v.
C14	100-40	.5 x 200 v.
C15	100-40	.5 x 200 v.
C16	100-37	.003 x 600 v.
C17	100-11	.01 x 400 v.
		C4 and C5 in same unit
		PARTS
T1	111-66	Antenna coil complete
T2	110-45	Oscillator coil complete
T3	108-84	Input I.F. coil complete - 465 kc.
T4	108-85	Output I.F. coil complete - 465 kc.
T5	114-63	P.M. Speaker
T6	104-62	Power Transformer
L1	105-30	Filter Choke
L2	123-3	R. F. "B" Choke
L3	105-19	"A" Choke
S1		Switch on volume control
	126-4	Vibrator

BATTERY CONNECTIONS:

Referring to Fig. 1, connect the battery cable to the storage battery in the following manner:

(a) The storage battery should be located as far from the receiver as the battery cable will permit.

(b) Connect the lead (containing the fuse receptacle) marked A negative (—) to the negative (—) post of the storage battery.

(c) Connect the lead marked A positive (+) to the positive (+) post of the storage battery.

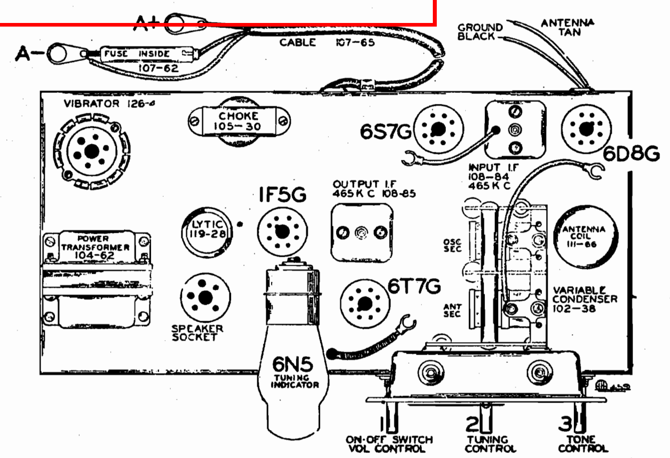
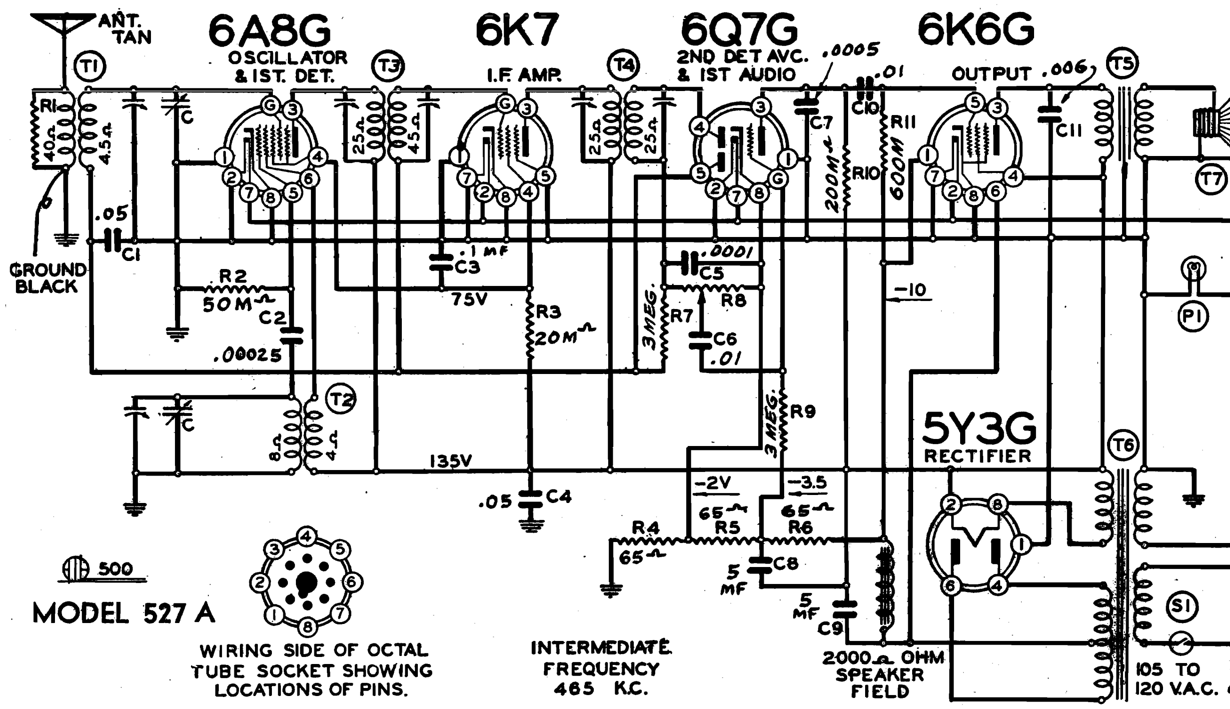


FIG. 1—TOP VIEW

MODEL 527A
Schematic, Voltage, Alignment
Socket, Trimmers,

GAMBLE SKOGMO, INC.



Frequency Range —535 - 1720 Kilocycles

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No.108-95B Output I.F. Transformer
Part No. 108-96 Input I. F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condensor, to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-95B) to resonance.
   (b) Move oscillator output clip from grid of 6K7 to grid of 6A8G and adjust input I.F. transformer (No. 108-96) to resonance.
   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-95B) if necessary.

1. **R.F. ALIGNMENT: (535-1720 K.C.)**

1. With the gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 100 mmf. condensor to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

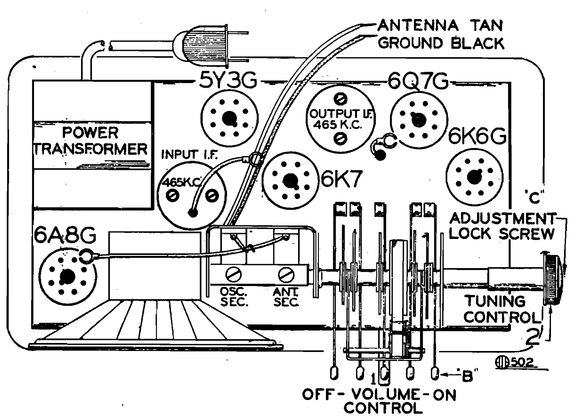


FIG. 1—TOP VIEW

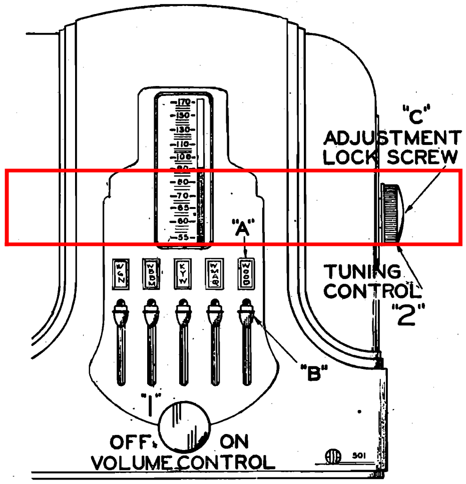


FIG. 2—FRONT VIEW

FOR TUNER PROCEDURE, SEE DATA ON MODEL 677A

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 115 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

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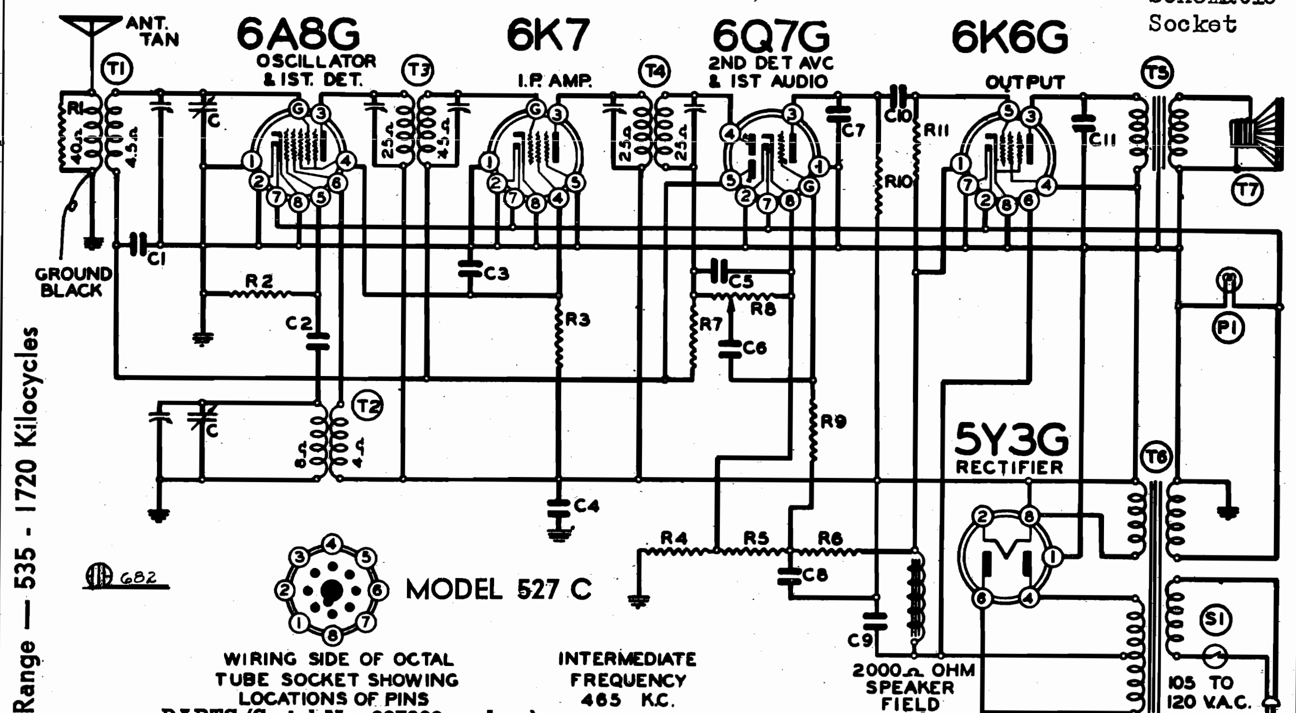


PARTS (Serial No. 307600 and up)

Code No.	Part No.	Description
		RESISTORS
R1	13021	20M ohm—⅓ w.
R2	13012	50M ohm—⅓ w.
R3	13021	20M ohm—⅓ w.
R4	10635	Resistor Strip—65 ohm
R5	10635	45 ohm—resistor strip
R6	10635	220 ohm—resistor strip
R7	130170	3 megohm—⅓ w.
R8	101141	500M ohm volume control
R9	130170	3 megohm—⅓ w.
R10	1309	200M ohm—⅓ w.
R11	130118	600M ohm—⅓ w.
		CONDENSERS
C	10290	2 gang variable condenser
C1	1009	.05 x 200 v.
C2	12912	.00025 Mica
C3	1001	.1 x 400 v.

Code No.	Part No.	Description
C4	10013	.05 x 400 v.
C5	1295	.0001 Mica
C6	10011	.01 x 400 v.
C7	1292	.0005 Mica
C8	11947E	5.0 mfd.—250 w. v. lytic
C9	11947E	5.0 mfd.—250 w. v. lytic
C10	10011	.01 x 400 v.
C11	10019	.006 x 600 v.
		PARTS
T1	11192	Antenna coil complete
T2	11073	Oscillator coil complete
T3	10896F	Input I. F.—465 kc. complete
T4	10895E	Output I. F.—465 kc. complete
T5	10555D	Output Transformer
T6	104149	Power Transformer
T7	114113	5" Dynamic Speaker (2000 ohm Field)
S1		Off-on switch on volume control
P1	10794	6-8 v. pilot light

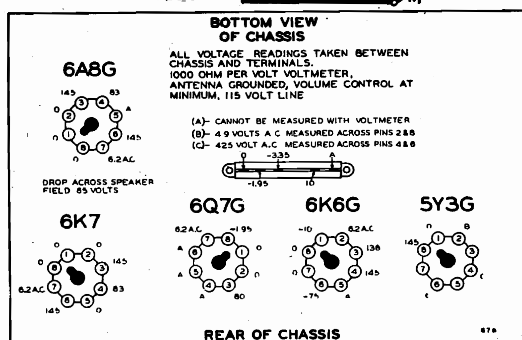


FIG. 3

TUBES:

DESCRIPTION:

The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows:

1—Type 6A8G Pentagrid Mixer, First Detector-oscillator.
1—Type 6K7 Remote Cut-off Pentode, I.F. Amplifier (465 K.C.)
1—Type 6Q7G Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1—Type 6K6G Pentode Output Amplifier.
1—Type 5Y3G High Vacuum Rectifier.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:
- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 100 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6A8G	Rotor full open (Plates out of mesh)	Four trimmers (See Fig. 1)	Input I. F. and Output I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	100 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	100 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Broadcast Antenna	Adjust to maximum output

FREQUENCY RANGE
535 to 1720 K.C.

Power Consumption—50 Watts
Power Output—1 Watt Undistorted, 1.7 Watts Maximum
Intermediate Frequency—465 K.C.

GAMBLE SKOGMO, INC.

MODEL 587 - Series A

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-76A Output I.F. Transformer
Part No. 108-75A Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-76A) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6A8 and adjust input I.F. transformer (No. 108-75A) to resonance.
   (c) With oscillator still connected to 6A8, readjust output I.F. transformer (108-76A) if necessary.

BROADCAST AND SHORT WAVE BAND ALIGNMENT

Broadcast Band:—535 to 1720 Kilocycles.
Short Wave Band:—2280 to 6600 Kilocycles.

Important:—These adjustments must be made in the following order:

SHORT WAVE OSCILLATOR ADJUSTMENT:

1. With band switch in the short wave band position, extreme right of its rotation, and with the gang condenser in its minimum capacity position, plates entirely out of mesh, and with the external oscillator connected in series with "Dummy 1" to grid cap of the 6A8 tube, make the following adjustment:
   (a) Set external oscillator to 6.6 megacycles and adjust short wave oscillator trimmer to resonance. This adjustment is marked "S.W. Osc." (see top view of chassis, Fig. 1, for location of this adjustment).

NOTE: Make certain that the fundamental 6.6 megacycles signal has been tuned in and not the image frequency, noting that the image appears when the tuning knob is moved to approximately 5.7 megacycles.

BROADCAST BAND OSCILLATOR ADJUSTMENT:

1. With band switch in the broadcast position, extreme left of its rotation, and with the gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 1" to grid cap of the 6A8 tube, make the following adjustment:
   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. This adjust ment is the trimmer mounted on the front section of the variable gang condenser.

BROADCAST BAND ANTENNA ADJUSTMENT:

1. With the band switch still in the broadcast position, move the external oscillator from the grid cap of the 6A8 tube to the tan antenna lead and black ground lead, in series with "Dummy 2" and make the following adjustments:
   (a) Set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer to resonance. This adjustment is marked "B.C. Ant." (See top view of chassis, Fig. 1, for location of this adjustment.)
   (b) Re-set external oscillator to 600 K.C. and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until, by adjusting series pad, maximum output is attained. This adjustment is located on the top of the chassis directly in front of the antenna coil. (See top view of chassis, Fig. 1).
   (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

SHORT WAVE BAND ANTENNA ADJUSTMENT:

1. With the band switch in the short wave position, and with external oscillator connected in series with "Dummy 3," to the tan antenna lead and black ground lead, make following adjustment:
   (a) Set external oscillator to 6 megacycles and adjust the short-wave antenna trimmer to resonance. This adjustment is the trimmer mounted on the rear section of the variable gang condenser.

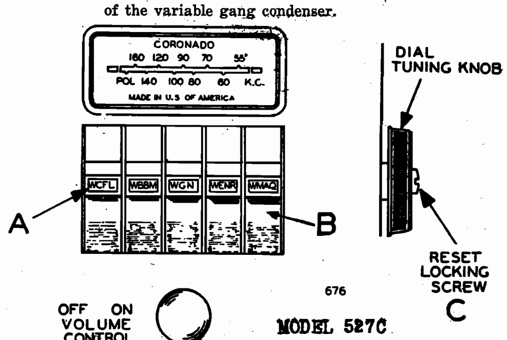


FIG. 2—FRONT VIEW

MODEL 527C

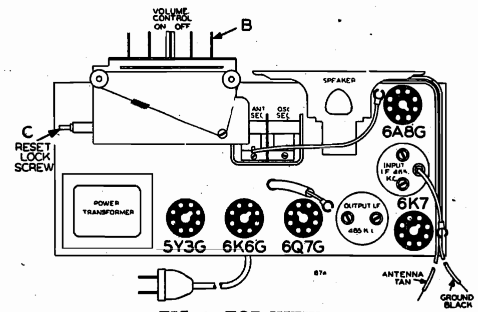


FIG. 1—TOP VIEW

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2)

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner button an opening is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic tuner buttons. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner lever buttons. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab on this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever button. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab on this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

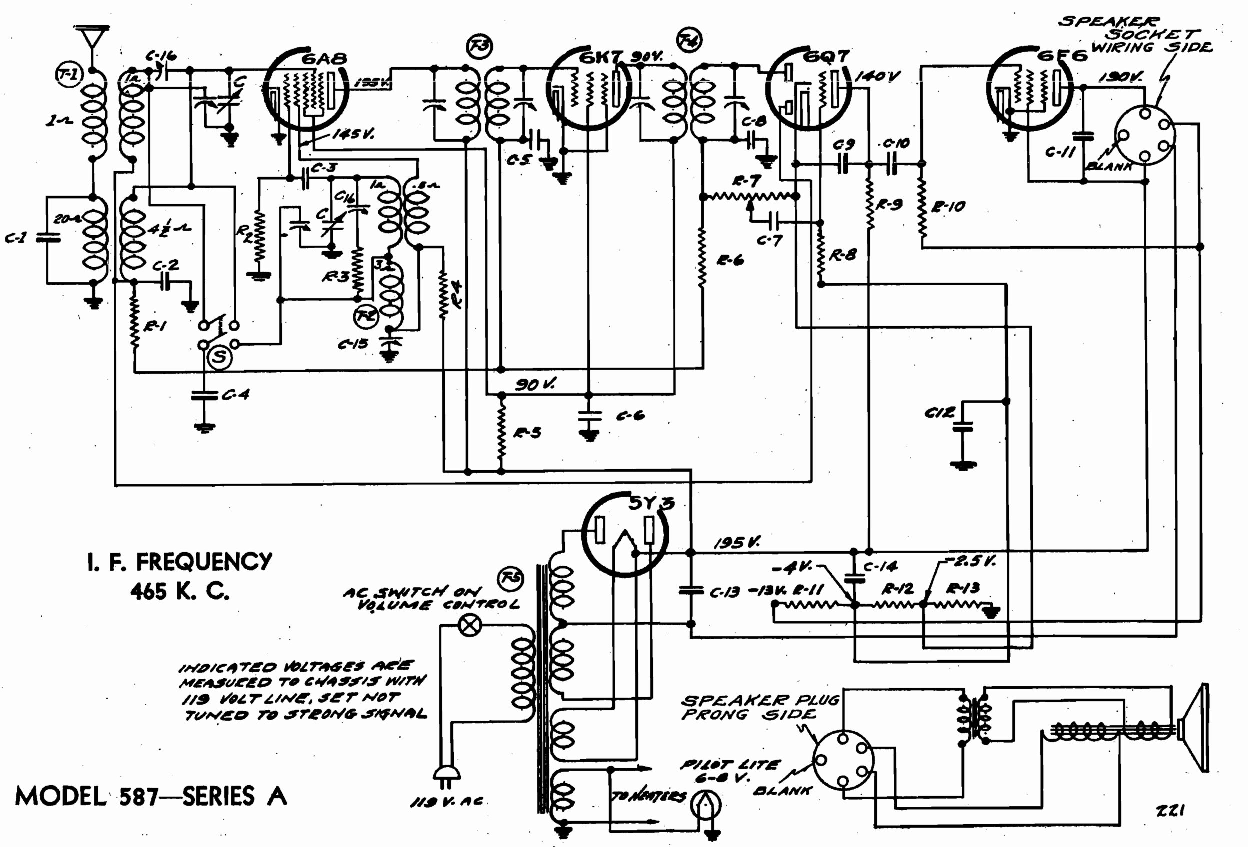
If you should desire to change any station you selected to another, hold the tuning knob No. 2 securely and with a coin loosen the locking screw "C" one or two turns; select the new station as explained. Be sure to retighten the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and—your fayorite station is selected.

MODEL 587 Series A
Schematic, Voltage
Socket, Trimmers

GAMBLE-SKOGMO, INC.

2-Band A. C. Superheterodyne Receiver



MODEL 587—SERIES A

PARTS (Serial No. 6G310775 and up)

RESISTORS

No.	Part No.		Description
R1	130-111	100M	Ohms 1/10W—20%—50V Carbon
R2	130-12	50M	Ohms 1/3 W—20%—20V Carbon
R3	130-112	100	Ohms 1/10W—20%—10V Carbon
R4	130-22	5M	Ohms 1/3 W—20%—10V Carbon
R5	130-77	10M	Ohms 1 W—20%—100V Carbon
R6	130-110	1 meg	Ohm 1/10W—10%—100V Carbon
R7	101-49	1 meg	Ohm Volume Control
R8	130-113	2 meg	Ohm 1/10W—20%—100V Carbon
R9	130-20	100M	Ohms 1/3W—20%— 50V Carbon
R10	130-100	150M	Ohms 1/3W—20%— 50V Carbon
R11	106-26	220	Ohms
R12	106-26	33	Ohms
R13	106-26	52	Ohms

NOTE: R11, R12, and R13 in one unit—106-26

CONDENSERS

C1	129-63	.0004 Mica—W—10%
C2	100-26	.02 x 400 Volt—25%
C3	129-62	.00003 Mica—0—10%
C4	129-61	.0017 Mica—W—2½%
C5	100-9	.05 x 200 Volt—25%
C6	100-6	.25 x 200 Volt—25%
C7	100-11	.01 x 400 Volt—25%
C8	129-12	.00025 Mica—0—20%
C9	129-12	.00025 Mica—0—20%
C10	100-11	.01 x 400 Volt—25%
C11	100-19	.006 x 600 Volt—25%
C12	100-6	.25 x 200 Volt—25%
C13	103-6	8 mfd. x 350 Volt Electrolytic
C14	103-7	8 mfd. x 300 Volt Electrolytic
C15	124-29	Adjustable condenser 390 mmf. ~~working capacity~~
C16	124-30	Adjustable Dual Condenser

TUNING RANGE—

Standard Broadcast Band
535-1720 Kilocycles.

Short Wave Band
2280-6600 Kilocycles

MISCELLANEOUS PARTS

T1	111-56A	Antenna Coil
T2	110-44	Oscillator Coil
T3	108-75A	Input I.F. 465 Kc.
T4	108-76A	Output I.F. 465 Kc.
T5	104-56	Power Transformer—60 Cycles
S	125-19	Band Switch
C	102-31	One Section of Two Gang Condenser

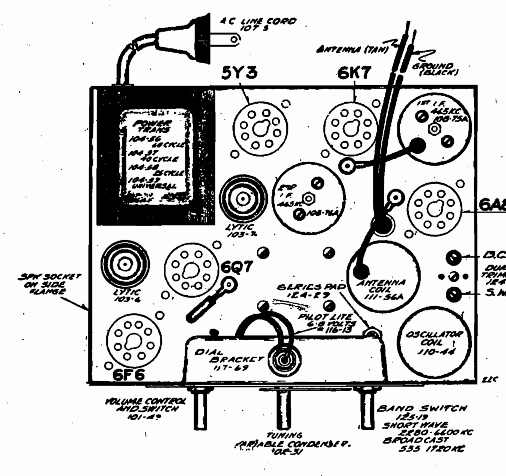


FIG. 1—TOP VIEW

DESCRIPTION:

TUBES:

The tube complement of this chassis consists of the following tubes.

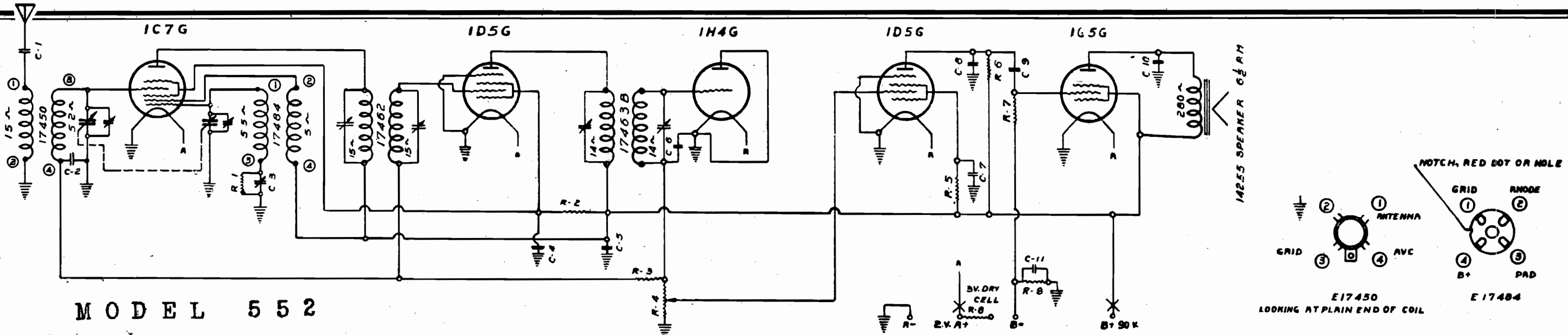
The type and function of each tube is as follows:

1—Type 6A8 Pentagrid Mixer, First Detector-oscillator
1—Type 6K7 Remote Cut-Off Pentode, I. F. Amplifier (465 K.C.)
1—Type 6Q7-G Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1—Type 6F6-G Pentode Output Amplifier.
1—Type 5Y3 High Vacuum Rectifier.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see parts list) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

MODEL 541A
MODEL 552
Schematics, Alignment

GAMBLE-SKOGMO, INC.



C-1	.01	200 V.
C-2	.05	200 V.
C-3	500 MMF PAD	
C-4	.05	200 V.
C-5	.25	200 V.
C-6	.0005	600 V.
C-7	.05	200 V.
C-8	.0005	600 V.
C-9	.01	200 V.
C-10	.002	600 V.
C-11	10 x 25 ELECTROLYTIC	

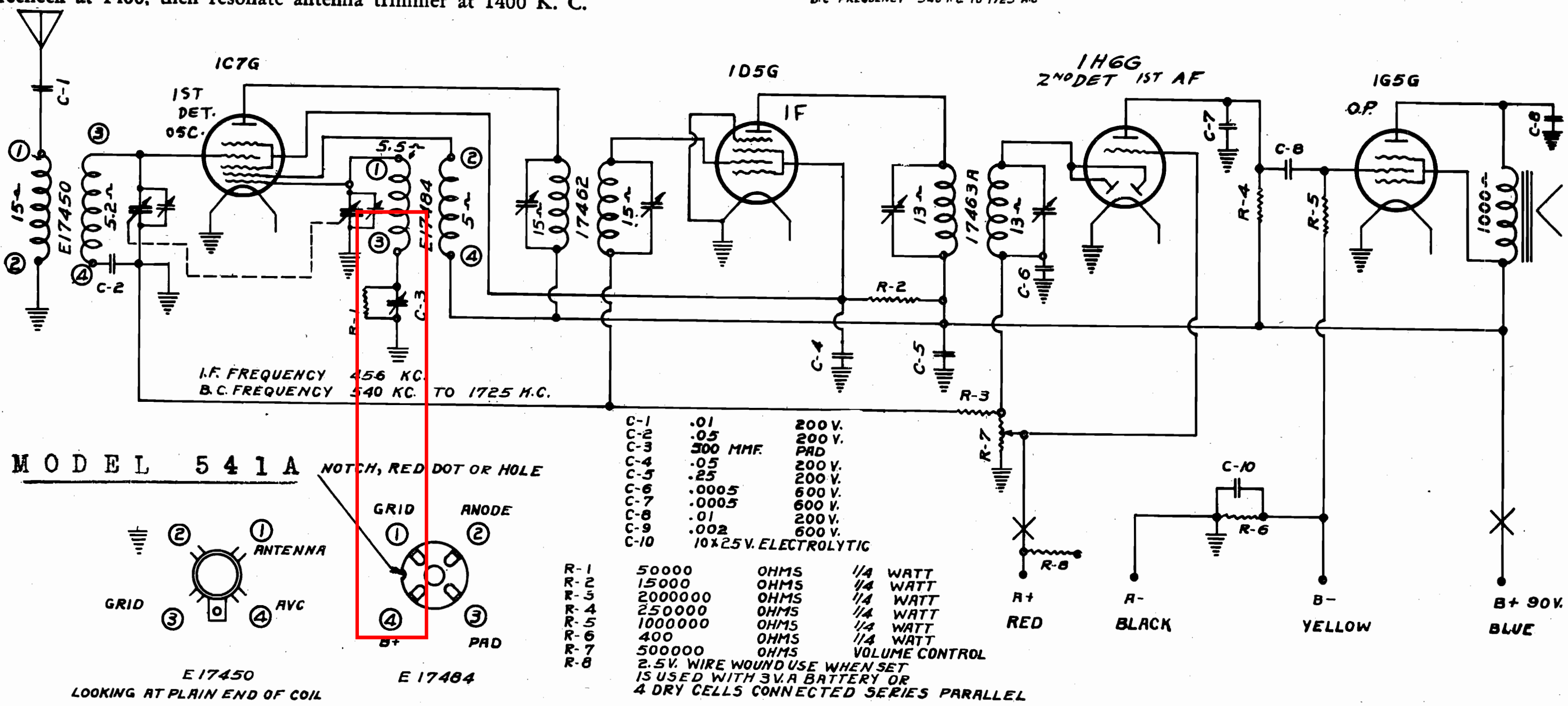
R-1	50000	OHMS	1/4 WATT
R-2	15000	OHMS	1/4 WATT
R-3	2000000	OHMS	1/4 WATT
R-4	500000	OHMS	VOLUME CONTROL
R-5	500000	OHMS	1/4 WATT
R-6	100000	OHMS	1/4 WATT
R-7	1000000	OHMS	1/4 WATT
R-8	2.0 2.2	WIRE	WOUND USED WHEN SET IS USED WITH 3 V. A BATTERY
R-9	450	OHMS	

I.F. FREQUENCY 456 K.C.
B.C FREQUENCY 540 K.C. TO 1725 K.C.

MODEL 552

IF ALIGNMENT 456 K. C. Connect signal generator to grid of 1C7G tube through a .01 MFD condenser, leave grid cap in place and open tuning condenser (turn dial to high frequency end). Peak IF trimmers — use an output meter — use only enough signal to give a readable output, and go over trimmers several times.

OSCILLATOR & ANTENNA ALIGNMENT: With pointer set to end of scale calibration when tuning condenser is closed, trim oscillator (rear section of tuning condenser) for maximum response at 1400 K. C. dial reading with a 1400 K. C. signal into the antenna lead. Next adjust padding condenser at 540 K. C. and recheck at 1400, then resonate antenna trimmer at 1400 K. C.



I.F. FREQUENCY 456 KC.
B.C. FREQUENCY 540 KC. TO 1725 K.C.

C-1	.01	200 V.
C-2	.05	200 V.
C-3	500 MMF.	PAD
C-4	.05	200 V.
C-5	.25	200 V.
C-6	.0005	600 V.
C-7	.0005	600 V.
C-8	.01	200 V.
C-9	.002	600 V.
C-10	10 x 25 V. ELECTROLYTIC	

R-1	50000	OHMS	1/4 WATT
R-2	15000	OHMS	1/4 WATT
R-3	2000000	OHMS	1/4 WATT
R-4	250000	OHMS	1/4 WATT
R-5	1000000	OHMS	1/4 WATT
R-6	400	OHMS	1/4 WATT
R-7	500000	OHMS	VOLUME CONTROL
R-8	2.5V. WIRE WOUND USE WHEN SET IS USED WITH 3V. A BATTERY OR 4 DRY CELLS CONNECTED SERIES PARALLEL		

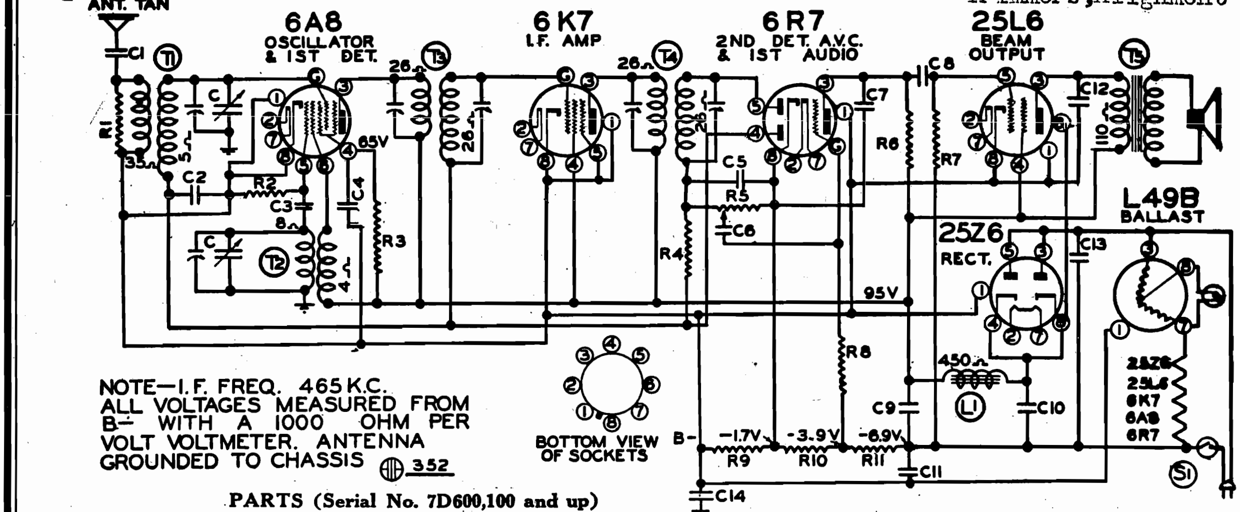
MODEL 541A

MODEL 541A ALIGNMENT the same as Model 552, but connect signal gen. thru a .00025 condenser

MODEL 602B
MODEL 602C
Alignment

GAMBLE SKOGMO, INC.

MODEL 602
Schematic, Voltage, Socket
Trimmers, Alignment



PARTS (Serial No. 7D600,100 and up)

RESISTORS

No.	Part No.	Description	
R1	130-17	10M ohm - 1/3 w.	20%
R2	130-12	50M ohm - 1/3 w.	20%
R3	130-149	15M ohm - 1/3 w.	20%
R4	130-4	3 meg ohm - 1/3 w.	20%
R5	101-77	Volume Control (1 Meg)	
R6	130-12	50M ohm - 1/3 w.	20%
R7	130-20	100M ohm - 1/3 w.	20%
R8	130-19	1 megohm - 1/3 w.	20%
R9	106-38	30 ohm	
R10	106-38	40 ohm	
R11	106-38	55 ohm	

R9, R10, and R11 in one unit

CONDENSERS

No.	Part No.	Description	
C	102-48	2 gang variable	
C1	100-25	.002 x 600	25%
C2	100-9	.05 x 200	25%
C3	129-12	.00025 Mica	20%
C4	100-22	.05 x 200	25%
C5	129-5	.0001 Mica	20%
C6	100-11	.01 x 400	25%
C7	129-2	.0005 Mica	20%
C8	100-22	.05 x 200	25%
C9	119-39	20 mfd. lytic - 100 w.v.	
C10	119-39	15 mfd. lytic - 100 w.v.	
C11	100-20	.1 x 200	25%

No.	Part No.	Description	
C12	100-13	.05 x 400	25%
C13	100-39	.1 x 400	20%
C14	100-53	.25x400	20%

PARTS

No.	Part No.	Description
T1	111-58B	Antenna Coil Complete
T2	110-46	Oscillator Coil Complete
T3	108-82B	Input I. F. Complete
T4	108-83B	Output I. F. Complete
T5	114-71	Dynamic Speaker
L1		450 ohm speaker field
S1		Switch on Volume Control

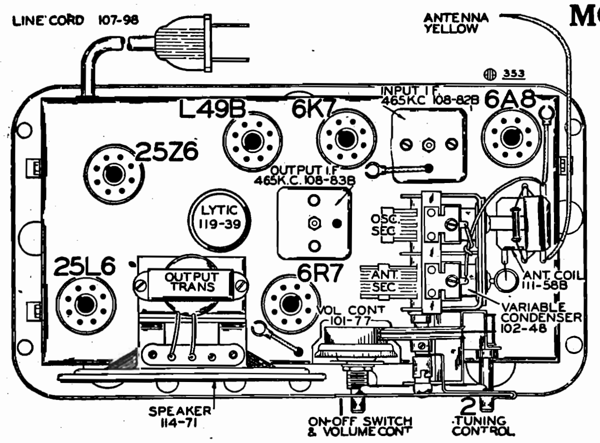


FIG. 1—TOP VIEW

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 119 volt A.C. or D.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals

MODEL 602

Range 535-1720 Kilocycles

of the type 25L6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT - 465 KC - Model 602
I.F. ALIGNMENT -470 KC - Models 602 B & C

Part No. 108-83B Output I.F. Transformer
Part No. 108-82B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83B) to resonance.
   (b) Move oscillator output clip from grid of 6K7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82B) to resonance.
   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83B) if necessary.

Models 602, 602B & 602C

R.F. ALIGNMENT: (535-1720 K.C.)

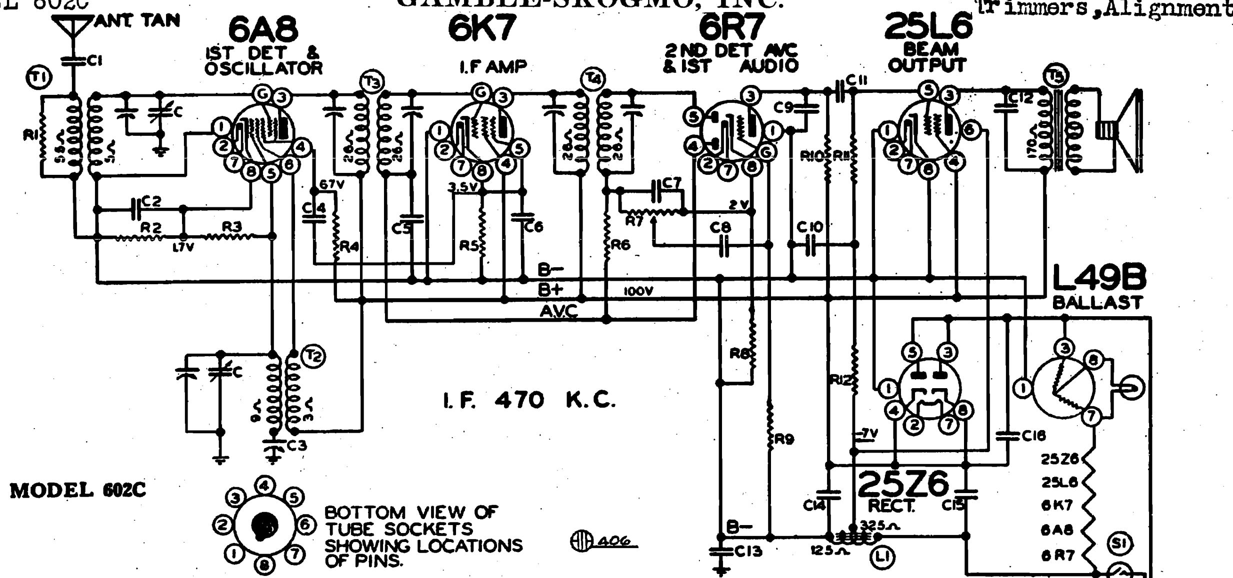
1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

MODEL 602B
MODEL 602C

GAMBLE-SKOGMO, INC.

Schematics, Socket Trimmers, Alignment

Frequency Range 535-1720 Kilocycles



PARTS (Serial No. 878500 and up)

No.	Part No.	Description	
		CONDENSERS	
C	102-55	2 Gang Variable Condenser	
C1	100-25	.002 x 600	25%
C2	100-22	.05 x 200	25%
C3	129-75	.0003386 Compression Type Condenser 1%	
C4	100-22	.05 x 200	25%
C5	100-9	.05 x 200	25%
C6	100-20	.1 x 200	25%
C7	129-21	.0002 Mica	20%
C8	100-11	.01 x 400	25%
C9	129-2	.0005 Mica	20%
C10	100-75	.22 x 200	10%
C11	100-10	.05 x 200	10%
C12	100-67	.025 x 400	25%
C13	100-53	.25 x 400	20%
C14	119-42	5. mfd. lytic 100 w. v.	
C15	119-42	20. mfd. lytic 100 w. v.	
C16	100-39	.1 x 400	20%
		RESISTORS	
R1	130-17	10M ohm — 1/3 w.	20%
R2	130-97	200 ohm — 1/3 w.	10%
R3	130-12	50M ohm — 1/3 w.	20%
R4	130-149	15M ohm — 1/3 w.	20%
R5	130-54	500 ohm — 1/3 w.	20%
R6	130-4	3 megohm — 1/3 w.	20%
R7	101-77	Volume Control (1 meg)	
R8	130-193	3M ohm — 1/3 w.	10%
R9	130-19	1 megohm — 1/3 w.	20%
R10	130-94	50M ohm — 1/3 w.	10%
R11	130-103	100M ohm — 1/3 w.	10%
R12	130-194	35M ohm — 1/3 w.	10%
		PARTS	
T1	111-79	Antenna Coil Complete	
T2	110-62	Oscillator Coil Complete	
T3	108-82B	Input I. F. Complete	
T4	108-83B	Output I. F. Complete	
T5	114-88	5" Dynamic Speaker	
L1		Speaker field 450 ohm— total tapped 125 ohm	
S1		Switch on volume control	

MODEL 602 C

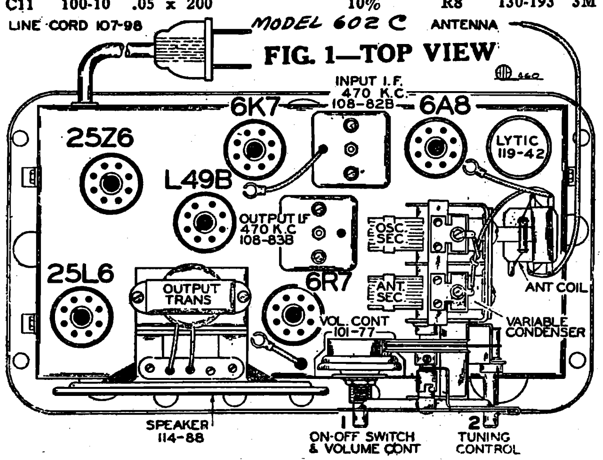


FIG. 1—TOP VIEW

MODEL 602 B

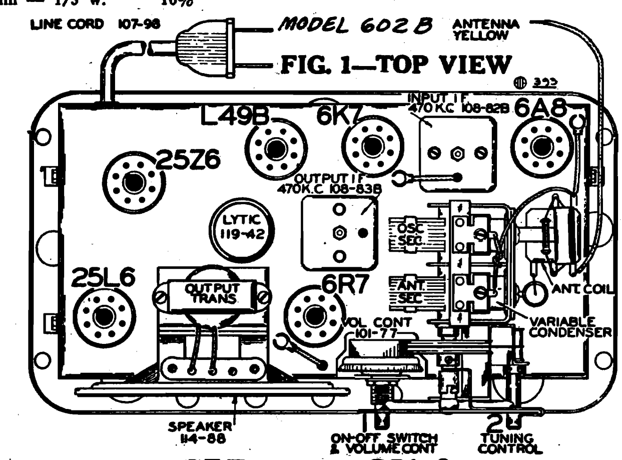
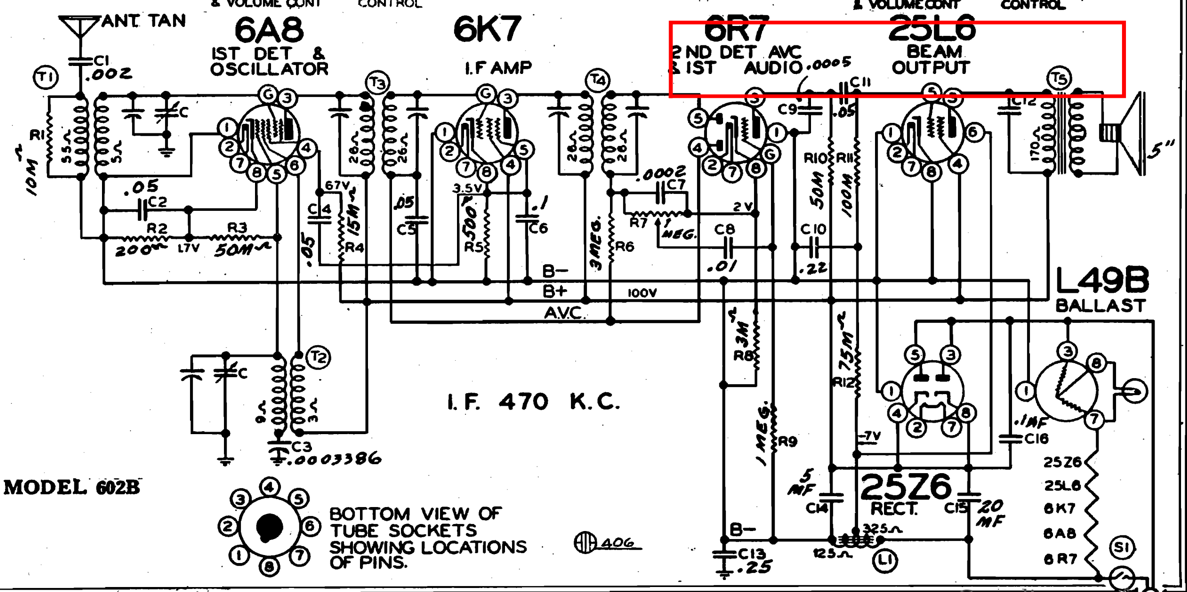


FIG. 1—TOP VIEW

ALIGNMENT FOR MODELS 602B and 602C THE SAME AS MODEL 602, EXCEPT I.F. ADJUSTMENT IS AT 470 KC

Range 535-1720 Kilocycles



Socket, Trimmers
Parts, Notes

GAMBLE-SKOGMO, INC.

MODEL 666
Schematic, Voltage

The tube complement consists of the latest "Metal-Glass" tubes which are interchangeable with metal tubes.

NOTE.

C3, C4, C9, C15, in one unit—part No. 116-18.
C5, C8, C10, C11, in one unit—part No. 116-17.
C12, C17, C19, in one unit—part No. 116-16.
C24, C25, in one unit—part No. 119-21.

T6	102-26	Three Gang Variable Condenser
T7	108-72	Output I.F. Coil—465 Kc.
T8	105-27	Output Transformer
T9	104-51	Power Transformer
L1	105-23	Filter Choke
L2	105-19	"A" Choke
L3	105-24	"A" Choke
L4	105-26	"A" Choke
L5	114-34	5¼" Speaker (Field Resistance—4 Ohms)
V	126-1	Vibrator

DESCRIPTION:

Model No. 666 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

The I.F. frequency used is 465 K.C., the R.F. end of the receiver consisting of a high gain iron core antenna coil which gives high signal to noise ratio and an R.F. stage especially designed to give high image rejection and high I.F. attenuation. The I.F. transformers are designed to give high gain and selectivity and yet to have a broad nose for ease of tuning and hi-fidelity response. They are of the air core type and wound with solid wire to give *minimum* drift and variation of gain due to climatic changes.

The receiver is so designed that it may be used as either a single or two unit installation. Taps are provided on the output transformer to a pin jack terminal board, a red dot distinguishing dual speaker tap and green dot for single speaker operation.

For complete details see illustration and Header speaker data chart.

Dash kits for the remote control head are available for 1936 cars drilled for dash plates.

This receiver has been carefully designed to facilitate servicing, the top and bottom covers are both removable and are fastened in place by spring clips, self tapping screws and trimount buttons.

All adjustments are accessible and any part replaceable without removing the chassis from the case.

CONDENSERS

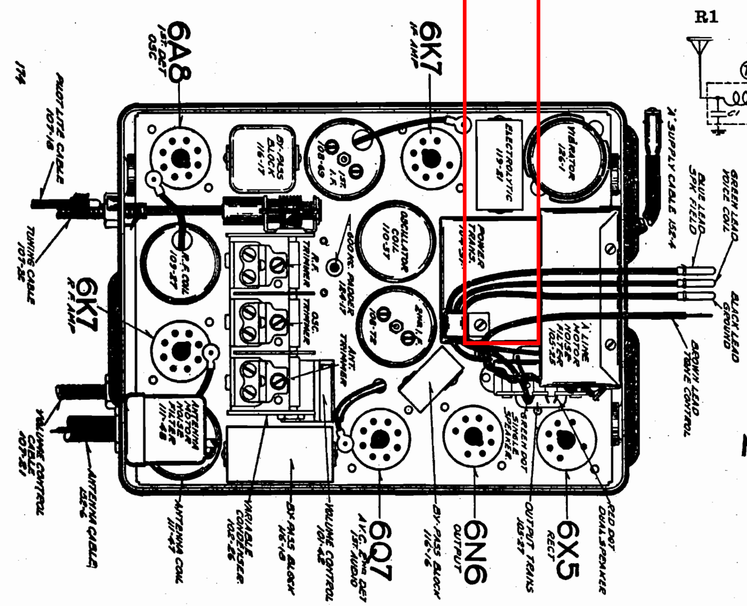
C		Spark Plate
C1	129-3	.00002 Mica - "O" - 20%
C2	129-49	.00009 Mica - "O" - 5%
C3	116-18	.05 x 200 Volt
C4	116-18	.25 x 200 Volt
C5	116-17	.05 x 200 Volt
C6	129-21	.0002 Mica - MT - "O" 20%
C7	124-17	Single Padder J-4-S
C8	116-17	.1 x 400 Volt
C9	116-18	.1 x 400 Volt
C10	116-17	.1 x 200 Volt
C11	116-17	.1 x 200 Volt
C12	116-16	.05 x 200 Volt
C13	129-5	.0001 Mica - MT - "O" - 20%
C14	129-2	.0005 Mica - MT - "O" - 20%
C15	116-18	.02 x 200 Volt
C16	129-5	.0001 Mica - MT - "O" - 20%
C17	116-16	.05 x 400 Volt
C18	100-37	.003 x 600 Volt - 10%
C19	116-16	.01 x 800 Volt
C20	100-35	.5 x 200 Volt - 50% - 10%
C21	100-35	.5 x 200 Volt - 50% - 10%
C22	100-35	.5 x 200 Volt - 50% - 10%
C23	100-36	.01 x 1400 Volt - 10%
C24	119-21	8.0 mfd. Lytic Cond. 350 Working Volts
C25	119-21	4.0 mfd. Lytic Cond. 350 Working Volts
C26		5.0 mmf. Gimmick

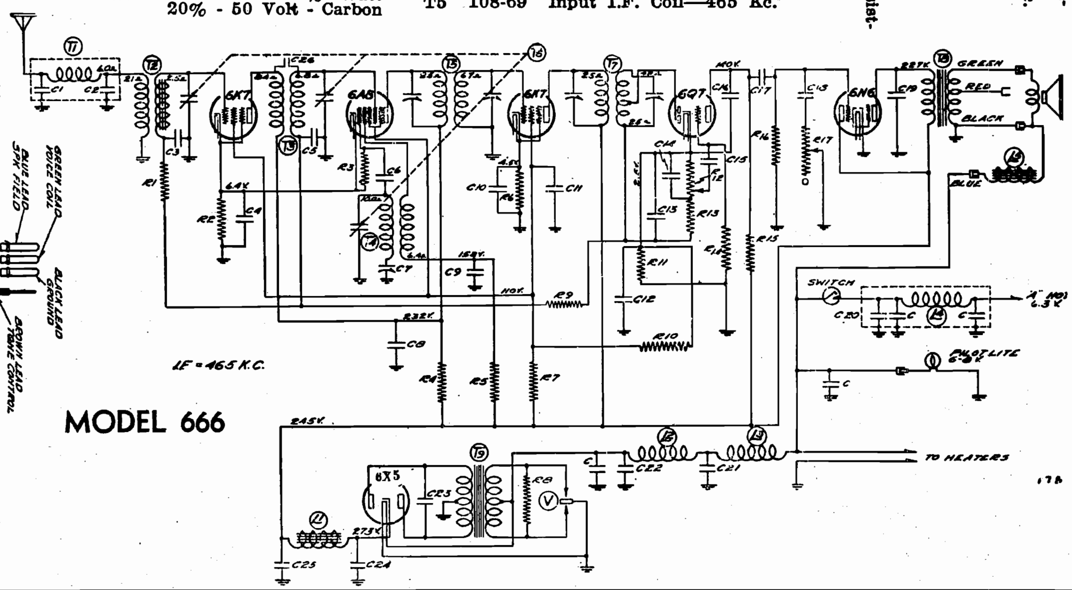
RESISTORS

R1	130-20	100M Ohm - ½ Watt 20% - 50 Volt - Carbon
R2	130-99	300 Ohm - ⅓ Watt - 20% - 10 Volt - Carbon
R3	130-94	50M Ohm - ⅓ Watt - 10% - 10 Volt - Carbon
R4	130-98	1500 Ohm - ½ Watt - 20% - 25 Volt - Carbon
R5	130-42	20M Ohm - ⅓ Watt - 20% - 100 Volt - Carbon
R6	130-70	500 Ohm - ⅓ Watt - 10% - 10 Volt - Carbon
R7	130-95	12M Ohm - 1.2 Watt - 10% - 100 Volt - Carbon
R8	130-97	200 Ohm - ⅓ Watt - 10% - 10 Volt - Carbon
R9	130-3	500M Ohm - ⅓ Watt 20% - 100 Volt - Carbon
R10	130-108	40M Ohm - ⅓ Watt - 10% - 100 Volt - Carbon
R11	130-107	800 Ohm - ⅓ Watt - 10% - 10 Volt - Carbon
R12	101-42	50M Ohm - Volume Control and Switch
R13	130-22	5M Ohm - ⅓ Watt - 20% -10 Volt - Carbon
R14	130-68	1 Meg Ohm - ⅓ Watt - 10% - 20 Volt - Carbon
R15	130-9	200M Ohm - ⅓ Watt - 20% - 20 Volt - Carbon
R16	130-3	500M Ohm - ⅓ Watt - 20% - 100 Volt - Carbon
R17	101-45	1 Meg Ohm - Tone Control

PARTS

T1	111-48	Antenna Filter Coil Assembly
T2	111-47	Antenna Coil Assembly
T3	109-27	R.F. Coil Assembly
T4	110-37	Oscillator Coil Assembly
T5	108-69	Input I.F. Coil—465 Kc.

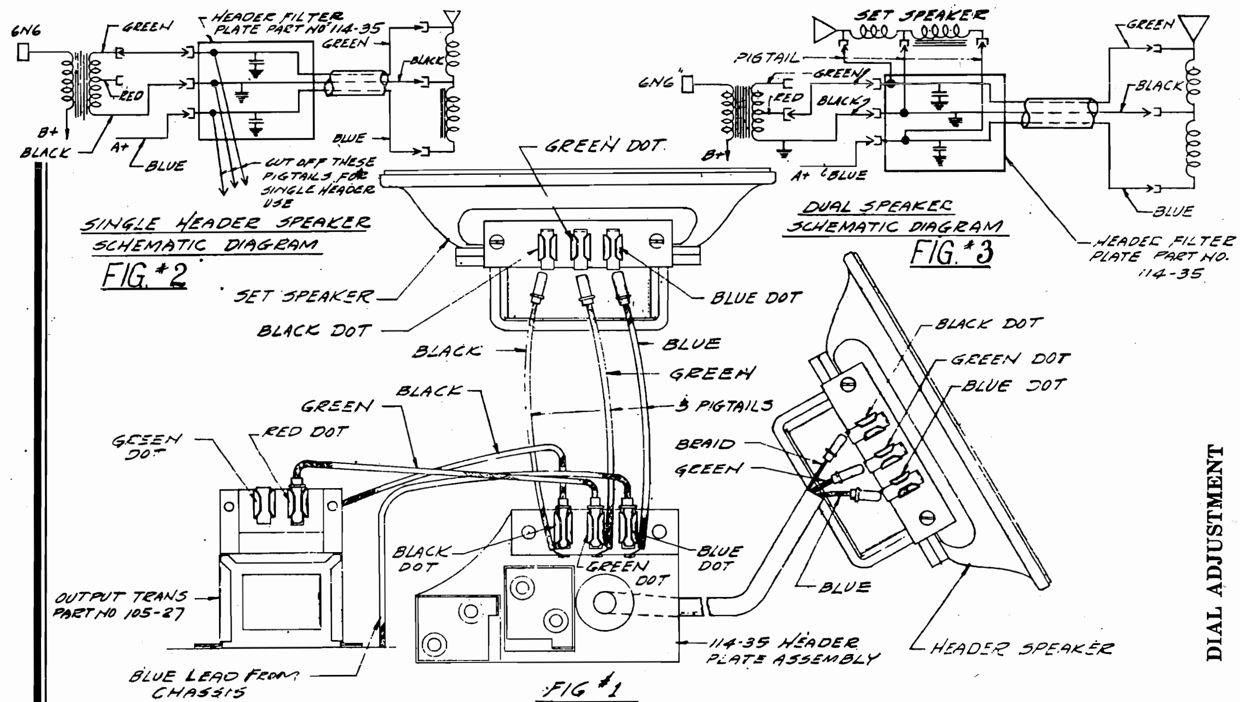




MODEL 666

MODEL 666
Speaker Data,
Alignment

GAMBLE-SKOGMO, INC.



SINGLE HEADER SPEAKER SCHEMATIC DIAGRAM
FIG #2

DUAL SPEAKER SCHEMATIC DIAGRAM
FIG #3

FIG #1

DIAL ADJUSTMENT

Tune set to some station of a known frequency (between 800 and 1200 K.C.), hold selector knob, then remove pilot light assembly from back of remote head and with a screw driver adjust the slotted screw through this opening and in this way adjust the dial pointer to the correct frequency setting.

SINGLE HEADER SPEAKER CONNECTIONS

Consult Fig. No. 1. On this application, all that is required is to remove speaker from receiver case and place in header board of car. Install the special seven foot shielded speaker cable and header filter plate assembly and insert the three leads (which formerly connected the radio to the speaker) to the pin jacks on the header filter plate assembly. Remove the three short pigtail leads from the header filter plate assembly, namely, black, green and blue. These leads are only used when dual (two) speakers are to be used, one in the header and the other in the receiver case.

DUAL SPEAKER CONNECTIONS

Consult Fig. No. 1. On this application, leave speaker in receiver case, install a complete header speaker in the header board of the automobile and assemble header filter plate assembly and seven foot shielded cable to front cover of receiver case.

The speaker leads from the radio are removed from the terminal board of the set speaker and plugged into the pin jacks of the header filter plate assembly, making certain to match the colors of the leads with the color dots on the pin jacks. The three short pigtail leads from the header filter plate assembly are then connected to the set speaker. Shift the green lead which runs to the output transformer (No. 105-27) to the pin jack with red dot for dual speaker operation.

For further explanation, consult Fig. No. 2 Single Header Speaker schematic diagram, and Fig. No. 3, Dual Speaker schematic diagram.

A more technical explanation of the manner of interconnecting the set speaker with the header speaker and header filter plate is that for dual speaker operation the two speakers are connected in parallel and for single header speaker operation, three pigtail leads from the header filter plate terminal assembly are cut off. All leads are color-coded and correspond to color dots on the pin jacks mounted on the speakers and the terminal board of the header filter plate assembly. A tapped output transformer is provided for impedance matching.

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 175 mmfd. condenser connected in series with the output lead of the test oscillator.

I.F. ALIGNMENT

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-72 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-69 to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

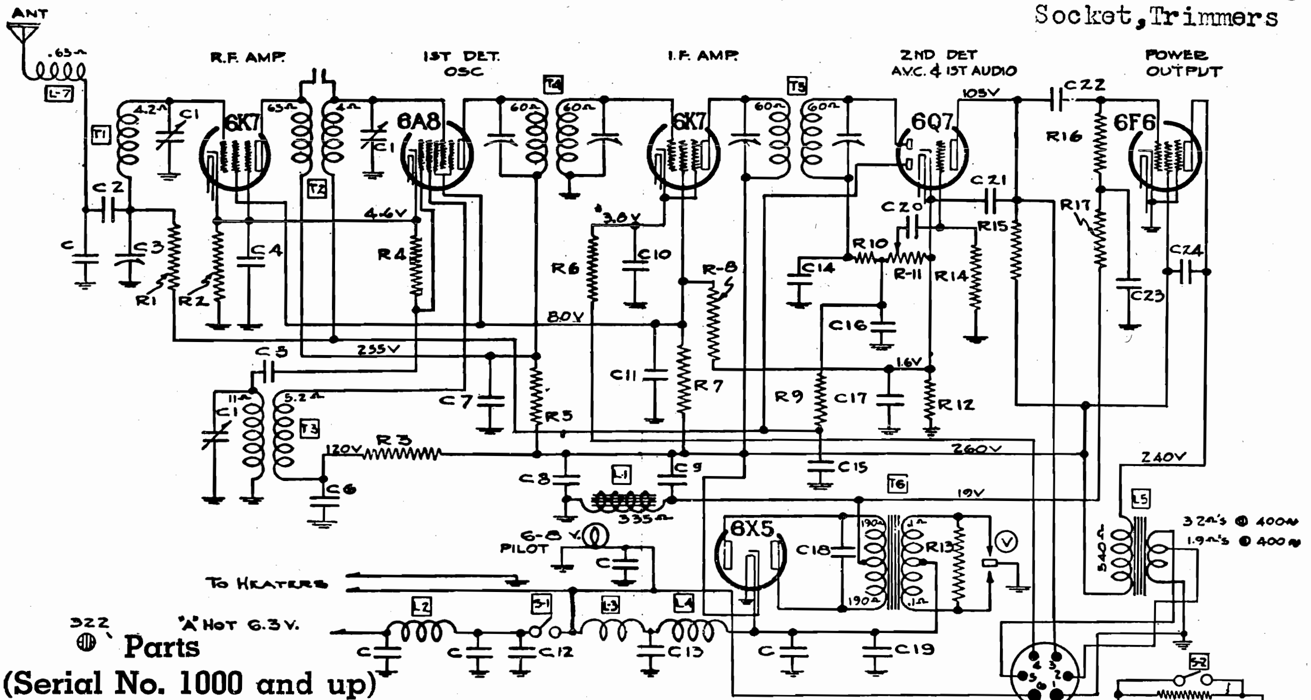
BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view.
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 KC. Adjust series pad rocking gang condenser to and fro at the same time adjusting series pad for maximum gain. This adjustment is accessible from the top of chassis (see top view.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

Alignment, Parts

GAMBLE SKOGMO, INC.

MODEL 667
Schematic, Voltage
Socket, Trimmers



NOTE— I.F FREQ 262.5 KC.
ALL VOLTAGES MEASURED FROM GROUND WITH A 1000-Ω/V VOLTMETER
* CATHODE of RF AMP TO GND 3.8V IN DISTANCE POSITION of LOCAL DISTANCE SWITCH, 7V IN LOCAL POSITION.

Parts
(Serial No. 1000 and up)

CONDENSERS

C		Spark Plate
C1	102-45	3 Gang Condenser
C2	129-73	.002 Mica - MW-W - 10%
C3	124-36	Series Pad
C4	116-20	.1 x 200 v. - 20%
C5	129-12	.00025 Mica - MT - 20%
C6	116-19	.1 x 400 - 20%
C7	116-19	.1 x 400 - 20%
C8	119-34	8. mfd. - 350 W v.
C9	119-34	4 mfd. 350 W v.
C10	116-19	.05 x 200 v. - 20%
C11	116-20	.25 x 200 v. - 20%
C12	100-31	.5 x 120 v. - 10-50% - Braid leads
C13	100-31	.5 x 120 v. - 10-50%
C14	129-5	.0001 Ceramicon - 20%
C15	116-19	.05 x 200 v. - 20%
C16	129-5	.0001 Ceramicon - 20%
C17	116-20	.02 x 200 - 20%
C18	100-36	.01 x 1400 v. - 20% - 10% "A"
C19	100-31	.5 x 120 v. - 10% - 50%
C20	116-20	.02 x 200 - 20%
C21	129-5	.0001 Mica - 20%
C22	100-55	.01 x 400 - 25%
C23	100-48	.25 x 200 - 20%
C24	100-54	.006 x 600 - 25%
C25	100-11	.01 x 400 - 25%

C4, C11, C17, C20 All in Block 116-20
C7, C6, C10, C15 All in Block 116-19

RESISTORS

R1	130-141	250M ohm - 1/3 w. Insulated
R2	130-54	500 ohm - 1/3 w.
R3	130-138	50M ohm - 1/2 w. Insulated
R4	130-52	50M ohm - 1/3 w.
R5	130-31	1500 ohm - 1/3 w.
R6	130-154	1000 ohm - 1/3 w. Insulated
R7	130-143	30M ohm - 1.2 w.
R8	130-139	40M ohm - 1/3 w. Insulated
R9	130-19	1 meg - 1/3 w.
R10	130-162	50M ohm - 1/3 w. Insulated
R11	101-73	250M ohm - Volume Control
R12	130-153	700 ohm - 1/3 w.
R13	130-84	200 ohm - 1/3 w.
R14	130-19	1 meg ohm - 1/3 w.
R15	130-11	250M ohm - 1/3 w.
R16	130-5	300M ohm - 1/3 w.
R17	130-11	250M ohm - 1/3 w.
R18	130-161	4000 ohm - 1/3 w. Insulated
R19	101-45	Tone Control 1 Meg ohm

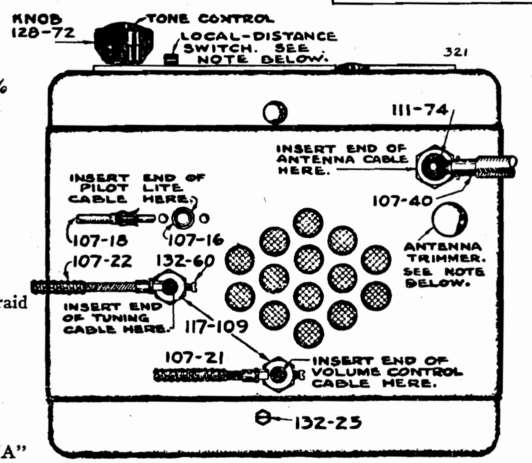


FIG. 1—SIDE VIEW

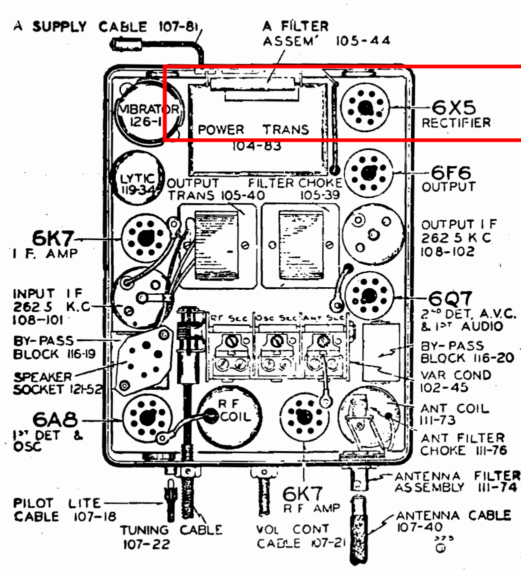


FIG. 2—TOP VIEW

I.F. ALIGNMENT - Adj at 262.5 KC thru .5 mf condenser

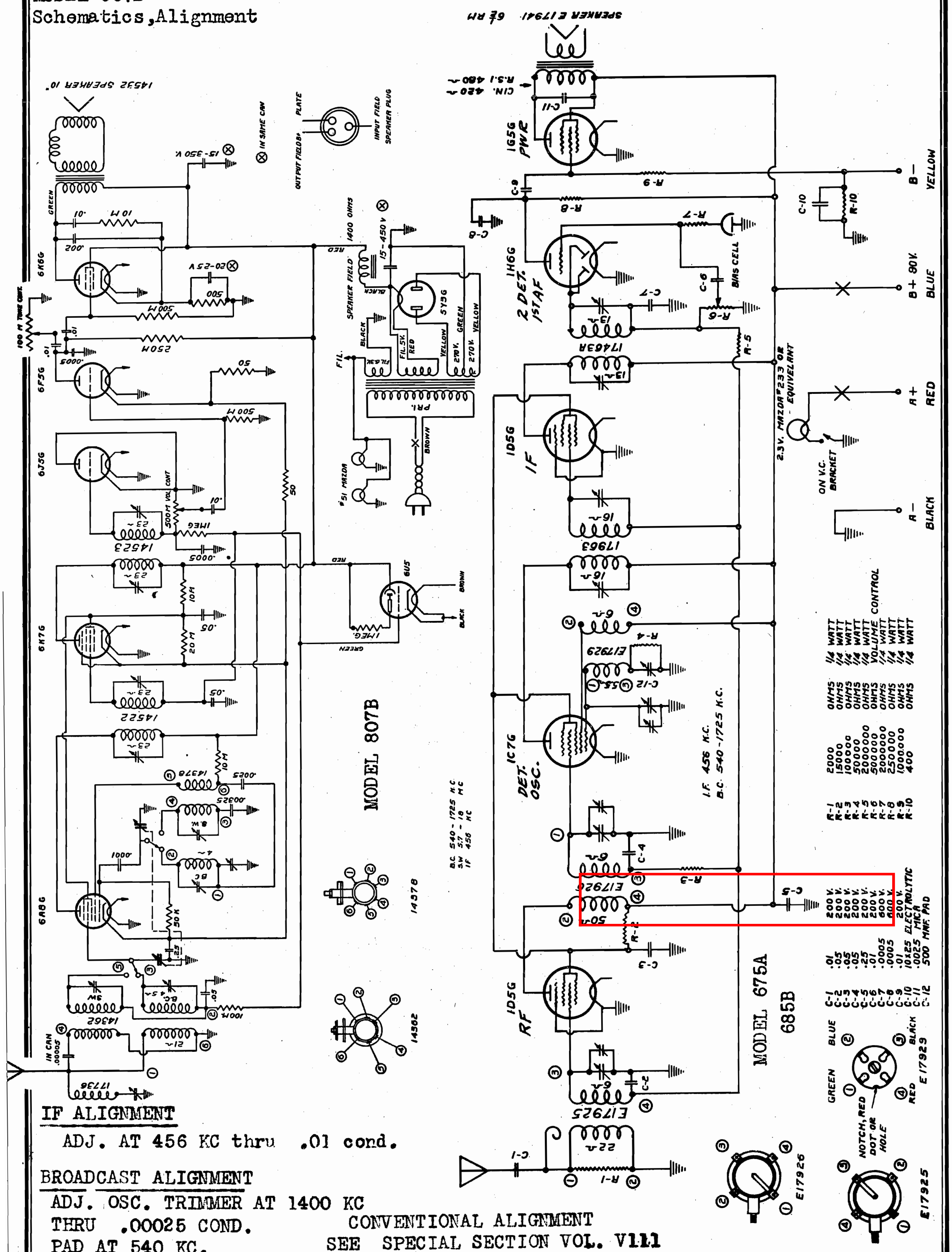
B.C. ALIGNMENT - Adj. osc. trim. thru 17 mmf cond. at 1500 KC.
Adj. RF & Ant. trim. at 1400 KC. - Pad at 600 KC.

SENSITIVITY - 1000 KC. CHECK

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION VOLUME VII

MODELS 675A, 685B
MODEL 807B
Schematics, Alignment

GAMBLE-SKOGMO, INC.



IF ALIGNMENT

ADJ. AT 456 KC thru .01 cond.

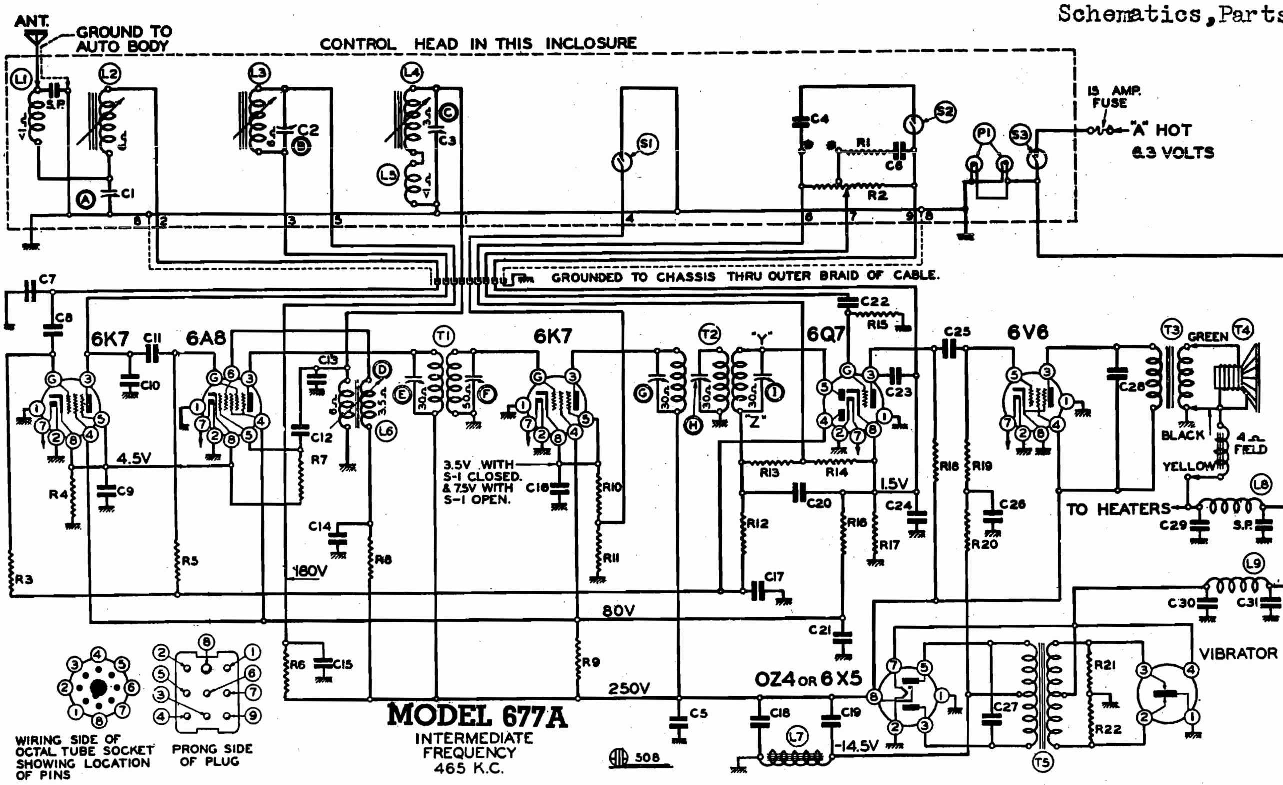
BROADCAST ALIGNMENT

ADJ. OSC. TRIMMER AT 1400 KC
THRU .00025 COND.
PAD AT 540 KC.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

MODEL 677A
MODEL 677B
Schematics, Parts

GAMBLE-SKOGMO, INC.



PARTS (Serial No. 30,001 and up)

CONDENSERS

Code	Part No.	Description
C1	124-45	Antenna trimmer 50 - 450 w. c. 350 mmf.
C2	127-82	R. F. Trimmer - 5-30 mmf.
C3	127-84	Oscillator Trimmer 5 - 30 mmf.
C4	100-25	.002 x 600 v. - 25%
C5	100-74	.1 x 400 v. 50 - 10%
C6	100-19	.006 x 600 v. - 25%
C7	129-95	.00015 Mica 2½%
C8	129-39	.00005 Mica 20%
C9	100-22	.05 x 200 v. 25%
C10	129-96	.000035 Mica 5%
C11	129-2	.0005 Mica 20%
C12	129-12	.00025 Mica 20%
C13	129-97	.00005 Mica 5%
C14	100-13	.05 x 400 v. 25%
C15	116-24	By pass block .25 x 400 v. 20-10%
C16	100-9	.05 x 200 v. 25%
C17	100-22	.05 x 200 v. 25%
C18	119-51	8.0 mfd. 350 w.v. lytic
C19	119-51	8.0 mfd. 350 w.v. lytic
C20	129-5	.0001 Mica 20%
C22	100-11	.01 x 400 v. 25%
C21	116-24	.25 x 400 v. 20-10% By pass block
C23	129-5	.0001 Mica 20%
C24	100-26	.02 x 400 v. 25%
C25	100-11	.01 x 400 v. 25%
C26	116-24	.25 x 200 v. 20-10%
C27	100-23	.01 x 1400 v. 20-10%
C28	100-38	.01 x 800 v 10%
C29	129-6	.002 Mica 20%
C30	100-31	.5 x 120 v. 50-10%
C31	100-31	.5 x 120 v. 50-10%
SP		Spark Plates (2)

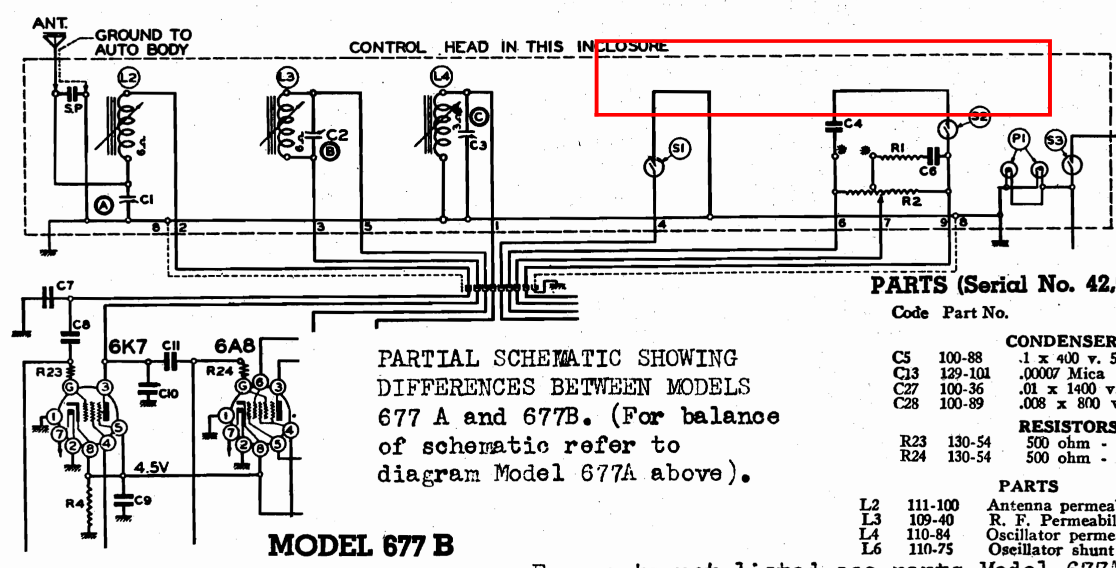
C15, C21 and C26 in same unit
C18 and C19 in same unit

RESISTORS

Code	Part No.	Description
R1	130-214	30M - ½ w. 20%
R2	101-109	1.2 meg. volume control
R3	130-19	1 megohm - ⅓ w. 20%
R4	130-79	400 ohm - ⅓ w. 10%
R5	130-19	1 megohm - ⅓ w. 20%
R6	130-21	20M ohm - ⅓ w. 20%
R7	130-12	50M ohm - ⅓ w. 20%
R8	130-12	50M ohm - ⅓ w. 20%
R9	130-65	30M ohm - 1 watt 20%
R10	130-39	700 ohm - ⅓ w. 20%
R11	130-85	3M ohm - ⅓ w. 20%
R12	130-19	1 megohm - ⅓ w. 20%
R13	130-20	100M ohm - ⅓ w. 20%
R14	130-118	600M ohm - ⅓ w. 20%
R15	130-19	1 megohm - ⅓ w. 20%
R16	130-208	40M ohm - ⅓ w. 20%
R17	130-101	600 ohm - ⅓ w. 10%
R18	130-11	250M ohm - ⅓ w. 20%
R19	130-5	300M ohm - ⅓ w. 20%
R20	130-11	250M ohm - ⅓ w. 20%
R21	130-56	100 ohm - ⅓ w. 20%
R22	130-56	100 ohm - ⅓ w. 20%

PARTS

Code	Part No.	Description
L1	111-96	Antenna Choke (No. 111-97)
L2	111-96	Antenna permeability coil complete
L3	109-40	R. F. Permeability coil complete
L4	110-77	Oscillator permeability coil complete
L5	110-77	Oscillator series coil (No. 110-79)
L6	110-75	Oscillator shunt coil Adj.
L7	105-62	Filter Choke - 250 ohms
L8	105-66	"A" Choke
L9	105-65	"A" Choke
T1	108-96C	Input I. F. Complete - 465 kc.
T2	108-115	Output I. F. Complete - 465 kc.
T3	105-61	Output Transformer
T4	114-113	8" Dynamic speaker
T5	104-132	Power Transformer
S1	125-47	Sensitivity switch
S2	125-47	Tone control switch
S3		Off-on switch on volume control
P1	107-97	6-8 v. pilot light (2)



PARTIAL SCHEMATIC SHOWING DIFFERENCES BETWEEN MODELS 677 A and 677B. (For balance of schematic refer to diagram Model 677A above).

PARTS (Serial No. 42,000 and up)

CONDENSERS

Code	Part No.	Description
C5	100-88	.1 x 400 v. 50 - 10%
C13	129-101	.00007 Mica 5%
C27	100-36	.01 x 1400 v. 20-10%
C28	100-89	.008 x 800 v. 10%

RESISTORS

Code	Part No.	Description
R23	130-54	500 ohm - ⅓ w. 20%
R24	130-54	500 ohm - ⅓ w. 20%

PARTS

Code	Part No.	Description
L2	111-100	Antenna permeability coil complete
L3	109-40	R. F. Permeability coil complete
L4	110-84	Oscillator permeability coil complete
L6	110-75	Oscillator shunt coil Adj.

For parts not listed, see parts, Model 677A (above).

MODEL 677A
MODEL 677B
Alignment, Socket, Trimmers
Automatic Tuner Procedure

MODEL 527A
Tuner Procedure

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are six levers on the dial by means of which six stations may be selected. (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the escutcheon is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in the escutcheon above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now Rotate the turning knob (No. 2) to the left (counter clockwise) as far as it will turn, and tighten the special reset lock screw ("C") located on left side of remote turner unit. (See Fig. 2).

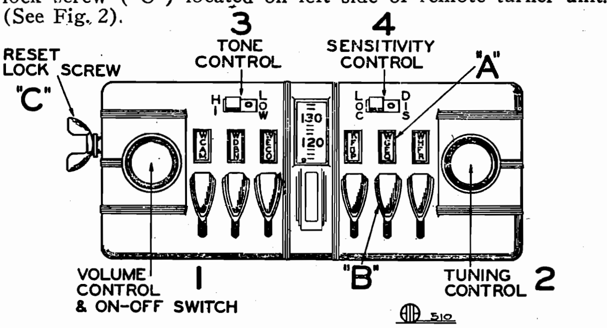


Fig. 2—Front View of Remote Tuner Unit

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Reset lock screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" one or two turns; select the new station as explained. **Be sure to retighten the locking screw**, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and Presto!—your favorite station is selected.

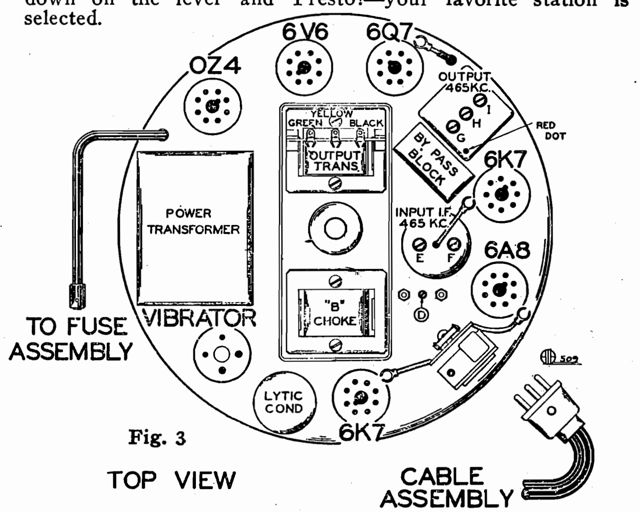


Fig. 3

TOP VIEW

I.F. ALIGNMENT: (465 K.C.)

IMPORTANT:

To align the output I.F. transformer without using a cathode ray oscillograph a 10M ohm resistor must be shunted across the tertiary coil of this unit.

Connect the resistor as indicated by points "Y" and "Z" on the circuit diagram as follows:

Locate the wires coming from the bottom of the output I.F. coil assembly on the underside of the radio chassis.

The white lead with green tracer which is connected to diode plate terminal No. 5 on the 6Q7 tube socket is one point and the **white lead with brown tracer** which is connected to the end terminal of the terminal strip is the other point. Proceed as follows:

1. With the dial of the Remote Tuner Unit set at 1400 K.C. and with volume control full on, connect test oscillator

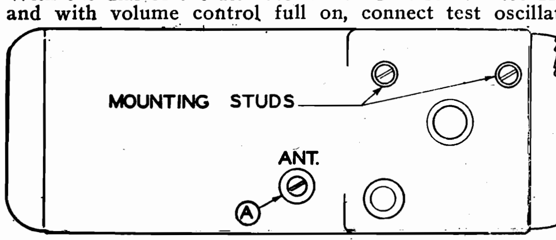
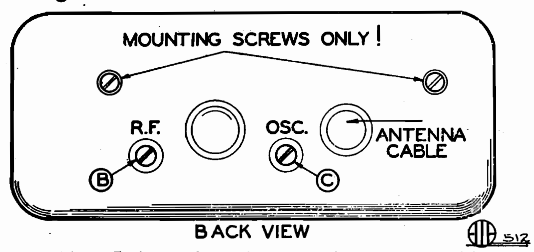


Fig. 4 SIDE VIEW



set at 465 K.C. in series with I.F. dummy to grid of 6K7 I.F. tube. (.5 MF COND.)

2. Adjust trimmers "G" and "H" of output I.F. transformer for maximum gain, (See Fig. 3, top view).
3. Disconnect the 10M ohm resistor which has been shunted across the tertiary winding and adjust trimmer "I" for maximum gain.
   (a) This transformer is now correctly tuned. Under no circumstances re-adjust trimmers "G" and "H" after the 10M ohm resistor has been removed.
   (b) For alignment of the output I.F. transformer using a cathode ray oscillograph the 10M ohm resistor is not used and the procedure is similar to the alignment of any two circuit I.F. transformer; merely tune for a symmetrical curve of maximum amplitude.
   (c) Output connections for the cathode ray oscillograph should be made to pin No. 8 on 6Q7 tube socket and to the end terminal on the terminal strip; at this point the diode load resistors terminate.
4. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers "E" and "F" of input I.F. transformer for maximum gain.

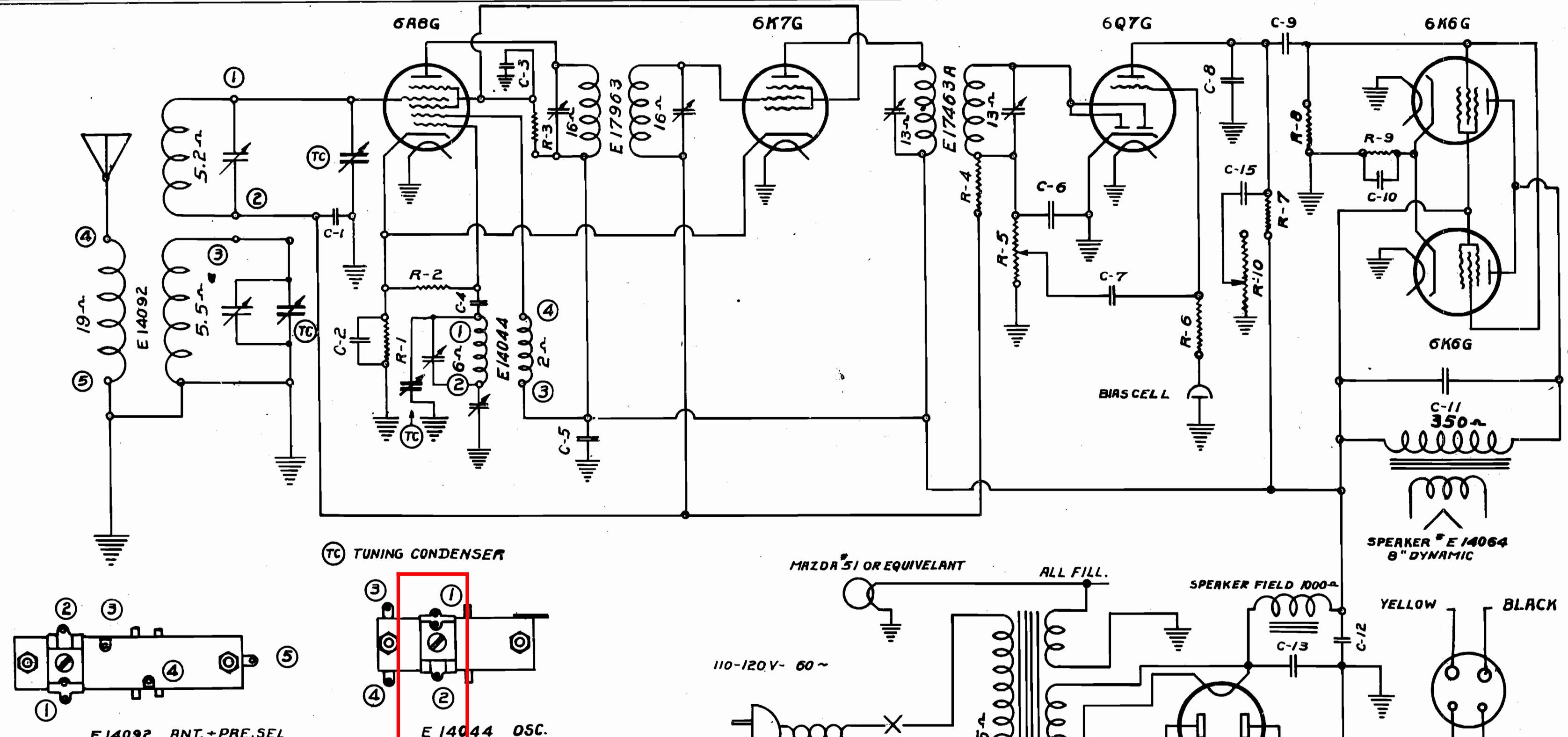
NOTE: A red dot on top of output I.F. can designates location of trimmer "G"

BROADCAST ALIGNMENT:

1. With the dial on the Remote Tuner Unit set at 1560 K. C., connect test oscillator set at 1560 K. C. in series with broadcast dummy to the antenna lead of receiver. (175 MMF COND)
2. Adjust oscillator trimmer (adjustment "C", on back of Remote Tuner Unit) to resonance. (See Fig. 4, back view).
3. Re-set test oscillator to 1400 K.C. and pick up signal by rotating dial on Remote Tuner Unit. Adjust R. F. trimmer (adjustment "B", on back of Remote Tuner Unit), and Antenna Trimmer (adjustment "A", on side of Remote Tuner Unit), to resonance.
4. Re-set test oscillator to 600 K.C. and rotate Remote Tuner Unit dial to 600 K. C. Adjust shunt oscillator adjustment "D", rotating dial to and fro at the same time adjusting shunt oscillator for maximum gain. This adjustment is accessible from the top of the radio chassis, (See Fig. 3, top view).
5. Go back and check 1400 K. C. If adjustment is made here, check 600 K. C. again.

MODEL 690B
Schematic
Alignment

GAMBLE-SKOGMO, INC.



POWER TRANSFORMER # E-17960 60 CYC.
POWER TRANSFORMER E-14141 25 CYC.

C-1	.05	200 V.	
C-2	.25	150 V.	
C-3	.05	400 V.	
C-4	.0001	MICA.	
C-5	.1	400 V.	
C-6	.0005	600 V.	
C-7	.01	200 V.	
C-8	.0005	600 V.	
C-9	.01	400 V.	
C-10	10	MFD.	25V.
C-11	.005	600 V.	
C-12	16	MFD.	250V.
C-13	16	MFD.	350V.
C-14	.03	400V.	
C-15	.01	400V.	

C-10 – C-12 – C-13 ALL IN SAME CAN

R-1	200	OHM	1/4 WATT.
R-2	50000	OHM	1/4 WATT.
R-3	30000	OHM	1 WATT.
R-4	1000000	OHM	1/4 WATT.
R-5	500000	VOLUME CONTROL	
R-6	500000	OHM	1/4 WATT.
R-7	350000	OHM	1/4 WATT.
R-8	500000	OHM	1/4 WATT.
R-9	300	OHM	1 1/2 WATT.
R-10	100000	TONE CONTROL	

I.F. 456 K.C.
B.C. 540-1725 K.C.

TUBE FUNCTIONS: "6A8G" First detector - oscillator, "6K7G" Intermediate amplifier, "6Q7G" Second detector and first audio, two "6K6G" as parallel power tubes, "5Y3G" rectifier.

IF ALIGNMENT: Connect signal generator to grid of 6A8G tube, through a .01 condenser, leave grid cap in place and turn tuning condenser open - peak IF transformers at 456 KC.

BROADCAST ALIGNMENT: Check pointer setting - should reach end of scale with condenser closed - may be changed slightly by loosening set screw on lower pulley and slipping pulley around on tuning shaft. Connect signal generator to antenna terminal through .00025 condenser. Trim oscillator at 1400 KC-- this trimmer is reached through hole in top of chassis to the right of antenna coil. Pad at 540 KC, recheck at 1400, and trim preselector trimmer on coil on top of chassis, and antenna trimmer on gang condenser at 1400 KC. Use as low output from generator as possible for final adjustments and it is best to use an output meter connected across speaker to indicate "peak".

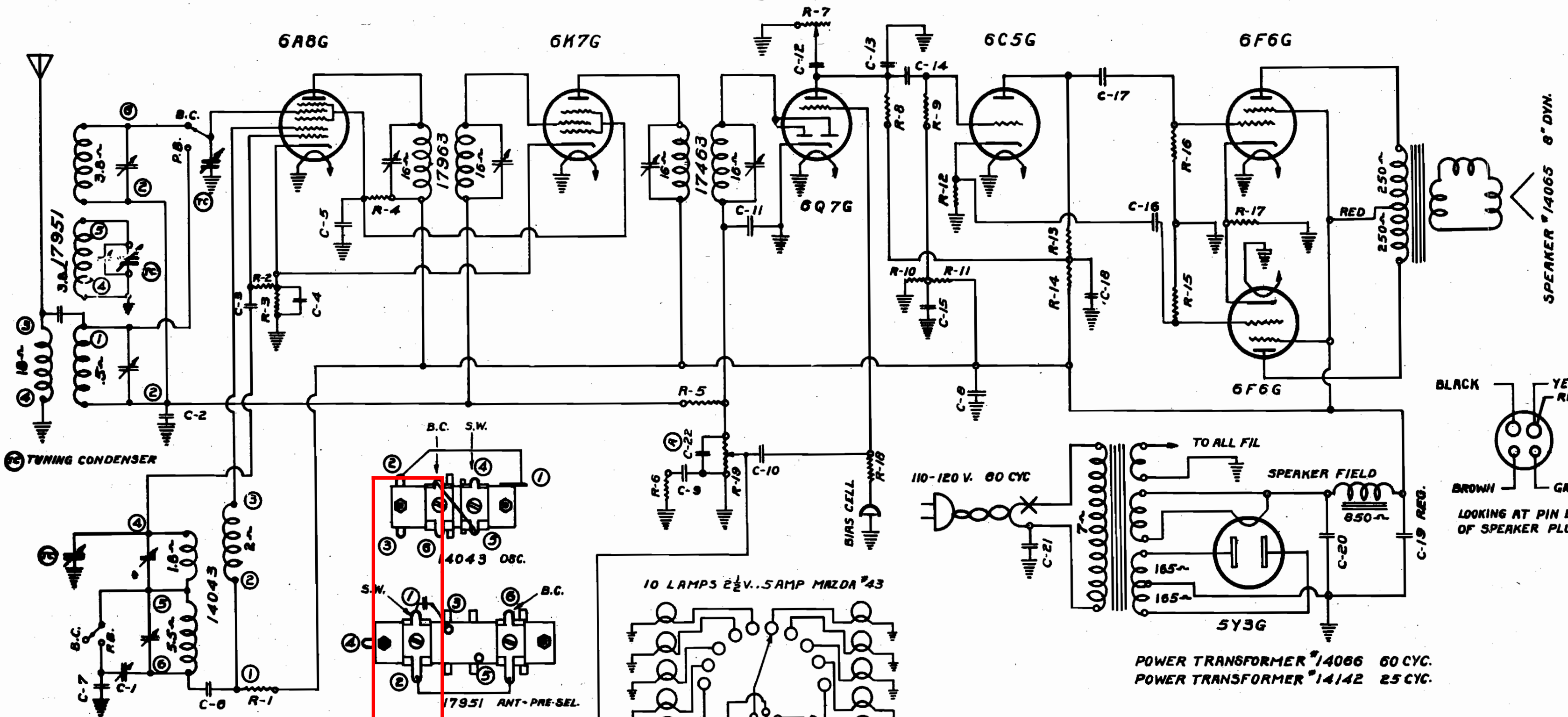
MODEL 715B
Schematic
Alignment

GAMBLE-SKOGMO, INC.

IF ALIGNMENT: Connect signal generator to grid of 6A8G tube, through a .01 condenser, leave grid cap in place and turn tuning condenser open - peak IF transformers at 456 KC.

BROADCAST ALIGNMENT: Connect signal generator to antenna terminal through a .00025 condenser. Trim oscillator at 1400 KC (see picture of coil on circuit diagram for location of trimmer). Adjust padder condenser at 540 KC, recheck at 1400 KC, then peak antenna and preselector trimmers at 1400 KC. (See picture on diagram for location of antenna trimmer, preselector trimmer is on gang condenser.)

SHORT WAVE ALIGNMENT: Connect signal generator to antenna terminal through a 300 or 400 ohm resistor. Be sure wave switch is to the "left". Trim SW oscillator at 6 MC., also SW antenna coil at same frequency. The SW pad condenser is fixed for proper range.



C-1	650 MMF	PAD
C-2	.05	200 V.
C-3	.0001	MICA
C-4	.25	200 V.
C-5	.05	400 V.
C-6	.0025	MICA
C-7	.0018	P. B. PAD
C-8	.25	400 V.
C-9	.05	200 V.
C-10	.01	200 V.
C-11	.0005	600 V.
C-12	.01	400 V.
C-13	.0005	600 V.
C-14	.01	400 V.
C-15	.05	200 V.
C-16	.01	400 V.
C-17	.01	400 V.
C-18	.1	400 V.
C-19	16 MMF.	300 V. REG.
C-20	16 MMF.	475 V.
C-21	.02	400 V.
C-22	.0005	600 V. REMOVED AFTER SERIAL #723

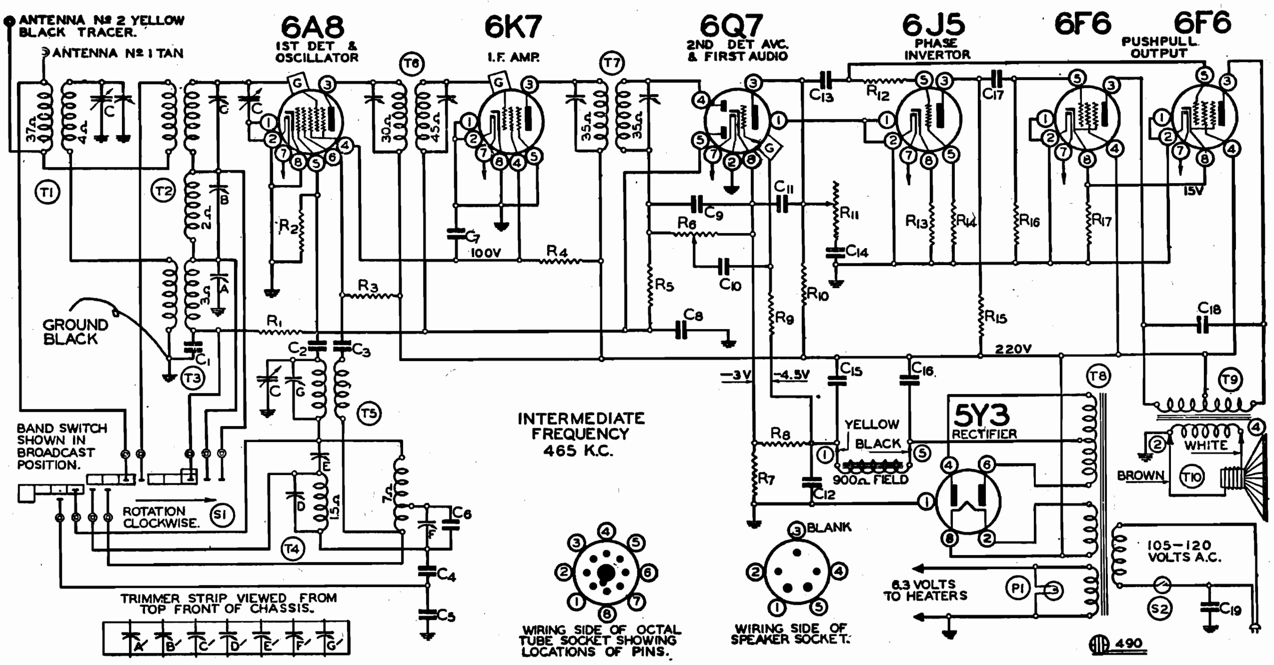
R-1	15000	OHMS	1 WATT
R-2	50000	OHMS	1/4 WATT
R-3	200	OHMS	1/4 WATT
R-4	20000	OHMS	1/4 WATT
R-5	1 MEG.	OHMS	1/4 WATT
R-6	8000	OHMS	1/4 WATT
R-7	100000	TONE CONTROL	
R-8	.25 MEG.	OHMS	1/4 WATT
R-9	.5 MEG.	OHMS	1/4 WATT
R-10	50000	OHMS	1/4 WATT
R-11	.5 MEG.	OHMS	1/4 WATT
R-12	25000	OHMS	1/4 WATT
R-13	25000	OHMS	1/4 WATT
R-14	50000	OHMS	1/4 WATT
R-15	.25 MEG.	OHMS	1/4 WATT
R-16	.25 MEG.	OHMS	1/4 WATT
R-17	300	OHMS	1½ WATT
R-18	.5 MEG.	OHMS	1/4 WATT
R-19	.5 MEG.	VOLUME CONTROL	
R-20	4 OHM WIRE WOUND		

TUBE FUNCTIONS & CIRCUIT: "6A8G" First detector - oscillator, "6K7G" Intermediate amplifier, "6Q7G" Second detector and first audio, "6C5G" Phase invertor, two "6F6G" as push-pull power tubes, "5Y3G" Rectifier.

MODEL 761A
Schematic, Voltage
Socket, Trimmers

GAMBLE-SKOGMO, INC.

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Lower Scale	540 to 1750 K.C. (Kilocycles)
Middle Wave	Upper Scale	1730 to 5800 K.C. (Kilocycles)
Short Wave	Center Scale	5.5 to 18.1 M.C. (Megacycles)



MODEL 761 A

PARTS (Serial No. 8A973750 and up)

RESISTORS

Code No.	Part No.	Description
R1	130-103	100M ohm - 1/3 w. 10%
R2	130-12	50M ohm - 1/3 w. 20%
R3	130-123	15M ohm - 1/2 w. 10%
R4	130-196	30M ohm - 1 w. 10%
R5	130-4	3 megohm - 1/3 w. 20%
R6	101-104	1 megohm volume control
R7	130-198	40 ohm - 1/2 w. 10%
R8	130-197	20 ohm - 1/3 w. 10%
R9	130-4	3 megohm - 1/3 w. 20%
R10	130-103	100M ohm - 1/3 w. 10%
R11	101-105	300M ohm - tone control
R12	130-163	400M ohm - 1/3 w. 10%
R13	130-22	5M ohm - 1/3 w. 20%
R14	130-103	100M ohm - 1/3 w. 10%
R15	130-12	50M ohm - 1/3 w. 20%
R16	130-102	500M ohm - 1/3 w. 10%
R17	130-195	250 ohm - 1.2 w. 10%

CONDENSERS

Code No.	Part No.	Description
C	102-62	3 gang variable
C1	100-22	.05 x 200 v. 25%
C2	129-67	.00004 Mica 10%
C3	100-25	.002 x 600 v. 25%
C4	129-83	.0027 Mica 2-1/2%
C5	129-84	.003 Mica 2-1/2%
C6	129-88	.0006 Mica 5%
C7	100-39	.1 x 400 v. 20%
C8	100-26	.02 x 400 v. 25%
C9	129-5	.0001 Mica 20%
C10	100-26	.02 x 400 v. 25%
C11	129-2	.0005 Mica 20%
C12	100-20	.1 x 200 v. 25%
C13	100-26	.02 x 400 v. 25%
C14	100-57	.006 x 600 v. + 10 - 20%
C15	103-14	16 mfd. lytic 275 w.v. Reg.
C16	103-6	8 mfd. lytic 350 w.v.
C17	100-26	.02 x 400 v. 25%
C18	100-37	.003 x 600 v. 10%
C19	100-61	.02 x 600 v. bakelite 20%

FOR ALIGNMENT
AND TUNER DATA
SEE INDEX

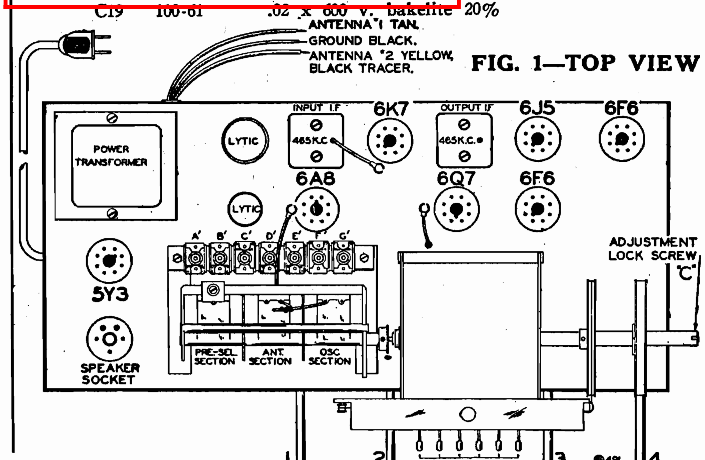


FIG. 1—TOP VIEW

GAMBLE SKOGMO, INC.

Telephone Dial Adjustments,Data

NOS. 9, 10, & 11 — 17 BUTTON TELEPHONE DIAL

NOS. 3 & 7 — PHANTOM LIGHT DIAL

APRIL, 1937

Identification of Dial and Chassis

The following description will identify the different dials:

No. 9 Dial—17 Button Telephone Dial—Station call letters in black push buttons.

No. 11 Dial—Same as No. 9 Dial except push buttons are brown.

No. 10 Dial—17 Button Telephone Dial—Station call letters are rectangular in shape and are mounted in rectangular openings in escutcheon ring. Equipped with visible tone and volume indicators.

No. 3 Dial—Glass dial—Moving beam of light indicators—Tone and volume indicated by series of circles.

No. 7 Dial—Glass dial—Moving beam of light indicators—Tone and volume indicated by slanting lines.

Telephone Dial Assembly

The telephone dial assembly provides a means of pre-setting a number of broadcasting stations and tuning in these stations at any time by depressing a button and rotating the dial to a stop position.

The apparatus is mounted on an assembly attached at the front of the chassis. An examination of this assembly will clearly show the method of operation.

Silencer Circuit—A silencer circuit is provided which results in silent tuning between stations when using the telephone dial buttons.

When a telephone dial button is depressed, a circuit is established between the ungrounded end of the volume control and the chassis ground. Referring to Fig. 1 it will be noted that contact is made between the line from the volume control, contact ring, contact washer arm (when button is depressed), spring and pulley ring stud. Since the pulley ring is at ground potential, this grounds the audio voltage and no signal will be heard until the button is released to break the contact.

It should be noted that the contact ring is part of the pulley ring assembly, but is insulated from it.

In the case of powerful local stations a slight amount of signal may be heard when the button is depressed.

Telephone Dial Adjustments

Noise When Tuning in a Signal with a Telephone Dial Button

As explained in the article on "Silencer Circuit" in this manual, no noise or signal should be heard when tuning in a signal with a telephone dial button until the button is released. If noise is heard while tuning in a signal with one of these buttons, it can be corrected as follows:

If Noise Occurs on All Buttons—This is probably due to a poor contact between the flat contact spring and the contact ring—See Fig. 1. Clean the flat contact spring and contact ring to insure a good electrical connection. Ordinary cleaning fluid may be used and will be effective in most cases in cleaning the surface without affecting the plating. If the contact is still not satisfactory, a piece of fine emery cloth may be used.

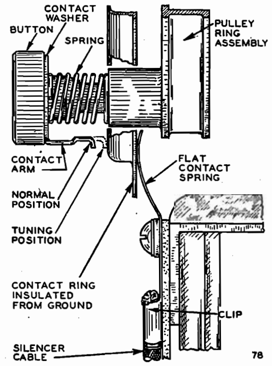


Fig. 1—Silencer Assembly

If Noise Occurs on One Button Only—This is due to a poor contact between the pulley ring stud, spring, contact washer, and contact ring—See Fig. 1. Clean all of these items of the particular button, in the same manner as mentioned previously, so as to provide a good electrical connection.

Telephone Dial Drive Cord Slipping

If the telephone dial drive cord slips on the tuning shaft pulley, this may be remedied by adjusting the drive cord tension pulley. Loosen the tension pulley bracket screw and adjust pulley assembly until the desired tension is obtained.

Position of Stop Pin

When the telephone dial assembly is on the chassis, the gang condenser rotor should not completely open or close. The travel of the rotor in this respect is controlled by the gang stop pin on the pulley ring—See Fig. 4. This is necessary to protect the gang condenser in case the telephone dial is swung rapidly to either of the extreme positions. When the gang stop pin is properly set, it will serve as the stop at both extreme positions. If the rotor is seen to open completely or close completely, the stop pin should be pulled back and re-set to overcome this condition.

Greasing and Oiling

After a period of time, put some light grease on the pulley ring shaft and on the teeth of the pulley ring. Use light oil on the drive shaft assembly bearing, care being taken not to get any on the drive cord.

Telephone Dial Replacements

Replacing Complete Dial and Condenser Assembly

Remove the grid lead clip from tube grid cap.

Remove silencer cable from the contact spring assembly. Unsolder dial lamp lead from terminal of tube socket.

Unsolder the three stator section connections of the gang condenser. Unsolder the three braided shield leads which ground the gang condenser frame to the chassis, taking care not to loosen the connections of any other units which are grounded at these common points.

At the back of the gang condenser is a stud which secures the assembly to an "L" bracket which is secured to the chassis.

Through this stud is a cotter pin. Remove only the cotter pin, metal washer, and rubber washer.

Viewing the assembly from the back, on the left is a brass bolt which holds the dial support bracket to the chassis—remove this bolt from underneath the chassis.

Grasp the dial support brace and move entire assembly toward the front of the chassis. When the support casting rubber cushions slip clear of the slot in front of chassis, lift entire assembly clear of chassis.

To replace this assembly, reverse the procedure as given above.

Replacing Pulley and Button Ring Assembly Only

Remove drive cord.

From underneath the chassis, unsolder the dial lamp lead from prong of the tube socket. Pull this lead through and out to the front of the assembly.

Remove the four escutcheon screws which hold the escutcheon ring and glass crystal in place. The dial scale pointer is removed by unhooking it from the center stud. Unscrew and remove center stud, washers, and dial scale. Slide pulley ring assembly off the center shaft.

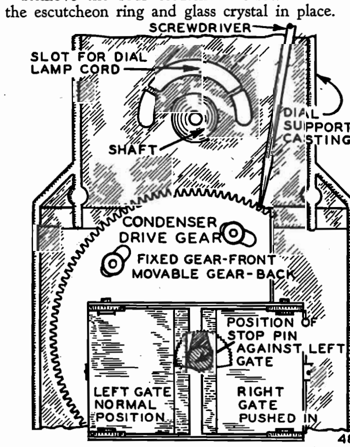


Fig. 2—Replacing Pulley Ring Assembly

On the No. 10 dial, two strips of celluloid between the escutcheon ring and the glass crystal will have to be removed.

To replace the pulley ring assembly, proceed as follows: Lay the assembly face down and adjust the stop pin. The stop pin (Fig. 2) is directly in back of the wide spacer on the dial button ring. Pull this pin back and adjust it to the center position —See Fig. 2.

Rotate tuning condenser rotor counter-clockwise (from front) as far as possible—See. Fig. 2.

Place the pulley ring assembly on the shaft with the knot of the dial lamp lead at the top—do not engage the gears.

Pull the dial lamp lead through the slot in the pulley ring gear and through the long slot in the dial support casting. Then place this lead through the clip under the dial support brace and out through the opening in the back of this brace.

With the gears still disengaged, rotate the pulley ring clockwise (from front) ½ revolution until the stop pin passes over the right gate and comes to rest against the left gate—See Fig. 2.

With the condenser rotor fully closed, push the pulley ring on the shaft until the pulley ring gear engages the *fixed gear only* (front) of the condenser drive gear assembly. Hold the pulley ring assembly and with a fine blade screw driver, move the movable (back) gear clockwise one tooth relative to the fixed gear—See Fig. 2. Then push the pulley ring all of the way on, engaging the movable gear.

Now lay the chassis on its back. Replace in the order given the large washer with rectangular hole, dial scale, washers, center stud, dial pointer, glass crystal, and escutcheon. Resolder the lamp lead.

For the No. 10 dial, before putting the escutcheon on, lay the two celluloid strips on the glass crystal with the inside flange facing away from the glass. Then lay the escutcheon on top of the celluloid strips. The section not cut out for station call letters should be at the wide spacer in the button spacer ring. Center the small holes in the celluloid discs in the station call letter openings and then tighten the escutcheon screws.

The stop pin must now be adjusted, as explained in article "Position of Stop Pin," until the condenser does not open or close fully. Injury to the condenser will result if allowed to open or close fully.

Replace the drive cord as explained in the article "Replacing Drive Cord."

Replacing Gates

After a great amount of use, one or both of the stop gates may wear, making it necessary to replace the stop gate assembly. This is done by first removing the pulley ring assembly as explained in the article "Replacing Pulley and Button Ring Assembly."

The stop gate assembly is then removed by taking out the two screws at the bottom of the assembly

Phantom Light Dial
Assembly Views, Data
Parts List

GAMBLE SKOGMO, INC.

MODEL 762
MODEL 774
MODEL 776

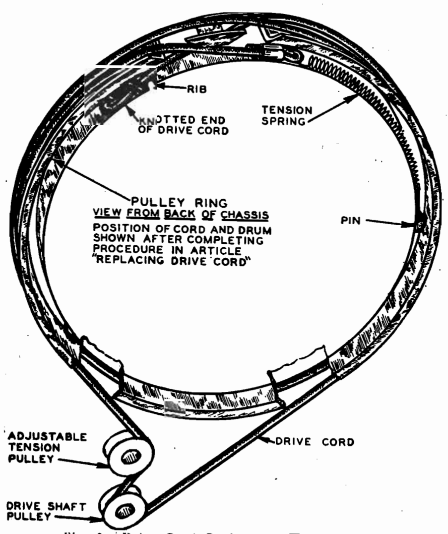


Fig. 3—Drive Cord Replacement–Telephone Dial

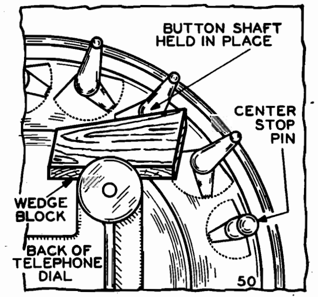


Fig. 4—Holding a Push Button Shaft in Place

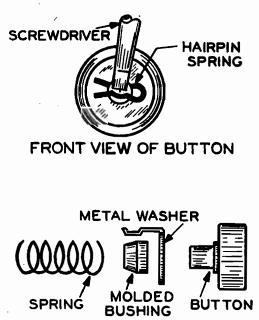


Fig. 5—Putting a Hair Spring on a Push Button Shaft

Replacing a Telephone Dial Button or Button Shaft

A telephone dial button or button shaft may be replaced without removing the chassis from the cabinet.

Rotate the dial until the button shaft to be replaced is in the position shown in Fig. 4. Using a wooden wedge block or any other wedge, hold this button shaft in place as shown. Remove the clear celluloid disc and the call letter disc with the point of a pin from the button of the shaft to be replaced (No. 10 dial—brown opaque celluloid disc only).

Remove the hairpin spring from the front of this shaft, spreading it with an ice pick or screwdriver. Take off the button, metal washer, molded bushing, and spring. Take out the wedge block, remove the button shaft to be replaced from the back of the dial assembly and put in the new one. Then put the wedge block back in place again as illustrated.

Lay the cabinet back down against a chair so that it will be about 30 degrees from the vertical position.

Assemble the spring, molded bushing, metal washer, and button in the order shown in Fig. 5. (Last three items may be in one unit). Push the button and spring assembly over the button shaft with the tab of the metal washer in the normal position—See illustration in instruction book. Hold the tab and rotate the button until the flat in the shank coincides with the flat on the shaft. Push the button all of the way on.

Put the hairpin spring in place, as shown in Fig. 5, with the upper part of the slot near the end of the button shaft and the lower part over the end of the shaft. Place the blade of a screwdriver at the center of the lower part of the spring and push down until the spring snaps into place in the slot on the shaft. Remove the wedge block.

Phantom Light Dial - Replacing Drive Cord

Remove the dial assembly as follows: Take out the screw which secures the dial frame brace to the back of the gang condenser. Take out the two screws which secure the brackets on the bottom of the dial frame to the chassis. Lay the dial assembly face down in front of the chassis—it is not necessary to remove the volume control and tone control indicator cords.

Remove the phantom light assembly from the drive drum by taking out the screw.

Take off the old cord and tension spring. Tie a knot with a small loop in it in one end of the new cord. Then tie the other end of this cord to the hook on the tension spring. The distance from the loop on one end to the tension spring is 17¾ inches.

From the front of the chassis, place the looped end of the cord through the drum hole located near the cord track opening, and hook it over the hook provided for it at the back of the drum.

Bring the cord up and around the right side of the drum, keeping the cord in the grooved track of the drum.

Bring the cord down to the right side of the drive shaft and wind it three and one-third times around this shaft progressing toward the back.

Then bring the cord up and around the left side of the drive drum. Hook the tension spring on the hook of the drive drum.

Replace the phantom light and the dial assembly.

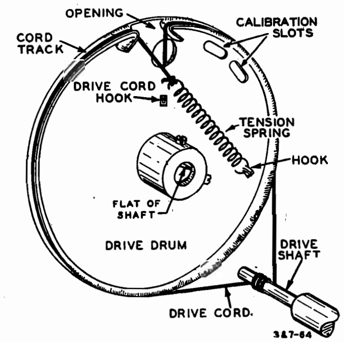


Fig. 6—Drive Cord Replacement, Phantom Light Dial

Phantom Light Dial Parts

See article "Identification of Dial and Chassis" in this manual in order to determine the correct dial and chassis assembly number.

Prices Subject to Change Without Notice.

DESCRIPTION	No. 3 DIAL PARTS — PART NO.	No. 3 DIAL PARTS — LIST PRICE	No. 7 DIAL PARTS — PART NO.	No. 7 DIAL PARTS — LIST PRICE
DIAL ASSEMBLY				
Dial Assembly, Complete with Dial Glass, Dial Assembly Mounting Plate, Brace, Support Bracket, Celluloid Dial Background, Indicator Tension Spring, Indicator Cords, Indicator Cord Takeup Collars, Side Reflectors, Lamp Sockets and Lamps, Fibre Strips, and Fibre Light Shield	Specify Type of Dial, Name on Dial or Escutcheon, Model or Series of Radio	$10.85	Specify Type of Dial, Name on Dial or Escutcheon, Model or Series of Radio	$10.70
Dial Glass Only (Series A1-A5)	See Above	.95	See Above	.80
Dial Glass Only (Series A4)	See Above	.95	See Above	.70
Celluloid Background for Dial (Series A1-A5)	58X206	.45	9X41	.40
Celluloid Background for Dial (Series A4)	58X206	.45	9X42	.40
Dial Assembly Mounting Plate with Tone & Volume Indicators, and Indicator Pulleys	25X381	.90	25X411	1.00
Dial Assembly Brace (Attached to Gang Condenser)	25X383	.10	25X383	.10
Fibre Strip (At Back of Tone and Volume Indicator Lamps)	11X58	.10	11X58	.10
Tension Spring for Tone and Volume Indicators	28X88	.10	28X88	.10
8" Black Cord for Indicators	doz.	.20	doz.	.20
Brass Collars with Set Screws—to secure Indicator Cords to Shafts	29X20 ea.	.10	29X20 ea.	.10
Dial Lamp Reflector (Right From Front)	41X18	.10	41X18	.10
Dial Lamp Reflector (Left From Front)	41X17	.10	41X17	.10
Dial Lamp Sockets and Clips (For Edge Lighting of Dial and Tone & Volume Indicators)	7A62	.10	7A62	.10
Dial Lamp Socket Assembly (4 Sockets) Less Lamps	7A64	.60	7A64	.60
Dial Lamp (No. 51 Bayonet Type)	7A32	.20	7A32	.20
Phantom Light Assembly Complete with Lamps (Series A1-A5)	25A164	1.65	25A164	1.65
Phantom Light Assembly Complete with Lamps (Series A4)	25A207	1.30	25A207	1.30
Springs for Lamps of Above Assembly	28X86 ea.	.10	28X86 ea.	.10
Brass Collars for Lamps of Above Assembly	19X61	.10	19X61	.10
Bracket (To secure Phantom Light Assembly to Drum)	25X360	.10	25X360	.10
Fibre Strip (At bottom of Dial Glass)	11X59	.10	11X59	.10
DRIVE ASSEMBLY				
Tuning Shaft Only	26X248	.15	26X248	.15
Tuning Drive Cord—20"	doz.	.45	doz.	.45
Tension Spring for Above Cord	28X27 ea.	.10	28X27 ea.	.10
Drive Drum & Hub	24X279	.40	24X279	.40
Rubber Cushion (Front) for Assembly Mounting	8X43 ea.	.10	8X43 ea.	.10
Rubber Cushion (Rear)—Gang Mounting	8X44 ea.	.10	8X44 ea.	.10
Rubber Cushion (Rear—under Chassis)—Gang Mounting	8X45 ea.	.10	8X45 ea.	.10
Rear Mounting Foot for Gang Condenser	25X283	.10	25X283	.10
Support Bracket and Drive Shaft Bushing for Gang Condenser	25X380	.45	25X380	.45

MODEL 762
MODEL 774
MODEL 776
Telephone Dial
Parts List

GAMBLE-SKOGMO, INC.

Telephone Dial Replacement Parts

See article "Identification of Dial and Chassis" in this manual in order to determine the correct dial and chassis assembly number.

Replacing Drive Cord

Remove the old drive cord and tension spring. Rotate telephone dial clockwise (from back of chassis) as far as it will go.

Viewing the pulley ring drum from above and to the back, place the knotted end of the drive cord in the slot provided for it, catching the knot in back of the rib as shown in Fig. 3.

Bring the cord down and around the right side (from back) of the drum at front part of groove in pulley ring drum and under the drive shaft pulley making one-half turn on this pulley. Then bring the cord around the right side (from back) of the adjustable tension pulley and up to the upper left side of the pulley ring drum in front of the cord already on.

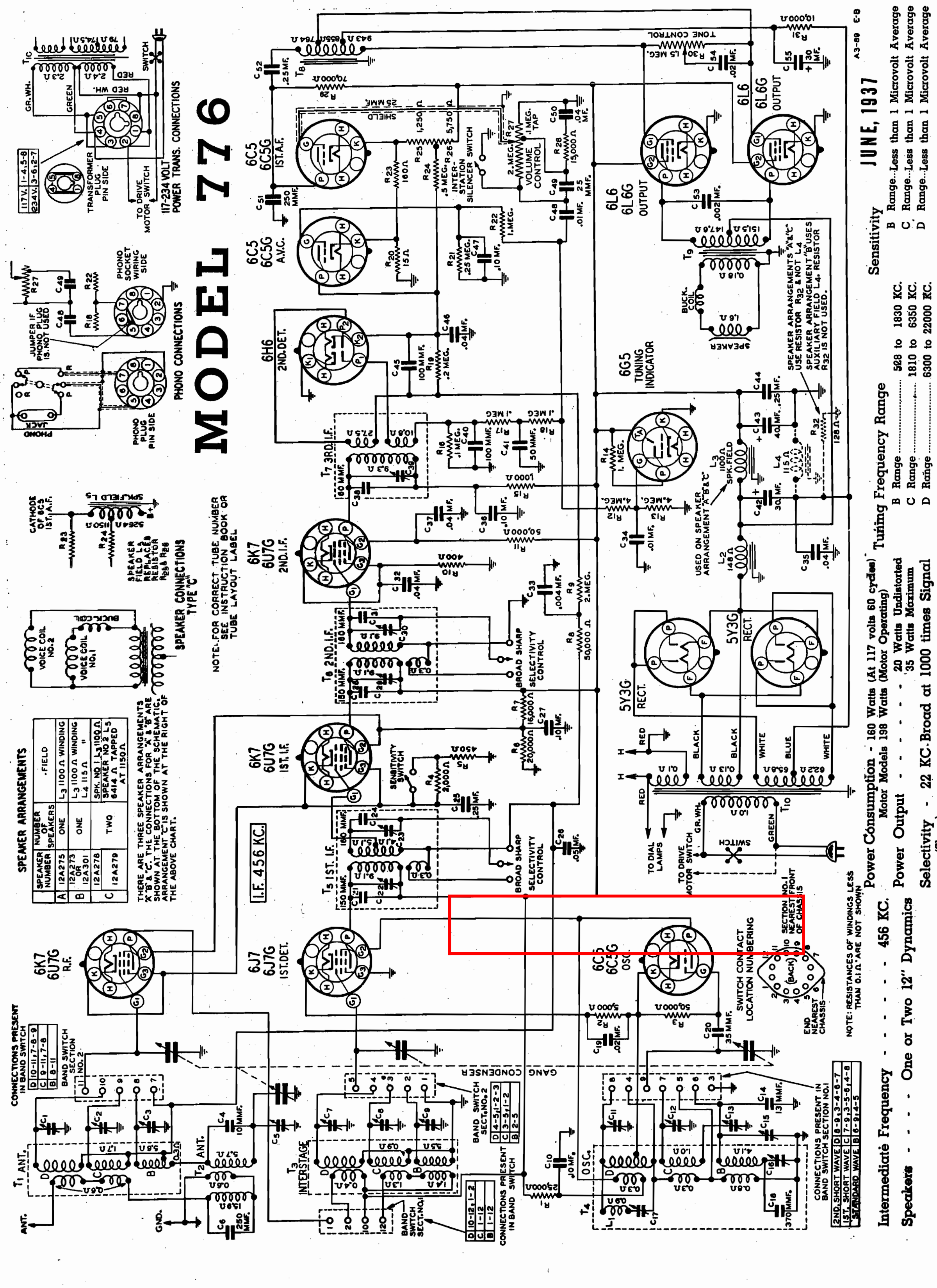
Hold the cord in the left hand and rotate the dial counter-clockwise with the right hand. Feed the cord on the drum in such a way that after passing the two openings at the top of the pulley ring drum, it passes to the back of the groove in the drum. After the pulley ring drum makes one complete revolution, place the cord through the left drum opening into the slot and secure the tension spring hook over the pin provided for it—See Fig. 3.

DESCRIPTION	No. 9 DIAL PARTS		No. 11 DIAL PARTS		No. 10 DIAL PARTS	
	PART NO.	LIST PRICE	PART NO.	LIST PRICE	PART NO.	LIST PRICE
Pulley, Button Ring and Gang Cond. Assy. complete with Buttons, Dial Scale, Pointer and Glass Crystal (A1, A2, A5, and A7 Chassis)	11A103	$23.20	11A121	$23.40	11A114	$25.50
Pulley, Button Ring, and Gang Condenser Assembly, as above (A3 Chassis)	11A111	24.60	11A120	25.00	11A113	27.00
Support Casting for above	25X368	1.35	25X368	1.35	25X410	1.45
Brace for above Casting (over Tuning Cond.) (A1, A2, A5, and A7 Chassis)	25X371	.15	25X371	.15	25X371	.15
Brace as above (A3 Chassis)	25X367	.20	25X367	.20	25X367	.20
Hex. Brass Stud (Support Bracket Mounting)	20X152	.04	20X152	.04	20X152	.04
Rubber Grommet for above Stud	6X8	.10	6X8	.10	6X8	.10
"L" Bracket—Rear Gang Mounting (A1, A2, A5, and A7 Chassis)	25X362	.08	25X362	.08	25X362	.08
"L" Bracket—Rear Gang Mounting (A3 Chassis)	25X382	.10	25X282	.10	25X382	.10
Stud (Rear Gang Mounting)	20X150	.08	20X150	.08	20X150	.08
Rubber Washer for Gang Mounting on "L" Bracket	2X236 doz.	.15	2X236 doz.	.15	2X236 doz.	.15
Rubber Grommet for Gang Mounting on "L" Bracket	6X16 doz.	.30	6X16 doz.	.30	6X16 doz.	.30
Rubber Cushions for Support Bracket (Front)	8X43	.10	8X43	.10	8X43	.10
Drive Cord Tension Spring	28X114 doz.	.35	28X114 doz.	.35	28X114 doz.	.35
Drive Cord	10X23	.65	10X23	.65	10X23	.65
Cord Tension Adjustment Assembly complete	26A59	.20	26A59	.20	26A59	.20
Drive Shaft only (Tuning)	26X245	.10	26X245	.10	26X245	.10
Front Brass Bearing Race and Drive Pulley for Drive Shaft	29X74	.10	29X74	.10	29X74	.10
Rear Brass Bearing Race for Drive Shaft	29X73	.15	29X73	.15	29X73	.15
8 Ball Bearings in Retainer (Two sets used on above Shaft)	20X151	.10	20X151	.10	20X151	.10
Horseshoe Washer for Drive Shaft	19X67 doz.	.15	19X67 doz.	.15	19X67 doz.	.15
Gate Assembly complete	25A154	.45	25A154	.45	25A154	.45
Spring only for Gate Assembly	28X45 doz.	.10	28X45 doz.	.10	28X45 doz.	.10
Condenser Drive Gear Assembly complete	25A153	.60	25A153	.60	25A153	.60
Gear Spreader Spring for above	28X102 doz.	.20	28X102 doz.	.20	28X102 doz.	.20
Pulley and Button Ring complete (Less Dial Crystal, Dial Crystal Escutcheon, Dial Scale, Dial Scale Washers, Dial Pointer and Stud, and Dial Lamps and Sockets)	26A61	11.50	26A62	11.50	26A62	11.50
Pulley Ring Casting only	25A162	3.20	25A162	3.20	25A162	3.20
Button Spacer Ring only	24X273	1.70	24X285	1.70	24X285	1.70
Silencer Contact Ring	30X79	.30	30X79	.30	30X79	.30
Push Button Assembly complete (Including Hairpin Spring, Button Spring, Push Button, Button Bushing, Button Shaft, Metal Washer and Tab)	26A63	.40	26A64	.40	26A64	.40
Push Button only	10A105	.10	10A111	.10	10A111	.10
Metal Washer and Tab	19X66	.10	19X66	.10	19X66	.10
Bakelite Bushing for Push Button	10A104	.10	10A104	.10	10A104	.10
Shaft for Push Buttons	26X238	.15	26X238	.15	26X238	.15
Hairpin Springs for Push Button Assembly	28X111 doz.	.10	28X111 doz.	.10	28X111 doz.	.10
Springs for Push Buttons	28X109 doz.	.10	28X126 doz.	.10	28X126 doz.	.10
Stop Pin Shaft Assembly (Behind Wide Spacer)	26A60	.30	26A60	.30	26A60	.30
Stop Pin Shaft	26X244	.25	26X244	.25	26X244	.25
Spring for above Stop Pin	28X112 doz.	.10	28X112 doz.	.10	28X112 doz.	.10
Dial Scale (Specify Type of Dial, Name of Radio, and Series or Model Number)		.55		.55		1.20
Washer, Dial Spacer (Large with rectangular hole)	19X74 doz.	.10	19X74 doz.	.10	19X74 doz.	.10
Washer, Dial Clamp (Small with round hole)	19X73 doz.	.10	19X73 doz.	.10	19X73 doz.	.10
Dial Pointer	15X95	.20	15X95	.20	15X95	.20
Dial Pointer Cap	15X96	.10	15X104	.10	15X104	.10
Dial Pointer Stud	20X171	.10	20X171	.10	20X171	.10
Glass Crystal	17X21	.15	17X21	.15	17X21	.15
Glass Crystal Escutcheon	4X174	.45	4X196	.40	4X184	.40
Dial Lamp Socket	7A62 ea.	.10	7A62 ea.	.10	7A62 ea.	.10
Dial Lamp Socket Assembly (3 Sockets) Less Lamps	7A63	.50	7A63	.50	7A63	.50
Dial Lamp (No. 51 Bayonet Type)	7A32	.20	7A32	.20	7A32	.20
Celluloid Dial Light Diffusers	41X16	.10	41X16	.10	41X16	.10
Silencer Contact Spring Assembly	26A57	.10	26A57	.10	26A57	.10
Complete Set of Station Call Letter Discs with 25 Celluloid Discs	26A56	.35	26A56	.35	26A56	.35
Tone Indicator Assembly (Less Dial Light Socket and Dial Lights, Take up Cord and Collar)					26A65	.35
Celluloid Indicator and Arm (Tone or Volume)					26A67	.20
Indicator Mounting Bracket (Tone)					25X407	.10
Spring for Tone or Volume Indicator					28X133 doz.	.60
Brass Collar, Cord Take up (Tone or Volume)					29X20	.10
3" Tone and Volume Indicator Cord					doz.	.10
Volume Indicator Assembly (Less Dial Light Socket, Dial Light, Take up Cord and Collar)					26A66	.35
Indicator Mounting Bracket (Volume)					25X408	.10
Call Letter Holder, Celluloid					58X254	.25
Brown Opaque Discs for Telephone Dial Buttons					58X217 doz.	.10
Dial Lamp Socket Assembly (For Tone or Volume Indicator)					7A57	.10
Paper Light Diffuser—Circular 4⅝" Diameter					41X22	.10
Complete Set of Station Call Letter Cards					26A58	.40
Blank Sheet of Call Letter Cards (Used for Export Sets Only)					58X240	.15

Prices Subject to Change Without Notice.

MODEL 776
Schematic, Phono. Speaker Data

GAMBLE-SKOGMO, INC.



MODEL 776
Alignment, Socket
Trimmers, Voltage
Coils, Notes

GAMBLE-SKOGMO, INC.

ALIGNMENT PROCEDURE

Local-Distance Switch — Distance Position.
Volume Control—Maximum All Adjustments.
Selectivity Control—Sharp Position All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator With a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration	PROCEDURE INITIAL STEPS	PROCEDURE ADJUSTMENT
I.F.							
3rd I.F.	Range B	.1 mf.	456 KC	Grid of 2nd I.F. Tube	3rd I.F. (C39)	Turn Rotor to Full Open	Adjust to Maximum Output
2nd I.F.	Range B	.1 mf.	456 KC	Grid of 1st I.F. Tube	2nd I.F. (C29) & (C30)	Turn Rotor to Full Open	Adjust to Maximum Output
1st I.F.	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C22) & (C23)	Turn Rotor to Full Open	Adjust to Maximum Output
RANGE B							
1830 KC	Range B	200 mmf.	1830 KC	Antenna Lead	Oscillator Range B (C15)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	1st & 2nd Ant. Range B (C5) & (C3)—Int. Range B (C9)	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C16)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE C							
6350 KC	Range C	400 Ohm	6350 KC	Antenna Lead	Oscillator Range C (C12)	Turn Rotor to Full Open	Adjust to Maximum Output
6000 KC	Range C	400 Ohm	6000 KC	Antenna Lead	Ant. Range C (C2) Int. Range C (C8)	Turn Rotor to Max. Output	Adjust to Maximum Output
2000 KC	Range C	400 Ohm	2000 KC	Antenna Lead	2000 KC (C13)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE D							
22,000 KC	Range D	400 Ohm	22,000 KC	Antenna Lead	Oscillator Range D (C11)	Turn Rotor to Full Open	Adjust to Maximum Output
20,000 KC	Range D	400 Ohm	20,000 KC	Antenna Lead	Ant. Range D (C1) Int. Range D (C7)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
7000 KC	Range D	400 Ohm	7000 KC	Antenna Lead	7000 KC (C17)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—In sets using the telephone dial tuning, there will be seen inside the telephone dial button ring an escutcheon plate held in place by four screws. Loosen the 2 screws nearest the pointer. An extension of the pointer will be seen protruding over the edge of this escutcheon plate. Move the pointer to the 1500 KC mark on the dial and then tighten the 2 escutcheon screws. (Do not tighten these screws too much.)

On the electric drive models, the pointer is held to the shaft by a friction clip arrangement. With the electric-manual lever in the manual position, hold the tuning knob and move the pointer to the 1500 KC mark on the dial.

In sets using any other type of dial mechanism, it will be necessary to adjust the position of the indicator until it is at the 1500 KC mark.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTICE—Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

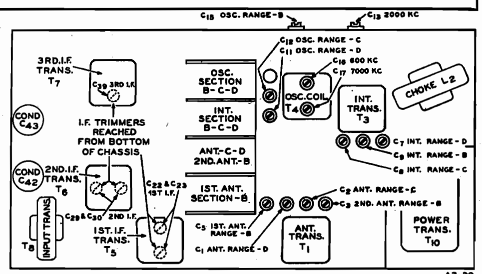


Fig. 3—Location of Trimmers

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control Maximum
Local-Distance Switch in Distance Position
Readings taken with 1000 Ohm-per-volt meter

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated) Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7—6U7G	R.F.	0	6.1(1)	250	130	10.0(2)		6.1(1)	10.0(2)
6J7—6J7G	1st Det.	0	6.1(1)	250	115	0		6.1(1)	6.0
6C5—6C5G	Osc.	0	6.1(1)	115				6.1(1)	0
6K7—6U7G	1st I.F.	0	6.1(1)	250	130	10.0(2)		6.1(1)	10.0(2)
6K7—6U7G	2nd I.F.	0	6.1(1)	240	130	5.0		6.1(1)	5.0
6H6	2nd Det.	0	6.1(1)					6.1(1)	0
6C5—6C5G	A.V.C.	0	6.1(1)	5(3)				6.1(1)	.5
6C5—6C5G	1st A.F.	0	6.1(1)	145				6.1(1)	6.0
6L6—6L6G	Output	0	6.1(1)	330	250	21(4)		6.1(1)	0
5Y3G	Rectifier	0	4.7(5)		1100(6)		1100(6)		4.7(5)
6G5	Tuning Indicator	Plate to Ground 20(3)		Target to Ground 250		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject to variation.
(3) As read with a 1000 Ohm-per-volt meter (500 volt scale).
(4) Bias as read across L4 or R32, depending on speaker arrangement. See Schematic Diagram.
(5) A.C. voltage as read across filament terminals 2 and 8.
(6) A.C. voltage as read across terminals 4 and 6.

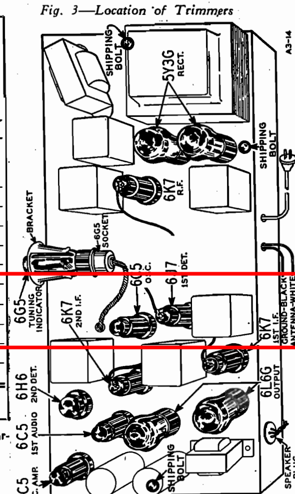


Fig. 4—Location of Tubes

Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

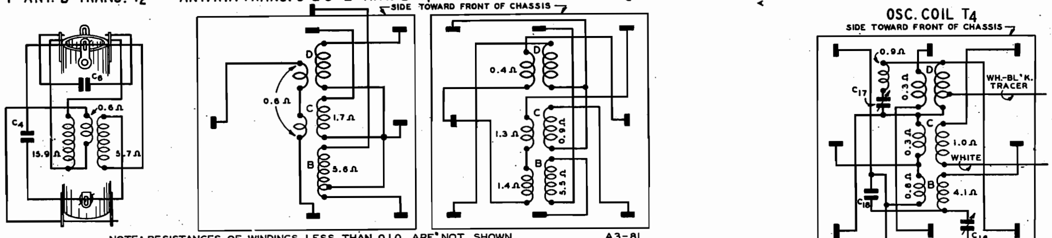
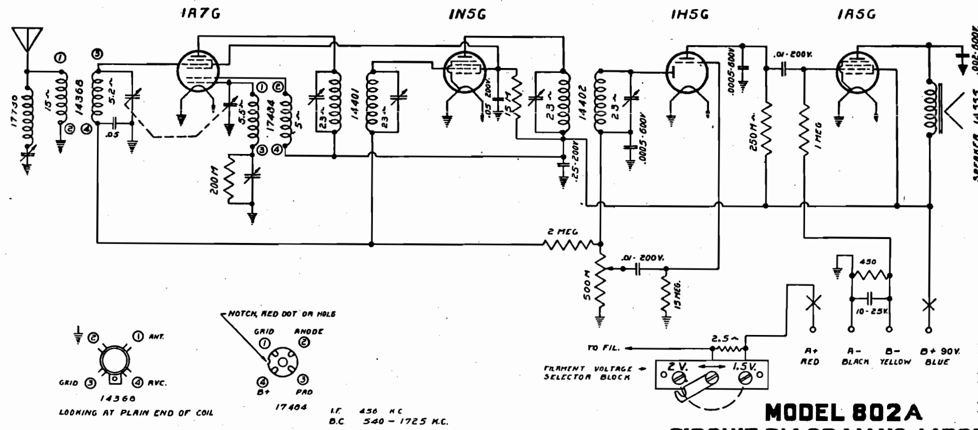


Fig. 7—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

Schematics, Parts

MODEL 802A
MODEL 806A
MODEL 813A
MODEL 813B

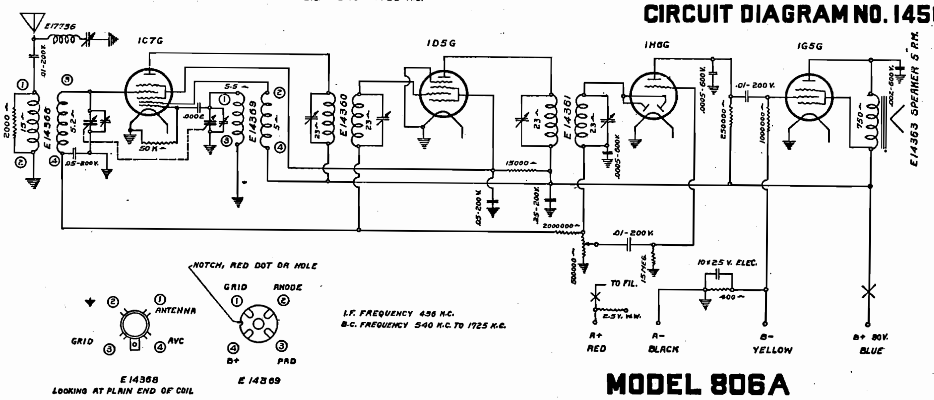
GAMBLE-SKOGMO, INC.



MODEL 802A
CIRCUIT DIAGRAM NO. 14565

Model 802-A

Part No.	Description
14368	Coil—Antenna ......
17484	Coil—Oscillator .....
14464	Condenser—Tuning ..
17451	Control—Volume with Switch ....
14589	Disc—Dial Pointer with Hub ....
14555	Speaker—5" P. M. ....
14401	Transformer—IF Input
14402	Transformer—IF Output
17736	Trap—Wave ....

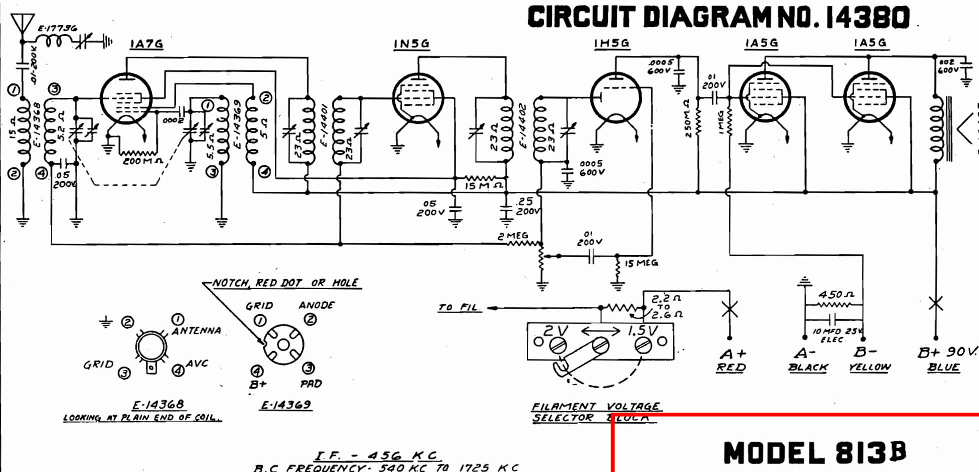


MODEL 806A
CIRCUIT DIAGRAM NO. 14380

SERVICE - PARTS
MODEL 806A

Part		List Price
14368	COIL ANT	.60
14369	COIL OSC	.60
14305	COND TUNING	2.50
14357	CABLE BAT	1.00
14358	CONTROL VOL	.75
14316	KNOB LARGE	.20
14359	KNOB SMALL	.15
14317	POINTER	.10
14319	SCALE DIAL	.25
14363	SPEAKER	3.50
14360	I. F. INPUT	1.30
14361	I. F. OUTPUT	1.30
17736	TRAP WAVE	.50
17582	RESISTOR (DRY CELL)	.30

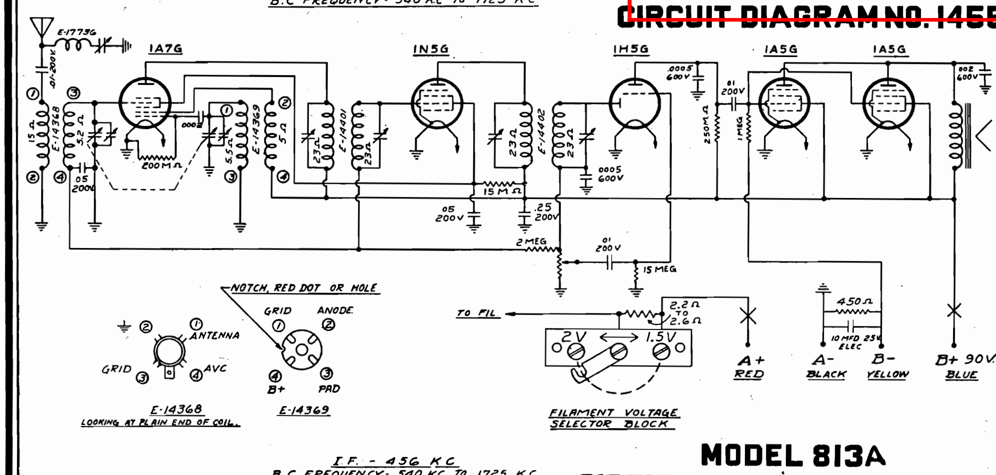
ORDER CONDENSERS AND RESISTORS BY VALUE ON DIAGRAM.



Model 813-B

Part No.	Description
14384	Button Push ....
14437	Belt—Tuning ......
14368	Coil—Antenna .....
14369	Coil—Oscillator ....
14455	Condenser—Tuning
14573	Tuning Unit Assembly complete with tuning condenser ....
14401	Transformer—IF Input
14402	Transformer—IF Output
17736	Trap—Wave ....

MODEL 813B
CIRCUIT DIAGRAM NO. 14556



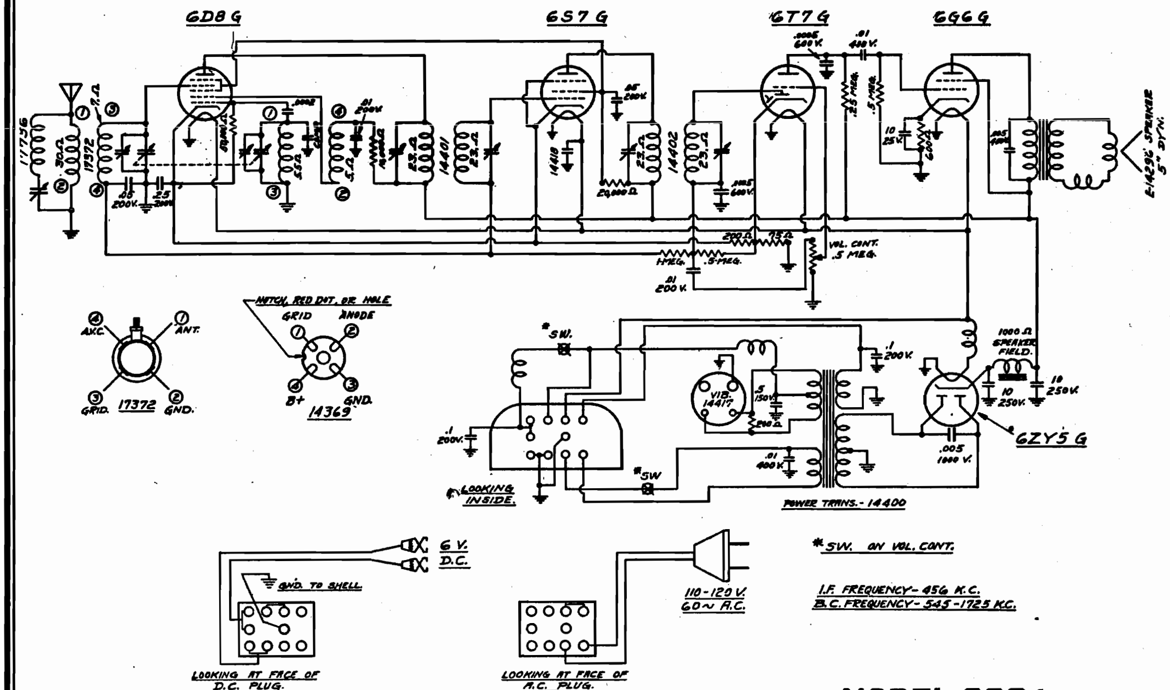
Part No.	Description
14384	Button Push ......
14437	Belt—Tuning .....
14368	Coil—Antenna .....
14369	Coil—Oscillator ....
14455	Condenser—Tuning
14475	Control—Volume ...
14345	Dial—Scale ....
14425	Escutcheon—Dial with Crystal ....
14485	Speaker—5 Inch PM.
14364	Socket—Octal .....
14401	Transformer—IF Input
14402	Transformer—IF Output
17736	Trap—Wave ....

MODEL 813A
CIRCUIT DIAGRAM NO. 14556

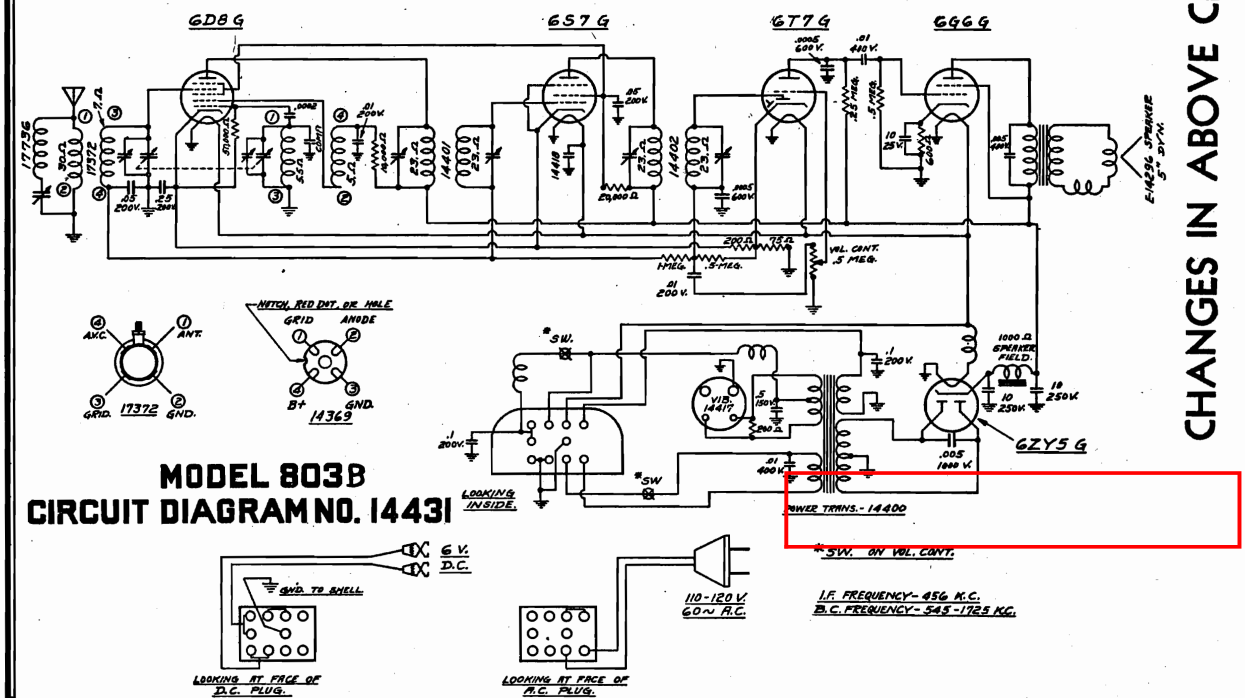
MODEL 803A
MODEL 803B

GAMBLE-SKOGMO, INC.

Schematics



MODEL 803A
CIRCUIT DIAGRAM NO. 14431



MODEL 803B
CIRCUIT DIAGRAM NO. 14431

CHANGES IN ABOVE CIRCUIT FOR 803-B

Speaker field is replaced with filter choke No. 17790
Speaker changed to 6½ P. M.

For Model 803 A.

Part No.	Name	List Price
14429	Clip "A" Battery	.15
14403	Condenser - Filter 10-250-10-250	.90
17080	Condenser - Filter 10-25	.60
14399	Control - Volume with Switch	1.50
14369	Coil-Oscillator	.60
17372	Coil-Antenna	.80
14404	Transformer-Speaker	.70
17736	Trap-Wave	.50
14400	Transformer-Power	2.80
14401	Transformer - I. F. Input	1.20
14402	Transformer - I. F. Output	1.20
14417	Vibrator-6 Volt	2.50

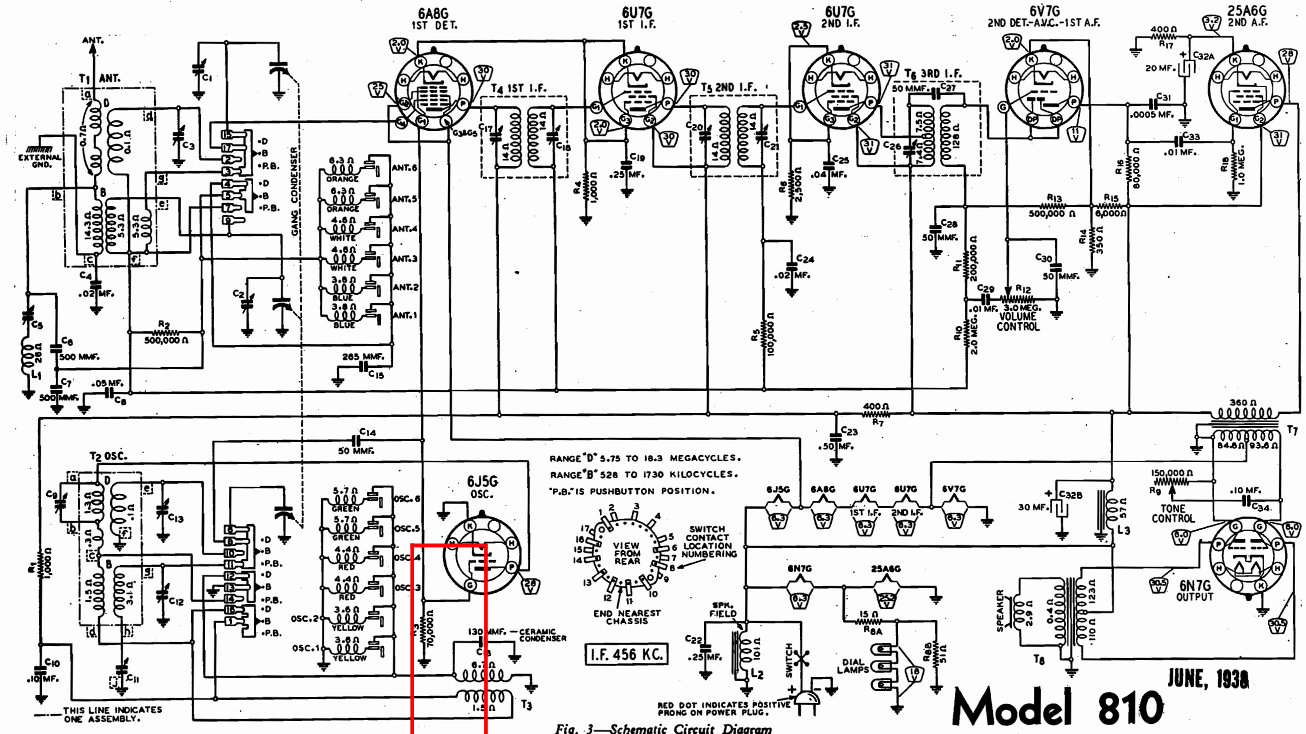
For Model 803-B

Part No.	Name	List Price
14403	Condenser - Filter 10-250-10-250	.90
17080	Condenser - Filter 10-25	.60
17790	Choke—Filter	.80
14369	Coil-Oscillator	.60
17372	Coil-Antenna	.80
14571	Control—Volume with Switch	1.50
14404	Transformer-Speaker	.70
17736	Trap-Wave	.50
14400	Transformer-Power	2.80
14401	Transformer - I. F. Input	1.20
14402	Transformer - I. F. Output	1.20
14417	Vibrator-6 Volt	2.50

Socket, Tuner, Coils
Sensitivity

GAMBLE SKOGMO, INC.

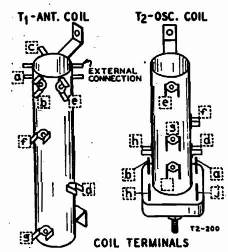
MODEL 810(1938)
Schematic, Voltage

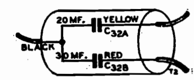


JUNE, 1938

Model 810

Fig. 3—Schematic Circuit Diagram





SPECIFICATIONS

Power Consumption - 1.45 Amperes at 32 Volts DC
Power Output - - - - - - .17 Watts Undistorted
.40 Watts Maximum
Selectivity - - 30 KC Broad at 1000 times Signal
Sensitivity
B Range (Manual Tuning).........6.0 Microvolts Average
B Range (Automatic Tuning).......6.0 Microvolts Average
D Range........................6.0 Microvolts Average
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - - - - 8" Dynamic
Tuning Frequency Range
B Range (Manual Tuning)... 528 to 1730 KC (Kilocycles)
D Range (Manual Tuning)...5750 to 18300 KC (Kilocycles)
Buttons 1 and 2 (Automatic Tuning)........820 to 1600 KC
Buttons 3 and 4 (Automatic Tuning)........650 to 1250 KC
Buttons 5 and 6 (Automatic Tuning).........520 to 980 KC

This model is a two band 32 Volt DC operated radio. A 6 button inductive type automatic tuning system is employed. This system is separate from the variable condenser tuned circuits which are used for the 2 manual tuning ranges.

A 3 position rotary switch is used to switch the tuning circuits from automatic (push button) tuning to either of the 2 manual tuning ranges.

In AUTOMATIC TUNING, the gang condenser is not used. A single tuned circuit is used before the 1st detector.

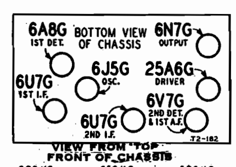
The antenna circuit is connected to the automatic tuning antenna coils numbered 1 to 6 on the schematic. When the band switch is in the automatic tuning position and one of the automatic tuning buttons is depressed, the coil corresponding to the button depressed is connected to the control grid circuit of the 1st detector tube. The antenna coil is tuned by fixed condensers C7 and C15. The antenna transformer B band No. 1 secondary is short circuited and the B band No. 2 secondary is open circuited. The antenna transformer D band secondary is open circuited.

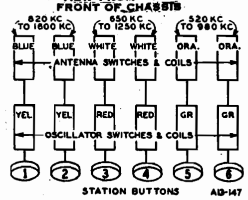
The primary of the automatic tuning oscillator tracking coil assembly T3 is connected to the B+ line. The secondary of this assembly is connected through the band switch to the control grid circuit of the oscillator tube. This secondary coil is tuned by fixed condenser C16 and the inductance of one of the automatic tuning oscillator coils numbered 1 to 6 on the schematic.

The oscillator coil assembly B and D band grid coils are open circuited.

Tuning of the R.F. and oscillator fixed tuned circuits to the desired frequency is accomplished by varying the inductance of the tuning coils by changing the permeability of the magnetic circuit. This is done by moving an iron core in and out of the coil. The iron cores within the antenna and oscillator automatic tuning coil forms are secured to a brass rod. This rod is moved back and forth by a screw located at the front of the radio.

Alignment between the oscillator and antenna tuning coils is obtained by moving the antenna (rear) coil position while the iron core remains stationary.





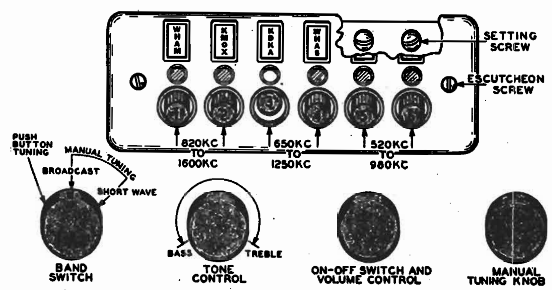


Fig. 1—Location of Controls and Push Buttons—No. 11 Dial Escutcheon

MODEL 810(1938)
Alignment, Trimmers

GAMBLE-SKOGMO, INC.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (Unless otherwise specified)
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 2nd I.F. (C20) & (C21) 3rd I.F. (C26)
WAVE TRAP					
456 KC	Antenna Lead	200 mmf.	Push Button Position Button No. 6 Depressed		Wave Trap (C5) Adjust for MINIMUM Output
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	1st Ant. Range B (C2) 2nd Ant. Range B (C1)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C11) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C3) Rock Rotor—See Note B
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C9) Rock Rotor—See Note B
PERMEABILITY TUNING UNIT			BUTTON DEPRESSED (Band Switch in Push Button Position)	TURN SETTING SCREW TO MAXIMUM OUTPUT —See Instruction Book	ADJUST COIL POSITION TO MAXIMUM OUTPUT —See Note C
1100 KC	Antenna Lead	200 mmf.	No. 1	Setting Screw No. 1	Antenna Coil No. 1
1100 KC	Antenna Lead	200 mmf.	No. 2	Setting Screw No. 2	Antenna Coil No. 2
850 KC	Antenna Lead	200 mmf.	No. 3	Setting Screw No. 3	Antenna Coil No. 3
850 KC	Antenna Lead	200 mmf.	No. 4	Setting Screw No. 4	Antenna Coil No. 4
700 KC	Antenna Lead	200 mmf.	No. 5	Setting Screw No. 5	Antenna Coil No. 5
700 KC	Antenna Lead	200 mmf.	No. 6	Setting Screw No. 6	Antenna Coil No. 6

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1500 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1500 KC mark, and tighten the clamps.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—At the top of the permeability tuning unit can be seen six "W" openings. Insert the end of a pair of long nose pliers or a screwdriver in the "W" opening of the proper button and adjust the position of the antenna (rear) coil by twisting the pliers or screwdriver until maximum output is obtained.

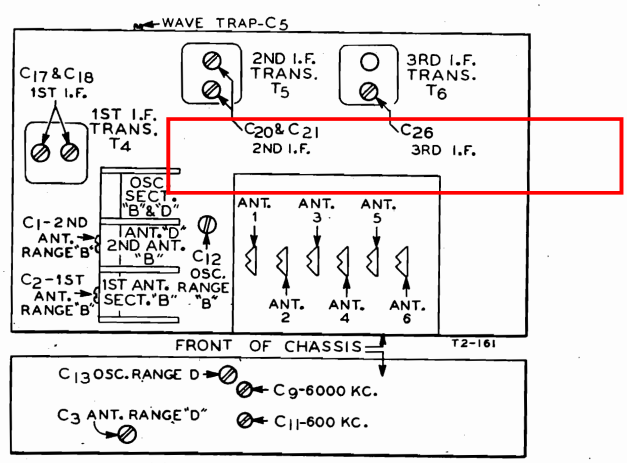


Fig. 2—Trimmer Location

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

MODEL 867A
Schematic, Voltage
Parts

GAMBLE-SKOGMO, INC.

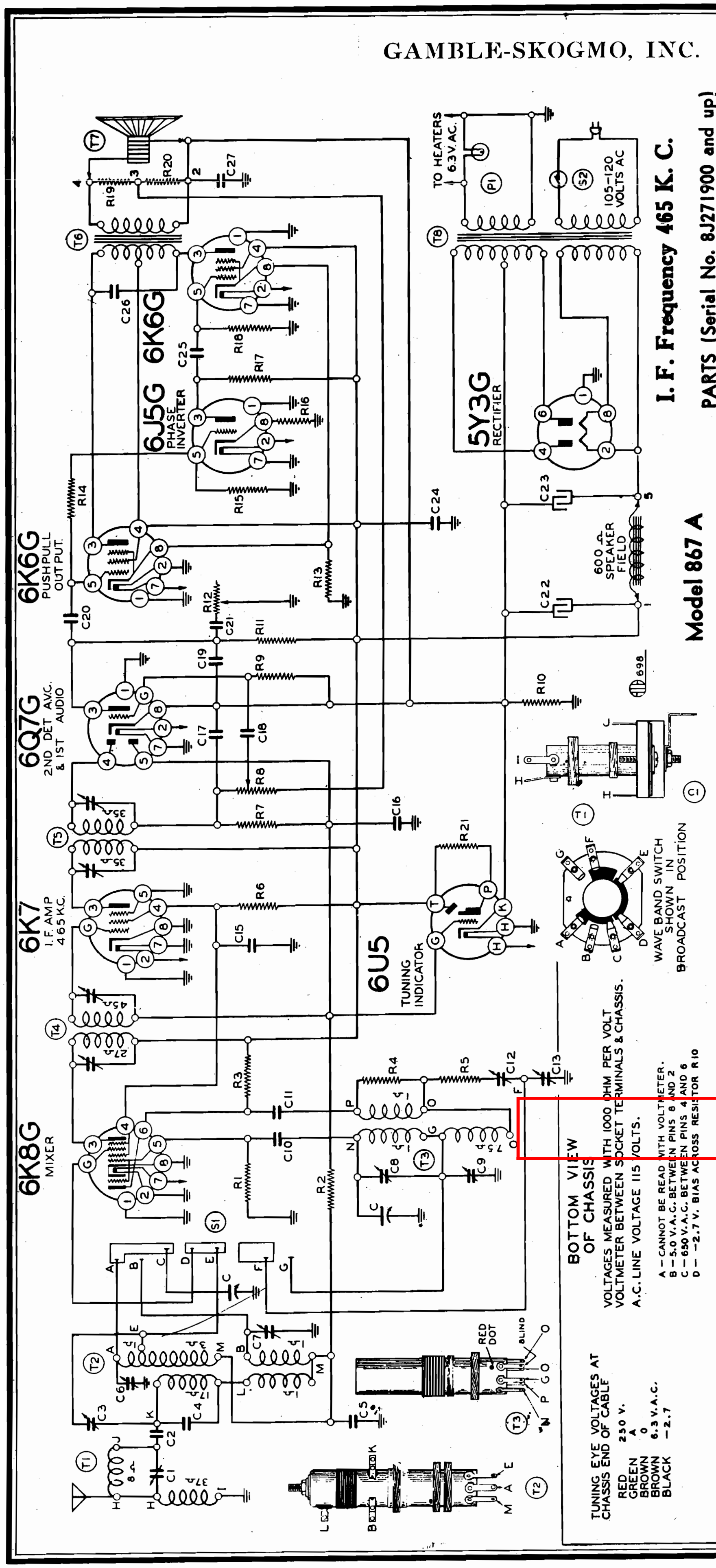
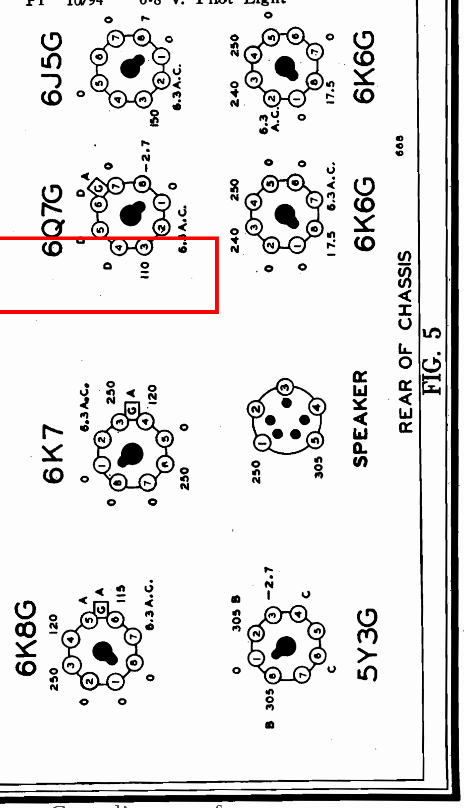


Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13094	50M ohm—⅓ w.
R2	13011	250M ohm—⅓ w.
R3	13030	25M ohm—1 watt
R4	13031	1500 ohm—⅓ w.
R5	130231	75 ohm—⅓ w.
R6	13030	25M ohm—1 watt
R7	1304	3 megohm—⅓ w.
R8	101144	1 megohm volume control
R9	130225	15 megohm—⅓ w.
R10	130240	30 ohm—⅓ w.
R11	130103	100M ohm—⅓ w.
R12	101145	1 megohm tone control
R13	130220	300 ohm—1 watt
R14	130163	400M ohm—⅓ w.
R15	130103	100M ohm—⅓ w.
R16	130218	5M ohm—⅓ w.
R17	13094	50M ohm—⅓ w.
R18	130102	500M ohm—⅓ w.
R19	130168	100 ohm —⅓ w.
R20	130215	25 ohm—⅓ w.
R21	130110	1 megohm— 1/10 in tuning indicator socket
		CONDENSERS
C	10292	2 gang variable condenser
C1	12467	Wave Trap Trimmer
C2	10011	.01 x 400 v.
C3	12468	Image Adj. Trimmer
C4	129132	.000125 mica
C5	129131	.002775 mica
C6	12469	B. C. Antenna Trimmer
C7	12469	S. W. Antenna Trimmer
C8	12470	S. W. Oscillator trimmer
C9	12470	B. C. Oscillator Trimmer
C10	12939	.00005 mica
C11	10025	.002 x 600 v.
C12	12466	.000422 compression type B. C. Oscillator Pad
C13	12466	.001366 compression type S. W. Oscillator Pad
C15	1001	.1 x 400 v.
C16	1009	.05 x 200 v.
C17	1295	.0001 mica
C18	10019	.006 x 600 v.
C19	1292	.0005 mica
C20	10026	.02 x 400 v.
C21	10013	.05 x 400 v.
C22	11974	10 mfd. lytic—350 w. v.
C23	11973	16 mfd. lytic—400 w. v.
C24	1001	.1 x 400 v.
C25	10026	.02 x 400 v.
C26	10012	.003 x 600 v.
C27	10020	.1 x 200 v.
		PARTS
T1	108125	Wave Trap
T2	111112	B. C. and S. W. Antenna Coils
T3	11098	B. C. and S. W. Oscillator Coils
T4	108105B	Input I. F.—465 kc.
T5	108106M	Output I. F.—465 kc.
T6	10554B	Output Transformer
T7	114135	8" Dynamic Speaker (600 ohm field)
T7	114136	10" Dynamic Speaker (600 ohm field)
T8	104143B	Power Transformer
S1	12568	Wave Band Switch
S2		Off-on Switch on Vol. Control
P1	10794	6-8 v. Pilot Light



MODEL 867A
Alignment
Trimmers

GAMBLE-SKOGMO, INC.

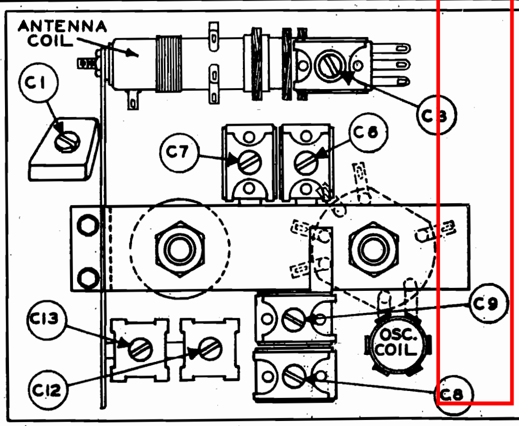
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C9) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer (C6) (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C12C) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
	465 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C1) (See Fig. 4)	I. F. Wave Trap	Adjust for minimum output
IMAGE REJECTION ADJUST-MENTS	2330 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1400 Kc. on dial	Trimmer (C3) (See Fig. 4)	Image rejection	Adjust for minimum output (See note "B")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer (C8) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 Mc.	Trimmer (C7) (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer (C13) (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")



C1—WAVE TRAP TRIMMER 465 K.C.
C3—IMAGE REJECTION TRIMMER
C6—B.C. ANT. TRIMMER
C7—S.W. ANT. TRIMMER
C8—S.W. OSC. TRIMMER
C9—B.C. OSC. TRIMMER
C12—B.C. OSC. PAD
C13—S.W. OSC. PAD

690

FIG. 4

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B" 1400KC is the image frequency of 2330KC. Adjust Trimmer (C3) until a minimum output is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.6 to 18 MC.
Extreme Left Rotation	Broadcast	540 to 1730 KC.

Power Consumption .... 80 Watts (At 115 volts 50-60 cycles)
Power Output .... 5 Watts Undistorted, 7 Watts Maximum
Intermediate Frequency .... 465 KC.

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	540 to 1730 KC. (Kilocycles)
Short Wave	Lower	5.6 to 18.0 MC. (Megacycles)

MODEL 867A
Socket, Trimmers
Tuner Data, Notes

GAMBLE SKOGMO, INC.

PROCEDURE FOR SETTING THE AUTOMATIC TUNER LEVERS:

IMPORTANT—Read carefully before setting the automatic levers.

There are six levers by means of which six stations may be selected. Make a list of local stations or stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever button an opening is provided for inserting the call letter tabs.

Insert the call letter tabs in the rectangular openings of each of the automatic tuner buttons. One of the small celluloid tabs supplied should be inserted into place over each of the station call letter tabs.

NOW, PROCEED AS FOLLOWS:—

1. Pull the dial tuning knob **all the way out** (See Illus. "B," Fig. 3), and rotate the tuning knob to the **left** (counterclockwise) until it cannot be turned any further (See Illus. "D," Fig. 3). This will unlock the automatic tuner mechanism. (NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Press **down all the way** any one of the automatic tuner levers. Holding it down **firmly,** press in on the dial tuning knob No. 3 and tune in the station indicated on the station call letter tab on this lever. You will note that in order to tune the station, the dial tuning knob will have to be **pressed in** (See Illus. "E" Fig. 3). Turn the dial tuning knob very slowly back and forth **(while still holding the automatic tuner lever in downward position),** noting the width of the shadow on the screen of the cathode-ray tuning indicator. Minimum width on the tuning indicator indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in.

3. Press down another automatic tuner lever. Holding it down **firmly, press** in on the dial tuning knob and carefully tune in the station indicated on the call letter tab on this lever.

4. Follow this procedure until you have selected all of your favorite stations.

5. Pull the dial tuning knob **all the way out** (See Illus. "B," Fig. 3) and rotate the tuning knob to the **right** (clockwise) until it cannot be turned any further (See Illus. "C," Fig. 3). This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place. After you have locked the tuner mechanism, push the dial tuning knob **in.**

6. If you should desire to change any station you selected to another, pull the dial tuning knob all the way **out** and rotate the knob to the left (counterclockwise) and unlock the tuner mechanism. Select the new station as explained. (NOTE:—If the dial mechanism works hard when setting up a new station for one of the automatic tuner levers, it is due to the tuner mechanism not being unlocked all the way. Pull the dail tuning knob out all the way and rotate the knob to the left (counterclockwise) until it will turn no further. The dial mechanism should work freely with the tuner lever pressed down).

7. After you have selected the new station, pull the dial tuning knob all the way **out** and rotate the knob to the **right** (clockwise) to lock the tuner mechanism. Be sure the knob is turned until it will turn no further, then **press** the dial tuning knob **in.**

8. The automatic tuner levers are now set up for quick tuning. Press down the lever key and—YOUR FAVORITE STATION IS SELECTED!

The **important** steps to remember when setting up stations on the tuner levers for automatic tuning are:

1. **To unlock** the tuner mechanism pull the **dial** tuning knob **all** the **way out.** You may find it necessary to rotate the knob slightly when pulling it out to make certain that the gears mesh properly. Rotate the dial tuning knob to the left (counterclockwise) as far as it will turn without forcing.

2. **To set a lever, press** down **all the way** and **hold** in this position while tuning in by means of the dial tuning knob the station you want this lever to be tuned to. (NOTE:—you will notice that it will be necessary to keep pressing in on the dial tuning knob while tuning in the station as a spring tends to push the knob out.) Set all the levers in the same manner before locking the mechanism.

3. **To lock** the tuner mechanism pull the dial tuning knob **all the way out.** Rotate the dial tuning knob to the right as far as it will turn making certain that it is tight, but it is not necessary to use force.

4. After locking or unlocking the tuner mechanism always return the dial tuning knob to its normal position **(pushed in).**

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 115 volts A. C. on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

DIAL CALIBRATION:

To correct dial calibration rotate the tuning knob to the right until the dial pointer reaches the extreme end of the dial scale; then rotate the tuning knob to the left until the pointer reaches the other extreme end of the dial scale.

Stop clamps on the pointer slider bar make the pointer self-aligning, thereby correcting dial calibration.

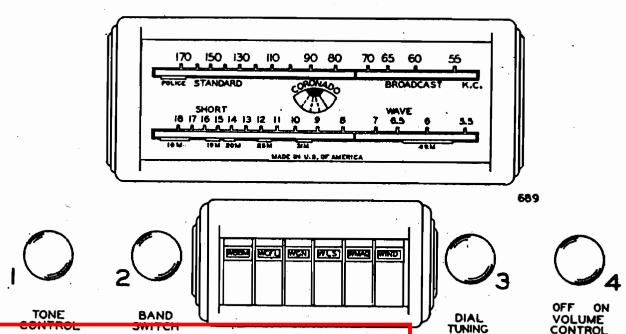
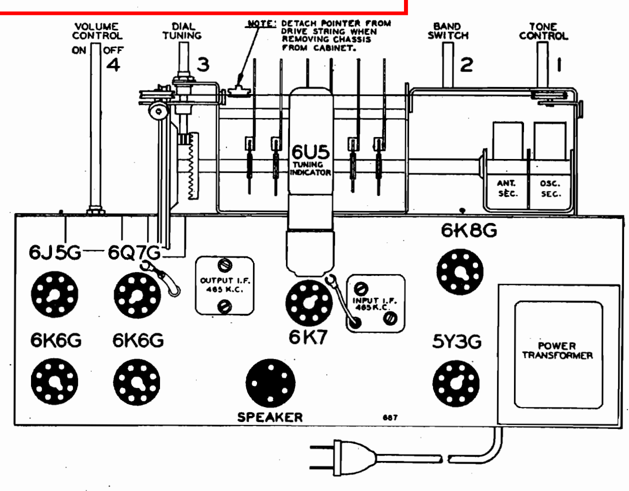
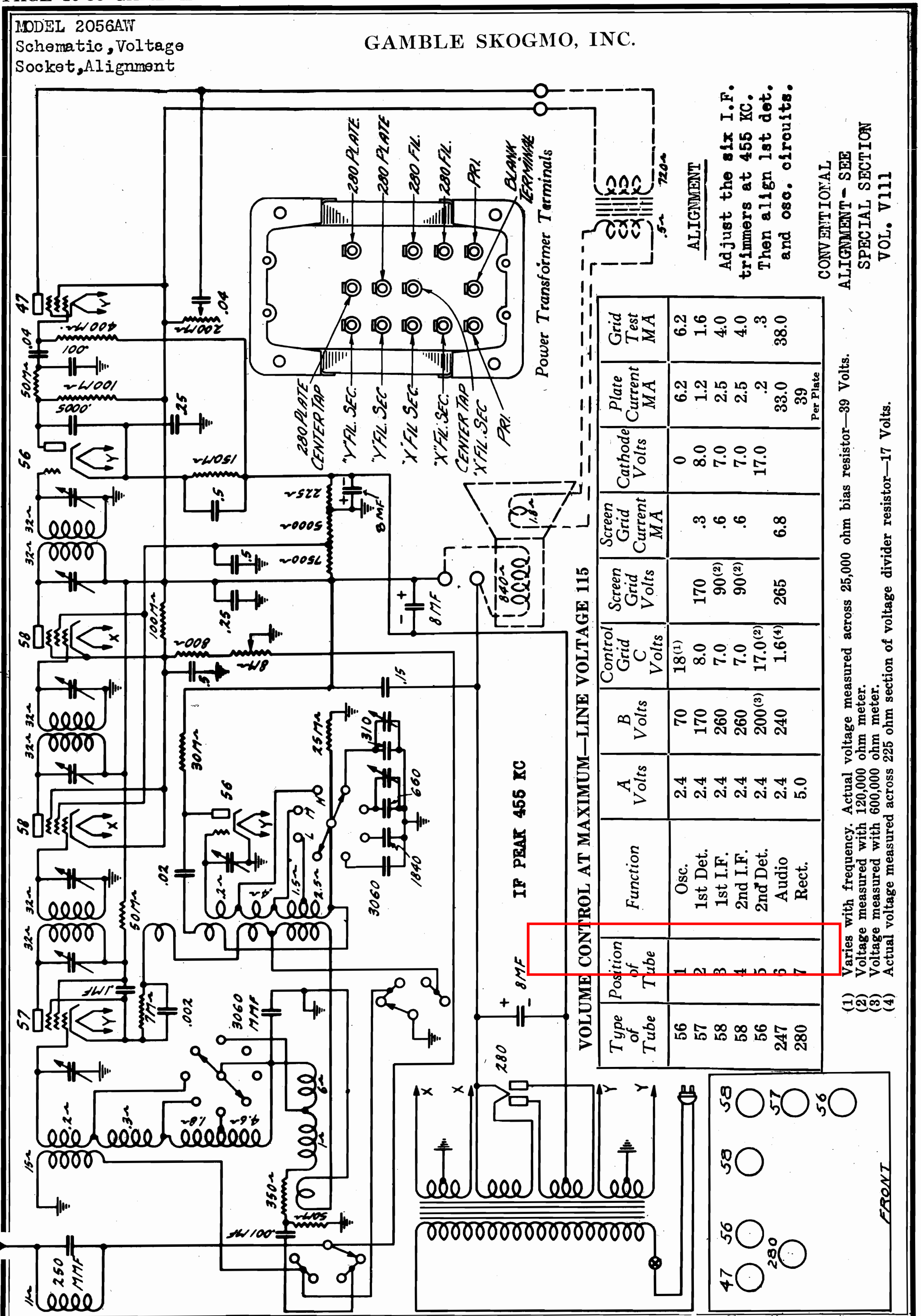


FIG. 2—FRONT VIEW



MODEL 2056AW
Schematic, Voltage
Socket, Alignment

GAMBLE SKOGMO, INC.



ALIGNMENT

Adjust the six I.F. trimmers at 455 KC. Then align 1st det. and osc. circuits.

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION VOL. VIII

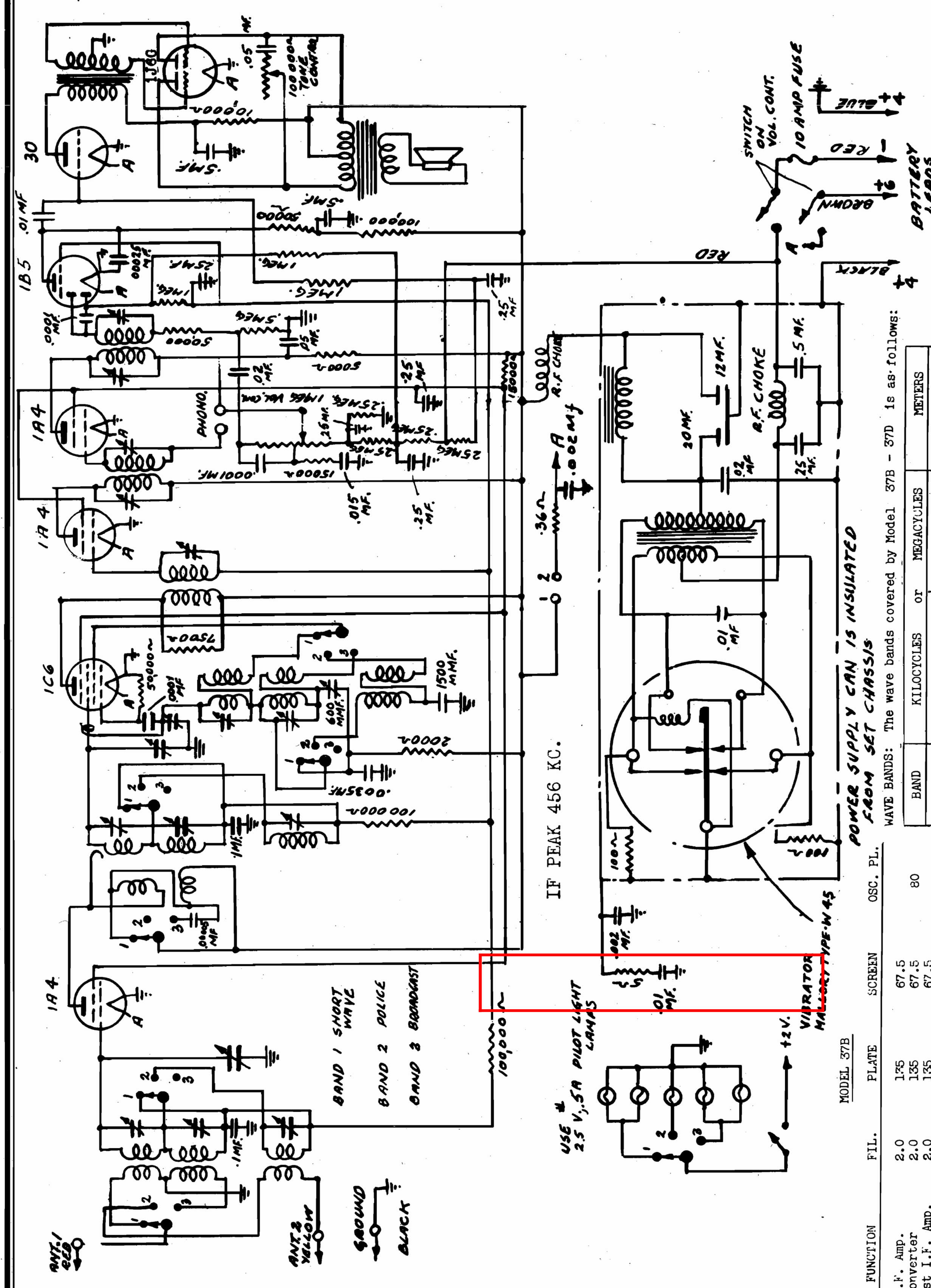
VOLUME CONTROL AT MAXIMUM—LINE VOLTAGE 115

Type of Tube	Position of Tube	Function	A Volts	B Volts	Control Grid C Volts	Screen Grid Volts	Screen Grid Current MA	Cathode Volts	Plate Current MA	Grid Test MA
56	1	Osc.	2.4	70	18(1)			0	6.2	6.2
57	2	1st Det.	2.4	170	8.0	170	.3	8.0	1.2	1.6
58	3	1st I.F.	2.4	260	7.0	90(2)	.6	7.0	2.5	4.0
58	4	2nd I.F.	2.4	260	7.0	90(2)	.6	7.0	2.5	4.0
56	5	2nd Det.	2.4	200(3)	17.0(2)			17.0	.2	.3
247	6	Audio	2.4	240	1.6(4)	265	6.8		33.0	38.0
280	7	Rect.	5.0						39 Per Plate	

(1) Varies with frequency. Actual voltage measured across 25,000 ohm bias resistor—39 Volts.
(2) Voltage measured with 120,000 ohm meter.
(3) Voltage measured with 600,000 ohm meter.
(4) Actual voltage measured across 225 ohm section of voltage divider resistor—17 Volts.

MODELS 37B,37D
Schematic,Voltage

GAROD RADIO CORP.



WAVE BANDS: The wave bands covered by Model 37B - 37D is as follows:

BAND	KILOCYCLES	or MEGACYCLES	METERS
1		5.65 to 19	15.8 to 53
2		1.45 to 3.65	82 to 207
3	540 to 1570		191 to 555

MODEL 37B

TUBE	FUNCTION	FIL.	PLATE	SCREEN	OSC. PL.
1A4	R.F. Amp.	2.0	135	67.5	
1C6	Converter	2.0	135	67.5	80
1A4	1st I.F. Amp.	2.0	135	67.5	
1A4	2nd I.F. Amp.	2.0	125	67.5	
1B5/25S	Det. & 1st. Audio	2.0	75		
30	Driver	2.0	110		
1J6G	Audio Output	2.0	135		

All voltages are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the Wave Band switch in broadcast position with Battery fully charged and new "B" Batteries.

Filament voltages are taken from filament prong to filament prong at tube socket.

MODELS 37B,37D
Alignment,Socket

GAROD RADIO CORP.

MODEL 159
Schematic,Socket
Trimmers

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (1C6). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on tops of the i.f. transformer shield cans.

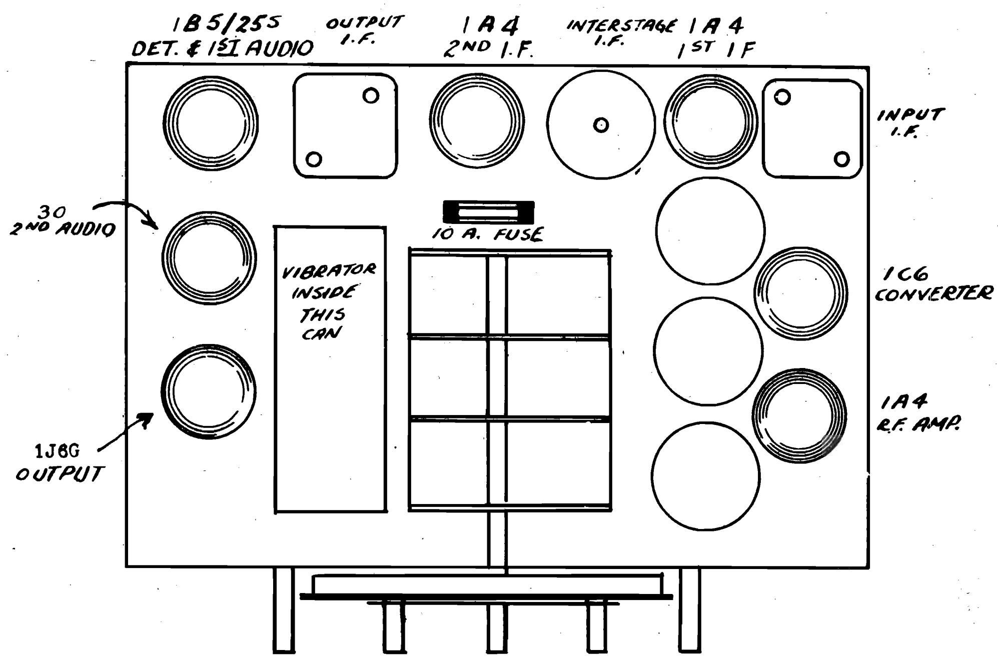
18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted so that the 18 mc signal is tuned in exactly at the 18 mc calibration point, with the volume control on full and the signal generator adjusted for minimum imput. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the sides of the shield cans and are opposite the lower openings. This is the only adjustment on Band #1.

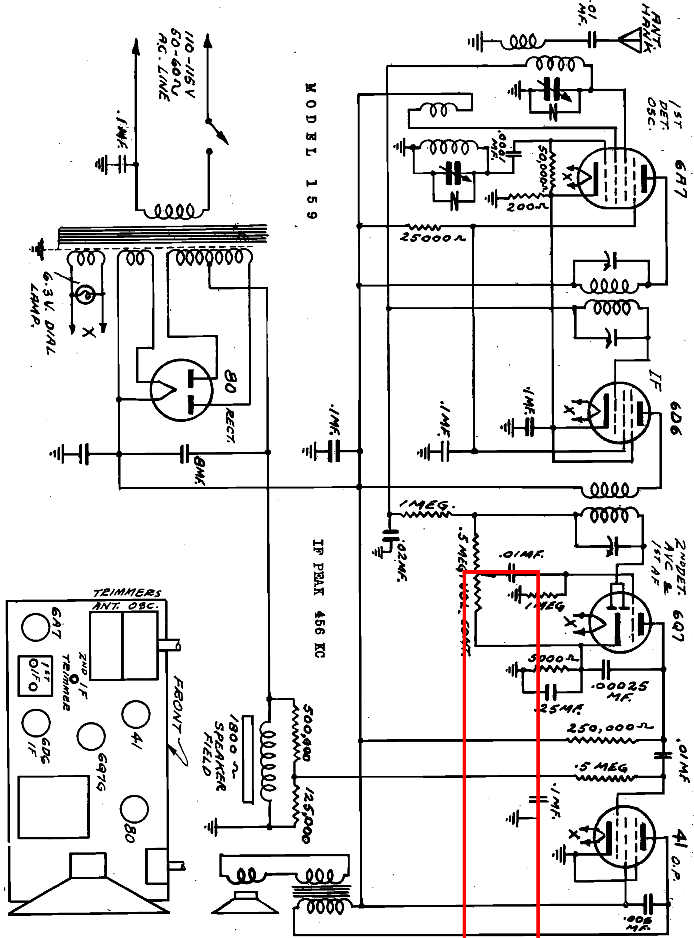
1500 K.C. ADJUSTMENT - With the band selector switch in position for operation on band no. 3. and the receiver and signal generator both set at 1500 K.C. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is opposite the upper opening. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 600 K.C. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 1500 K.C. adjustment should then be rechecked. The 600 K.C. Padder is located as indicated in the sketch.

3 MC. ADJUSTMENT - The band selector switch is set in position for operation on the No. 2. band. The receiver and signal generator are both set at 3 M.C. and the procedure outlined above is repeated. The oscillator trimmer is found on the Police Band Coil located under the chassis and is towards the rear. The other trimmers for this band are located in similar positions on the corresponding coils.

The signal generator is set at 1.7 M.C. and the signal tuned in on the dial. The padder condenser for the police band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 3 M.C. adjustment should then be rechecked. The 1.7 MC. padder is located as indicated.





MODEL 100
Schematic

GAROD RADIO CORP.

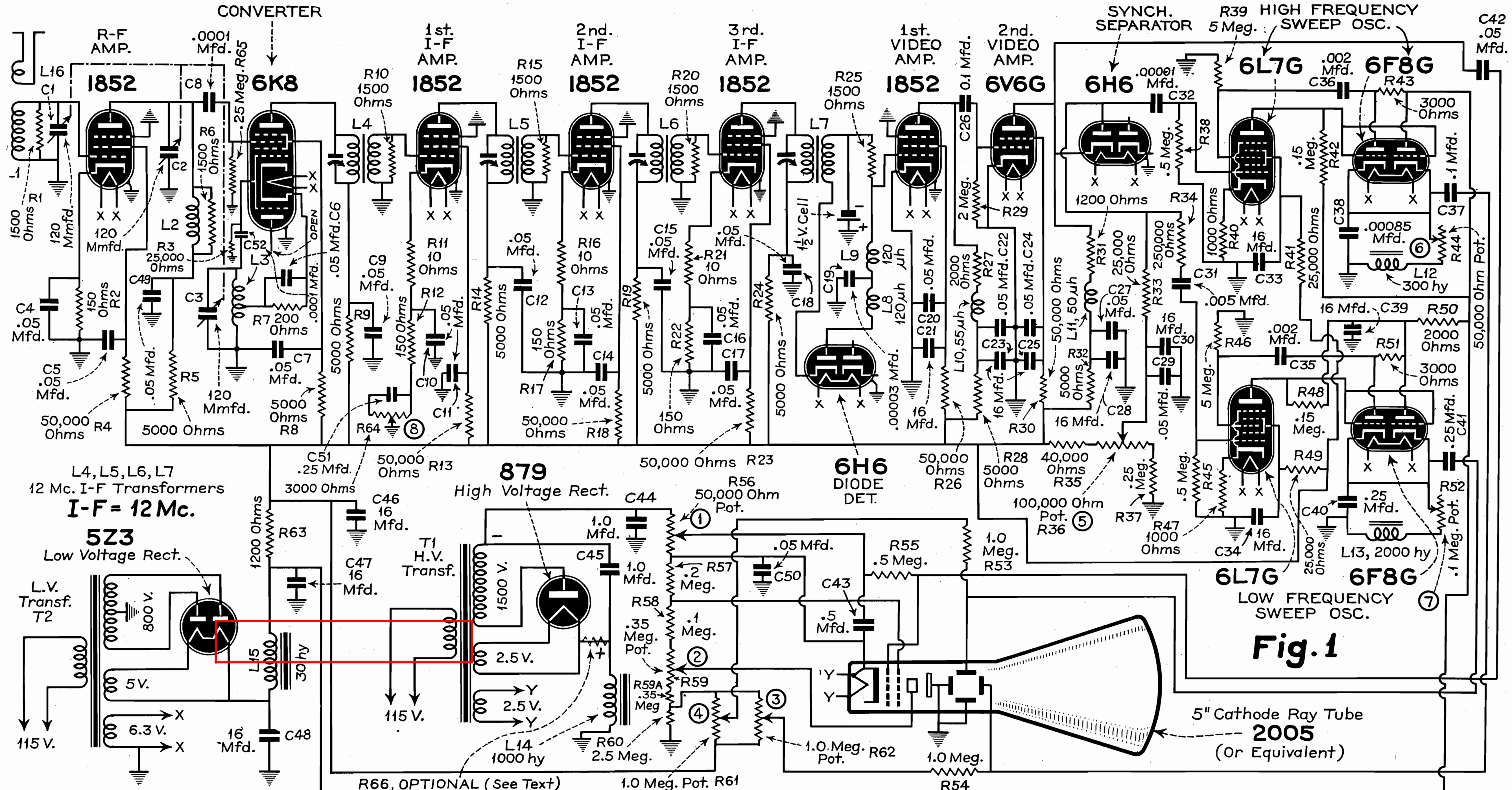


Fig. 1

MODEL 100
Chassis Wiring (Top)

GAROD RADIO CORP.

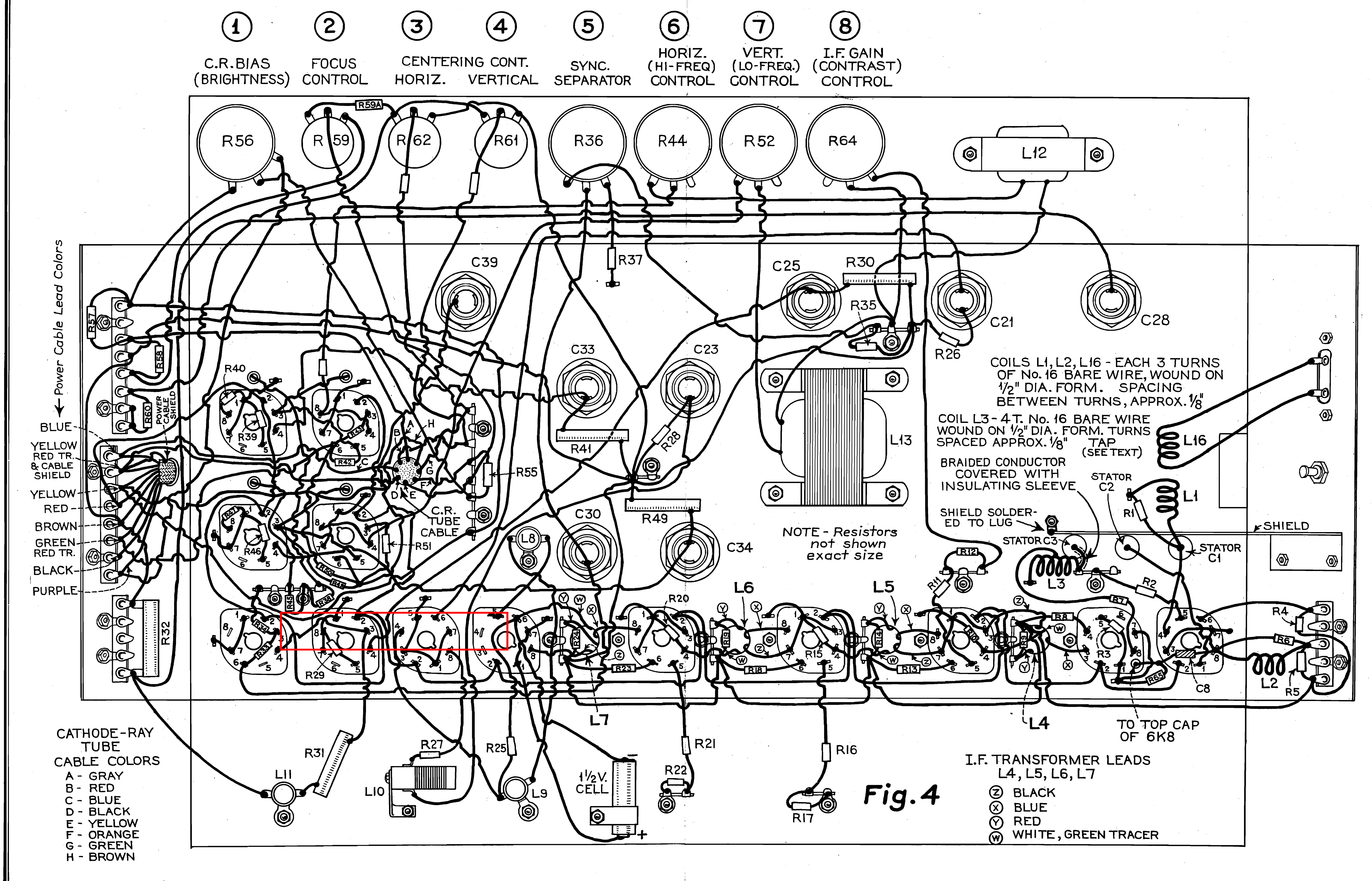
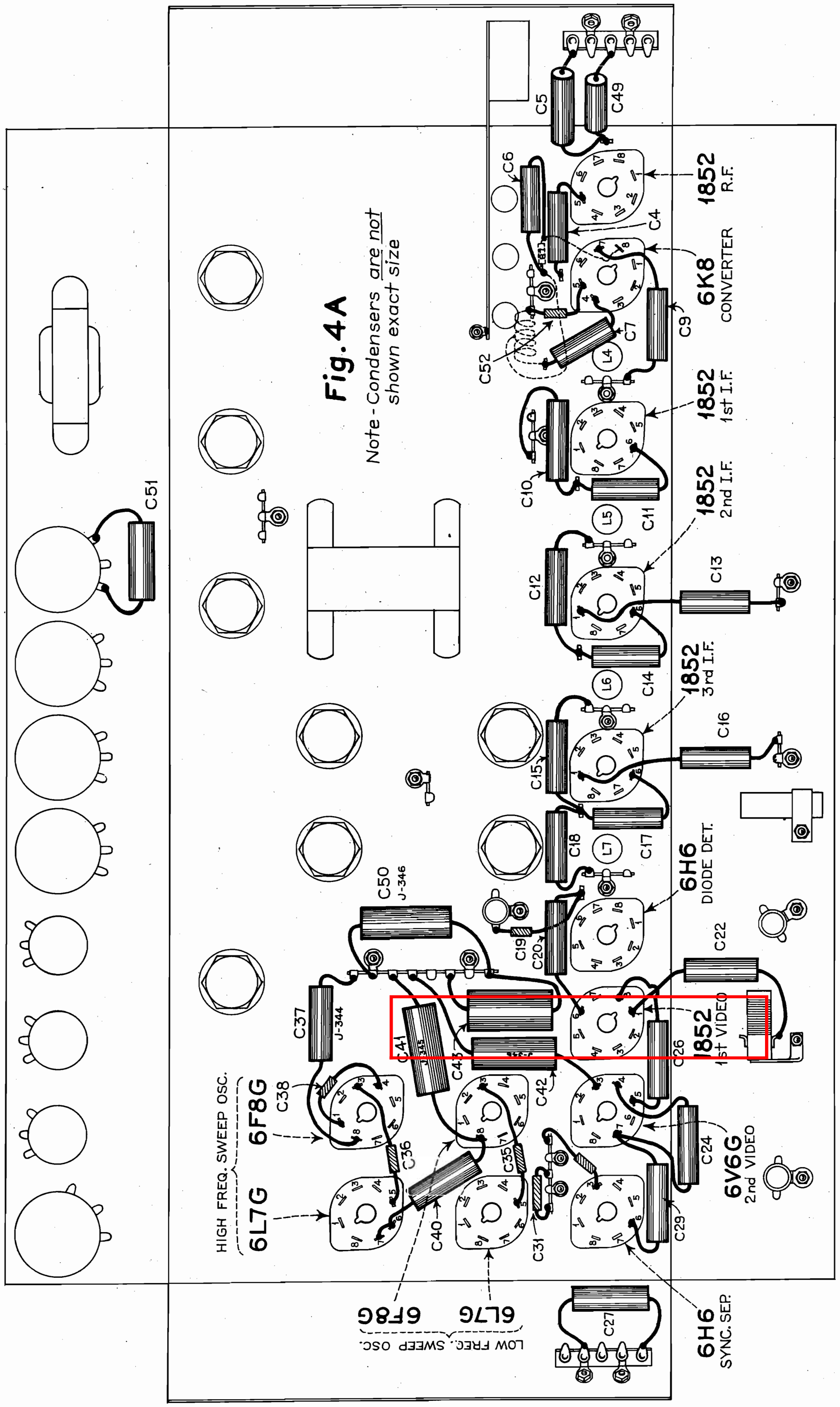


Fig. 4

MODEL 100
Chassis Wiring
(Bottom)

GAROD RADIO CO.



MODEL 100
Chassis View
Socket, Controls

GAROD RADIO CORP.

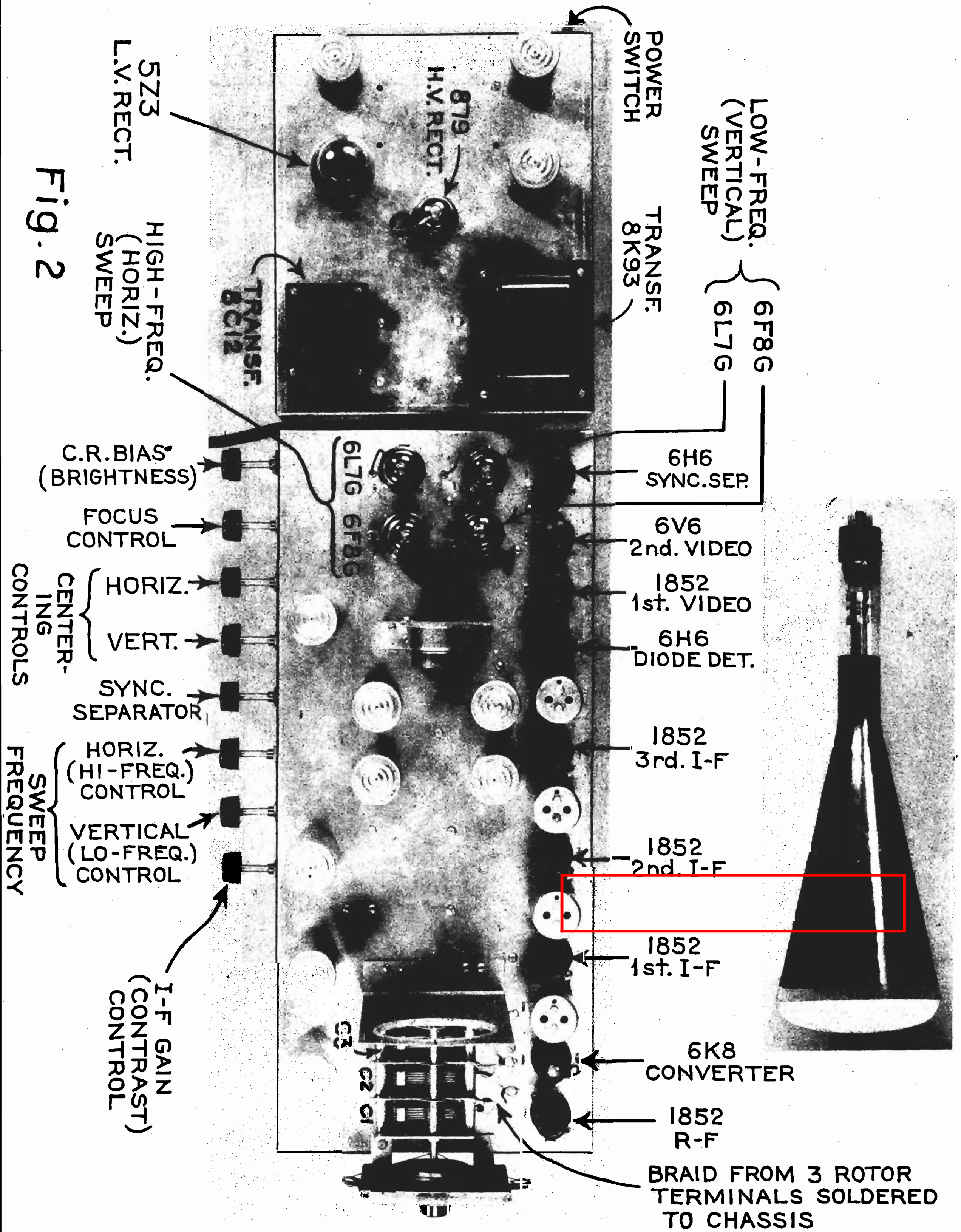


Fig. 2

GAROD RADIO CORP.

MODEL 100
Circuit Data
Assembly, Wiring Notes

Fig. 1 shows the Schematic circuit. It will be noted that is is of the Superheterodyne type. The antenna primary L 16 is connected to the Dipole (or other type) antenna thru a twisted pair. The secondary is tuned to the carrier frequency by the first section of the three gang condenser, and is fed into the grid of the 1852 R.F. amplifier. The plate circuit feeds thru inductor L 2 as a plate load into the control grid of the 6K8 converter (thru the .0001 mfd coupling condenser). The oscillator is of the Hartley type, although the elements have been used in a somewhat unconventional manner. Note that the oscillator plate (#6 pin) is not used. It was found that better stability was obtained with the circuit as shown, than with the conventional arrangement. The converter is followed by three I.F. stages operating at 12 M.C. The 6H6 is used as a diode detector in the usual way. The two chokes L8 – L9 together with the .00003 mfd condenser serve as a filter to remove the I.F. component from the VIDEO channel. The 1852 and 6V6 act as 1st and 2nd VIDEO AMPLIFIERS respectively for the picture signal. A single 1½volt cell such as is used for Pen-Lite flashlights supplies the "C" bias for the 1852 first video stage. This cell is not supplied with the kit, but can be obtained at any Five and Ten Cent store or hardware store. This cell will last for a considerable period, since no current is drawn. The output of the 6H6 is connected to the control grid of the Cathode Ray tube as well as the SYNCH. SEPARATOR.

A second 6H6 serves as a SYNCH. SEPARATOR. This function is accomplished by putting a negative bias on the DIODE plate. This bias may be varied by means of the 100,000 POT.(R36). Thus, since no current can flow until this negative bias is overcome, we have a means of selecting a part of the incoming wave, by adjusting this bias. Since the synchronizing impulses are of considerably higher amplitude than the picture signals, we can adjust our bias so as to bar the passage of these picture signals and permit only the high amplitude Synch. signals to come thru the diode.

The Low and High Frequency SYNCH impulses are then separated by frequency discrimination. The low frequency pulses cannot pass thru the .0001 condenser which couples to the high frequency sweep, but are attenuated very little by the .005 leading to the Low Frequency sweep oscillator.

The Sweep circuit oscillators are of the multi-vibrator type, are very stable in operation, and can be readily controlled by the SYNCH. pulses, which are introduced into the respective grids of the 6L7 tubes. Both sweeps utilize the same circuit arrangement, except of course, that different constants are used for the Horizontal (HIGH) and Vertical (LOW) sweep frequencies. The saw-tooth waves generated in such a multi-vibrator, are, if no compensating means is used, logarithmic in form. Chokes L12 and L13 are therefore inserted to correct this deficiency and produce a saw-tooth, substantially linear, so that the Electron beam is carried across the tube at a uniform rate.

The Synchronized saw-tooth pulses are then fed to the two sets of deflecting plates to scan the face of the Picture tube by means of the Electron Beam emitted by the Electron Gun in the neck of the tube. This beam is in turn modulated (thru the control grid) by the picture impulses obtained from the output of the 6V6.

An 879 Rectifier fed by a separate transformer supplies the High Voltage for the Cathode Ray tube. The 5Z3 serves as a full wave rectifier for the sweep circuits, and other receiver functions. Adequate filtering is used to eliminate any hum voltages that might otherwise interfere with proper operation.

Means are provided for centering the picture by varying the fixed positive potential on the two sets of deflecting plates. Other controls focus the beam by changing the potential on the focusing electrode (R59) and adjust the bias on the Cathode Ray tube (R56) to set the average brightness. (CONTRAST)

Note that the I.F. as well as R.F. circuits are very heavily loaded, so as to broaden the response curves sufficiently to pass the wide band required for good definition.

ASSEMBLY AND WIRING

The assembly of the component parts may be seen from the photographs FIGS 2 and 3 and diagrams 4, 4A and 5. All parts should be assembled as shown and checked against the cricuit diagram to prevent any possibility of error. The dial assembly is shown in the sketch. (FIG 6) The 2 angle brackets which hold the dial to the chassis are fastened with Self-Tapping screws, which are provided. The cord is strung as indicated. The dial crystal is held by 2 TRIMOUNTS which are also provided. These are simply pressed into the holes, and may be removed to calibrate the scale by pushing them out from the rear. The pointer is fastened to the dial cord by pressing the prongs together, over the piece of sleeving, which has been slipped over the cord to prevent chafing.

Note that the end of the shield on the underside of the chassis is soldered to a lug fastened under one of the screws which holds the gang condenser. (See FIG 4)

The large rubber grommet is slipped into the hole in the REAR picture tube support bracket and serves to insulate the leads from the tube socket.

Other grommets are located as shown in the various figures.

Coils L1, L2, L3, and L16 are wound with #16 bare wire (supplied with kit). A½" diameter form is used and removed after winding. Turns are spaced approximately 1/8". The number of turns is indicated in the diagram.

It is important that the wiring shown in FIGS 4 and 4A be followed carefully. As each wire or component is put in, it should be checked off on both schematic and picture diagrams. The grounds and heaters should be wired first, then the various B voltages, I.F. transformers; then resistors, mica and tubular condensers. All wiring should be as short and direct as possible. Particular care should be taken in wiring the Video Amplifier to avoid high Grid or Anode capacities to ground, since this will result in a loss of high frequencies with consequent poor detail. This applies especially to leads from the Diode detector to the 1852 and coupling condenser from 1852 to 6V6 as well as wiring from L 11. These should be lifted away from the chassis ¼ to ½ inch. Do not fasten the GRID LEAD from the picture tube to the chassis or wrap it around the other leads in the cable.

After the receiver has been assembled and wired it should be very carefully checked over, to see that it is wired in exact accordance with the schematic and pictorial diagrams. When this has been ascertained, insert all tubes into their respective sockets, as shown in the photograph.

CAUTION

Approximately 1400 volts is supplied to the high voltage Anode. This voltage should be treated with great respect, since under certain conditions it may be *DANGEROUS*. Be sure that the power switch is *OFF* or better still, remove the line cord from the outlet, when making any changes, or touching any parts, other than the control knobs.

With a High Resistance (1000 ohms per volt) Voltmeter, measure all voltages, with respect to the chassis. Results should be approximately as tabulated. Variations will occur due to line voltage conditions and tubes. If there is any SUBSTANTIAL deviation in voltage from that given in this table, ascertain the reason, and correct it before proceeding further, or damage to tubes or other components may result.

WARNING

Be sure that the Voltmeter prongs are well insulated and use great care in making these measurements to avoid shock from the High Voltage supply.

MODEL 100
S.P.U. Chassis Wiring
Voltage

GAROD RADIO CORP.

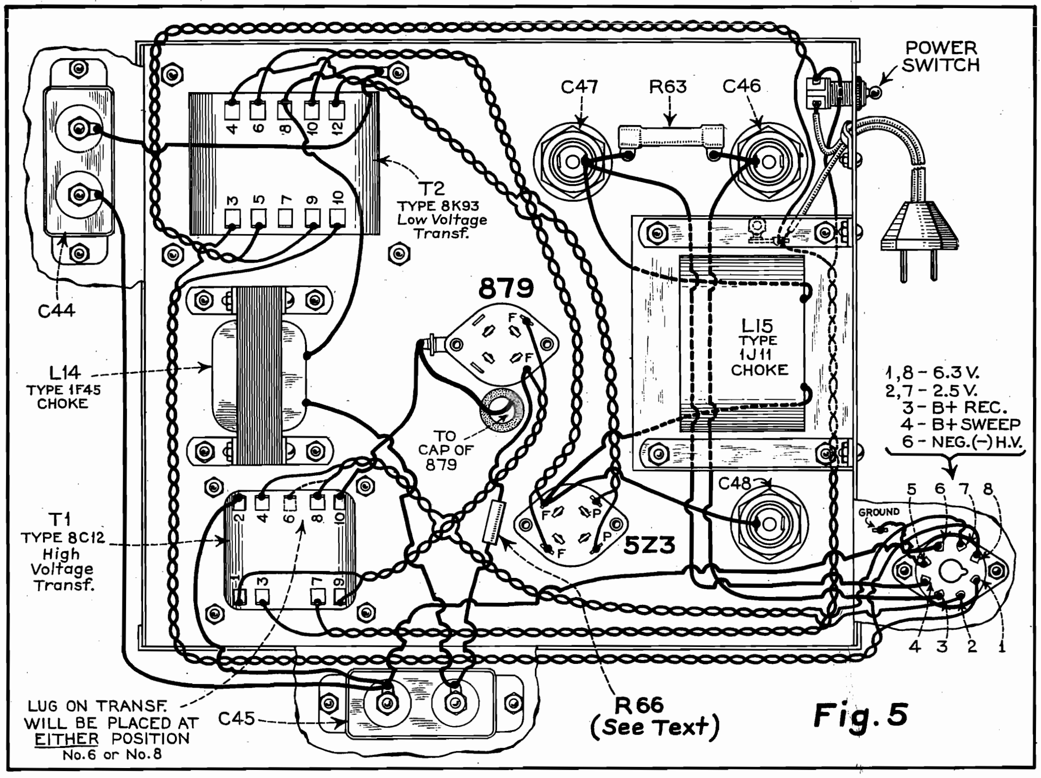


Fig. 5

VOLTAGE TABLE — TELEVISION RECEIVER

		CAP.	1		2		3		4		5		6		7		8	
1852	R. F. Amp.		SH.	0	H	6 A. C.	Sup.	0	GR.	0	K	2	SC.	160	H	0	P	290
6K8	Converter	Contr. GR. 0	SH.	0	H	6 A. C.	P	275	SC	135	Osc. GR.	0	Osc. Pl.	0	H	0	K	1.4
1852	1st I.F. Amp.		SH.	0	H	6 A. C.	Sup.	0	GR.	0	K	7	SC.	157	H	0	P	290
1852	2nd I.F. Amp.		SH.	0	H	6 A. C.	Sup.	0	GR.	0	K	2	SC.	170	H	0	P	150
1852	3rd I.F. Amp.		SH.	0	H	6 A. C.	Sup.	0	GR.	0	K	2	SC.	170	H	0	P	150
6H6	Diode Det.		SH.	0	H	6 A. C.	D.P.2	X	K-2	X	D.P.1	-15	X		H	0	K-1	-1.5
1852	1st Video		SH.	0	H	6 A. C.	Sup.	0	GR.	0	K	0	SC.	160	H	0	P	235
6V6G	2nd Video		X		H	6 A. C.	P	90	SC	125	G	-2	X		H	0	K	0
6H6	SYNC. Sep.		SH.	0	H	6 A. C.	D.P.2	100	K-2	92	D.P.1		X		H	0	K-1	
6L7G	Hi-Freq. Sweep	Contr. GR. 2	X	0	H	6 A. C.	P	150	SC	150	Inj.GR	2	X		H	0	K	10
6F8G			X	0	H	6 A. C.	P-2	435	K-2	250	G-1	150	P-1	435	H	0	K	-1250
6L7G	Low Freq. Sweep	Contr. GR. 2	X	0	H	6 A. C.	P	110	SC	135	Inj.Gr	2	X		H	0	K	8
6F8G			X	0	H	6 A. C.	P-2	235	K-2	270	G-1	110	P-1	240	H	0	K-1	170
2005	Videotron		A-2 (Black	0	H	2.2 AC to #7 (Blue)	A-1 (Yellow)	-850	Def-1 Pl	85 (Red)	GR-1 (Orange)	-1250	Def-3 Pl.	100 (Green)	H&K (Brown)	-1250	GR#2 (Grey)	-1000
5Z3	Low Voltage Rect.		F	5AC 470	P				F	5AC 470								
879	High Voltage Rect.	-1380	F	2.3AC					F	2.3AC								

ALL VOLTAGES MEASURED WITH A HIGH - RESISTANCE D.C. VOLT METER (EXCEPT HEATERS)
ALL CONTROLS TURNED ALL WAY TO THE RIGHT (CLOCKWISE)

SH - Shell
H - Heater
Sup. - Supressor Grid
GR. - Grid
K - Cathode

SC. - Screen
P - Plate
D.P. - Diode Plate
Def.Pl. - Deflecting Plate
A - Anode

Inj. Grid. - Injector Grid
F. - Filament
X. - No connection

GAROD RADIO CORP.

MODEL 100
Alignment, Operating
Antenna Notes

ALIGNMENT AND OPERATION

Set the Picture Tube bias control (#1) all the way to the right. Set the Horizontal and Vertical Sweep (#6 and 7) controls approximately half way.

Now turn the Spot locating control (#3) all the way to the left and rotate the other spot control (#4) thru its entire range. If neither a spot nor a Raster (the scanning pattern) appears, move the first spot locating control (#3) slightly to the right and rotate the other locating control thru its entire range again. Continue this procedure step by step until something appears upon the viewing screen of the Cathode Ray Tube.

Now adjust the Vertical and Horizontal Sweep controls until a complete raster appears. This should be approximately 4" square (The actual picture will be somewhat smaller due to the presence of the Blanking and Sync pulses in the station carrier).

By means of the Spot Location controls (#3 and #4) this Pattern may now be centered on the tube face. The Cathode Ray Tube socket can be rotated to level the Raster.

The size of the picture is determined by two factors, namely; the sweep circuit voltage and the voltage applied to the second anode. The picture increases with increase in sweep voltage and decreases INVERSELY as the square of the second or High voltage Anode potential. The saw-tooth voltage developed by the multi-vibrators is a function of the "B" voltage applied to the plates. Since we are operating near the voltage limit of the 5Z3 rectifier tube, it is impractical to obtain any improvement in this direction. Amplifiers could be used to increase the sweep voltages, but this would complicate matters greatly. The other alternative is to reduce the 2nd Anode voltage. Referring to the circuit diagram, a 100,000 ohm (R66) dropping resistor is indicated in series with the low voltage filter system. This results in a larger picture, at only a slight sacrifice in brilliance. The use of this resistor is optional, depending upon which characteristic is the more desirable.

The Image Ratio should be 4:3. If the picture does not conform to this ratio, a rearrangement of resistors in the sweep plate and screen circuits will correct this. Potentiometers could be inserted to control the voltages applied to the deflection plates, but these additional controls are hardly necessary, since once this adjustment is made, it need not be changed, for a given set of tubes.

After this has been satisfactorily checked, we may proceed to the I.F. amplifier adjustments. An output meter or preferably an Oscilloscope is connected across the output of the Video amplifier (6V6 plate). A signal from a Signal Generator or equivalent source is now introduced at the converter grid (6K8). The Intermediate Frequency is 12M.C. The I.F. transformers are now adjusted for maximum output in the conventional way.

Now introduce a signal, whose frequency is approximately that of the principal station to be received, into the antenna circuit. Tune this signal by rotating the dial, then align the antenna and R.F. circuits for maximum output by means of the trimmers on the variable condenser.

After this has been done, the receiver is ready for a test on the air. It is best to make adjustments on the fixed pattern transmitted by Television stations during test periods preceeding the regular scheduled programs. The I.F. system should now be readjusted by staggering the peaks to accept a wide band of frequencies (2 Megacycles). This will result in considerable improvement in picture detail, with relatively slight loss in gain.

The I.F. transformers are heavily loaded (with 1500 ohms across each secondary). It is possible to omit these, with an increase in gain if they are carefully realigned so as to stagger the peaks, with a resultant "square top" resonance curve over the desired band.

The R.F. circuits should now be realigned for best tracking. It may be necessary to adjust the R.F. coil inductances slightly to obtain the proper range and tracking. If necessary the end plates of the variable condenser may be bent to accomplish this.

About 20 Volts at the Control Grid of the Cathode Ray Tube is necessary in order to obtain a good picture. If everything is functioning properly this should be easily obtained from stations within range. This can be checked with a vacuum tube voltmeter or calibrated oscilloscope.

A little experience will enable the user to tune in a station quickly and clearly. Proper manipulation of the controls is important, and the function of each should be studied carefully and thoroughly understood. A cathode bias control in the first I.F. stage sets the over-all gain. Other controls locate the pattern, Vertically and Horizontally; set the Vertical and Horizontal Sweep Frequencies; adjust Focus of the Picture Tube, fix the Average Brightness (Contrast); and adjust the Sinc separator and Selector. See Illustration.

RECEIVING ANTENNA

The installation of an antenna for Television reception is extremely important. In residential locations, the antenna should be elevated as high as possible and located in such a way as to be furthest from sources of interference. Automobile ignition systems cause considerable interference, as do electrical devices having sparking or intermittant contacts. Reflections from buildings, bridges and steel or other metal structures may result in multiple transmission, thereby producing 2 or more images superimposed upon each other, due to the slight time difference in the arrival of the several reflected waves.

This effect may become extremely critical in large cities where a great number of these high structures are present. If possible a "line of sight" transmission path from the transmitter antenna should be selected. Again, care must be taken to obtain the maximum freedom from electrical interference, since this will result in spotting and blotching of the picture.

It is noticed that less of this "noise" interference, from automobile ignition systems particularly, is picked up when using a Horizontally polarized antenna than with a vertical antenna. Since, from all other considerations, it is equally as effective it is therefore desirable to use such an antenna for our Television receiver, when the field strength is sufficient to give us the necessary signal for satisfactory operation.

A simple dipole with twisted-pair lead-in (or a transposed lead-in) will usually give satisfactory results. These dipoles are available with arms of adjustable length and so arranged that they can be rotated. For a given station, maximum pickup will be obtained when the dipole is at right angles to the signal path from the transmitter. Where several stations are to be received, or the field strength is inadequate, more complicated forms of antennae may be required, or in the case of a directive antenna, a compromise may have to be reached so as to include all the desired stations within range. The length of the dipole is adjusted for maximum pickup from desired stations. An overall length of 120 inches is suggested for a start. In some cases, it may be desirable to use separate antennas facing in different directions for different stations.

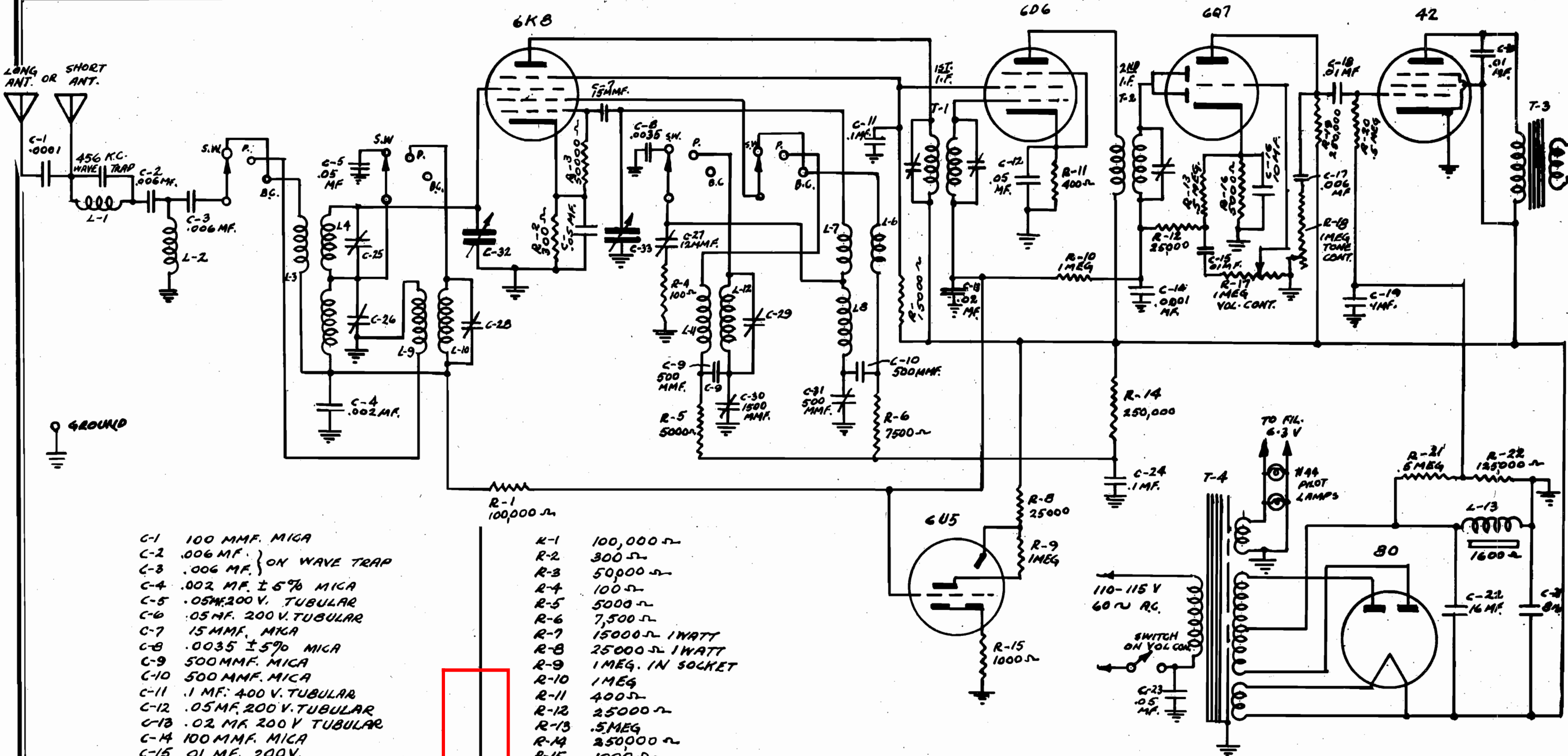
It is extremely important that the antenna be securely fastened so as to prevent swinging of either the antenna itself, or the transmission line, since this may result in intermittent blurring or loss of the picture. (To avoid complications, no A.V.C. system has been incorporated in this receiver.)

It is strongly recommended that the builder study all literature available on Television and Ultra Short waves before attempting to go ahead with the construction so as to enable him to proceed intelligently. A knowledge of the exact function of each component will help greatly towards the successful accomplishment of the desired results.

References: QST – Dec, Jan, Feb, Mar, Apr, May 1937
ELECTRONICS – 1937-38
TELEVISION – Vol I and II – RCA Technical Press.

MODEL 369
Schematic

GAROD RADIO CORP.



SW. 22.5 M.C. - 5.8 M.C. OR 13.3 METERS - 51.7 METERS
P. 6.25 M.C. - 2.2 M.C. OR 48 METERS - 136.5 METERS
B.C. 1720 K.C. - 543 K.C. OR 174.5 METERS TO 552 METERS

FOR ALIGNMENT
SEE INDEX

I.F. = 456 K.C.

6 TUBE A.C. RECEIVER 3 BAND	
USED ON 369 C-21	
DWN BY J.K.	CHECKED BY.

C-1 100 MMF. MICA
C-2 .006 MF. } ON WAVE TRAP
C-3 .006 MF. }
C-4 .002 MF. ± 5% MICA
C-5 .05 MF. 200 V. TUBULAR
C-6 .05 MF. 200 V. TUBULAR
C-7 15 MMF. MICA
C-8 .0035 ± 5% MICA
C-9 500 MMF. MICA
C-10 500 MMF. MICA
C-11 .1 MF. 400 V. TUBULAR
C-12 .05 MF. 200 V. TUBULAR
C-13 .02 MF. 200 V TUBULAR
C-14 100 MMF. MICA
C-15 .01 MF. 200 V.
C-16 10 MF. 25 W.V.
C-17 .006 MF. 600 V.
C-18 .01 MF 400 V.
C-19 .1 MF. 200 V.
C-20 .01 MF. 400 V.
C-21 8 MF. 450 W.V.
C-22 16 MF. 450 W.V.
C-23 .05 MF 400 V TUBULAR
C-24 .1 MF. 400 V.
C-25 30 MMF. TRIMMER
C-26 } DUAL 12 MMF. TRIMMER
C-27 }
C-28 } DUAL 12 MMF. TRIMMER
C-29 }
C-30 1500 MMF PADDER
C-31 500 MMF. PADDER
C-32 } TWO GANG 450 MMF. VARIABLE #2.136
C-33 }

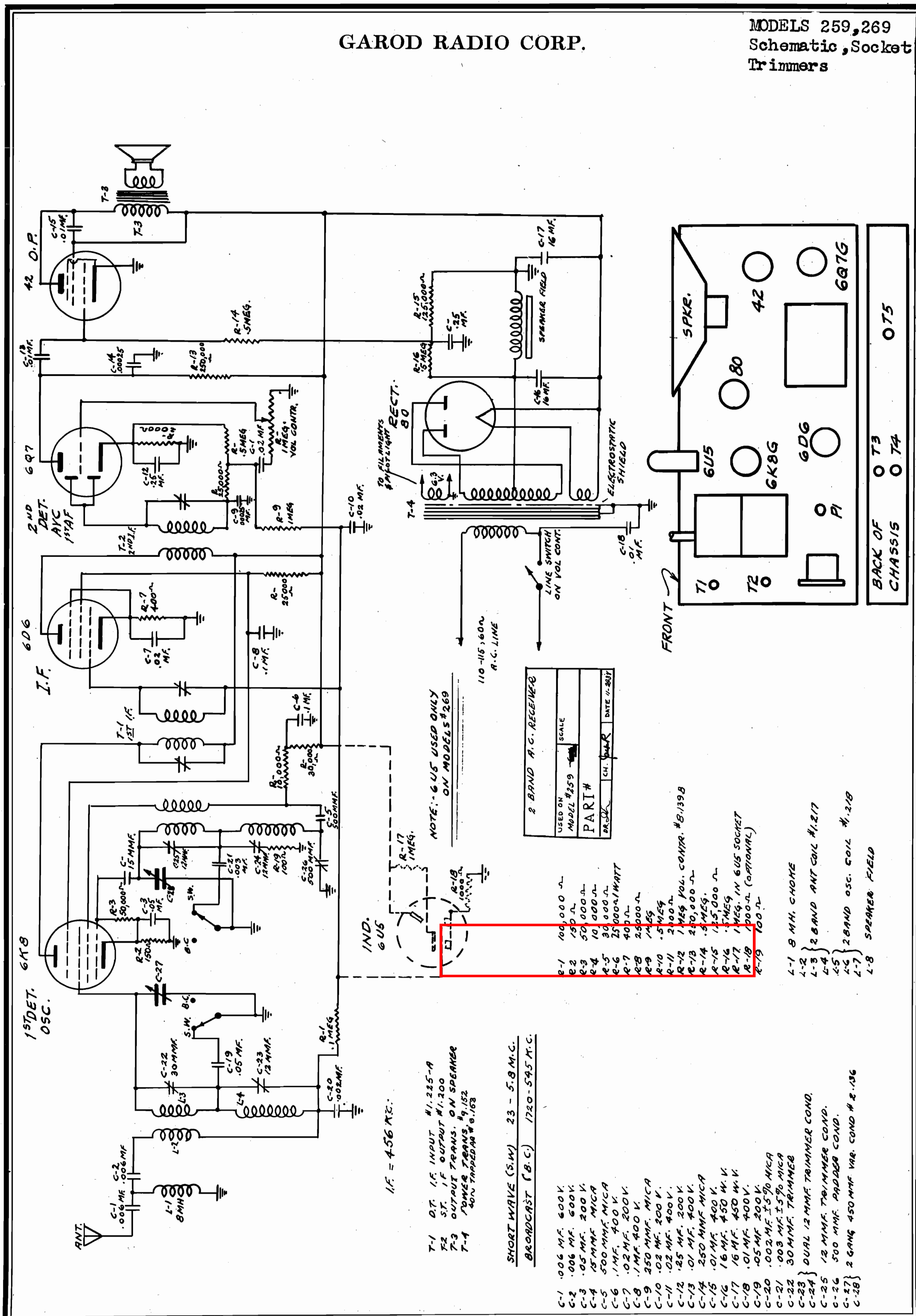
T-1 INPUT I.F. #1.163
T-2 OUTPUT I.F. #1.200
T-3 OUTPUT TRANS. ON SPEAKER
T-4 POWER TRANSFORMER

R-1 100,000 Ω
R-2 300 Ω
R-3 50,000 Ω
R-4 100 Ω
R-5 5000 Ω
R-6 7,500 Ω
R-7 15000 Ω 1 WATT
R-8 25000 Ω 1 WATT
R-9 1 MEG. IN SOCKET
R-10 1 MEG
R-11 400 Ω
R-12 25000 Ω
R-13 .5 MEG
R-14 250000 Ω
R-15 1000 Ω
R-16 5000 Ω
R-17 1 MEG. VOL. CONTROL
R-18 1 MEG TONE CONTROL
R-19 250 000 Ω
R-20 .5 MEG
R-21 .5 MEG.
R-22 125,000 Ω
R-23

L-1 456 K.C. WAVE TRAP } ON #1.198
L-2 CHOKE }
L-3 }
L-4 } TWO BAND ANT. COIL #1.217
L-5 }
L-6 }
L-7 } TWO BAND OSC. COIL #1.218
L-8 }
L-9 } POLICE BAND ANT. COIL } #1.237
L-10 }
L-11 } POLICE BAND OSC. COIL }
L-12 }
L-13 1600 Ω SPEAKER FIELD

MODELS 259,269
Schematic, Socket
Trimmers

GAROD RADIO CORP.



MODELS 259,269
MODEL 369
MODELS 629,729
MODEL 739
MODEL 7390

GAROD RADIO CORP.

Alignment

Re-alignment of this receiver should not be attempted unless all other possible causes have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave bands, and an output meter for indicating the effect of adjustments are required.

During the alignment procedure all adjustments should be made under the following conditions.

1) Line voltage as indicated on instruction sheet
2) Volume and tone control at maximum volume positions.
3) Minimum input from signal generator.

If this procedure is not adhered to, all adjustments will appear very broad. This is due to the action of the automatic volume control.

ALIGNMENT - MODELS 259,269,629,729,739,7390, and 369.

I.F. ADJUSTMENT The signal generator is set at 456 KC and is connected to the grid of the converter tube (6K8) through a .5 MFD condenser. Be sure to connect a resistor of approximately 25,000 ohms between the converter grid and ground so that the grid circuit is at ground potential for D.C.

The Band switch should be set on Broadcast and the pointer set at 550 kc. The Imput I.F. transformer trimmers are located on the rear chassis apron, between the variable condenser and the 6D6 I.F. tube. Both screws are adjusted for maximum output as indicated by the output meter connected across either the voice coil or the primary coil of the loud speaker output transformer.

The output I.F. transformer trimmer is located on the rear chassis apron, under the power transformer adjust the trimmer for maximum output as indicated on the output meter. The Input I.F. should now be re-checked for maximum output.

BROADCAST BAND

The dummy antenna for this band consists of only a 250 MMFD condenser. Set the band Switch in the Broadcast position and condenser plates completely out of mesh.

MODEL -259,269.

Set the signal generator at 1720 KC and adjust the broadcast oscillator trimmer located on top of the chassis (it is the trimmer to the rear of the chassis) until a response is indicated on the output meter. The generator is now set at 1500 KC. Turn the variable condenser until a response is indicated. The dial pointer should now co-incide with the 1500 KC mark on the dial. Adjust the 1500 KC Antenna trimmer (located on top of the chassis, near the variable condenser. It is the trimmer to the front of the chassis.) for maximum output.

MODEL-629,729.

Set the signal generator at 1770 KC and adjust the broadcast oscillator trimmer on top of the chassis, to the right of the gang condenser. The oscillator trimmer is the front adjustment, until a response is indicated. The dial pointer should now co-incide with the 1500 KC mark on the dial. Adjust the 1500 KC Antenna for maximum output.

MODEL 739, 7390

Set the signal generator at 1720 KC and adjust the broadcast oscillator trimmer (under the chassis, behind the tone control. The oscillator trimmer is the one nearest the band switch) until a response is indicated on the output meter. The generator is now set at 1500 KC. Turn the variable condenser until a response is indicated. The dial pointer should now coincide with the 1500 KC mark on the dial. Adjust the 1500 KC Antenna trimmer (located adjacent to the oscillator trimmer, under the chassis) for maximum output.
Set the generator at 600 KC and turn the variable condenser control until a response is indicated. Adjust the broadcast oscillator padder condenser (located directly behind the variable condenser) for maximum response while "rocking" the gang condenser. The high frequency adjustments should now be rechecked.

SHORT-WAVE BAND #1 ADJUSTMENT. (right position) — *FOR MODEL 369 ONLY*
Set the band switch to the extreme left hand position which is short wave band #1. Turn the dial control knob to the extreme high frequency end so that the condenser plates are entirely out of mesh. The signal generator is connected to the "short-antenna" lead through a dummy antenna consisting of a 250 MMFD condenser and a 400 ohm non-inductive resistor in series. *With the generator set at 22MC (22.5MC) the short wave oscillator trimmer is opened until a response is heard. The trimmer condenser is then opened further (capacity reduced) until a second response is heard. This response (with trimmer at low capacity) is the correct response to use, the other being the image.
*With the generator set at 23MC—FOR MODELS 629,729.
Set the generator at 19MC Turn the condenser until a response is indicated. The pointer should coincide with the 19MC mark on the dial. Adjust the antenna trimmer for the short-wave band (located under the chassis, on the antenna coil) for maximum output while rocking the condenser gang from left to right.

SHORT WAVE BAND #2 *MODEL 369 ONLY*
Set the band switch to the middle position. Turn the dial control knob to the extreme high frequency end so that the condenser plates are entirely out of mesh. The signal generator is left connected as for band #1. The generator is set at 6.25 MC and the Band #2 oscillator trimmer is opened until a response is indicated at the lower capacity setting of the trimmer. (Located on top of the chassis, behind the dial bracket. The one is the front trimmer). Set the generator at 6MC and turn the variable condenser until a response is indicated. The pointer should now co-incide with the 6 MC mark on the dial. The antenna trimmer is then adjusted for maximum output while the condenser gang is rocked from right to left. The antenna trimmer is located on the top of the chassis, in line with and directly behind the oscillator trimmer. Set the generator at 2.4 MC and turn the variable condenser knob until a response is indicated. The padder for this band, which is located on top of the chassis and is the projecting adjacent screw to the right of the osculator trimmer, is now adjusted for maximum output while rocking the condenser gang from left to right. The high frequency adjustments should then be rechecked.

LONG WAVE BAND *MODEL-7390 ONLY*
The dummy antenna for this band is the same one used in aligning the broadcast band.

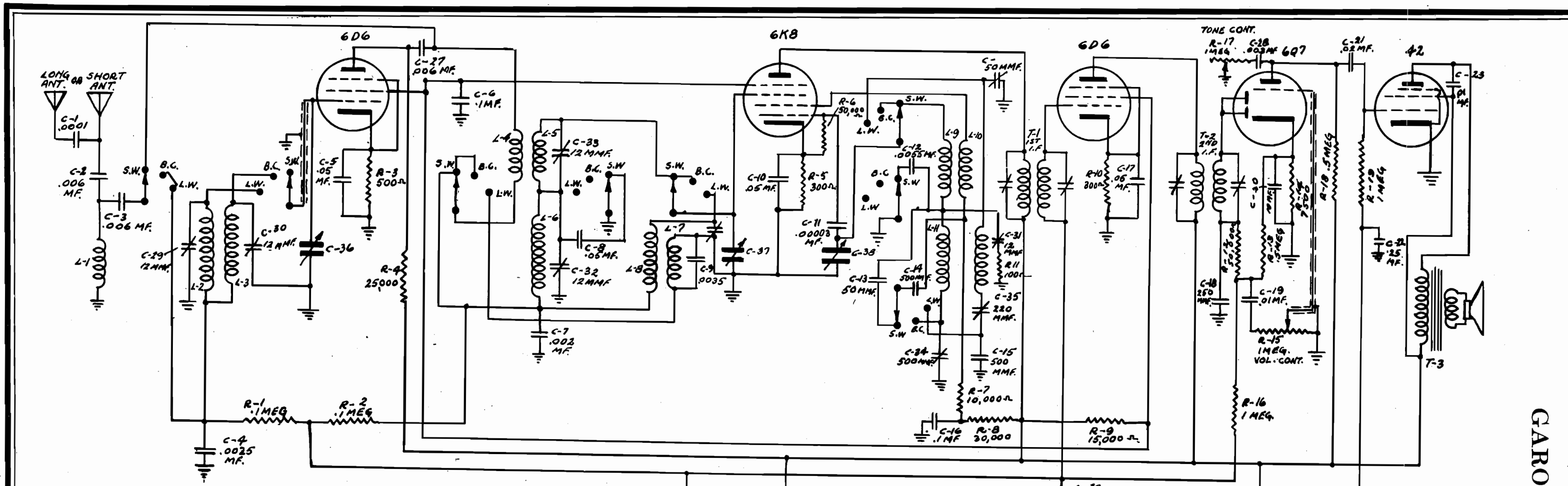
Set the generator at 300 KC. Set the dial pointer so as to coincide with the 300 KC mark on the dial. The long-wave oscillator trimmer (located on top of chassis, right hand side, behind the right hand dial bracket. The oscillator is the rear trimmer) is now adjusted until a response is indicated. The long wave antenna trimmer (located adjacent to the oscillator trimmer) is now adjusted for maximum output.

Set the generator at 150 KC and tune for a response. Adjust the Long-Wave padding condenser (located on top of chassis to the right and forward of the oscillator antenna trimmers for maximum output while "rocking" the gang condenser. The high frequency adjustments should now be rechecked.

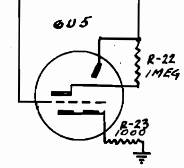
Now set the signal generator at about 1200 kc and leave THE BAND SWITCH ON THE LONG WAVE POSITION. Adjust the generator output voltage until a response is heard. The 1200 kc wave trap on top right of the chassis is now adjusted for MINIMUM response.

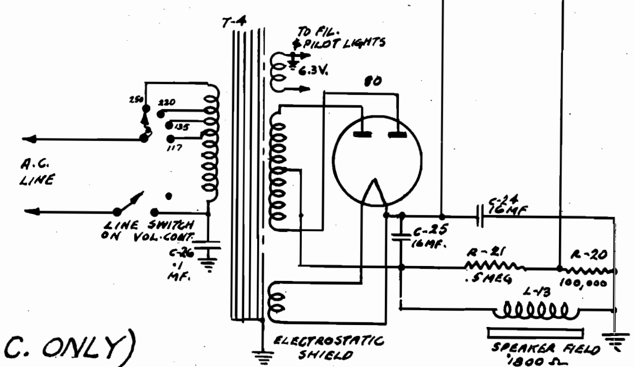
GAROD RADIO CORP.

MODELS 379,3790
Schematic



SHORT WAVE (S.W.) 22.1 MC. TO 5.75 MC. OR 13.5 METERS - 52 METERS
BROADCAST (B.C.) 1650 KC. TO 540 KC. OR 181 METERS - 550 METERS
LONG WAVE (L.W.) 375 KC. TO 142 KC. OR 800 METERS TO 2125





MODEL 379 (B.C. ONLY)
MODEL 3790 (B.C. & L.W.)

I.F.: 456 K.C.

C-1	.0001 MF. MICA
C-2	.006 MF. 600 V. TUBULAR
C-3	.006 MF. 600 V. TUBULAR
C-4	.0025 MF. ±5% MICA
C-5	.05 MF. 200 V. TUBULAR
C-6	.1 MF. 400 V.
C-7	.002 MF. ±5% MICA
C-8	.05 MF. 200 V.
C-9	.0035 MF. MICA
C-10	.05 MF. 200 V.
C-11	30 MMF. MICA
C-12	.0055 MF. ±5% MICA
C-13	50 MMF. MICA
C-14	500 MMF. MICA
C-15	500 MMF. MICA
C-16	.1 MF. 400 V.
C-17	.05 MF. 200 V.
C-18	250 MMF. MICA
C-19	.01 MF. 200 V.
C-20	10 MF. 25 V.
C-21	.02 MF. 400 V. TUBULAR
C-22	.25 MF. 200 V. TUBULAR
C-23	.01 MF. 400 V.
C-24	16 MF. 450 W.V. PART #5.338
C-25	16 MF. 450 W.V. PART #5.336
C-26	.1 MF. 400 V.
C-27	.006 MF. 600 V. MICA
C-28	.003 MF. 600 V. MICA
C-29, C-30	DUAL 12 MMF. TRIMMER
C-31, C-32	DUAL 12 MMF. TRIMMER
C-33	12 MMF. TRIMMER
C-34	500 MMF. PADDER
C-35	220 MMF. PADDER
C-36, C-37, C-38	3 GANG 450 MMF. VAR. COND.
C-39	.015 MF. 200 W.V. TUBULAR

R-1	100,000 Ω 1/3 WATT
R-2	100,000 Ω
R-3	500 Ω
R-4	25,000 Ω
R-5	300 Ω
R-6	50,000 Ω
R-7	10,000 Ω
R-8	30,000 Ω
R-9	15000 Ω 1 WATT
R-10	300 Ω
R-11	100 Ω
R-12	50,000 Ω
R-13	.5 MEG
R-14	500 Ω
R-15	1 MEG. VOL. CONTR. #8.139 B
R-16	1 MEG.
R-17	1 MEG TONE CONTR. #8.140
R-18	.5 MEG.
R-19	1 MEG.
R-20	100,000 Ω
R-21	500,000 Ω
R-22	1 MEG IN TUBE SOCKET
R-23	1000 Ω

L-1	ANT. CHOKE 8 MH. #1.221
L-2	LONG WAVE ANT. COIL #1.141
L-3	BROADCAST ANT. COIL #1.207
L-4, L-5, L-6	2 BAND COIL #1.228
L-7, L-8	LONG WAVE INTERSTAGE COIL
L-9, L-10, L-11	2 BAND OSC. COIL #1.229
L-12	LONG WAVE OSC. COIL #1.209
L-13	SPEAKER FIELD 1800 Ω
L-14	

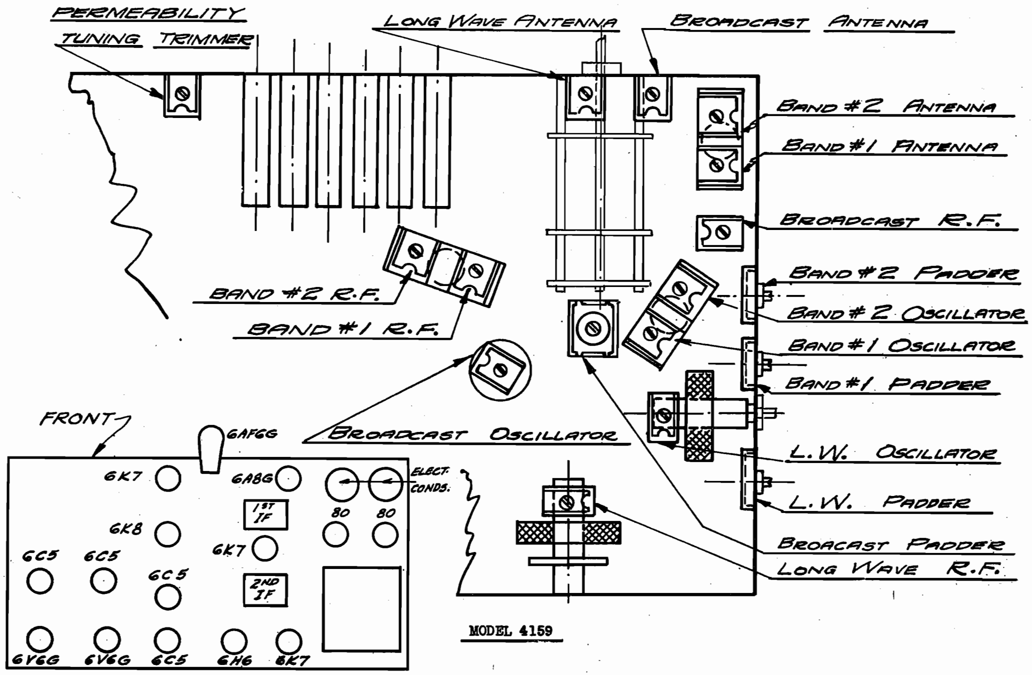
T-1	INPUT I.F. D.T. #1.163
T-2	OUTPUT I.F.T. #1.164
T-3	OUTPUT TRANS. ON SPEAKER
T-4	POWER TRANS. #9.157

3 BAND A.C. RECEIVER
USED ON MODEL #3790 | SCALE
PART#
DR. | CH. | DATE

MODELS 379,3790
Socket,Trimmers
Tuner Data

GAROD RADIO CORP.

MODEL 4159
Socket,Trimmers



MODEL 4159

MODELS 379 and 3790

PROCEDURE FOR SETTING STATION BUTTONS

Select the six favorite broadcast stations which you wish to set up for automatic tuning. The stations chosen should be from amount those received most clearly when using dial tuning. It is not advisable to use this system of tuning for short wave or distant broadcast stations.

Although each button will cover the entire dial range it may be most advisable, from the standpoint of convenience, to arrange the stations chosen in order of frequency.

SETTING THE STATION BUTTONS: The proper procedure is as follows--grasp the first button to be set with the finger tips and loosen it by unscrewing it about one-half turn to the left or in a counter clockwise direction. Now tune in the station which you desire to set on this button, using the regular tuning knob. After the station is perfectly tuned, hold the knob firmly with one hand and depress the button just loosened as far as it will go. Then tighten it gently by turning it to the right, or in a clockwise direction. The button should be kept depressed in the meantime, and the dial knob should be held firmly so that the station does not become detuned.

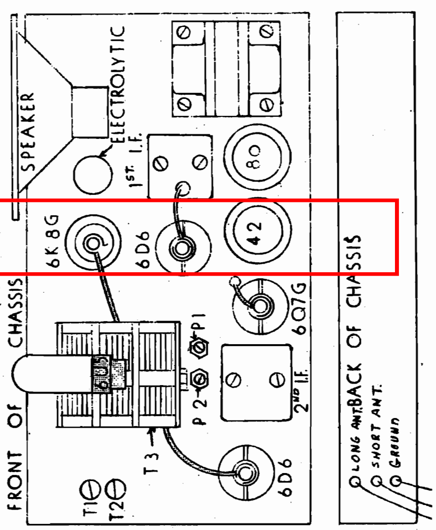
Now release the push button and turn it again in a clockwise direction to make sure it is firmly tightened. Then tune the dial off the station and try depressing the push button as far as it will go. The station should then be perfectly retuned. If it is not tuned properly that is, if you are able to retune it better with the dial, it will be necessary to repeat the above procedure.

The other five buttons may now be set up in the same manner as described above, tuning each to one of the favorite stations which you have selected.

The tabs bearing the station call letters may now be removed from the sheet provided, and placed in the slots below the pushbuttons.

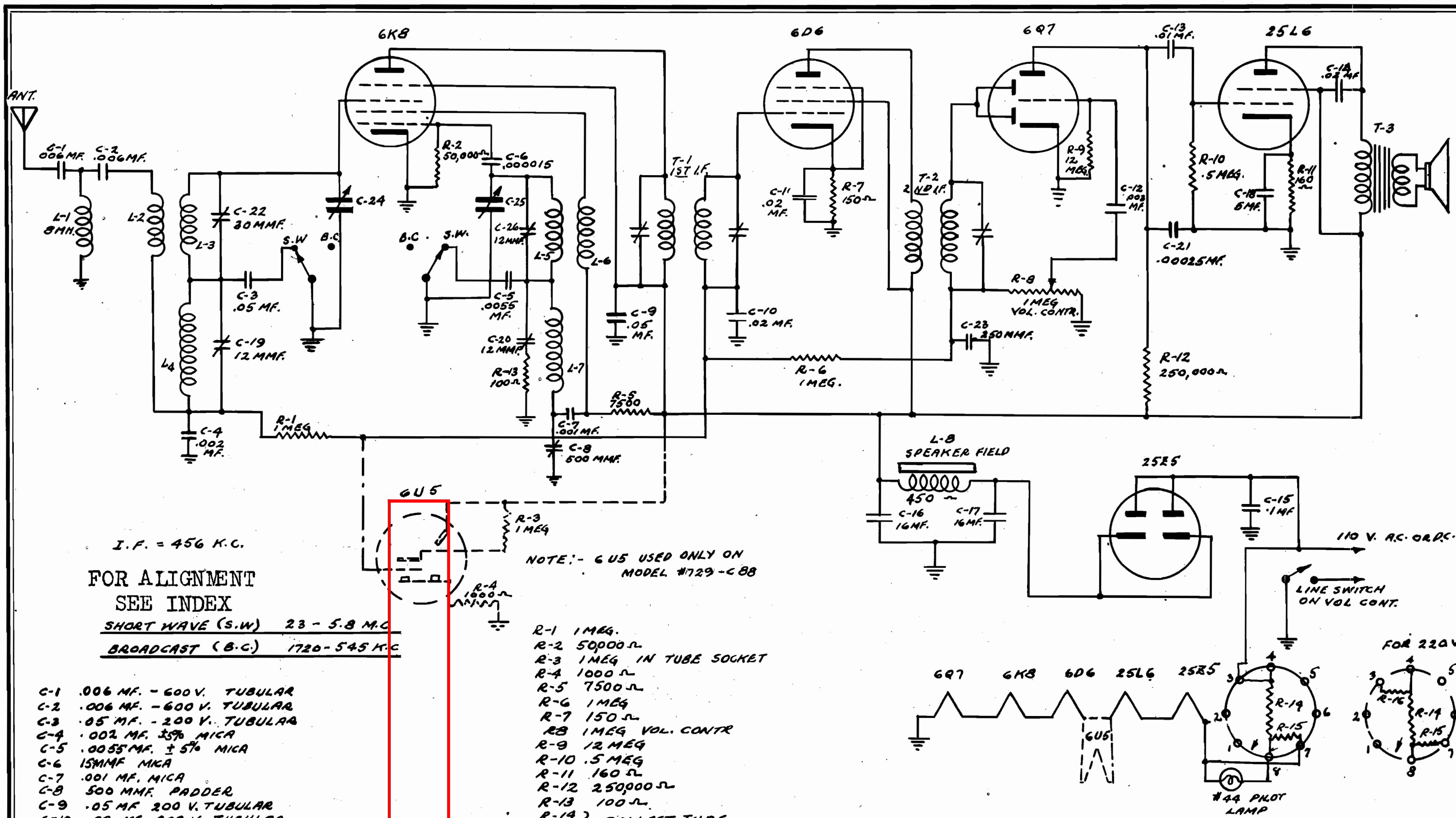
When tuning with the pushbuttons, it must be remembered that this is a mechanically driven device, depending upon pressure for proper operation. For this reason the pushbuttons must be depressed firmly, otherwise the dial may not come to the correct setting before the button is released.

If at any time it is desired to change one of the stations which is set up for automatic tuning, this may be done without disturbing the settings of the other stations. Merely set up the new station on the button which was used for the station no longer desired.



MODELS 629,729
Schematic

GAROD RADIO CORP.



I.F. = 456 K.C.

FOR ALIGNMENT
SEE INDEX

SHORT WAVE (S.W) 23 - 5.8 M.C.
BROADCAST (B.C.) 1720-545 K.C.

C-1 .006 MF. - 600 V. TUBULAR
C-2 .006 MF. - 600 V. TUBULAR
C-3 .05 MF. - 200 V. TUBULAR
C-4 .002 MF. ±5% MICA
C-5 .0055 MF. ± 5% MICA
C-6 15MMF MICA
C-7 .001 MF. MICA
C-8 500 MMF. PADDER
C-9 .05 MF 200 V. TUBULAR
C-10 .02 MF. 200 V. TUBULAR
C-11 .02 MF. 200 V.
C-12 .003 MF. 600 V. TUBULAR
C-13 .01 MF. 400 V.
C-14 .02 MF. 400 V.
C-15 .1 MF. 400 W.V.
C-16 } 16 MF. 150 W.V. ELECTROLYTIC } #5.337
C-17 } 16 MF. 150 W.V. ELECTROLYTIC
C-18 5 MF. 25 W.V.
C-19 } C-20 } DUAL 3-12 MMF TRIMMER
C-21 250 MMF. MICA
C-22 30 MMF. TRIMMER
C-23 250 MMF. MICA
C-24 } C-25 } 2 GANG VARIABLE 450 MMF #2.136

R-1 1 MEG.
R-2 50000 Ω
R-3 1 MEG IN TUBE SOCKET
R-4 1000 Ω
R-5 7500 Ω
R-6 1 MEG
R-7 150 Ω
R8 1 MEG VOL. CONTR
R-9 12 MEG
R-10 .5 MEG
R-11 160 Ω
R-12 250,000 Ω
R-13 100 Ω
R-14 } R-15 } BALLAST TUBE
R-16 } IN 220 V. BALLAST TUBE

L-1 8 MH. CHOKE
L-2 } L-3 } L-4 } 2 BAND ANT. COIL #1.217
L-5 } L-6 } L-7 } 2 BAND OSC. COIL #1.218

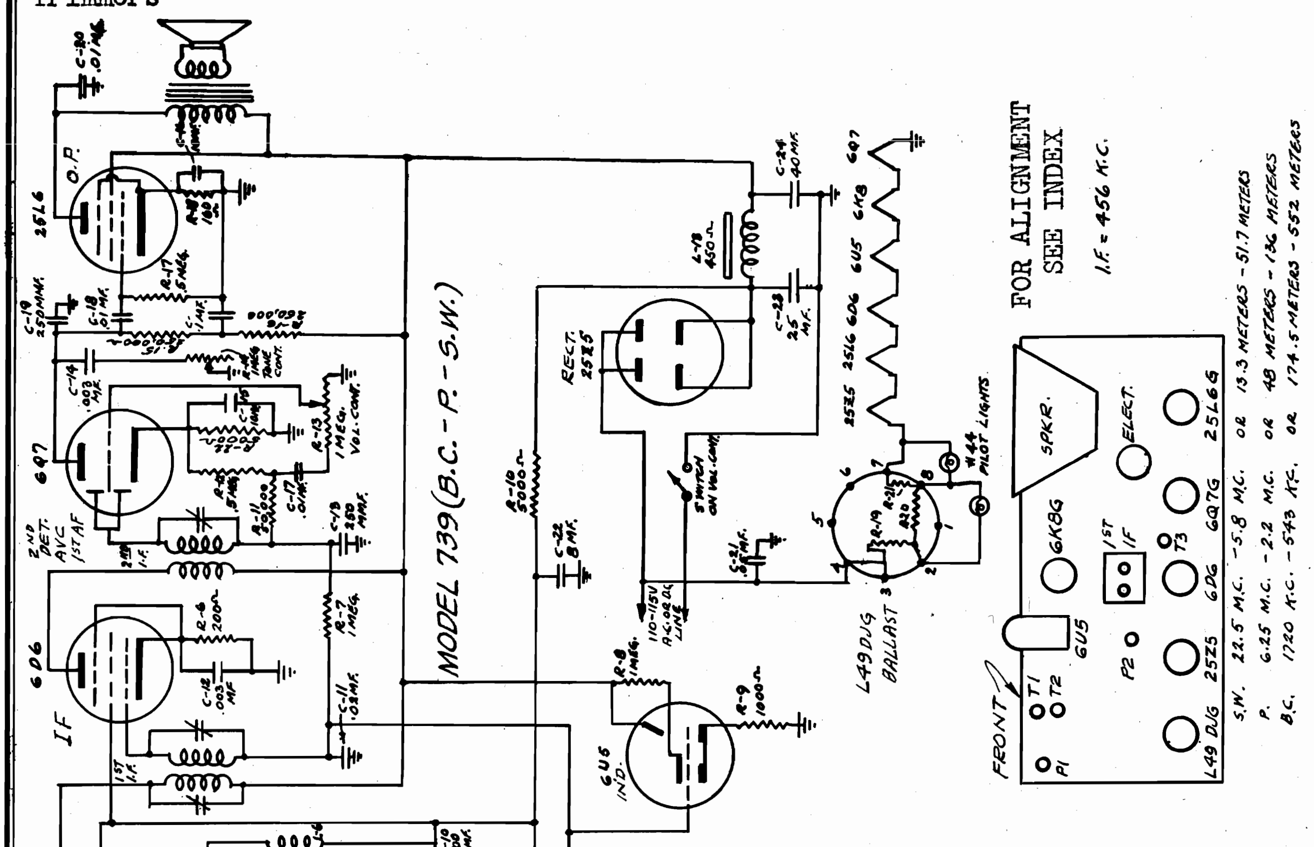
T-1 DOUBLE TUNED INPUT I.F. #1225
T-2 SINGLE TUNED OUTPUT I.F. #1200
T-3 OUTPUT TRANS. ON SPEAKER

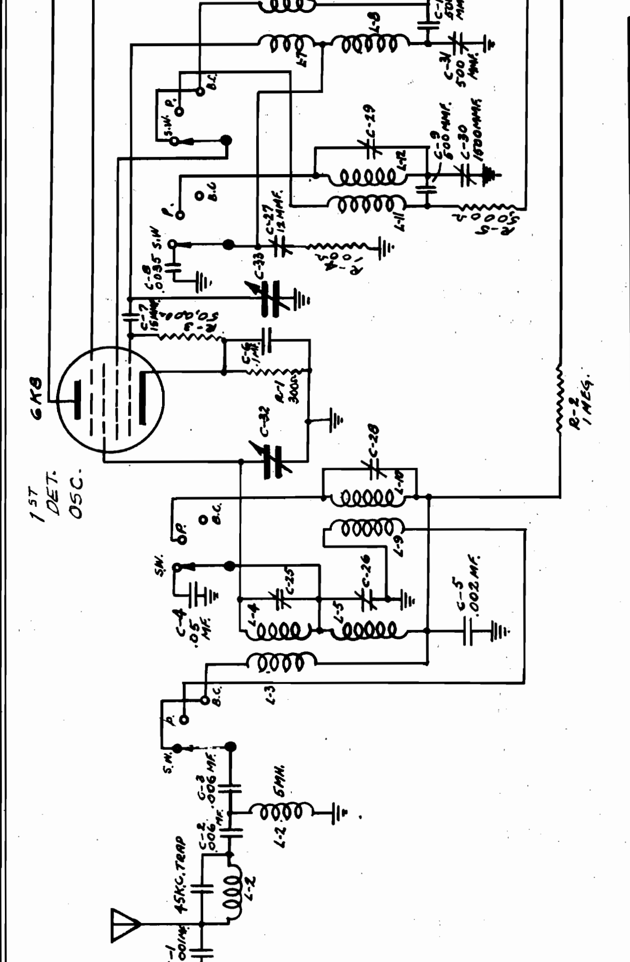
SHORT WAVE (S.W.) 23 M.C. TO 5.8 M.C.
BROADCAST (B.C.) 1720 K.C. TO 545 K.C.

2 BAND A.C. & DC RECEIVER	
USED ON MODEL 629,	SCALE
PART#	
DATE	DRN BY / CHK'D

MODEL 739
Schematic, Socket
Trimmers

GAROD RADIO CORP.





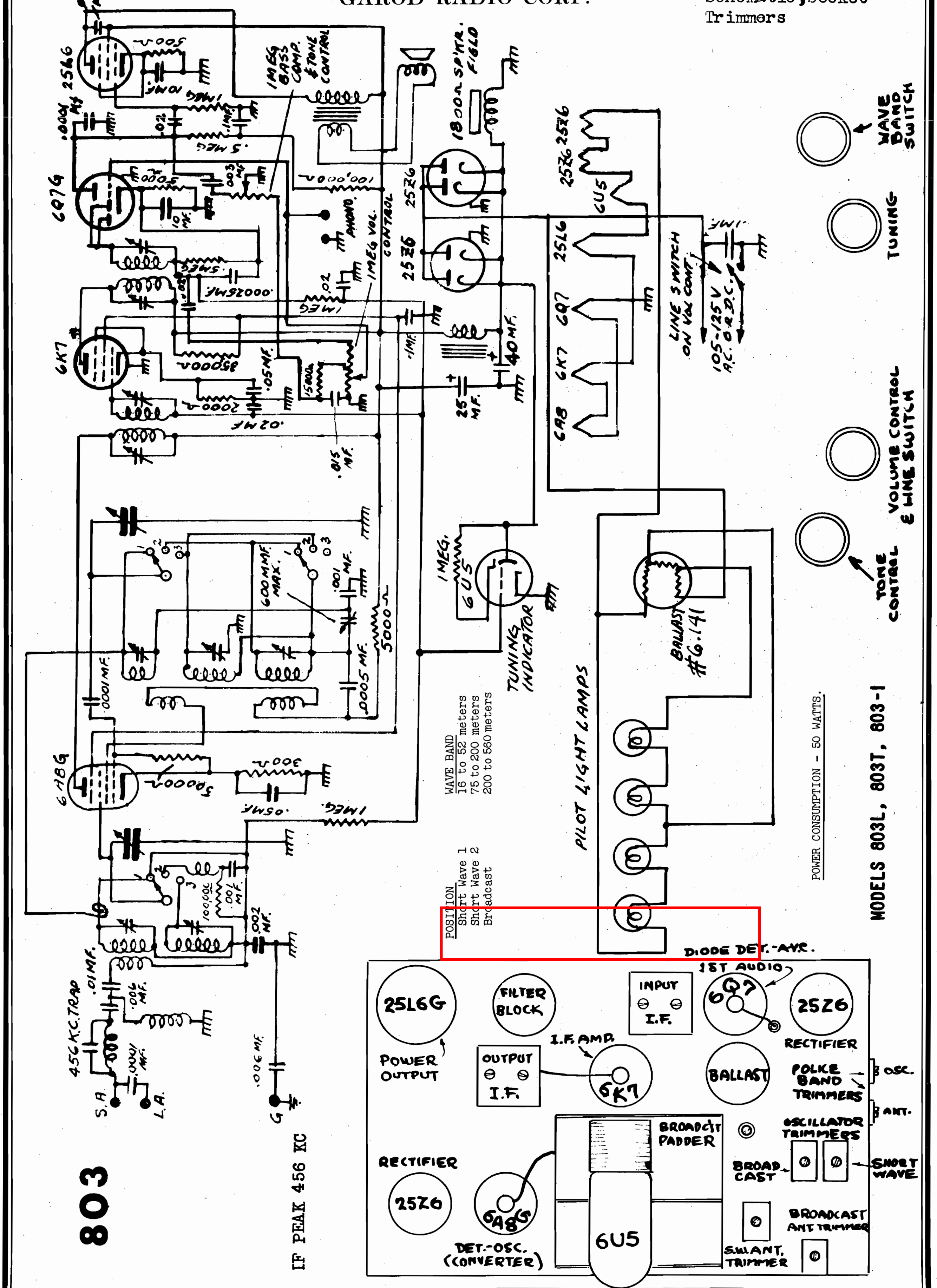
R-1 300Ω
R-2 1 MEG
R-3 50,000Ω
R-4 100Ω
R-5 5000Ω
R-6 200Ω
R-7 1 MEG
R-8 1 MEG. IN SOCKET
R-9 1000Ω
R-10 5000Ω
R-11 50,000Ω
R-12 .5 MEG
R-13 1 MEG VOL. CONTROL #8.139 B
R-14 1 MEG TONE CONTROL 8.140
R-15 250,000Ω
R-16 250,000Ω
R-17 .5 MEG
R-18 160Ω 1 WATT FLEX
R-19, R-20, R-21 } IN BALLAST TUBE
R-22 5000Ω

L-1 WAVE TRAP } ON 1.198
L-2 CHOKE
L-3, L-4, L-5 } 2 BAND ANT. COIL #1.217
L-6, L-7, L-8 } 2 BAND OSC. COIL #1218
L-9, L-10 } POLICE BAND ANT. COIL } #1.231
L-11, L-12 } POLICE BAND OSC. COIL
L-13 450Ω SPEAKER FIELD

C-1 100 MMF. MICA
C-2 .006 MF. } ON #1.198
C-3 .006 MF
C-4 .05 MF. 200 V. TUBULAR
C-5 .002 MF. ±5% MICA
C-6 .1 MF. - 200 V TUBULAR
C-7 15 MMF. MICA
C-8 .0035 MF. ±5% MICA
C-9 500 MMF. MICA
C-10 500 MMF. MICA
C-11 .02 MF. 200 V.
C-12 .003 MF 600 W.V.
C-13 350 MMF. MICA
C-14 .008 MF. 600 V. TUBULAR
C-15, C-16 } 10 MF. 25 W.V. DUAL
C-17 .01 MF. 200 V.
C-18 .01 MF. 200 V.
C-19 250 MMF. MICA
C-20 .01 MF. 200 V.
C-21 .05 MF 400 V.
C-22 8 MF. 150 W.V.
C-23 25 MF. 150 W.V. } #5.339
C-24 40 MF. 150 W.V.
C-25 30 MMF. TRIMMER
C-26, C-27 } DUAL 12 MMF. TRIMMER
C-28, C-29 } DUAL 12 MMF. TRIMMER
C-30 1500 MMF. VARIABLE PADDER
C-31 500 MMF. VARIABLE PADDER
C-32, C-33 } 2 GANG 450 MMF. VARIABLE #2.136-A

GAROD RADIO CORP.

MODEL 803L,803T,803-1
Schematic, Socket
Trimmers



POSITION	WAVE BAND
Short Wave 1	16 to 52 meters
Short Wave 2	75 to 200 meters
Broadcast	200 to 560 meters

POWER CONSUMPTION - 50 WATTS.

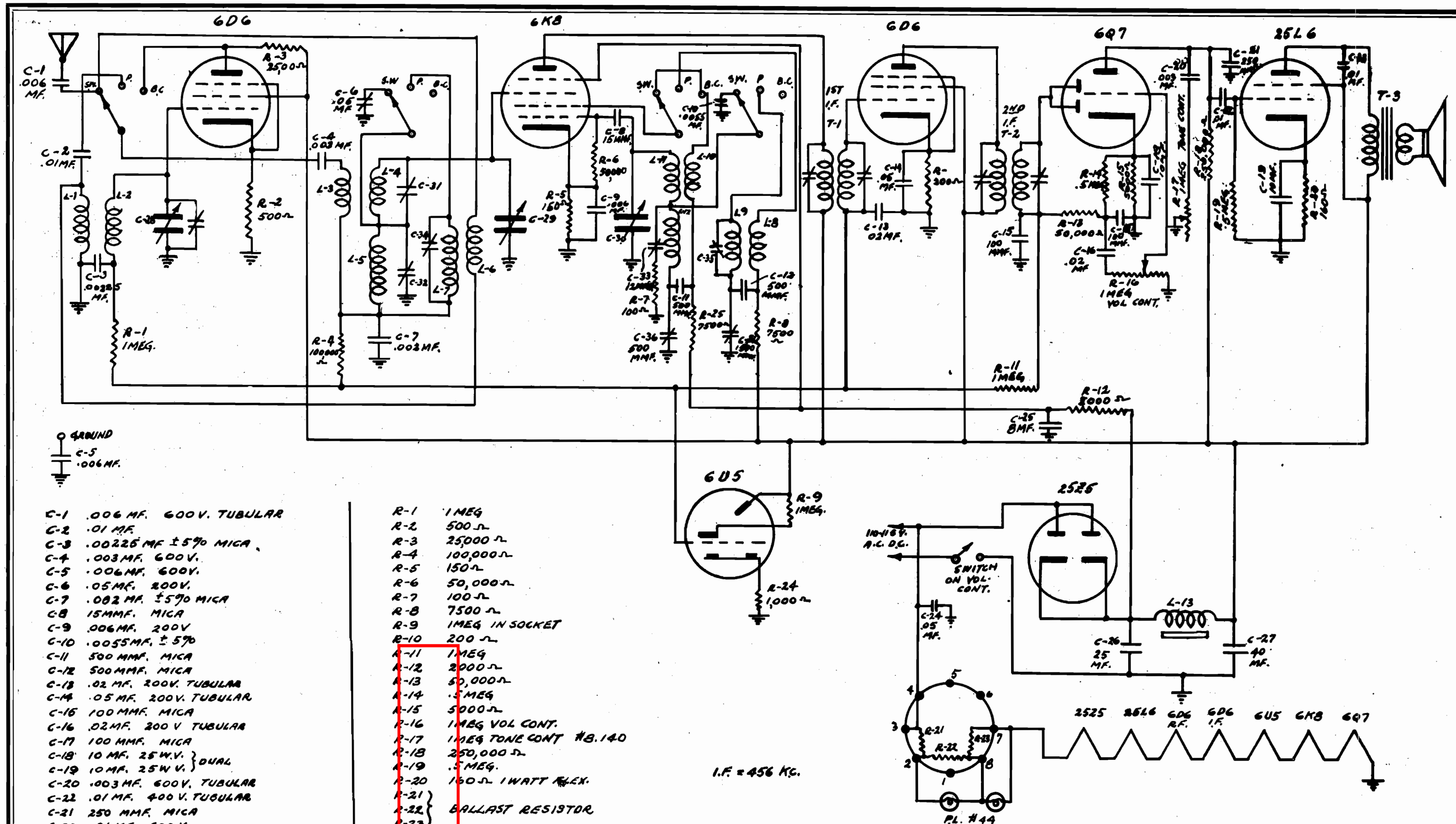
IF PEAK 456 KC

MODELS 803L, 803T, 803-1

803

MODEL 839
Schematic

GAROD RADIO CORP.



C-1 .006 MF. 600 V. TUBULAR
C-2 .01 MF.
C-3 .00225 MF ±5% MICA
C-4 .003 MF. 600 V.
C-5 .006 MF. 600 V.
C-6 .05 MF. 200 V.
C-7 .082 MF. ±5% MICA
C-8 15 MMF. MICA
C-9 .006 MF. 200 V
C-10 .0055 MF. ±5%
C-11 500 MMF. MICA
C-12 500 MMF. MICA
C-13 .02 MF. 200 V. TUBULAR
C-14 .05 MF. 200 V. TUBULAR
C-15 100 MMF. MICA
C-16 .02 MF. 200 V TUBULAR
C-17 100 MMF. MICA
C-18 10 MF. 25 W.V. } DUAL
C-19 10 MF. 25 W V. }
C-20 .003 MF. 600 V. TUBULAR
C-22 .01 MF. 400 V. TUBULAR
C-21 250 MMF. MICA
C-23 .01 MF. 400 V.
C-24 .05 MF. 400 V.
C-25 8 MF. 150 W.V. ELECTROLYTIC
C-26 25 MF. 150 W.V. } DUAL #5.339
C-27 40 MF. 150 W.V. }
C-28, C-29, C-30 } 3 GANG 450 MMF. VAR. COND.
C-31 30 MMF. TRIMMER
C-32, C-33 } DUAL 12 MMF. TRIMMER COND.
C-34, C-35 } DUAL 12 MMF TRIMMER COND.
C-36 500 MMF. PADDER
C-37 1500 MMF. PADDER

R-1 1 MEG
R-2 500 Ω
R-3 25,000 Ω
R-4 100,000 Ω
R-5 150 Ω
R-6 50,000 Ω
R-7 100 Ω
R-8 7500 Ω
R-9 1 MEG IN SOCKET
R-10 200 Ω
R-11 1 MEG
R-12 2000 Ω
R-13 50,000 Ω
R-14 .5 MEG
R-15 5000 Ω
R-16 1 MEG VOL CONT.
R-17 1 MEG TONE CONT #8.140
R-18 250,000 Ω
R-19 .5 MEG.
R-20 160 Ω 1 WATT FLEX.
R-21, R-22, R-23 } BALLAST RESISTOR
R-24 1000 OHMS
R-25 7500 Ω

L-1, L-2 } BROADCAST BAND ANTENNA COIL
L-3, L-4, L-5 } 2 BAND B.C. INTERSTAGE & S.W. ANT #1.229
L-6, L-7 } POLICE BAND ANTENNA COIL } #1.231
L-8, L-9 } POLICE BAND OSC COIL }
L-10, L-11, L-12 } 2 BAND OSC. COIL # 1.229
L-13 FILT CHOKE COIL # 9.129-A

I.F. = 456 KC.

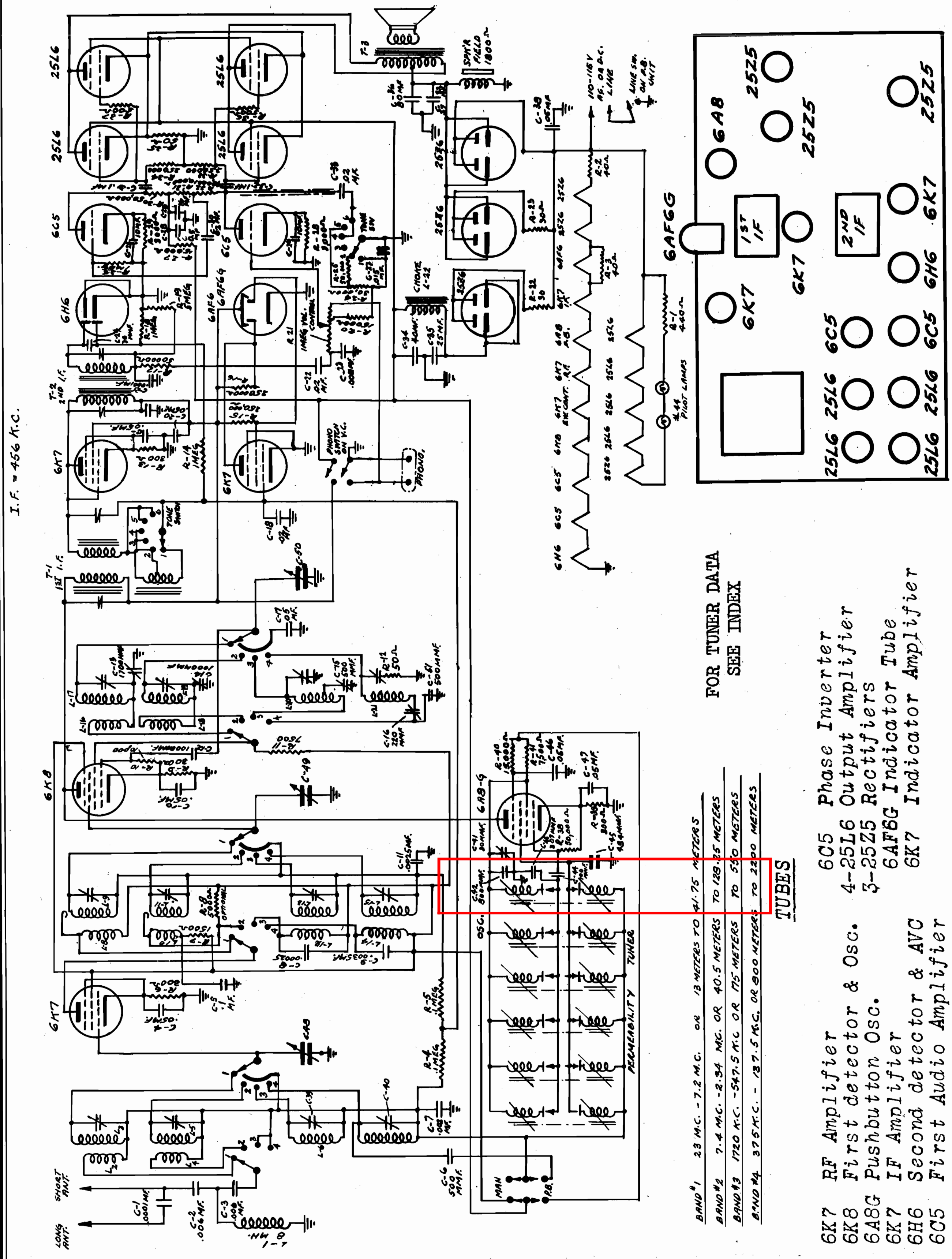
T-1 INPUT I.F. 1.163
T-2 OUTPUT I.F. 1.164
T-3 OUTPUT TRANS ON SPEAKER

S.W. 22.4 MC. - 5.825 MC | 13.4 METERS - 51.2 METERS
P. 6.25 MC. - 2.18 MC. | 48 METERS - 136.5 METERS
B.C. 1720 KC - 540 KC | 174 METERS - 555 METERS

8 TUBE A.C. D.C. RECEIVER 3 BAND	
USED ON 839 C-98	
DWN. BY	CHK'D BY

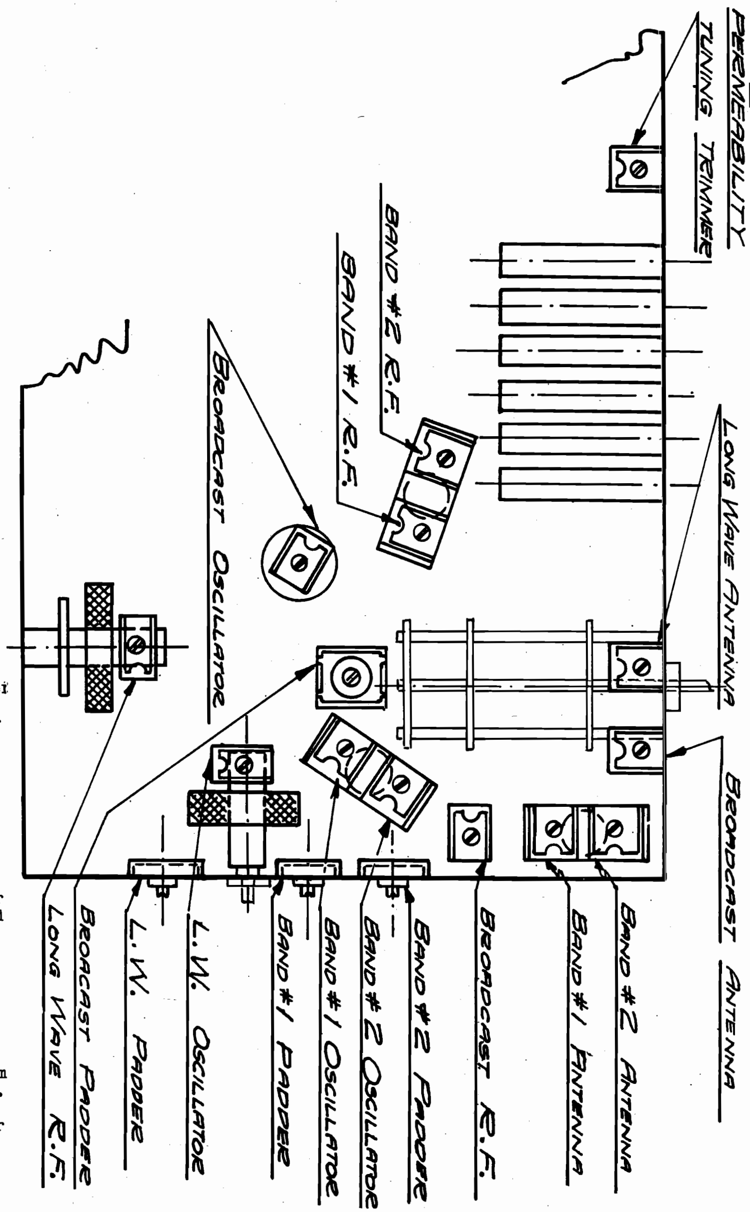
MODEL 1649
Schematic, Socket

GAROD RADIO CORP.



MODEL 1649
Alignment, Trimmers

GAROD RADIO CORP.



16 TUBE . . . 4 BAND . . . AC - DC RECEIVER

MODEL #1649 C 14

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave-bands and an output meter for indicating the effect of adjustments are required.

It is important to remember that in receivers of this kind which are equipped with automatic volume control it is necessary to use the minimum possible signal from the signal generator; otherwise the A.V.C. action will tend to nullify the variations in output as the trimmers are adjusted.

I.F. Adjustment: The signal generator is set at 456 kc and is connected through a .5 mmfd condenser to the grid of the first detector (6K8). With the band switch set on "Broadcast", the pointer set at 550 kc and the receiver volume control at its maximum position, the I.F. trimmers are adjusted for maximum output. These trimmers may be found on tops of the I.F. transformer shield cans.

Band #1 Adjustment: Turn the dial control knob so that the condenser plates are entirely out of mesh. Set the band switch to band #1. The signal generator should be connected to the short-antenna binding post through the dummy antenna consisting of a 250 mmfd mica condenser and a 400 ohm non-inductive resistor. The oscillator trimmer condenser should be opened to minimum capacity and the signal generator then set to 23 megacycles. The oscillator trimmer is then increased in capacity until maximum response is obtained. Two responses are possible and it is important that the high frequency response (oscillator trimmer low capacity) be used. The signal generator is then set to 21 MC and the variable condenser turned until a response is obtained. The pointer should coincide with the 21 MC mark on the dial. The antenna preselector and first detector trimmers are then adjusted in the order named, for maximum output. The variable condenser should be rocked slightly during this last adjustment. The signal generator is now set at 7.2 mc and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum reading of the output meter while the generator tuning condenser is rocked slightly to right and left. The high frequency adjustment should then be rechecked.

Band #2: The band selector switch is set in position for operation on short wave band #2. The variable condenser is opened so that the plates are completely unmeshed and the oscillator trimmer is opened to minimum capacity. The signal generator is set to 7.4 mc and the oscillator trimmer condenser is increased in capacity until a response is heard. Two responses are possible and it is important that the higher frequency response (oscillator trimmer low capacity be used. Set the signal generator at 7 mc and turn the tuning control until a response is indicated on the output meter. The pointer should now coincide with the 7 mc marker on the dial. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. After high frequency adjustments have been made set the signal generator at 2.5 mc and turn the variable gang condenser until a response is observed. Adjust the padding condenser for this band for maximum gain while rocking the tuning condenser slightly to the right and the left. The higher frequency adjustment should then be rechecked.

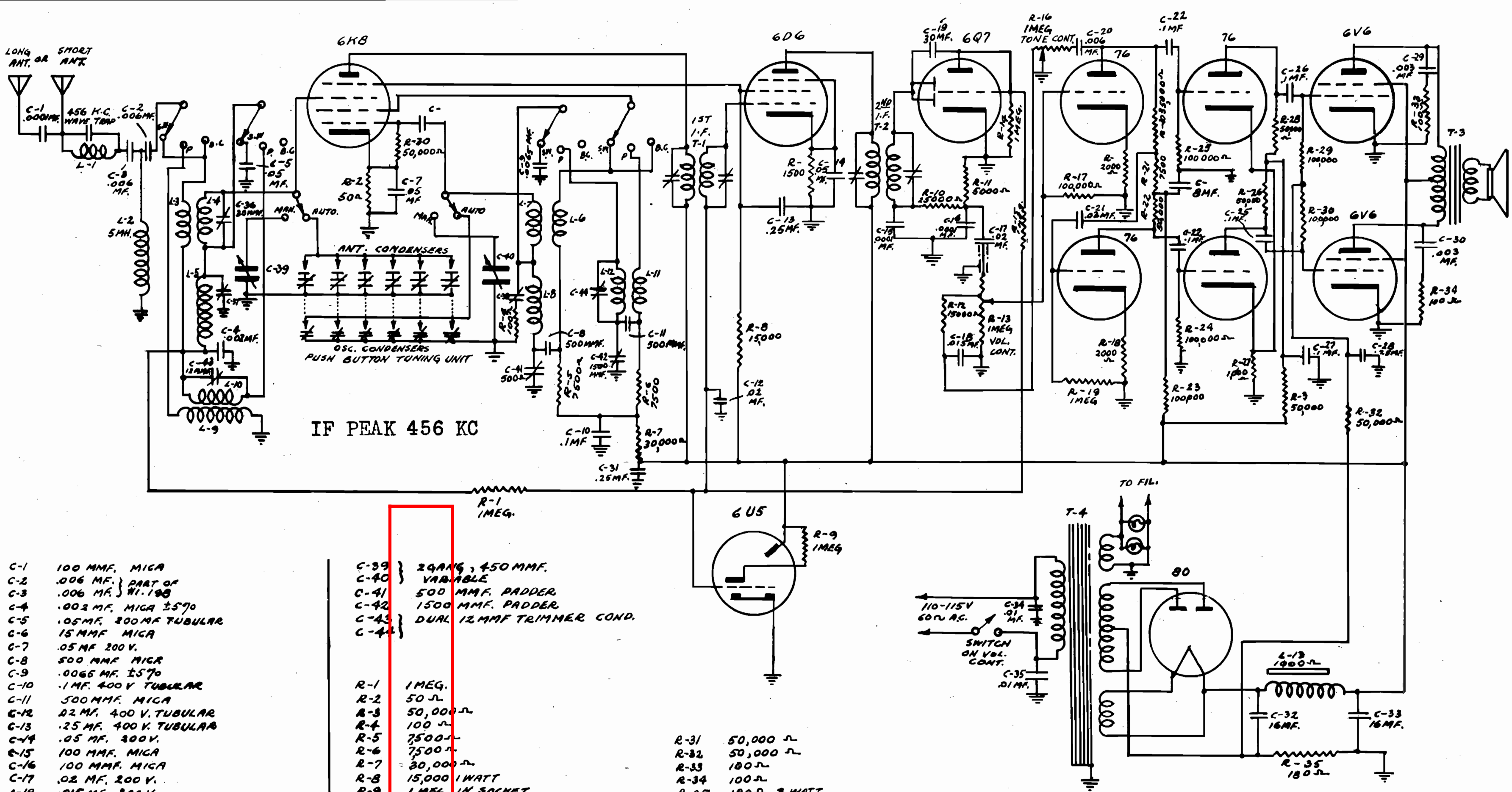
Broadcast Band: The dummy antenna for this band should consist of a 250 mmfd condenser only. The signal generator is set at 1720 kc, the band switch set at broadcast position. The variable condenser should be opened so that the plates are entirely out of mesh. The oscillator trimmer is then adjusted for maximum response on that frequency (1720kc). Set the signal generator at 1500 kc and tune the receiver until a response is indicated. The dial pointer should coincide with the 1500 kc mark on the dial. Then adjust the antenna and detector trimmers in the order indicated for maximum output. The signal generator is then set at 600 kc and the receiver tuned until a response is indicated. The padder condenser is then adjusted for maximum gain while the tuning gang condenser is rocked slightly to the left and right. The 1500 kc adjustment should then be rechecked.

Long Wave Band: The band selector switch is set in position for operation on the long wave band. The receiver and generator are both tuned to 300 kc and the oscillator trimmer is adjusted for maximum response. The antenna and first detector trimmers are adjusted in the order named for maximum output.

The signal generator is then set at 150 kc and the signal is tuned in. The long wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the left and right. The 300 kc adjustment should then be rechecked.

MODEL 3119
Schematic

GAROD RADIO CORP.



C-1	100 MMF. MICA
C-2	.006 MF. } PART OF #1.198
C-3	.006 MF. }
C-4	.002 MF. MICA ±5%
C-5	.05 MF. 200 MF. TUBULAR
C-6	15 MMF MICA
C-7	.05 MF 200 V.
C-8	500 MMF MICA
C-9	.0065 MF. ±5%
C-10	.1 MF. 400 V TUBULAR
C-11	500 MMF. MICA
C-12	.02 MF. 400 V. TUBULAR
C-13	.25 MF. 400 V. TUBULAR
C-14	.05 MF. 200 V.
C-15	100 MMF. MICA
C-16	100 MMF. MICA
C-17	.02 MF. 200 V.
C-18	.015 MF. 200 V.
C-19	30 MMF. MICA
C-20	.006 MF. 600 V. TUBULAR
C-21	.02 MF 400 V. TUBULAR
C-22	.1 MF. 400 V. TUBULAR
C-23	.1 MF. 400 V. TUBULAR
C-24	8 MF. 450 W.V. ELECTROLYTIC
C-25	.1 MF. 400 V. TUBULAR
C-26	.1 MF. 400 V. TUBULAR
C-27	.1 MF. 400 V. TUBULAR
C-28	.25 MF. 200 V.
C-29	.003 MF. 600 W.V.
C-30	.003 MF. 600 W.V.
C-31	.25 MF. 400 W.V.
C-32	16 MF. 450 W.V. WET ELECTROLYTIC
C-33	16 MF. 450 W.V.
C-34	.01 MF. 400 TUBULAR
C-35	.01 MF. 400 TUBULAR
C-36	30 MMF. TRIMMER
C-37 } C-38 }	DUAL 12 MMF. TRIMMER
C-39 } C-40 }	2 GANG, 450 MMF. VARIABLE
C-41	500 MMF. PADDER
C-42	1500 MMF. PADDER
C-43 } C-44 }	DUAL 12 MMF TRIMMER COND.

R-1	1 MEG.
R-2	50 Ω
R-3	50,000 Ω
R-4	100 Ω
R-5	7500 Ω
R-6	7500 Ω
R-7	30,000 Ω
R-8	15,000 1 WATT
R-9	1 MEG IN SOCKET
R-10	25,000 Ω
R-11	.5 MEG
R-12	15000 Ω
R-13	1 MEG VOL. CONT TAP AT 175000 Ω
R-14	1 MEG
R-15	1 MEG
R-16	1 MEG TONE CONTROL
R-17	100,000 Ω
R-18	2000 Ω
R-19	1 MEG.
R-20	350,000 Ω
R-21	7,500 Ω
R-22	50,000 Ω
R-23	100,000 Ω
R-24	100,000 Ω
R-25	100,000 Ω
R-26	50,000 Ω
R-27	1000 Ω
R-28	50,000 Ω
R-29	100,000 Ω
R-30	100,000 Ω
R-31	50,000 Ω
R-32	50,000 Ω
R-33	100 Ω
R-34	100 Ω
R-35	180 Ω 3 WATT

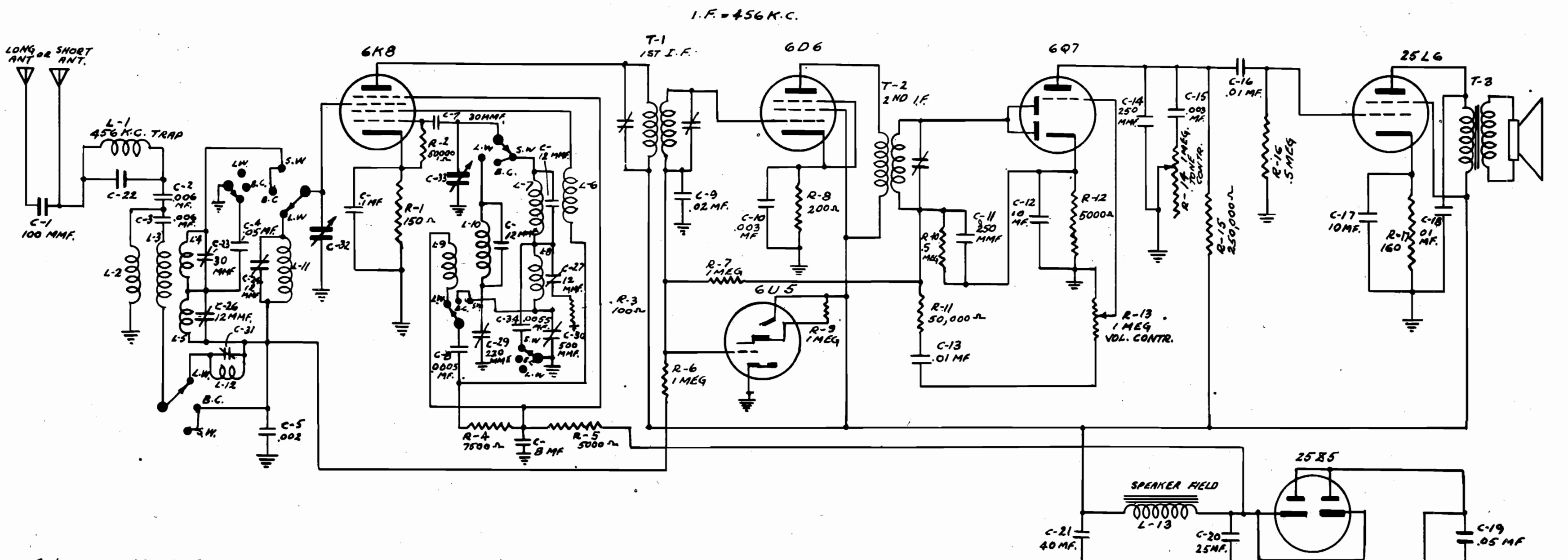
L-1 } L-2 }	456 KC TRAP COIL, CHOKE } #1.198
L-3 } L-4 } L-5 }	2 BAND ANT COIL #1.217
L-6 } L-7 } L-8 }	2 BAND OSC. COIL #1.229
L-9 } L-10 }	POLICE BAND ANT COIL } #1.231
L-11 } L-12 }	POLICE BAND OSC COIL } #1.231
L-13	1000 Ω SPEAKER COIL
T-1	INPUT I.F. #1.163
T-2	OUTPUT I.F. #1.164
T-3	OUTPUT TRANSF. ON SPEAKER
T-4	POWER TRANSF. 117V. #9.162 POWER TRANSF. MULTITAP 40~ #9.163

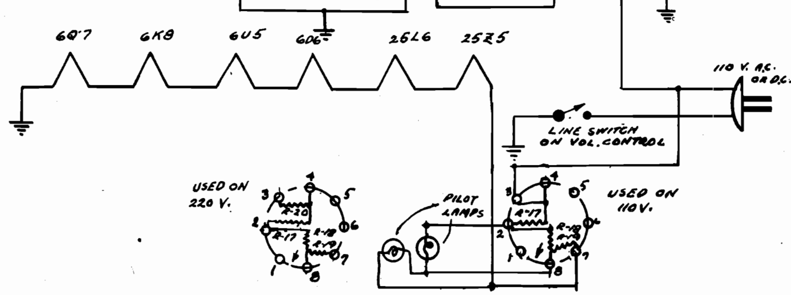
S.W.	22.5 M.C. - 5.8 M.C.	13.3 METERS - 51.8 METERS
P.	6.25 M.C. - 2.2. M.C.	48 METERS - 136.5 METERS
B.C.	1720 KC. - 543 KC.	174 METERS - 552 METERS

11 TUBE A.C RECEIVER
3 BAND
USED ON 3119 C-38
DRAWN BY J.K.
CHECKED BY

MODEL 7390
Schematic

GAROD RADIO CORP.





C-1 100 MMF. MICA
C-2 .006 MF.
C-3 .006 MF. } ON #1.198 WAVE TRAP
C-4 .05 MF. 200 V.
C-5 .002 ±5% MICA
C-6 .1 MF. 200 V.
C-7 30 MMF. MICA
C-8 500 MMF. MICA
C-9 .02 MF. 400 V.
C-10 .003 PAPER
C-11 250 MMF. MICA
C-12 10 MF. 25 W.V. ELECTROLYTIC
C-13 .01 MF. 800 V
C-14 250 MMF. MICA
C-15 .003 600 V.
C-16 .01 MF. 200 V
C-17 10 MF 25 V
C-18 .01 MF 400 V
C-19 .05 MF 400 V
C-20 25 MF. 150 W.V.
C-21 40 MF 150 W.V. } #5.339
C-22 PART OF WAVETRAP #1.198
C-23 30 MMF TRIMMER
C-24 DUAL 12 MMF.
C-25 } TRIMMER - OPTIONAL
C-26 DUAL 12 MMF.
C-27 } TRIMMER
C-28 12 MMF. TRIMMER OPTIONAL
C-29 220 MMF. VAR. PADDER
C-30 500 MMF. VAR. PADDER
C-31 TUNES L-12 TO 1200 K.C. FOR L.W TRAP
C-32 } VARIABLE COND 2 GANG
C-33 450 MMF.
C-34 .0055 MF. ±5% MICA

R-1 150 Ω
R-2 50,000 Ω
R-3 100 Ω
R-4 7500 Ω
R-5 5000 Ω
R-6 1 MEG
R-7 1 MEG
R-8 200 Ω
R-9 1 MEG (IN 6U5 SOCKET)
R-10 .5 MEG
R-11 50,000 Ω
R-12 5000 Ω
R-13 1 MEG VOL CONTROL
R-14 1 MEG TONE CONTROL #8.140
R-15 250,000 Ω
R-16 .5 MEG
R-17
R-18 } IN BALLAST TUBE
R-19
R-20 IN BALLAST TUBE ON 220 V.

L-1 456 KC. TRAP (WITH C-22) #1.198
L-2 6 MH. CHOKE
L-3
L-4 } 2 BAND ANT. COIL #1.228
L-5
L-6
L-7 } 2 BAND OSC. COIL #1.229
L-8
L-9 } L.W. OSC. COIL #1.121
L-10
L-11 L.W. ANT. COIL #1.141
L-12 TRAP TUNED BY C-31 TO 1200 KC. #1.142A
L-13 SPEAKER FIELD 450 Ω

T-1 D.T. INPUT I.F. #1.163
T-2 S.T. OUTPUT I.F. #1.200
T-3 OUTPUT TRANS ON SPEAKER

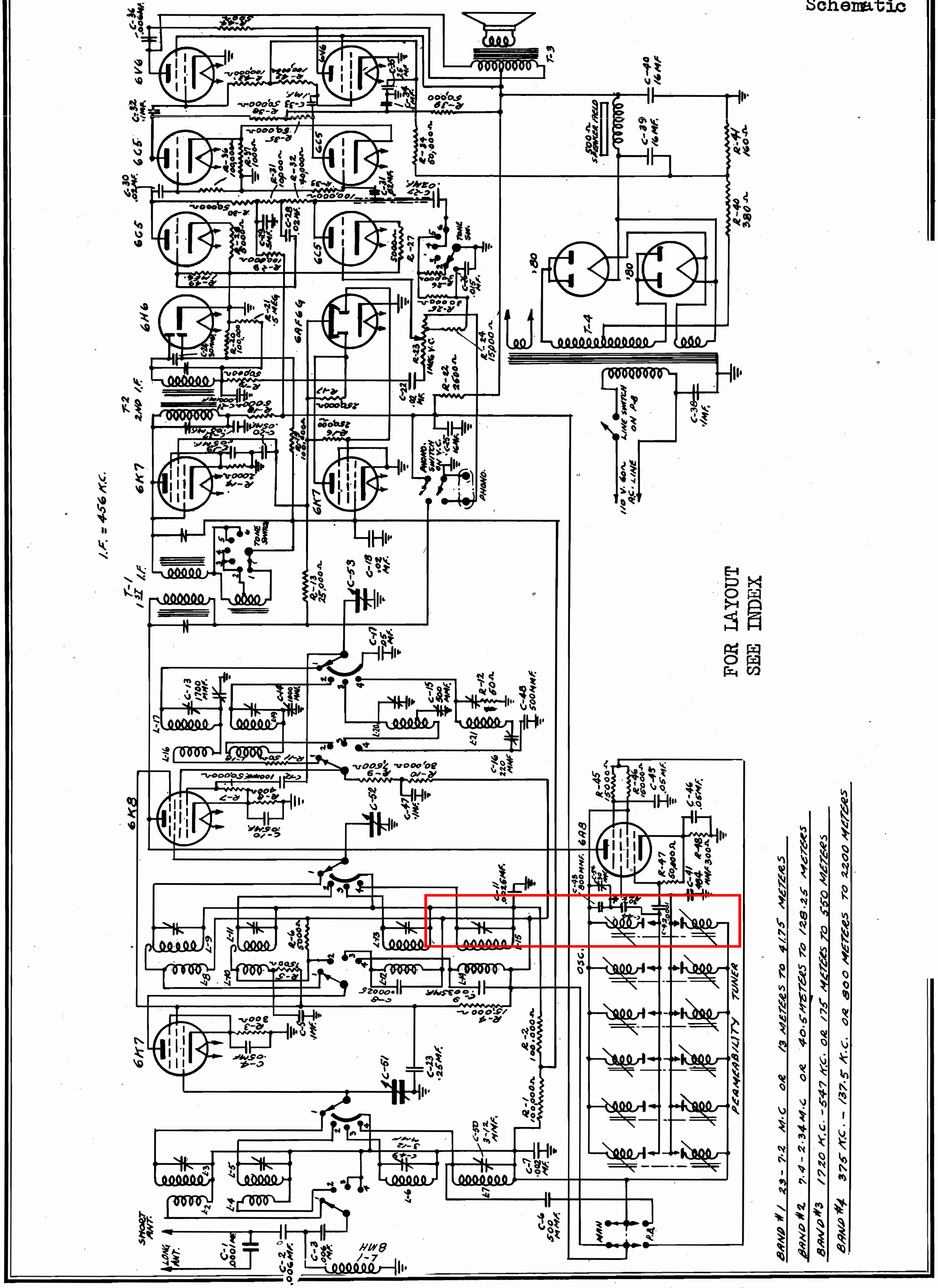
(S.W.) SHORT WAVE - 22 MC - 5.87 M.C. OR 13.6 METER - 51 METERS
(B.C.) BROADCAST 1650 K.C. - 547 K.C. OR 181 METERS TO 550 METERS
(L.W.) LONG WAVE 375 K.C. TO 144 K.C. OR 800 METERS - 2080 METERS

FOR ALIGNMENT
SEE INDEX

2 BAND A.C. & D.C. RECEIVER	
USED ON 7390 - C94	SCALE
PART #	
DWN BY QR / CHK'D / 11-28-38	

GAROD RADIO CORP.

MODEL 4159
Schematic



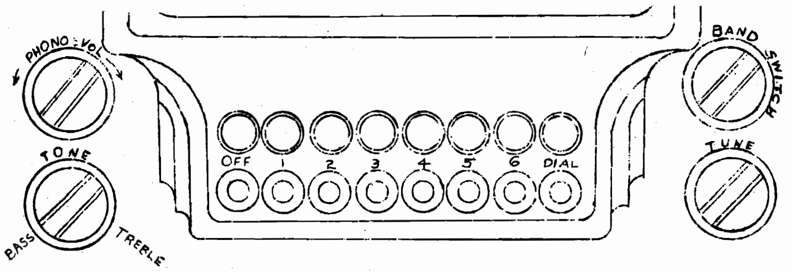
FOR LAYOUT SEE INDEX

MODEL 4159
Alignment, Tuner

GAROD RADIO CORP.

MODEL 1649
Tuner Data

PUSH BUTTON TUNING FOR MODELS 1649 & 4159



Line Voltage - 105/125 Volts
Line Frequency - 50/60 Cycles

CAUTION: THIS RECEIVER MUST NEVER BE USED ON VOLTAGES AND FREQUENCIES OTHER THAN THOSE GIVEN ABOVE. IF IN DOUBT ABOUT THE POWER IN USE IN YOUR LOCATION CONSULT YOUR LOCAL POWER COMPANY BEFORE PLUGGING IN THE RECEIVER.

NOTE: *Universal models supplied with tapped transformers may be used on 117, 135, 220 and 250 volts, 40 to 60 cycles alternating current. These may be identified by the cylindrical cap on the top of the power transformer, which covers the taps for the various voltages. To set the transformer for the voltage to be used, pull off the cap and clip the flexible lead to the lug marked for the desired voltage.*

PROCEDURE FOR SETTING STATION BUTTONS

SELECTING THE STATIONS TO BE SET: Make a list of the six favorite stations which you wish to set up for automatic tuning, and arrange them in order of frequency. They should be broadcast stations capable of putting in good signal strength at your locality as shown by the deflection of the tuning eye. It is not advisable to attempt the use of these buttons for tuning weak or distant stations. Next, consult the frequency chart below, in order to determine which button should be used for each station. For convenience in operating, arrange the stations in order of frequency from high to low frequency.

FREQUENCY RANGE OF PUSHBUTTONS

1	-	955	to	1560	Kilocycles
2	-	955	to	1560	"
3	-	685	to	1125	"
4	-	685	to	1125	"
5	-	520	to	840	"
6	-	520	to	840	"

SETTING THE STATION BUTTONS: The push-button frequency adjusting screws are accessable from the front panel. Under each of the tuning buttons you will find a circular pit with a hole in the center. Looking through this hole you should be able to see the slot of a screw. This is the adjusting screw for station setting.

After deciding which station is to be set up on the first button, tune in this station on the dial, using manual tuning. This is for identification only, and does not affect the button tuning. Then press in the button which you desire to set for automatic operation, until it remains depressed; the station which was tuned in will probably disappear and a different station or none at all will be heard.

With a small screw driver slowly turn the setting screw below button 1, until the desired station, the one previously heard, is tuned in. Be sure not to tune in some other station which is broadcasting the same program. Use the tuning eye as a guide for tuning in the station accurately. During this process, you will be able to check back by pressing the dial button and listening to the original station. The method of tuning will be exactly the same as with the dial except that the screw driver is used instead of the tuning knob.

The remaining buttons may be set up in the same manner. Once the adjustments have been made, no further changes will be necessary. The station markers may now be removed from the sheets provided, and inserted in the circular depressions below the corresponding buttons. Blank tabs may be used below buttons on which stations are not set.

ALIGNMENT FOR MODEL 4159

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave-bands and an output meter for indicating the effect of adjustments are required.

It is important to remember that in receivers of this kind which are equipped with automatic volume control it is necessary to use the minimum possible signal from the signal generator; otherwise the A.V.C. action will tend to nullify the variations in output as the trimmers are adjusted.

I.F. Adjustment: The signal generator is set at 456 kc and is connected through a .5 mmfd condenser to the grid of the first detector (6K8). With the band switch set on "Broadcast", the pointer set at 550 kc and the receiver volume control at its maximum position, the I.F. trimmers are adjusted for maximum output. These trimmers may be found on tops of the I.F. transformer shield cans.

Band #1 Adjustment: Turn the dial control knob so that the condenser plates are entirely out of mesh. Set the band switch to band #1. The signal generator should be connected to the short-antenna binding post through the dummy antenna consisting of a 250 mmfd mica condenser and a 400 ohm non-inductive resistor. The oscillator trimmer condenser should be opened to minimum capacity and the signal generator then set to 23 megacycles. The oscillator trimmer is then increased in capacity until maximum response is obtained. Two responses are possible and it is important that the high frequency response (oscillator trimmer low capacity) be used. The signal generator is then set to 21 MC and the variable condenser turned until a response is obtained. The pointer should coincide with the 21 MC mark on the dial. The antenna preselector and first detector trimmers are then adjusted in the order named, for maximum output. The variable condenser should be rocked slightly during this last adjustment. The signal generator is now set at 7.2 mc and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum reading of the output meter while the generator tuning condenser is rocked slightly to right and left. The high frequency adjustment should then be rechecked.

Band #2: The band selector switch is set in position for operation on short wave band #2. The variable condenser is opened so that the plates are completely unmeshed and the oscillator trimmer is opened to minimum capacity. The signal generator is set to 7.4 mc and the oscillator trimmer condenser is increased in capacity until a response is heard. Two responses are possible and it is important that the higher frequency response (oscillator trimmer low capacity be used. Set the signal generator at 7 mc and turn the tuning control until a response is indicated on the output meter. The pointer should now coincide with the 7 mc marker on the dial. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. After high frequency adjustments have been made set the signal generator at 2.5 mc and turn the variable gang condenser until a response is observed. Adjust the padding condenser for this band for maximum gain while rocking the tuning condenser slightly to the right and the left. The higher frequency adjustment should then be rechecked.

Broadcast Band: The dummy antenna for this band should consist of a 250 mmfd condenser only. The signal generator is set at 1720 kc, the band switch set at broadcast position. The variable condenser should be opened so that the plates are entirely out of mesh. The oscillator trimmer is then adjusted for maximum response on that frequency (1720kc). Set the signal generator at 1500 kc and tune the receiver until a response is indicated. The dial pointer should coincide with the 1500 kc mark on the dial. Then adjust the antenna and detector trimmers in the order indicated for maximum output. The signal generator is then set at 600 kc and the receiver tuned until a response is indicated. The padder condenser is then adjusted for maximum gain while the tuning gang condenser is rocked slightly to the left and right. The 1500 kc adjustment should then be rechecked.

Long Wave Band: The band selector switch is set in position for operation on the long wave band. The receiver and generator are both tuned to 300 kc and the oscillator trimmer is adjusted for maximum response. The antenna and first detector trimmers are adjusted in the order named for maximum output.

The signal generator is then set at 150 kc and the signal is tuned in. The long wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the left and right. The 300 kc adjustment should then be rechecked.

GENERAL ELECTRIC CO.

MODEL GM11
Wireless Record Player
Schematic,
Operating Notes

SERVICE DATA

Physical Specifications

Model GM-11
Height . . . . 8 inches
Width . . . . 15⅛ inches
Depth . . . . 13¼ inches

Electrical Specifications

115–125 volts . . . . . . 60 cycles* . . . . . . 25 watts

*Is also furnished in 50 and 25 cycle models. The operating frequency is shown on the label.

Record Player Oscillator

Frequency (Adjustable) . . . . 1400–1600 K.C.
Oscillator tube . . . . Type 12A7

Phonograph Mechanism

Motor . . . . Self-starting, induction
Pickup . . . . Crystal

Impedance (pickup) . . . . 80,000 ohms at 1,000 cycles
Record capacity . . . . Manual—10 or 12 inch
Turntable speed . . . . 78 rpm.

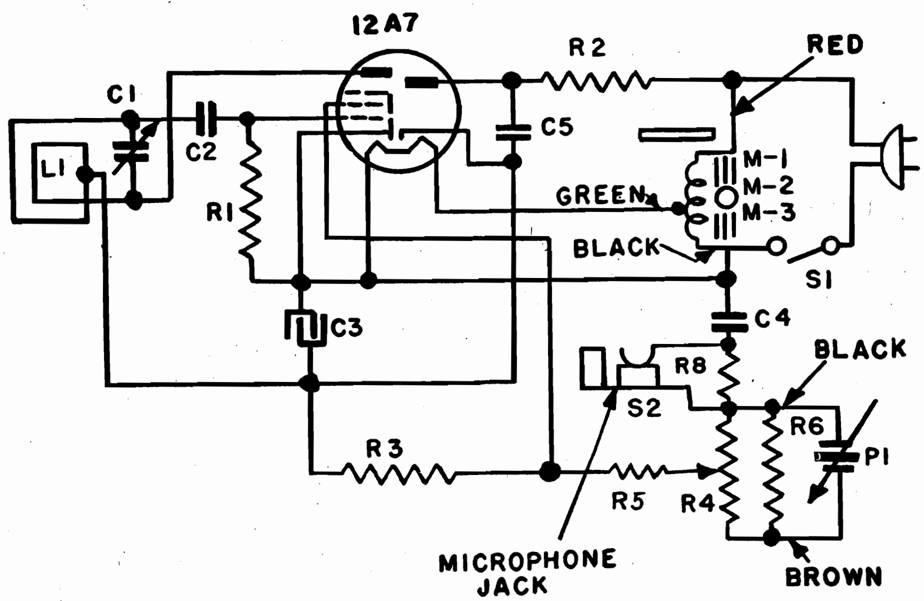
GENERAL INFORMATION

The Model GM-11 Wireless Record Player uses a Type 12A7 tube as combined rectifier and oscillator working directly from the A.C. power supply. The oscillator section of the 12A7 is modulated with audio from the phonograph recordings by means of a crystal pickup and its associated mechanism. The oscillator operates over a range of 1400–1600 kilocycles and the frequency is adjusted by the tuning trimmer (C-1). This is set at the factory to operate at 1500 K.C.

The turntable is driven at 78 revolutions per minute by a constant speed, self-starting induction motor. The motor is properly lubricated at the factory for long operation and should not require attention under normal weather conditions.

Symbol	Description
C1	160–375 mmf., padder
C2	47 mmf., mica capacitor
C3	8 mfd., dry electrolytic
C4	.02 mfd., molded capacitor
C5	.01 mfd., molded capacitor

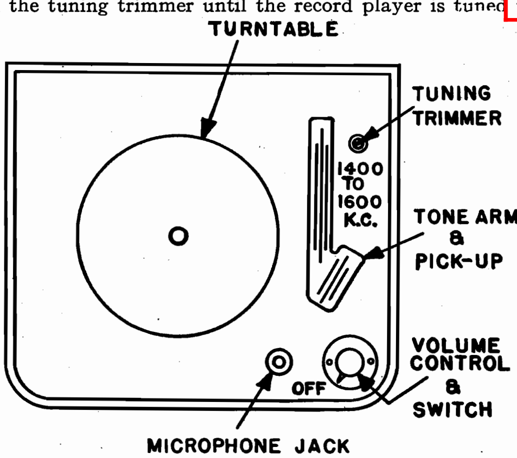
Symbol	Description
R1	470,000 ohm, carbon resistor
R2	15,000 ohm carbon resistor
R3	3.3 megohm carbon resistor
R4	Volume control, 0.5 meg.
R5	33,000 ohm carbon resistor
R6, 8	220,000 ohm carbon resistor
L1	Oscillator coil
M1, 2, 3	Phonograph motor
P1	Crystal pickup



Tuning Trimmer

This adjustment changes the frequency of the Wireless Record Player Signal. It is adjusted at the factory for approximately 1500 kilocycles and has a range of 1400–1600 kilocycles.

If the record player signal interferes with some local station (characterized by a whistle or low frequency beat note) or the receiver does not tune quite high enough to receive the record player signal, it will be necessary to adjust the tuning trimmer described in a previous paragraph. Proceed by tuning the radio to a quiet point above 1400 K.C. on the dial, then, using a small screw driver, turn the tuning trimmer until the record player is tuned to the dial setting of the receiver. Clockwise rotation of the trimmer lowers the frequency; while counterclockwise rotation raises the frequency.



Control Location

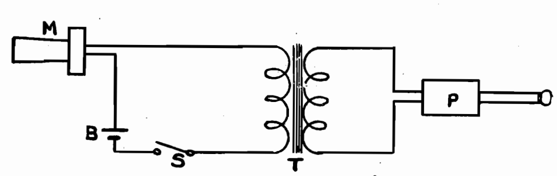
Microphone Connections

A suitable microphone (G-E No. GM-1) may be connected into the circuit of the record player by merely inserting the plug in the microphone jack (location shown in Fig. 1.)

A carbon microphone may be used provided a suitable step-up transformer is used. A suggested circuit is shown in Fig. 2.

Operating Notes

1. If a hum is noted when the pickup case is touched by the hand, merely reverse the power plug in the A.C. outlet.
2. If you are unable to receive the signal from the record player on the radio, it is possible that the oscillator tube in the record player is defective. When replacing, it is advisable to use only a General Electric Type 12A7 tube; otherwise a proper hum balance might not be obtained.
3. A microphonic feedback may be noticed if the record player is located on top or too close to the receiver when the volume is turned up. For this reason it may be desirable and more convenient to operate the record player from a nearby point.

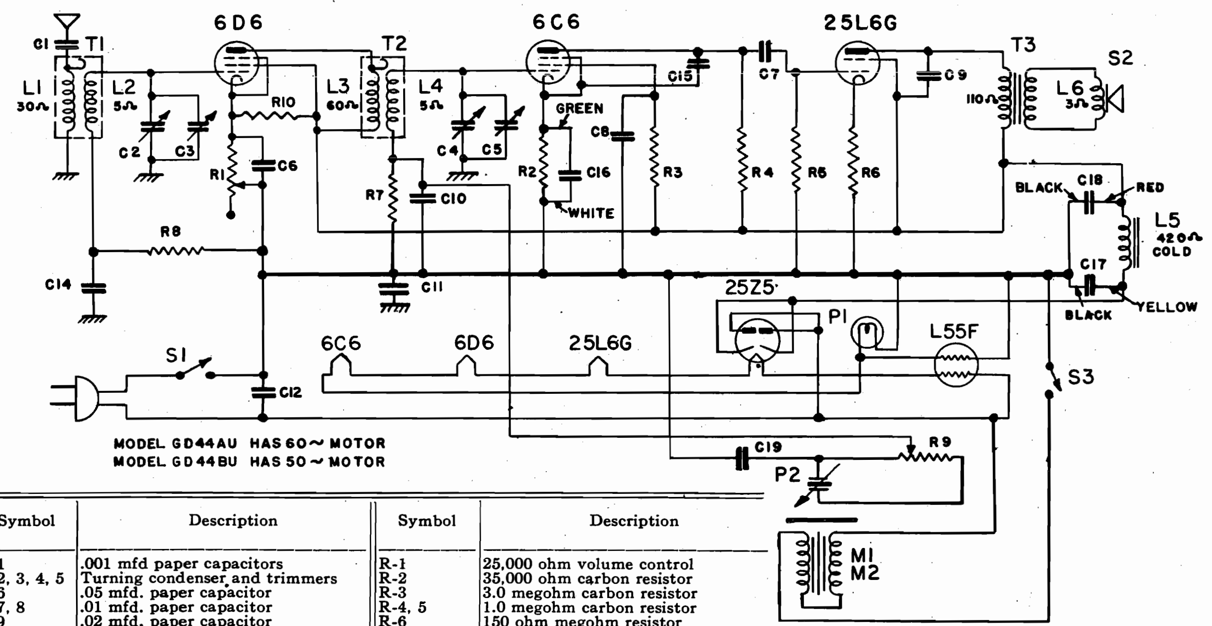


M—Carbon Microphone
B—2-volt Battery
T—Step-up Transformer
P—Telephone Plug

Fig. 2. Microphone Connections

MODELS GD44A, GD44B
GD44AU, GD44BU
Schematic, Voltage
Alignment

GENERAL ELECTRIC CO.



Symbol	Description	Symbol	Description
C-1	.001 mfd paper capacitors	R-1	25,000 ohm volume control
C-2, 3, 4, 5	Turning condenser and trimmers	R-2	35,000 ohm carbon resistor
C-6	.05 mfd. paper capacitor	R-3	3.0 megohm carbon resistor
C-7, 8	.01 mfd. paper capacitor	R-4, 5	1.0 megohm carbon resistor
C-9	.02 mfd. paper capacitor	R-6	150 ohm megohm resistor
C-10	.01 mfd. paper capacitor	R-7	150,000 ohm carbon resistor
C-11	.1 mfd. paper capacitor	R-8	500,000 ohm carbon resistor
C-12	.05 mfd. paper capacitor	R-9	100,000 ohm volume control
C-14	.01 mfd. paper capacitor	R-10	50,000 ohm carbon reistor
C-15	100 mmf. mica capacitor	S-1	Power switch
C-16	5 mfd. dry electrolytic	S-3	Motor switch
C-17	16 mfd. dry electrolytic	T-1	Antenna transformer
C-18	10 mfd. dry electrolytic	T-2	RF transformer
C-19	.01 mfd. paper capacitor	T-3	Output transformer

Tuning Frequency

Band "B" .... 540–1800 kc.
Alignment Frequency .... 1500 kc.

Electrical Power Output

Undistorted .... 1.0 watt
Maximum .... 2.0 watts

Loud-speaker—Electrodynamic

Outside Cone Diameter .... 5 inches
Voice Coil Impedance .... 3.5 ohms at 400 cycles
Field Coil Resistance .... 420 ohms (cold)

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consump- tion (Volts)
GD-44A	105–125	60	48
GD-44B	105–125	50	48

Models GD-44A and GD-44B are compact four tube AC-DC tuned radio frequency receivers that operate in the broadcast band of frequencies. In addition they have facilities for the reproduction of phonograph recordings. Condensers are used to isolate the power supply voltage from the chassis frame.

Phonograph Mechanism

The record reproducing facilities consist of a high impedance crystal pick-up with its associated balanced tone arm connected across the grid resistor (R-7) of the 6C6 tube. When using the phonograph, the volume control (R-1) should be set at a minimum and control (R-9) used for the desired volume level.

ALIGNMENT

Connect the high side of the signal generator through a 250 mmf. condenser to the antenna lead. The low side of the signal generator output should be connected to the receiver chassis through a .05 mfd. condenser. Connect a suitable output meter across the voice coil leads; then proceed as follows:

1. With gang condenser plates completely closed, the dial pointer should coincide with the horizontal dial line.
2. Tune receiver to the 1500 kc. point on the dial; then align trimmers (C-3 and C-5) on the gang condenser at 1500 kc. for a maximum output meter reading.

SOCKET VOLTAGES

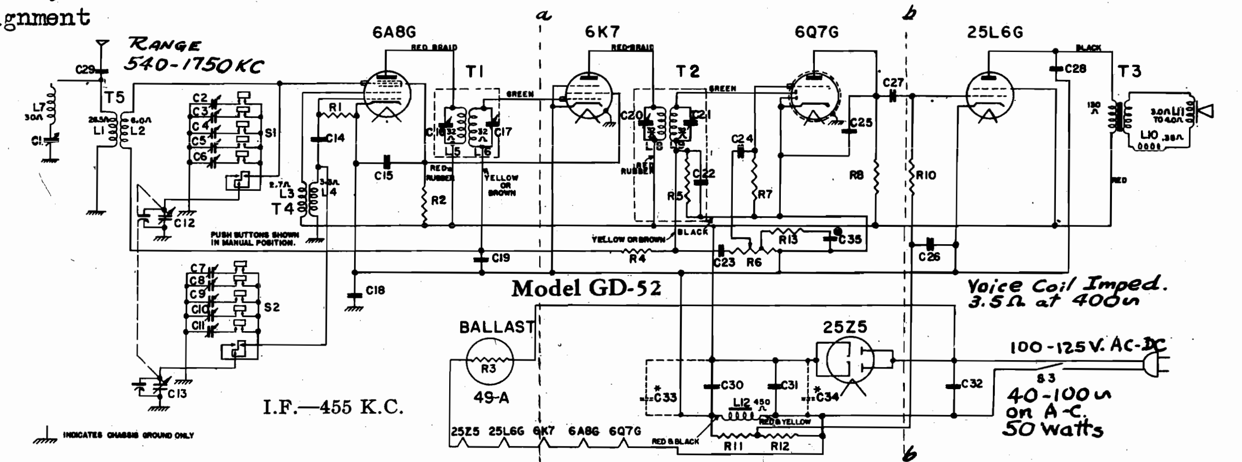
Tube No.	Plate to –B Volts D.C.		Screen to –B Volts D.C.		Cathode to –B Volts D.C.		Cathode Current M.A. D-C		Heater Volts	
	AC	DC	AC	DC	AC	DC	AC	DC	AC	DC
6D6	113	90	113	90	9.0	7.4	0.7	0.6	6.35	6.06
6C6	20 *	16.4 *	45	37	3.1	2.5	0.1	0.08	6.35	6.06
24L6G	108	88	113	90	7.6	6.2	40.5	33.1	25.0	23.5
25Z5	...	...			133	108	43.0	35.0	26.0	24.0

Line voltage 115 AC or DC—No signal input—1000 ohms per voltmeter.
Dial pointer at 540 kc. Volume control at minimum.
* Measured on 250-volt scale.
Note—The B – is not chassis ground.

Schematics, Voltage
Socket, Trimmers
Alignment

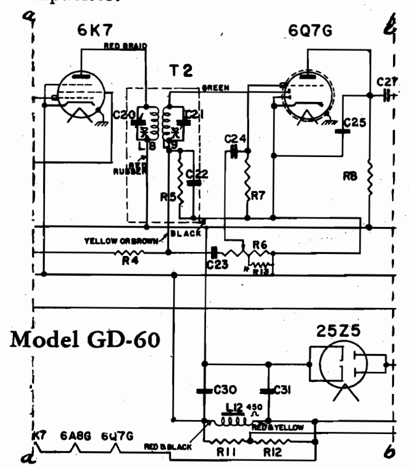
GENERAL ELECTRIC CO.

MODEL GD52
MODEL GD60



* Used on 25 cycle receivers only.
† On early production receivers C-28 was changed to .03 mfd. capacitor.

⊕ On late production receivers only.



* Used on early production receivers only.
For replacement purposes, use specified volume control and omit resistor, R-13.

NOTE—In some receivers a 150,000 to 390,000 ohm resistor is connected across C-18.

Symbol	Description
C-1	Wave Trap Trimmer
C-2—C-6	R.F. Trimmer Strip
C-7—C-11	Osc. Trimmer Strip
C-12, C-13	Variable Condenser
C-14	Mica Capacitor, 47 Mmf.
C-15	Paper Capacitor, .25 Mfd.
C-16, C-17	1st I.F. Trimmer
C-18	Paper Capacitor, .25 Mfd.
C-19	Paper Capacitor, .05 Mfd.
C-20, C-21	2nd I.F. Trimmers
C-22	Mica Capacitor, 470 Mmf.
C-23, C-24	Paper Capacitor, .002 Mfd.
C-25	Mica Capacitor, 330 Mmf.
C-26	Paper Capacitor, .15 Mfd.
C-27, C-35	Paper Capacitor, .005 Mfd.
†C-28	Paper Capacitor, .01 Mfd.
C-29	Paper Capacitor, .001 Mfd.
C-30	Dry Electrolytic Capacitor, 12 Mfd.
C-31	Dry Electrolytic Capacitor, 20 Mfd.
C-32	Paper Capacitor, .02 Mfd.
*C-33	Dry Electrolytic Capacitor, 35 Mfd.
*C-34	Dry Electrolytic Capacitor, 15 Mfd.
R-1	Carbon Resistor, 47,000 Ohms
R-2	Carbon Resistor, 10,000 Ohms
R-3	Ballast Tube 49-A, 170 Ohms
R-4	Carbon Resistor, 2.2 Megohms
R-5	Carbon Resistor, 470,000 Ohms
R-6	Volume Control, 2.0 Megohms
R-7	Carbon Resistor, 15.0 Megohms
R-8	Carbon Resistor, 220,000 Ohms
R-10	Carbon Resistor, 470,000 Ohms
R-11	Carbon Resistor, 270,000 Ohms
R-12	Carbon Resistor, 680,000 Ohms
R-13	Carbon Resistor, 68,000 Ohms
S-1	Antenna Switch
S-2	Oscillator Switch
S-3	Power Switch
T-1	1st I.F. Transformer
T-2	2nd I.F. Transformer
T-3	Output Transformer
T-4	Oscillator Transformer
T-5	Antenna Transformer
L-10	Hum Buck Coil
L-11	Voice Coil
L-12	Field Coil—450 Ohms (cold)

Tubes

Converter and Oscillator....GE-6A8G
I.F. Amplifier............GE-6K7
Detector, AVC and Amplifier..............GE-6Q7G
Power Amplifier..........GE-25L6G
Rectifier.................GE-25Z5
Ballast Tube..............49-A

VOLTAGE CHART

Tube No.	6A8G	6K7	6Q7G	25L6G	25Z5
Plate to −B volts	115	115	55*	110	..
Screen to −B volts	75	75	..	115	..
Cathode to −B volts	0	0	0	0	115
Cathode Current MA	6.6	1.4	0.5	37	47
Filament Volts	6.0	6.0	6.1	24.5	24.0

Line Voltage—120 AC. No signal input
* Measured on 250-volt scale.
On DC, voltages are about 15 per cent lower.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

GENERAL INFORMATION

GD-60; GD-52; is a compact, five-tube AC-DC superheterodyne receiver, employing five General Electric Pre-tested Tubes as described above, in a superheterodyne circuit. It incorporates a simplified trimmer tuned "Touch-Tuning" system, allowing a set up of five stations for automatic tuning. Other features of design include I.F. wave trap, automatic volume control and an improved dustproof speaker.

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.

Set test oscillator to 455 and apply signal to the control grid of the 6A8G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 6A8G and keep the test oscillator output as low as possible to give a readable output. Adjust all four I.F. trimmers for maximum output.

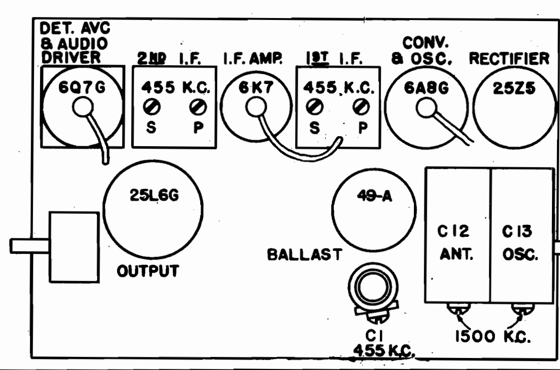
Wave Trap Alignment

Leave the test oscillator set to 455 K.C. and connect one output lead to the receiver chassis and the other through a 250 mmf. capacitor in series with 200 ohms to the receiver antenna lead. Adjust (C-1) for minimum output.

R.F. Alignment

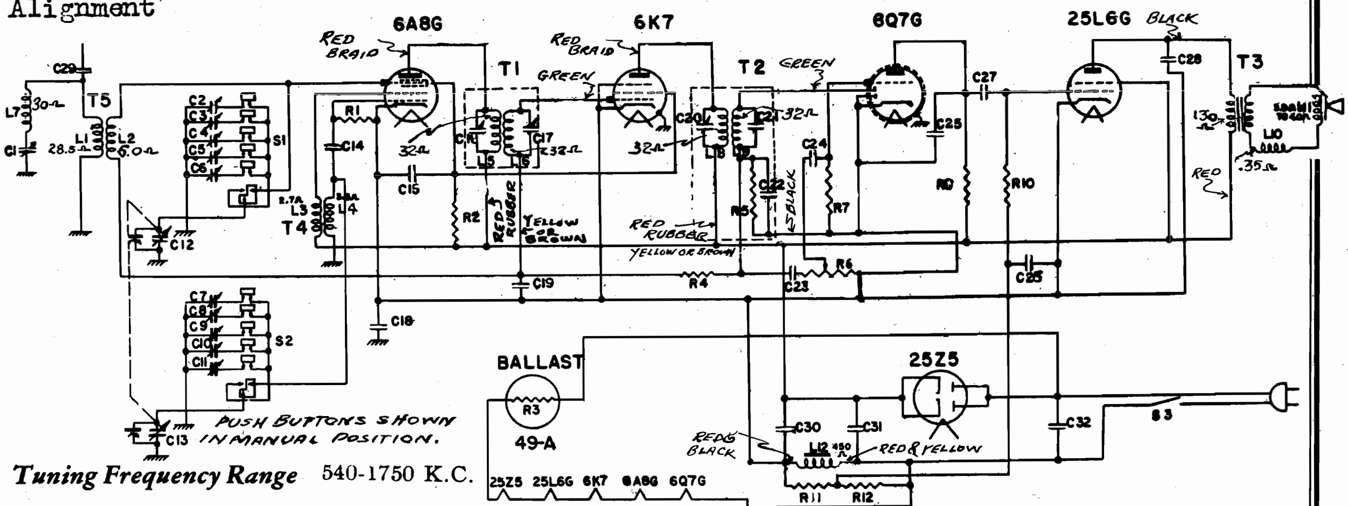
Use the same dummy antenna (250 mmf. and 200 ohms) with 1500 K.C. input, adjust the oscillator trimmer (C-13) and antenna trimmer (C-12) for a maximum output.

Precaution—One side of the power supply is connected to the chassis through a .25 mfd. capacitor. If signal generator is AC operated, connect a .05 mfd. capacitor in the ground side before connecting it to the receiver chassis.



MODEL GD52A
Schematic, Voltage
Socket, Trimmers
Alignment

GENERAL ELECTRIC CO.



Tuning Frequency Range 540-1750 K.C.

Intermediate Frequency 455 K.C.

Voice Coil Impedance......3.5 ohms at 400 cycles
Field Coil Resistance.......450 ohms (cold)

Symbol	Description	Symbol	Description	Symbol	Description
C-1	Wave Trap Trimmer, 45-145 Mmf.	C-20	Trimmer Capacitor, 50-135 Mmf.	R-7	Carbon Resistor, 15 Megohms
C-2	Selector Trimmer, 100-510 Mmf.	C-21	Trimmer Capacitor, 50-135 Mmf.	R-8	Carbon Resistor, 220,000 Ohms
C-3	Selector Trimmer, 75-410 Mmf.	C-22	Mica Capacitor, 470 Mmf.	R-10	Carbon Resistor, 470,000 Ohms
C-4	Selector Trimmer, 50-300 Mmf.	C-23	Paper Capacitor, .002 Mfd.	R-11	Carbon Resistor, 270,000 Ohms
C-5	Selector Trimmer, 50-300 Mmf.	C-24	Paper Capacitor, .002 Mfd.	R-12	Carbon Resistor, 68,000 Ohms
C-6	Selector Trimmer, 20-200 Mmf.	C-25	Mica Capacitor, 330 Mmf.	R-13	Carbon Resistor, 68,000 Ohms
C-7	Selector Trimmer, 50-300 Mmf.	C-26	Paper Capacitor, .15 Mfd.	S-1	Antenna Switch
C-8	Selector Trimmer, 50-300 Mmf.	C-27	Paper Capacitor, .005 Mfd.	S-2	Oscillator Switch
C-9	Selector Trimmer, 20-200 Mmf.	C-28	Paper Capacitor, .03 Mfd.	S-3	Power Switch combined with R-6
C-10	Selector Trimmer, 20-200 Mmf.	C-29	Paper Capacitor, .001 Mfd.	T-1	1st I.F. Transformer
C-11	Selector Trimmer, 10-100 Mmf.	C-30	Dry Electrolytic Cap., 12 Mfd.	T-2	2nd I.F. Transformer
C-12	Tuning Condenser Ant.	C-31	Dry Electrolytic Cap., 20 Mfd.	T-3	Output Transformer
C-13	Tuning Condenser Osc.	C-32	Paper Capacitor, .02 Mfd.	T-4	Oscillator Transformer
C-14	Mica Capacitor, 47 Mmf.	R-1	Carbon Resistor, 47,000 Ohms	T-5	Antenna Transformer
C-15	Paper Capacitor, .25 Mfd.	R-2	Carbon Resistor, 10,000 Ohms	L-10	Hum Buck Coil
C-16	Trimmer Capacitor, 50-135 Mmf.	R-3	Ballast Tube 49-A, 170 Ohms	L-11	Voice Coil
C-17	Trimmer Capacitor, 50-135 Mmf.	R-4	Carbon Resistor, 2.2 Megohms	L-12	Field Coil—450 Ohms (cold)
C-18	Paper Capacitor, .25 Mfd.	R-5	Carbon Resistor, 470,000 Ohms		
C-19	Paper Capacitor, 0.5 Mfd.	R-6	Volume Control, 2 Megohms		

NOTE—In some receivers a 150,000 to 390,000 ohm resistor is connected across C-18.

Fig. 2. Schematic Diagram

VOLTAGE CHART

Tube No.	6A8G	6K7	6Q7G	25L6G	25Z5
Plate to −B volts	115	115	55*	110	
Screen to −B volts	75	75		115	
Cathode to −B volts	0	0	0	0	115
Cathode Current MA	6.6	1.4	0.5	37	47
Filament Volts	6.0	6.0	6.1	24.5	24.0

Line Voltage—120 AC. No signal input
* Measured on 250-volt scale.
On DC, voltages are about 15 per cent lower.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.—455 K.C. Broadcast—1500
The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.

Set test oscillator to 455 and apply signal to the control grid of the 6A8G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 6A8G and keep the test oscillator output as low as possible to give a readable output. Adjust all four I.F. trimmers for maximum output.

Wave Trap Alignment

Leave the test oscillator set to 455 K.C. and connect one output lead to the receiver chassis and the other through a 250 mmf. capacitor in series with 200 ohms to the receiver antenna lead. Adjust (C-1) for minimum output.

R.F. Alignment

Use the same dummy antenna (250 mmf. and 200 ohms) with 1500 K.C. input, adjust the oscillator trimmer (C-13) and antenna trimmer (C-12) for a maximum output.

Precaution—One side of the power supply is connected to the chassis through a .25 mfd. capacitor. If signal generator is AC operated connect a .05 mfd. capacitor in the ground side before connecting it to the receiver chassis.

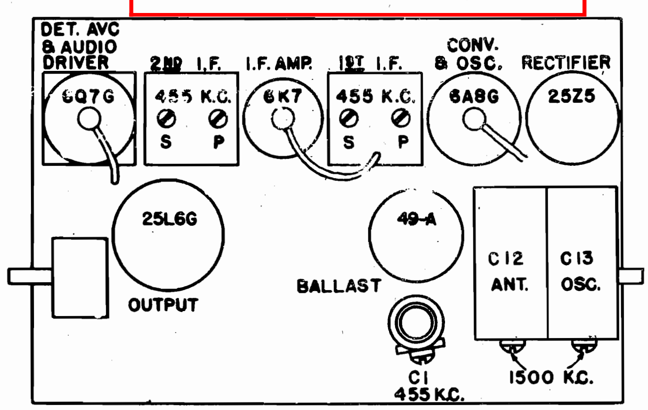
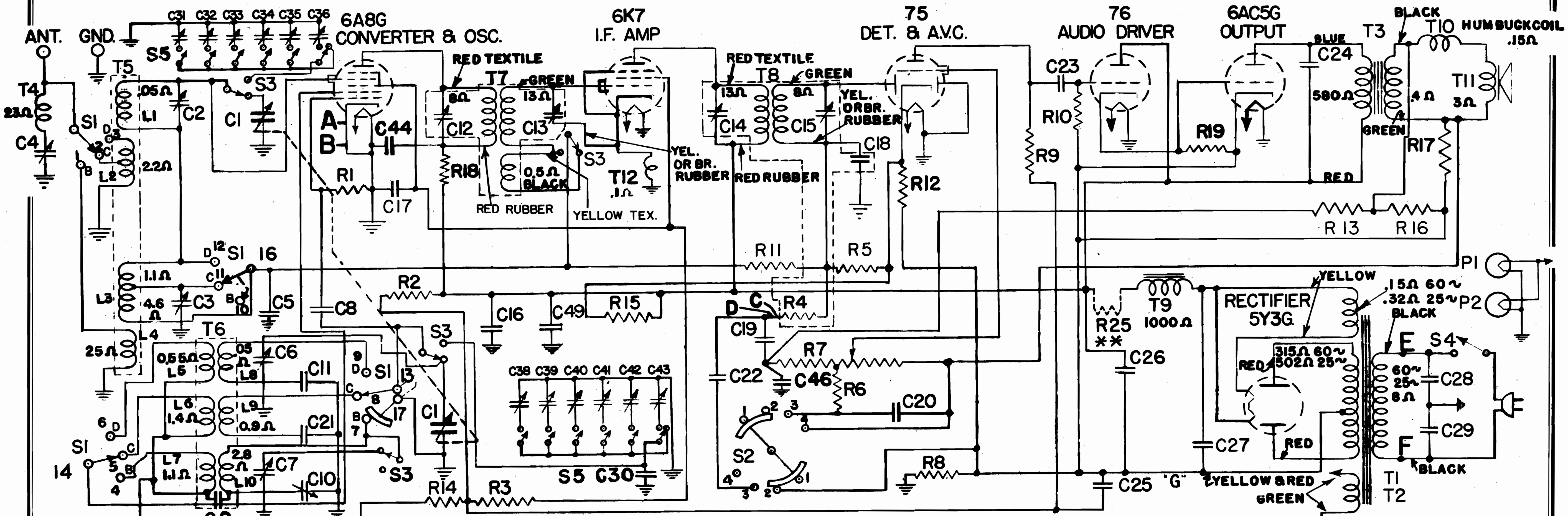


Fig. 1. Trimmer Location

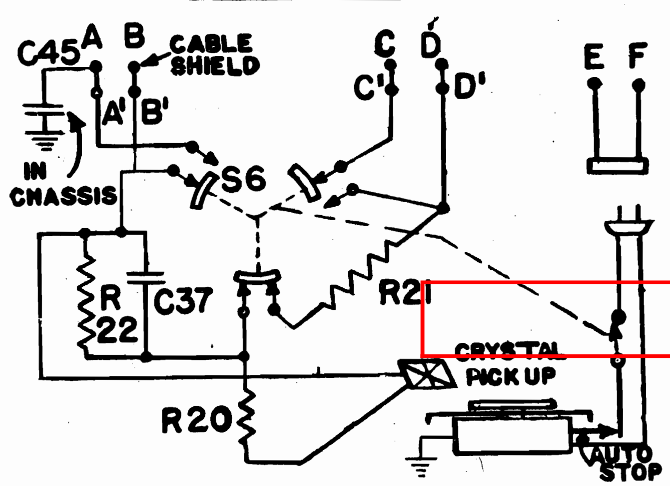
MODELS G61,G66,G68,G69
Schematic

GENERAL ELECTRIC CO.

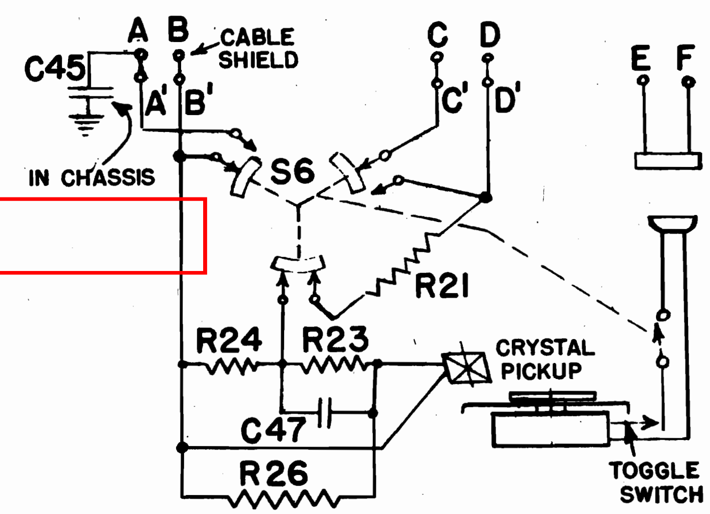


G69 ONLY—BREAK AB AND CD—CONNECT CABLE A-A B-B' C-C' AND D-D' AS SHOWN. CONNECT *C48 FROM POINT G TO GROUND.

**Used on 25 cycle Receivers only



Model G-68



Model G-69

SYMBOL	DESCRIPTION
C1	450 mmf. tuning condenser
C2, C3, C6, C7	Ant. and Osc. trimmer capacitor
C4	Wave trap trimmer
C5	.1 mfd. paper capacitor
C8	50 mmf. mica capacitor
C9	.005 mfd. paper capacitor
C10	300–650 mmf. padder capacitor
C11	4300 mmf. mica capacitor
C16	.1 mfd. paper capacitor
C17	.05 mfd. paper capacitor
C18	47 mmf. mica capacitor
C19, C20	.003 mfd. paper capacitor
C21	1500 mmf. mica capacitor
C22	.0015 mfd. paper capacitor
C23	.005 mfd. paper capacitor
C24	.02 mfd. paper capacitor
C25, C26, C27	8 mfd., 8 mfd., 12 mfd., dry electrolytic capacitor
C28, C29	.01 mfd. line capacitor
C30	20 mmf. compensating capacitor
C31–C36	Keyboard tuning trimmers
C37	470 mmf. mica capacitor
C38–C43	Keyboard tuning trimmers
C44, C45	.05 mfd. paper capacitor
C46	100 mmf. mica capacitor
C47	820 mmf. mica capacitor
*C48	10 mfd. dry electrolytic capacitor
C49	.1 mfd. paper capacitor
R1	47,000 ohm carbon resistor

SYMBOL	DESCRIPTION
R2	6,800 ohm carbon resistor
R3	22,000 ohm carbon resistor
R4	47,000 ohm carbon resistor
R5	220,000 ohm carbon resistor
R6	180,000 ohm carbon resistor
R7	2 megohm volume control
R8	270 ohm carbon resistor
R9	220,000 ohm carbon resistor
R10	1.0 megohm carbon resistor
R11	2.2 megohm carbon resistor
R12	150 ohm carbon resistor
R13	2.2 megohm carbon resistor
R14	3300 ohm carbon resistor
R15	33,000 ohm carbon resistor
R16	47 ohm carbon resistor
R17	22 ohm carbon resistor
R18	6800 ohm carbon resistor
R19	22,000 ohm carbon resistor
R20, R21	47,000 ohm carbon resistor
R22	100,000 ohm carbon resistor
R23, R24	220,000 ohm carbon resistor
**R25	470 ohm carbon resistor
R26	220,000 ohm carbon resistor
S1	Band change switch
S2	Tone control
S6	Phono-radio switch
T1, T2	Power transformer
T3	Output transformer
T4	Wave trap coil

Fig. 2. Schematic Diagram

Loud-speaker—Electrodynamic

Model	G-61	G-66	G-68	G-69
Outside Cone Diameter	6½ in.	12 in.	12 in.	12 in.
Voice Coil Impedance	3.5 ohms at 400 cycles			
Field Coil Resistance	880 Ohms (cold)			

Phonograph

Model	G-68	G-69
Type Pick-up	Crystal	Crystal
Impedance (pick-up)	80,000 ohms at 1000 cycles	
Record Capacity	Manual	8–10 in., 7–12 in.
Turntable Speed	78 RPM	78 RPM

Electrical Power Output

Undistorted.......................3.0 watts
Maximum.......................5.0 watts

Tone Control.......................4-position

Models G-61 and G-66

Rating A........115–125 volts, 50–60 cycles, 70 watts
Rating C........115–125 volts, 25–60 cycles, 75 watts

Models G-68 and G-69

Rating A-6........115–125 volts, 60 cycles, 95 watts
Rating A-5........115–125 volts, 50 cycles, 100 watts
Rating C-2........115–125 volts, 25 cycles, 100 watts

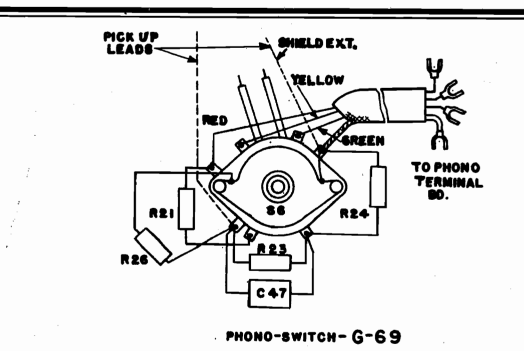
Tuning Frequency Range

Band "B"........535– 1600 KC
Band "C"........1600– 5700 KC
Band "D"........5700–18000 KC

Intermediate Frequency........455 KC

GENERAL ELECTRIC CO.

MODELS G61,G66,G68,G69
Socket,Trimmers,Chassis
Phono.Connections,Dial



PHONO-SWITCH-G-69

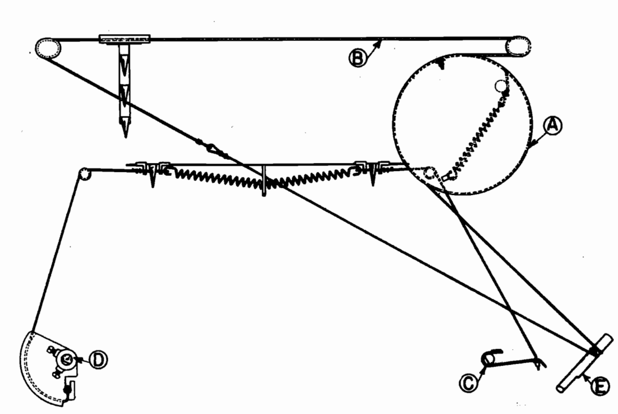


Fig. 5. Dial Mechanism

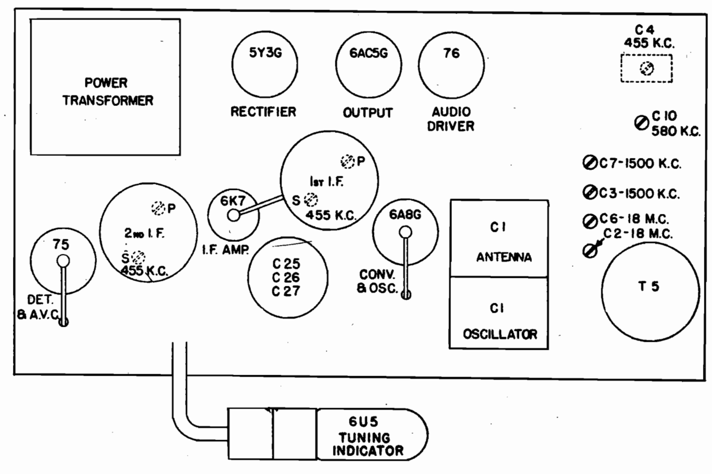


Fig. 4. Trimmer Location

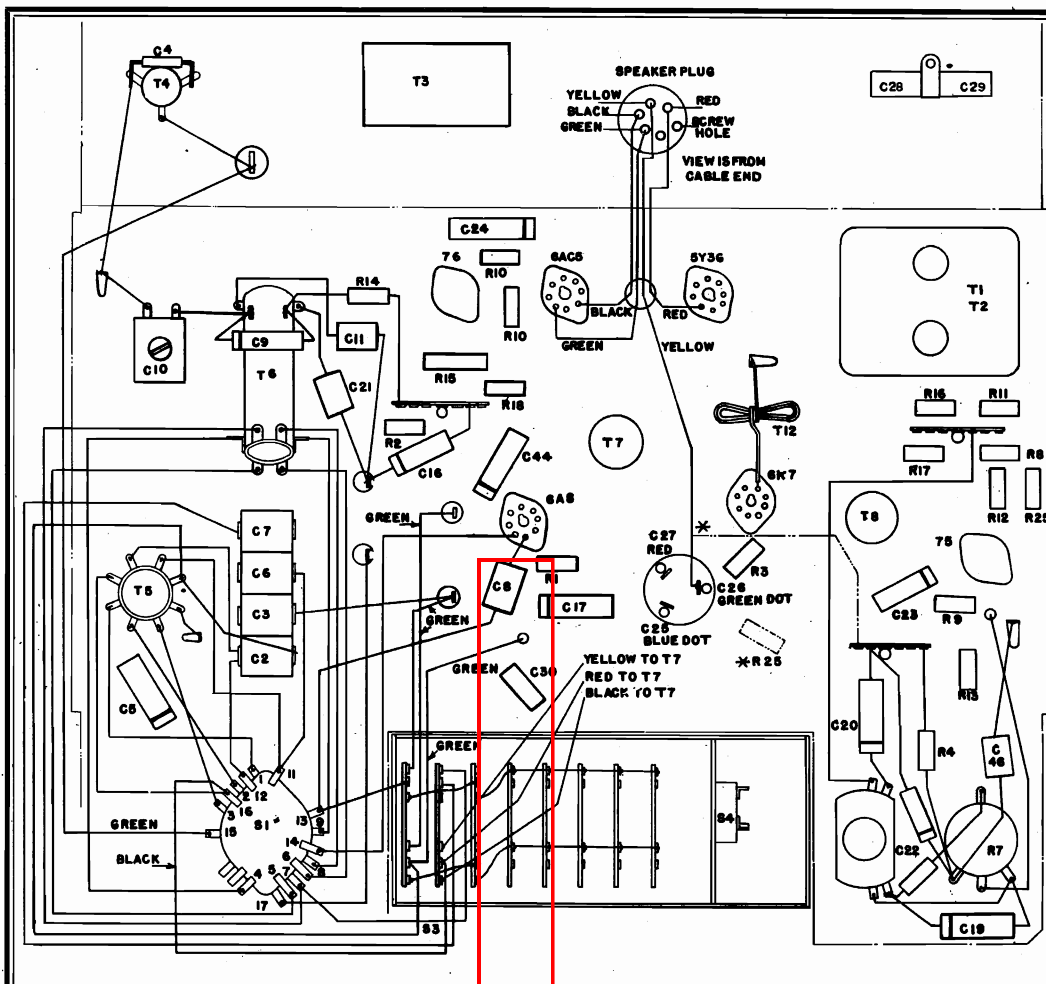
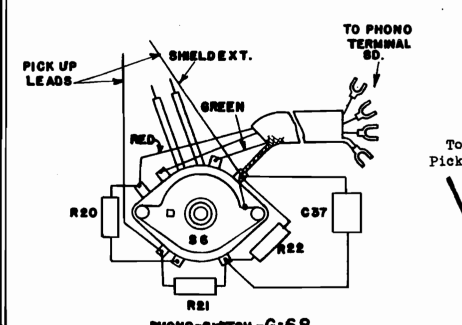


Fig. 6. Chassis Parts Layout



PHONO-SWITCH-G-68

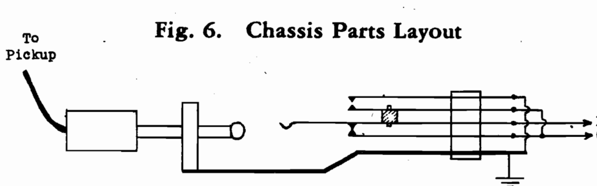


Fig. 1. Phonograph Connections

MODELS G61,G66,G68,G69
Voltage,Alignment,Coils
Parts List

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

I. F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-14)	Gang condenser plates closed—"manual" key depressed—connect audio input of oscilloscope to ground and to the junction of C-19 and R-4 of the 2nd I.F. transformer. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resultant curve is shown in Fig. 3.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-12)	
3. Band "B"	455 K.C. Sweep	Antenna Post	250 Mmf. 200 ohms	Wave Trap Trimmer (C-4)	Adjust trimmer for minimum amplitude.

I. F. ALIGNMENT WITH OUTPUT METER

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-14)	Gang Condenser plates closed—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
2. Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-12)	
3. Band "B"	455 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Wave Trap Trimmer (C-4)	Adjust trimmer for minimum output.

R. F. ALIGNMENT

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale.
2. Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-6) Ant. (C-2)	Connect output meter across voice coil—tone control on "Bass" position. The image of any "D" band signal should be heard 930 K.C. below signal input when (C-6) is on proper peak. Example: 15 M.C. image—14.09 M.C. Peak (C-2) while rocking the gang condenser.
3. Band "C"	No adjustments necessary.				
4. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-7) Ant. (C-3)	Peak trimmers for maximum output with a low input signal.
5. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. Padder (C-10)	Adjust padder for maximum output in vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-7) Ant. (C-3)	Retrim for maximum output with a low input signal.

SOCKET VOLTAGES

Tube No.	6A8G	6K7	75	76	6AC5G	5Y3G
Plate to Gnd. Volts	Conv.-230 Osc.-180	250	*110	250	230	310/310 RMS
Screen to Gnd. Volts	87	87	...	...	...	
Cathode to Gnd. Volts	0	0	3.0	8.0	4.5	315
Cathode Current MA	11.0	7.3	1.3	6.1	33.5	70
Filament Volts	6.3	6.3	6.3	6.3	6.3	5.2

*A-c line voltage 125—no signal input. Dial pointer set at 550 KC on "B" band.

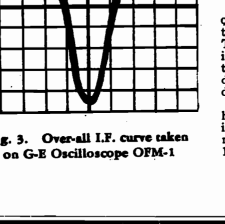


Fig. 3. Over-all I.F. curve taken on G-E Oscilloscope OFM-1

Coil System

T-5 and T-6 are the antenna and oscillator transformers respectively for the "B," "C," and "D" bands. All Band Switch terminals are numbered in Fig. 2 and Fig. 6 to facilitate in service by showing common points on the schematic diagram, Fig. 2 and the pictorial wiring diagram, Fig. 6.

The following table shows the coils in use for various positions of the band change switch.

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid Coil	Oscillator Plate Coil	Remarks
Band "B"	L-4	L-1+L-3	L-10	L-7	
Band "C"	Part of L-2	L-1+Part of L-3	L-9	L-6	Part of L-3 shorted. L-10 shorted
Band "D"	L-2	L-1	L-8	L-5	L-9, L-10 shorted. L-3 shorted
Automatic Tuning	L-4	L-1+L-3	L-10	L-7	C-1 removed. Tuned by fixed trimmers

Models G-61, G-66, G-68, and G-69 are three-band AC operated receivers employing six General Electric Pre-tested tubes as described above, in a superheterodyne circuit. They incorporate a simplified trimmer tuned "Touch Tuning" system allowing a set-up of six stations for automatic tuning. Other features of design include IF wave trap, degenerative feedback and an improved dustproof electrodynamic speaker.

In addition to the above features Models G-68 and G-69 have facilities for the reproduction of phonograph recordings. Model G-68 has a manually operated phonograph mechanism, while the Model G-69 is designed to play either 10-inch or 12-inch records on one side, automatically.

Loud-speaker

12-inch speaker—To center the voice coil, remove dust cover by softening with acetone. Loosen the two clamping screws and place three 1 in. by ¼ in. by 0.010 in. paper or celluloid strips equally spaced around pole piece for clearance—then tighten clamping screws. Remove strips and cement the dust cap back in place with Glyptal cement.

STOCK No.	DESCRIPTION	List Price
	CHASSIS ASSEMBLY	
*RB-026	BOARD—Antenna—ground terminal board	$0.10
*RB-046	BOARD—Terminal board (near 75 tube)	.15
*RB-062	BOARD—Terminal board (near power trans.)	.10
*RB-079	BOARD—Phono-terminal board	.10
RC-006	CAPACITOR—.0015 mfd., 600 V. paper (C-22)	.25
*RC-023	CAPACITOR—.005 mfd., 600 V. paper (C-9, C-23)	.25
*RC-048	CAPACITOR—.02 mfd., 600 V. paper (C-24)	.30
*RC-055	CAPACITOR—.003 mfd., 600 V. paper (C-19, C-20)	.25
*RC-092	CAPACITOR—.05 mfd., 600 V. paper (C-17, C-44, C-45)	.30
*RC-104	CAPACITOR—.1 mfd., 600 V. paper (C-5, C-16, C-49)	.30
*RC-206	CAPACITOR—50 mmf., mica (C-8)	.35
RC-216	CAPACITOR—47 mmf., mica (C-18)	.25
RC-230	CAPACITOR—20 mmf. mica compensator (C-30)	.35
*RC-235	CAPACITOR—100 mmf. mica (C-46)	.25
RC-294	CAPACITOR—470 mmf., mica (C-37)	.30
*RC-310	CAPACITOR—820 mmf., mica (C-47)	.25
RC-346	CAPACITOR—1500 mmf., mica (C-21)	.30
RC-391	CAPACITOR—4300 mmf., mica (C-11)	.35
RC-594	CAPACITOR—8 mfd., 400 V.; 8 mfd., 400 V.; 12 mfd., 450 V.; dry electrolytic (C-25, C-26, C-27)	1.60
RC-693	CAPACITOR—Wave trap trimmer (45–100 mmf.) (C-4)	.15
RC-676	CAPACITOR—300–650 mmf. padder (C-10)	.35
RC-677	CAPACITOR—Antenna and oscillator trimmer (C-2, C-3, C-6, C-7)	.55
RC-728	CONDENSER—2 gang tuning condenser (C-1)	2.95
*RC-755	CAPACITOR—.01-.01 mfd., 250 V. A. C. line capacitor (C-28, C-29)	.40
*RC-863	CORD—Power cord	.65
RC-5105	CAPACITOR—10 mfd., 50 volt dry electrolytic (C-48)	.60
RC-8035	CABLE—Speaker cable	.50
RG-015	GRID CLIP—Control grid clip (large) (Pkg. 5)	.05
RG-016	GRID CLIP—Control grid clip (small) (Pkg. 5)	.10
RK-027	KNOB—Control knob (winged) (Pkg. 5)	.50
RK-028	KNOB—Control knob (plain) (Pkg. 5)	.30
RL-062	COIL—Antenna coil band B, C, and D (T-5)	1.50
RL-266	COIL—Oscillator coil band B, C, and D (T-6)	1.30
RL-603	COIL—Wave trap coil (T-4)	.60
RL-802	COIL—Neutralizing coil (T-12)	.10
RQ-711	RESISTOR—470 ohm, 3 W. carbon (R-25)	.25
RQ-780	RESISTOR—33,000 ohm, 3 W. carbon (R-15)	.15
*RQ-1219	RESISTOR—22 ohm, ½ W. carbon (R-17) (Pkg. 5)	.70
*RQ-1227	RESISTOR—47 ohm, ½ W. carbon (R-16) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohm, ½ W. carbon (R-12) (Pkg. 5)	.70
*RQ-1245	RESISTOR—270 ohm, ½ W. carbon (R-8) (Pkg. 5)	.70
*RQ-1271	RESISTOR—3,300 ohm, ½ W. carbon (R-14) (Pkg. 5)	.70
*RQ-1279	RESISTOR—6,800 ohm, ½ W. carbon (R-2, R-18) (Pkg. 5)	.70
RP-107	PLUG—Male speaker plug	$0.20
RS-074	SPEAKER—6½-inch speaker	3.70
*RX-030	ASSEMBLY—Speaker mounting assembly	.10
	SPEAKER ASSEMBLY (G-66, G-68, G-69)	
RC-932	CONE—12-inch cone and voice coil assembly	1.10
*RC-991	CLAMP—Cone spider clamp	.05
RD-301	DUST CAP—Speaker cone dust cap (Pkg. 5)	.10
RP-109	PLUG—Male speaker plug	.20
RS-073	SPEAKER—12-inch speaker	5.40
*RX-030	ASSEMBLY—Speaker mounting assembly	.10
	DIAL SCALE MECHANISM	
*RB-155	BRACKET—Band change bracket (C)	.05
RC-8037	CORD—Drive cord assembly (set) (B)	.25
RC-8038	CORD—Tone control cord (Pkg. 5)	.35
RC-8039	CORD—Volume control cord (Pkg. 5)	.35
RD-071	DRUM—Condenser drive drum (A)	.35
RD-072	DIAL—Dial scale	1.10
RD-205	DRIVE—Vernier drive bracket assembly (E)	.35
RE-030	ESCUTCHEON—Dial scale escutcheon	1.40
*RP-073	POINTER—Volume and tone control pointer (Pkg. 5)	.10
*RP-075	PULLEY—Small idler pulley (Pkg. 6)	.20
*RP-077	POINTER—Dial scale pointer (Pkg. 5)	.90
*RP-084	PULLEY—Tone control pulley (D)	.10
RR-919	REFLECTOR—Lamp reflector	.10
RS-186	SHIELD—Light shield (cardboard) (Pkg. 10)	.05
*RS-218	SOCKET—Lamp socket assembly	.10
*RS-425	SPRING—Drive drum spring (Pkg. 5)	.10
RS-445	SPRING—Tone and volume cord tension spring (Pkg. 5)	.25
RX-048	ASSEMBLY—Tuning condenser mounting assembly	.25
	PHONOGRAPH ASSEMBLY MODEL G-68	
*RA-405	ARM—Pick-up tone arm	2.30
*RC-5000	CRYSTAL—Crystal pick-up	6.00
*RC-8021	CABLE—Radio-phono shielded cable	.35
*RK-018	KNOB—Radio-phono switch knob (Pkg. 5)	.40
*RM-106	MOTOR—Motor complete, 115–125 V, 60 cy.	13.75
*RM-107	MOTOR—Motor complete, 115–125 V, 50 cy.	13.75
*RM-108	MOTOR—Motor complete, 115–125 V, 25 cy.	15.25
*RP-024	PLUG—To contact round female plug	.60
*RP-025	PLUG—Male connector plug	.20
*RS-366	SWITCH—Phono radio switch	1.10
*RS-374	SWITCH—Automatic stop and switch (complete)	1.50
*RS-859	SCREW—Needle screw	.10
*RT-903	TURNTABLE—10-inch turntable (brown velveteen)	1.75
*RX-037	ASSEMBLY—Motor mounting assembly	.20
	PHONOGRAPH ASSEMBLY MODEL G-69	
RB-165	BRACKET—Pick-up locating lever mounting bracket (3)	.30
RC-1982	CAM—Cam and gear assembly (4)	2.80

STOCK No.	DESCRIPTION	List Price
*RQ-1291	RESISTOR—22,000 ohm, ½ W. carbon (R-19) (Pkg. 5)	$0.70
*RQ-1299	RESISTOR—47,000 ohm, ½ W. carbon (R-1, R-4, R-20, R-21) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohm, ½ W. carbon (R-22) (Pkg. 5)	.70
*RQ-1313	RESISTOR—180,000 ohm, ½ W. carbon (R-6) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohm, ½ W. carbon (R-5, R-9, R-23, R-24, R-26) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½ W. carbon (R-10) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½ W. carbon (R-11, R-13) (Pkg. 5)	.70
*RQ-1491	RESISTOR—20,000 ohm, 1 W. carbon (R-3)	.20
*RS-200	SOCKET—Tube socket (6AC5G) (Pkg. 5)	.75
*RS-204	SOCKET—Five prong octal base socket (Pkg. 5)	.75
*RS-215	SOCKET—Tube socket (75) (Pkg. 5)	.60
RS-227	SOCKET—Octal base tube socket	.15
RS-224	SOCKET—Tube socket (76) (Pkg. 5)	.50
RS-394	SWITCH—Band change switch (S-1)	.95
RS-395	SWITCH—Tone control switch (S-2)	.35
RS-3013	SWITCH—Phono radio switch (S-3) (G-68, G-69)	1.00
*RT-0711	TRANSFORMER—Power transformer 120 V. 25-60 cycles	7.60
RT-0616	TRANSFORMER—Power transformer 120 V. 50-60 cycles	4.60
RT-261	TRANSFORMER—1st I.F. transformer and shield	1.60
RT-262	TRANSFORMER—2nd I.F. transformer and shield	1.60
RT-438	TRANSFORMER—Output transformer (T-3)	1.70
RV-041	VOLUME CONTROL—2 meg. volume control (R-7)	.75
*RW-101	WASHER—Felt washer (Pkg. of 10)	.45
*RX-021	ASSEMBLY—Chassis mounting assembly	.10
	TOUCH TUNING ASSEMBLY	
RB-813	BUTTON—Molded push button (Pkg. 5)	.35
RC-8036	CARDS—Station letter cards (set)	.25
RC-8053	CARD—"Off" tab card (strip of 10)	.05
RC-8086	CARD—"Manual" tab card (Strip of 10)	.05
RE-029	ESCUTCHEON—Push button escutcheon	.35
RS-393	SWITCH—Push button switch (S-5)	3.30
RS-444	SPRING—Spring for push-button (Pkg. 10)	.10
RT-854	TRIMMER STRIP—Oscillator trimmer strip (C-38, C-39, C-40, C-41, C-42, C-43)	1.15
RT-855	TRIMMER STRIP—Antenna trimmer strip (C-31, C-32, C-33, C-34, C-35, C-36)	1.15
RW-021	WINDOWS—Celluloid station windows (Pkg. 25)	.10
	SPEAKER ASSEMBLY (G-61)	
RC-931	CONE—6½-inch cone and voice coil assembly	.60
RD-300	DUST CAP—Speaker cone dust cap (Pkg. 5)	.10
RC-1983	CLUTCH—Trip lever friction clutch assembly (5)	$0.35
RC-1984	COUPLING—Motor coupling complete with turntable drive gear, rubber strips, motor coupling and drive arm (6)	1.80
RC-5001	CRYSTAL—Pick-up crystal cartridge and needle screw	4.25
RF-402	FINGER—Trip lever friction finger assembly (7)	.40
RG-107	GUIDE—Main lever spring guide (11)	.10
RG-500	GOVERNOR—Motor speed governor	3.05
RG-701	GEAR—Long arm and rack gear for front left-hand record post (8)	.60
RG-702	GEAR—Short arm and rack gear for front right-hand record post (9)	.60
RG-703	GEAR—Record post gear (10)	.55
RL-927	LEVER—Index lever assembly (12)	.30
RL-929	LEVER—Index lever tension spring lever (13)	.90
RL-930	LEVER—Locating lever and pawl assembly (14)	.55
RL-931	LEVER—Main lever assembly (15)	.55
	LEVER—Pick-up lift cable lever and spring assembly (16)	
RL-932	LEVER—Pick-up locating lever assembly (17)	.55
RL-933	LEVER—Record separator elevating lever complete with adjustment screws (18)	.40
RL-934	LEVER—Trip detaining lever (19)	.30
RL-935	LEVER—Trip lever assembly (20)	1.25
RL-936	LEVER—Trip regulator lever (21)	.35
RM-116	MOTOR—Phono-motor 105-125 V., 25 cy.	23.70
RM-117	MOTOR—Phono-motor, 105-125 V., 50 cy.	20.80
RM-118	MOTOR—Phono-motor, 105-125 V., 60 cy.	17.75
RP-400	PAWL—Trip pawl assembly (22)	.80
RP-401	PIN—Record post drive pin (23) (Pkg. 5)	.20
RP-501	PICK-UP—Pick-up and arm complete	7.45
RR-922	ROLLER—Pick-up lift cable roller and bracket assembly (24)	.20
RS-452	SPRING—Cam pawl tension spring on main gear (Pkg. 5)	.40
RS-453	SPRING—Pick-up locating lever short spring (28) (Pkg. 5)	.05
RS-454	SPRING—Main lever tension spring (29)	.40
RS-455	SPRING—Pick-up locating lever long spring or index lever tension spring (30)	.05
RS-456	SPRING—Pick-up lift cable tension spring (31) (Pkg. 5)	.20
RS-457	SPRING—Record separator pressure spring (32) (Pkg. 5)	.10
RS-458	SPRING—Trip detaining lever or locating lever tension spring (33) (Pkg. 5)	.20
RS-609	SEPARATOR—Record separator knife (25)	.75
RS-610	SHELF—Record post shelf assembly (27)	1.25
RS-611	SPINDLE—Turntable spindle shaft and spring	1.40
RS-701	STRIP—Rubber strips for flexible coupling (set)	.40
RS-867	SCREW—Cone pointed set screw for trip lever hub or record post shelf (Pkg. 5)	.20
RS-868	SCREW—Pick-up lift cable screw and nut (Pkg. 5)	.30
RS-869	SCREW—Special screw to adjust friction-clutch tension (Pkg. 5)	.15
RS-870	SCREW—Pick-up needle screw (Pkg. 5)	.60
RS-917	SHAFT—Record separator post shaft (26)	.40
RS-918	SHAFT—Pick-up pivot arm and shaft assembly	.45
RS-3012	SWITCH—Motor toggle switch	.90
RT-907	TURNTABLE—Turntable assembly, less spindle	3.35
RW-111	WASHER—Turntable thrust washers (1 steel, 1 bronze, 1 felt)	.15

* Used on previous receivers.

(Prices subject to change without notice)

AUTOMATIC RECORD CHANGER (G-69)

General Information

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc., are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving with a standard pin punch.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

Adjustments

A. Main Lever—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pick-up is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pick-up Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pick-up lift cable. To adjust pick-up for proper elevation, stop the changer "in-cycle" at the point where pick-up is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10-inch record. Position of eccentric stud "E" governs the landing of the needle on a 12-inch record; this, however, is dependent on the proper 10-inch adjustment.

To adjust for needle landing, place 10-inch record on turntable; push index lever to reject position and return to the 10-inch position; see that pick-up locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pick-up base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone-pointed screw "D."

After adjusting for needle landing on a 10-inch record, place 12-inch record on turntable; push index lever to reject and return to 12-inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10-inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10-inch record is nominally .055 inch, and for the 12-inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .052—.058 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustments be such that the record is released from both shelves at the same instant. To adjust, place a 12-inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone-pointed screw "H."

If record shelves or knives are bent, or not perfectly horizontal improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pick-up head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

Do not allow oil or grease to come in contact with rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

Miscellaneous Service Hints

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10- and 12-inch records—Make complete adjustments "D" and "E."
3. Needle does not land properly on 12-inch record but correct on 10-inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pick-up strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pick-up output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; flexible coupling between motor and changer mechanism not correctly assembled; or instrument is not being operated at normal room temperature (65° F).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. Needle lands in 10 inch position on 12 inch record—Increase tension of pick-up locating lever spring "30."

MODELS G61,G66,G68,G69
Phono.Connections,Motor
Data,Assembly of Changer

GENERAL ELECTRIC CO.

PHONOGRAPH MECHANISM (G-68)

Motor Adjustments

The speed of the turntable is controlled by a governor which allows correct adjustment of the turntable rotation to 78 revolutions per minute. The speed may be checked by placing a piece of paper under a record and counting the number of revolutions in a minute while the record is being played. If adjustment is necessary lift up the turntable and the speed regulator setscrew will be found adjacent to the turntable hub of the motor. Clockwise rotation of this setscrew reduces speed.

The motor bearings and gears are properly lubricated for long operation under normal weather conditions. If the motor chatters or runs unevenly, place a few drops of light machine oil on the governor felt.

Trip Mechanism

The trip mechanism is of simple design and consists of a latch bar connected to the motor switch and a trip lever. The latch is held closed by means of a spring between the latch bar and the trip lever. The motor switch is mechanically connected to the latch bar so that when the trip mechanism is released the motor switch is in the "off" position. Be sure this latch bar mechanism works freely without binding.

The trip is actuated by an adjustable arm on the trip lever. When the eccentric groove in the record swings the tone arm back and forth, it pushes the latch out of engagement.

Phonograph Connections (G-61 and G-66)

Fig. 1 shows a simple sketch for connecting a crystal or high impedance magnetic pick-up into the G-61 or G-66 circuit for the reproduction of phonograph recordings. This method uses a two circuit jack and is connected into the receiver by opening the circuit at C-D at the output of the 2nd IF transformer; and connecting the jack terminals as shown. A telephone plug is attached to the pick-up leads; and for phonograph operation, it is merely necessary to insert this plug into the jack. The jack may be mounted on the rear chassis deck and all connecting leads should be well shielded.

When the pick-up is connected as suggested, the regular radio volume and tone controls work for both radio and phonograph reproduction.

NOTE.—A suitable load consisting of a 300,000 ohm resistor should be connected across the pick-up leads when using a crystal type unit.

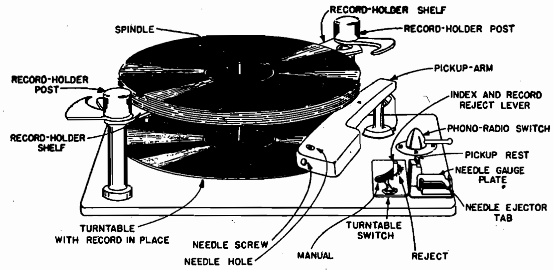
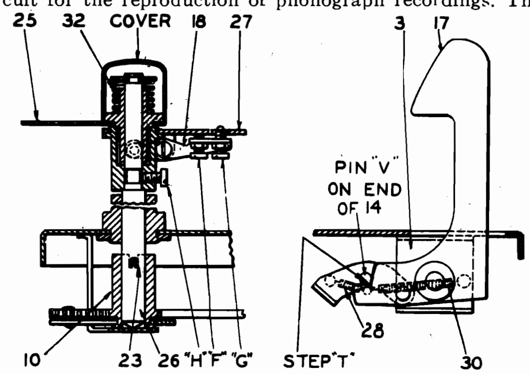
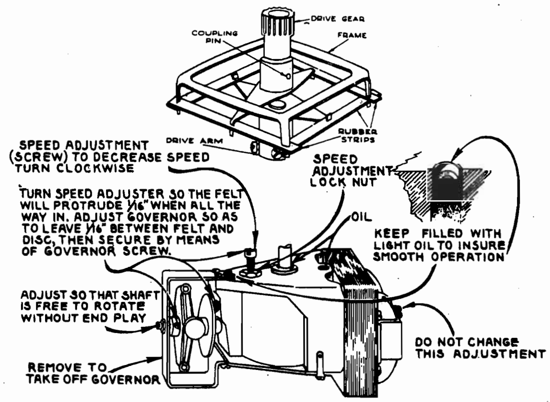


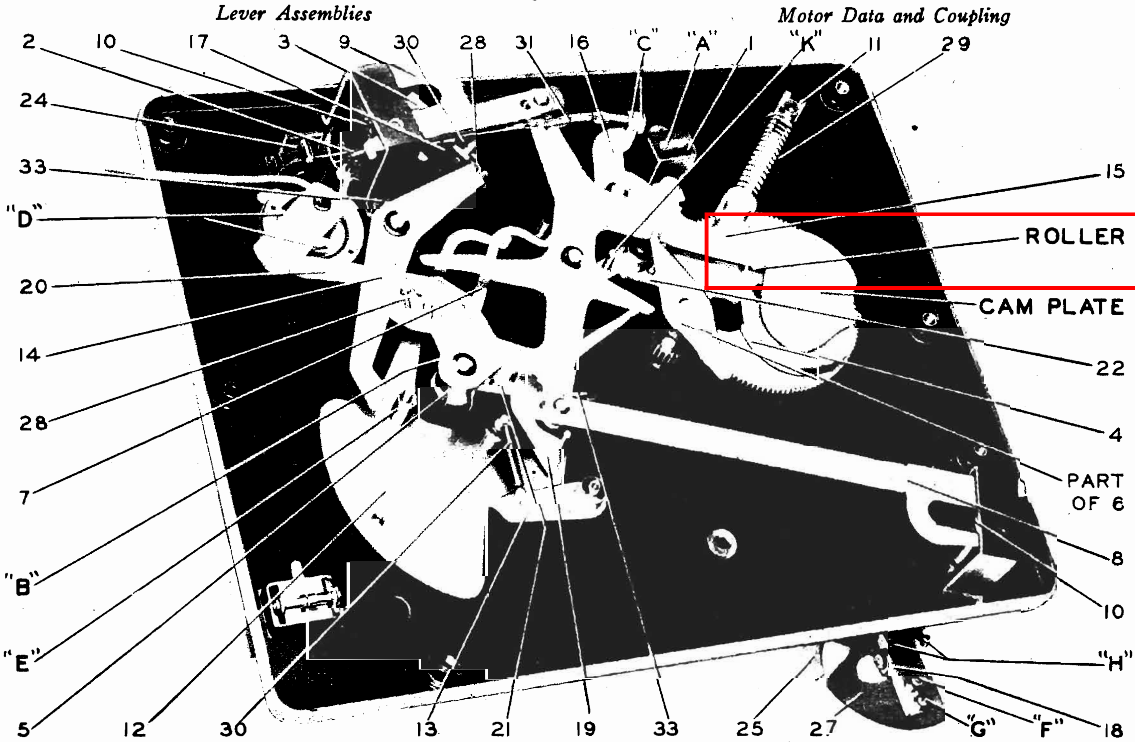
Fig. 7. Top View of Automatic Record Changer



Details of Record Shelf Posts, and Locating Lever Assemblies



Motor Data and Coupling

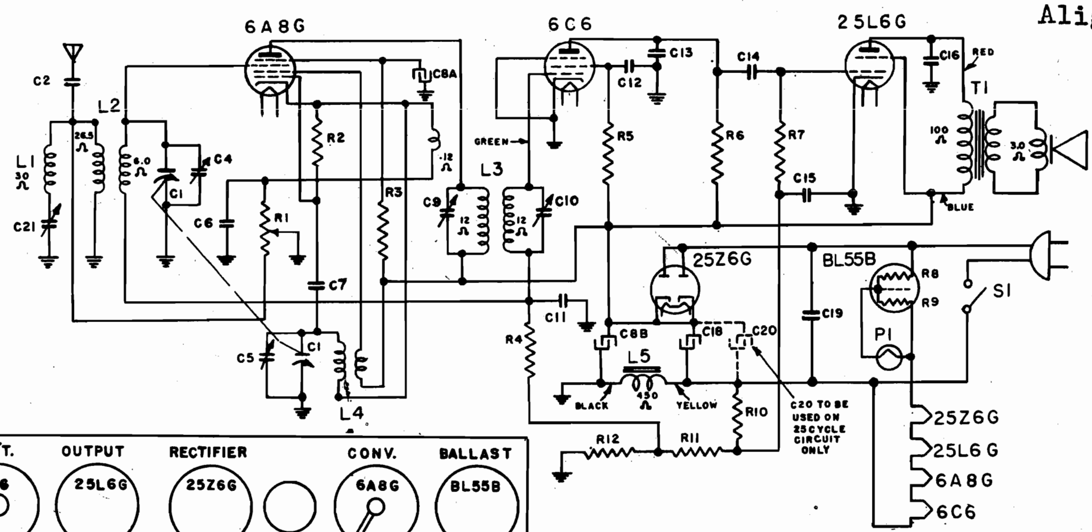


Bottom View of Automatic Record Changer

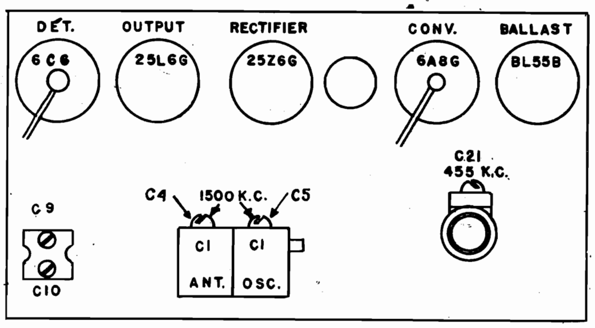
NOTE: Numbers refer to parts—letters refer to adjustments.

GENERAL ELECTRIC CO.

MODEL GD51
Schematic, Socket, Trimmers, Voltage Alignment



Electrical Power Output (120—line volts)	DC	AC
Undistorted	0.9	1.0
Maximum	1.5	1.8



Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
100–125 Volts AC or DC	40–60	45

Tuning Frequency Range.............540-1750 K.C.

Intermediate Frequency..............455 K.C.

Symbol	Description	Symbol	Description	Symbol	Description
C-1, -4, -5	Tuning Condenser	C-16	.03 Mfd., Paper Capacitor	R-7	680,000 Ohm Carbon Resistor
C-2	.001 Mfd., Paper Capacitor	C-18	15 Mfd., Dry Electrolytic	R-8	162 Ohm Ballast Resistor
C-6	.05 Mfd., Paper Capacitor	C-19	.02 Mfd., Molded Capacitor	R-9	31 Ohm Ballast Resistor
C-7	47 Mmf., Mica Capacitor	C-20	35 Mfd., Dry Electrolytic	R-10	680,000 Ohm Carbon Resistor
C-8a	10 Mfd., Dry Electrolytic	C-21	Wave Trap Trimmer	R-11	150,000 Ohm Carbon Resistor
C-8b	15 Mfd., Dry Electrolytic	R-1	10,000 Ohm Volume Control	R-12	75,000 Ohm Carbon Resistor
C-11	.05 Mfd., Paper Capacitor	R-2	47,000 Ohm Carbon Resistor	L-1	Wave Trap Coil
C-12	.02 Mfd., Paper Capacitor	R-3	22,000 Ohm Carbon Resistor	L-2	Antenna Coil
C-13	100 Mmf., Mica Capacitor	R-4	4.7 Megohm Carbon Resistor	L-3	I.F. Transformer
C-14	.005 Mfd., Paper Capacitor	R-5	3.3 Megohm Carbon Resistor	L-4	Oscillator Coil
C-15	0.1 Mfd., Paper Capacitor	R-6	470,000 Ohm Carbon Resistor	T-1	Output Transformer

VOLTAGE CHART

Tube No.	6A8G	6C6	25L6G	25Z6G
Plate to -B Volts	102	30*	98	....
Screen to -B Volts	65	20*	102	....
Cathode to -B Volts	0–30	0	0	127
Filament Volts	6.2	6.2	24.5	25.0

Line voltage—120 VAC. No Signal Input.
* Measured on 250-volt scale.
On DC, voltages are about 15 per cent lower.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

Loud-speaker—Electrodynamic

Outside Cone Diameter............. 5 inches
Voice Coil Impedance (400 cycles)...4.0 ohms
Field Coil Resistance...............420 ohms (cold)

Tubes

Converter and Oscillator............GE-6A8G
I.F. Detector and Amplifier........GE-6C6
Power Amplifier...................GE-25L6G
Rectifier..........................GE-25Z6G
Ballast Resistor Tube.............BL-55B
Pilot Lamp.........................Mazda No. 44

Model GD-51 is a compact, five-tube AC-DC superheterodyne receiver employing four General Electric tubes plus a ballast tube, as described above in a superheterodyne circuit. It incorporates a simplified mechanically tuned "Touch Tuning" system allowing a set up of five stations for automatic tuning. Other features of design include I.F. wave trap, automatic overload control and an efficient electro-dynamic speaker.

Alignment Frequencies

I.F.—455 K.C. Broadcast—1500 K.C.

The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.

Set test oscillator to 455 and apply signal to the control grid of the 6A8G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 6A8G. Keep the test oscillator output as low as possible to give a readable output. Adjust the two I.F. trimmers (C9 and C10) for maximum output.

Wave Trap Alignment

Leave the test oscillator set to 455 K.C. and connect one output lead to the receiver chassis and the other through a 250 mmf. capacitor in series with 200 ohms to the receiver antenna lead. Adjust (C-21) for minimum output.

R.F. Alignment

Use the same dummy antenna (250 mmf. and 200 ohms) with 1500 K.C. input, adjust the oscillator trimmer (C-5) and antenna trimmer (C-4) for a maximum output.

Precaution—One side of the power supply is connected directly to the chassis. If the signal generator is AC operated, connect a .05 mfd. capacitor in the ground side before connecting it to the receiver chassis.

MODEL GA62
Schematic, Voltage, Socket
Trimmers, Alignment

GENERAL ELECTRIC CO.

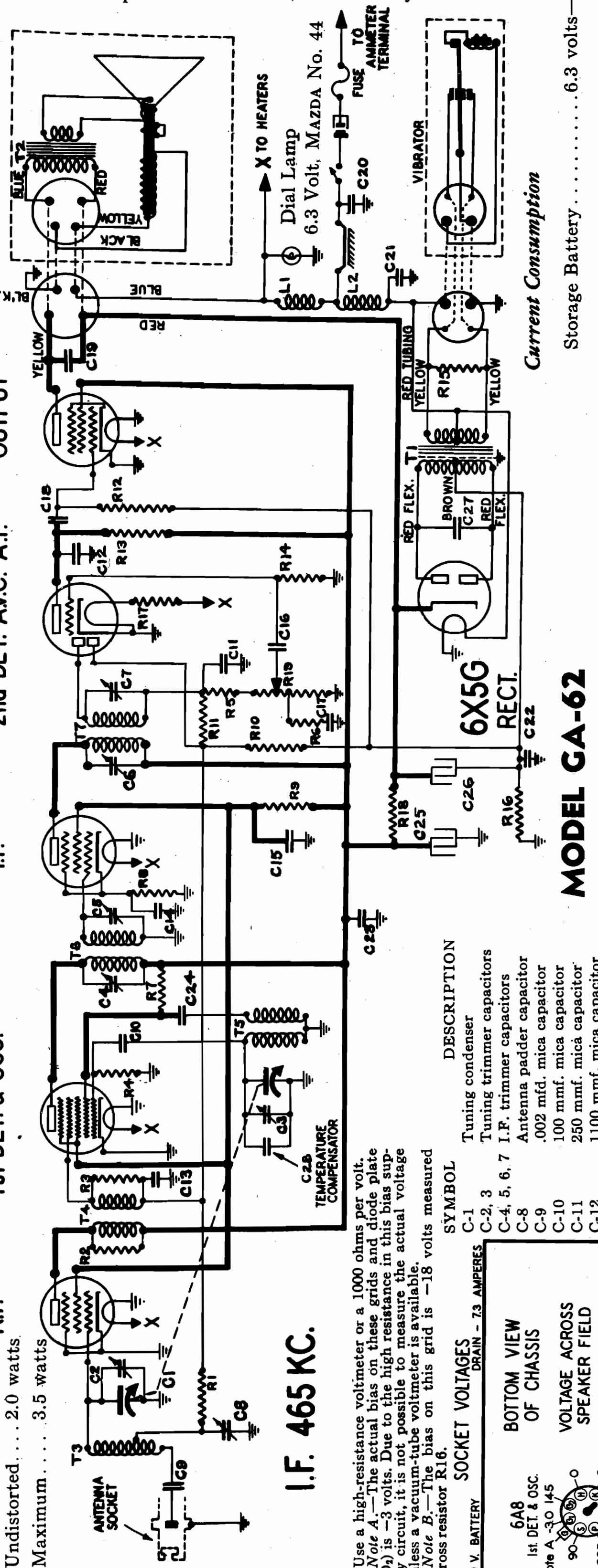
Loud-speaker—Electrodynamic

Speaker Diameter . . . . 6 inches
Cone Coil Impedance . . . . . . 4 ohms at 400 cycles

Tuning Frequency Range . . 540-1540 K.C.

Electrical Power Output
Undistorted . . . . 2.0 watts
Maximum . . . . . 3.5 watts

Current Consumption
Storage Battery . . . . 6.3 volts—7.3 amps



GENERAL INFORMATION

Model GA-62 is a compact, six-tube superheterodyne receiver, employing six General Electric Pre-tested Tubes as described previously. The power supply consists of a non-synchronous type vibrator and full-wave high-vacuum rectifier operating in a conventional rectifier circuit. The receiver incorporates a simplified mechanically adjusted "Touch-Tuning" system, allowing a setup of five stations for automatic tuning. The use of an antenna-matching trimmer results in the maximum transfer of energy from the antenna to the control grid of the 6K7 R.F. tube, providing a high signal-to-noise ratio.

ALIGNMENT

IF ALIGNMENT - Adj. 4 trimmers at 465 KC thru .1 mf cond.

RF ALIGNMENT - Adj. osc. and Ant. trimmers C-3 and C-2 at 1400 KC. thru 100 mmf cond.- PEAK C-8 at 600 KC.

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION VOL. V111.

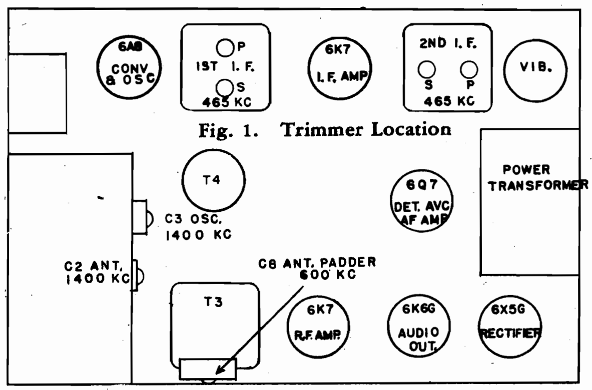
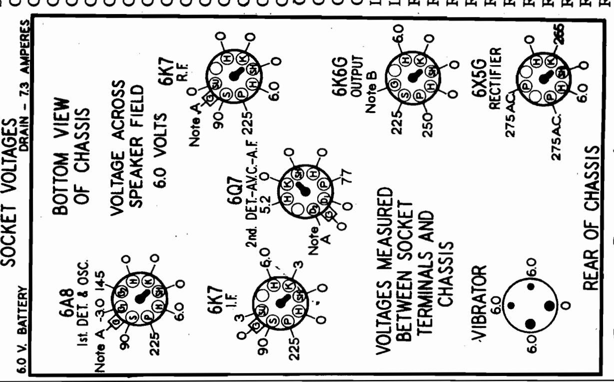


Fig. 1. Trimmer Location

Use a high-resistance voltmeter or a 1000 ohms per volt.
Note A.—The actual bias on these grids and diode plate (D_2) is −3 volts. Due to the high resistance in this bias supply circuit, it is not possible to measure the actual voltage unless a vacuum-tube voltmeter is available.
Note B.—The bias on this grid is −18 volts measured across resistor R16.

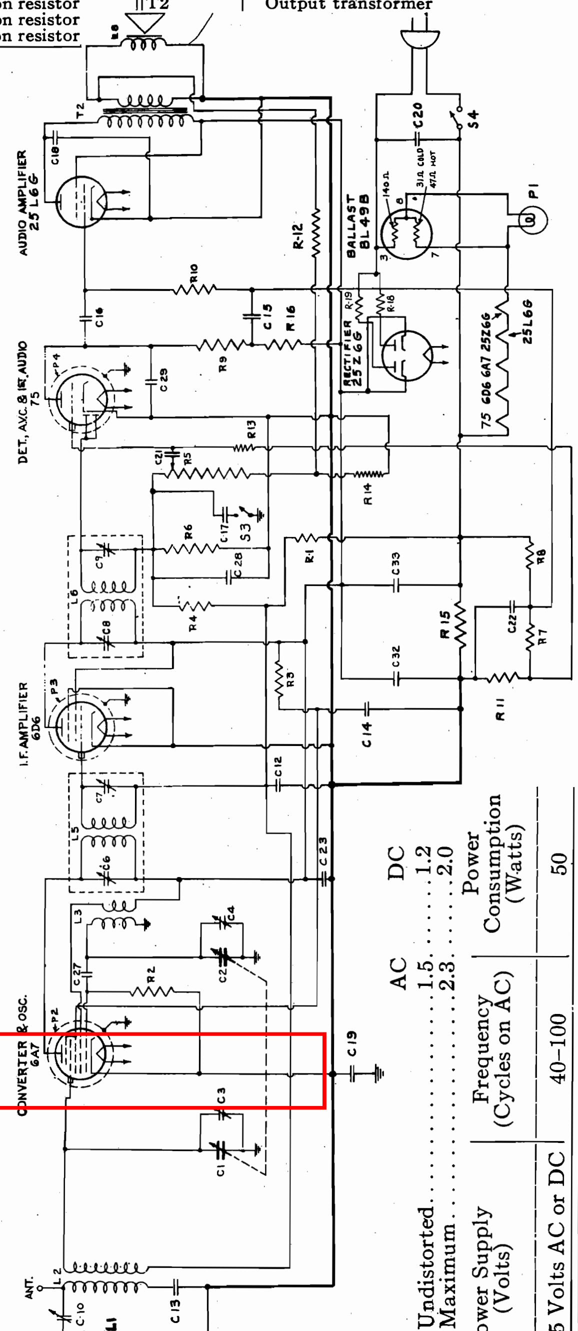


SYMBOL	DESCRIPTION
C-1	Tuning condenser
C-2, 3	Tuning trimmer capacitors
C-4, 5, 6, 7	I.F. trimmer capacitors
C-8	Antenna padder capacitor
C-9	.002 mfd. mica capacitor
C-10	100 mmf. mica capacitor
C-11	250 mmf. mica capacitor
C-12	1100 mmf. mica capacitor
C-13	.05 mfd. paper capacitor
C-14, 15	.1 mfd. paper capacitor
C-16, 22	.004 mfd. paper capacitor
C-17, 24	.01 mfd. paper capacitor
C-18	.02 mfd. paper capacitor
C-19	.005 mfd. paper capacitor
C-20, 21	.5 mfd. paper capacitor
C-23	.1 mfd. paper capacitor
C-25, 26	8 mfd. dry electrolytic
C-27	.01 mfd. oil-filled capacitor
C-28	Temp. compensator capacitor
L-1	Choke coil (short)
L-2	Choke coil (long)
R-1	470,000 ohms, carbon resistor
R-2	68,000 ohms, carbon resistor
R-3	33,000 ohms, carbon resistor
R-4, 5, 6	47,000 ohms, carbon resistor
R-7	22,000 ohms, carbon resistor
R-8	820 ohms, carbon resistor
R-9	27,000 ohms, carbon resistor
R-10	10 megohms, carbon resistor
R-11	1.5 megohms, carbon resistor
R-12	470,000 ohms, carbon resistor
R-13	220,000 ohms, carbon resistor
R-14	10 megohms, carbon resistor
R-15	220 ohms, wire wound resistor
R-16	360 ohms, wire wound resistor
R-17	3 ohms, wire wound resistor
R-18	1500 ohms, wire wound resistor
R-19	500,000 ohms, volume control
T-1	Power transformer
T-2	Output transformer
T-3	Antenna transformer
T-4	Detector transformer
T-5	Oscillator transformer
T-6	1st I.F. transformer
T-7	2nd I.F. transformer

GENERAL ELECTRIC CO.

MODELS GD62,GD67
Schematic,Voltage,Socket
Trimmers,Alignment

Symbol	Description	Symbol	Description	Symbol	Description
C1 C2. C3	Tuning condenser and trimmers	C23	.1 mfd paper capacitor	R10	220,000 ohm carbon resistor
C4	5-35 mmf. trimmer capacitor	C27	100 mmf mica capacitor	R11	15,000 ohm carbon resistor
C10	30-70 mmf. trimmer capacitor	C28	500 mmf mica capacitor	R12	470 ohm carbon resistor
C12	.1 mfd paper capacitor	C29	250 mmf mica capacitor	R13	1.5 megohm carbon resistor
C13	.001 mfd paper capacitor	C32, C33	50 mfd, 50 mfd, dry electrolytic	R14	68 ohm carbon resistor
C14	.05 mfd paper capacitor	R1	10 megohm carbon resistor	R15	230 ohm w.w. resistor
C15	.1 mfd paper capacitor	R2	47,000 ohm carbon resistor	R16	100,000 ohm carbon resistor
C16	.005 mfd paper capacitor	R3	15,000 ohm carbon resistor	R18, R19	100 ohm w.w. resistor
C17	.002 mfd paper capacitor	R4	2.2 megohm carbon resistor	L1	Wave trap coil
C18	.03 mfd paper capacitor	R5	2.0 megohm volume control	L2	Antenna coil
C19	.25 mfd paper capacitor	R6	470,000 ohm carbon resistor	L3	Oscillator coil
C20	.01 mfd moulded capacitor	R7	180,000 ohm carbon resistor	T2	Output transformer
C21	.005 mfd paper capacitor	R8	220,000 ohm carbon resistor		
C22	.1 mfd paper capacitor	R9	330,000 ohm carbon resistor		



VOLTAGE CHART

Tube No.	6A7	6D6	75	25L6G	25Z6G
Plate to —B Volts	115	115	50*	105	120 V. A.C.
Screen to —B Volts	70	115		115	
Cathode to —B Volts	3.0	3.0	0.5	8.5	115
Filament Volts	6.4	6.4	6.4	23.0	24.0

*Measured on 250-volt scale.
Line Voltage—120 A.C. No signal input.
On DC, voltages are about 15 per cent lower.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

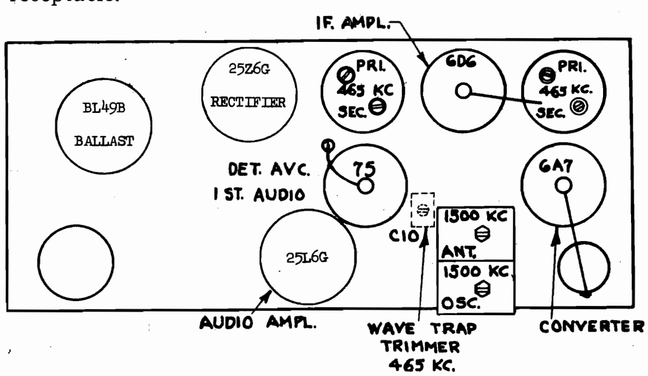


Fig. 1. Trimmer Location

Touch-Tuning Mechanism

The dial mechanism is a very simple arrangement and should not require service. The frequency range of each of the automatic tuning buttons is as follows:

Button No.	Frequency Range (Kilocycles)	Button No.	Frequency Range (Kilocycles)
1	540–590	5	830–1150
2	570–670	6	1020–1400
3	630–780	7	1220–1700
4	710–940	8	1580–1800

Tuning Frequency Range................540–1800 K.C.

Intermediate Frequency......................465 K.C.

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)	AC	DC
100–125 Volts AC or DC	40–100	50		
Undistorted			1.5	1.2
Maximum			2.3	2.0

IF ALIGNMENT - Adj. 4 trimmers at 465 KC thru .05 mf condenser.

WAVE TRAP - Adj. C10 cond. at 465 KC thru 250 mmf and 200 ohms series.

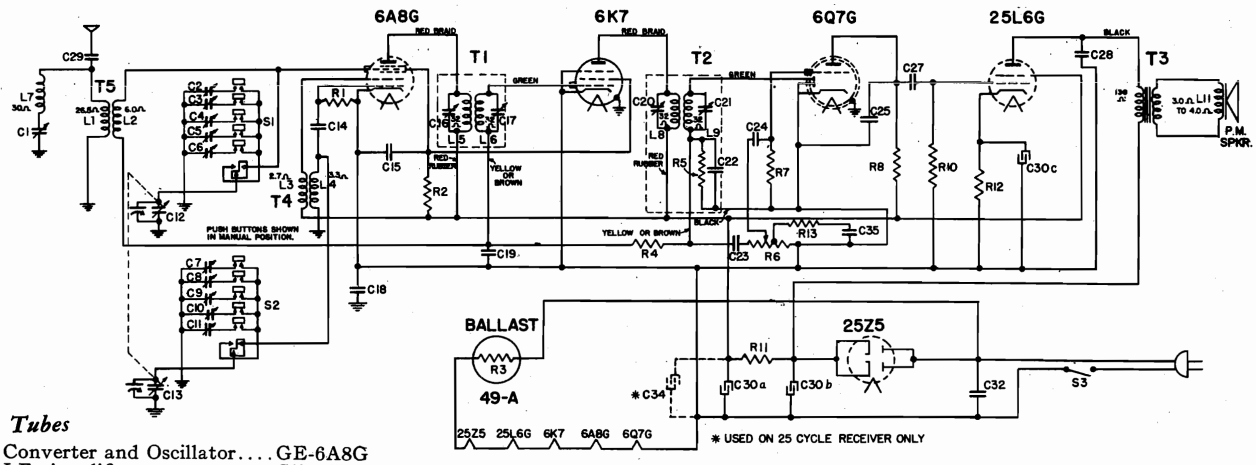
RF ALIGNMENT - Thru a 250 mmf and 200 ohm series :-Adj. C4 cond. osc. trimmer at 1830 KC - Adj. C3 Ant. trimmer at 1500 KC.

Pwr. Supply connection to chassis is thru .25 mf cond. If Sig. gen. is AC, connect .05 mf cond. in grd. side before chassis connection.

FOR CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION VOLUME V111.

MODEL GD63
Schematic, Voltage, Socket
Trimmers, Alignment

GENERAL ELECTRIC CO.



Tubes

Converter and Oscillator....GE-6A8G
I.F. Amplifier.............CE-6K7
Detector, AVC and Amplifier..................GE-6Q7G
Power Amplifier...........GE-25L6G
Rectifier.................GE-25Z5
Ballast Tube..............49-A

Tuning Frequency Range.....540–1750 K.C.

Intermediate Frequency......455 K.C.

Symbol	Description
C1	Wave trap trimmer
C2–C6	Antenna trimmer strip
C7–C11	Oscillator trimmer strip
C12 C13	Tuning condenser
C14	47 mmf., mica capacitor
C15	.25 mfd., paper capacitor
C18	.25 mfd., paper capacitor
C19	.05 mfd., paper capacitor
C22	470 mmf., mica capacitor
C23 24	.002 mfd., paper capacitor
C25	330 mmf., mica capacitor
C27	.005 mfd., paper capacitor
C28	.01 mfd., paper capacitor
C29	.001 mfd., paper capacitor
C30a	20 mfd., dry electrolytic
C30b	40 mfd., dry electrolytic
C30c	20 mfd., dry electrolytic
C32	.02 mfd., molded capacitor
C34	15 mfd., dry electrolytic
C35	.005 mfd., paper capacitor
R1	47,000 ohm, carbon resistor
R2	10,000 ohm, carbon resistor
R3	Ballast resistance, 49A
R4	2.2 megohm, carbon resistor
R5	470,000 ohm, carbon resistor
R6	2.2 megohm, volume control
R7	15.0 megohm, carbon resistor
R8	220,000 ohm, carbon resistor
R10	1.0 megohm, carbon resistor
R11	2200 ohm, carbon resistor
R12	180 ohm, carbon resistor
R13	68,000 ohm, carbon resistor
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer
T4	Osc. transformer
T5	Antenna transformer

GENERAL INFORMATION

Model GD-63 is a compact, six-tube AC-DC superheterodyne receiver, employing six General Electric Pre-tested Tubes as described above, in a superheterodyne circuit. It incorporates a simplified trimmer tuned "Touch-Tuning" system, allowing a set up of five stations for automatic tuning. Other features of design include I.F. wave trap, automatic volume control and an improved dustproof speaker.

Electrical Specifications

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
110-125 Volts AC or DC	40–100	50

Electrical Power Output (120—line volts)

	AC	DC
Undistorted	1.2	1.0
Maximum	2.5	2.0

Loud-speaker—Permanent Magnet

Outside Cone Diameter.....5-inch
Voice Coil Impedance......4.0 ohms at 400 cycles

VOLTAGE CHART

Tube No.	6A8G	6K7	6Q7G	25L6G	25Z5
Plate to −B volts	112	112	55*	130	..
Screen to −B volts	75	75	..	115	..
Cathode to −B volts	0	0	0	7.5	136
Cathode Current MA	6.6	1.4	0.5	40	50
Filament Volts	6.0	6.0	6.1	24.5	24.0

Line Voltage—120 AC. No signal input
* Measured on 250-volt scale.
On DC, voltages are about 15 per cent lower.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.—455 K.C. Broadcast—1500 K.C.
The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.

Set test oscillator to 455 and apply signal to the control grid of the 6A8G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 6A8G. Keep the test oscillator output as low as possible to give a readable output. Adjust all four I.F. trimmers for maximum output.

Wave Trap Alignment

Leave the test oscillator set to 455 K.C. and connect one output lead to the receiver chassis and the other through a 250 mmf. capacitor in series with 200 ohms to the receiver antenna lead. Adjust (C-1) for minimum output.

R.F. Alignment

Use the same dummy antenna (250 mmf. and 200 ohms) with 1500 K.C. input, adjust the oscillator trimmer (C-13) and antenna trimmer (C-12) for a maximum output.

Precaution—One side of the power supply is connected to the chassis through a .25 mfd. capacitor. If signal generator is AC operated, connect a .05 mfd. capacitor in the ground side before connecting it to the receiver chassis.

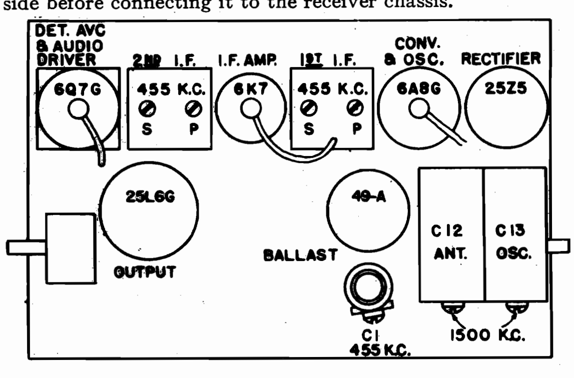


Fig. 1. Trimmer Location

GENERAL ELECTRIC CO.

MODELS G64,G65
Schematic,Chassis Wiring

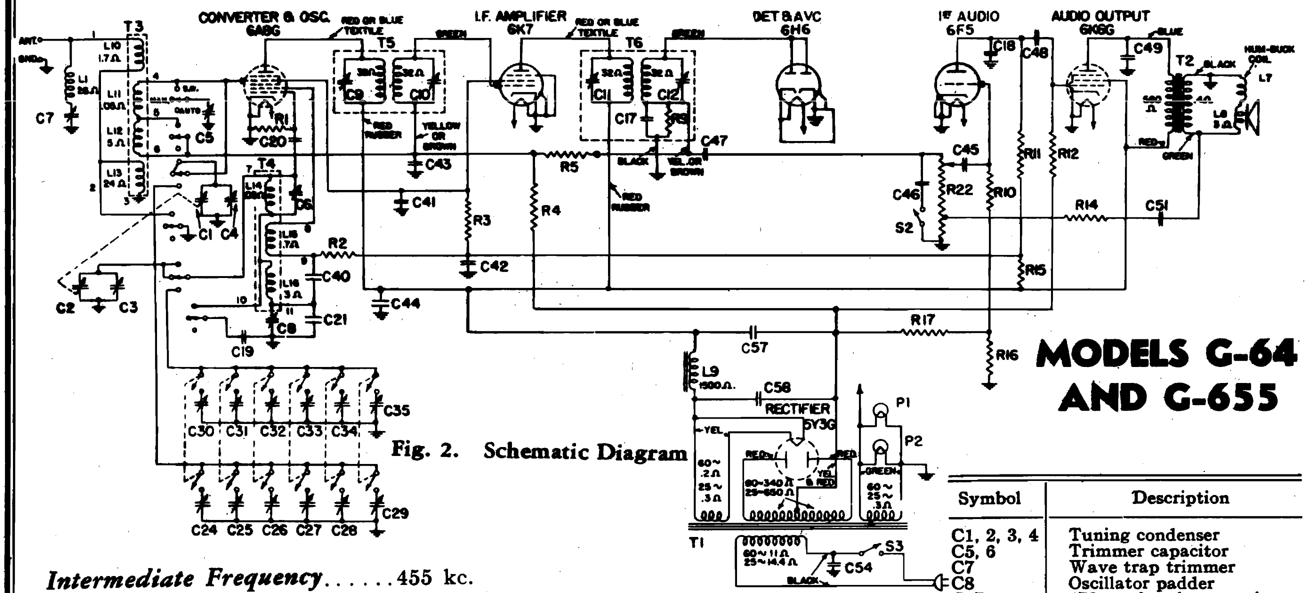


Fig. 2. Schematic Diagram

Intermediate Frequency......455 kc.

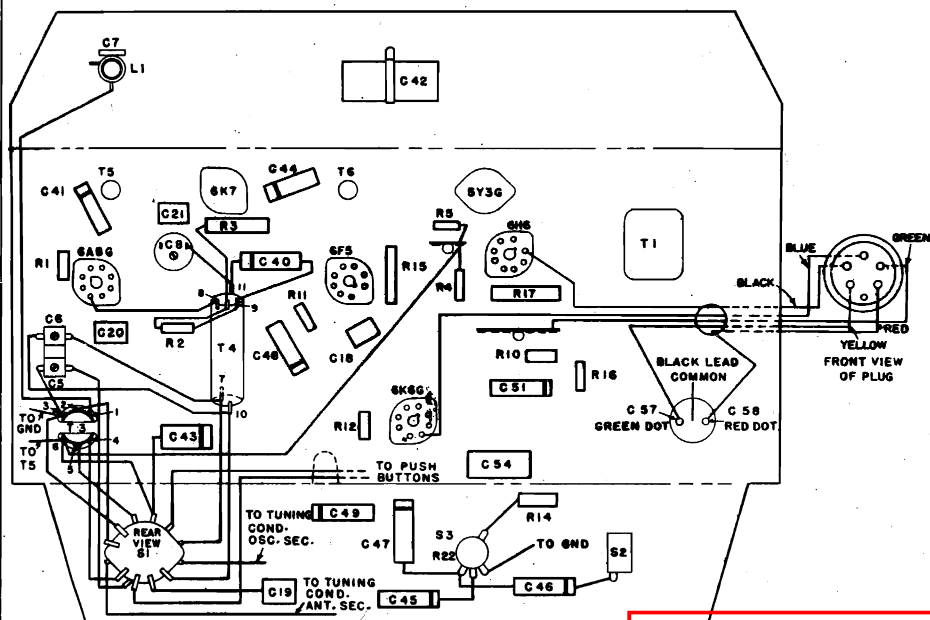


Fig. 3. Chassis Parts Layout

Symbol	Description
C1, 2, 3, 4	Tuning condenser
C5, 6	Trimmer capacitor
C7	Wave trap trimmer
C8	Oscillator padder
C17	470 mmf., mica capacitor
C18	330 mmf., mica capacitor
C19	3900 mmf., mica capacitor
C20	47 mmf., mica capacitor
C21	370 mmf., mica capacitor
C24, 29	Antenna trimmer strip
C30, 35	Oscillator trimmer strip
C40	.001 mfd., paper capacitor
C41	.05 mfd., paper capacitor
C42	0.5 mfd., paper capacitor
C43, 44	.05 mfd., paper capacitor
C45	.01 mfd., paper capacitor
C46	.001 mfd., paper capacitor
C47, 48	.005 mfd., paper capacitor
C49	.012 mfd., paper capacitor
C51	0.1 mfd., paper capacitor
C54	.01 mfd., molded paper
C57	8 mfd., dry electrolytic
C58	8 mfd., dry electrolytic
R1	47,000 ohm, carbon resistor
R2	4,700 ohm, carbon resistor
R3	18,000 ohm, carbon resistor
R4	10.0 megohm, carbon resistor
R5	1.5 megohm, carbon resistor
R9	470,000 ohm, carbon resistor
R10	2.2 megohm, carbon resistor
R11, 12	330,000 ohm, carbon resistor
R14	33,000 ohm, carbon resistor
R15	3900 ohm, carbon resistor
R16	22 ohm, carbon resistor
R17	330 ohm, carbon resistor
R22	2.0 megohm, volume control
T1	Power transformer
T2	Output transformer
T3	Antenna transformer
T4	Oscillator transformer

SERVICE DATA

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115–125	50–60	65
C	115–125	25–60	70
V	115–125 140–155 190–220 220–250	50–60	70

Tuning Frequency Range

Band "B"................540 to 1750 kc.
Band "D"................5700 to 18,300 kc.

Physical Specifications

Model................	G-64	G-655
Height...............	11 inches	34 inches
Width................	18⅞ inches	31 inches
Depth................	$7\frac{5}{16}$ inches	11½ inches

Tuning Control Drive Ratio. 10 to 1

Electrical Power Output

Undistorted...............2.0 watts
Maximum................4.0 watts

Tone Control................2 Point—
Bass and Normal

Loud-speaker—Electrodynamic

Model....................	G-655	G-64
Cone Diameter............	12 inches	6.5 inches
Voice Coil Impedance (400 cycles)............	3.5 ohms	3.5 ohms

MODELS G64,G65
Alignment,Voltage,Socket
Trimmers,Phono.Connections
Parts List.Dial Data

GENERAL ELECTRIC CO.

KEYBOARD RADIOS

Models G-64 and G-655

ALIGNMENT PROCEDURE

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-12) 2nd I.F. Pri. (C-11)	Gang condenser plates wide open—connect audio input of oscilloscope to ground and to the junction of C-47 and R-5. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 5.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-10) 1st I.F. Pri. (C-9)	
3. Band "B"	455 K.C. Sweep	Antenna Post	250 Mmf. 200 Ohms	Wave Trap Trimmer (C-7)	Adjust trimmer for minimum amplitude.

I.F. ALIGNMENT WITH OUTPUT METER

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-12) 2nd I.F. Pri. (C-11)	Gang condenser plates wide open—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
2. Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-10) 1st I.F. Pri. (C-9)	
3. Band "B"	455 K.C. with Modulation.	Antenna Post	250 Mmf. 200 Ohms	Wave Trap Trimmer (C-7)	Adjust trimmer for minimum output.

R.F. ALIGNMENT

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	......	......	....	....	Close gang condenser plates. Adjust pointer to first line at left end of tuning scale.
2. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-3) Ant. (C-4)	Connect output meter across voice coil—tone control on "bass" position—peak trimmers for maximum output with a low input signal.
3. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. Padder (C-8)	Adjust padder for a maximum output meter indication in vicinity of 580 kc. while rocking the gang condenser.
4. Band "B"	Repeat Operation 2				
5. Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-6) Ant. (C-5)	Peak C-5 for maximum output while rocking the gang condenser at the 18 mc. point. The image of any signal on "D" band should be heard 930 kc. below the input signal when proper peak is obtained on oscillator trimmer C-6. Example: 12 mc. image—11.09 mc.

Use a dummy antenna in making all alignments. The grid lead should not be removed from the tube to which the input signal is applied when aligning the I.F. amplifier.

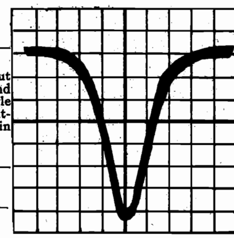


Fig. 5. Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

VOLTAGE CHART

Tube No.	6A8G	6K7	6F5	6K6G	5Y3G
Plate to –B volts	Conv.-236 Osc.-186	236	84 *	220	....
Screen to –B volts	95	95	....	236	....
Cathode to –B volts	0	0	0	0	320
Filament volts	6.5	6.5	6.5	6.5	5.3

A-C line voltage—120.
* Measured on 500-volt scale.

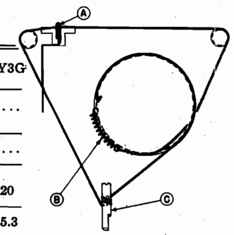


Fig. 6. Dial Drive Mechanism

GENERAL INFORMATION

Coil System

The "B" and "D" band antenna coils are wound on a single coil form (T-3) as shown in Fig. 2. T-4 is the oscillator transformer for both the "B" and "D" bands. All coil terminals are numbered in Fig. 2 and 3 to facilitate in service by showing common points on the schematic diagram, Fig. 2, and the pictorial wiring diagram, Fig. 3.

Phonograph Connections

Fig. 1 shows a simple sketch for connecting a crystal or high impedance magnetic pick-up into the receiver circuit for the reproduction of phonograph recordings. S-1 is either a rotary or toggle triple-pole, double-throw switch. A suitable loading circuit consisting of a resistor or resistor and capacitor network should be used across the pick-up leads when using a crystal type unit. It is very important that the pick-up leads have a shield such as copper braid to prevent hum interference. This lead should be connected to the chassis ground.

The circuit should be opened between the top end of the volume control (R-22) and (C-47), and phonograph connections made as shown. This procedure requires removal of the chassis from the cabinet.

When the pick-up is connected as shown, the regular radio volume and tone controls work for both radio and phonograph reproduction. The parts suggested are:

Symbol	Description	Stock No.
Sp	Phono Switch	RS-366
Rp	330,000 Ohm Resistor	RQ-1319

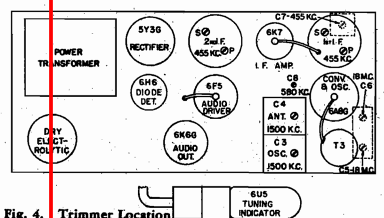


Fig. 4. Trimmer Location

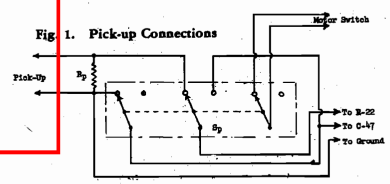


Fig. 1. Pick-up Connections

REPLACEMENT PARTS LIST
MODELS G-64 AND G-655

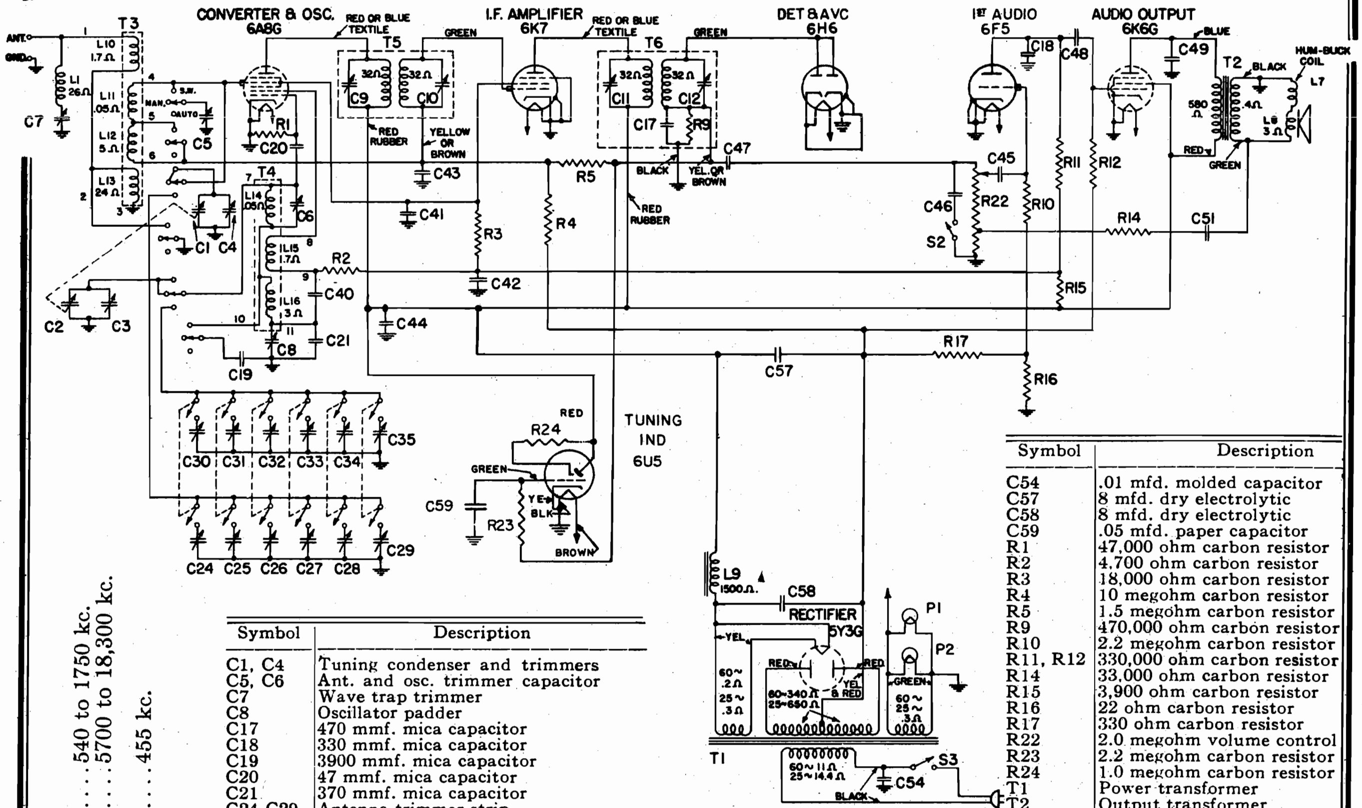
12-38 (8M)

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
*RB-008	BOARD—Terminal board (2 lug)	$0.10
RB-093	BOARD—Terminal board (6 lug)	.10
*RC-009	CAPACITOR—.001 mfd., 600 V. paper (C-40, 46)	.30
*RC-023	CAPACITOR—.005 mfd., 600 V paper (C-47, 48)	.25
*RC-039	CAPACITOR—.01 mfd., 200 V paper (C-45)	.25
RC-044	CAPACITOR—.012 mfd., 600 V paper (C-	.25
*RC-092	CAPACITOR—.05 mfd., 600 V paper (C-49)	.30
	41, 43, 44)	.30
*RC-104	CAPACITOR—0.1 mfd., 600 V paper (C-51)	.30
*RC-196	CAPACITOR—0.5 mfd., 600 V paper (C-42)	.75
RC-216	CAPACITOR—47 mmf., mica (C-20)	.25
*RC-274	CAPACITOR—330 mmf., mica (C-18)	.30
RC-285	CAPACITOR—370 mmf., mica (C-21)	.25
RC-294	CAPACITOR—470 mmf., mica (C-17)	.30
RC-390	CAPACITOR—3900 mmf., mica (C-19)	.35
RC-593	CAPACITOR—8 mfd., 450 V; 8 mfd., 450 V; dry electrolytic (C-57, 58)	1.40
RC-674	CAPACITOR—Wave trap trimmer (C-7)	.15
RC-698	CAPACITOR—Oscillator padder (C-8)	.40
RC-699	CAPACITOR—Trimmer capacitors "D" band (C-5, 6)	.30
RC-727	CONDENSER—Tuning condenser (C-1, 2, 3, 4)	2.25
RC-791	CAPACITOR—.01 mfd., 250 V. AC (C-54)	.30
RC-8103	CABLE—Speaker cable and plug	.50
*RC-863	CORD—Power cord	.65
RG-016	GRID CLIP—Control grid clip	.10
RK-027	KNOB—Winged control knob (Pkg. 5)	.50
RK-028	KNOB—Plain control knob (Pkg. 5)	.30
RL-061	COIL—Antenna coil bands "B & D"	1.15
RL-265	COIL—Oscillator coil bands "B & D"	.75
RL-603	COIL—Wave trap coil (L-1)	.60
*RQ-1219	RESISTOR—22 ohm, ½-W. carbon (R-16) (Pkg. 5)	.70
*RQ-1275	RESISTOR—4,700 ohm, ½-W. carbon (R-2) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohm, ½-W. carbon (R-14) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohm, ½-W. carbon (R-1) (Pkg. 5)	.70
*RQ-1319	RESISTOR—330,000 ohm, ½-W. carbon (R-11, 12) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohm, ½-W. carbon (R-9) (Pkg. 5)	.70
*RQ-1335	RESISTOR—1.5 megohm, ½-W. carbon (R-5) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½-W. carbon (R-10) (Pkg. 5)	.70
*RQ-1355	RESISTOR—10 megohm, ½-W. carbon (R-4) Pkg. 5)	.70
*RQ-1447	RESISTOR—330 ohm, 1-W. carbon (R-17)	.20
*RQ-1473	RESISTOR—3900 ohm, 1-W. carbon (R-15)	.20
*RQ-1489	RESISTOR—18,000 ohm, 1-W. carbon (R-3)	.20
*RS-200	SOCKET—Octal base tube socket (Pkg. 5)	.75
*RS-204	SOCKET—Rectifier tube socket (Pkg. 5)	.75
*RS-223	SOCKET—Socket for 6A8G (Pkg. 5)	.80
RS-236	SOCKET—Lamp Socket Assembly	$0.10
RS-390	SWITCH—Tone control switch (S-2)	.35
RS-391	SWITCH—Band change switch (S-1)	.90
RT-0516	TRANSFORMER—Power transformer (50–60 cy.) (T-1)	4.20
RT-0517	TRANSFORMER—Power transformer (25 cy.) (T-1)	7.05
RT-0518	TRANSFORMER—Power transformer—Universal (T-1)	9.00
RT-260	TRANSFORMER—1st IF transformer (complete)	1.15
RT-286	TRANSFORMER—2nd IF transformer (complete)	1.40
RT-438	TRANSFORMER—Output transformer (T-2)	1.70
RV-040	VOLUME CONTROL—2 meg. volume control and power switch (R-22, S-3)	.95
*RW-101	WASHER—Felt washers for control knobs (Pkg. 10)	.45
RX-046	ASSEMBLY—Gang condenser mounting assembly	.20
*RX-015	ASSEMBLY—Chassis mounting assembly	.10
	SPEAKER ASSEMBLY G-64	
RC-931	CONE—6½ inch cone and voice coil assembly	.60
RD-300	DUST CAP—6½ inch cone dust cap (Pkg. 5)	.10
*RP-015	PLUG—Male speaker plug	.20
RS-098	SPEAKER—6½ inch speaker (less output trans.)	4.25
RX-047	ASSEMBLY—Speaker nuts and washers	.05
	SPEAKER ASSEMBLY G-655	
RC-932	CONE—12 inch cone and voice coil assembly	1.10
RD-301	DUST CAP—Speaker dust cap (Pkg. 5)	.10
*RP-015	PLUG—Male speaker plug	.20
RS-096	SPEAKER—12 inch speaker (less output trans.)	6.00
RX-047	ASSEMBLY—Speaker nuts and washers	.05
	TOUCH-TUNING AND DIAL SCALE MECHANISM	
RB-617	BUTTON—Molded push button (Pkg. 5)	.45
RC-8034	CORD—Drive cord (Pkg. 5)	.70
RC-8033	CARD—Station letter card (set)	.45
RD-070	DRUM—Condenser drive drum	.20
RD-090	DIAL—Dial scale	1.25
RD-204	DRIVE—Drive shaft	.15
RE-028	ESCUTCHEON—Dial scale escutcheon	1.60
*RP-075	PULLEY—Pointer drive cord pulley (Pkg. 6)	.20
RP-108	POINTER—Dial scale pointer	.15
RS-392	SWITCH—Touch-tuning switch (less trimmer strips)	2.35
*RS-432	SPRING—Drive cord tension spring (Pkg. 5)	.20
RS-444	SPRING—Spring for molded push button (Pkg. 10)	.10
RT-852	TRIMMER STRIP—Push button trimmer strip; osc. sec.	1.05
RT-853	TRIMMER STRIP—Push button trimmer strip; RF section	1.05
RW-027	WINDOW—Station letter windows (Pkg. 25)	.40

* Used on previous productions.
(Prices subject to change without notice)

GENERAL ELECTRIC CO.

MODEL G75
Schematic, Chassis Wiring



Symbol	Description
C1, C4	Tuning condenser and trimmers
C5, C6	Ant. and osc. trimmer capacitor
C7	Wave trap trimmer
C8	Oscillator padder
C17	470 mmf. mica capacitor
C18	330 mmf. mica capacitor
C19	3900 mmf. mica capacitor
C20	47 mmf. mica capacitor
C21	370 mmf. mica capacitor
C24-C29	Antenna trimmer strip
C30-C35	Oscillator trimmer strip
C40	.001 mfd. paper capacitor
C41	.05 mfd. paper capacitor
C42	.05 mfd. paper capacitor
C43, C44	.05 mfd. paper capacitor
C45	.01 mfd. paper capacitor
C46	.001 mfd. paper capacitor
C47, C48	.005 mfd. paper capacitor
C49	.012 mfd. paper capacitor
C51	0.1 mfd. paper capacitor

Symbol	Description
C54	.01 mfd. molded capacitor
C57	8 mfd. dry electrolytic
C58	8 mfd. dry electrolytic
C59	.05 mfd. paper capacitor
R1	47,000 ohm carbon resistor
R2	4,700 ohm carbon resistor
R3	18,000 ohm carbon resistor
R4	10 megohm carbon resistor
R5	1.5 megohm carbon resistor
R9	470,000 ohm carbon resistor
R10	2.2 megohm carbon resistor
R11, R12	330,000 ohm carbon resistor
R14	33,000 ohm carbon resistor
R15	3,900 ohm carbon resistor
R16	22 ohm carbon resistor
R17	330 ohm carbon resistor
R22	2.0 megohm volume control
R23	2.2 megohm carbon resistor
R24	1.0 megohm carbon resistor
T1	Power transformer
T2	Output transformer
S1	Band switch
S2	Tone control switch
S4	Keyboard tuning switch

Fig. 2. Schematic Diagram

Tuning Frequency Range
Band "B" ....540 to 1750 kc.
Band "D" ....5700 to 18,300 kc.

Intermediate Frequency ....455 kc.

Electrical Power Output
Undistorted ....2.0 watts
Maximum ....3.8 watts

Tone Control ....2 Point—Bass and Normal

Loud-speaker—Electrodynamic
Cone Diameter ....12 inches
Voice Coil Impedance (400 cycles) ....3.5 ohms

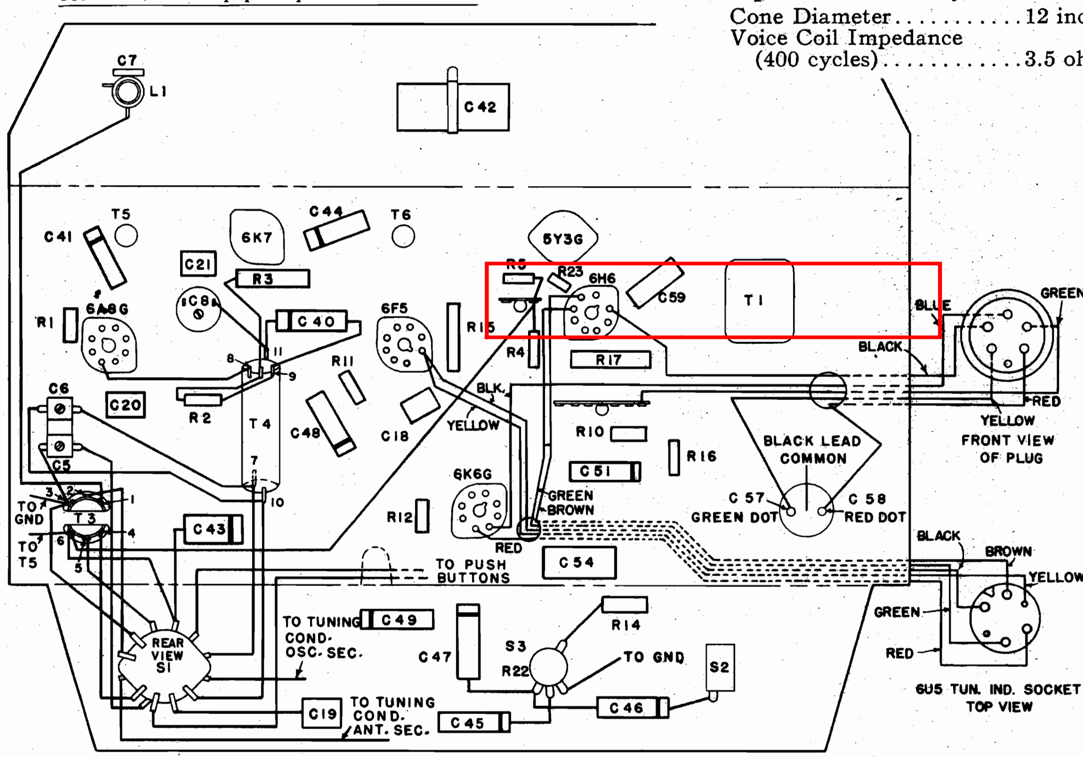


Fig. 3. Chassis Parts Layout

MODEL G75
Alignment,Voltage,Socket
Trimmers,Phono., Dial

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-12) 2nd I.F. Pri. (C-11)	Gang condenser plates wide open—connect audio input of oscilloscope to ground and to the junction of C-47 and R-5. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 5.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-10) 1st I.F. Pri. (C-9)	
3. Band "B"	455 K.C. Sweep	Antenna Post	250 Mmf. 200 Ohms	Wave Trap Trimmer (C-7)	Adjust trimmer for minimum amplitude

I.F. ALIGNMENT WITH OUTPUT METER

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-12) 2nd I.F. Pri. (C-11)	Gang condenser plates wide open—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
2. Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-10) 1st I.F. Pri. (C-9)	
3. Band "B"	455 K.C. with Modulation.	Antenna Post	250 Mmf. 200 Ohms	Wave Trap Trimmer (C-7)	Adjust trimmer for minimum output.

R.F. ALIGNMENT

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
Band "B"	....	......	....	....	Close gang condenser plates. Adjust pointer to first line at left end of tuning scale.
2. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-3) Ant. (C-4)	Connect output meter across voice coil—tone control on "bass" position—peak trimmers for maximum output with a low input signal.
3. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. Padder (C-8)	Adjust padder for a maximum output meter indication in vicinity of 580 kc. while rocking the gang condenser.
4. Band "B"	Repeat Operation 2				
5. Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-6) Ant. (C-5)	Peak C-5 for maximum output while rocking the gang condenser at the 18 mc. point. The image of any signal on "D" band should be heard 930 kc. below the input signal when proper peak is obtained on oscillator trimmer C-6. Example: 12 mc. image—11.09 mc.

Use a dummy antenna in making all alignments. The grid lead should not be removed from the tube to which the input signal is applied when aligning the I.F. amplifier.

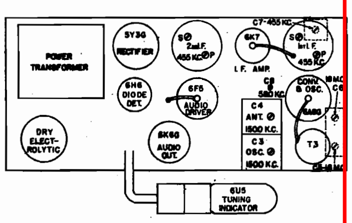


Fig. 4. Trimmer Location

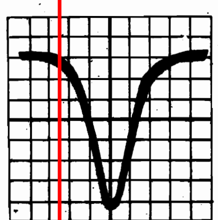


Fig. 5. Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

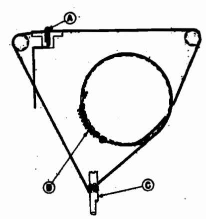


Fig. 6. Dial Drive Mechanism

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115–125	50–60	65
C	115–125	25–60	70
V	115–125 140–155 190–220 220–250	50–60	70

Coil System

The "B" and "D" band antenna coils are wound on a single coil form (T-3) as shown in Fig. 2. T-4 is the oscillator transformer for both the "B" and "D" bands. All coil terminals are numbered in Fig. 2 and 4 to facilitate in service by showing common points on the schematic diagram, Fig. 2, and the pictorial wiring diagram, Fig. 4.

The following table shows the coils in use for the various positions of the wave change switch.

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid Coil	Plate Coil	
Short Wave	L-10	L-11	L-14	L-15	L-12 Shorted L-16 Shorted
Manual Broadcast	L-10 and L-13	L-11 and L-12	L-14 and L-16	L-15	Tuned by gang condenser C-1 and C-2
Automatic Tuning	L-10 and L-13	L-11 and L-12	L-14 and L-16	L-15	C-1 and C-2 removed tuned by fixed trimmers

Phonograph Connections

Fig. 1 shows a simple sketch for connecting a crystal or high impedance magnetic pick-up into the G-75 circuit for the reproduction of phonograph recordings. S-1 is either a rotary or toggle triple-pole, double-throw switch. A suitable loading circuit consisting of a resistor or resistor and capacitor network should be used across the pick-up leads when using a crystal type unit. It is very important that the pick-up leads have a shield such as copper braid to prevent hum interference. This lead should be connected to the chassis ground.

The circuit should be opened between the top end of the volume control (R-22) and (C-47), and phonograph connections made as shown. This procedure requires removal of the chassis from the cabinet.

When the pick-up is connected as shown, the regular radio volume and tone controls work for both radio and phonograph reproduction. The parts suggested are:

Symbol	Description	Stock No.
Sp	Phono Switch	RS-366
Rp	330,000 Ohm Resistor	RQ-1319

VOLTAGE CHART

Tube No.	6A8G	6K7	6F5	6K6G	5Y3G
Plate to −B volts	Conv.-236 Osc.-186	236	84*	220	....
Screen to −B volts	95	95	....	236	
Cathode to −B volts	0	0	0	0	320
Filament volts	6.5	6.5	6.5	6.5	5.3

A-C line voltage—120.
* Measured on 500-volt scale.

PARTS LIST—MODEL G-75

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
*RB-008	BOARD—Terminal board (2 lug)	$0.10
RB-093	BOARD—Terminal board (6 lug)	.10
*RB-158	BRACKET—Tuning indicator tube bracket	.15
*RC-009	CAPACITOR—.001 mfd., 600 V paper (C-40, 46)	.30
*RC-023	CAPACITOR—.005 mfd., 600 V paper (C-47, 48)	.25
*RC-039	CAPACITOR—.01 mfd., 200 V paper (C-45)	.25
RC-044	CAPACITOR—.012 mfd., 600 V paper (C-49)	.25
*RC-092	CAPACITOR—.05 mfd., 600 V paper (C-41, 43, 44, 59)	.30
*RC-104	CAPACITOR—0.1 mfd., 600 V paper (C-51)	.30
*RC-196	CAPACITOR—.05 mfd., 600 V paper (C-42)	.75
RC-216	CAPACITOR—47 mmf., mica (C-20)	.25
*RC-274	CAPACITOR—330 mmf., mica (C-18)	.30
RC-285	CAPACITOR—370 mmf., mica (C-21)	.25
RC-294	CAPACITOR—470 mmf., mica (C-17)	.30
RC-390	CAPACITOR—3900 mmf., mica (C-19)	.35
RC-593	CAPACITOR—8 mfd., 450 V; 8 mfd., 450 V; dry electrolytic (C-57, 58)	1.40
*RC-630	CAPACITOR—Oscillator padder (C-8)	.40
RC-674	CAPACITOR—Wave trap trimmer (C-7)	.15
RC-675	CAPACITOR—Trimmer capacitors "D" band (C-5, 6)	.30
RC-727	CONDENSER—Tuning condenser (C-1, 2, 3, 4)	2.25
RC-791	CAPACITOR—.01 mfd., 250 V A.C. (C-54)	.30
RC-8098	CABLE—Tuning indicator cable	.50
RC-8099	CABLE—Speaker cable and plug	.50
*RC-863	CORD—Power cord	.65
RG-016	GRID CLIP—Control grid clip (Pkg. 5)	.10
RK-027	KNOB—Winged control knob (Pkg. 5)	.50
RK-028	KNOB—Plain control knob (Pkg. 5)	.30
RL-061	COIL—Antenna coil bands "B" and "D"	1.15
RL-265	COIL—Oscillator coil bands "B" and "D"	.75
RL-603	COIL—Wave trap coil (L-1)	.60
*RQ-1219	RESISTOR—22 ohm, ½-W. carbon (R-16) (Pkg. 5)	.70
*RQ-1275	RESISTOR—4,700 ohm, ½-W. carbon (R-2) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohm, ½-W. carbon (R-14) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohm, ½-W. carbon (R-1) (Pkg. 5)	.70
*RQ-1319	RESISTOR—330,000 ohm, ½-W. carbon (R-11, 12) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohm, ½-W. carbon (R-9) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½-W. carbon (R-24) (Pkg. 5)	.70
*RQ-1335	RESISTOR—1.5 megohm, ½-W. carbon (R-5) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½-W. carbon (R-10, 23) (Pkg. 5)	.70
*RQ-1355	RESISTOR—10 megohm, ½-W. carbon (R-4) (Pkg. 5)	.70
*RQ-1447	RESISTOR—330 ohm, 1-W. carbon (R-17)	$0.20
*RQ-1473	RESISTOR—3900 ohm, 1-W carbon (R-15)	.20
*RQ-1489	RESISTOR—18,000 ohm, 1-W. carbon (R-3)	.20
*RS-200	SOCKET—Octal base tube socket (Pkg. 5)	.75
*RS-204	SOCKET—Rectifier tube socket (Pkg. 5)	.75
*RS-218	SOCKET—Lamp socket assembly	.10
*RS-223	SOCKET—Socket for 6A8G (Pkg. 5)	.80
RS-390	SWITCH—Tone control switch (S-2)	.35
RS-391	SWITCH—Band change switch (S-1)	.90
RT-0712	TRANSFORMER—Power transformer (50–60 cycles) (T-1)	5.30
RT-0713	TRANSFORMER—Power transformer (25 cycles) (T-1)	8.10
RT-0518	TRANSFORMER—Power transformer—Universal (T-1)	9.00
RT-259	TRANSFORMER—2nd I.F. transformer (complete)	1.40
RT-260	TRANSFORMER—1st I.F. transformer (complete)	1.15
RT-438	TRANSFORMER—Output transformer (T-2)	1.70
RV-040	VOLUME CONTROL—2 meg. volume control and power switch (R-22, S-3)	.95
*RW-101	WASHER—Felt washers for control knobs (Pkg. 10)	.45
RX-046	ASSEMBLY—Gang condenser mounting assembly	.20
*RX-015	ASSEMBLY—Chassis mounting assembly	.10
	SPEAKER ASSEMBLY	
RC-932	CONE—12-in. cone and voice coil assembly	1.10
RD-301	DUST CAP—Speaker dust cap (Pkg. 5)	.10
RP-015	PLUG—Male speaker plug	.20
RS-096	SPEAKER—12-in. speaker (less output transformer)	6.00
RX-047	ASSEMBLY—Speaker nuts and washers	.05
	TOUCH-TUNING AND DIAL SCALE MECHANISM	
RB-617	BUTTON—Molded push button (Pkg. 5)	.45
RC-8033	CARD—Station letter card (set)	.45
RC-8034	CORD—Drive cord (Pkg. 5)	.70
RD-070	DRUM—Condenser drive drum	.20
RD-204	DRIVE—Drive shaft	.15
RE-028	ESCUTCHEON—Dial scale escutcheon	1.60
RE-046	ESCUTCHEON—Tuning indicator escutcheon	.25
*RP-075	PULLEY—Pointer drive cord pulley (Pkg. 6)	.20
RP-108	POINTER—Dial scale pointer	.15
RS-392	SWITCH—Touch-tuning switch (less trimmer strips)	2.35
*RS-432	SPRING—Drive cord tension spring (Pkg. 5)	.20
RS-444	SPRING—Spring for molded push button (Pkg. 10)	.10
RT-852	TRIMMER STRIP—Push button trimmer strip; osc. section	1.05
RT-853	TRIMMER STRIP—Push button trimmer strip; R.F. section	1.05
RW-027	WINDOW—Celluloid station letter window (Pkg. 25)	.40

*Used on previous receivers

(Prices subject to change without notice)

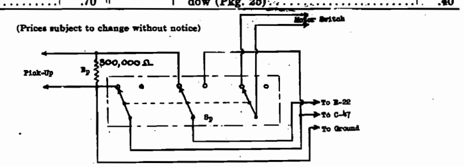


Fig. 1. Pick-up Connections

GENERAL ELECTRIC CO.

MODEL G78
Schematic, Socket, Trimmers
Chassis Wiring, Voltage

SOCKET VOLTAGES

Tube No.	6A8G	6SK7	6SF5	76	6AC5G	5Y3G
Plate to Gnd. Volts	Conv.-210 Osc.-165	215	*100	245	225	310/310 RMS
Screen to Gnd. Volts	100	100	...	...	...	
Cathode to Gnd. Volts	0	0	3.0	8.0	4.7	315
Cathode Current MA	12.0	9.0	0.3	6.0	33.5	71
Filament Volts	6.4	6.4	6.4	6.4	6.4	5.2

A-c line voltage 125—no signal input. Dial pointer set at 550 kc. on "B" band. *Measured on 500-volt scale.

Electrical Power Output

Undistorted....................3.0 watts
Maximum.........................5.0 watts

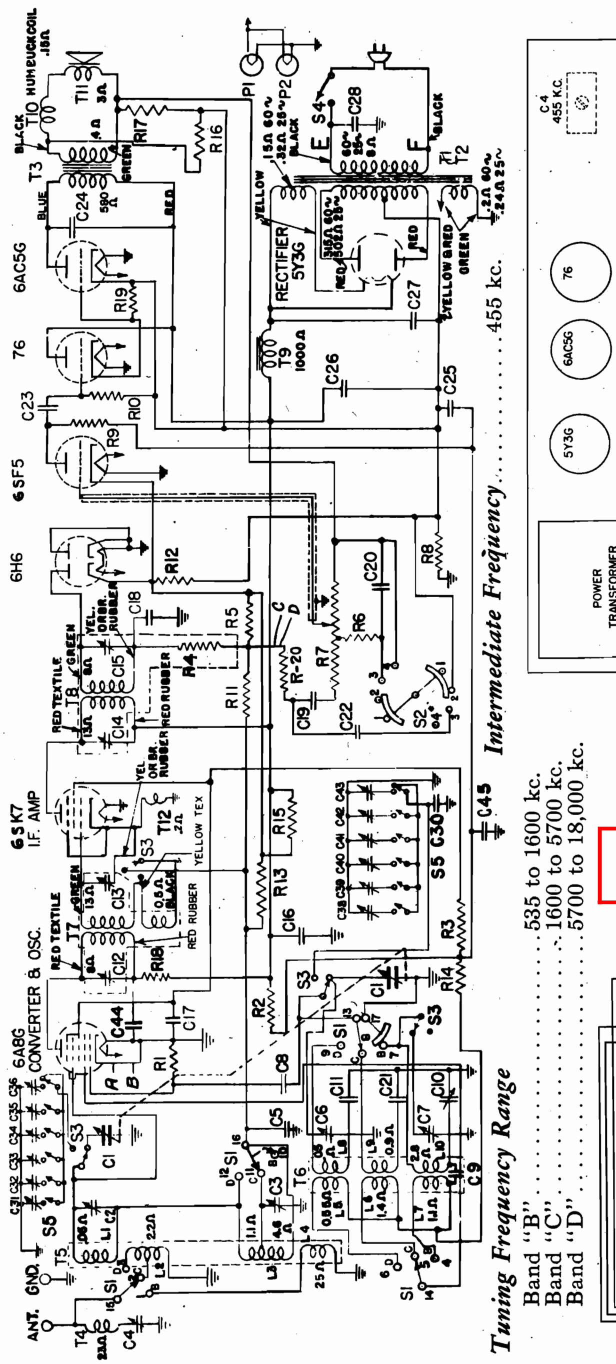
Tone Control......................4-position

Loud-speaker—Electrodynamic

Outside Cone Diameter...........12 inches
Voice Coil Impedance (400 Cycles)..3.5 ohms
Field Coil Resistance.............880 ohms (cold)

MODEL G-78

Symbol	Description
C1	Tuning condenser
C2, 3	Antenna trimmers
C4	Wave trap trimmer
C5	.1 mfd, paper capacitor
C6, 7	Oscillator trimmer
C8	50 mmf., mica capacitor
C9	.005 mfd., paper capacitor
C10	300–650 mmf., padder
C11	4300 mmf., mica capacitor
C16	.1 mfd., paper capacitor
C17	.05 mfd., paper capacitor
C18	47 mmf., mica capacitor
C19, 20	.003 mfd., paper capacitor
C21	1500 mmf., mica capacitor
C22	.0015 mfd., paper capacitor
C23	.005 mfd., paper capacitor
C24	.015 mfd., paper capacitor
C25	8 mfd., dry electrolytic
C26	8 mfd., dry electrolytic
C27	12 mfd., dry electrolytic
C28	.02 mfd., line capacitor
C30	20 mmf., compensating capacitor
C31-C36	Antenna trimmer strip
C38-C43	Oscillator trimmer strip
C44	.05 mfd., paper capacitor
C45	.1 mfd., paper capacitor
R1	47,000 ohm carbon resistor
R2	6800 ohm carbon resistor
R3	15,000 ohm carbon resistor
R4	47,000 ohm carbon resistor
R5	220,000 ohm carbon resistor
R6	180,000 ohm carbon resistor
R7	2.0 megohm volume control
R8	220 ohm carbon resistor
R9	220,000 ohm carbon resistor
R10	1.0 megohm carbon resistor
R11	2.2 megohm carbon resistor
R12	150 ohm carbon resistor
R13	3.3 megohm carbon resistor
R14	3300 ohm carbon resistor
R15	33,000 ohm carbon resistor
R16	100 ohm carbon resistor
R17	22 ohm carbon resistor
R18	6800 ohm carbon resistor
R19	22,000 ohm carbon resistor
R20	47,000 ohm carbon resistor
T1, T2	Power transformer
T3	Output transformer
T4	Wave trap coil
T5	Antenna coil
T6	Oscillator coil



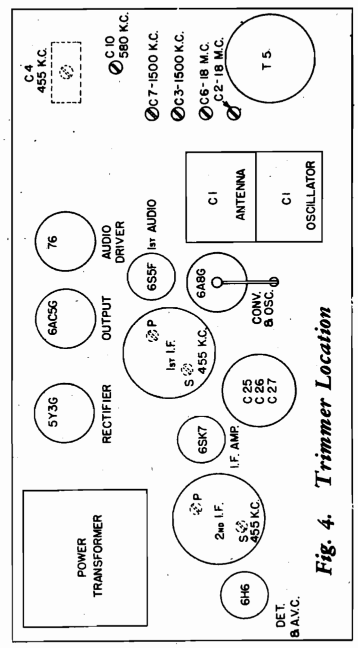


Fig. 4. Trimmer Location

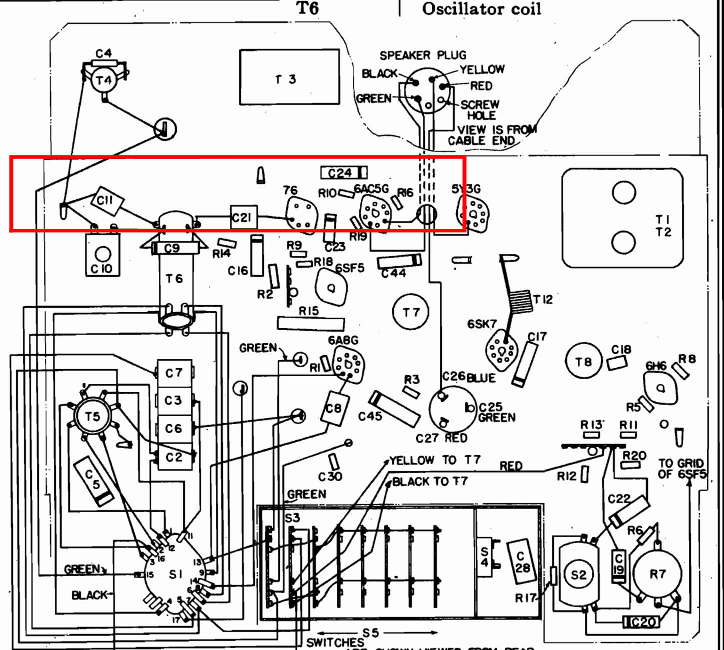


Fig. 3. Chassis Layout

MODEL G78
Alignment, Dial, Phono.

GENERAL ELECTRIC CO.

SERVICE DATA

Physical Specifications

Model G-78
Height .... 39⅛ inches
Width .... 27¾ inches
Depth .... 12¾ inches

Tuning Control Drive Ratio .... 13 to 1

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115–125	50–60	70
C	115–125	25–60	75

GENERAL INFORMATION

Coil System

T-5 and T-6 are the antenna and oscillator transformers respectively for the "B," "C," and "D" bands. All band switch terminals are numbered in Fig. 2 and Fig. 3 to facilitate circuit tracing by showing common points on the schematic diagram, Fig. 2 and the pictorial wiring diagram, Fig. 3.

The following table shows the coils in use for various positions of the band change switch.

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid Coil	Oscillator Plate Coil	Remarks
Band "B"	L-4	L-1+L-3	L-10	L-7	
Band "C"	Part of L-2	L-1+Part of L-3	L-9	L-6	Part of L-3 shorted. L-10 shorted
Band "D"	L-2	L-1	L-8	L-5	L-9, L-10 shorted. L-3 shorted
Automatic Tuning	L-4	L-1+L-3	L-10	L-7	C-1 removed. Tuned by fixed trimmers

Loud-speaker

12-inch speaker—To center the voice coil, remove dust cover by softening with acetone. Loosen the two clamping screws and place three 1 in. by ¼ in. by 0.010 in. paper or celluloid strips equally spaced around pole piece for clearance—then tighten clamping screws. Remove strips and cement the dust cap back in place with Glyptal cement.

Phonograph Connections

Fig. 1 shows a simple sketch for connecting a crystal or high impedance magnetic pickup into the G-78 circuit for the reproduction of phonograph recordings. Sp is a rotary triple-pole, double-throw switch. A suitable loading circuit consisting of a resistor or resistor and capacitor network should be used across the pickup leads when using a crystal type unit. It is very important that the pickup leads have a shield such as copper braid to prevent hum interference. This lead should be connected to the chassis ground.

The 6A8G cathode circuit should be opened between A-B on the schematic. Also open the circuit between C-D in the diode circuit and make connections of phono switch as indicated in Fig. 1.

When the pickup is connected as suggested, the regular radio volume and tone controls work for both radio and phonograph reproduction. The following are suggested parts:

Symbol	Description	Stock No.
Sp	Triple-pole, double-throw switch	RS-3013
Rp	330,000-ohm carbon resistor	RQ-1319

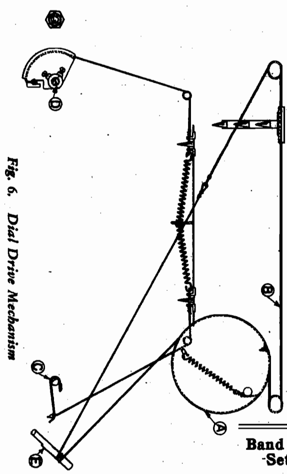


Fig. 6. Dial Drive Mechanism

Tubes:
Converter and Oscillator-GE-6A8G
IF Amplifier- GE-6SK7
Detector and AVC- GE-6H6
1st Audio- GE-6SF5
Driver --- GE-76
Power Output- GE-6AC5G
Rectifier- GE-5Y3G
Pilot Lamp (2) Mazda No. 44

MODEL G-78

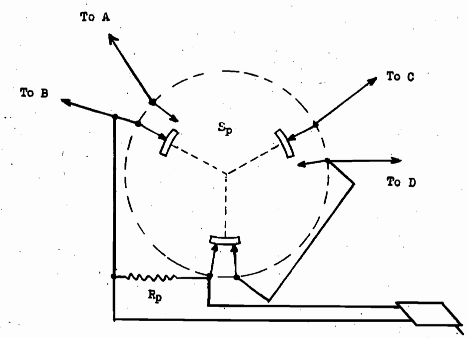


Fig. 1. Pickup Connections

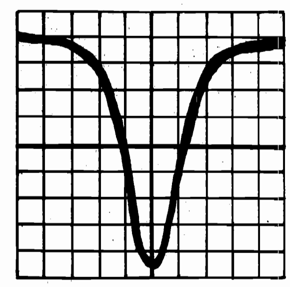


Fig. 5. Over-all I. F. curve taken on G-E oscilloscope OFM-1

ALIGNMENT PROCEDURE

I. F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-14)	Gang condenser plates closed—"manual" key depressed—connect audio input of oscilloscope to ground and to the junction of C-19 and R-20 of the 2nd I.F. transformer. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resultant curve is shown in Fig. 5.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-12)	
3. Band "B"	455 K.C. Sweep	Antenna Post	250 Mmf. 200 ohms	Wave Trap Trimmer (C-4)	Adjust trimmer for minimum amplitude.

I. F. ALIGNMENT WITH OUTPUT METER

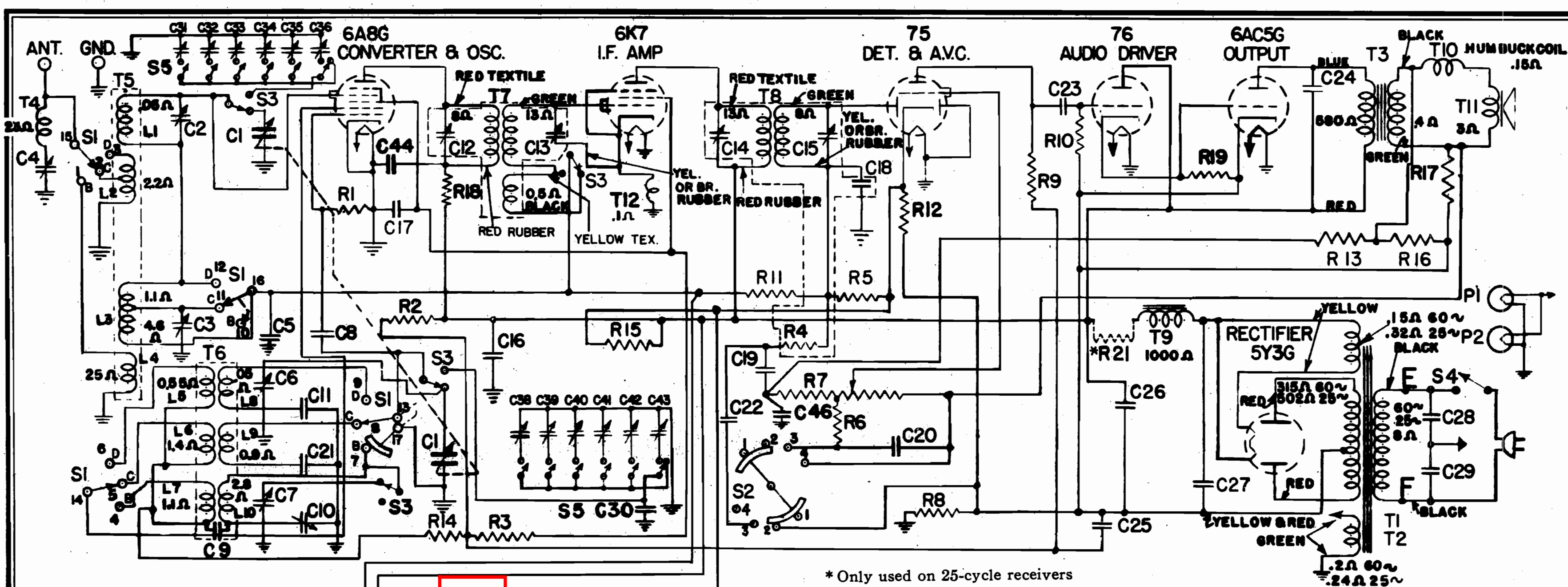
Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-14)	Gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
2. Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-12)	
3. Band "B"	455 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Wave Trap Trimmer (C-4)	Adjust trimmer for minimum output.

R. F. ALIGNMENT

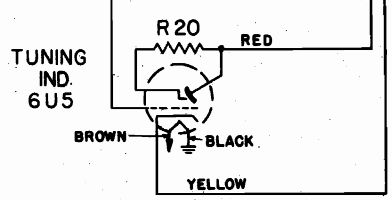
Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale.
2. Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-6) Ant. (C-2)	Connect output meter across voice coil—tone control on "Bass" position. The image of any "D" band signal should be heard 930 K.C. below signal input when (C-6) is on proper peak. Example: 15 M.C. image—14.09 M.C. Peak (C-2) while rocking the gang condenser.
3. Band "C"	No adjustments necessary.				
4. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-7) Ant. (C-3)	Peak trimmers for maximum output with a low input signal.
5. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. Padder (C-10)	Adjust padder for maximum output in vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (3-7) Ant. (C-3)	Retrim for maximum output with a low input signal.

MODEL G76
Schematic, Socket
Alignment, Trimmers

GENERAL ELECTRIC CO.



* Only used on 25-cycle receivers



Symbol	Description	Symbol	Description	Symbol	Description
C1	450 mmf. tuning condenser	C25	8 mfd. dry electrolytic	R9	220,000 ohm carbon resistor
C2, C3, C6, C7	Ant. and osc. trimmer capacitors	C26	8 mfd. dry electrolytic	R10	1.0 megohm carbon resistor
C4	Wave trap capacitor	C27	12 mfd. dry electrolytic	R11	2.2 megohm carbon resistor
C5	.1 mfd. paper capacitor	C28, C29	.01 mfd. line capacitor	R12	150 ohm carbon resistor
C8	50 mmf. mica capacitor	C30	20 mmf. compensating capacitor	R13	2.2 megohm carbon resistor
C9	.005 mfd. paper capacitor	C31-C36	Automatic tuning trimmers	R14	3300 ohm carbon resistor
C10	300-650 mmf. padder capacitor	C38-C43	Automatic tuning trimmers	R15	33,000 ohm carbon resistor
C11	4300 mmf. mica capacitor	C44	.05 mfd. paper capacitor	R16	47 ohm carbon resistor
C16	.1 mfd. paper capacitor	C46	100 mmf. mica capacitor	R17	22 ohm carbon resistor
C17	.05 mfd. paper capacitor	R1	47,000 ohm carbon resistor	R18	6800 ohm carbon resistor
C18	47 mmf. mica capacitor	R2	6,800 ohm carbon resistor	R19	22,000 ohm carbon resistor
C19, C20	.003 mfd. paper capacitor	R3	22,000 ohm carbon resistor	R20	1.0 megohm carbon resistor
C21	1500 mmf. mica capacitor	R4	47,000 ohm carbon resistor	R21*	470 ohm carbon resistor
C22	.0015 mfd. paper capacitor	R5	220,000 ohm carbon resistor	S1	Band change switch
C23	.005 mfd. paper capacitor	R6	180,000 ohm carbon resistor	S2	Tone control switch
C24	.02 mfd. paper capacitor	R7	2.0 megohm volume control	T1 T2	Power transformer
		R8	270 ohm carbon resistor	T3	Output transformer
				T4	Wave trap coil

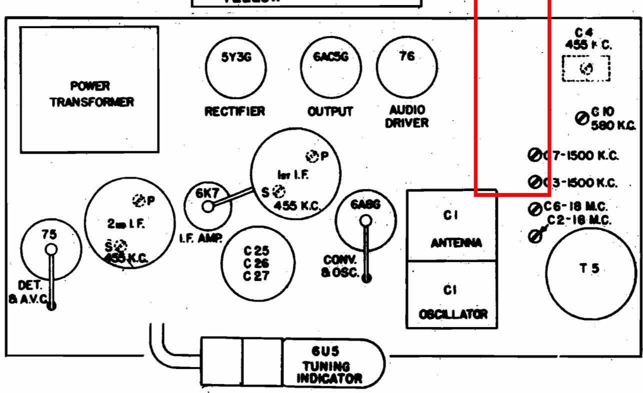


Fig. 1. Trimmer Location

Align the I.F. at 455 K.C. by visual or output meter method.

Align wave trap trimmer C-4 at 455 K.C. by peaking for a minimum output.

Band change switch on "D" band, align C-6 at 18 M.C. Rock the gang condenser when peaking C-2 for maximum output. The image of any signal on the "D" band should be heard 910 K.C. below input signal. Example: 18 M.C. image at 17.09 M.C.

On Broadcast band, align trimmers C-7 and C-3 at 1500 K.C. Align C-10 at 580 K.C. while rocking the gang condenser.

ALIGNMENT

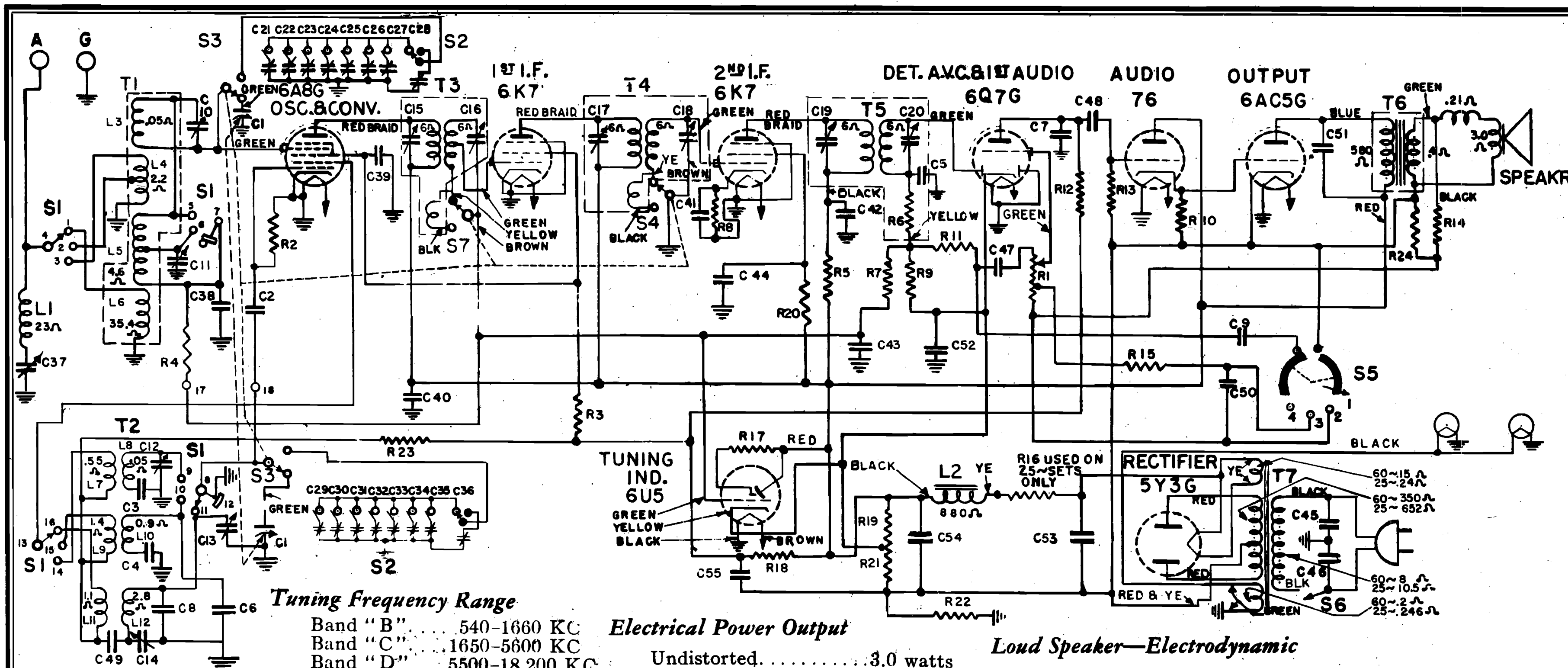
I.F.	"D" Band
455 K.C.	18.0 M.C.

"B" Band

1500 K.C. and 580 K.C.

MODEL G85
Schematic, Socket, Trimmers

GENERAL ELECTRIC CO.



Tuning Frequency Range

Band "B" . . . . 540–1660 KC
Band "C" . . . . 1650–5600 KC
Band "D" . . . . 5500–18,200 KC.

Intermediate Frequency

455 KC

Electrical Power Output

Undistorted . . . . 3.0 watts
Maximum . . . . 5.0 watts

Loud Speaker—Electrodynamic

Outside Cone Diameter . . . . 12 inches
Voice Coil Impedance . . . . 3.5 ohms at 400 cycles
Field Coil Resistance . . . . 880 ohms (cold)

C1	Tuning Condenser
C2	50 mmf Mica Capacitor
C3	3900 mmf Mica Capacitor
C4	1200 mmf Mica Capacitor
C5	47 mmf Mica Capacitor
C6	6 mmf Mica Capacitor
C7	47 mmf Mica Capacitor
C8	20 mmf Compensating Capacitor
C9	.0012 mf 600 V. Paper Capacitor
C10	3–20 mmf "D" Ant. Trimmer
C11	3–20 mmf "B" Ant. Trimmer
C12	3–20 mmf "D" Osc. Trimmer
C13	3–30 mmf "B" Osc. Trimmer
C14	300–650 mmf. "B" Padder
C15	200–400 mmf. 1st I.F. Pri. Trimmer
C16	200–400 mmf 1st I.F. Sec. Trimmer
C17	200–400 mmf 2nd I.F. Pri. Trimmer
C18	200–400 mmf 2nd I.F. Sec. Trimmer
C19	200–400 mmf 3rd I.F. Pri. Trimmer
C20	200–400 mmf 3rd I.F. Sec. Trimmer
C21–C28	Antenna Trimmer Strip
C29–C36	Oscillator Trimmer Strip
C37	30–70 mmf Wave Trap Trimmer
C38	.05 mfd 200 V. Paper Capacitor
C39	.05 mfd 400 V. Paper Capacitor
C40	0.1 mfd 400 V. Paper Capacitor
C41	0.1 mfd 100 V. Paper Capacitor
C42	.05 mfd 400 V. Paper Capacitor
C43	.05 mfd 200 V. Paper Capacitor
C44	.05 mfd 400 V. Paper Capacitor
C45	.01 mfd 250 V.—Ac Line Capacitor
C46	.01 mfd 250 V.—Ac Line Capacitor
C47	.003 mfd 600 V. Paper Capacitor
C48	.005 mfd 600 V. Paper Capacitor
C49	.005 mfd 600 V. Paper Capacitor
C50	.004 mfd 600 V. Paper Capacitor
C51	.02 mfd 600 V. Paper Capacitor
C52	0.1 mfd 100 V. Paper Capacitor
C53	12 mfd 450 V., Dry Electro
C54	8 mfd 400 V., Dry Electro
C55	8 mfd 200 V., Dry Electro
L1	Wave Trap Coil
R1	2 megohm, Volume Control
R2	47,000 ohm, Car. Resistor
R3	15,000 ohm, Car. Resistor
R4	470,000 ohm, Car. Resistor
R5	1,000 ohm, Car. Resistor
R6	47,000 ohm, Car. Resistor
R7	2.2 megohm, Car. Resistor
R8	1,000 ohm, Car. Resistor
R9	220,000 ohm, Car. Resistor
R10	22,000 ohm, Car. Resistor
R11	82,000 ohm, Car. Resistor
R12	220,000 ohm, Car. Resistor
R13	1,000,000 ohm, Car. Resistor
R14	82 ohm, Car. Resistor
R15	120,000 ohm, Car. Resistor
R16	470 ohm, 3 watt, Car. Resistor
R17	1.0 megohm, Car. Resistor
R18	6800 ohm, Car. Resistor
R19	39,000 ohm, 2 watt, Car. Resistor
R20	82,000 ohm, Car. Resistor
R21	150 ohm, Car. Resistor
R22	180 ohm, Car. Resistor
R23	3300 ohm, Car. Resistor
R24	22 ohm, Car. Resistor
S1	Band Change Switch
S2	Station Selector Switch
S3	Man.-Auto. Switch
S4	I.F. Band Expansion Switch on S-3 1st
S5	Tone Control
S6	Power Switch on S-3
S7	I.F. Band Expansion Switch on S-3 (2nd
SPKR	Speaker 12 in.
T1	Antenna Transformer
T2	Oscillator Transformer
T3	1st I.F. Transformer
T4	2nd I.F. Transformer
T5	3rd I.F. Transformer
T6	Output Transformer
T7	50–60 Power Transformer
T8	25–60 Power Transformer

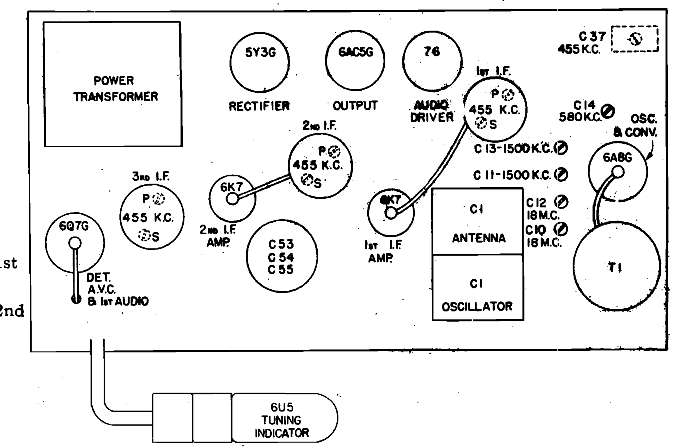


Fig. 6. Chassis Layout and Trimmer Location

Dial Mechanism

GENERAL ELECTRIC CO.

MODEL G85
Chassis Wiring, Coil Data

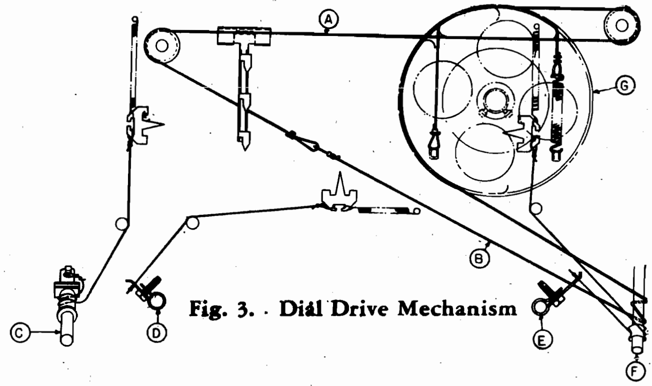


Fig. 3. Dial Drive Mechanism

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid Coil	Oscillator Plate Coil	Remarks
Band "B"	L-6	L-3 + L-5	L-12	L-11	
Band "C"	Part of L-4	L-3 + L-5	L-10	L-9	Lower portion of L-5 shorted
Band "D"	L-4	L-3	L-8	L-7	L-5 shorted
Automatic Tuning	L-6	L-3 + L-5	L-12	L-11	Condenser C-1 removed. Tuned by fixed trimmers

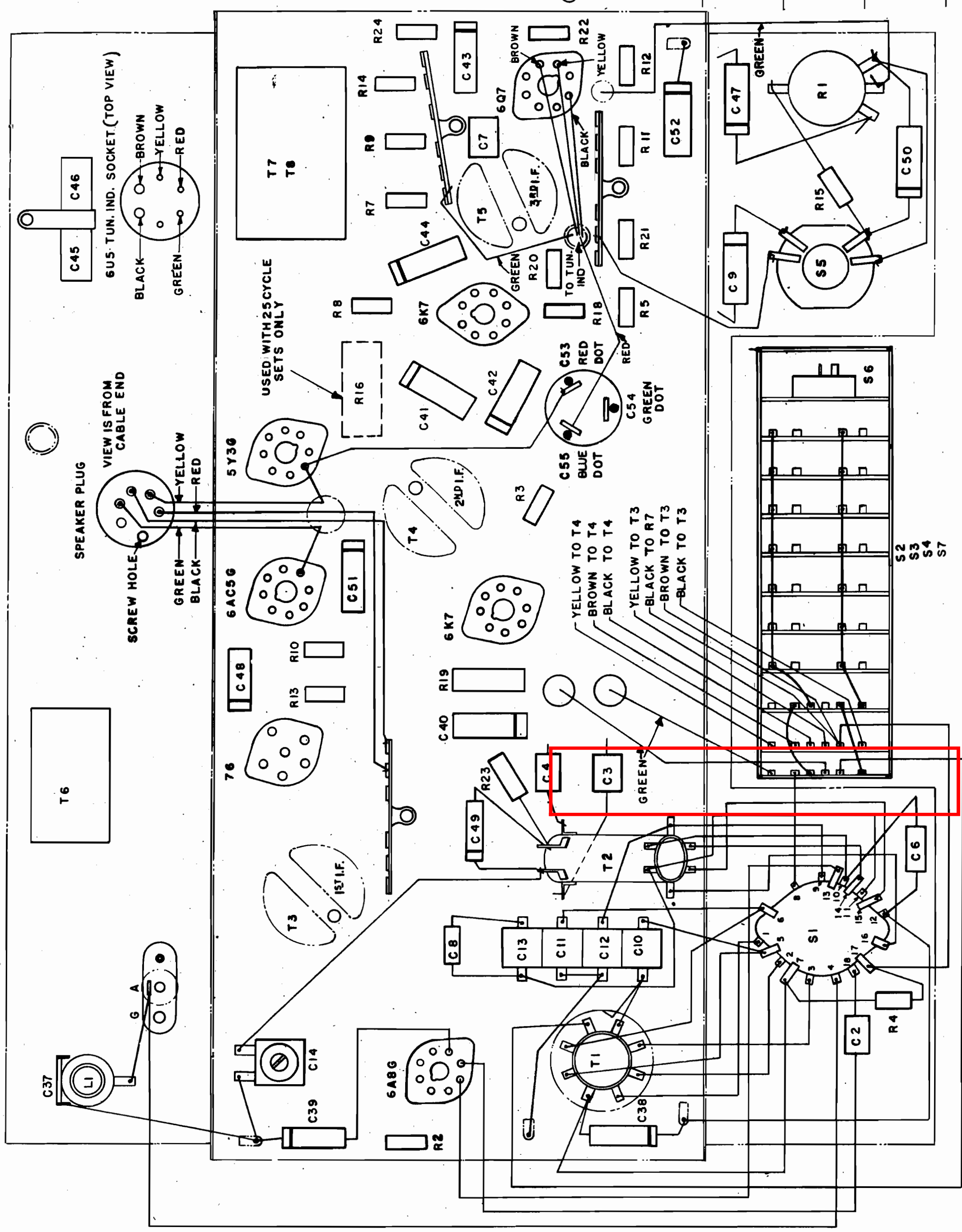


Fig. 4. Chassis Parts Layout

Coil System

The "B," "C" and "D" band antenna coils are wound on a single coil form, T-1 as shown in Fig. 2. T-2 is the oscillator transformer for all three bands. All switch points are numbered in Fig. 2 to facilitate in locating these switch points on the pictorial wiring diagram Fig. 4.

The following table gives the coils in use for the various positions of the wave change switch.

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Volts)
A	115-125	50-60	70
C	115-125	25-60	75

MODEL G85
Alignment, Voltage
Parts List

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
I.F. Alignment with Oscilloscope					
1. Band "B"	455 K.C. Sweep	2nd I.F. Grid	.05 Mfd.	3rd I.F. Sec. (C-20) Pri. (C-19)	Manual key depressed—gang condenser plates closed—connect vertical input of oscilloscope to ground and the junction of R-9 and R-11 on 3rd I.F. transformer. Adjust trimmers for a single symmetrical curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 5.
2. Band "B"	455 K.C. Sweep	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-18) Pri. (C-17)	
3. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-16) Pri. (C-15)	
4. Band "B"	455 K.C. Sweep	Antenna Post	250 Mmf. 200 Ohms	Wave trap trimmer (C-37)	Adjust trimmer for minimum amplitude.
I.F. Alignment with Output Meter					
1. Band "B"	455 K.C. with Modulation	2nd I.F. Grid	.05 Mfd.	3rd I.F. Sec. (C-20) Pri. (C-19)	Manual key depressed—gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control at maximum. Adjust all trimmers in order mentioned for maximum output. Do not attempt an overall realignment after stage by stage alignment has been accomplished.
2. Band "B"	455 K.C. with Modulation	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-18) Pri. (C-17)	
3. Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-16) Pri. (C-15)	
4. Band "B"	455 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Wave trap trimmer (C-37)	Adjust trimmer for minimum output.
R.F. Alignment					
1. Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale.
2. Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-12) Ant. (C-10)	Connect output meter across voice coil—manual key depressed. The image of any "D" band signal should be heard 930 K.C. below input signal when (C-12) is on proper peak. Example: 15 M.C. image—14.09 K.C. Peak (C-10) while rocking the gang condenser.
3. Band "C"	No adjustment necessary				
4. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-13) Ant. (C-11)	Peak trimmers for maximum output with a low input signal.
5. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. padder (C-14)	Adjust padder for maximum output in vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"	Repeat operation 4				

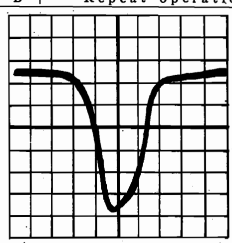


Fig. 5. Overall IF Curve Taken on G-E Oscilloscope OFM-1

VOLTAGE CHART

Tube No.	Plate to Gnd. Volts D.C.	Screen to Gnd. Volts D.C.	Cathode to Gnd. Volts D.C.	Filament Volts
6A8G	240 Conv. 150 Osc.	97	0	6.4
6K7	240	97	0	6.4
6K7	230	105	5.1	6.4
6Q7G	102	...	3.0	6.4
76	230	...	7.5	6.4
6AC5G	230	...	4.5	6.4
6U5	240	...	3.0	6.4
5Y3G	306/306 A.C. RMS.		310	5.1

Socket voltages taken at 120 volt line—No signal input.—1000 ohms per volt meter—Dial pointer at 550 K.C. on "B" band.

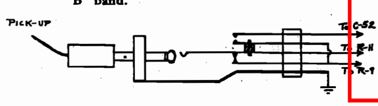


Fig. 1. Phonograph Connections

Phonograph Connections

Fig. 1 shows a simple sketch for connecting a crystal or high impedance magnetic pick-up into the G-85 circuit for the reproduction of phonograph recording. This method uses a two circuit jack and is connected into the receiver by opening the circuit between R-11 and the junction of R-7 and R-9; connecting the jack terminals as shown. A telephone plug is attached to the pick-up leads; and for phonograph operation, it is merely necessary to insert it into the jack. The jack may be mounted on the rear chassis deck and all connecting leads should be properly shielded to prevent interference.

When the pick-up is connected as suggested, the regular radio volume and tone controls work for both radio and phonograph reproduction.

NOTE—A suitable loading circuit consisting of a 300,000 ohm resistor should be connected across the pick-up leads when using a crystal type unit.

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
*RB-017	BOARD—Terminal board (1 lug)	$0.10
*RB-026	BOARD—Ant. Grd. terminal board	.10
*RB-062	BOARD—Terminal board (6 lug)	.10
RC-012	CAPACITOR—.0012 mfd., 600 V. paper (C-9)	.25
*RC-023	CAPACITOR—.005 mfd., 600 V. paper (C-48, 49)	.25
*RC-048	CAPACITOR—.02 mfd., 600 V. paper (C-51)	.30
*RC-049	CAPACITOR—.004 mfd., 600 V. paper (C-50)	.35
*RC-055	CAPACITOR—.003 mfd., 600 V. paper (C-47)	.25
*RC-092	CAPACITOR—.05 mfd., 600 V. paper (C-38, 39, 42, 43, 44)	.30
*RC-104	CAPACITOR—.1 mfd., 600 V. paper (C-40, 41, 52)	.30
*RC-206	CAPACITOR—50 mmf., mica (C-2)	.35
RC-216	CAPACITOR—47 mmf., mica (C-5, 7)	.25
RC-220	CAPACITOR—6 mmf., mica (C-6)	.25
RC-230	CAPACITOR—20 mmf., compensating capacitor (C-8)	.35
RC-341	CAPACITOR—1200 mmf., mica (C-4)	.35
RC-390	CAPACITOR—3900 mmf., mica (C-3)	.35
RC-594	CAPACITOR—8 mfd., 400 V.; 8 mfd., 400 V.; 12 mfd., 450 V.; dry electrolytic (C-53, 54, 55)	1.60
RC-674	CAPACITOR—Wave trap trimmer (30–70 mmf.) (C-37)	.15
RC-676	CAPACITOR—300–650 mmf., "B" padder (C-14)	.35
RC-677	CAPACITOR—Antenna and oscillator trimmer (C-10, 11, 12, 13)	.55
RC-728	CONDENSER—2 gang tuning condenser (C-1)	2.95
*RC-754	CAPACITOR—.01–.01 mfd., 250 V. A.C. line capacitor (C-45, 46)	.40
*RC-863	CORD—Power cord	.65
RC-8035	CABLE—Speaker cable and plug	.50
RC-8054	CABLE—Tuning indicator cable and socket	.40
RD-205	DRIVE—Vernier drive bracket assembly	.35
RG-016	GRID CLIP—Control grid clip (pkg. of 5)	.10
RK-027	KNOB—Control knob (winged) (pkg. 5)	.50
RK-028	KNOB—Control knob (plain) (pkg. 5)	.30
RL-062	COIL—Ant. coil assembly	1.50
RL-266	COIL—Oscillator coil and bracket	1.30
RL-603	COIL—Wave trap coil (T-4)	.60
RQ-711	RESISTOR—470 ohm, 3 w. carbon (R-16) (Pkg. of 5)	.25
*RQ-1219	RESISTOR—22 ohm, ½ w. carbon (R-24) (pkg. 5)	.70
*RQ-1233	RESISTOR—82 ohm, ½ w. carbon (R-14) (pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohm, ½ w., carbon (R-21) (pkg. 5)	.70
RQ-1241	RESISTOR—180 ohm. ½ w. carbon (R-22) (pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohm, ½ w. carbon (R-5, 8) (pkg. 5)	.70
*RQ-1271	RESISTOR—3300 ohm, ½ w. carbon (R-23) (pkg. 5)	.70
*RQ-1279	RESISTOR—6800 ohm, ½ w. carbon (R-18) (pkg. 5)	.70
*RQ-1287	RESISTOR—15,000 ohm, ½ w. carbon (R-3) (pkg. 5)	.70
*RQ-1291	RESISTOR—[illegible] ohm, ½ w. carbon (R-10) (pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohm, ½ w. carbon (R-2, 6) (pkg. 5)	.70
RQ-1305	RESISTOR—82,000 ohm, ½ w. carbon (R-11, 20) (pkg. 5)	.70
*RQ-1309	RESISTOR—120,000 ohm, ½ w. carbon (R-15) (pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohm, ½ w. carbon (R-9, 12) (pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohm, ½ w. carbon (R-4) (pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½ w. carbon (R-13, 17) (pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½ w. carbon (R-7) (pkg. 5)	$0.70
*RR-281	RESISTOR—39,000 ohm, 2 w. carbon (R-19)	.30
RS-185	SHIELD—6A8G tube shield and base	.15
RS-188	SHIELD—Antenna coil shield	.20
*RS-200	SOCKET—Octal base tube socket (pkg. 5)	.75
*RS-204	SOCKET—Rectifier tube socket (pkg. 5)	.75
*RS-223	SOCKET—Octal base tube socket (pkg. 5)	.80
RS-224	SOCKET—Tube socket (76) (pkg. 5)	.50
RS-227	SOCKET—Octal base tube socket (6A8G)	.15
RS-394	SWITCH—Band change switch (S-1)	.95
RS-395	SWITCH—Tone control switch (S-2)	.55
RT-0711	TRANSFORMER—Power transformer (T-7) 120 V., 25–60 cy.	7.60
RT-0616	TRANSFORMER—Power transformer (T-7) 120 V., 50–60 cy.	4.60
RT-265	TRANSFORMER—3rd I.F. transformer	1.60
RT-266	TRANSFORMER—2nd I.F. transformer and shield	1.80
RT-267	TRANSFORMER—1st I.F. transformer and shield	1.90
RT-438	TRANSFORMER—Output transformer (T-3)	1.70
RV-051	VOLUME CONTROL—2 megohm volume control (R-1)	.80
*RW-101	WASHER—Felt washer for control shafts (pkg. 10)	.45
*RX-021	ASSEMBLY—Chassis mounting assembly	.10
RX-048	ASSEMBLY—Tuning condenser mounting assembly	.25
	SPEAKER ASSEMBLY	
RC-932	CONE—12-inch cone and V.C. assembly	1.10
*RC-991	CLAMP—Cone spider clamp	.05
RD-301	DUST CAP—Speaker cone dust cap (pkg. 5)	.10
RP-109	PLUG—Male speaker plug	.20
RS-073	SPEAKER—12-inch speaker	5.40
*RX-030	ASSEMBLY—Speaker mounting assembly	.10
	DIAL DRIVE MECHANISM	
*RB-152	BRACKET—Tone control indicator bracket (D)	.05
*RB-155	BRACKET—Band change bracket (E)	.05
RB-614	BUSHING—Volume control drive bushing (C)	.15
RC-1977	CLAMP—Tuning indicator tube clamp and thumbscrews	.10
RC-8048	CORD—Volume indicator cord (pkg. 5)	.50
RC-8049	CORD—Tone indicator cords (pkg 5)	.50
RC-8050	CORD—Band change indicator cord (pkg. 5)	.50
RC-8051	CORD—Dial pointer drive cord (A) (B)	.20
*RD-013	DRUM—Condenser drive drum (G)	.35
RD-074	DIAL—Dial scale	2.70
RE-033	ESCUTCHEON—Dial scale escutcheon	1.65
RP-112	POINTER—Tone, band change and volume indicator pointer	.10
RP-113	POINTER—Dial scale pointer	.30
RP-303	PULLEY—Idler pulley (pkg. 2)	.10
RR-920	REFLECTOR—Lamp reflector assembly	.50
RS-187	SHIELD—Lamp shield (pkg. 10)	.05
*RS-218	SOCKET—Lamp socket assembly	.10
*RS-425	SPRING—Drive drum spring (pkg. 5)	.10
*RS-427	SPRING—Volume, tone, and band change cord spring (pkg. 5)	.20
	TOUCH TUNING ASSEMBLY	
RB-613	BUTTON—Molded push button (pkg. 5)	.35
RC-8036	CARDS—Station letter cards (set)	.25
RC-8052	CARDS—"Manual" tab cards (strip of 10)	.05
RC-8053	CARDS—"Off" tab cards (strip of 10)	.05
RE-032	ESCUTCHEON—Push button escutcheon	.50
RS-444	SPRING—Spring for push button (pkg. 10)	.10
RS-3002	SWITCH—Power switch	2.15
RS-3010	SWITCH—Push button switch (less trimmers)	3.90
RT-856	TRIMMER STRIP—Osc. trimmer strip (C-29, 30, 31, 32, 33, 34, 35, 36)	1.40
RT-857	TRIMMER STRIP—Antenna section trimmer strip (C-21, 22, 23, 24, 25, 26, 27, 28)	1.40
RW-021	WINDOWS—Celluloid station windows (pkg. 25)	.10

*Indicates parts used in previous production receivers.

(Prices subject to change without notice)

GENERAL ELECTRIC CO.

MODEL G86
Schematic, Voltage, Socket
Trimmers

Tone Control
....4 position

Intermediate Frequency
....455 K.C.

Electrical Power Output
Undistorted.....................3.0 watts
Maximum.........................5.0 watts

Loud-speaker—Electrodynamic
Outside Cone Diameter.............12 inches
Voice Coil Impedance (400 cycles)...3.5 ohms
Field Coil Resistance..............880 ohms (cold)

Tubes

Oscillator and Converter............GE-6A8G
I.F. Amplifier......................GE-6SK7
Detector and AVC....................GE-6H6
1st Audio Amplifier.................GE-6SF5
Driver..............................GE-76
Power Output........................GE-6AC5G
Tuning Indicator....................GE-6U5
Rectifier...........................GE-5Y3G
Pilot Lamps.........................(2) MAZDA No. 44

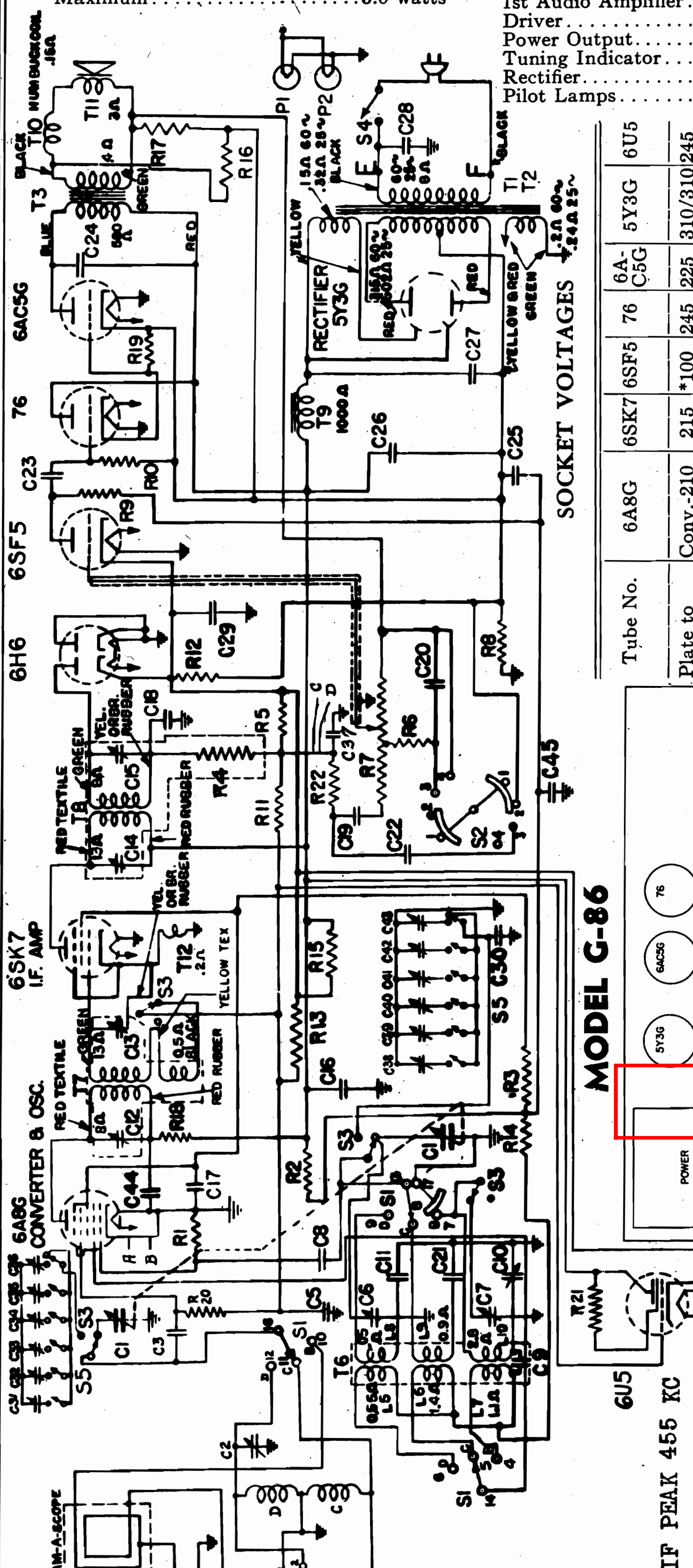


Fig. 2. Schematic Diagram

SOCKET VOLTAGES

Tube No.	6A8G	6SK7	6SF5	76	6A-C5G	5Y3G	6U5
Plate to Gnd. Volts	Conv.-210 Osc.-165	215	*100	245	225	310/310 RMS	245
Screen to Gnd. Volts	100	100	...	..	..		
Cathode to Gnd. Volts	0	0	3.0	8.0	4.7	315	3.0
Cathode Current MA	12.0	9.0	0.3	6.0	33.5	72	1.0
Filament Volts	6.4	6.4	6.4	6.4	6.4	5.2	6.4

*Measure on 500-volt scale.
A-c line voltage 125—no signal input. Dial pointer set at 550 K.C. on "B" band.

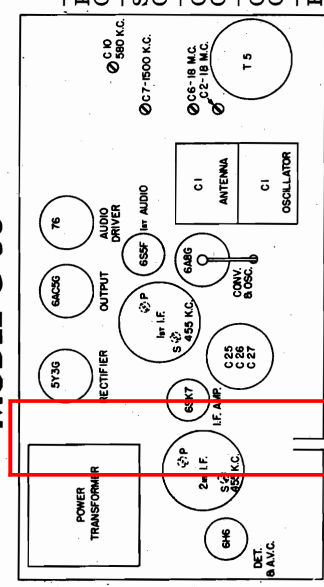


Fig. 6. Chassis Layout and Trimmer Location

Symbol	Description
C1	450 mmf., tuning condenser
C2	3–20 mmf., ant. trimmer
C3	150 mmf., mica capacitor
C5, C7	.1 mfd., paper capacitor
C6	3–20 mmf., osc. trimmer
C8	50 mmf., mica capacitor
C9	.005 mfd., paper capacitor
C10	300–650 mmf. padder capacitor
C11	4300 mmf., mica capacitor
C16	.1 mfd., paper capacitor
C17	.05 mfd., paper capacitor
C18	47 mmf., mica capacitor
C19, 20	.003 mfd., paper capacitor
C21	1500 mmf., mica capacitor
C22	.0015 mfd., paper capacitor
C23	.005 mfd., paper capacitor
C24	.015 mfd., paper capacitor
C25	8 mfd., dry electrolytic
C26	8 mfd., dry electrolytic
C27	12 mfd., dry electrolytic
C28	.02 mfd., line capacitor
C29	.1 mfd., paper capacitor
C30	20 mmf., compensating capacitor
C31, C36	Antenna trimmer strip
C37	47 mmf., mica capacitor
C38, C43	Oscillator trimmer strip
C44	.05 mfd., paper capacitor
C45	.1 mfd., mica capacitor
R1	47,000 ohm, carbon resistor
R2	6,800 ohm, carbon resistor
R3	15,000 ohm, carbon resistor
R4	47,000 ohm, carbon resistor
R5	220,000 ohm, carbon resistor
R6	180,000 ohm, carbon resistor
R7	2.0 megohm, volume control
R8	220 ohm, carbon resistor
R9	220,000 ohm, carbon resistor
R10	1.0 megohm, carbon resistor
R11	2.2 megohm, carbon resistor
R12	150 ohm, carbon resistor
R13	3.3 megohm, carbon resistor
R14	3,300 ohm, carbon resistor
R15	33,000 ohm, carbon resistor
R16	100 ohm, carbon resistor
R17	22 ohm, carbon resistor
R18	6,800 ohm, carbon resistor
R19	22,000 ohm, carbon resistor
R20	1.0 megohm, carbon resistor
R21	1.0 megohm, carbon resistor
R22	47,000 ohm, carbon resistor
T1, T2	Power transformer
T3	Output transformer
T6	Oscillator transformer
L1	Beam-a-scope antenna

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Volts)
A	115–125	50–60	70
C	115–125	25–60	75

Tuning Frequency Range
Band "B"........................540–1600 K.C.
Band "C"........................1600–5700 K.C.
Band "D"........................5700–18,000 K.C.

MODEL G86
Alignment, Chassis Wiring "Beam-A-Scope" Data, Dial Phono. Data

GENERAL ELECTRIC CO.

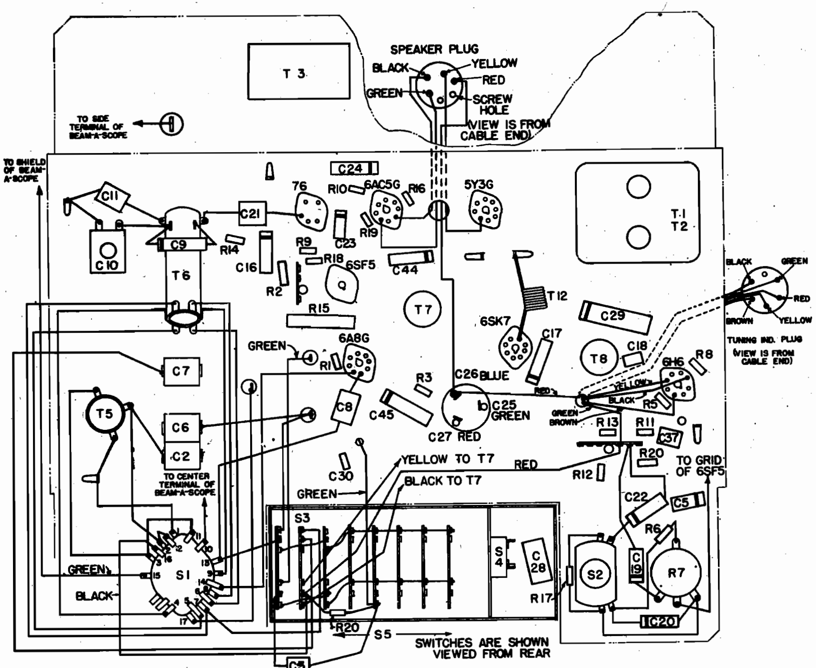


Fig. 4. Chassis Parts Layout

MODEL G-86

SERVICE DATA

Physical Specifications

Model.............................G-86
Height............................42 inches
Width.............................29⅝ inches
Depth.............................14½ inches

Tuning Control Drive Ratio

....13:1

GENERAL INFORMATION

The Model G-86 is a three-band A-C operated receiver, employing eight General Electric Pre-tested tubes in a superheterodyne circuit as described above. It incorporates a simplified trimmer tuned "Touch Tuning" system; and the new and exclusive self-contained antenna system, "Beam-a-Scope." Other features of design include I.F. band expansion when using Touch Tuning, degenerative audio feedback, and an improved dustproof electrodynamic speaker.

BEAM-A-SCOPE

The "Beam-a-Scope" is essentially a tuned coil antenna wound on an impregnated frame and shielded by a Faraday screen against electrostatic disturbances. This construction discriminates in favor of the desired signal as against a local man-made noise source in three ways. First, since any noise source is composed of two components—electrostatic and magnetic fields—the "Beam-a-Scope" may be revolved so that a null point is found where no voltage is produced from these two components in the direction where the noise originates. Due to the fact that this null point is very sharp, it is very unusual that any desired station will be in a direct line with the rejected noise signal and thereby have its signal strength reduced appreciably. In the second place, the "Beam-a-Scope" eliminates the external return path to ground present in the case of an unshielded antenna. This reduces or eliminates local man-made noise sources in much the same way as a shielded antenna lead-in does in an ordinary antenna installation. In the third place, the "Beam-a-Scope" discriminates against the electrostatic component of an incoming wave in comparison with the magnetic component, because of the Faraday shield. Since the electrostatic component of a local noise source is a great deal larger than the magnetic component, this rejection property brings about an enormous increase in signal-to-noise ratio.

The above operation is only available on the broadcast band and in this position the Beam-a-Scope is also the first tuned grid circuit. On the "C" and "D" bands, the Beam-a-Scope is connected to operâte as a capacity type antenna. When an outside antenna is connected to the receiver, it is tapped in on the grid coil (Beam-a-Scope L-1) when operating on the "B" band. On the "C" and "D" bands the outside antenna is connected through the Beam-a-Scope to the "C" and "D" band primaries of the antenna coil.

Loud-speaker

To center the voice coil, remove the dust cover by softening with acetone. Loosen the two spider clamping screws and place three 1 in. by ¼ in. by 0.010 in. paper or celluloid strips equally spaced around pole piece for clearance; then tighten clamping screws. Remove centering strips and cement the dust cap in place with Glyptal cement.

Coil System

The "C" and "D" band antenna coils are wound on a single coil form as shown in Fig. 2, T-6 is the oscillator transformer for all three bands. All switch points are numbered in Fig. 2 and Fig. 4 to facilitate in service by showing common points on the schematic diagram, Fig. 2, and the pictorial wiring diagram, Fig. 4.

Phonograph Connections

Fig. 1 shows a simple sketch for connecting a crystal or high-impedance magnetic pick-up into the G-86 circuit for the reproduction of phonograph recordings. SP is a rotary triple-pole, double-throw switch. A suitable loading circuit consisting of a resistor or resistor and capacitor network should be used across the pick-up leads when using a crystal type unit. It is very important that the pick-up leads have a shield such as copper braid to prevent hum interference. This lead should be connected to chassis ground.

The 6A8G cathode circuit should be opened between A-B as shown on the schematic. Also open the circuit between C-D in the diode load and make connections to phonograph switch as indicated in Fig. 1.

When the pick-up is connected as suggested, the regular radio volume and tone controls work for both radio and phonograph reproduction. The following are suggested parts:

Symbol	Description	Stock No.
SP	Triple-pole, double-throw switch......	RS-3013
RP	330,000-ohm carbon resistor..........	RQ-1319

ALIGNMENT PROCEDURE

I.F. Alignment with Oscilloscope

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-14)	Gang condenser plates closed—"manual" key depressed—connect audio input of oscilloscope to ground and to the junction of R-11 and R-4 of the 2nd I.F. transformer. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resultant curve is shown in Fig. 3. When a station key is depressed, this I.F. curve should expand considerably.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-12)	

I.F. Alignment with Output Meter

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"	455 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-14)	Gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
2 Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-12)	

R.F. Alignment

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale.
2. Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-6) Ant. (C-2)	Connect output meter across voice coil—tone control on "Bass" position. The image of any "D" band signal should be heard 910 K.C. below signal input when (C-6) is on proper peak. Example: 15 M.C. image—14.09 M.C. Peak (C-2) while rocking the gang condenser.
3. Band "C"	No adjustments necessary.				
4. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-7)	Peak oscillator trimmer C-7 for maximum output in vicinity of 1500 K.C. while rocking the gang condenser.
5. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. Padder (C-10)	Adjust padder for maximum output in vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 ohms	Osc. (C-7)	Retrim for maximum output as described in step No. 4.

Use a "dummy" antenna in making all alignments. The grid lead should not be removed from the tube to which the input signal is applied when aligning the I.F. amplifier.

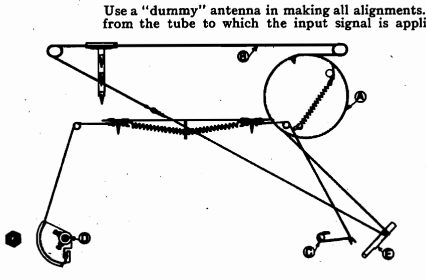


Fig. 3. Dial Drive Mechanism

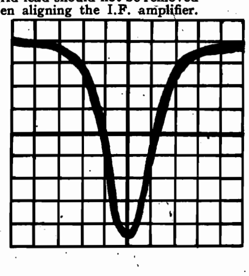


Fig. 5. Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

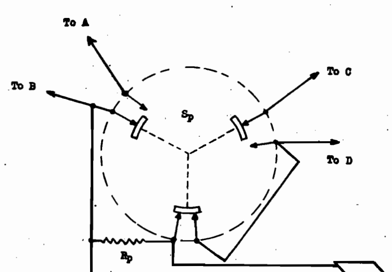


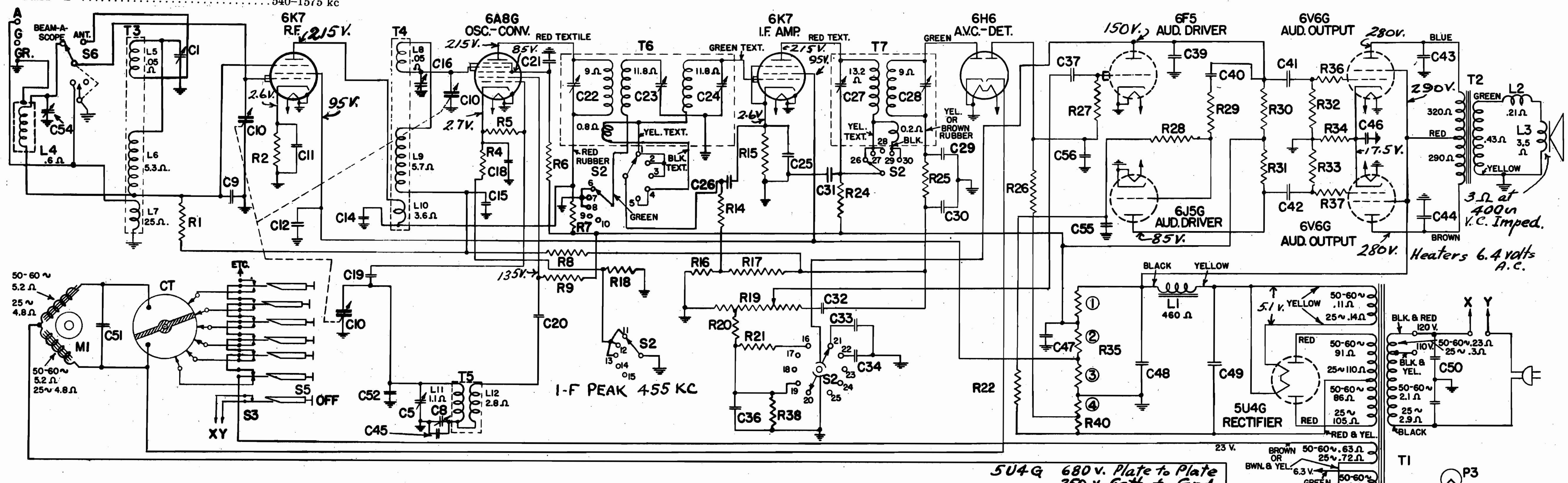
Fig. 1. Phonograph Connections

GENERAL ELECTRIC CO.

MODEL G95, Radioforte
Schematic, Chassis Wiring
Socket, Trimmers, Voltage

Tuning Frequency Range

Band "B" .... 540–1575 kc



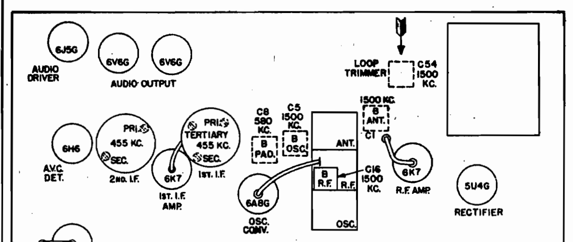
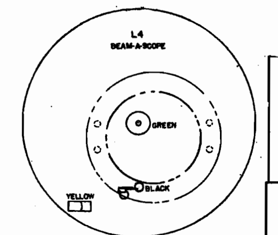


Fig. 1. Trimmer Location

Rating "A"....105–115 (115–125)* volts, 50–60 cycles, 155 watts

Rating "C"....105–115 (115–125)* volts, 25–60 cycles, 160 watts

* The receivers as shipped from the factory have the power cord connected to the 115–125-volt tap of the transformer (black and red lead). If the normal voltage of the power supply is always below 110 volts, the connection of the power cord should be removed from this lead and soldered to the 105–115-volt tap (black and yellow lead). After changing the connection, tape the soldered joint as well as the exposed end of the unused lead. This change requires removal of the chassis from the cabinet.



SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
R-1	220,000 Ohm Carbon Resistor	R-33	220,000 Ohm Carbon Resistor	C-24	50-135 MMF. 1st I.F. Tert. Trimmer	C-51	60 MFD. 40 V. A.C. Dry Electro.
R-2	330 Ohm Carbon Resistor	R-34	230 Ohm Resistor (W.W.)	C-25	.05 MFD. 200 V. Paper Capacitor	C-52	20 MMF. Compensating Capacitor
R-4	330 Ohm Carbon Resistor	R-35	4 Sections Voltage Divider	C-26	.05 MFD. 200 V. Paper Capacitor	C-54	2-20 MMF. Trimmer Capacitor
R-5	47,000 Ohm Carbon Resistor	(1)	1600 Ohms	C-27	50-135 MFF. 2nd I.F. Pri. Trimmer	C-55	.25 MFD. 200 V. Paper Capacitor
R-6	39,000 Ohm Carbon Resistor	(2)	9000 Ohms	C-28	100-230 MMF. 2nd I.F. Sec. Trimmer	C-56	.25 MFD. 200 V. Paper Capacitor
R-7	1,000 Ohm Carbon Resistor	(3)	9000 Ohms	C-29	150 MMF. Mica Capacitor	T-1	Power Transformer, 50-60 cycles,
R-8	1.8 Megohm Carbon Resistor	(4)	11 Ohms	C-30	150 MMF. Mica Capacitor		cycles
R-9	22,000 Ohm Carbon Resistor	R-36	1,000 Ohm Carbon Resistor	C-31	.05 MFD. 400 V. Paper Capacitor	T-2	Output Transformer
R-14	2.2 Megohm Carbon Resistor	R-37	1,000 Ohm Carbon Resistor	C-32	.02 MFD. 200 V. Paper Capacitor	T-3	Ant. Transformer
R-15	330 Ohm Carbon Resistor	R-38	470,000 Ohm Carbon Resistor	C-33	.0055 MFD. 600 V. Paper Capacitor	T-4	R.F. Transformer
R-16	56,000 Ohm Carbon Resistor	R-40	20 Ohm W.W. Resistor	C-34	.002 MFD. 600 V. Paper Capacitor	T-5	Osc. Transformer
R-17	220,000 Ohm Carbon Resistor	C-1	5–40 MMF. "B" Ant. Trimmer	C-35	.05 MFD. 200 V. Paper Capacitor	T-6	Ist I.F. Transformer
R-18	330 Ohm Carbon Resistor	C-5	7–23 MMF. "B" Osc. Trimmer	C-36	.0055 MFD. 600 V. Paper Capacitor	T-7	2nd I.F. Transformer
R-19	2 Megohm, 1 Megohm Tap. Vol. Control	C-8	160–375 MMF. "B" Padder	C-37	.02 MFD. 200 V. Paper Capacitor	L-1	Field Coil 460 Ohms (cold)
R-20	68,000 Ohm Carbon Resistor	C-9	.05 MFD. 200 V. Paper Capacitor	C-39	270 MMF. Mica Capacitor	L-2	Hum Buck Coil
R-21	68,000 Ohm Carbon Resistor	C-10	10–450 MMF. Tuning Capacitor	C-40	.02 MFD. 400 V. Paper Capacitor	L-3	Voice Coil, 3.5 Ohms
R-22	1.2 Megohm Carbon Resistor	C-11	.05 MFD. 200 V. Paper Capacitor	C-41	.05 MFD. 400 V. Paper Capacitor	L-4	Beam-a-Scope
R-23	1,000 Ohm Carbon Resistor	C-12	.05 MFD. 200 V. Paper Capacitor	C-42	.05 MFD. 400 V. Paper Capacitor	CT	Contactor Assembly
R-24	1,000 Ohm Carbon Resistor	C-14	.1 MFD. 400 V. Paper Capacitor	C-43	.0015 MFD. 1500 V. Paper Capacitor	P-3	Tuning Lamp 25 V.—.2 Amps.
R-25	47,000 Ohm Carbon Resistor	C-15	.05 MFD. 200 V. Paper Capacitor	C-44	.0015 MFD. 1500 V. Paper Capacitor	S-2	Tone Control Switch
R-26	470,000 Ohm Carbon Resistor	C-16	5-30 MMF. "B" R.F. Trimmer	C-45	175 MMF. Compensating Capacitor	S-3	Power Supply Switch
R-27	1.5 Megohm Carbon Resistor	C-18	.05 MFD. 200 V. Paper Capacitor	C-46	25 MFD. 25 V. W.V. Dry Electro.	S-4	Tuning Lamp Switch
R-28	82,000 Ohm Carbon Resistor	C-19	50 MMF. Silver Plated Capacitor	C-47	10 MFD. 400 V. W.V. Dry Electro.	S-5	Station Selector Switch
R-29	1.2 Megohm Carbon Resistor	C-20	4,700 MMF. Mica Capacitor	C-48	30 MFD. 450 V. W.V. Wet Electro.	S-6	Beam-a-Scope—Ant. Switch
R-30	68,000 Ohm Carbon Resistor	C-21	.05 MFD. 400 V. Paper Capacitor	C-49	30 MFD. 450 V. W.V. Wet Electro.	M	Tuning Motor 23 V. 50-60 Cycles, 25
R-31	68,000 Ohm Carbon Resistor	C-22	100-230 MMF. 1st I.F. Pri. Trimmer	C-50	.01-.01 MFD. 250 V. A.C. Line Capacitor		Cycles
R-32	220,000 Ohm Carbon Resistor	C-23	50-135 MMF. 1st I.F. Sec. Trimmer				

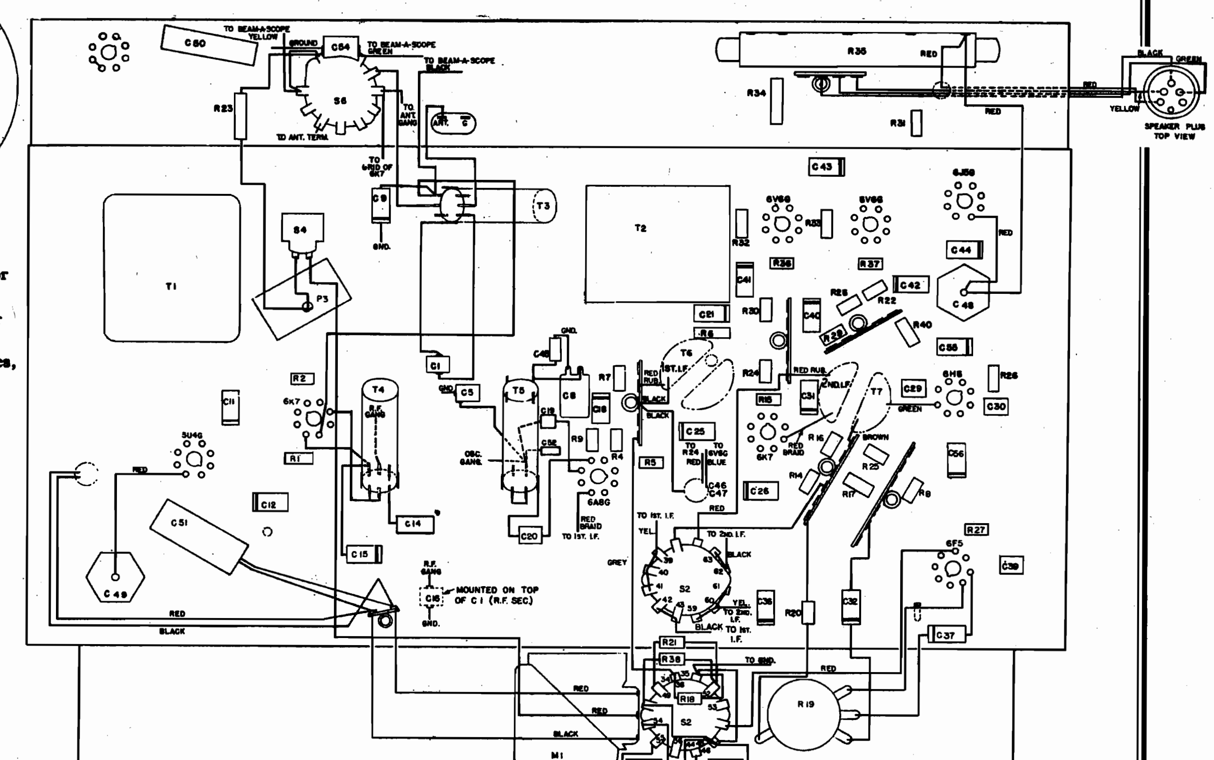


Fig. 3 Chassis Parts Layout

GENERAL ELECTRIC CO.

MODEL G95, Radioforte
Alignment, Phono., Parts

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
RS-396	SWITCH—Tone control switch (S-2)	1.35
RS-397	SWITCH—Station set-up lamp switch (S-4)	.20
RS-399	SWITCH—Antenna-Beam-a-Scope switch (S-6)	.85
RS-446	SPRING—Drive cord tension spring (K) (Pkg. of 5)	.25
RS-448	SPRING—Vol. control drive pulley spacer spring (C)	.05
RS-449	SPRING—Tone control drive cord tension spring (H) (Pkg. of 5)	.10
RC-006	CAPACITOR—.0015 mfd., 1500 V. paper (C-43, 44)	.25
*RC-011	CAPACITOR—.002 mfd., 600 V. paper (C-34)	.25
*RC-023	CAPACITOR—.005 mfd., 600 V. paper (C-36)	.25
RC-028	CAPACITOR—.006 mfd., 600 V. paper (C-33)	.30
*RC-048	CAPACITOR—.02 mfd., 600 V. paper (C-32, 37, 40)	.30
*RC-092	CAPACITOR—.05 mfd., 600 V. paper (C-9, 11, 12, 15, 18, 21, 25, 26, 31, 41 42)	.30
*RC-104	CAPACITOR—.1 mfd., 600 V. paper (C-14)	.30
*RC-136	CAPACITOR—.25 mfd., 200 V. paper (C-55, 56)	.30
RC-217	CAPACITOR—50 mmf., mica (silver plated) (C-19)	.35
RC-230	CAPACITOR—20 mmf., compensating capacitor (C-52)	.35
*RC-242	CAPACITOR—150 mmf., mica (C-29-30)	.25
RC-245	CAPACITOR—175 mmf., compensating capacitor (C-45)	.45
RC-263	CAPACITOR—270 mmf., mica (C-39)	.25
RC-393	CAPACITOR—4700 mmf., mica (silvered) (C-20)	.50
*RC-429	CAPACITOR—30 mfd., 450 V. wet electrolytic (C-48, 49)	1.35
RC-596	CAPACITOR—25 mfd., 25 V; 10 mfd., 400 V. dry electrolytic (C-46, 47)	1.10
RC-597	CAPACITOR—60 mfd., 40 V. A.C. motor capacitor (C-51)	1.00
*RC-672	CAPACITOR—5-35 mmf., R.F. trimmer (C-16)	.15
RC-678	CAPACITOR— mmf., "P" padder (C-8)	.30
RQ-1305	RESISTOR—82,000 ohm, ½-W. carbon (R-28) (Pkg. of 5)	$0.70
*RQ-1315	RESISTOR—220,000 ohm, ½-W. carbon (R-1, 17, 32, 33) (Pkg. of 5)	.70
*RQ-1323	RESISTOR—470,000 ohm, ½-W. carbon (R-26, 38) (Pkg. of 5)	.70
*RQ-1333	RESISTOR—1.2 megohm, ½-W. carbon (R-22, 29) (Pkg. of 5)	.70
*RQ-1335	RESISTOR—1.5 megohm, ½-W. carbon (R-27) (Pkg. of 5)	.70
*RQ-1337	RESISTOR—1.8 megohm, ½-W. carbon (R-8) (Pkg. of 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½-W. carbon (R-14) (Pkg. of 5)	.70
RQ-1459	RESISTOR—1000 ohm, 1-W. carbon (R-23)	.20
RQ-1497	RESISTOR—39,000 ohm, 1-W. carbon (R-6)	.20
RR-740	RESISTOR—Voltage divider resistor (R-35)	.85
RR-1006	RESISTOR—20 ohm, ½-W. W.W. resistor (R-40) (Pkg. of 5)	.70
RR-1007	RESISTOR—230 ohm. 2-W. resistor (R-34)	.20

Stock No.	Description	List Price
RS-509	SPACER—Volume control pulley spacers (Pkg. of 2)	.10
RS-911	SHAFT—Idler drive wheel shaft and collar	.15
RS-914	SHAFT—Tone or volume flexible drive shaft (A)	.35
RS-915	SHAFT—Vol. or tone drive shafts	.10
RT-104	TRANSFORMER—Power transformer, 105-125 V, 25-60 cycles (T-1)	14.75
RT-105	TRANSFORMER—Power transformer, 105-125 V. 50-60 cycles (T-1)	9.00
RT-263	TRANSFORMER—1st I.F. transformer and shield (T-6)	2.30
RC-679	CAPACITOR—2-20 mmf., trimmer (C-54)	$0.20
RC-681	CAPACITOR—7-23 mmf., "B" osc. trimmer (C-5)	.90
RC-683	CAPACITOR—5-40 mmf., ant. trimmer (C-1)	.35
RC-729	CONDENSER—3-gang tuning condenser (C-10)	5.60
*RC-755	CAPACITOR—.01-.01 mfd., line capacitor (C-50)	.40
*RC-863	CORD—Power cord	.65
RC-1980	COUPLER—Volume or tone control coupling unit (B)	.20
RC-8035	CABLE—Speaker cable and plug	.50
RC-8044	CABLE—Condenser drive cable (J) (Pkg. of 5)	.65
RC-8083	CABLE—Tone control drive cable (G)	.25
RC-8084	CABLE—Vol. control drive cable	.20
RG-016	GRID CLIP—Control grid clip (for metal tubes) (Pkg. of 5)	.10
RL-063	COIL—Ant. coil Band "B," "C," and "D" (T-3)	1.25
RL-142	COIL—R.F. coil Band "B," "C," and "D" (T-4)	1.15
RL-267	COIL—Osc. Coil Band "B," "C," and "D"	1.25
RL-500	BEAM-A-SCOPE—Beam-a-Scope Antenna (complete)	9.15
RM-112	MOTOR—Tuning motor, 50-60 cycles	4.00
RM-113	MOTOR—Tuning motor, 25 cycles	5.35
*RP-048	DRIVE PULLEY—Condenser drive pulley (F)	.35
*RP-076	PULLEY—Vol. control driven pulleys or tone control drive pulleys (D)	.15
RP-300	PULLEY—Rubber cone drive pulley (motor)	.25
RP-301	PULLEY—Drive cord idler pulley (Pkg. of 2)	.10
RP-305	PULLEY—Tone control driven pulley (I)	.30
RP-306	PULLEY—Volume control drive pulley (E)	.20
*RQ-1247	RESISTOR—330 ohm, ½-W. carbon (R-2, 4, 15, 18) (Pkg. of 5)	.70
*RQ-1259	RESISTOR—1000 ohm, ½-W. carbon (R-7 24, 36, 37) (Pkg. of 5)	.70
*RQ-1291	RESISTOR—22,000 ohm, ½-W. carbon (R-9) (Pkg. of 5)	.70
*RQ-1299	RESISTOR—47,000 ohm, ½-W. carbon (R-5, 25) (Pkg. of 5)	.70
*RQ-1301	RESISTOR—56,000 ohm, ½-W. carbon (R-16) (Pkg. of 5)	.70
*RQ-1303	RESISTOR—68,000 ohm, ½-W. carbon (R-20, 21, 30, 31) (Pkg. of 5)	.70
RT-264	TRANSFORMER—2nd I.F. transformer and shield (T-7)	$1.60
RT-439	TRANSFORMER—Output transformer (T-2)	3.20
RV-045	VOLUME CONTROL—2 meg. vol. control (R-19)	.75
*RW-101	WASHERS—Felt washers for knobs (Pkg. of 10)	.45

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lug)	$0.10
*RB-023	BOARD—Terminal board (4 lug)	.10
*RB-049	BOARD—Ant.-Gnd. terminal board	.10
*RB-062	BOARD—Terminal board (6 terminals)	.10
*RB-066	BOARD—Terminal board (4 lugs)	.10
*RB-070	BOARD—Terminal board (3 lugs)	.10
RB-094	BOARD—Terminal board (7 lugs)	.10
RB-160	BRACKET—Reduction drive wheel bracket	.20
RB-161	BRACKET—Manual and motor drive bracket	.40
RB-162	BRACKET—Tuning condenser mtg. bracket (front)	.45
RB-700	BRAKE—Drive wheel friction brake (complete)	.20
*RS-174	SHIELD—Grid shield cap (Pkg. of 5)	.25
*RS-200	SOCKET—8-prong octal base socket (Pkg. of 5)	.75
*RS-204	SOCKET—5-prong octal tube socket (Pkg. of 5)	.75
RS-226	SOCKET—Octal base (on rear deck of chassis)	.15
RS-227	SOCKET—Tube socket (low loss octal base)	.15
RS-228	SOCKET—Station set-up lamp socket	.20
RS-229	SOCKET—Tube socket (6A8G)	.35
RW-900	WHEEL—Idler drive wheel	.45
RW-904	WHEEL—Vol. control wheel	.65
RW-905	WHEEL—Tone control wheel	.65
*RX-027	ASSEMBLY—Chassis mounting assembly	.15
RX-049	ASSEMBLY—Condenser mounting assembly	.15
	SPEAKER ASSEMBLY	
RC-936	CONE—12-inch cone and voice coil assembly	1.10
RC-991	CLAMP—Cone spider clamp	.05
RD-301	DUST CAP—Speaker cone dust cap (Pkg. of 5)	.10
RP-109	PLUG—Male speaker plug	.20
RS-075	SPEAKER—12-inch speaker	5.50
*RX-030	ASSEMBLY—Speaker mounting assembly	.10
	PUSH-BUTTON MECHANISM	
RC-8045	CARDS—Station letter cards (set)	.60
RC-8046	CABLE—Power cable and plug to push button assembly	.50
RC-8047	CABLE—Station selector button cable	.95
RK-203	KEY—Station key (Pkg. of 5)	.30
RS-444	SPRING—Station button springs (Pkg. of 10)	.10
RS-864	SCREWS—Keyboard assembly thumb screws (Pkg. of 10)	.40
RS-3008	SWITCH—Button "On-Off" switch	.50
RT-906	TAB—"Off" tab for station button (Strip of 10)	.05
RW-025	WINDOW—Celluloid station window (Pkg. of 25)	.15
RX-051	ASSEMBLY—Keyboard Touch Tuning Assembly switch	7.40
	STATION SELECTOR ASSEMBLY (BEHIND TUNING CONDENSER)	
RB-701	BAND—Contactor band	.10
RC-1978	CONTACT—Thumbscrew contact (complete) (Pkg. of 5)	.45
RD-080	DIAL—Dial scale for contactor drum	.15
RI-108	INSULATOR—Contactor band insulator (Pkg. of 5)	.15
RS-447	SPRING—Contactor band tension spring (Pkg. of 5)	.15
RW-901	WHEEL—Contactor wheel (CT) (complete)	2.00

(Prices subject to change without notice)

*Used on previous receivers.

Fig. 2. I.F. curves taken on G-E oscilloscope OPM-1

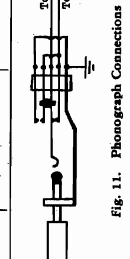


Fig. 11. Phonograph Connections

MODEL G95, Radioforte
Tuner and Remote Cont.
Schematics, Data

GENERAL ELECTRIC CO.

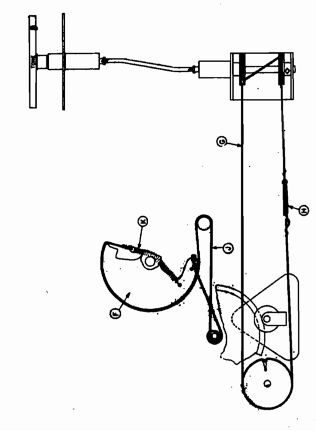


Fig. 8. Drive Mechanism

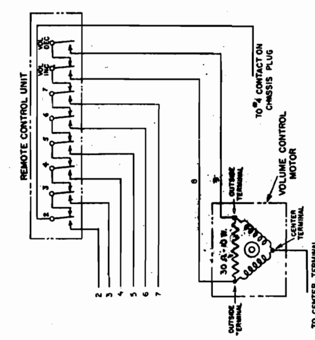


Fig. 10. Remote Control Schematic

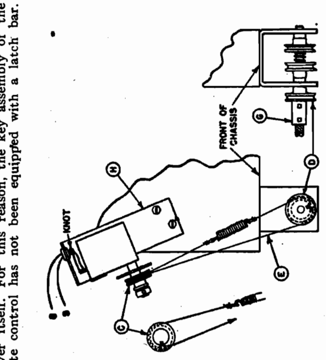


Fig. 9. Volume Control Motor Mounting

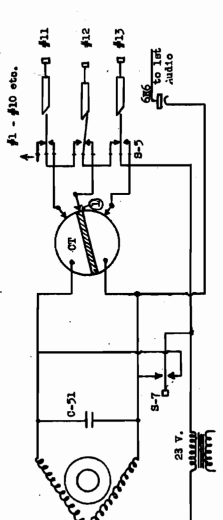


Fig. 5. Schematic of Touch-Tuning System

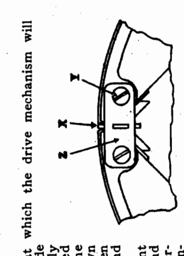


Fig. 7

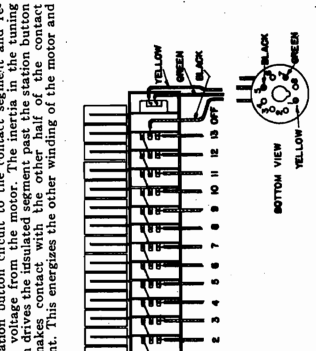


Fig. 6. Keyboard Wiring Diagram

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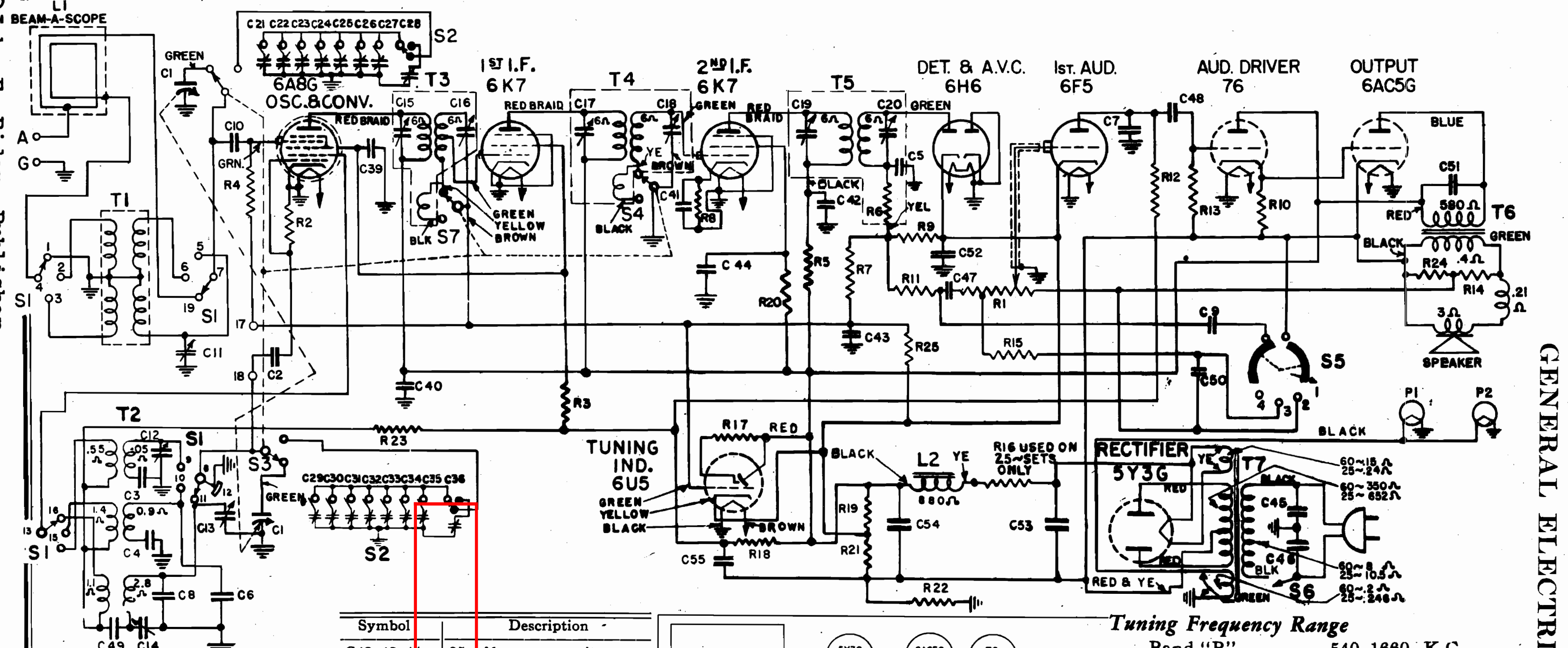
MODEL G99 Schematic, Socket, Trimmers



Symbol	Description
C1	Tuning Capacitor
C2	50 mmf mica capacitor
C3	3900 mmf mica capacitor
C4	1200 mmf mica capacitor
C5	47 mmf mica capacitor
C6	6 mmf mica capacitor
C7	47 mmf mica capacitor
C8	20 mmf regulating capacitor
C9	.0012 mfd paper capacitor
C10	150 mmf mica capacitor
C11-C13	Trimmer capacitors
C14	"B" band padder
C21-C28	Antenna trimmer strip
C29-C36	Oscillator trimmer strip
C39	.05 mfd paper capacitor
C40, 41	0.1 mfd paper capacitor
R23	3300 ohm carbon resistor
R24	12 ohm carbon resistor
R25	1.0 megohm carbon resistor
S1	Band change switch
S2, S3	Station selector switch
S5	Tone control switch
T1	Antenna transformer
T2	Oscillator transformer
T3	1st I.F. transformer
T4	2nd I.F. transformer
T5	3rd I.F. transformer
T6	Output transformer
T7 T8	Power transformer

Symbol	Description
C42, 43, 44	.05 mfd paper capacitor
C45, 46	.01 mfd line capacitor
C47	.003 mfd paper capacitor
C48, 49	.005 mfd paper capacitor
C50	.004 mfd paper capacitor
C51	.02 mfd paper capacitor
C52	0.1 mfd paper capacitor
C53	12 mfd 450 V dry electrolytic
C54	8 mfd 400 V dry electrolytic
C55	8 mfd 400 V dry electrolytic
R1	2 megohm volume control
R2	47,000 ohm carbon resistor
R3	15,000 ohm carbon resistor
R4	1.5 megohm carbon resistor
R5	1,000 ohm carbon resistor
R6	47,000 ohm carbon resistor
R7	2.2 megohm carbon resistor
R8	1,000 ohm carbon resistor
R9	220,000 ohm carbon resistor
R10	22,000 ohm carbon resistor
R11	82,000 ohm carbon resistor
R12	220,000 ohm carbon resistor
R13	1.0 megohm carbon resistor
R14	82 ohm carbon resistor
R15	120,000 ohm carbon resistor
R16	470 ohm carbon resistor
R17	1.0 megohm carbon resistor
R18	6,800 ohm carbon resistor
R19	39,000 ohm carbon resistor
R20	82,000 ohm carbon resistor
R21	150 ohm carbon resistor
R22	180 ohm carbon resistor

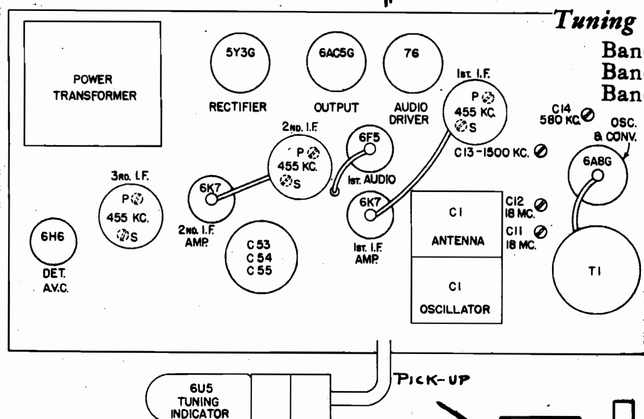


Fig. 6. Chassis Layout and Trimmer Location

Tuning Frequency Range

Band "B" . . . . 540–1660 K.C.
Band "C" . . . . 1650–5600 K.C.
Band "D" . . . . 5500–18,200 K.C.

IF PEAK 455 KC

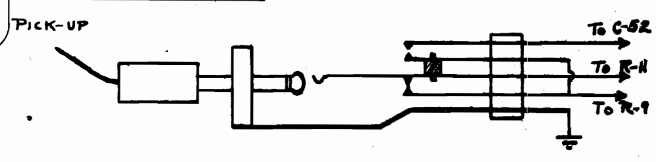


Fig. 1. Phonograph Connections

MODEL G99
Voltage, Chassis Wiring
Dial Mechanism

GENERAL ELECTRIC CO.

VOLTAGE CHART

Tube No.	Plate to Ground Volts, D.C.	Screen to Ground Volts, D.C.	Cathode to Ground Volts, D.C.	Fila-ment Volts
6A8G	240 Conv. 150 Osc.	97	0	6.4
6K7	240	97	0	6.4
6K7	230	105	5.1	6.4
6F5	102	....	3.0	6.4
76	230	....	7.5	6.4
6AC5G	230	....	4.5	6.4
6U5	240	....	3.0	6.4
5Y3G	306/306 A.C. RMS.	...	310 V	5.1

Socket voltages taken at 120-volt line—no signal input—1000 ohms per volt meter—Dial pointer at 550 K.C. on "B" band.

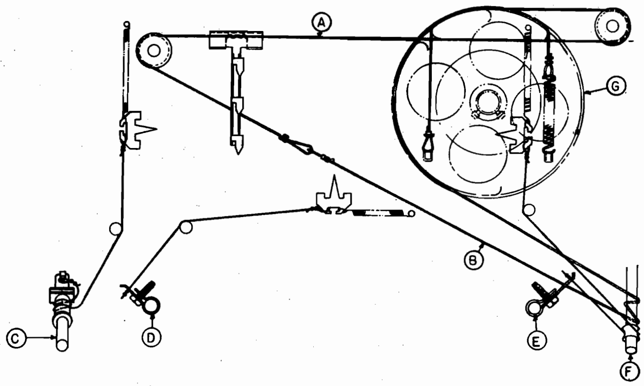


Fig. 3. Dial Drive Mechanism

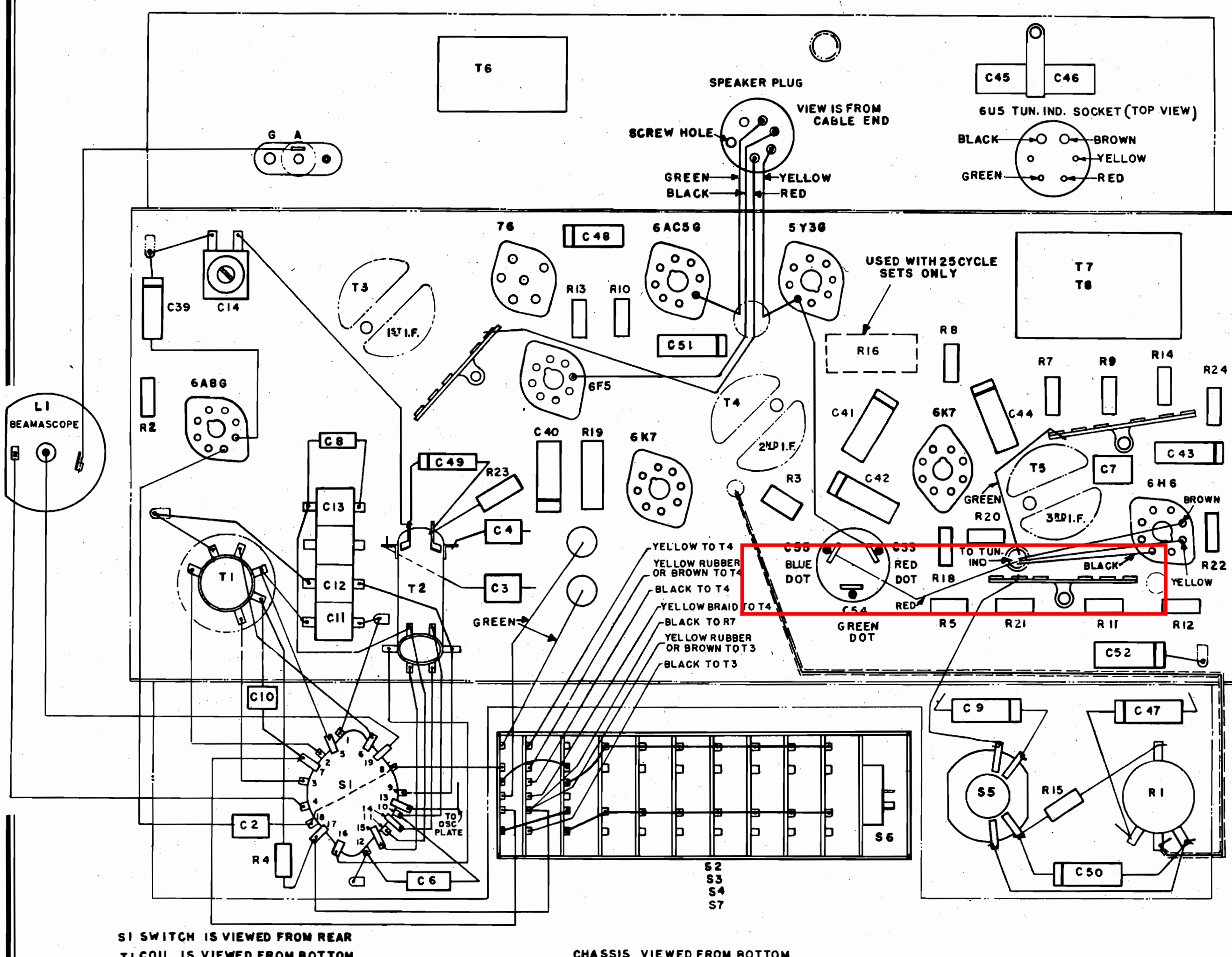


Fig. 4. Chassis Parts Layout

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ALIGNMENT PROCEDURE

I.F. Alignment with Oscilloscope

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1. Band "B"	455 K.C. Sweep	2nd I.F. Grid	.05 Mfd.	3rd I.F. Sec. (C-20) Pri. (C-19)	Manual key depressed—gang condenser plates closed—connect vertical input of oscilloscope to ground and the junction of R-9 and R-11 on 3rd I.F. transformer. Adjust trimmers for a single symmetrical curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 5. When a station key is pressed this I.F. curve should expand considerably.
2. Band "B"	455 K.C. Sweep	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-18) Pri. (C-17)	
3. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-16) Pri. (C-15)	

I.F. Alignment with Output Meter

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1. Band "B"	455 K.C. with Modulation	2nd I.F. Grid	.05 Mfd.	3rd I.F. Sec. (C-20) Pri. (C-19)	Manual key depressed—gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control at maximum. Adjust all trimmers in order mentioned for maximum output. Do not attempt an over-all realignment after stage by stage alignment has been accomplished.
2. Band "B"	455 K.C. with Modulation	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-18) Pri. (C-17)	
3. Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-16) Pri. (C-15)	

R.F. Alignment

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1. Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale.
2. Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-12) Ant. (C-11)	Connect output meter across voice coil—manual key depressed. The image of any "D" band signal should be heard 930 K.C. below input signal when (C-12) is on proper peak. Example: 15 M.C. image—14.09 K.C. Peak (C-11) while rocking the gang condenser.
3. Band "C"	No adjustment necessary				
4. Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Osc. (C-13)	Peak oscillator trimmer (C-13) for maximum output in vicinity of 1500 K.C. while rocking the gang condenser.
5. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 200 Ohms	Padder (C-14)	Adjust padder for maximum output in vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"	Repeat Operation 4				

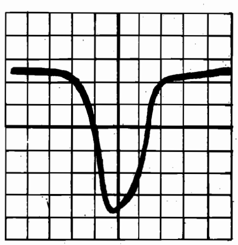


Fig. 5. Over-all IF Curve Taken on G-E Oscilloscope OFM-1

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Volts)
A	115–125	50–60	70
C	115–125	25–60	75

Electrical Power Output

Undistorted .... 3.0 watts
Maximum .... 5.0 watts

Tone Control

.... 4-position

Loud-speaker—Electrodynamic

Outside Cone Diameter .... 12 inches
Voice Coil Impedance .... 3.5 ohms at 400 cycles
Field Coil Resistance .... 880 ohms (cold)

REPLACEMENT PARTS LIST
MODEL G-99

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
*RB-017	BOARD—Terminal board (1 lug)	$0.10
*RB-026	BOARD—Ant. grid terminal board	.10
*RB-062	BOARD—Terminal board (near power trans.)	.10
RC-012	CAPACITOR—.0012 mfd., 600 V. paper (C-9)	.25
*RC-023	CAPACITOR—.005 mfd., 600 V. paper (C-48, 49)	$0.25
*RC-048	CAPACITOR—.02 mfd., 600 V. paper (C-51)	.30
*RC-049	CAPACITOR—.004 mfd., 600 V. paper (C-50)	.35
*RC-055	CAPACITOR—.003 mfd., 600 V. paper (C-47)	.25
*RC-092	CAPACITOR—.05 mfd., 600 V. paper (C-39, 42, 43, 44)	$0.30
*RC-104	CAPACITOR—.1 mfd., 600 V. paper (C-40, 41, 52)	.30
*RC-206	CAPACITOR—50 mmf., mica (C-2)	.35
RC-216	CAPACITOR—47 mmf., mica (C-5, 7)	.25
RC-220	CAPACITOR—6 mmf., mica (C-6)	.25
RC-230	CAPACITOR—20 mmf., compensating capacitor (C-8)	.35
RC-242	CAPACITOR—150 mmf., mica (C-10)	.25
RC-341	CAPACITOR—1200 mmf., mica (C-4)	.35
RC-390	CAPACITOR—3900 mmf., mica (C-3)	.35
RC-594	CAPACITOR—8 mfd., 400 V.; 8 mfd., 400 V; 12 mfd., 450 V.; dry electrolytic (C-53, 54, 55)	1.60
RC-676	CAPACITOR—300-650 mmf., "B" padder (C-14)	.35
RC-692	CAPACITOR—Antenna and oscillator trimmer (C-11, 12, 13)	.30
RC-728	CONDENSER—2-gang tuning condenser (C-1)	2.95
*RC-754	CAPACITOR—.01-.01 mfd., 250 V. A.C. line capacitor (C-45, 46)	.40
*RC-863	CORD—Power cord	.65
RC-8035	CABLE—Speaker cable and plug	.50
RC-8054	CABLE—Tuning indicator cable and socket	.40
RD-205	DRIVE—Vernier drive bracket assembly	.35
RG-016	GRID CLIP—Control grid clip (Pkg. of 5)	.10
RK-027	KNOB—Control knob (winged) (Pkg. of 5)	.50
RK-028	KNOB—Control knob (plain) (Pkg. of 5)	.30
RL-062	COIL—Ant. coil assembly	1.50
RL-266	COIL—Oscillator coil and bracket	1.30
RL-501	BEAM-A-SCOPE—Beam-a-Scope antenna (L-1)	9.25
RQ-711	RESISTOR—470 ohms, 3 W. carbon (R-16)	.25
RQ-1213	RESISTOR—12 ohm, ½ W. carbon (R-24) (Pkg. of 5)	.70
*RQ-1233	RESISTOR—82 ohm, ½ W. carbon (R-14) (Pkg. of 5)	.70
*RQ-1239	RESISTOR—150 ohm, ½ W. carbon (R-21) (Pkg. of 5)	.70
RQ-1241	RESISTOR—180 ohm, ½ W. carbon (R-22) (Pkg. of 5)	.70
*RQ-1259	RESISTOR—1000 ohm, ½ W. carbon (R-5, 8) (Pkg. of 5)	.70
*RQ-1271	RESISTOR—3300 ohm, ½ W. carbon (R-23) (Pkg. of 5)	.70
*RQ-1279	RESISTOR—6800 ohm, ½ W. carbon (R-18) (Pkg. of 5)	.70
*RQ-1287	RESISTOR—15,000 ohm, ½ W. carbon (R-3) (Pkg. of 5)	.70
*RQ-1291	RESISTOR—22,000 ohm, ½ W. carbon (R-10) (Pkg. of 5)	.70
*RQ-1299	RESISTOR—47,000 ohm, ½ W. carbon (R-2, 6) (Pkg. of 5)	.70
RQ-1305	RESISTOR—82,000 ohm, ½ W. carbon (R-11, 20) (Pkg. of 5)	.70
*RQ-1309	RESISTOR—120,000 ohm, ½ W. carbon (R-15) (Pkg. of 5)	.70
*RQ-1315	RESISTOR—220,000 ohm, ½ W. carbon (R-9, 12) (Pkg. of 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½ W. carbon (R-13, 17, 25) (Pkg. of 5)	.70
*RQ-1335	RESISTOR—1.5 megohm, ½ W. carbon (R-4) (Pkg. of 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½ W. carbon (R-7) (Pkg. of 5)	.70
*RR-281	RESISTOR—39,000 ohm, 2 W. carbon (R-19)	.30
RS-185	SHIELD—6A8G tube shield and base	.15
*RS-200	SOCKET—Octal base tube socket (Pkg. of 5)	.75
*RS-204	SOCKET—Rectifier tube socket (Pkg. of 5)	.75
*RS-223	SOCKET—Octal base tube socket (Pkg. of 5)	.80
RS-224	SOCKET—Tube socket (76) (Pkg. of 5)	.50
RS-227	SOCKET—Octal base tube socket (6A8G)	$0.15
RS-395	SWITCH—Tone control switch (S-2)	.55
RS-3011	SWITCH—Band change switch (S-1)	.95
RT-0711	TRANSFORMER — Power transformer (T-7) 120 V. 25-60 cy.	7.60
RT-0616	TRANSFORMER—Power transformer (T-7) 120 V. 50-60 cy.	4.60
RT-265	TRANSFORMER—3rd I.F. transformer	1.60
RT-266	TRANSFORMER—2nd I.F. transformer and shield	1.80
RT-267	TRANSFORMER—1st I.F. transformer and shield	1.90
RT-438	TRANSFORMER—Output transformer (T-3)	1.70
RV-051	VOLUME CONTROL—2 megohm volume control (R-1)	.80
*RW-101	WASHER—Felt washer for control shafts (Pkg. of 10)	.45
*RX-021	ASSEMBLY—Chassis mounting assembly	.10
RX-048	ASSEMBLY—Tuning condenser mounting assembly	.25
	SPEAKER ASSEMBLY	
RC-932	CONE—12-inch cone and V. C. assembly	1.10
*RC-991	CLAMP—Cone spider clamp	.05
RD-301	DUST CAP—Speaker cone dust cap (Pkg. of 5)	.10
RP-109	PLUG—Male speaker plug	.20
RS-073	SPEAKER—12-inch speaker	5.40
*RX-030	ASSEMBLY—Speaker mounting assembly	.10
	DIAL DRIVE MECHANISM	
*RB-152	BRACKET—Tone control indicator bracket (D)	.05
*RB-155	BRACKET—Band change bracket (E)	.05
RB-614	BUSHING—Volume control drive bushing (C)	.15
RC-1977	CLAMP—Tuning indicator tube clamp and thumbscrews	.10
RC-8048	CORD—Volume indicator cord (Pkg. of 5)	.50
RC-8049	CORD—Tone indicator cord (Pkg. of 5)	.50
RC-8050	CORD—Band change indicator cord (Pkg. of 5)	.50
RC-8051	CORD—Dial pointer drive cord (A) (B)	.20
*RD-013	DRUM—Condenser drive drum (G)	.35
RD-074	DIAL—Dial scale	2.70
RE-033	ESCUTCHEON—Dial scale escutcheon	1.65
RP-112	POINTER—Tone, band change or volume indicator pointer	.10
RP-113	POINTER—Dial scale pointer	.30
RP-303	PULLEY—Idler pulley (Pkg. of 2)	.10
RR-920	REFLECTOR—Lamp reflector assembly	.50
RS-187	SHIELD—Lamp shield (Pkg. of 10)	.05
*RS-218	SOCKET—Lamp socket assembly	.10
*RS-425	SPRING—Drive drum spring (Pkg. of 5)	.10
*RS-427	SPRING—Volume, tone or band change cord spring (Pkg. of 5)	.20
	TOUCH TUNING ASSEMBLY	
RB-613	BUTTON—Molded push button (Pkg. of 5)	.35
RC-8036	CARDS—Station letter cards (set)	.25
RC-8052	CARDS—"Manual" tab cards (strip of 10)	.05
RC-8053	CARDS—"Off" tab cards (strip of 10)	.05
RE-032	ESCUTCHEON—Push button escutcheon	.50
RS-444	SPRING—Spring for push button (Pkg. of 10)	.10
RS-3009	SWITCH—Power switch	1.00
RS-3010	SWITCH—Push button switch (less trimmers)	3.90
RT-856	TRIMMER STRIP—Osc. trimmer strip (C-29, 30, 31, 32, 33, 34, 35, 36)	1.40
RT-857	TRIMMER STRIP—Antenna section trimmer strip (C-21, 22, 23, 24, 25, 26, 27 28)	1.40
RW-021	WINDOWS—Celluloid station windows (Pkg. of 25)	.10

* Used on previous receivers.

(Prices subject to change without notice)

Phonograph Connections

Fig. 1 shows a simple sketch for connecting a crystal or high impedance magnetic pick-up into the G-99 circuit for the reproduction of phonograph recordings. This method uses a two circuit jack and is connected into the receiver by opening the circuit between R-11 and the junction of R-7 and R-9; connecting the jack terminals as shown. A telephone plug is attached to the pick-up leads; and for phonograph operation, it is merely necessary to insert it into the jack. The jack may be mounted on the rear chassis deck and all connecting leads should be properly shielded to prevent interference.

When the pick-up is connected as suggested, the regular radio volume and tone controls work for both radio and phonograph reproduction.

NOTE—A suitable loading circuit consisting of a 300,000 ohm resistor should be connected across the pick-up leads when using a crystal type unit.

MODEL GM125
Power Supply and
Operating Notes

GENERAL ELECTRIC CO.

Antenna and Ground

Since this receiver operates at a relatively high radio frequency, it is very essential to construct a good antenna and ground system in order to obtain maximum results.

For distances up to within thirty miles from the transmitter, a simple horizontal di-pole as shown in Fig. 1 should give excellent results. It should be located free from all obstructions and placed as high from the earth as possible. Make sure it is run approximately at right angles to the direction of the transmitter: i.e., if the transmitter is located due west, run the horizontal doublet in a north and south direction. The horizontal flat top has an effective antenna length of 10-feet, 8-inches and consists of #12 or #14 bare copper wire (preferably stranded), cut in the middle and the two halves insulated by glass insulators. A twisted lead-in wire is then soldered to each side of the doublet as shown, and the other two ends of the transmission line are connected to the #1 and #2 terminals on the receiver chassis. The lead-in transmission line may be of any length up to 100 feet and should consist of low loss antenna lead-in wire. A good ground connection to a water pipe is connected to the terminal marked "G".

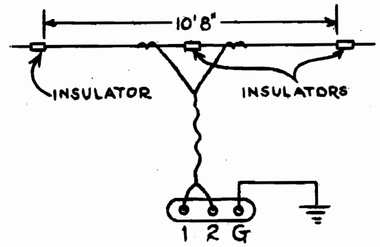


Fig. 1

Somewhat better results may be obtained by constructing the antenna shown in Fig. 2. This varies somewhat from the di-polo antenna and is more efficient due to the fact that the transmission line has very little loss.

The antenna proper consists of a 10-foot, 8-inch length of 1-inch diameter copper pipe supported at the middle by a pole located as high above ground as possible. The transmission line is made up of two #12 or #14 copper wires, spaced about 2-inches apart and transposed every two or three feet. The antenna end of the transmission line is soldered 13-1/2 inches each side of the center of the copper pipe and should form a triangle, 27 inches on all sides. As in the previous installation, the horizontal flat-top should run approximately at right angles to the direction of tho transmitter.

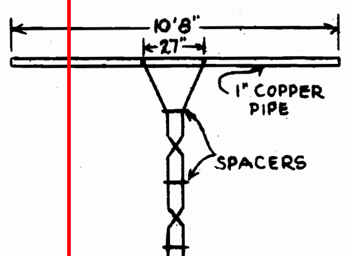


Fig. 2

For greater distances, somewhat better results may be obtained by using a reflector in conjunction with the antenna described and shown in Fig. 2. A suggested system is to use a 1-inch diameter copper pipe similar to the antenna, running parallel to the regular antenna and located farthest from the direction of the received signal. Fig. 3 shows a diagram looking from top and dimensions should be followed very carefully. By experimenting, however, with the distance between reflector and antenna, improvement in the individual installation may be noted.

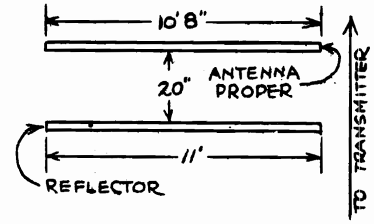


Fig. 3

Note - The reflector is a floating copper bar and there are no external connections. Connect and install the regular antenna as shown in Fig. 2.

Model	GM-125
Height	36-1/4 inches
Width	39-3/8 inches
Depth	17-1/8 inches

Tuning Control Drive Ratio 1:1

Electrical Specifications

Volts	115-125
Frequency	50/60 Cycles
Watts Consumption	160

Tuning Frequency Range .... 37-44 M.C.

Intermediate Frequency

Mid-frequency	3.0 M.C.
Band Width	300 K.C.

Electrical Power Output

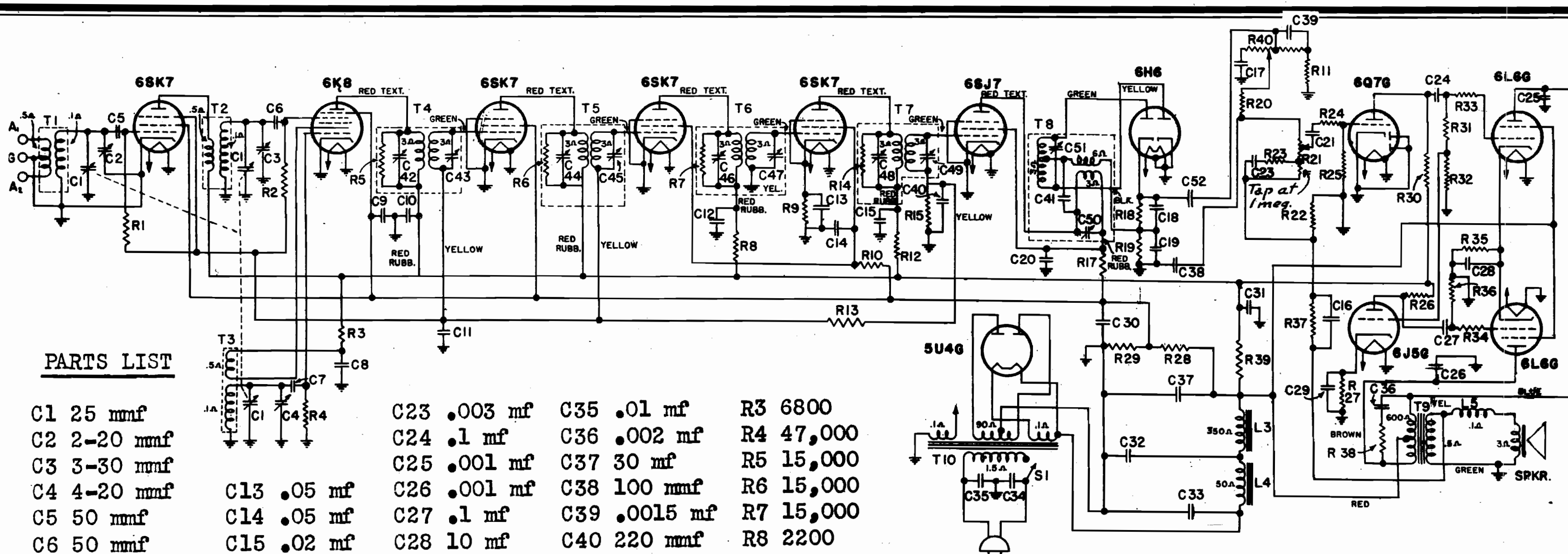
Undistorted	12.0 Watts
Maximum	15.0 Watts

Loudspeaker - Electrodynamic

Cone - Outside Diameter	10 inches
Voice Coil Impedance (400 cycles)	3.5 Ohms
Field Resistance	450 Ohms (cold)

MODEL GM125
Schematic, Voltage

GENERAL ELECTRIC CO.



IF FREQUENCY
Mid-frequency ..... 3 MC
Band Width .... 300 KC

PARTS LIST

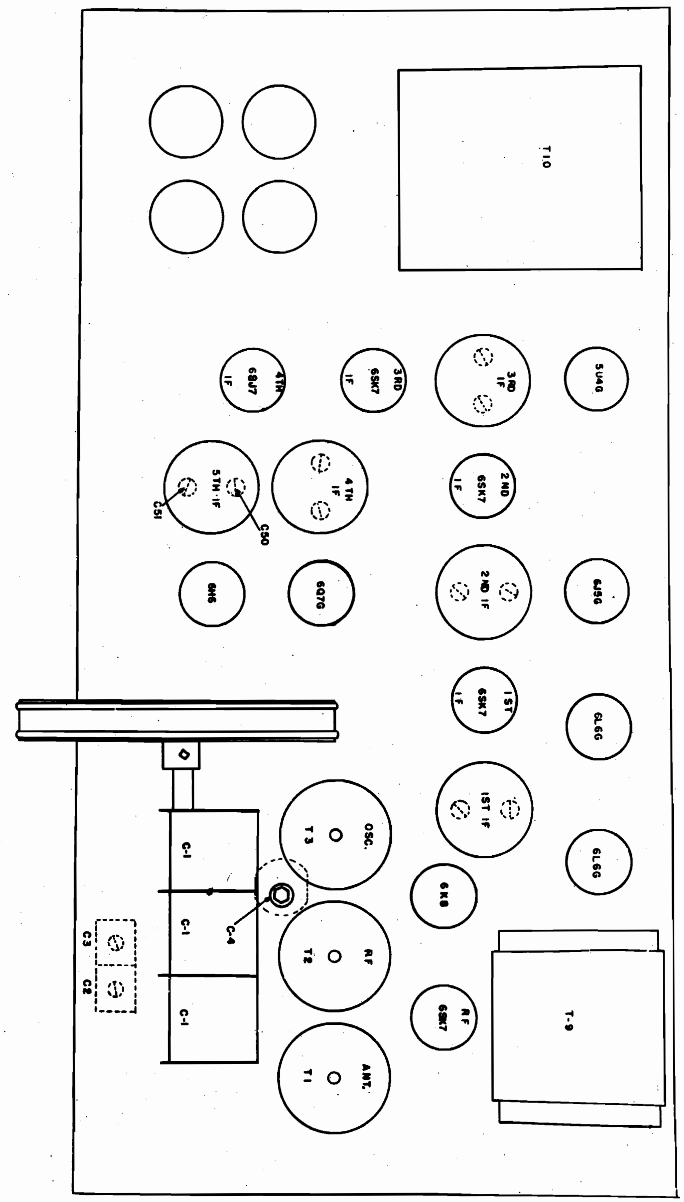
C1 25 mmf
C2 2-20 mmf
C3 3-30 mmf
C4 4-20 mmf
C5 50 mmf
C6 50 mmf
C7 50 mmf
C8 220 mmf
C9 .05 mf
C10 .05 mf
C11 .05 mf
C12 .02 mf
C13 .05 mf
C14 .05 mf
C15 .02 mf
C16 .05 mf
C17 68 mmf
C18 22 mmf
C19 22 mmf
C20 .05 mf
C21 .01 mf
C23 .003 mf
C24 .1 mf
C25 .001 mf
C26 .001 mf
C27 .1 mf
C28 10 mf
C29 10 mf
C30 8 mf
C31 8 mf
C32 30 mf
C33 30 mf
C34 .01 mf
C35 .01 mf
C36 .002 mf
C37 30 mf
C38 100 mmf
C39 .0015 mf
C40 220 mmf
C41 50 mmf
C42 to C51
14-50 mmf
C52 .02 mf
R1 470,000
R2 470,000
R3 6800
R4 47,000
R5 15,000
R6 15,000
R7 15,000
R8 2200
R9 390
R10 2200
R11 270,000
R12 2200
R13 2.2 meg.
R14 15,000
R15 330,000
R17 2200
R18 100,000
R19 100,000
R20 470,000
R21 2 meg.
R22 15
R23 180,000
R24 47,000
R25 15 meg.
R26 68,000
R27 1500
R28 5600
R29 5600
R30 220,000
R31 120,000
R32 8200
R33 1000
R34 1000
R35 180
R36 120,000
R37 47
R38 10,000
R39 2000
R40 2 meg.

Tube	Application	Plate to Gnd Volts	Screen to Gnd Volts	Cathode to Gnd Volts	Cathode Cur. MA	Filament Volts
6SK7	RF	240	90	0	7.5	6.4
6K8	Conv.	238	90	0	8.0	6.4
	Osc.	188				
6SK7	1st IF	238	90	0	8.1	6.4
6SK7	2nd IF	230	83	0	6.1	6.4
6SK7	3rd IF	225	83	2.9	6.1	6.4
6SJ7	4th IF	65	65	0	7.2	6.4
6Q7G	1st Audio	65	--	0	---	6.4
6J5G	Inverter	48	--	1.7	2.0	6.4
(2) 6L6G	Output	267	285	21	112	6.4
5U4G	Rectifier	350/350 V. A.C. RMS	---	---	180	50

Line Voltage - 120 No signal input. Pilot Light-Mazda 44

MODEL GM125
Socket, Trimmers
Alignment

GENERAL ELECTRIC CO.



TUBE AND TRIMMER LOCATION

CIRCUIT ALIGNMENT

IF Amplifier

Due to the good stability of components and the wide band characteristics of this amplifier, alignment should be unnecessary under normal operating conditions. Should it become imperative that an IF alignment is desirable, it will be necessary to use a cathode ray oscilloscope in conjunction with a 3.0 megacycle signal generator with a superimposed ±300 K.C. sweep frequency. This generator may be built up by constructing an oscillator with the tank condensor semi-fixed and variable, the variable portion being designed to be rotated by a motor and of proper capacity to give ±300 K.C. variation of the 3.0 megacycle mid-frequency. Connect the vertical plates of the oscilloscope across the resistor R-15 of the 4th IF stage and align transformers T-7, T-6, T-5 and T-4 in a progressive step by step method.

Frequency Demodulator

With the same oscillator and sweep signal as used above, connect the vertical oscilloscope plates across the resistors, R-18 and R-19, then align the transformer T-8 for a cross-over curve as shown in Fig. 4. Proper alignment of trimmer C-51 is indicated when the curve crosses about mid-way in a vertical plane. Proper alignment of C-50 is indicated when the sides of the curve near cross-over are nearest to a straight line.

Note - Keep signal input high enough so that noise limiter is functioning. This point is indicated when an increase in signal input no longer changes the size of the curve.

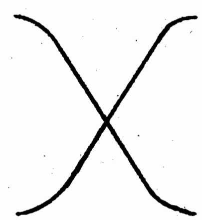


Fig. 4

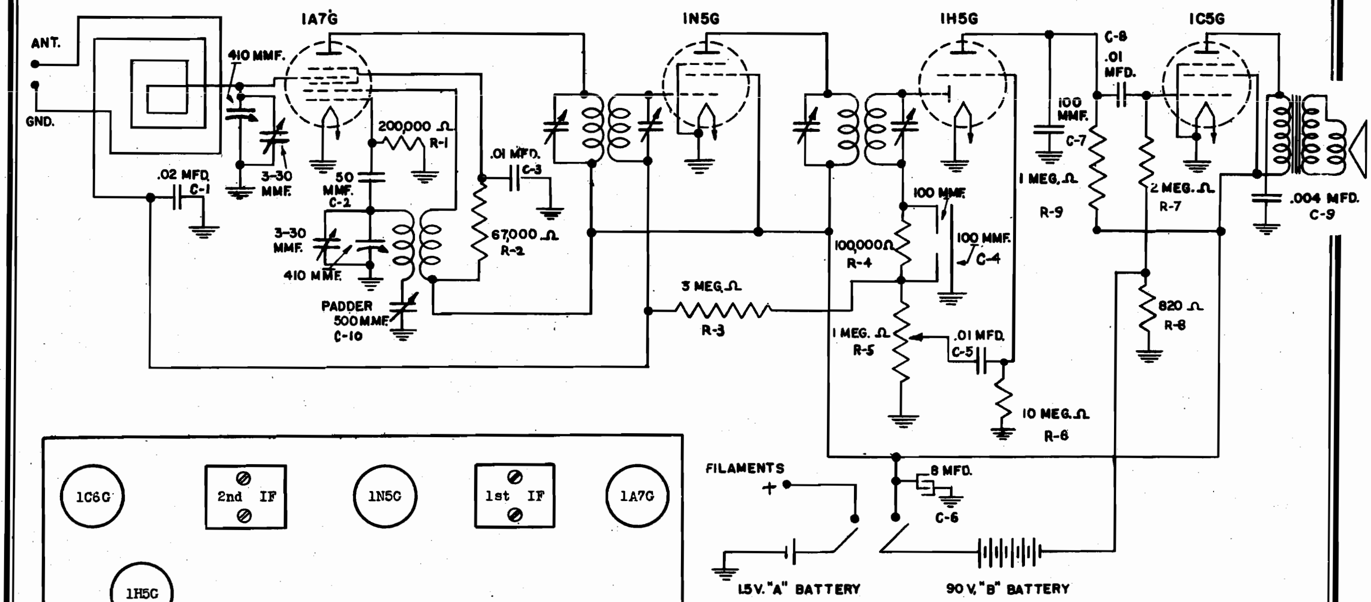
RF Alignment

Make sure the last division on the low frequency end of the drum dial coincides with the escutcheon mark when the gang condenser is completely closed; then, proceed as follows:

1. Connect a high resistance 0-10 V D.C. voltmeter across R-15.
2. Apply a 42.8 megacycle unmodulated signal to the antenna terminal board.
3. Set dial scale so it is tuned to 42.8 megacycle and peak oscillator trimmer C-4 for maximum voltage reading on the meter.
4. Peak the antenna (C-2) and RF (C-3) trimmers for maximum voltage output on meter.

Note - The proper location of the trimmers is shown on a following page.

GENERAL ELECTRIC CO. MODEL GD400 Schematic, Socket, Trimmers Alignment



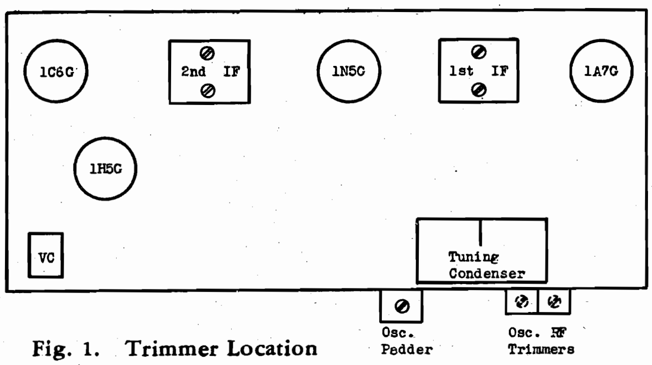


Fig. 1. Trimmer Location

MODEL GB-400 BATTERY-OPERATED

SERVICE DATA

Physical Specifications

Model	GB-400
Height	9⅜ inches
Width	13 inches
Depth	8¼ inches

Tuning Control Drive-Ratio 1:1

Batteries Required

1—1½-volt "A" battery (Eveready No. 741 or equivalent).

2—45-volt "B" batteries (Eveready No. 762 or equivalent).

Tuning Frequency Range .... 540–1600 kc.

Alignment Frequency

IF	455 kc.
RF	600 and 1500 kc.

Loud-speaker—Permanent Magnet

Over-all diameter	5 inch
Cone Coil Impedance (400 cycles)	3.0 ohms

Tubes

Converter and Oscillator	GE-1A7G
IF Amplifier	GE-1N5G
Detector and 1st Audio	GE-1H5G
Power Amplifier	GE-1C5G

ALIGNMENT PROCEDURE

Alignment Frequencies

IF—455 kc. Broadcast—1500 kc. and 600 kc.

NOTE—Do not rest the chassis on any of its sides when attempting to align; place in either an inverted or upright position.

IF Alignment

To align the IF, it will be necessary to remove the chassis from the cabinet. Connect an output meter across the voice coil. Set the volume control for maximum.

Adjust the test oscillator to 455 kc. and apply the signal to the control grid of the 1A7G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 1A7G tube. Keep the test oscillator output as low as possible to give a readable output. Adjust all four IF trimmers for maximum output.

RF Alignment

The following alignment should be made with the receiver fastened in the case. Turn the receiver to its inverted position and make trimmer and padder alignments through the holes provided in the bottom of the case.

Connect the ground lead of the signal generator to the receiver chassis and the other lead to the receiver antenna terminal (located underneath cabinet). A dummy antenna consisting of a 250 mmf. capacitor in series with 200 ohms should be connected in the antenna lead of the signal generator. Apply a 600 kc. modulated signal and adjust the oscillator padder for a maximum output while rocking the gang condenser in vicinity of 600 kc. mark on the dial.

Using the same dummy antenna with a 1500 kc. signal generator input, adjust the oscillator trimmer for a maximum output. Now remove signal generator leads, tune in a station at approximately the 1500 kc. point on dial and then peak the RF trimmer for a maximum signal.

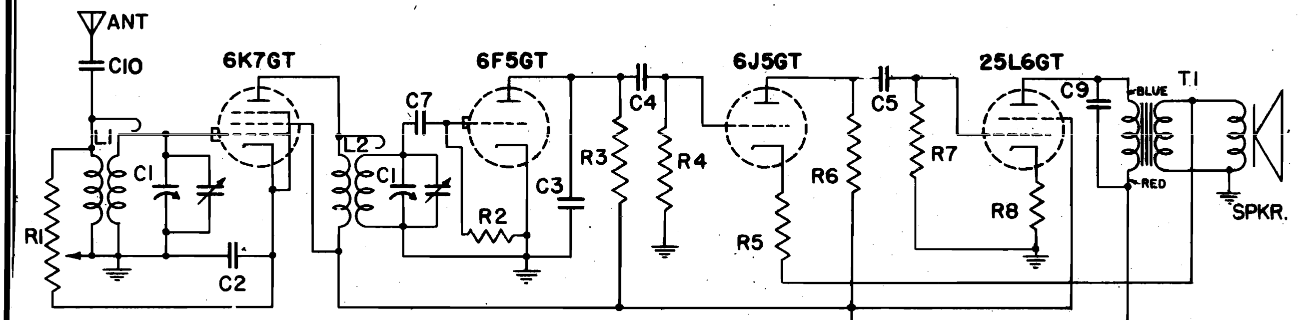
GENERAL INFORMATION

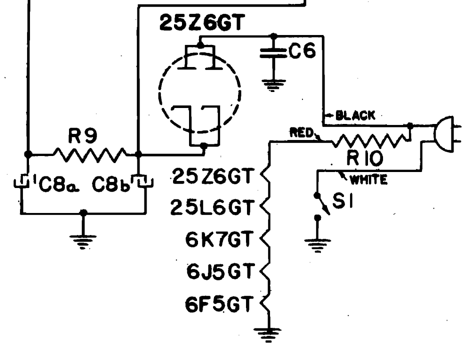
The Model GB-400 is a compact and portable battery-operated receiver that employs four tubes in a superheterodyne circuit. Features of design include self-contained "A" and "B" battery supply, an efficient loop antenna built inside of the cabinet, and an efficient P.M. speaker.

MODEL GD 500
Schematic, Socket, Trimmers

GENERAL ELECTRIC CO.

Voltage, Alignment





Symbol	Description
C-1	Tuning Condenser
C-2	.05 mfd., Paper Capacitor
C-3	.001 mfd., Paper Capacitor
C-4, -5	.005 mfd., Paper Capacitor
C-6, -7	.01 mfd., Paper Capacitor
C-8a	15 mfd., Dry Electrolytic
C-8b	30 mfd., Dry Electrolytic
C-9	.02 mfd., Paper Capacitor
C-10	.002 mfd., Paper Capacitor
R-1	30,000 ohm, Volume Control
R-2	15 megohm, Carbon Resistor
R-3, -4	470,000 ohm, Carbon Resistor
R-5	3,300 ohm, Carbon Resistor
R-6	100,000 ohm, Carbon Resistor
R-7	470,000 ohm, Carbon Resistor
R-8	150 ohm, Carbon Resistor
R-9	4,700 ohm, Carbon Resistor
R-10	162 ohm, Power Cord Resistor
L-1	Antenna Coil
L-2	RF Coil
T-1	Output Transformer

Tubes

RF Amplifier GE-6K7GT
Detector GE-6F5GT
1st Audio GE-6J5GT
Power Output GE-25L6GT
Rectifier GE-25Z6GT

MODEL GD-500
TRF RECEIVER

VOLTAGE CHART

Tube No.	6K7GT	6J5GT	6F5GT	25L6GT	25Z6GT
Plate to −B Volts	88	30 *	35 *	132	120 AC
Screen to −B Volts	88	...	....	88	....
Cathode to −B Volts	0	1.3	0	5.5	140
Filament Volts	6.4	6.3	6.2	25.0	25.0

Voltage measured when volume control is set to maximum.
Line Voltage—120 AC. No signal input.
* Measured on 500-volt scale.
On DC, voltages should read approximately 10% lower.

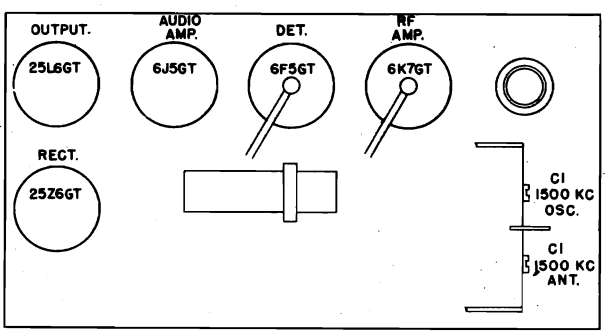


Fig. 1. Trimmer Location

Electrical Specifications

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
110–120 AC or DC	25–60	45

Tuning Frequency Range

Band "B" . . . . 540–1750 KC
Alignment Frequency . . . . 1500 KC

Electrical Power Output

Undistorted . . . . 1.4 watts
Maximum . . . . 2.0 watts

Loudspeaker—Permanent Magnet

Outside Cone Diameter . . . . 4½ inches
Voice Coil Impedance (400 cycles) . . . . . 3.5 ohms

GENERAL INFORMATION

Model GD-500 is a compact five-tube AC-DC tuned radio frequency receiver that tunes the broadcast band of frequencies. One side of the power line is connected directly to the chassis ground, therefore, caution should be exercised in servicing.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise, the receiver will fail to function. If any hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT

Connect the high side of the signal generator through a 250 mmf. condenser to the antenna lead. The low side of the signal generator output should be connected to the receiver chassis through a .05 mfd. condenser. Connect a suitable output meter across the voice coil leads; then proceed as follows:

1. With gang condenser plates completely closed, the tuning mark should be over the last mark on the dial.
2. Tune receiver to the 1500 KC point on the dial; then align trimmers on the gang condenser at 1500 KC for a maximum output meter reading.

Precaution—One side of the power supply is connected to the chassis. Do not connect chassis to any external ground.

GENERAL ELECTRIC CO.

MODELS GD520,GD521
Schematic,Socket,Trimmers
Voltage,Alignment

Tuning Frequency Range

Band "B"......................535 to 1730 kc

Electrical Power Output

Undistorted..........................1.1 watts
Maximum.............................2.0 watts

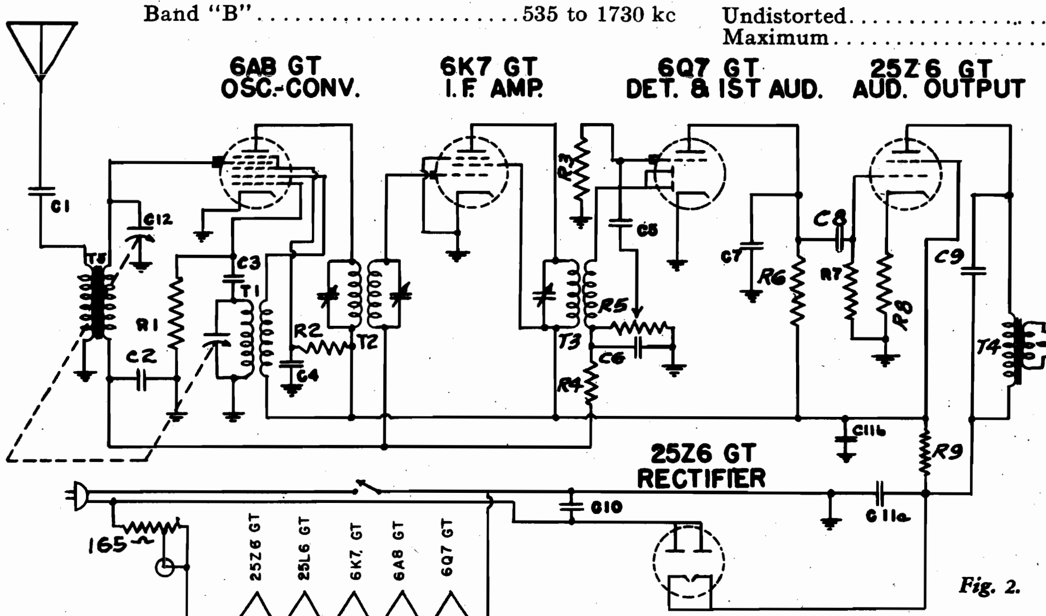


Fig. 2.

Physical Specifications
Height..................$5\frac{3}{16}$ inches
Width...................$7\frac{5}{8}$ inches
Depth...................$4\frac{7}{16}$ inches

Tuning Control Drive Ratio..........3 to 1

Loud-speaker—Permanent Magnet
Outside Cone Diameter..........$3\frac{7}{16}$ inches
Voice Coil Impedance (400 cycles)..3.0 ohms

Symbol	Description	Symbol	Description	Symbol	Description
C1	.005 mfd. paper capacitor	C10	.05 mfd. paper capacitor	R6	250,000 ohm, carbon resistor
C2	.02 mfd. paper capacitor	C11a	25 mfd. dry electrolytic	R7	500,000 ohm, carbon resistor
C3	50 mmf. mica capacitor	C11b	20 mfd. dry electrolytic	R8	180 ohm, carbon resistor
C4	.01 mfd. paper capacitor	C12	Tuning condenser	R9	2000 ohm, carbon resistor
C5	.01 mfd. paper capacitor	R1	50,000 ohm, carbon resistor	T1	Oscillator transformer
C6	250 mmf. mica capacitor	R2	40,000 ohm, carbon resistor	T2	1st I.F. transformer
C7	250 mmf. mica capacitor	R3	5 megohm, carbon resistor	T3	2nd I.F. transformer
C8	.01 mfd. paper capacitor	R4	2 megohm, carbon resistor	T4	Output transformer
C9	.03 mfd. paper capacitor	R5	500,000 ohm, volume control	T5	Antenna transformer

Power Supply	Frequency	Power Consumption
105–125 Volts AC or DC	60 Cycles	45 Watts

MODELS GD-520 AND GD-521

GENERAL INFORMATION

Models GD-520 and GD-521 are compact five-tube AC-DC superheterodyne receivers, employing five General Electric Pre-tested Tubes. One side of the power line is connected directly to the chassis ground in either receiver; therefore, caution should be exercised in servicing.

When operating from a D-c source of power, it is necessary to insert the power plug with proper polarity; otherwise, the receiver will fail to function. If any hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

Alignment Frequencies

I.F.—456 kc.........................Broadcast—1500 kc

The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.

Set test oscillator to 456 kc and apply signals to the control grid of the 6A8GT tube through a .05 mfd. capacitor. Do not remove the grid lead from the 6A8GT. Keep the test oscillator output as low as possible to give a readable output. Adjust all three I.F. trimmers for maximum output.

R.F. Alignment

Set test oscillator to 1500 kc and connect one output lead to the receiver chassis† and the other through a 250 mmf. capacitor in series with 200 ohms to the receiver antenna lead. Adjust the oscillator trimmer (C-13) and the antenna trimmer (C-14) for a maximum output.

†**Precaution.** One side of the power supply is connected to the chassis. Do not connect chassis to any external ground. If signal generator is A-c operated, connect a .05 mfd. capacitor in the ground side before connecting it to the receiver chassis.

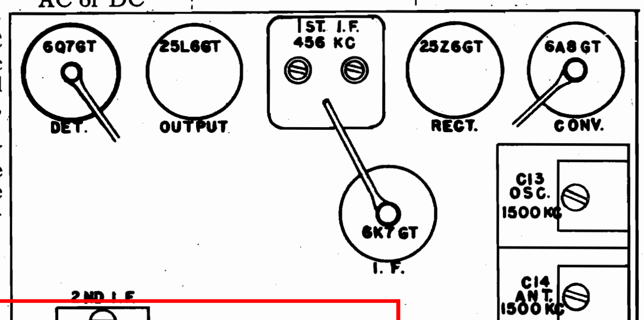


Fig. 1. Trimmer Location

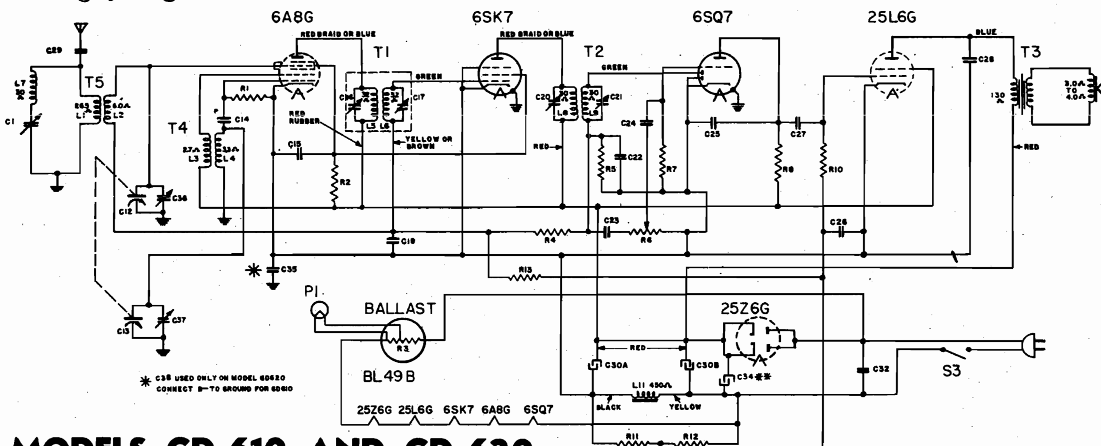
VOLTAGE CHART

Tube No.	6A8GT	6K7GT	6Q7GT	25L6GT	25Z6GT
Plate to −B Volts	92	92	32*	125	120 AC
Screen to −B Volts	37	92	....	92	....
Cathode to −B Volts	0	0	0	5.9	133
Filament Volts	6.4	6.3	6.2	25.0	25.0

Voltage measured when volume control is set to minimum.
Line Voltage—120 AC. No signal input.
* Measured on 500-volt scale.
On DC, voltages should read approximately 10% lower.

MODELS GD610, GD620
Schematic, Socket, Trimmers
Voltage, Alignment

GENERAL ELECTRIC CO.



Tubes
Converter and Oscillator......GE-6A8G
I.F. Amplifier......GE-6SK7
Detector and A.V.C......GE-6SQ7
Power Output......GE-25L6G
Rectifier......GE-25Z6G
Pilot Lamp......Mazda No. 44
Ballast......BL-49B

MODELS GD-610 AND GD-620

Symbol	Description	Symbol	Description	Symbol	Description
C1	Wave trap trimmer	C29	.001 mfd., paper capacitor	R7	15 megohm, carbon resistor
C12, 13	Tuning condenser	C30a	10 mfd., dry electrolytic	R8	220,000 ohm, carbon resistor
C14	47 mmf., mica capacitor	C30b	30 mfd., dry electrolytic	R10	470,000 ohm, carbon resistor
C15	.25 mfd., paper capacitor	C32	.02 mfd., paper capacitor	R11	270,000 ohm, carbon resistor
C19	.05 mfd., paper capacitor	**C34	35 mfd., dry electrolytic	R12	680,000 ohm, carbon resistor
C22	470 mmf., mica capacitor	*C35	.2 mfd., paper capacitor	R13	15 megohm, carbon resistor
C23	.002 mfd., paper capacitor	R1	47,000 ohm, carbon resistor	T1	1st I.F. transformer
C24	.002 mfd., paper capacitor	R2	10,000 ohm, carbon resistor	T2	2nd I.F. transformer
C25	330 mmf., mica capacitor	R3	Ballast resistance, BL49B	T3	Output transformer
C26	.15 mfd., paper capacitor	R4	2.2 megohm, carbon resistor	T4	Oscillator transformer
C27	.005 mfd., paper capacitor	R5	470,000 ohm, carbon resistor	T5	Antenna transformer
C28	.03 mfd., paper capacitor	R6	2.0 megohm, volume control		

SERVICE DATA

Specifications

Model	GD-610	GD-620
Height	8¼ inches	8¼ inches
Width	12⅜ inches	12⅜ inches
Depth	5¾ inches	5¾ inches

Tuning Control Drive Ratio 1:1

VOLTAGE CHART

Tube No.	6A8G	6SK7	6SQ7	25L6G	25Z6G
Plate to —B volts	112	112	50*	102	....
Screen to —B volts	75	75	..	112	..
Cathode to —B volts	0	0	0	0	134
Filament Volts	6.4	6.4	6.4	24.5	24.5

Line Voltage—120 V. AC. Volume control at maximum.
* Measured on 250 volt scale.
On DC, voltages are about 15 per cent lower.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.—455 K.C. Broadcast—1500 K.C.
The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.
Set test oscillator to 455 K.C. and apply signal to the control grid of the 6A8G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 6A8G. Keep the test oscillator output as low as possible to give a readable output. Adjust all four I.F. trimmers for maximum output.

Wave Trap Alignment

Leave the test oscillator set to 455 K.C. and connect one output lead to the receiver chassis and the other through a 250 mmf. capacitor in series with 200 ohms to the receiver antenna lead. Adjust (C-1) for minimum output.

R.F. Alignment

Use the same dummy antenna (250 mmf. and 200 ohms) with 1500 K.C. input, adjust the oscillator trimmer (C-37) and antenna trimmer (C-36) for a maximum output.

Precaution—On the Model GD-610 one side of the power supply is connected to the chassis. If signal generator is AC operated, connect a .05 mfd. capacitor in the ground side before connecting it to the receiver chassis.

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
100-125 Volts AC or DC	40-60	50

Tuning Frequency Range .... 540–1750 K.C.

Intermediate Frequency .... 455 K.C.

Electrical Power Output (120-line Volts)

	A-C	D-C
Undistorted	1.0	0.9
Maximum	1.8	1.5

Loud-speaker—Electrodynamic

Outside Cone Diameter....... 5 inches
Voice Coil Impedance (400 cycles).................. 4.0 ohms
Field Coil Resistance......... 420 ohms

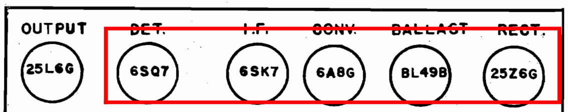
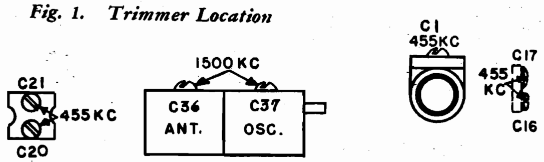


Fig. 1. Trimmer Location



Production Change

On a number of receivers, substitute electrolytic capacitor RC-5113 is used for C30b with both sections tied in parallel and RC5114 is used for C30a.

GENERAL INFORMATION

The models GD-610 and GD-620 are compact six tube AC-DC superheterodyne receivers employing five General Electric tubes plus a ballast tube, described above in a superheterodyne circuit. Features of design include I.F. wave trap, automatic volume control, and an efficient electrodynamic speaker. Model GD-620 is fully approved by Underwriters Laboratories.

GENERAL ELECTRIC CO.

MODEL GD600
MODEL GD630
Schematics

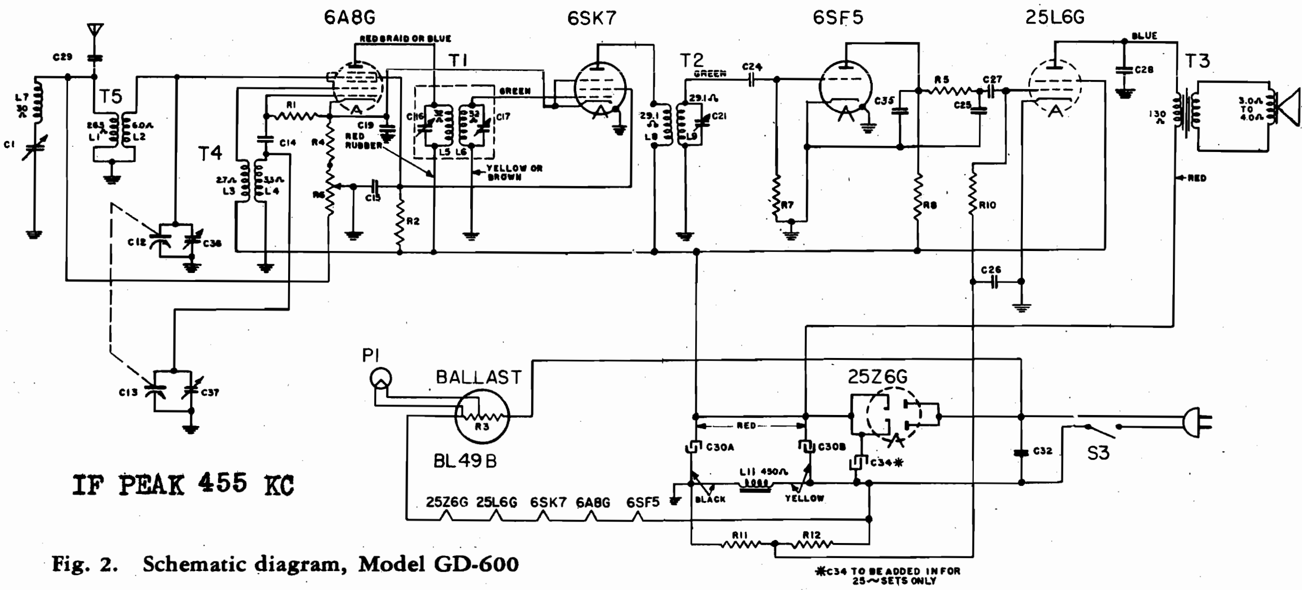


Fig. 2. Schematic diagram, Model GD-600

Symbol	Description	Symbol	Description	Symbol	Description
C1	Wave trap trimmer	C30a	10 mfd., dry electrolytic	R6	10,000 ohm volume control
C12, 13	Tuning condenser	C30b	30 mfd., dry electrolytic	R7	15 megohm carbon resistor
C14	47 mmf., mica capacitor	C32	.02 mfd., line capacitor	R8, 10	470,000 ohm carbon resistor
C15	.25 mfd., paper capacitor	C34	35 mfd., dry electrolytic	R11	270,000 ohm carbon resistor
C19	.05 mfd., paper capacitor		(for 25 v sets only)	R12	680,000 ohm carbon resistor
C24	.002 mfd., paper capacitor	C35	150 mmf., mica capacitor	T1	1st I.F. transformer
C25	330 mmf., mica capacitor	R1	47,000 ohm carbon resistor	T2	2nd I.F. transformer
C26	.15 mfd., paper capacitor	R2	10,000 ohm carbon resistor	T3	Output transformer
C27	.005 mfd., paper capacitor	R3	Ballast resistor	T4	Oscillator transformer
C28	.03 mfd., paper capacitor	R4	330 ohm carbon resistor	T5	Antenna transformer
C29	.001 mfd., paper capacitor	R5	10,000 ohm carbon resistor		

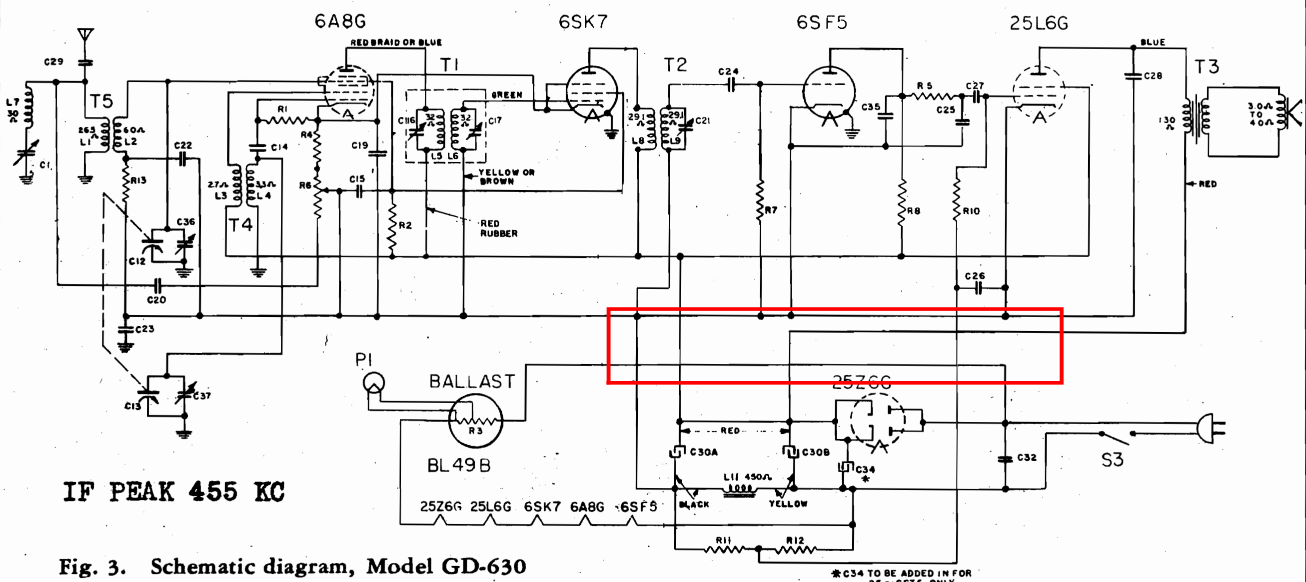


Fig. 3. Schematic diagram, Model GD-630

Symbol	Description	Symbol	Description	Symbol	Description
C1	Wave trap trimmer	C28	.03 mfd., paper capacitor	R5	10,000 ohm carbon resistor
C12, 13	Tuning condenser	C29	.001 mfd., paper capacitor	R6	10,000 ohm volume control
C14	47 mmf., mica capacitor	C30a	10 mfd., dry electrolytic	R7	15 megohm carbon resistor
C15	.25 mfd., paper capacitor	C30b	30 mfd., dry electrolytic	R8, 10	470,000 ohm carbon resistor
C19	.05 mfd., paper capacitor	C32	.02 mfd., line capacitor	R11	270,000 ohm carbon resistor
C20	.05 mfd., paper capacitor	C34	35 mfd, dry electrolytic	R12	680,000 ohm carbon resistor
C22	.05 mfd., paper capacitor		(used on 25-cycle sets only)	R13	470,000 ohm carbon resistor
C23	.20 mfd., paper capacitor	C35	150 mmf., mica capacitor	T1	1st I.F. transformer
C24	.002 mfd., paper capacitor	R1	47,000 ohm carbon resistor	T2	2nd I.F. transformer
C25	330 mmf., mica capacitor	R2	10,000 ohm carbon resistor	T3	Output transformer
C26	.15 mfd. paper capacitor	R3	Ballast resistor	T4	Oscillator transformer
C27	.005 mfd., paper capacitor	R4	330 ohm carbon resistor	T5	Antenna transformer

MODEL GD600
MODEL GD630
Socket, Trimmers
Voltage, Alignment

GENERAL ELECTRIC CO.

MODELS GD-600 AND GD-630

SERVICE DATA

Specifications

Model	GD-600	GD-630
Height	8¼ inches	8¼ inches
Width	12⅜ inches	12⅜ inches
Depth	5¾ inches	5¾ inches

Tuning Control Drive Ratio 1:1

Electrical Specifications

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
100–125 Volts AC or DC	40–60	50

Tuning Frequency Range..........540–1750 kc.

Intermediate Frequency...........455 kc.

Electrical Power Output (120-line Volts)

	AC	DC
Undistorted	1.0	0.9
Maximum	1.8	1.5

Loud-speaker—Electrodynamic

Outside Cone Diameter.........5 inches
Voice Coil Impedance
(400 cycles).................4.0 ohms
Field Coil Resistance...........420 ohms

Tubes

Converter and Oscillator........GE-6A8G
I.F. Amplifier.................GE-6SK7
Detector......................GE-6SF5
Power Output.................GE-25L6G
Rectifier......................GE-25Z6G
Pilot Lamp...................Mazda No. 44
Ballast......................BL49-B

Production Change

On a number of receivers, substitute electrolytic RC-5113 is used for C30b with both sections tied in parallel and RC-5114 is used for C30a.

GENERAL INFORMATION

The models GD-600 and GD-630 are compact six-tube AC-DC superheterodyne receivers employing five General Electric tubes plus a ballast tube, as described above in a superheterodyne circuit. Features of design include I.F. wave trap, automatic overload control and an efficient electrodynamic speaker. Model GD-630 is fully approved by Underwriters' Laboratories.

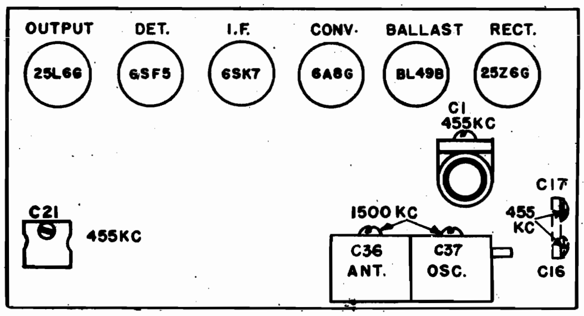


Fig. 1. Trimmer Location

VOLTAGE CHART

Tube No.	6A8G	6SK7	6SF5	25L6G	25Z6G
Plate to −B volts	112	112	35*	102	..
Screen to −B volts	75	75	..	112	..
Cathode to −B volts	3.4	3.4	0	0	134
Filament volts	6.4	6.4	6.4	24	24

Line Voltage—120 V. AC. No signal input—Vol. control at max.
* Measured on 250-volt scale.
On DC, voltages are about 15 per cent lower.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.—455 K.C.   Broadcast—1500 K.C.
The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.

Set test oscillator to 455 K.C. and apply signal to the control grid of the 6A8G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 6A8G. Keep the test oscillator output as low as possible to give a readable output. Adjust all I.F. trimmers for maximum output.

Wave Trap Alignment

Leave the test oscillator set to 455 K.C. and connect one output lead to the receiver chassis and the other through a 250 mmf. capacitor in series with 200 ohms to the receiver antenna lead. Adjust (C-1) for minimum output.

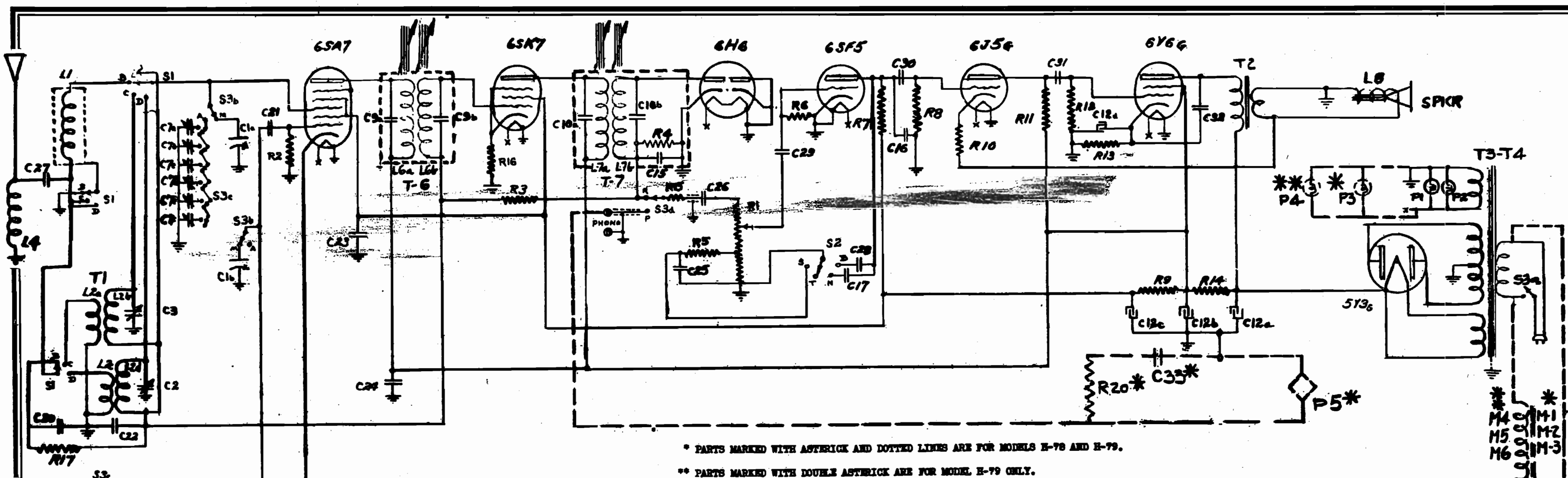
R. F. Alignment

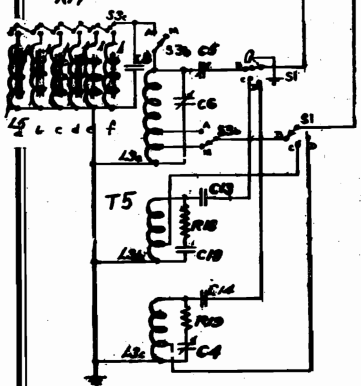
Use the same dummy antenna (250 mmf. and 200 ohms) with 1500 K.C. input, adjust the oscillator trimmer (C-37) and antenna trimmer (C-36) for a maximum output.

Precaution—On the Model GD-600, one side of the power supply is connected to the chassis. If signal generator is AC operated, connect a .05 mfd. capacitor in the ground side before connecting it to the receiver chassis.

GENERAL ELECTRIC CO.

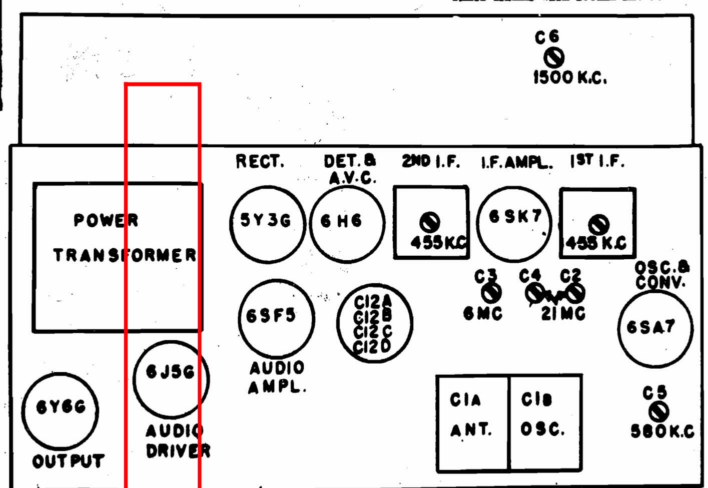
MODELS H73,H77,H79
Preliminary
Schematic,Socket
Alignment,Trimmers





* PARTS MARKED WITH ASTERICK AND DOTTED LINES ARE FOR MODELS H-78 AND H-79.

** PARTS MARKED WITH DOUBLE ASTERICK ARE FOR MODEL H-79 ONLY.



Symbol	Description
C-1	Tuning Condenser
C-2	"D" band antenna trimmer
C-3	"C" band antenna trimmer
C-4	"D" band oscillator trimmer
C-5	"B" band oscillator padder
C-6	"B" band oscillator trimmer
C-7	Station selector trimmers
C-8	750 mmf. silvered mica capacitor
C-9	Adjusted silvered mica capacitor
C-10	Adjusted silvered mica capacitor
C-12a	40 mfd. 300 V. dry electrolytic
C-12b	20 mfd. 300 V. dry electrolytic
C-12c	20 mfd. 300 V. dry electrolytic
C-12d	20 mfd. 25 V. dry electrolytic
C-13	2000 mmf. mica capacitor
C-14	5600 mmf. mica capacitor
C-15	100 mmf. mica capacitor
C-16	100 mmf. mica capacitor
C-17	680 mmf. mica capacitor
C-19	22 mmf. mica capacitor
C-20	4700 mmf. mica capacitor
C-21	50 mmf. mica capacitor
C-22	.05 mfd. 600 V. paper capacitor
C-23	.05 mfd. 600 V. paper capacitor
C-24	.05 mfd. 600 V. paper capacitor
C-25	.0072 mfd. 600 V. paper capacitor
C-26	.005 mfd. 600 V. paper capacitor
C-27	0.1 mfd. 200 V. paper capacitor
C-28	.002 mfd. 600 V. paper capacitor
C-29	.01 mfd. 600 V. paper capacitor
C-30	.005 mfd. 600 V. paper capacitor
C-31	.02 mfd. 600 V. paper capacitor
C-32	.01 mfd. 600 V. paper capacitor
C-33	.01 mfd. 600 V. paper capacitor
L-1	Beam-a-scope
L-2	antenna coil
L-3	oscillator coil
L-4	antenna choke
L-5	station selector inductances
M-1	Phono motor, 60 cycles
M-2	Phono Motor, 50 cycles
M-3	Phono motor, 25 cycles
M-4	Phono motor, 60 cycles
M-5	Phono motor, 50 cycles
M-6	Phono motor, 25 cycles
P-1	Pilot Lamp, Mazda No.44
P-2	Pilot Lamp, Mazda No.44
P-3	Pilot Lamp, Mazda No.44
P-4	Pilot Lamp, Mazda No.44
P-5	Crystal Pick-up.
R-1	Volume Control
R-2	22,000 ohms 1/2 W. carbon
R-3	2.2 megohms 1/2 W. carbon
R-4	470,000 ohms 1/2 W. carbon
R-5	56,000 ohms 1/2 W. carbon
R-6	15 megohms 1/4 W. carbon
R-7	220,000 ohms 1/2 W. carbon
R-8	1.0 megohm 1/2 W. carbon
R-9	3,900 ohms 1/2 W. carbon
R-10	3,300 ohms 1/2 W. carbon
R-11	100,000 ohms 1/2 W. carbon
R-12	330,000 ohms 1/2 W. carbon
R-13	220 ohms 2 W. carbon
R-14	3,300 ohms 2 W. carbon
R-15	47,000 ohms 1/2 W. carbon
R-16	470 ohms 1/2 W. carbon
R-17	47,000 1/2 W. carbon
R-18	150 ohms 1/2 W. carbon
R-19	68 ohms 1/2 W. carbon
R-20	100,000 ohms 1/2 W. carbon
S-1	Band switch
S-2	Tone switch
S-3a	Power switch
S-3b	Manual switch
S-3c	Station selector switch
S-3d	Phonograph switch
T-2	Output Transformer
T-3	Power Transformer, 60 cycles
T-4	Power Transformer, 25 cycles
T-6	1st I.F. Transformer
T-7	2nd I.F. Transformer

ALIGNMENT

Set dial pointer to first line at left end of scale with gang condenser plates completely closed.

1. Turn band switch to "B" band and, using non-metallic screwdriver, align I.F. at 455 K.C. by visual or output meter method. I.F. transformers are double, permeability tuned with adjusting shafts at top and bottom of shield cans.

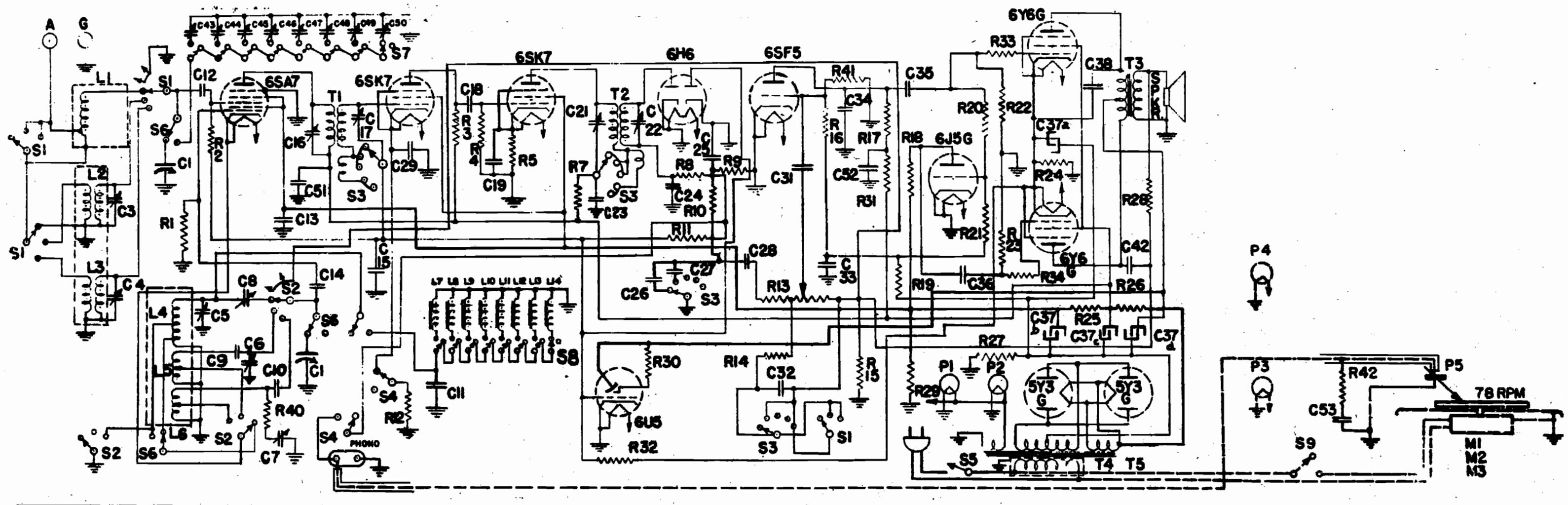
2. On "B" band, set dial pointer to 580 K.C. mark and tune in 580 K.C. signal with (C5). Then peak (C6) on 1500 K.C. while rocking gang condenser. Re-peak (C5) on 580 K.C. and end by re-peaking (C6) on 1500 K.C.

3. On "C" band, tune gang condenser to 6MC signal and peak with (C3) for maximum output.

4. On "D" band, align (C4) at 21 MC. Peak (C2) for maximum output by rocking gang condenser. The image of the 21 MC signal should be heard at approximately 20 MC.

MODELS H116,H118
Preliminary
Schematic,Socket
Alignment,Trimmers

GENERAL ELECTRIC CO.



Symbol	Description
C-1	Tuning Capacitor
C-3	"C" Band Antenna Trimmer
C-4	"D" Band Antenna Trimmer
C-5	"B" Band Oscillator Trimmer
C-6	"C" Band Oscillator Trimmer
C-7	"D" Band Oscillator Trimmer
C-8	"B" Band Padder
C-9	1800 mmf. mica Capacitor
C-10	4300 mmf. Mica Capacitor
C-11	750 mmf. Silvered Mica Capacitor
C-12	150 mmf. Mica Capacitor
C-13	0.1 mfd. 600 V. Paper Capacitor
C-14	47 mmf. mica Capacitor
C-15	0.1 mfd. 200 V. Paper capacitor
C-18	47 mmf. mica Capacitor
C-19	.05 mfd. 200 V. Paper Capacitor
C-23	.05 mfd. 600 V. Paper Capacitor
C-24	100 mmf. Mica Capacitor
C-25	47 mmf. Mica Capacitor
C-26	.001 mfd. 600 V. Paper Capacitor
C-27	470 mmf. Mica Capacitor
C-28	.01 mfd. 600 V. Paper Capacitor
C-29	.05 mfd. 200 V. Paper Capacitor
C-31	.01 mfd. 600 V. Paper Capacitor
C-32	.003 mfd. 600 V. Paper Capacitor
C-33	0.1 mfd. 200 V. Paper Capacitor
C-34	47 mmf. Mica Capacitor
C-35	.05 mfd. 600 V. Paper Capacitor
C-36	.05 mfd. 600 V. Paper Capacitor
C-37a	20 mfd. 25 V. Dry Electrolytic
C-37b	[illegible]0 mfd. 300 V. Dry Electrolytic
C-37c	[illegible]0 mfd. 300 V. Dry Electrolytic
C-37d	[illegible]0 mfd. 350 V. Dry Electrolytic
C-38	.02 mfd. 1500 V. Paper Capacitor
C-42	.01 mfd. 1000 V. Paper Capacitor
C-51	0.1 mfd. 600 V. Paper Capacitor
C-52	.25 mfd. 600 V. Paper Capacitor
C-53	.01 mfd. 600 V. Paper Capacitor
R-1	22,000 ohms, 1/2-W. Carbon Resistor
R-2	1.0 megohm, 1/2-W. Carbon Resistor
R-3	6800 ohms, 1/2-W. Carbon Resistor
R-4	47,000 ohms, 1/2-W. Carbon Resistor
R-5	330 ohms, 1/2-W. Carbon Resistor
R-7	1000 ohms, 1/2-W. Carbon Resistor
R-8	47,000 ohms, 1/2-W. Carbon Resistor
R-9	220,000 ohms, 1/2-W. Carbon Resistor
R-10	47,000 ohms, 1/2-W. Carbon Resistor
R-11	2.2 megohms, 1/2-W. Carbon Resistor
R-12	470 ohms, 1/2-W. Carbon Resistor
R-13	2 megohm Volume Control
R-14	100,000 ohms, 1/2-W. Carbon Resistor
R-15	15 ohms, 1/2-W. Carbon Resistor
R-16	4.7 megohms, 1/2-W. Carbon Resistor
R-17	150,000 ohms, 1/2-W. Carbon Resistor
R-18	47,000 ohms, 1/2-W. Carbon Resistor
R-19	1.0 megohms, 1/2-W. Carbon Resistor
R-20	3.3 megohms, 1/2-W. Carbon Resistor
R-21	270,000 ohms, 1/2-W. Carbon Resistor
R-22	220,000 ohms, 1/2-W. Carbon Resistor
R-23	220,000 ohms, 1/2-W. Carbon Resistor
R-24	100 ohms, 3.4 W. Wire Wound
R-25	2400 ohms, 2 W. Carbon Resistor
R-26	2200 ohms, 2.6 W. Wire Wound
R-27	12 ohms, 1/2-W. Carbon Resistor
R-28	68 ohms, 1/2-W. Carbon Resistor
R-29	47,000 ohms, 1/2-W. Carbon Resistor
R-30	1.0 megohm, 1/2-W. Carbon Resistor
R-31	47,000 ohms, 1/2-W. Carbon Resistor
R-32	5.6 megohms, 1/2-W. Carbon Resistor
R-33	1000 ohms, 1/2-W. Carbon Resistor
R-34	1000 ohms, 1/2-W. Carbon Resistor
R-40	33 ohms, 1/2-W. Carbon Resistor
R-41	4.7 megohms, 1/2-W. Carbon Resistor
R-42	100,000 ohms, 1/2-W. Carbon Resistor
PI-4	Pilot Lights, Mazda #44

ALIGNMENT

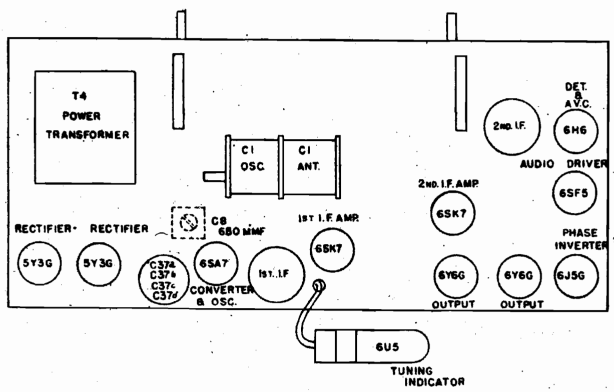
Set dial pointer to first line at left end of scale with gang condenser plates completely closed.

1. Turn band switch to "B" band and, using non-metallic screw-driver, align I.F's at 455 KC by visual or output meter method. I.F. transformers are double, permeability tuned with adjusting shafts at top and bottom of shield cans.

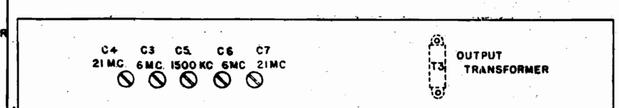
2. On "B" band, set dial pointer to 580 KC mark and tune in 580 KC signal with (C-8). Then peak (C-5) on 1500 KC while rocking gang condenser. Re-peak (C-8) on 580 KC and end by re-peaking (C-5) on 1500 KC.

3. On "C" band, set pointer to 6MC mark and align (C-6) to 6MC. Peak (C-3) for maximum output.

4. On "D" band, align (C-7) at 21 MC. Peak (C-4) for maximum output by rocking gang condenser. The image of the 21 MC signal should be heard at approximately 20 MC.

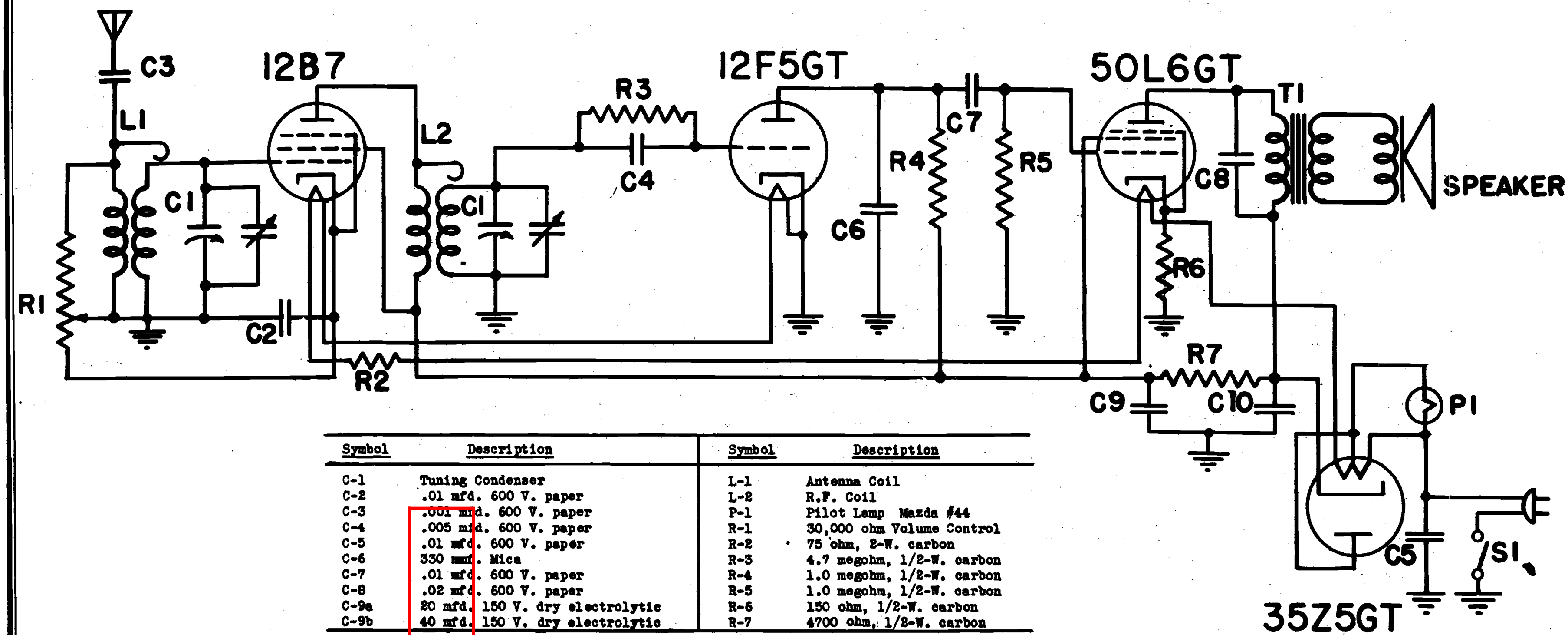


PARTS AND CONNECTORS SHOWN WITH DASH LINES ARE FOR H-118 ONLY.

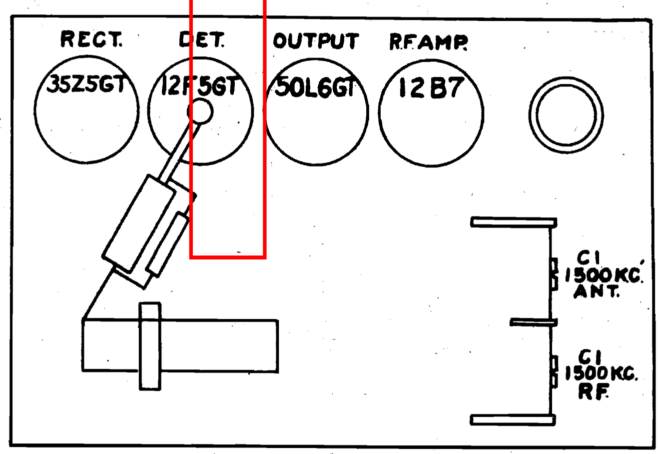


GENERAL ELECTRIC CO.

MODEL H400, Preliminary Schematic, Socket Alignment, Trimmers



Symbol	Description	Symbol	Description
C-1	Tuning Condenser	L-1	Antenna Coil
C-2	.01 mfd. 600 V. paper	L-2	R.F. Coil
C-3	.001 mfd. 600 V. paper	P-1	Pilot Lamp Mazda #44
C-4	.005 mfd. 600 V. paper	R-1	30,000 ohm Volume Control
C-5	.01 mfd. 600 V. paper	R-2	75 ohm, 2-W. carbon
C-6	330 mmf. Mica	R-3	4.7 megohm, 1/2-W. carbon
C-7	.01 mfd. 600 V. paper	R-4	1.0 megohm, 1/2-W. carbon
C-8	.02 mfd. 600 V. paper	R-5	1.0 megohm, 1/2-W. carbon
C-9a	20 mfd. 150 V. dry electrolytic	R-6	150 ohm, 1/2-W. carbon
C-9b	40 mfd. 150 V. dry electrolytic	R-7	4700 ohm, 1/2-W. carbon



ALIGNMENT

Connect the high side of the signal generator through a 100 mmf. capacitor to the terminal to which the antenna bank is soldered. The low side of the signal generator output should be connected to the receiver chassis through a .05 mfd. condenser. Connect a suitable output meter across the voice coil leads; then proceed as follows:

1. With gang condenser plates completely closed, the tuning mark should be over the last mark on the dial.

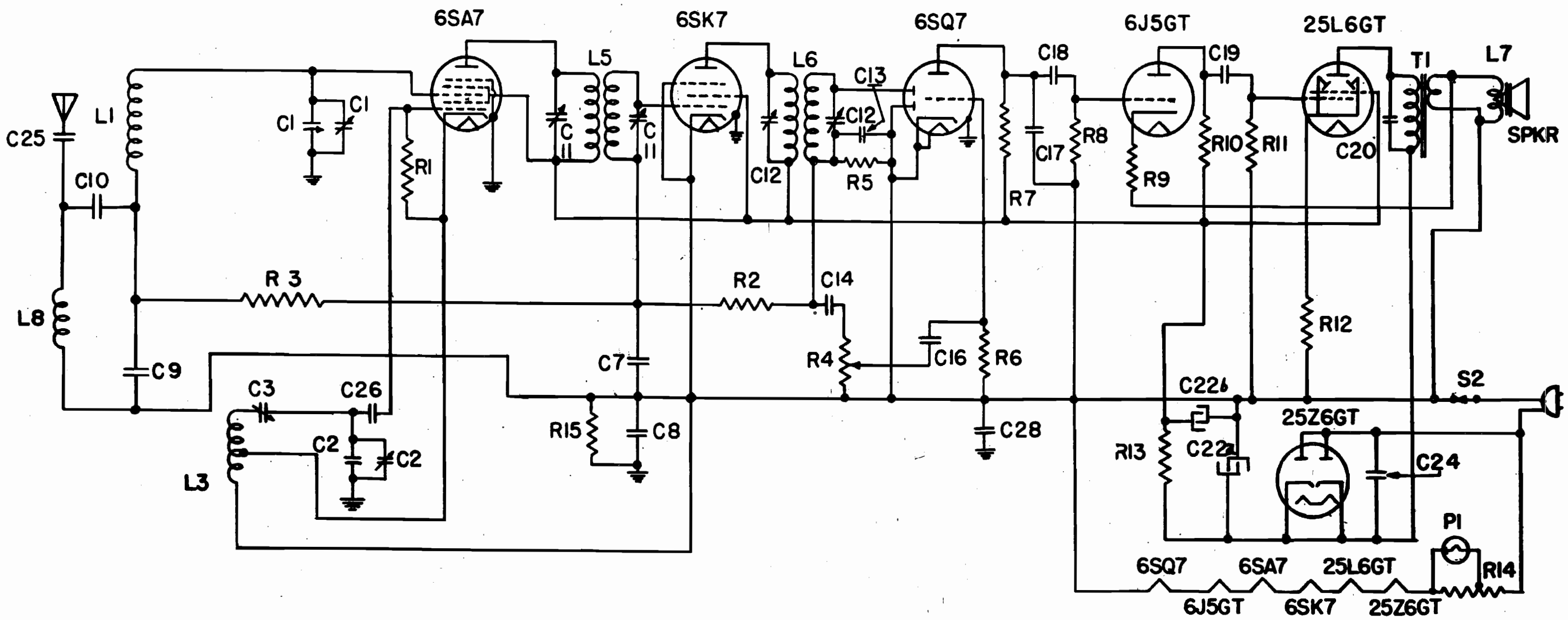
2. Set volume control to about 3/4 maximum.

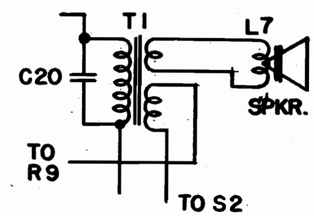
3. Rotate gang to minimum capacity and tune trimmers on the gang condenser to 1750 K.C. signal. Re-tune gang to 1500 K.C. signal and peak trimmers by alternate adjustment.

Precaution--one side of the power supply is connected to the chassis. Do not connect the chassis to any external ground.

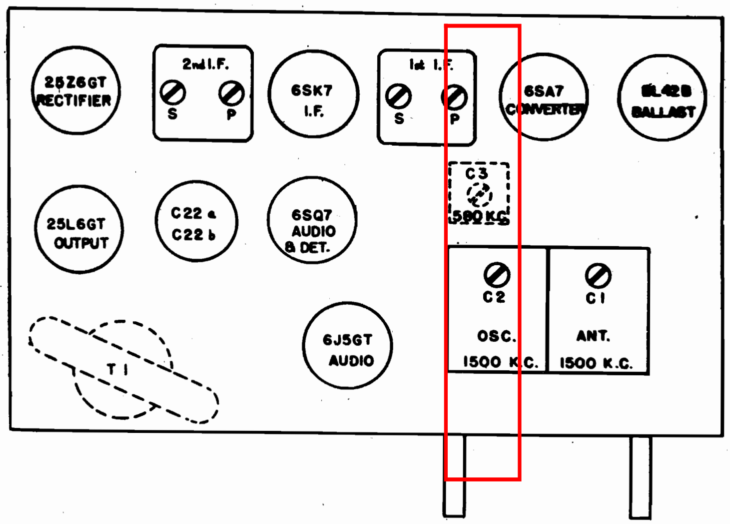
MODELS H600,H601,H610
H611, Preliminary
Schematic,Socket
Alignment,Trimmers

GENERAL ELECTRIC CO.





ON H-601 & H-611 RECEIVERS
SUBSTITUTE THIS TRANS-
FORMER (T-1) FOR ONE SHOWN
ABOVE.



ALIGNMENT

With gang condenser plates completely closed, set dial pointer to first line at left-end of scale.

1. Align I. F.'s at 455 K.C. by visual or output meter method.

2. Apply a 1500 K.C. signal either through a standard I.R.E. dummy to the antenna terminal or by a loop coupling arrangement using an additional loop at the signal generator into which the 1500 K.C. signal is fed and which magnetically couples to the receiver Beam-a-scope. Align (C-2) at 1500 K.C. and peak (C-1) for maximum output. Then peak (C-3) on 580 K.C. while rocking the gang condenser. Retrim at 1500 K.C.

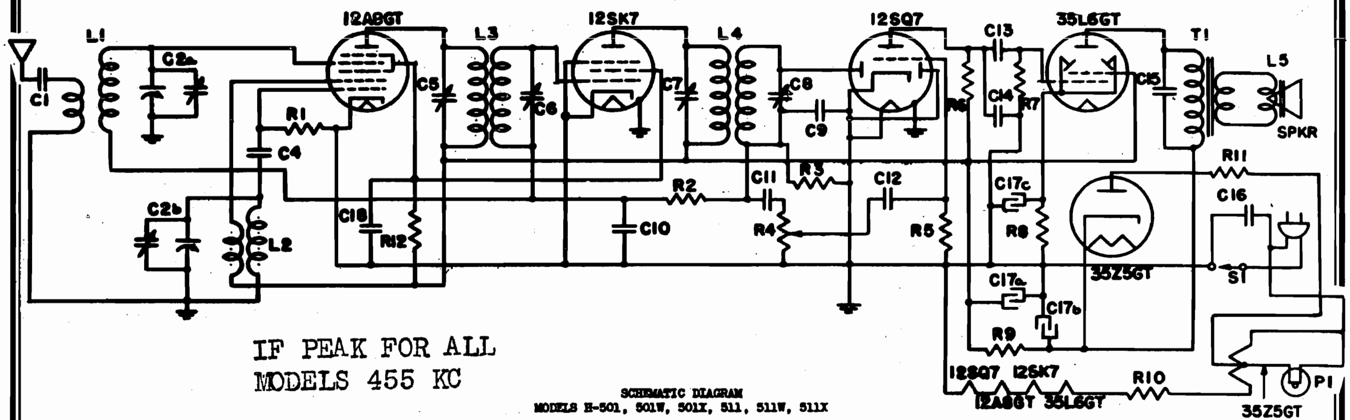
Symbol	Description	Symbol	Description	Symbol	Description
C-1, 2	Tuning Condenser	C-20	.01 mfd. Paper Capacitor	R-3	470,000 ohms Carbon Resistor
C-3	"B" Band Padder	C-22a	50 mfd. Dry Electrolytic	R-4	Volume Control, 2 megohms
C-7	.05 mfd. Paper Capacitor	C-22b	30 mfd. Dry Electrolytic	R-5	470,000 ohms Carbon Resistor
C-8	.1 mfd. Paper Capacitor	C-24	.05 mfd. Paper Capacitor	R-6	15 megohms Carbon Resistor
C-9	3900 mmf. Mica Capacitor	C-25	.01 mfd. Paper Capacitor	R-7	470,000 ohms Carbon Resistor
C-10	.01 mfd. Paper Capacitor	C-26	47 mmf. Mica Capacitor	R-8	1.0 megohm Carbon Resistor
C-13	470 mmf. Mica Capacitor	C-28	.1 mfd. Paper Capacitor	R-9	3300 ohms Carbon Resistor
C-14	.002 mfd. Paper Capacitor	L-1	Loop	R-10	39,000 ohms Carbon Resistor
C-16	.002 mfd. Paper Capacitor	L-3	"B" Band Oscillator Coil	R-11	470,000 ohms Carbon Resistor
C-17	470 mmf. Mica Capacitor	L-8	Antenna Choke 1 1/2 MH.	R-12	150 ohms Carbon Resistor
C-18	.005 mfd. Paper Capacitor	P-1	Pilot Lamp Mazda #44	R-13	1000 ohms Carbon Resistor
C-19	.005 mfd. Paper Capacitor	R-1	33,000 ohms Carbon Resistor	R-14	Ballast Resistor BL42B
		R-2	2.2 megohms Carbon Resistor	R-15	470,000 ohms Carbon Resistor

MODELS H520, H520W, H520X
MODELS H521, H521W, H521X
Schematics Preliminary

GENERAL ELECTRIC CO.

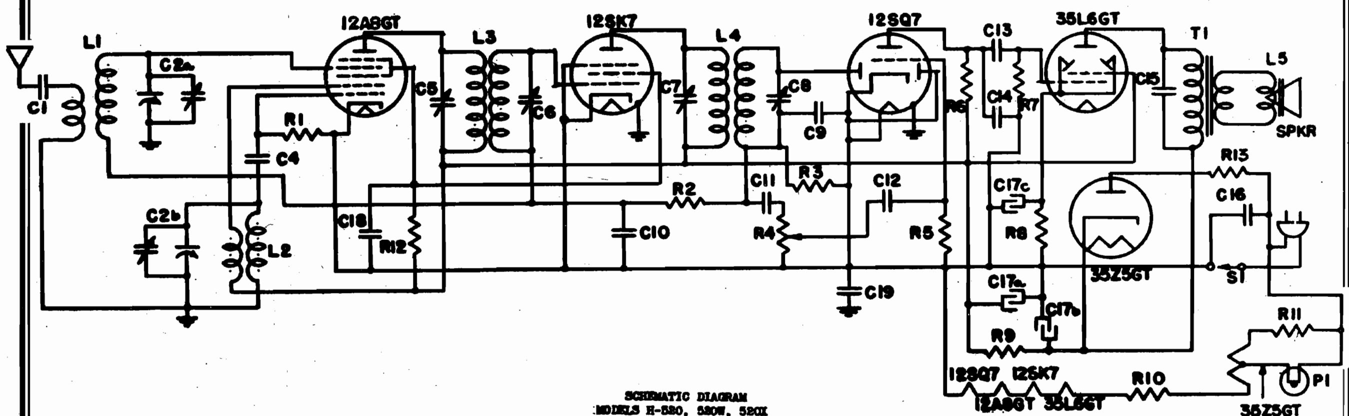
MODELS H500, H500W, H500X
H510, H510W, H510X
MODELS H501, H501W, H501X
H511, H511W, H511X

MODELS H-500, 500W, 500X, 510, 510W, 510X

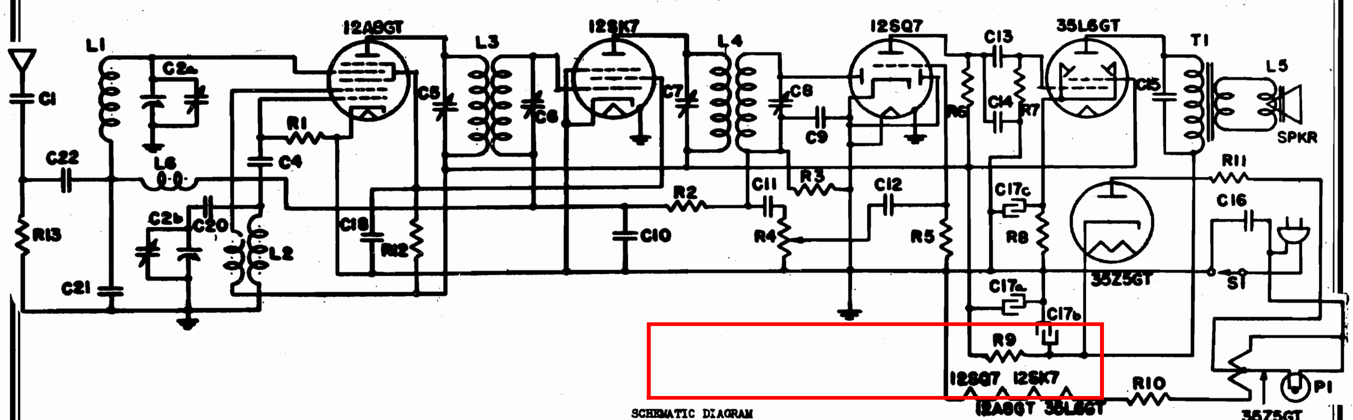


IF PEAK FOR ALL
MODELS 455 KC

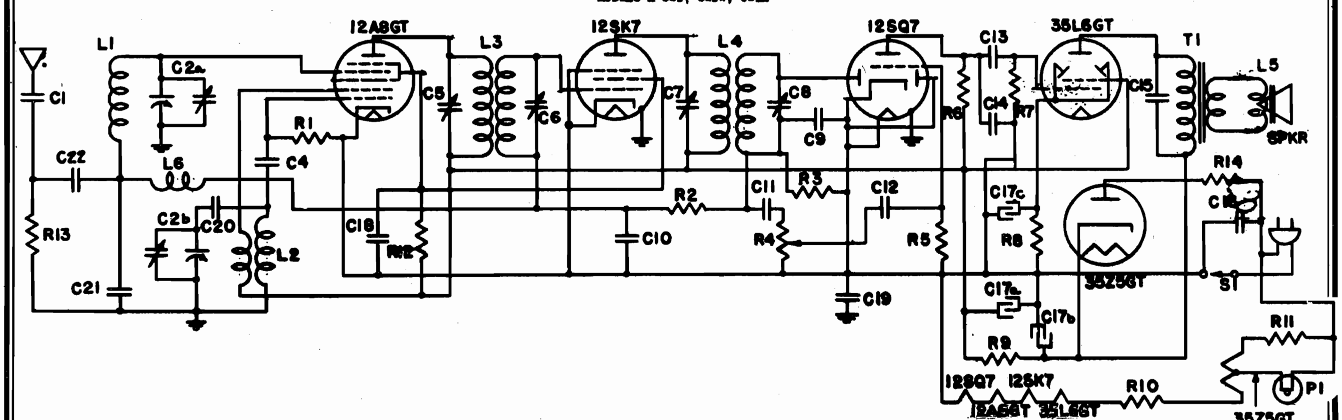
SCHEMATIC DIAGRAM
MODELS H-501, 501W, 501X, 511, 511W, 511X



SCHEMATIC DIAGRAM
MODELS H-520, 520W, 520X



SCHEMATIC DIAGRAM
MODELS H-521, 521W, 521X



MODELS H500,H500W,H500X
H510,H510W,H510X
MODELS H501,H501W,H501X
H511,H511W,H511X

GENERAL ELECTRIC CO.

MODELS H520,H520W,H520X
MODELS H521,H521W,H521X
Alignment,Socket,Parts
Trimmers Preliminary

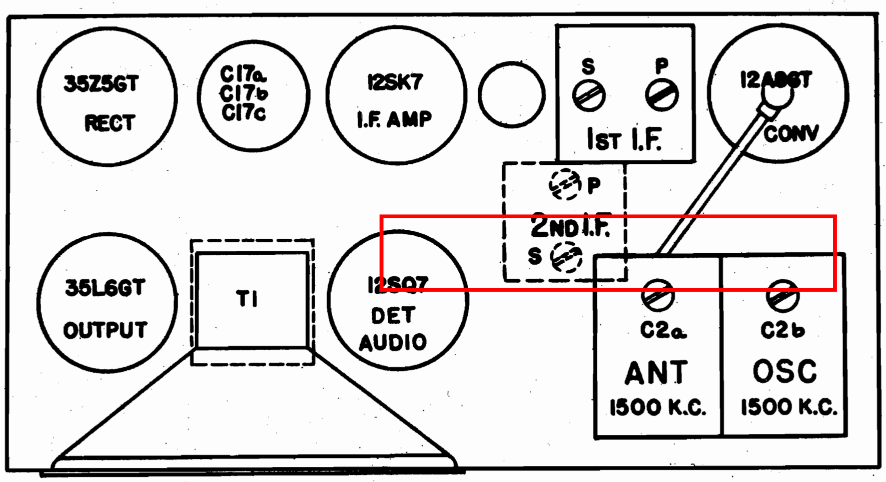
PRELIMINARY
REPLACEMENT PARTS LIST
MODELS H-500, 501, 510, 511, 520, 521
(W & X MODELS INC.)

Stock No.		Description	List Price
*RB-008	BOARD	- Terminal board (2 lug)	.10
*RB-013	BOARD	- Terminal board (2 lug) for models H-500, 501, 510, 511	.10
*RB-070	BOARD	- Terminal board (3 lug) for models H-520 and H-521	.10
RB-179	BRACKET	- Bracket for beam-a-scope frame for models H-520 and H-521	
RB-914	BACK COVER	- Cabinet back for models H-500, 501, 510, 511 (W and X models included)	
RB-915	BACK COVER	- Plastic cabinet back for models H-520 and H-521	
RB-916	BACK COVER	- Plastic cabinet back for models H-520W and H-521W	
RB-917	BACK COVER	- Plastic cabinet back for models H-520X and H-521X	
RC-016	CAPACITOR	- .002 mfd. 600 V. paper (C-1,11.18)	.25
*RC-023	CAPACITOR	- .005 mfd. 600 V. paper (C-13)	.25
*RC-039	CAPACITOR	- .01 mfd. 600 V. paper (C-15)	.25
*RC-072	CAPACITOR	- .05 mfd. 200 V. paper (C-10,18)	.25
*RC-092	CAPACITOR	- .05 mfd. 600 V. paper (C-16)	.30
*RC-130	CAPACITOR	- .2 mfd. 400 V. paper for models H-501, H-511, H-521 (C-19)	.30
*RC-216	CAPACITOR	- 47 mmf. mica (C-4)	.25
*RC-274	CAPACITOR	- 330 mmf. mica (C-14)	.30
*RC-294	CAPACITOR	- 470 mmf. mica (C-9)	.30
*RC-348	CAPACITOR	- 1600 mmf. mica for models H-520, 521	.35
*RC-390	CAPACITOR	- 3900 mmf. mica for models H-520 and H-521 C-21	.35
*RC-863	CORD	- Power Cord	.65
RC-1990	CLAMP	- Antenna coil clamp for models H-500, 501, 510, 511	
RC-5136	CAPACITOR	- 30 mfd. 150 V; 40 mfd. 150 V; 20 mfd. 25 V; dry electrolytic (C-17a, 17b, 17c)	
RC-7012	CONDENSER	- Tuning condenser for models H-510, 511, 520, 521 (C-2a, 2b)	
RC-7013	CONDENSER	- Tuning condenser for models H-500 and H-501 (C-2a, 2b)	
RC-8008	CARDS	- Station letter cards for models H-510, 511, 520, 521	
RC-9013	CONE ASSEMBLY	- Cone assembly for all models	
RD-111	DIAL	- Dial scale for models H-500, 501, 510, 511	
RD-112	DIAL	- Dial scale for models H-520 and H-521	
RD-410	DRUM	- Tuning condenser drive drum assembly for models in brown	
RD-411	DRUM	- Tuning condenser drive drum assembly for all models in white and onyx	
*RG-016	GRID CLIP	- Tube control grid clip (Pkg. 5)	.10
RH-007	HANK	- Antenna hank for models H-500,501,510,511	
RK-048	KNOB	- Control knob for all white models	
RK-061	KNOB	- Control knob for all models except white	
RK-206	KEY	- Station selector key for models H-510,511, 520,521	
RK-207	KEY	- Station selector key for models H-510W, H-511W, H-520W, H-521W	
RK-208	KEY	- Station selector key for models H-510X, H-511X, H-520X, H-521X	
RL-085	COIL	- Antenna coil for models H-500,501,510,511 (L-1)	
RL-290	COIL	- Oscillator coil for models H-500,501,510,511 (L-2)	
RL-291	COIL	- Oscillator coil for models H-520 and H-521 (L-2)	
RL-346	CHOKE	- RF choke for models H-520 and H-521 (L-6)	
RL-510	LOOP	- Beam-a-scope assembly for models H-520 and H-521 (L-1)	
RP-134	PIN	- Key pin for models H-510,511,520,521	
*RQ-1215	RESISTOR	- 15 ohms, 1/2-W. carbon (Pkg. 5)	.70
*RQ-1219	RESISTOR	- 22 ohms, 1/2-W. carbon (R-11)(Pkg. 5) Models H-501,511,521	.70
*RQ-1239	RESISTOR	- 150 ohms, 1/2-W. carbon (R-8)(Pkg. 5)	.70
*RQ-1261	RESISTOR	- 1200 ohms, 1/2-W. carbon (R-9)(Pkg. 5)	.70
*RQ-1281	RESISTOR	- 8200 ohms, 1/2-W. carbon (R-12)(Pkg. 5)	.70
*RQ-1283	RESISTOR	- 10,000 ohms, 1/2-W. carbon (R-13)(Pkg. 5) Models H-520 and H-521	.70
*RQ-1299	RESISTOR	- 47,000 ohms, 1/2-W. carbon (R-1)(Pkg. 5)	.70
*RQ-1323	RESISTOR	- 470,000 ohms, 1/2-W. carbon (R-3,6,7)(Pkg.5)	.70
*RQ-1339	RESISTOR	- 2.2 megohms, 1/2-W. carbon (R-2)(Pkg. 5)	.70
*RQ-1365	RESISTOR	- 15 megohms, 1/4 W. carbon (R-5)(Pkg. 5)	.70
RR-351	RESISTOR	- 100 ohms, 3.4 W. Wire Wound (R-10)	
*RS-238	SOCKET	- Octal tube socket	.15
RS-256	SOCKET	- Electrolytic mounting socket for models H-501,511,521	
RS-257	SOCKET	- Electrolytic mounting socket for models H-500,510,520	
RS-258	SOCKET	- Pilot lamp socket	
RS-951	SPACER	- Speaker cabinet spacer	
RS-1016	SPEAKER	- 4-inch speaker for models H-501,511,521 (L-5)	
RS-1017	SPEAKER	- 4-inch speaker for models H-500,510,520 (L-5)	
RT-321	TRANSFORMER	- 1st IF transformer (L-3) for models H-520 and H-521 (W and X models included)	
RT-322	TRANSFORMER	- 2nd IF transformer (L-4)	
RT-323	TRANSFORMER	- 1st IF transformer for models H-500,H-501,H-510, H-511 (W and X models included)	
RT-465	TRANSFORMER	- Output transformer (T-1)	
RV-070	VOLUME CONTROL	- 2 meg. volume control (R-4)	
RW-039	WINDOW	- Celluloid station letter window for models H-510, 511,520,521	
RZ-152	CABINET	- Cabinet for models H-510,511,520,521	
RZ-153	CABINET	- Cabinet for models H-510W,H-511W, H-520W,H-521W	
RZ-154	CABINET	- Cabinet for models H-510X,H-511X,H-520X,H-521X	
RZ-155	CABINET	- Cabinet for models H-500,H-501	
RZ-156	CABINET	- Cabinet for models H-500W, H-501W	
RZ-157	CABINET	- Cabinet for models H-500X, H-501X	

*Used on previous receivers

(Prices subject to change without notice)

ALIGNMENT FOR
MODELS
H-500,H-501,H-510,H-511
H-520,H-521
(W and X Models incl.)



I-F ALIGNMENT:

Apply a 455-kc signal to the grid of the 12SK7 and align the 2nd i-f transformer by visual or output meter method. Repeat the procedure, applying the 455-kc signal to the grid of the 12A8GT and aligning the 1st i-f transformer.

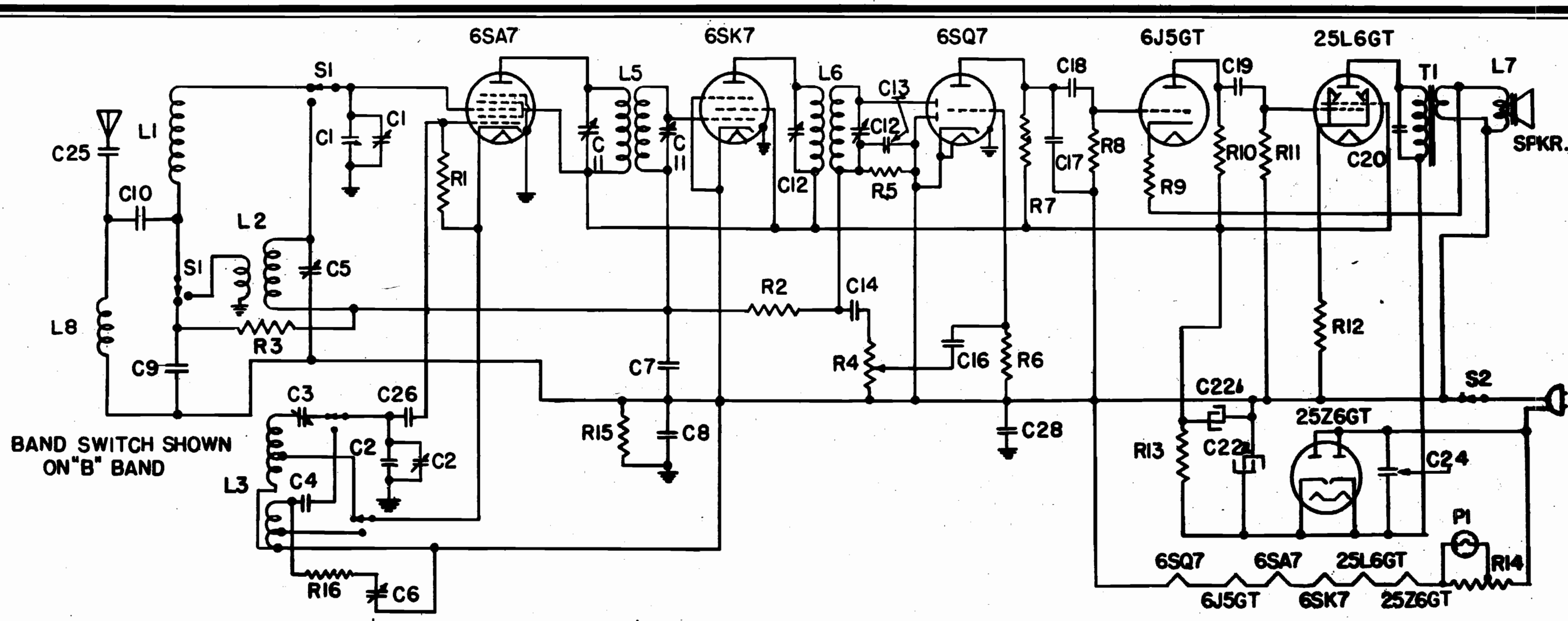
R-F ALIGNMENT:

On Models H500,H501,H510 and H511 (W and X models incl.) apply a 1500-kc signal through a 100 mmf mica condenser to the antenna terminal. Align C-2b. Peak C-2a for maximum output.

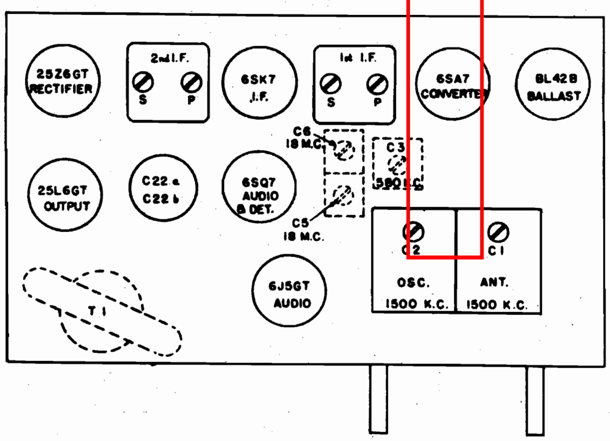
On Models H-520 and H-521 (W and X models incl.), apply a 1500-kc signal either through a standard I.R.E. dummy to the antenna terminal or by a loop coupling arrangement using an additional loop at the signal generator into which the 1500-kc signal is fed and which magnetically couples to the receiver Beam-a-scope. Align C-2b. Peak C-2a for maximum output.

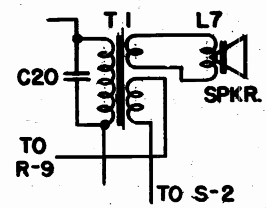
GENERAL ELECTRIC CO.

MODELS H620, H621, H630
H631, H632, H633
Schematic, Socket, Trimmers
Alignment Preliminary



Symbol	Description
C-1, 2	Tuning Condenser
C-3	"B" Band Padder
C-4	3900 mmf. Mica Condenser
C-5	"D" Band Antenna Trimmer
C-6	"D" Band Oscillator Trimmer
C-7	.05 mfd. Paper Capacitor
C-8	.1 mfd. Paper Capacitor
C-9	3900 mmf. Mica Capacitor
C-10	.01 mfd. Paper Capacitor
C-13	470 mmf. Mica Capacitor
C-14	.002 mfd. Paper Capacitor
C-16	.002 mfd. Paper Capacitor
C-17	470 mmf. Mica Capacitor
C-18	.005 mfd. Paper Capacitor
C-19	.005 mfd. Paper Capacitor
C-20	.01 mfd. Paper Capacitor
C-22a	50 mfd. Dry Electrolytic
C-22b	30 mfd. Dry Electrolytic
C-24	.05 mfd. Paper Capacitor
C-25	.01 mfd. Paper Capacitor
C-26	47 mmf. Mica Capacitor
C-28	0.1 mfd. Paper Capacitor
L-1	Loop
L-2	"D" Band antenna coil
L-3	"B-D" Band Oscillator Coil
L-8	Antenna Choke 1 1/2 MH.
P-1	Pilot Lamp Mazda #44
R-1	33,000 ohms Carbon Resistor
R-2	2.2 megohms Carbon Resistor
R-3	470,000 ohms Carbon Resistor
R-4	Volume Control, 2 megohms
R-5	470,000 ohms Carbon Resistor
R-6	15 megohms Carbon Resistor
R-7	470,000 ohms Carbon Resistor
R-8	1.0 megohm Carbon Resistor
R-9	3300 ohms Carbon Resistor
R-10	39,000 ohms Carbon Resistor
R-11	470,000 ohms Carbon Resistor
R-12	150 ohms Carbon Resistor
R-13	1000 ohms Carbon Resistor
R-14	Ballast Resistor BL42B
R-15	470,000 ohms Carbon Resistor
R-16	100 ohms Carbon Resistor





ON H-621, H-631 & H-633 RECEIVERS SUBSTITUTE THIS TRANSFORMER (T-1) FOR ONE SHOWN ABOVE

ALIGNMENT

With gang condenser plates completely closed, set dial pointer to first line at left-end of scale.

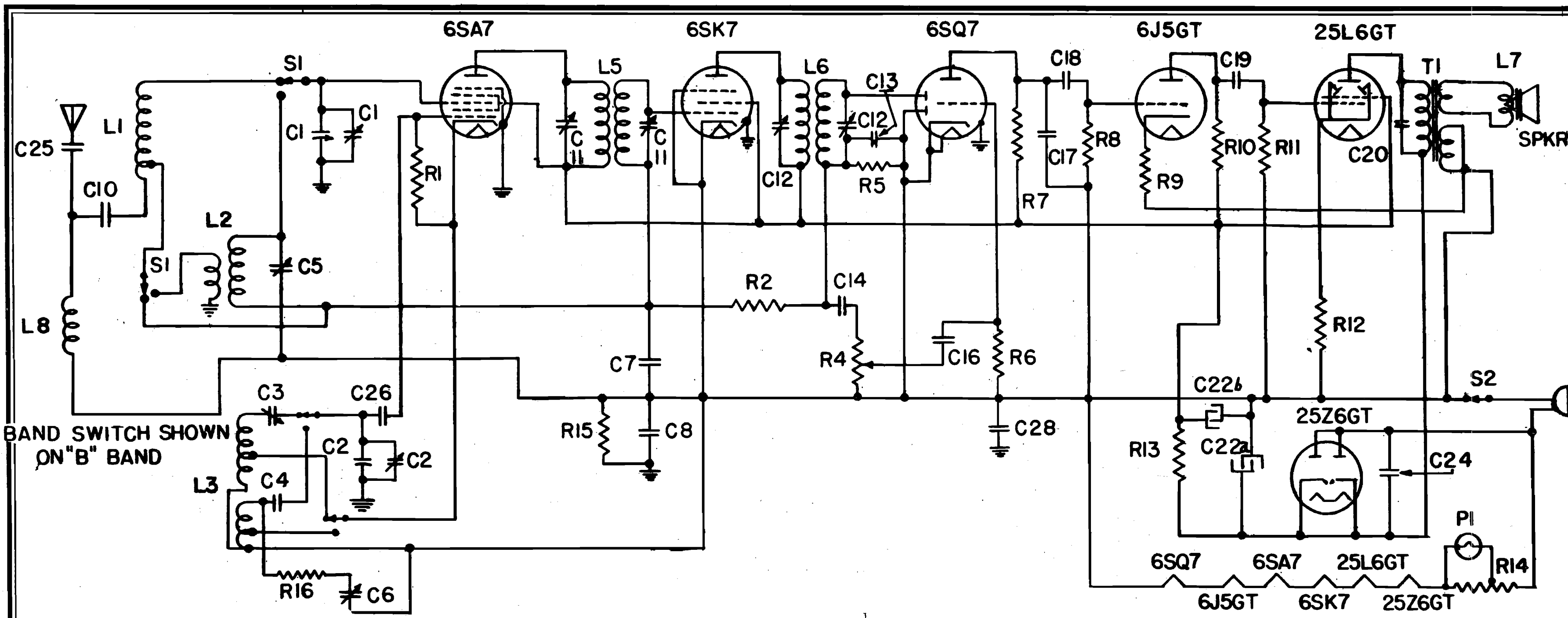
1. Turn band switch to "B" band, if the receiver has two bands, and align I.F.'s at 455 K.C. by visual or output meter method.

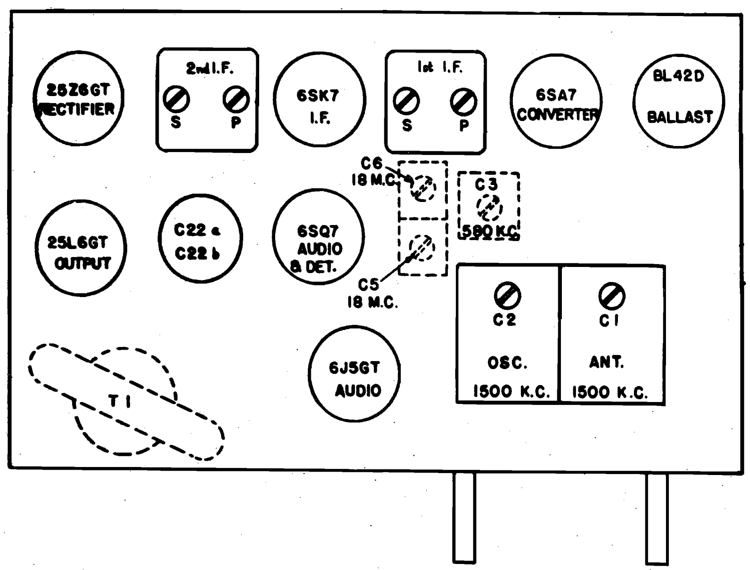
2. Apply a 1500 K.C. signal either through a standard I.R.E. dummy to the antenna terminal or by a loop coupling arrangement using an additional loop at the signal generator into which the 1500 K.C. signal is fed and which magnetically couples to the receiver Beam-a-scope. Align (C-2) at 1500 K.C. and peak (C-1) for maximum output. Then peak (C-3) on 580 K.C. while rocking the gang condenser. Retrim at 1500 K.C.

3. Turn band switch to "D" band, align (C-6) at 18 M.C. and peak (C-5) while rocking the gang condenser. The image of the 18 M.C. signal should be heard at approximately 17 M.C.

MODEL H625 Preliminary
Schematic, Socket
Alignment, Trimmers

GENERAL ELECTRIC CO.





C-1, 2	Tuning Condenser
C-3	"B" Band Padder
C-4	3900 mmf. Mica Condenser
C-5	"D" Band Antenna Trimmer
C-6	"D" Band Oscillator Trimmer
C-7	.05 mfd. Paper Capacitor
C-8	.1 mfd. Paper Capacitor
C-10	.01 mfd. Paper Capacitor
C-13	470 mmf. Mica Capacitor
C-14	.002 mfd. Paper Capacitor
C-16	.002 mfd. Paper Capacitor
C-17	220 mmf. Mica Capacitor
C-18	.005 mfd. Paper Capacitor
C-19	.005 mfd. Paper Capacitor
C-20	.01 mfd. Paper Capacitor
C-22a	50 mfd. Dry Electrolytic
C-22b	30 mfd. Dry Electrolytic
C-24	.05 mfd. Paper Capacitor
C-25	.01 mfd. Paper Capacitor
C-26	47 mmf. Mica Capacitor
C-28	0.1 mfd. Paper Capacitor
L-1	Loop
L-2	"D" Band Antenna Coil
L-3	"B-D" Band Oscillator Coil
L-8	Antenna Choke 1 1/2 MH.
P-1	Pilot Lamp Mazda #44
R-1	33,000 ohms Carbon Resistor
R-2	2.2 megohms Carbon Resistor
R-4	Volume Control, 2 megohms
R-5	470,000 ohms Carbon Resistor
R-6	15 megohms Carbon Resistor
R-7	470,000 ohms Carbon Resistor
R-8	1.0 megohm Carbon Resistor
R-9	3300 ohms Carbon Resistor
R-10	39,000 ohms Carbon Resistor
R-11	470,000 ohms Carbon Resistor
R-12	150 ohms Carbon Resistor
R-13	1000 ohms Carbon Resistor
R-14	Ballast Resistor BL42D
R-15	470,000 ohms Carbon Resistor
R-16	100 ohms Carbon Resistor

ALIGNMENT

With gang condenser plates completely closed, set dial pointer to first line at left-end of scale.

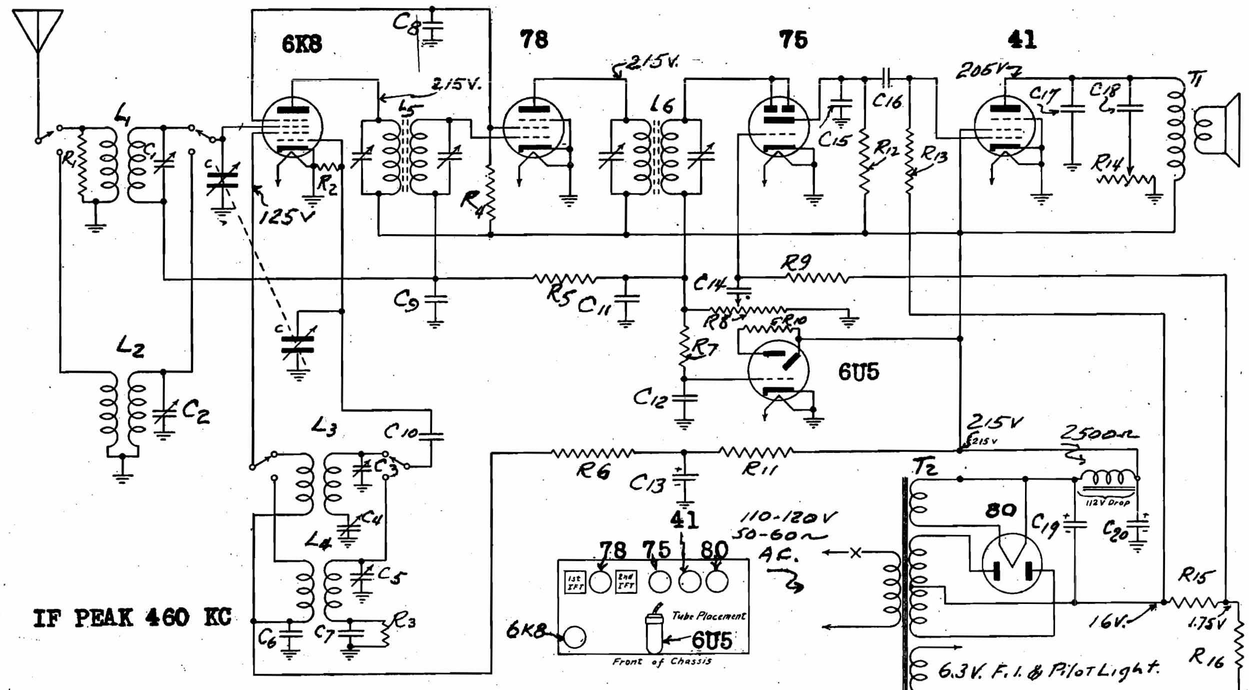
1. Turn band switch to "B" band and align I.F's at 455 KC by visual or output meter method.

2. Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or by a loop coupling arrangement using an additional loop at the signal generator into which the 1500 KC signal is fed and which magnetically couples to the receiver Beam-a-scope. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Then peak (C-3) on 580 KC while rocking the gang condenser. Retrim at 1500 KC.

3. Turn band switch to "D" band, align (C-6) at 18 MC and peak (C-5) while rocking the gang condenser. The image of the 18 MC signal should be heard at approximately 17 MC.

GILFILLAN BROS., INC.

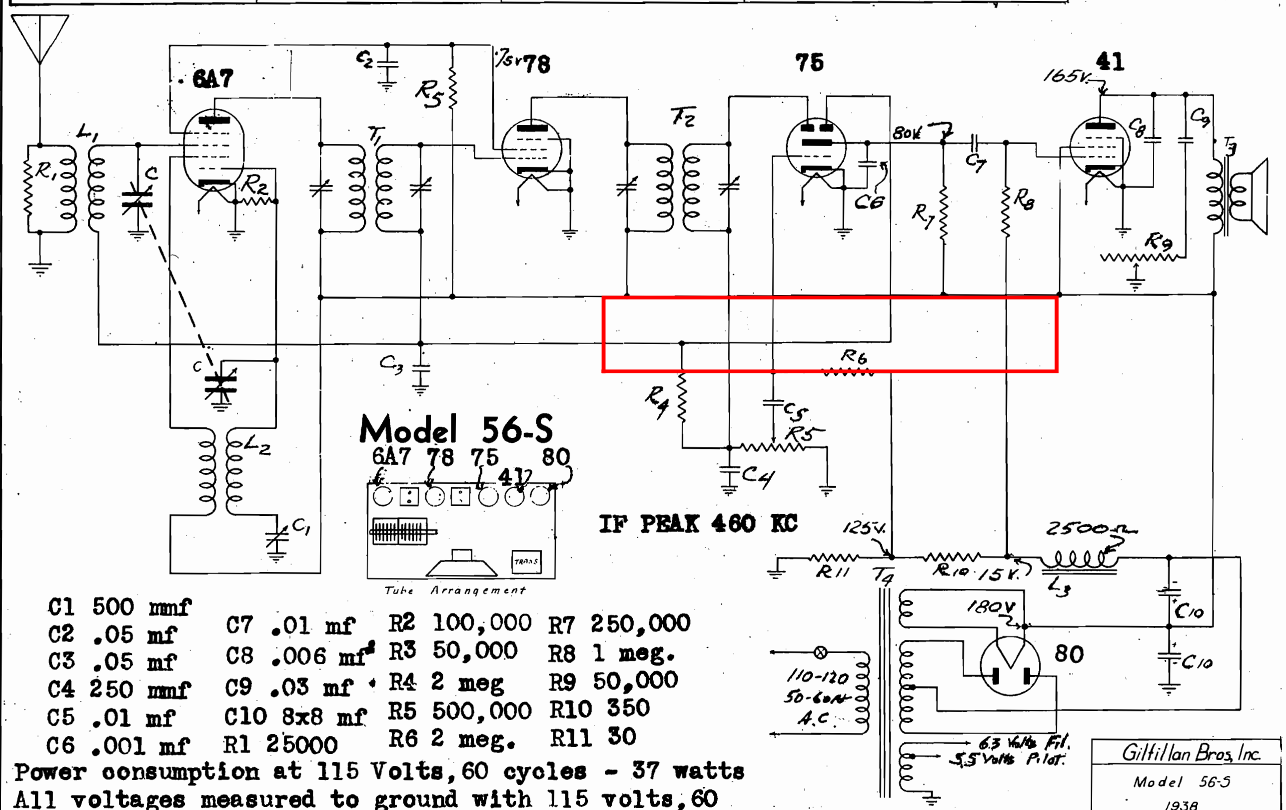
MODEL 56S
MODEL 66S
Schematics
Socket, Voltage



C	2 Gang Condenser	C17	.01 MF. 600V	R11	10 000 Ohms 1/4 Watt
C1	3-30 MMF. Trimmer	C18	.03 MF. 800V	R12	250 000 " " "
C2	3-30 MMF. "	C19	12 MF. 375V Elec	R13	1 Meg " " "
C3	3-30 MMF. "	C20	16 MF 250V "	R14	50 000 " Tone Control
C4	500 MMF. Padder			R15	350 " 1/2 Watt
C5	3-30 MMF. Trimmer			R16	30 " 1/4 "
C6	.05 MF. 400V.	R1	25000 Ohms 1/4 Watt		
C7	Mica	R2	100000 " " "	L1, L2	Antenna Coil B.C. & S.W.
C8	.25 MF. 400V	R3	30000 " " "	L3	Oscillator Coil B.C.
C9	.05 MF. 200V	R4	50000 " 1 "	L4	" " S.W.
C10	50 MMF. Mica	R5	2 Meg " 1/4 "	L5	1st I.F. Trans.
C11	250 MMF. Mica	R6	10000 " " "	L6	2nd I.F. Trans.
C12	.02 MF. 200V	R7	2 Meg " " "		
C13	16 MF. 250V Elec.	R8	50000 " Vol Control	T1	Output Trans.
C14	.01 MF. 400V	R9	2 Meg " 1/4 Watt	T2	Power Trans.
C15	.001 MF. 600V	R10	1 Meg " " "		
C16	.01 MF. 600V				

Power consumption:-
40 watts at 115 volts
60 cycles on primary,
All voltages to ground
with a 1000 ohm per
volt meter.

Gilfillan Bros. Inc.
MODEL 66-S
1938



C1	500 mmf						
C2	.05 mf	C7	.01 mf	R2	100,000	R7	250,000
C3	.05 mf	C8	.006 mf	R3	50,000	R8	1 meg.
C4	250 mmf	C9	.03 mf	R4	2 meg	R9	50,000
C5	.01 mf	C10	8x8 mf	R5	500,000	R10	350
C6	.001 mf	R1	25000	R6	2 meg.	R11	30

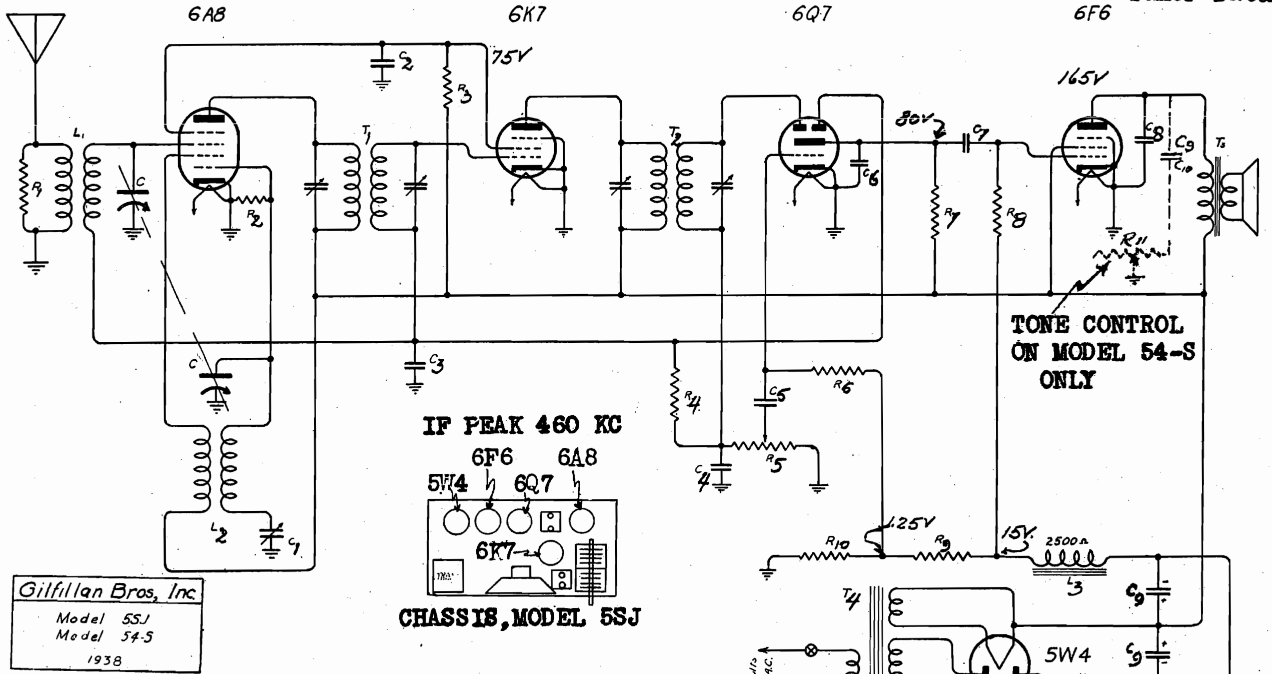
Power consumption at 115 Volts, 60 cycles - 37 watts
All voltages measured to ground with 115 volts, 60
cycles applied to transformer primary using 1000 ohms per volt meter.

Gilfillan Bros, Inc.
Model 56-S
1938

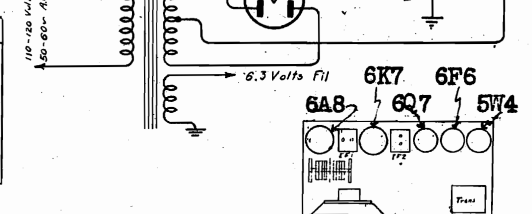
MODELS 5SJ,54S
Schematic,Socket

GILFILLAN BROS., INC.

MODEL 56S
MODEL 66S
Tuner Data



Gilfillan Bros, Inc
Model 5SJ
Model 54-S
1938



CHASSIS,MODEL 54-S

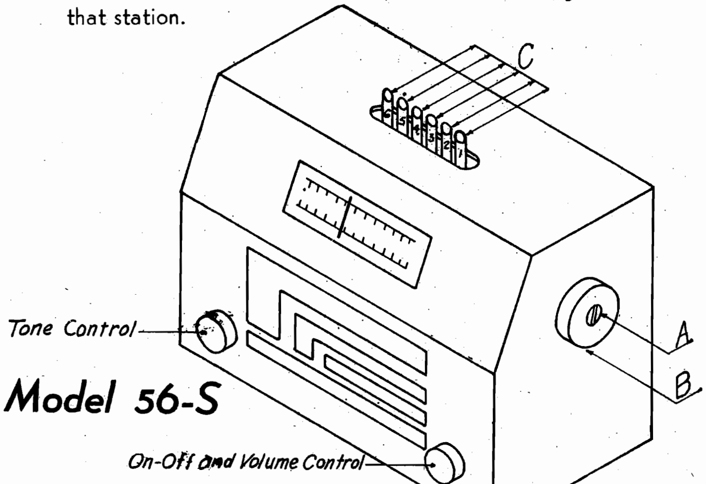
Code	Value	Type	Part No.	Code	Value	Type	Part No.	Code	Item	Part No.
C	2 Gang Variable Condenser			R_1	25,000 Ohms	1/4 Watt		L_1	Antenna Coil	
C_1	500 MMF	Padder		R_2	100,000 "	" "		L_2	Oscillator Coil	
C_2	.05 MF	400 V. Tubular		R_3	50 000 "	" "		L_3	Speaker Field - 2500 Ω	
C_3	.05 MF	200V "		R_4	2 Meg "	" "		T_1	IF Transformer #1	
C_4	250 MMF	Mica		R_5	500,000 "	Vol. Control		T_2	IF Transformer #2	
C_5	.01 MF	200 V. Tubular		R_6	2 Meg "	1/4 Watt		T_3	Output Transformer	
C_6	.001 MF	600V "		R_7	250 000 "	" "		T_4	Power Transformer	
C_7	.01 MF	600V "		R_8	1 Meg "	" "				
C_8	.006 MF	600V "		R_9	350 "	1/2 Watt				
C_9	8×8 M.F.	450V Elec		R_{10}	30 "	1/4 Watt				
C_{10}	.03 MF	800 V. Tub.		R_{11}	50000 "	Tone Contr				

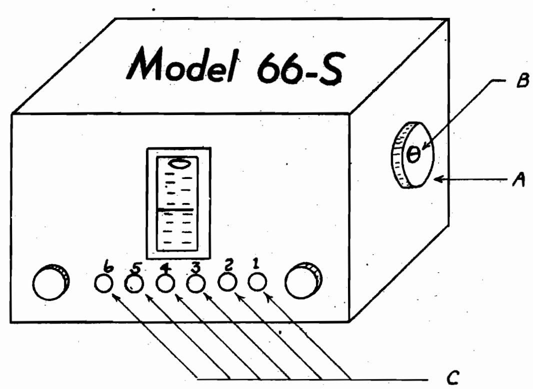
Power Consumption at 115 Volts, 60 Cycles is 33 Watts.
All voltages measured to ground with 115 Volts 60 cycles applied to transformer primary.

SETTING PUSH BUTTONS MODELS 56-S, 66-S.

To set push button station selector proceed as follows:

1. Release mechanism by turning screw "B" in center of manual control knob "A" approximately three turns to the left.
2. Manually tune the radio set by means of turning knob "A" until the pointer is at the bottom end of the dial scale (so that it is pointed at 170). Starting from this point tune the desired station you want to hear (on No. 1 button)
3. Press button marked 1 all the way in, then release. Tune the next station desired manually, then press button No. 2 all the way in, then proceed progressively until all six buttons have been tuned.
4. Turn screw "B" in center of manual control "A" to right until tight, locking the selector mechanism. Any of the stations selected can now be received by depressing its corresponding push button. **BE SURE SELECTOR BUTTON IS PUSHED ALL THE WAY IN,** both when setting selector to a station and when using push button tuning to receive that station.





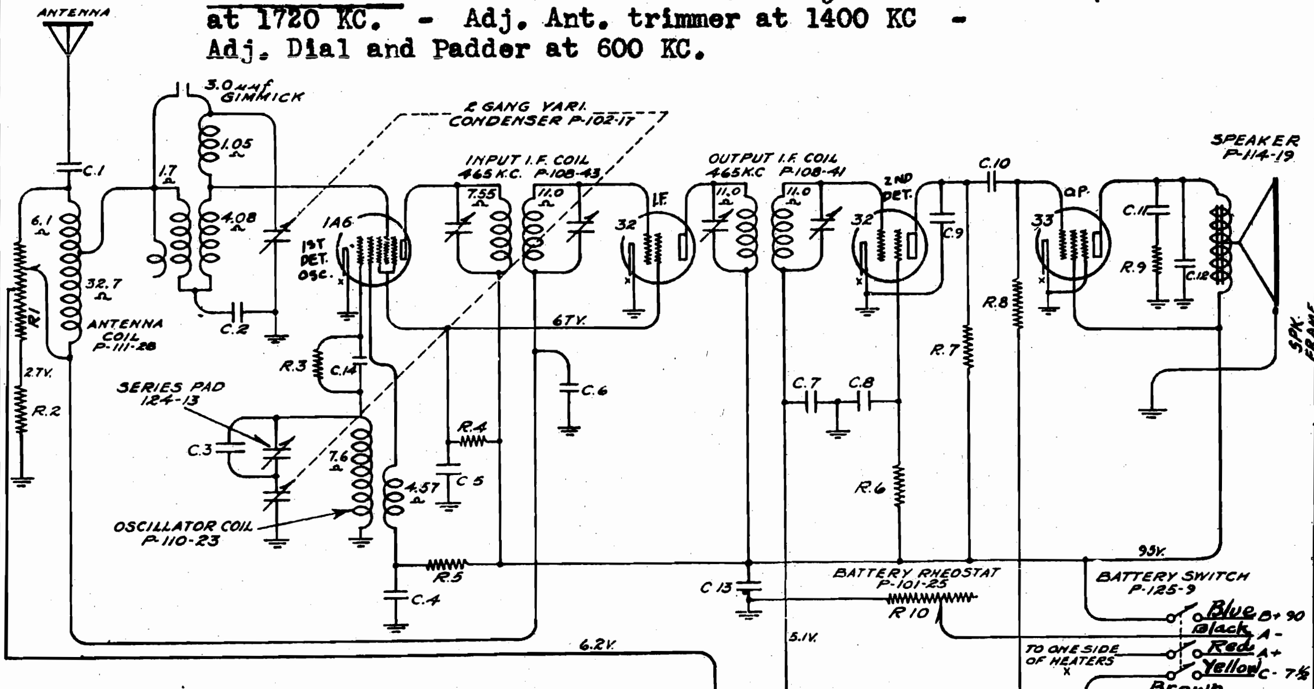
Socket, Trimmers
Alignment

MODEL 404
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

IF ALIGNMENT - Adj. trimmers at 465 KC thru .1 mf cond.-

BC ALIGNMENT - THRU 200 mmf cond.:- Adj. Osc. trimmer at 1720 KC. - Adj. Ant. trimmer at 1400 KC - Adj. Dial and Padder at 600 KC.



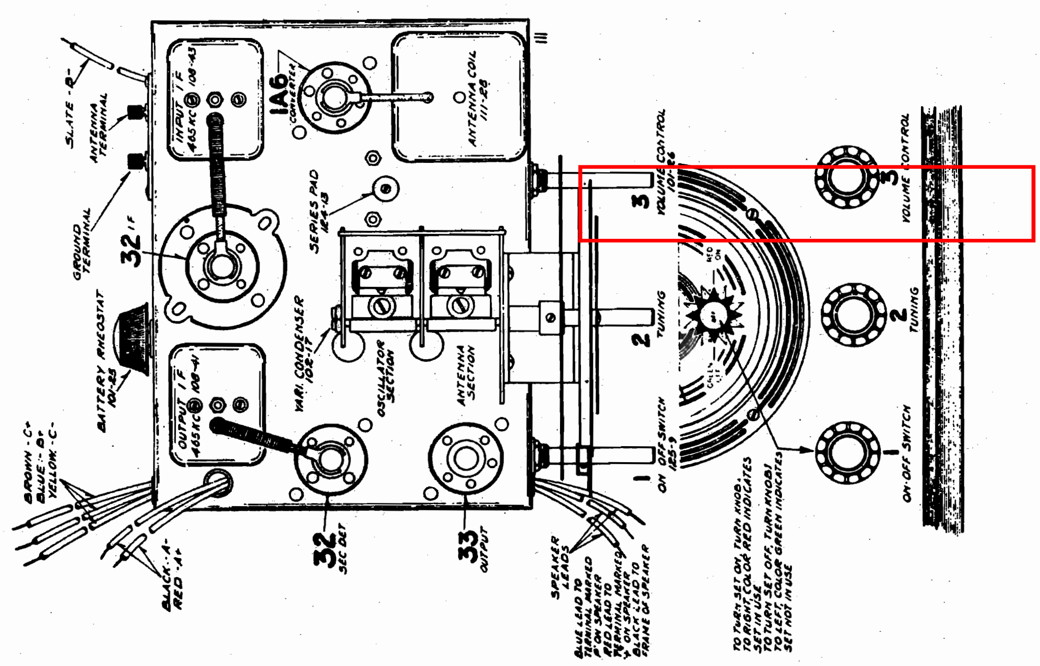
RESISTORS	
Nº	VALUE
R.1:-	20M VOL CONTROL P-101-26
R.2:-	3200Ω
R.3:-	50MΩ 1/3W.
R.4:-	11MΩ 1/3W.
R.5:-	10MΩ 1/3W.
R.6:-	3 MEG.Ω 1/3W.
R.7:-	750MΩ 1/3W.
R.8:-	500MΩ 1/3W.
R.9:-	35MΩ 1/3W.
R.10:-	4Ω BAT. RHEOSTAT P-101-25
R.11:-	1300Ω
R.12:-	1920Ω
R.13:-	9800Ω 1/3W

CONDENSERS	
Nº	VALUE
C.1:-	.001 MICA
C.2:-	.00483 MICA
C.3:-	.000395 MICA
C.4:-	.01 X 200V.
C.5:-	.05 X 200V.
C.6:-	.25 X 200V.
C.7:-	.05 X 200V.
C.8:-	.01 X 200V.
C.9:-	.00025 MICA
C.10:-	.01 X 400V.
C.11:-	.01 X 400V.
C.12:-	.0005 MICA
C.13:-	.25 X 200V.
C.14:-	.00025 MICA

- NOTE -
R.2, R.11, R.12 ARE IN ONE UNIT. P-106-21
C.4, C.5 ARE IN ONE UNIT P-118-11
C.6, C.13 " " " " P-118-5
C.7, C.8 " " " " P-118-11
NUMBERS PREFIXED BY LETTER P ARE PART Nos.
ALL VOLTAGES INDICATED ARE WITH NEW BATTERIES, VOLUME CONTROL ON FULL.

IF PEAK 465 KC

Serial No. 5D115200A and up



BATTERIES NEEDED

The following batteries are needed.

2..........45 volt "B" Batteries.

1..........7½ Volt "C" Battery.

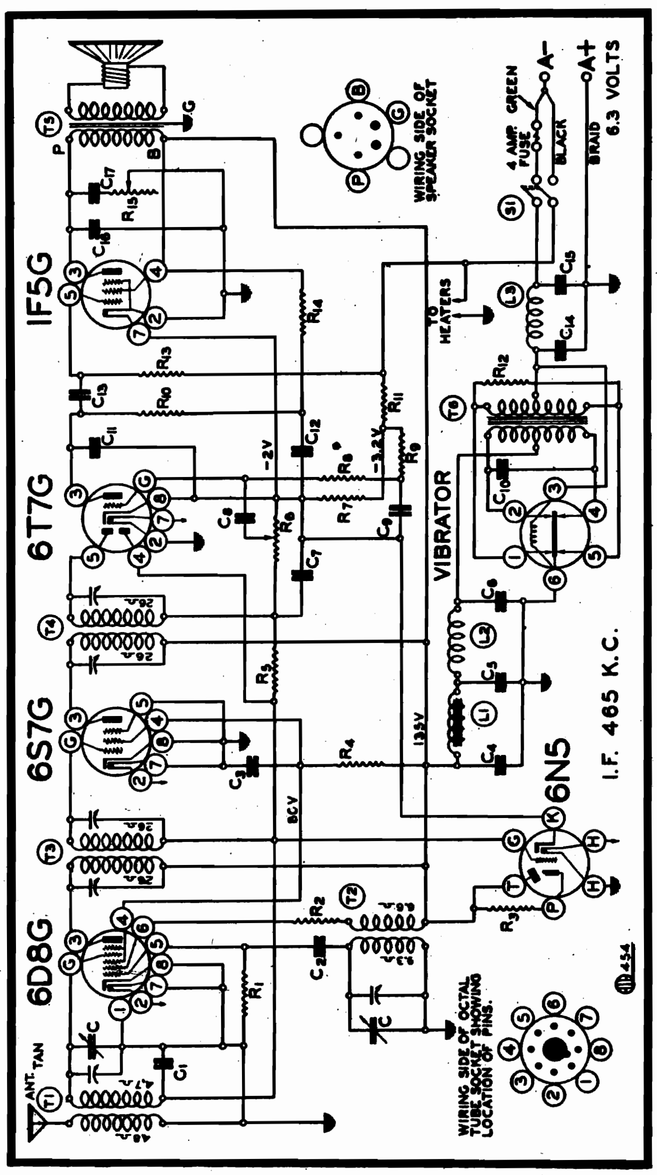
1..........3 Volt Dry "A" Battery or 2 Volt Storage Battery.

MODEL 504
Schematic, Voltage
Socket, Trimmers
Alignment

GOODYEAR TIRE & RUBBER CO., INC.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.



Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

ALIGNING I.F. TRANSFORMERS: (465 K. C.):

Part No. 108-85 Output I.F. Transformer.

Part No. 108-84 Input I.F. Transformer.

These I.F. Transformers have two adjustments, both of which are accessible from the top of chassis (see fig. 1, top view).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments.
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-85) to resonance.
   (b) Move oscillator output clip from grid of 6S7G to grid cap of 6D8G and adjust input I.F. transformer (No. 108-84) to resonance.
   (c) With oscillator still connected to 6D8G readjust output I.F. transformer (108-85) if necessary.

R. F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to tan antenna and black ground leads and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick-up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser)
   (c) Check sensitivity at 600 and 1000 kilocycles.

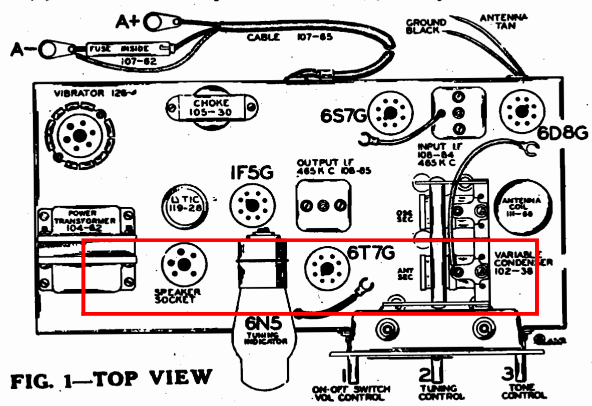


FIG. 1—TOP VIEW

504 SERIES A
535-1720 Kilocycles
Battery Operated

No.	Part No.	Description
		RESISTORS
R1	130-76	30M ohm - 1/3 w.
R2	130-23	2M ohm - 1/3 w.
R3	130-186	250M ohm - 1/10 w. - in tuning indicator
R4	130-123	15M ohm - 1/2 w.
R5	130-121	3.2 megohm - 1/3 w.
R6	101-56	1 megohm volume control
R7	106-36	10 ohms - resistor strip
R8	130-19	1 megohm - 1/3 w.
R9	130-19	1 megohm - 1/3 w.
R10	130-100	150M ohm - 1/3 w.
R11	106-36	25 ohms - resistor strip
R12	130-84	200 ohms - 1/3 w.
R13	130-19	1 megohm - 1/3 w.
R14	130-20	100M ohm - 1/3 w.
R15	101-72	300M ohm - tone control
		R7 and R11 in same unit
		CONDENSERS
C	102-38	2 gang variable
C1	100-9	.05 x 200 v.
C2	129-39	.00035 Mica
C3	100-33	.1 x 200 v.
C4	119-28	5.0 mfd. - 200 w. v. lytic
C5	119-28	5.0 mfd. - 200 w. v. lytic
C6	100-33	.1 x 200 v.
C7	129-5	.0001 Mica
C8	100-11	.01 x 400 v.
C9	100-11	.01 x 400 v.
C10	100-34	.005 x 1200 v.
C11	127-12	.00025 Mica
C12	100-33	.1 x 200 v.
C13	100-11	.01 x 400 v.
C14	100-40	.5 x 200 v.
C15	100-40	.5 x 200 v.
C16	100-37	.003 x 600 v.
C17	100-11	.01 x 400 v.
		C4 and C5 in same unit
		PARTS
T1	111-66	Antenna coil complete
T2	110-45	Oscillator coil complete
T3	108-84	Input I.F. coil complete - 465 kc.
T4	108-85	Output I.F. coil complete - 465 kc.
T5	114-63	P.M. Speaker
T6	104-62	Power Transformer
L1	105-30	Filter Choke
L2	123-3	R. F. "B" Choke
L3	105-19	"A" Choke
S1		Switch on volume control
	126-4	Vibrator

GOODYEAR TIRE & RUBBER CO., INC.

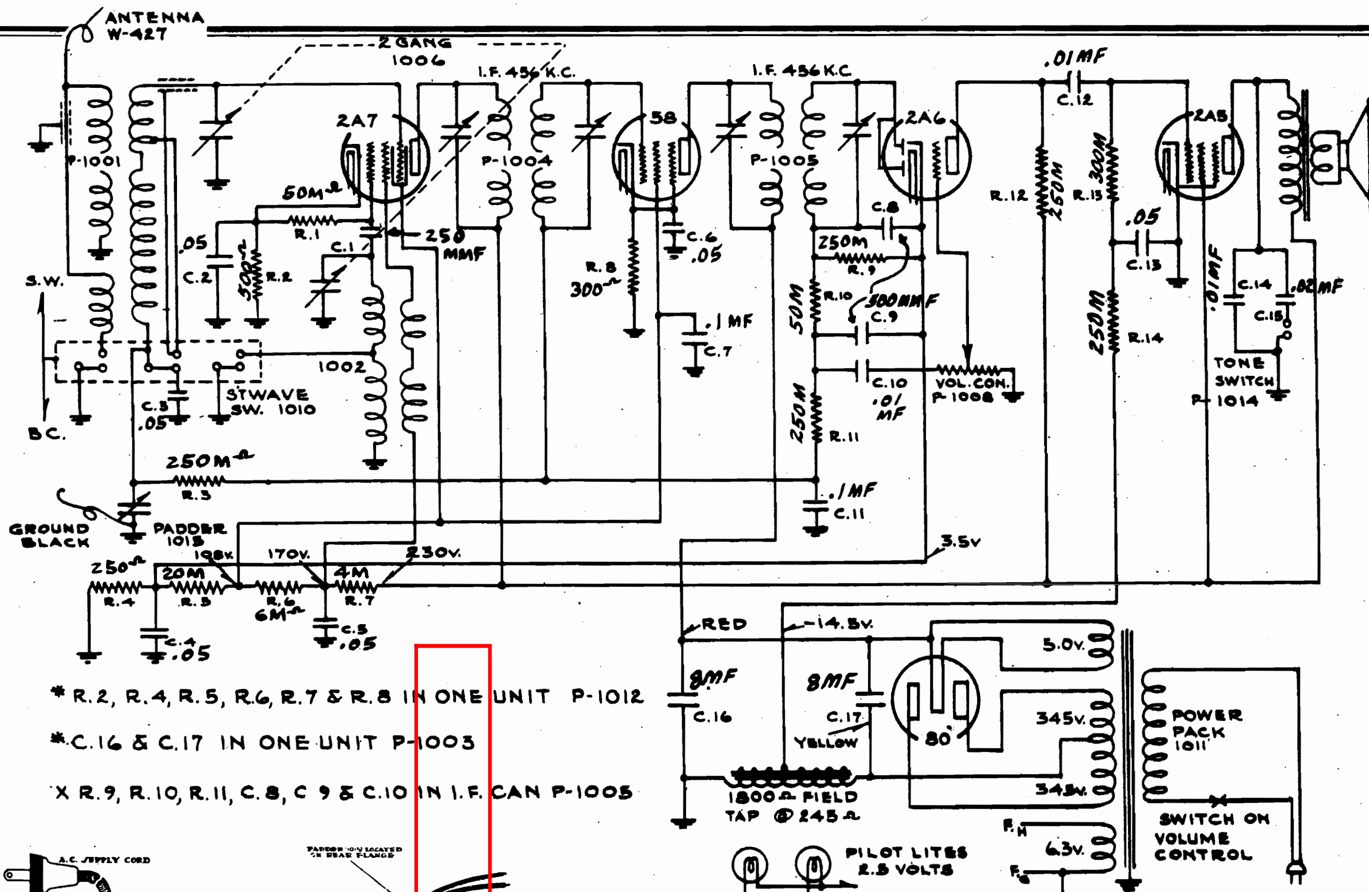
MODEL 550
Schematic, Voltage
Socket, Trimmers
Alignment

105-115 volts alternating current 50-60 cycles - 80 watts.
GREEN (Broadcast band) 530 - 1550 Kilocycles
RED (Short wave band) 1550 - 14,000 Kilocycles

NUMBERS PREFIXED BY LETTER "P" ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL.
VOLTAGES WITH 119V. A.C. LINE

33248

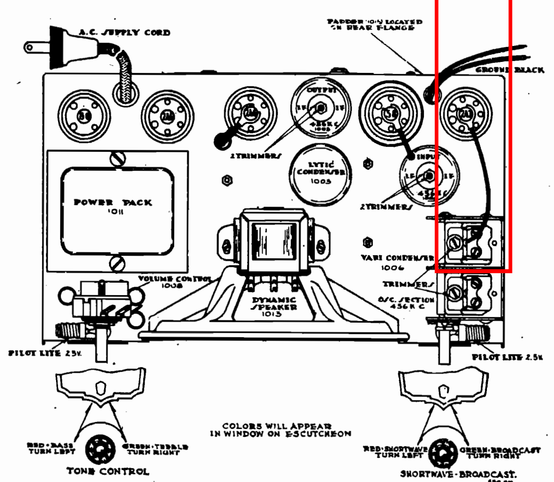
IF PEAK 456 KC



* R.2, R.4, R.5, R.6, R.7 & R.8 IN ONE UNIT P-1012

* C.16 & C.17 IN ONE UNIT P-1003

X R.9, R.10, R.11, C.8, C.9 & C.10 IN I.F. CAN P-1005



INTERMEDIATE FREQUENCY 456 K. C.

To peak I.F. transformers connect oscillator (set at 456 KC) to grid of 2A7 tube and (Black) ground wire. With variable condenser set at minimum capacity, (extreme left of its rotation) adjust four trimmers (one nut and one screw on each transformer trimmer) to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer).

To align Broadcast band, set wave changing switch to Green (right turn) and with variable condenser at minimum capacity disconnect antenna wire and connect 1550 KC oscillator to antenna coil in series with a 75 MMFD condenser. Adjust oscillator (front) section trimmer to resonance. Set oscillator to 1400 KC, rotate variable condenser until signal is tuned in, then adjust R.F. (rear) section trimmer to resonance. Check output at 1200, 1000, 800, and 600 Kilocycles if necessary bend plates (of rear R.F. section of variable only).

To align Short wave band, set wave changing switch to RED (left turn) and with input oscillator connected as above and set at 1720 KC, tune in signal, adjust padding condenser on rear of chassis to resonance. Check for output at 1550 KC and at harmonics of 1000 KC (2000 KC), of 1200 KC (2400 KC), of 1400 KC (2800 KC), and of 1720 KC (3440 KC). DO NOT BEND PLATES.

For failure to operate over both bands check 2A7 tube and connections to and contacts of wave changing switch.

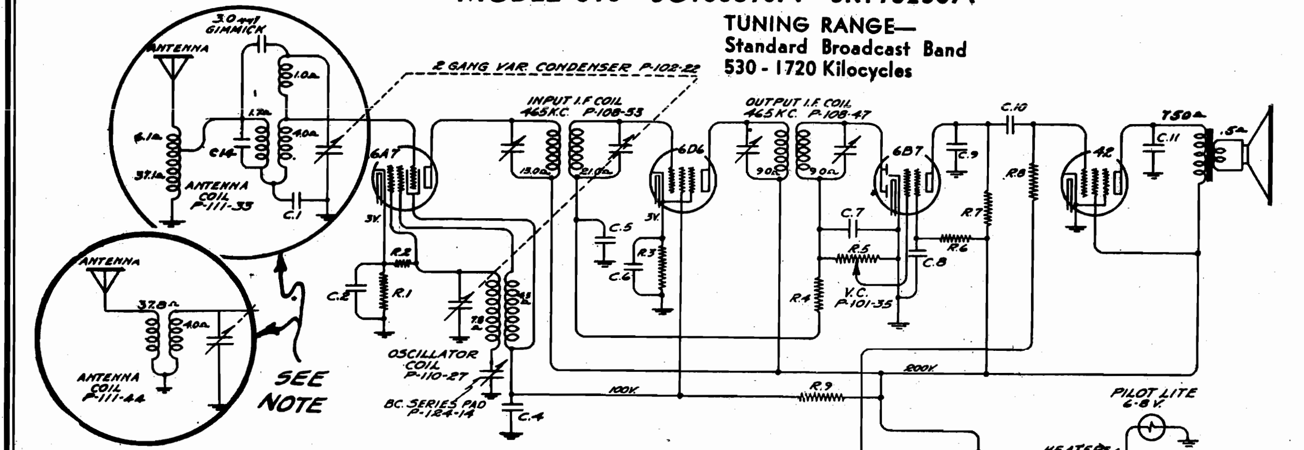
MODEL 578, Series A
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

Socket, Trimmers
Alignment

MODEL 578—5G133670A—5K173250A

TUNING RANGE—
Standard Broadcast Band
530 - 1720 Kilocycles



I. F. FREQUENCY:
465 K.C.

CONDENSERS
C.1—.00385 Mica
C.2—.1x200 V.
C.3—.1x200 V.
C.4—.1x200 V.
C.5—.1x200 V.
C.6—.1x200 V.
C.7—.00025 Mica
C.8—.1x200 V.
C.9—.0001 Mica
C.10—.01x400 V.
C.11—.006x600 V.
C.12—8.0 mfd. x 350 V P-103-6
C.13—8.0 mfd. x 300 V P-103-7
C.14—110 mfd. Either external Mica Cond. or cap. winding in coil.

RESISTORS
R.1—350 Ohm
R.2—50M Ohm ⅛ W.
R.3—350 Ohm
R.4—500M Ohm ⅓ W.
R.5—1 meg vol. cont. P-101-35
R.6—1 meg. ⅓ W.
R.7—250M Ohm ⅓ W.
R.8—500M Ohm ⅓ W.
R.9—12M Ohm 1 W.
R.10—800M Ohm ⅓ W.
R.11—201M Ohm ⅓ W.

NOTE: C.4—C.8 One Unit P-118-1

C.5—C.6 One Unit P-118-1

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GRD. VOL. CONT. ON FULL.

NUMBERS PREFIXED BY LETTER "P" ARE PART NUMBERS.

NOTE:—

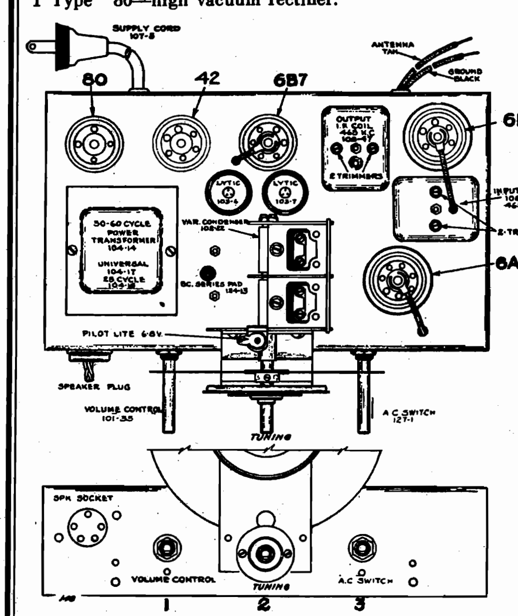
Beginning with 5K173250A, Antenna Coil No. 111-44 replaced No. 111-33, and capacities C1—.00385 mfd. and C14—.00011 mfd. were eliminated. Note: On early models C14 was a capacity winding on the primary of the No. 111-33 Antenna Coil.

See revised diagram

Tubes

The Tube complement of this chassis is as follows:

1 Type 6A7—pentagrid electron coupled oscillator and first detector.
1 Type 6D6—remote cut-off pentode as I.F. amplifier.
1 Type 6B7—duplex diode pentode as diode detector, A.V.C. and A.F.
1 Type 42—pentode output tube.
1 Type 80—high vacuum rectifier.



Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram

All voltages are measured with 119 volts on the primary of the power transformer.

ALIGNING INSTRUCTIONS

Description of various dummy antennas used and referred to in these instructions:

(1) I.F. Dummy—Consists of a .1 mfd. condenser connected in series with the external oscillator.

(2) Broadcast Dummy—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Aligning I. F. Transformers

1. With volume control full on, the extreme right of its rotation, and with variable condenser at its minimum capacity position, plates entirely out of mesh, adjust the I.F. transformers (two adjustments at the top of parts number 108-53 and 108-47)

(a) Connect external oscillator which has been adjusted to 465 kilocycles in series with I.F. dummy antenna, to the control grid cap of the type 6D6 tube and chassis ground. Adjust output I.F. transformer, part number 108-47, to resonance.

(b) Move generator output clip from grid of 6D6 to grid cap of 6A7 tube and align input I.F. transformer, part number 108-53.

(c) With generator connected to grid of type 6A7 tube, readjust output I.F. transformer, part number 108-47, to resonance.

R. F. Alignment—
(530 - 1720 Kilocycles)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with broadcast dummy antenna to tan antenna and black ground leads and make the following adjustments:

(a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer, (rear of gang condenser).

(b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance, (front section of gang condenser).

(c) Re-set external oscillator to 600 kilocycles and adjust series pad to resonance, rotate condenser and move dial pointer to 600 kilocycles by gently rocking condenser to and fro. Pick up oscillator signal while adjusting series pad to resonance, maximum deflection on an output meter. This adjustment is accessible from the top of the chassis and is located between variable condenser and power transformer.

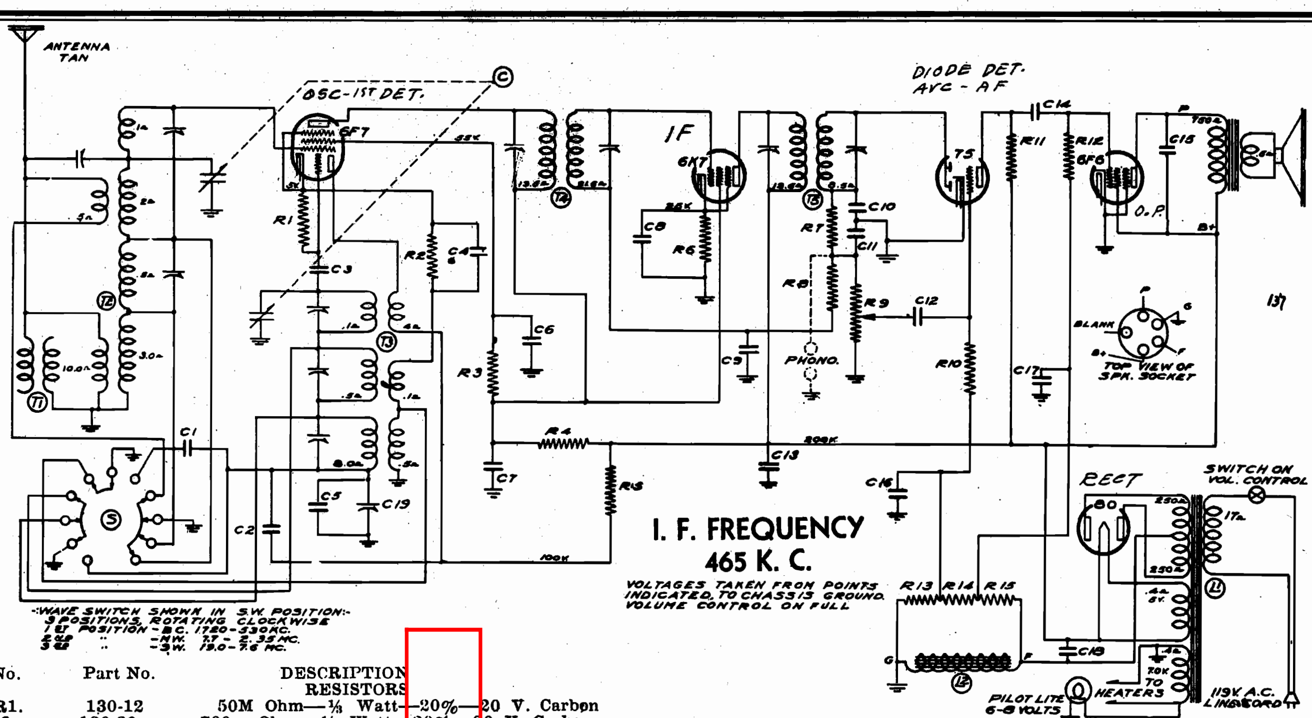
25 Cycle Chassis differ only from 60 cycle chassis in that part number 104-18 transformer is used in place of 50/60 cycle transformer, part number 104-14.

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 585
Schematic, Voltage
Socket, Trimmers
Alignment

MISCELLANEOUS

T1.	105-10	Antenna Choke Coil
T2.	111-27	Antenna Coil
T3.	110-22	Oscillator Coil
T4.	108-38A	Input I.F. Transformer
T5.	108-40	Output I.F. Transformer
C	102-12	Two Gang Variable Cond.
S	125-6	Wave Change Switch
L1.	104-14A	Power Transformer 50/60 Cycle
L1.	104-18	Power Transformer 25 Cycle
L2.	114-11	Speaker—Field Resistance 1550 Ohms
L1.	104-17	Power Trans. Universal 50/60 Cycle
L1.	104-41	Power Trans. Universal 25 Cycle.



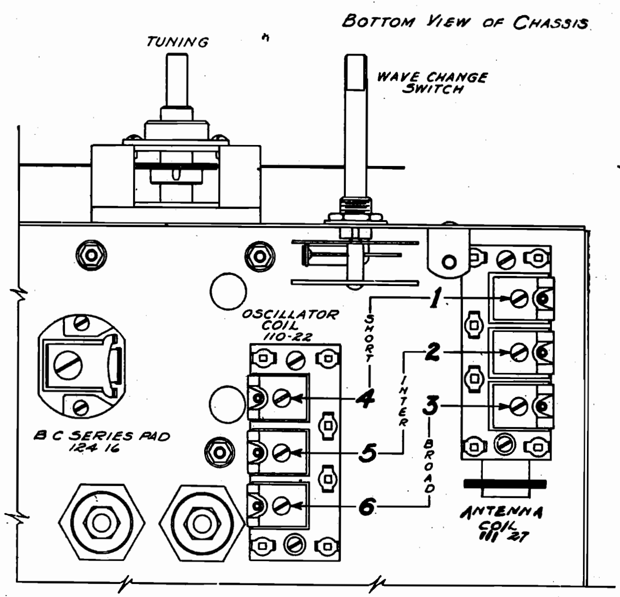
No.	Part No.	DESCRIPTION
		RESISTORS
R1.	130-12	50M Ohm—⅓ Watt—20%—20 V. Carbon
R2.	130-39	700 Ohm—⅓ Watt—20%—20 V. Carbon
R3.	130-20	100M Ohm—⅓ Watt—20%—50 V. Carbon
R4.	130-44	25M Ohm—½ Watt—20%—150 V. Carbon
R5.	130-42	20M Ohm—½ Watt—20%—100 V. Carbon
R6.	130-32	250 Ohm—⅓ Watt—20%—10 V. Wire Wound
R7.	130-12	50M Ohm—⅓ Watt—20%—20 V. Carbon
R8.	130-3	500M Ohm—⅓ Watt—20%—100 V. Carbon
R9.	101-18	500M Ohm Volume Control
R10.	130-19	1 meg Ohm—⅓ Watt—20%—100 V. Carbon
R11.	130-11	250M Ohm—⅓ Watt—10%—100 V. Carbon
R12.	130-11	250M Ohm—⅓ Watt—10%—100 V. Carbon
R13.	130-48	15M Ohm—⅓ Watt—10%—20 V. Carbon
R14.	130-47	180M Ohm—⅓ Watt—10%—100 V. Carbon
R15.	130-46	800M Ohm—⅓ Watt—10%—100 V. Carbon
		CONDENSERS
C1.	129-23	.002 Mica—MW—5%
C2.	100-20	.1 x 120 V.—25%
C3.	129-5	.0001 Mica—MT—20%
C4.	100-20	.1 x 200 V.—25%
C5.	129-24	.00038—MT—5%
C6.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C7.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C8.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C9	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C10.	129-51	.000125—Mica MT—20%
C11.	129-51	.000125—Mica MT—20%
C12.	100-22	.05 x 200 V.—25%
C13.	103-7	.8 mfd. x 300 V. Electrolytic
C14.	100-11	.01 x 400 V.—25%
C15.	100-19	.006 x 600 V.—25%
C16.	118-1	.1 x 200 V.—Dual Plus 50%: Minus 10%
C17.	118-1	.1 x 200 V.—Dual Plus 50%: Minus 10%
C18.	103-6	.8 mfd. x 350 V. Electrolytic
C19.	124-5	B. C. Series Pad J-3-S.

TUNING RANGE—

Standard Broadcast Band
530-1720 Kilocycles.

Intermediate Band
2350-7700 Kilocycles.

Short Wave Band
7.6-19.0 Megacycles.

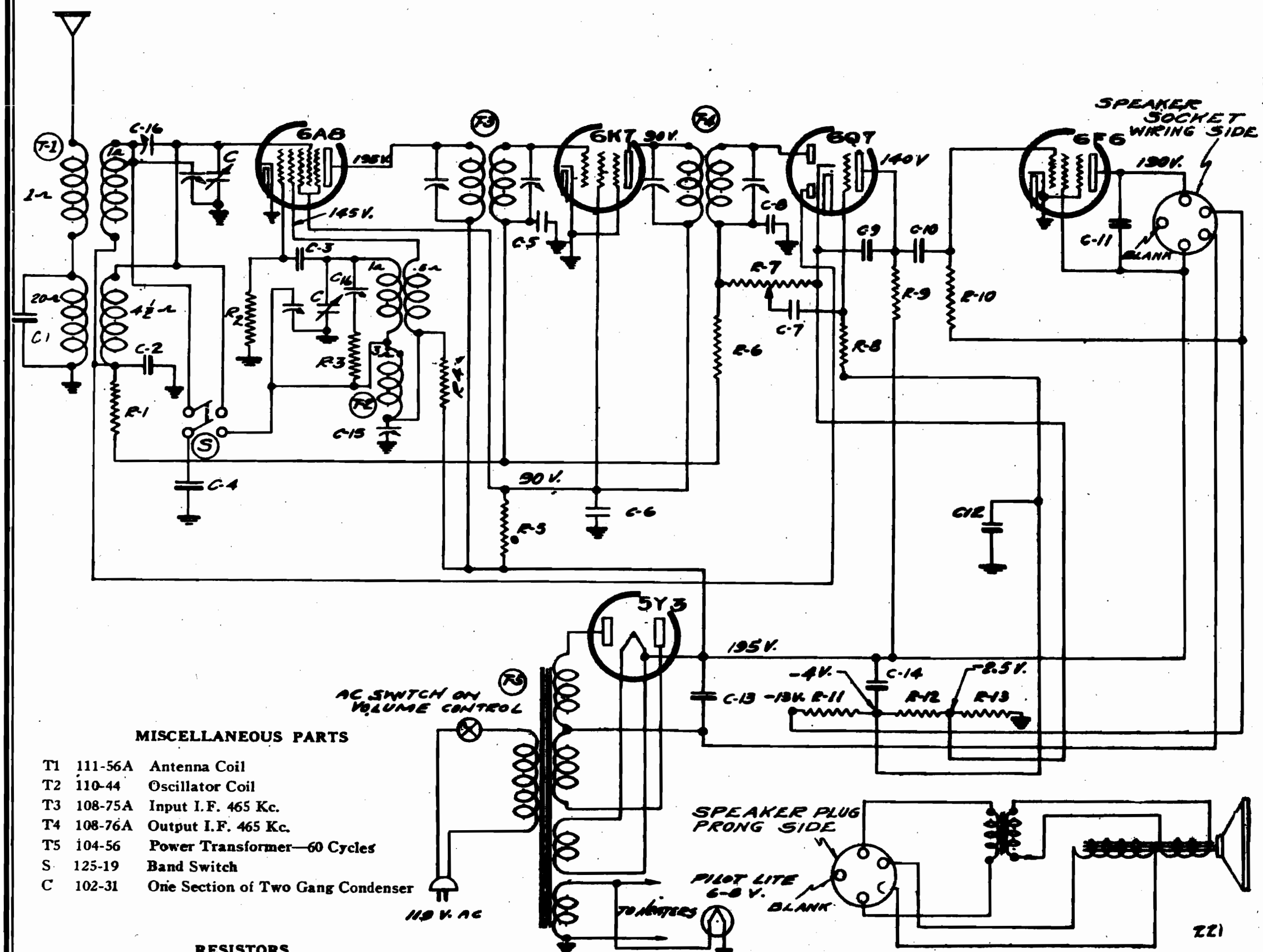


FOR ALIGNMENT SEE
MODEL 585 Run No. 2
Vol. IX page 2.

MODEL 587
Schematic

GOODYEAR TIRE & RUBBER CO., INC.

Voltage
Socket, Trimmers
Alignment



MISCELLANEOUS PARTS

T1	111-56A	Antenna Coil
T2	110-44	Oscillator Coil
T3	108-75A	Input I.F. 465 Kc.
T4	108-76A	Output I.F. 465 Kc.
T5	104-56	Power Transformer—60 Cycles
S	125-19	Band Switch
C	102-31	One Section of Two Gang Condenser

RESISTORS

No.	Part No.	Description	
R1	130-111	100M	Ohms 1/10W—20%—50V Carbon
R2	130-12	50M	Ohms 1/3 W—20%—20V Carbon
R3	130-112	100	Ohms 1/10W—20%—10V Carbon
R4	130-22	5M	Ohms 1/3 W—20%—10V Carbon
R5	130-77	10M	Ohms 1 W—20%—100V Carbon
R6	130-110	1 meg	Ohm 1/10W—10%—100V Carbon
R7	101-49	1 meg	Ohm Volume Control
R8	130-113	2 meg	Ohm 1/10W—20%—100V Carbon
R9	130-20	100M	Ohms 1/3W—20%— 50V Carbon
R10	130-100	150M	Ohms 1/3W—20%— 50V Carbon
R11	106-26	220	Ohms
R12	106-26	33	Ohms
R13	106-26	52	Ohms

NOTE: R11, R12, and R13 in one unit—106-26

CONDENSERS

C1	129-63	.0004 Mica—W—10%
C2	100-26	.02 x 400 Volt—25%
C3	129-62	.00003 Mica—0—10%
C4	129-61	.0017 Mica—W—2½%
C5	100-9	.05 x 200 Volt—25%
C6	100-6	.25 x 200 Volt—25%
C7	100-11	.01 x 400 Volt—25%
C8	129-12	.00025 Mica—0—20%
C9	129-12	.00025 Mica—0—20%
C10	100-11	.01 x 400 Volt—25%
C11	100-19	.006 x 600 Volt—25%
C12	100-6	.25 x 200 Volt—25%
C13	103-6	8 mfd. x 350 Volt Electrolytic
C14	103-7	8 mfd. x 300 Volt Electrolytic
C15	124-29	Adjustable condenser 390 mmf. working capacity
C16	124-30	Adjustable Dual Condenser

I. F. FREQUENCY
465 K. C.

MODEL 587

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

ALIGNMENT FREQUENCIES
I.F. 465 KC.
S.W.OSC. TRIMMER 6.6 M.C.
B.C.OSC. TRIMMER 1720 KC.
B.C.ANT. TRIMMER 1550 KC.
B.C.SERIES PAD 600 KC.
S.W.ANT. TRIMMER 6M.C.

TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles.
Short Wave Band
2280-6600 Kilocycles

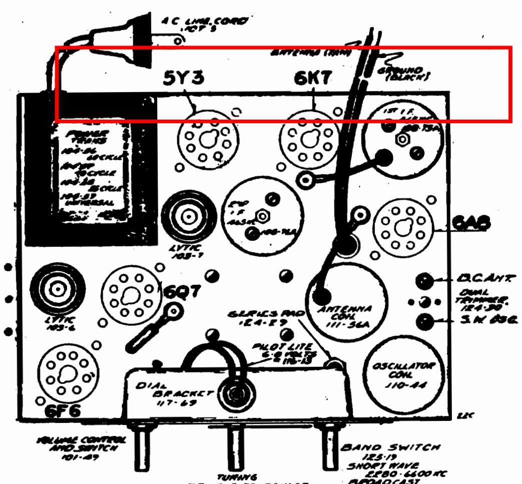


FIG. 1—TOP VIEW

Socket, Trimmers
Alignment

MODEL 601, Runs 1,2
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-83 Output I.F. Transformer
Part No. 108-82 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 78 tube, and adjust the output I.F. transformer (No. 108-83) to resonance.

   (b) Move oscillator output clip from grid of 78 grid cap of 6A7 and adjust input I.F. transformer (No. 108-82) to resonance.

   (c) With oscillator still connected to 6A7, readjust output I.F. transformer (108-83) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

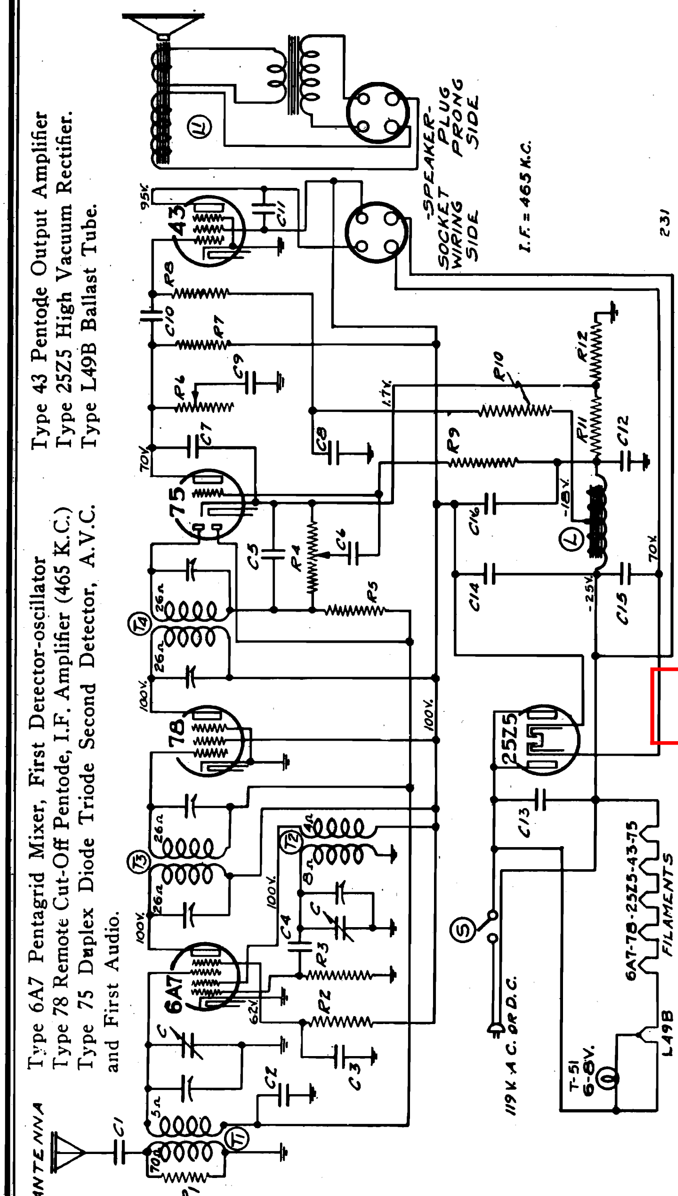
1. Unsolder the antenna wire from its terminal on the antenna coil and with gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 50 mmf. condenser to the antenna terminal on the antenna coil and chassis ground and make the following adjustments:

   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).

   (b) Re-set external oscillator to 1550 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).

   (c) Check sensitivity at 600 and 1000 kilocycles.

Type 6A7 Pentagrid Mixer, First Detector-oscillator
Type 78 Remote Cut-Off Pentode, I.F. Amplifier (465 K.C.)
Type 75 Duplex Diode Triode Second Detector, A.V.C. and First Audio.
Type 43 Pentode Output Amplifier
Type 25Z5 High Vacuum Rectifier.
Type L49B Ballast Tube.



MODEL 601—SERIES A

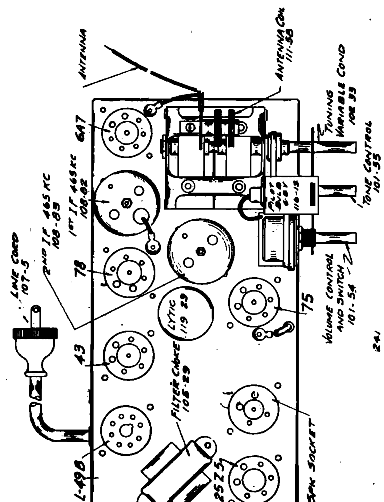


FIG. 2—TOP VIEW

RESISTORS

No.	Part No.		Description
R1	130-12	50M	Ohm—½W—20%— 20V—Carbon
R2	130-21	20M	Ohm—½W—20%— 20V—Carbon
R3	130-12	50M	Ohm—½W—20%— 20V—Carbon
R4	101-54	1 meg	Ohm—Volume Control
R5	130-119	3 meg	Ohm—½W—20%—100V—Carbon
R6	101-55	1 meg	Ohm—Tone Control
R7	130-120	100M	Ohm—½W—20%— 50V—Carbon
R8	130-5	300M	Ohm—½W—20%—100V—Carbon
R9	130-38	2 meg	Ohm—½W—20%—100V—Carbon
R10	130-9	200M	Ohm—½W—20%— 20V—Carbon
R11	106-28	35	Ohm—Muter Strip
R12	106-28	50	Ohm—Muter Strip

NOTE: R11 and R12 in one unit—No. 106-28.

CONDENSERS

C1	100-25	.002	x600 Volt—25%
C2	100-22	.05	x200 Volt—25%
C3	100-22	.05	x200 Volt—25%
C4	129-12	.00025	Mica—MT—20%
C5	129-12	.00025	Mica—MT—20%
C6	100-11	.01	x400 Volt—20%
C7	129-2	.0005	Mica—MT—20%
C8	100-20	.1	x200 Volt—25%
C9	100-11	.01	x400 Volt—25%
C10	100-11	.01	x400 Volt—25%
C11	100-25	.002	x600 Volt—25%
C12	100-6	.25	x200 Volt—20%
C13	100-39	.1	x400 Volt—20%
C14	119-25	16 mfd.	x100 Volt—Working Voltage
C15	119-25	5 mfd.	x100 Volt—Working Voltage
C16	119-25	8 mfd.	x100 Volt—Working Voltage

NOTE: C14, C15, and C16 in one unit—No. 119-25

C	102-33	One section of two gang condenser
T1	111-57	Antenna Coil
T2	110-46	Oscillator Coil
T3	108-82	Input I.F. Coil—465 Kc.
T4	108-83	Output I.F. Coil—465 Kc.
L	105-29	Filter Choke (Resistance 600 Ohms)
L1	114-43	Five Inch Speaker (Field resistance 3000 Ohms)
S	101-54	On and off switch on Volume Control

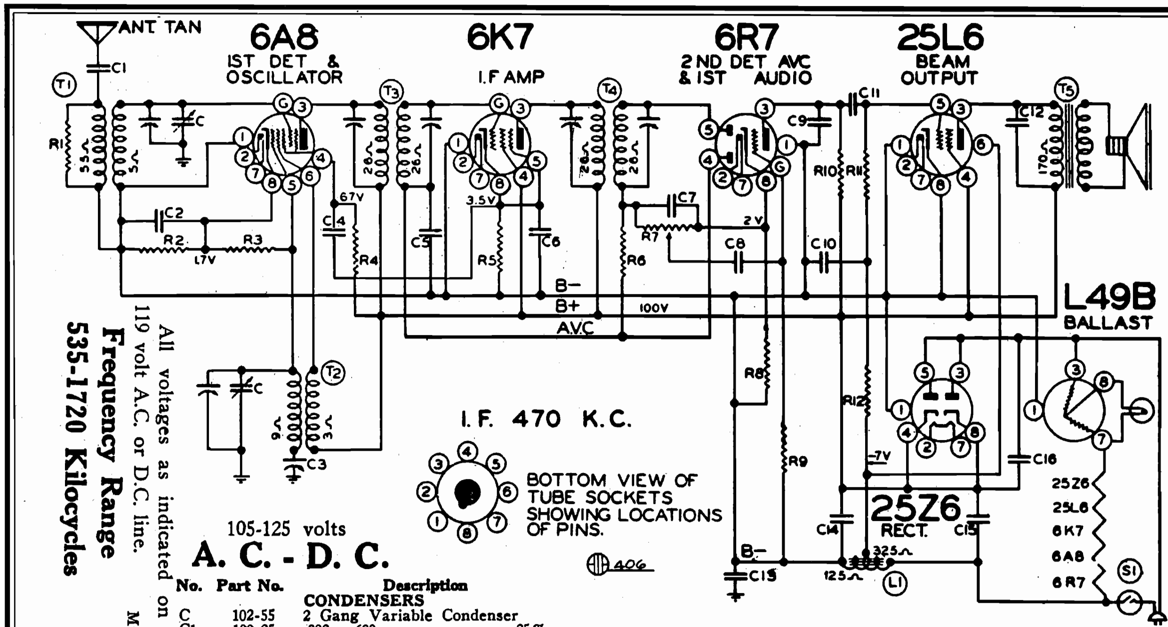
TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles

MODEL 601—SERIES B is the same as Series A, except for the following changes:-
1 - The C15 condenser was eliminated.
2 - The C14 condenser was replaced by a C15 (Part #119-29) 30 mfd. capacity, and the C16 was replaced by a C14 (Part #119-29) 5 mfd. capacity.

MODEL 602, Runs 1,2
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

Socket, Trimmers
Alignment



105-125 volts

A. C. - D. C.

No.	Part No.	Description	
		CONDENSERS	
C	102-55	2 Gang Variable Condenser	
C1	100-25	.002 x 600	25%
C2	100-22	.05 x 200	25%
C3	129-75	.0003386 Compression Type Condenser 1%	
C4	100-22	.05 x 200	25%
C5	100-9	.05 x 200	25%
C6	100-20	.1 x 200	25%
C7	129-21	.0002 Mica	20%
C8	100-11	.01 x 400	25%
C9	129-2	.0005 Mica	20%
C10	100-75	.22 x 200	10%
C11	100-10	.05 x 200	10%
C12	100-67	.025 x 400	25%
C13	100-53	.25 x 400	20%
C14	119-42	5. mfd. lytic 100 w. v.	
C15	119-42	20. mfd. lytic 100 w. v.	
C16	100-39	.1 x 400	20%
		RESISTORS	
R1	130-17	10M ohm — 1/3 w.	20%
R2	130-97	200 ohm — 1/3 w.	10%
R3	130-12	50M ohm — 1/3 w.	20%
R4	130-149	15M ohm — 1/3 w.	20%
R5	130-54	500 ohm — 1/3 w.	20%
R6	130-4	3 megohm — 1/3 w.	20%
R7	101-77	Volume Control (1 meg)	
R8	130-193	3M ohm — 1/3 w.	10%
R9	130-19	1 megohm — 1/3 w.	20%
R10	130-94	50M ohm — 1/3 w.	10%
R11	130-103	100M ohm — 1/3 w.	10%
R12	130-194	35M ohm — 1/3 w.	10%
		PARTS	
T1	111-79	Antenna Coil Complete	
T2	110-62	Oscillator Coil Complete	
T3	108-82B	Input I. F. Complete	
T4	108-83B	Output I. F. Complete	
T5	114-88	5" Dynamic Speaker	
L1		Speaker field 450 ohm— total tapped 125 ohm	
S1		Switch on volume control	

All voltages as indicated on diagram are measured with 119 volt A.C. or D.C. line.

Frequency Range
535-1720 Kilocycles

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

ALIGNING I.F. TRANSFORMERS: (470 K.C.):

Part No. 108-83B Output I.F. Transformer
Part No. 108-82B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

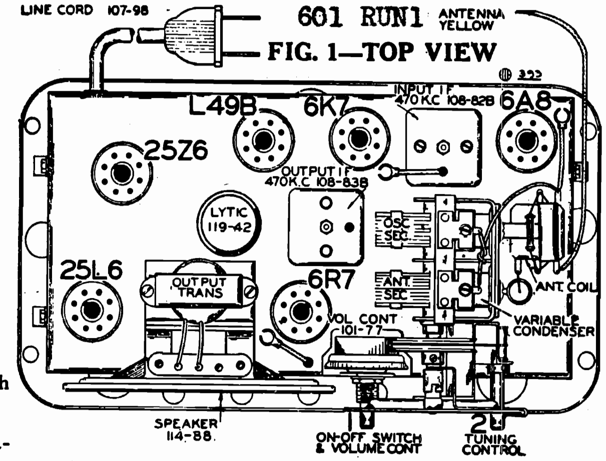
1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 470 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83B) to resonance.
   (b) Move oscillator output clip from grid of 6K7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82B) to resonance.
   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83B) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

1. Unsolder the antenna wire from its terminal on the antenna coil and with gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 50 mmf. condenser to the antenna terminal on the antenna coil and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

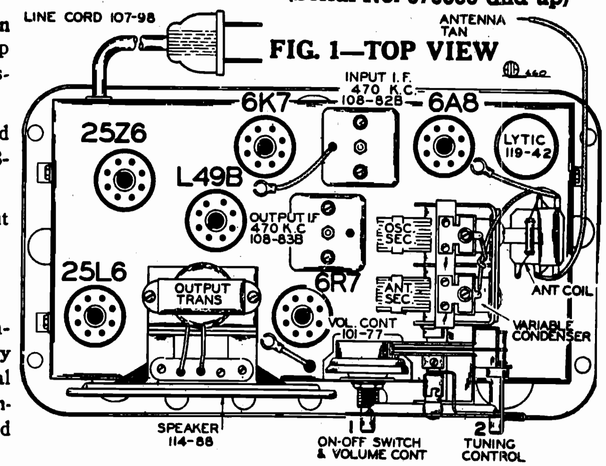
601 RUN1

FIG. 1—TOP VIEW



602 RUN2 **(Serial No. 878500 and up)**

FIG. 1—TOP VIEW

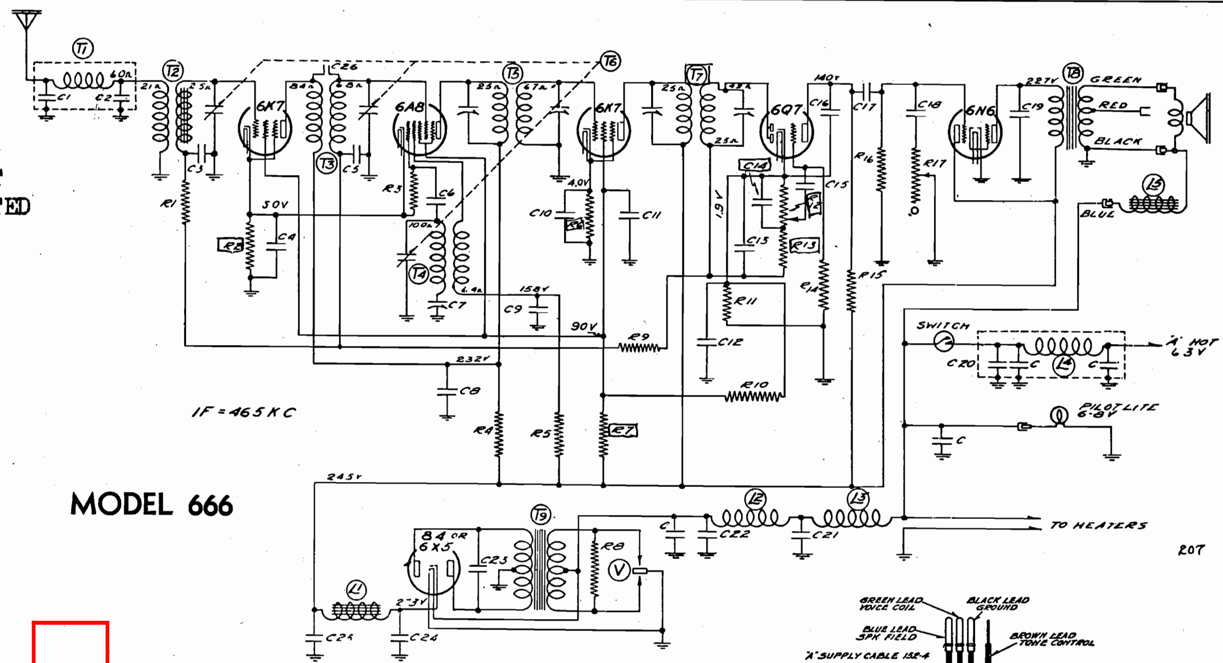


MODEL 666, Runs 1,2
Schematic, Voltage
Socket, Trimmers
Changes

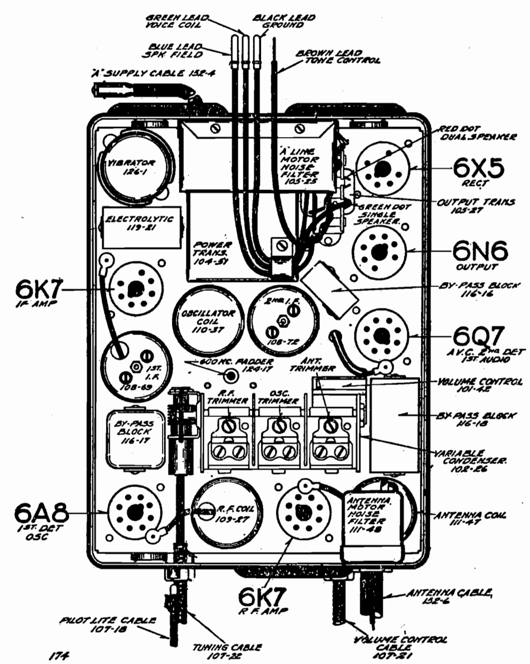
GOODYEAR TIRE & RUBBER CO., INC.

NOTE:- IN RUN 2 CERTAIN PARTS HAVE BEEN SUBSTITUTED WHICH DIFFER FROM THOSE OF THE FIRST RUN. THESE CHANGES ARE INDICATED BY THE BOXED NUMBERS ON THE SCHEMATIC AND IN THE PARTS LIST BELOW.

R2	130-79	400 Ohm - ½ Watt - 10% - 10 Volt - Carbon IRC
R6	130-101	600 Ohm - ½ Watt - 10% - 10 Volt - Carbon
R7	130-116	15M Ohm - 1.5 Watt - 10% - 100 Volt - Carbon
R12	101-41	500M Ohm - Volume Control and Switch
R13	130-94	50M Ohm - ½ Watt - 10% -10 Volt - Carbon
C.14	129-60	.00015 Mica - MT - "O" 20%
T7	108-70	Output I.F. Coil—465 Kc.



MODEL 666



No.	Part No.	Description
		RESISTORS
R1	130-20	100M Ohm - ½ Watt 20% - 50 Volt - Carbon
*R2	130-99	300 Ohm - ½ Watt - 20% - 10 Volt - Carbon
R3	130-94	50M Ohm - ½ Watt - 10% - 10 Volt - Carbon
R4	130-98	1500 Ohm - ½ Watt 20% - 25 Volt - Carbon
R5	130-42	20M Ohm - ½ Watt - 20% - 100 Volt - Carbon
*R6	130-70	500 Ohm - ½ Watt - 10% - 10 Volt - Carbon
*R7	130-95	12M Ohm - 1.2 Watt - 10% - 100 Volt - Carbon
R8	130-97	200 Ohm - ½ Watt - 10% - 10 Volt - Carbon
R9	130-3	500M Ohm - ½ Watt 20% - 100 Volt - Carbon
R10	130-108	40M Ohm - ½ Watt - 10% - 100 Volt - Carbon
R11	130-107	800 Ohm - ½ Watt - 10% - 10 Volt - Carbon
*R12	101-42	50M Ohm - Volume Control and Switch
*R13	130-22	5M Ohm - ½ Watt - 20% -10 Volt - Carbon
R14	130-08	1 Meg Ohm - ½ Watt 10% - 20 Volt - Carbon
R15	130-9	200M Ohm - ½ Watt 20% - 20 Volt - Carbon
R16	130-3	500M Ohm - ½ Watt 20% - 100 Volt - Carbon
R17	101-45	1 Meg Ohm - Tone Control

C		CONDENSERS
		Spark Plate
C1	129-3	.00002 Mica - "O" - 20%
C2	129-49	.00009 Mica - "O" - 5%
C3	116-18	.05 x 200 Volt
C4	116-18	.25 x 200 Volt
C5	116-17	.05 x 200 Volt
C6	129-21	.0002 Mica - MT - "O" - 20%
C7	124-17	Single Padder J-4-S
C8	116-17	.1 x 400 Volt
C9	116-18	.1 x 400 Volt
C10	116-17	.1 x 200 Volt
C11	116-17	.1 x 200 Volt
C12	116-16	.05 x 200 Volt
C13	129-5	.0001 Mica - MT - "O" - 20%
*C14	129-2	.0005 Mica - MT - "O" - 20%
C15	116-18	.02 x 200 Volt
C16	129-5	.0001 Mica - MT - "O" - 20%
C17	116-16	.05 x 400 Volt
C18	100-37	.003 x 600 Volt - 10%
C19	116-16	.01 x 800 Volt
C20	100-35	.5 x 200 Volt - 50% - 10%
C21	100-35	.5 x 200 Volt - 50% - 10%
C22	100-35	.5 x 200 Volt - 50% - 10%
C23	100-36	.01 x 1400 Volt - 10%
C24	119-21	8.0 mfd. Lytic Cond. 350 Working Volts
C25	119-21	4.0 mfd. Lytic Cond. 350 Working Volts
C26		5.0 mmf. Gimmick

PARTS

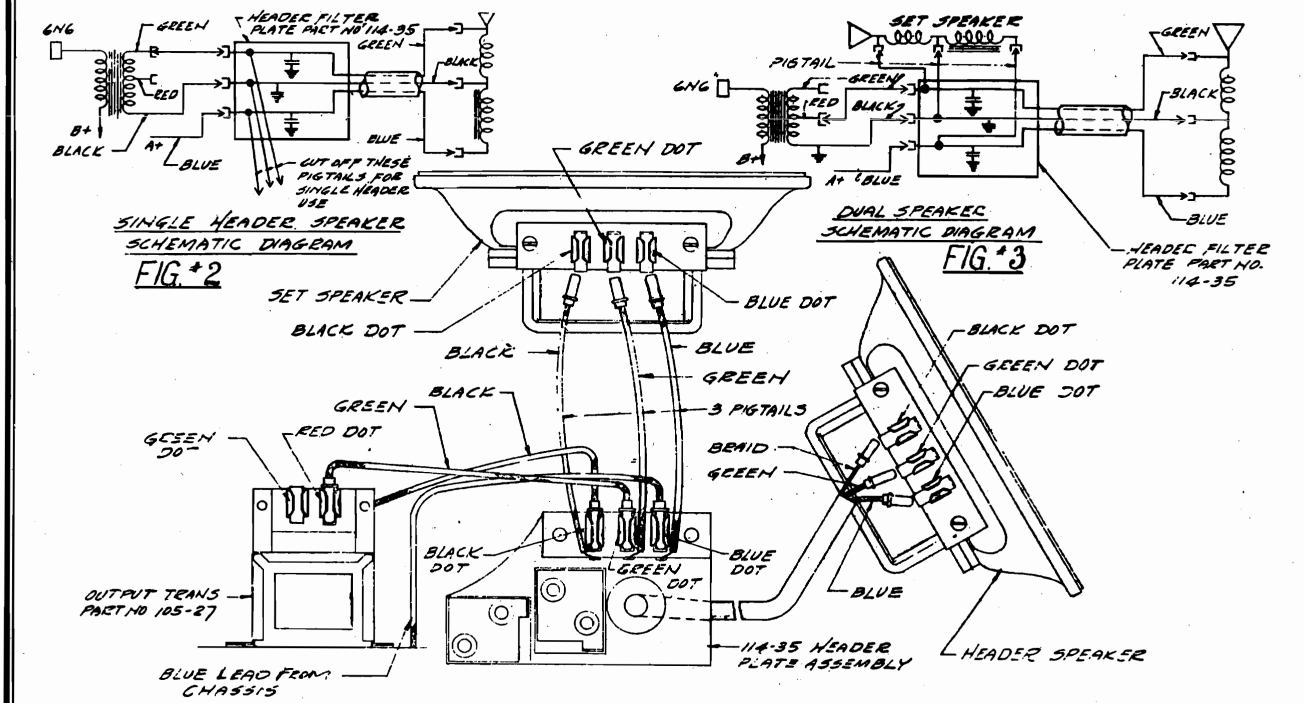
T1	111-48	Antenna Filter Coil Assembly
T2	111-47	Antenna Coil Assembly
T3	109-27	R.F. Coil Assembly
T4	110-37	Oscillator Coil Assembly
T5	108-69	Input I.F. Coil—465 Kc.
T6	102-26	Three Gang Variable Condenser
*T7	108-72	Output I.F. Coil—465 Kc.
T8	105-27	Output Transformer
T9	104-51	Power Transformer
L1	105-23	Filter Choke
L2	105-19	"A" Choke
L3	105-24	"A" Choke
L4	105-26	"A" Choke
L5	114-34	5¼" Speaker (Field Resistance—4 Ohms)
V	126-1	Vibrator

C3, C4, C9, C15, in one unit—part No. 116-18.
C5, C8, C10, C11, in one unit—part No. 116-17.
C12, C17, C19, in one unit—part No. 116-16.
C24, C25, in one unit—part No. 119-21.

MODEL 666, Runs 1, 2 — Alignment

Speaker Connections

GOODYEAR TIRE & RUBBER CO., INC.



NO SPARK PLUG SUPPRESSORS ARE REQUIRED

DESCRIPTION:

Model No. 666 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

The I.F. frequency used is 465 K.C., the R.F. end of the receiver consisting of a high gain iron core antenna coil which gives high signal to noise ratio and an R.F. stage especially designed to give high image rejection and high I.F. attenuation. The I.F. transformers are designed to give high gain and selectivity and yet to have a broad nose for ease of tuning and hi-fidelity response. They are of the air core type and wound with solid wire to give *minimum* drift and variation of gain due to climatic changes.

The receiver is so designed that it may be used as either a single or two unit installation. Taps are provided on the output transformer to a pin jack terminal board, a red dot distinguishing dual speaker tap and green dot for single speaker operation.

For complete details see illustration and Header speaker data chart.

Dash kits for the remote control head are available for 1936 cars drilled for dash plates.

This receiver has been carefully designed to facilitate servicing, the top and bottom covers are both removable and are fastened in place by spring clips, self tapping screws and trimount buttons.

All adjustments are accessible and any part replaceable without removing the chassis from the case.

TUBE COMPLEMENT

1—Type No. 6K7—Remote Cut-off Pentode as an R.F. Amplifier
1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator)
1—Type No. 6K7—Remote Cut-off Pentode as an I.F. Amplifier (465 K.C.)
1—Type No. 6Q7—Duplex Diode Triode Second Detector, A.V.C. and First Audio
1—Type No. 6N6—Twin Triode Output Amplifier
1—Type No. 6X5—High Vacuum Rectifier

The tube complement consists of the latest "Metal-Glass" tubes which are interchangeable with metal tubes.

Cars with floating power must have the motor bonded to the bulkhead and again to the frame to provide a direct path for the high frequency interference developed in the ignition system. ⅝" copper braid will be necessary, SMALL DIAMETER WIRE WILL NOT DO. Bond flexible shaft leads, such as free wheeling, choke wires, etc., which pick up motor noise and reradiate it into the car. Free wheeling cables should be grounded at the point at which they go through the fire wall of the car. In extreme cases it has been found necessary to ground the steering column.

I.F. ALIGNMENT

1. **With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.**
2. **Adjust trimmer condensers of output I.F. transformer No. 108-72 to resonance with oscillator.**
3. **Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-69 to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.**

BROADCAST ALIGNMENT

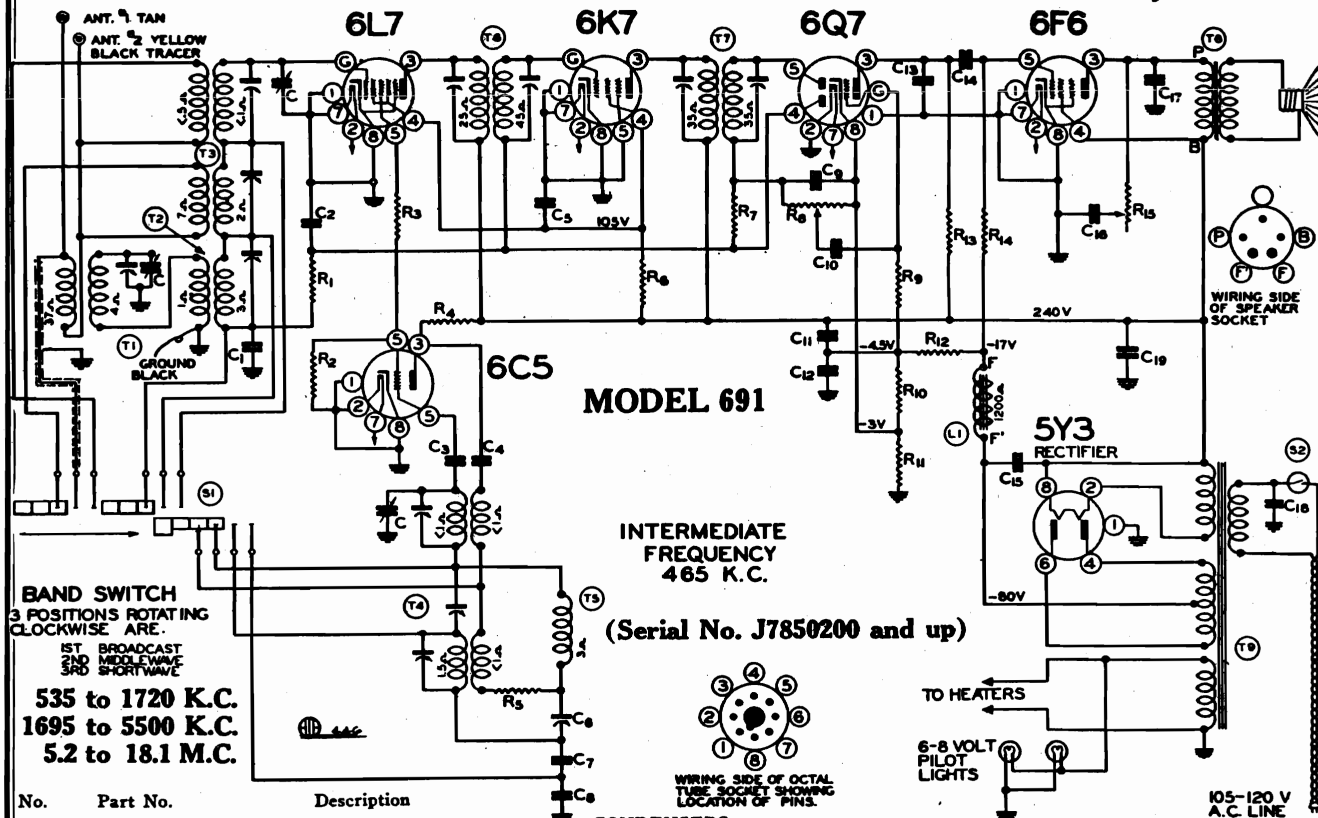
1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 KC. Adjust series pad rocking gang condenser to and fro at the same time adjusting series pad for maximum gain. This adjustment is accessible from the top of chassis (see top view).
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

Make certain that the instrument panel has a ground connection to the frame of the car.

NOTE—Where ignition coils are mounted in motor compartments a .5 mfd cond (148-1 or 148-3) connected between primary coil terminal and receiver mounting bolt will often reduce motor noise.

MODEL 691
Schematic, Voltage
Socket, Trimmers

GOODYEAR TIRE & RUBBER CO., INC.



No.	Part No.	Description
		RESISTORS
R1	130-103	100M ohm - 1/3 w.
R2	130-12	50M ohm - 1/3 w.
R3	130-105	150 ohm - 1/3 w.
R4	130-77	10M ohm - 1 watt
R5	130-27	50 ohm - 1/3 w.
R6	130-34	19M ohm - 1 watt
R7	130-4	3 meg - 1/3 w.
R8	101-93	1 meg volume control
R9	130-4	3 meg - 1/3 w.
R10	106-26	32 ohm - resistor strip
R11	106-26	52 ohm - resistor strip
R12	106-26	220 ohm - resistor strip
R13	130-103	100M ohm - 1/3 w.
R14	130-102	500M ohm - 1/3 w.
R15	101-92	50M ohm - tone control

R10, R11 and R12 in same unit

No.	Part No.	Description
		CONDENSERS
C	102-60	3 gang variable
C1	100-22	.05 x 200
C2	100-26	.02 x 400
C3	129-39	.00005 Mica
C4	100-37	.003 x 600
C5	100-1	.1 x 400
C6	124-40	.000715 W.C. Series Pad
C7	129-55	.0034 Mica
C8	129-54	.003 Mica
C9	129-5	.0001 Mica
C10	100-26	.02 x 400
C11	119-45	8 mfd. - 400 w. v. lytic
C12	100-20	.1 x 200
C13	129-2	.0005 Mica
C14	100-11	.01 x 400
C15	119-45	8 mfd. 400 w. v. lytic
C16	100-65	.015 x 600
C17	100-37	.003 x 600
C18	100-61	.02 x 600
C19	100-11	.01 x 400

C11 and C15 in same unit

No.	Part No.	Description
		PARTS
T1	111-51	Preselector Coil
T2	111-49	B. C. Antenna Coil Complete
T3	111-50	S.W. M.W. Antenna Coil complete
T4	110-39	S.W. M.W. Oscillator Coil complete
T5	110-38	B.C. Oscillator Coil complete
T6	108-109	Input I.F. Coil complete 465 kc.
T7	108-110	Output I.F. Coil complete 465 kc.
T8	114-85B	6" dynamic Speaker
T9	104-106	Power Transformer
L1		Speaker field 1200 ohm
S1	125-40	Wave band switch
S2		Off-On Switch on Volume Control

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½ %	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

The power consumption of this receiver is 75 watts.

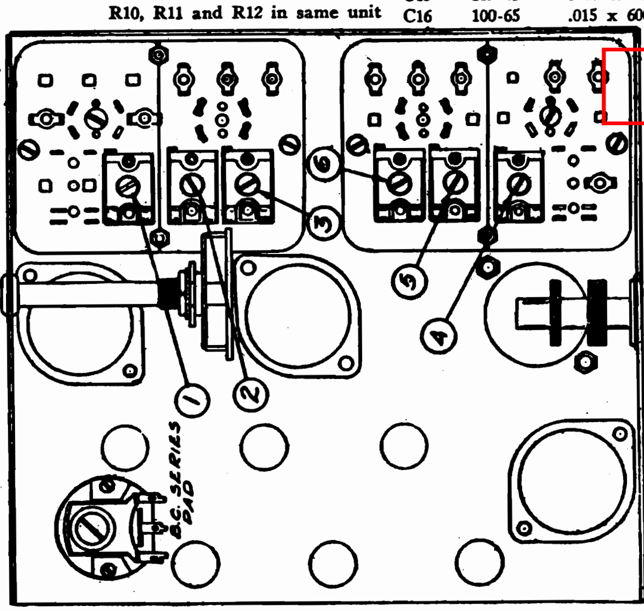


FIG. 3—BOTTOM VIEW SHOWING TRIMMERS

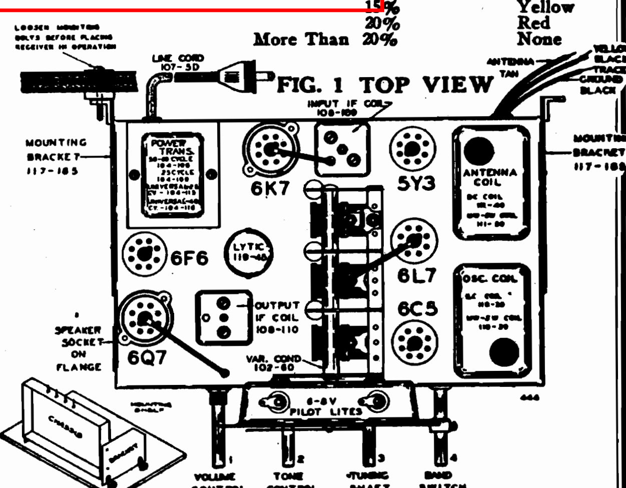


FIG. 1 TOP VIEW

MODEL 691
MODEL 787
Alignment

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 691 (Serial No. J7850200 and up)

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-110 Output I.F. Transformer
Part No. 108-109 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-110) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6L7 and adjust input I.F. transformer (No. 108-109) to resonance.

BROADCAST BAND ALIGNMENT:
535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number, 1; see bottom view of coil assembly. Fig. 3.)
   (b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)
   (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)
   (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1000 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

SHORT WAVE BAND ALIGNMENT:
5.2 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave antenna (Adjustment number 6) to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-set external oscillator and check set at 18.1 megacycles and 5.2 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 17 megacycle signal appears near 16.1 megacycles.

MIDDLE WAVE BAND ALIGNMENT:
1695 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments.
   (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.
   (b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-set external oscillator and check set at 5500 kilocycles and 1695 kilocycles for band coverage.
   (d) Recheck broadcast band alignment.

MODEL 787

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 119 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS; (465 K.C.):

Part No. 108-73 Output I.F. Transformer.
Part No. 108-74 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-73) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6L7 and adjust input I.F. transformer (No. 108-74) to resonance.
   (c) With oscillator still connected to 6L7, readjust output I.F. transformer (108-73) if necessary.

BROADCAST BAND ALIGNMENT:
535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3).
   (b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)
   (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)
   (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1000 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

SHORT WAVE BAND ALIGNMENT:
5.2 to 18.3 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave antenna (Adjustment number 6) to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:
1695 to 5500 Kilocycles

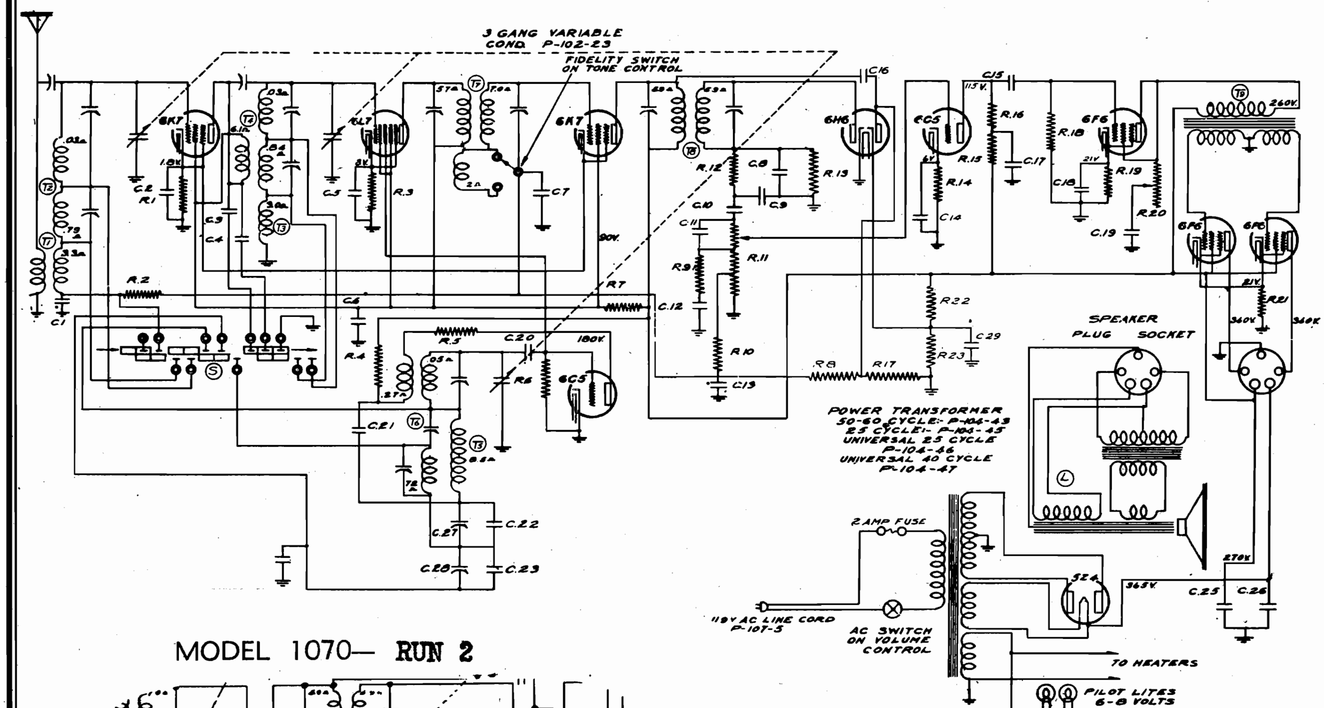
1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.
   (b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.

Schematic, Socket Trimmers, Changes

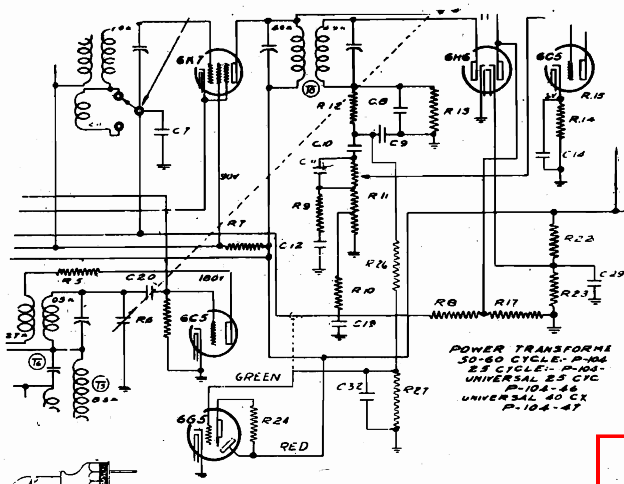
MODEL 1070, Runs 1,2

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 1070— RUN 1



MODEL 1070— RUN 2



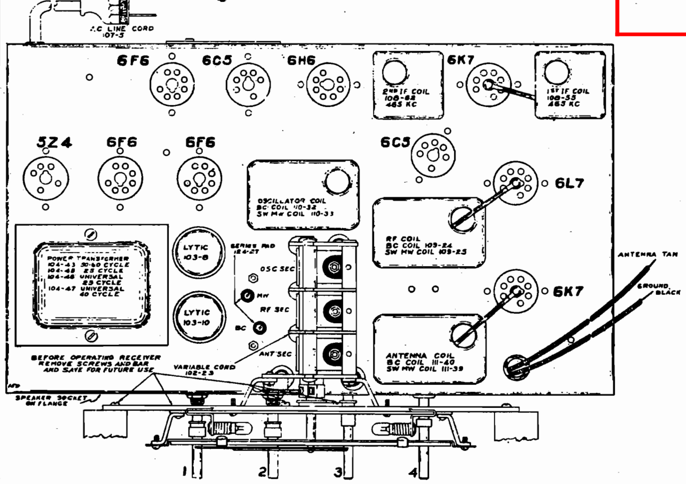
I. F. FREQUENCY 465 K. C.

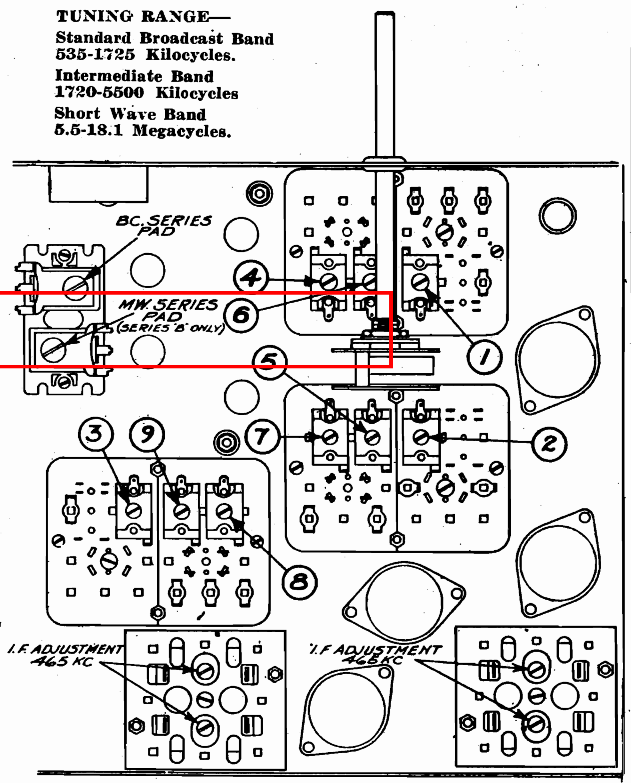
TUNING RANGE—

Standard Broadcast Band
535-1725 Kilocycles.

Intermediate Band
1720-5500 Kilocycles

Short Wave Band
5.5-18.1 Megacycles.





BOTTOM VIEW—SHOWING TRIMMERS

MODEL 1070, Runs 1,2
Alignment, Parts

GOODYEAR TIRE & RUBBER CO., INC.

10-Tube A. C. All Wave
3-Band High Fidelity Superheterodyne Receiver with Cathode Ray Tuning Indicator

MODEL 1070 - RUN 2

NOTE:—Operation of Cathode-Ray Tuning Indicator

Due to unsatisfactory indication of the cathode-ray tuning indicator on weak signals in some territories, a change was made in the circuit to correct this condition and still allow the tube to operate correctly on a strong signal.

Referring to the circuit diagram, resistors R26, R27 and condenser C32 were added and connected to the green wire from the cathode-ray tuning indicator as shown.

The dotted line on the circuit diagram indicates the manner in which the green wire for the cathode-ray tuning indicator cable was formerly connected, before resistors R26, R27 and condenser C32 were added.

1—Type 6G5 Cathode ray tuning indicator.

Form 1006 2M 8-36

MODEL 1070 - RUN 1

DESCRIPTION

The tube complement of this chassis is as follows:
1—Type 6K7 Remote cut-off pentode R.F. amplifier
1—Type 6L7 Pentode first detector
1—Type 6C5 Oscillator
1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
1—Type 6H6 Duplex diode second detector and A.V.C.
1—Type 6C5 First audio amplifier
1—Type 6F6 Pentode driver stage
2—Type 6F6 Class AB Output pentodes in push-pull
1—Type 5Z4 High vacuum rectifier

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagrams of series A.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 119 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

This chassis is protected against damage from faulty tubes or abnormal line conditions by a fuse in the primary circuit.

If when set is turned on pilot lights do not light, look for a blown fuse.

This fuse is made accessible for replacement by removing fuse cover located on back flange of chassis, replace only with a 2 ampere fuse. If replacement fuse blows out, check tubes, (particularly 5Z4 rectifier) circuit, repair or replace defective tubes or parts.

NEVER ATTEMPT TO REPLACE FUSE WITHOUT FIRST DISCONNECTING POWER.

NEVER REPLACE WITH FUSE OTHER THAN 2 AMPERE RATING.

NOTE: Chassis with serial numbers from 5K194500 to 5K195497 have the fuse mounted on the under-side of the chassis, it is necessary to remove the chassis from the cabinet to replace the fuse.

ALIGNING INSTRUCTIONS
Dummy Antennas

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Resonance Indicator:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

CAUTION:

No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the four bolts by which it is fastened.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-62 Output I.F. Transformer
Part No. 108-55 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view).

1. With volume control full on, (the extreme right of its rotation), the wave changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   - (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer to resonance.
   - (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6L7 and adjust input I.F. transformer to resonance.
   - (c) With oscillator still connected to 6L7, re-adjust output I.F. transformer.

ALIGNMENT PROCEDURE

The following adjustments to be made after the I.F.'s have been aligned as explained above.

BROADCAST BAND ALIGNMENT:

1. With wave changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:
   - (a) Adjust broadcast series pad to resonance with oscillator Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the electrolytic condenser. See top view.
   - (b) Re-set external oscillator to 1400 K.C., move dial/pointer to 1400 K.C. and adjust oscillator (adjustment number 3), R.F. (adjustment number 2) and antenna (adjustment number 1) to resonance. See bottom view for location of these adjustments.
   - (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

NOTE: IT IS EXTREMELY NECESSARY IN MAKING ALL OF THESE ADJUSTMENTS THAT THE FUNDAMENTAL OSCILLATOR SIGNAL BE TUNED IN AND NOT THE IMAGE FREQUENCY WHICH WILL FALL BELOW THE FUNDAMENTAL.

SHORT WAVE BAND ALIGNMENT:

1. With wave changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   - (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 8), short wave R.F. (adjustment number 7) and short wave antenna (adjustment number 6) to resonance.
   - (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

INTERMEDIATE BAND ALIGNMENT:

1. With wave changing switch in the intermediate wave position, center of its rotation, and with external oscillator set at 1800 K.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   - (a) Rotate variable condenser to approximately 1800 K.C., tune in oscillator signal and adjust M.W. series pad (see top view) to resonance. Slowly rock condenser to and fro while making this adjustment to be sure maximum output is obtained.
   - (b) Set external oscillator at 5 M.C., rotate condenser, pick up signal and adjust intermediate wave R.F. (adjustment number 5), intermediate wave antenna (adjustment number 4) and intermediate wave oscillator (adjustment number 9) to resonance.
   - (c) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. intermediate wave adjustments.

REPAIR PARTS LIST—MODEL 1070—RUN 1
REPAIRS PARTS LIST—MODEL 1070—RUN 2

Part No.	Description	Circuit Diagram Reference	List Price Each
	CONDENSERS		
100-1	.1 x 400 Volt Tubular	C17, C19	$0.25
100-6	.25 x 200 Volt Tubular with Bracket	C2	.35
100-7	.005 x 600 Volt Tubular	C29	.25
100-9	.05 x 200 Volt Tubular	C1, C7, C10	.25
100-11	.01 x 400 Volt Tubular	C32	.25
100-13	.05 x 400 Volt Tubular	C15, C21	.25
100-20	.1 x 200 Volt Tubular	C5	.25
100-22	.05 x 200 Volt Tubular	C12, C13	.25
100-24	.25 x 400 Volt Tubular	C6	.35
100-32	.0005 x 1000 Volt Condenser	C31	.25
103-8	14 Mfd. x 400 Volt Electrolytic	C25	1.35
103-10	30 Mfd. x 450 Volt Electrolytic	C26	1.35
119-19	Dual 20 Mfd. x 25 Volt Electrolytic	C14, C18	1.25
119-23	25 mfd. x 25 Volt Electrolytic	C30	.75
129-2	.0005 Mica - Type MT - 20%	C11	.25
129-3	.00002 Mica - Type MT - 20%	C16	.25
129-21	.0002 Mica - Type MT - 20%	C4	.25
129-22	.0014 Mica - Type MW - 5%	C23	.25
129-28	.00064 Mica - Type MT - 5%	C22	.25
129-29	.0038 Mica - Type MW - 2½%	C24	.50
129-30	.0014 Mica - Type MW - 20%	C3	.25
129-38	.00005 Mica - Type MT - 10%	C8, C9	.25
129-52	.000018 Mica - Type MT - 10%	C20	.25
	RESISTORS		
106-25	Metal Clad Resistor	R19, R21	.50
130-8	500M Ohm - ½ Watt - 20% - 100 Volt Carbon	R8, R17, R18	.20
130-9	200M Ohm - ½ Watt - 20% - 20 Volt Carbon	R22	.20
130-11	250M Ohm - ½ Watt - 20% - 50 Volt Carbon	R13	.20
130-20	100M Ohm - ½ Watt - 20% - 50 Volt Carb	R2, R12, R15, R16	.20
130-21	20M Ohm - ½ Watt - 20% - 20 Volt Carbon	R23, R25	.20
130-22	5M Ohm - ½ Watt - 20% - 10 Volt Carbon	R9	.20
130-36	10M Ohm - ½ Watt - 20% - 50 Volt Carbon	R14	.20
130-49	12M Ohm - 1 Watt - 20% - 150 Volt Carbon	R4	.20
130-52	50M Ohm - ½ Watt - 20% - 10 Volt Carbon	R6	.20
130-53	180 Ohm Watt—20%	R5	.20
130-54	500 Ohm - ½ Watt - 20% 10 Volt Carbon	R3	.20
130-60	100 Ohm - ½ Watt - 20% - 10 Volt Carbon	R1	.20
130-85	3M Ohm - ½ Watt - 20% - 10 Volt Carbon	R10	.20
130-86	10M Ohm - 1 Watt - Wire Wound	R7	.40
130-110	1 Megohm—1/10 Watt—10%—100 Volt Carbon	R24	.20
130-126	3 Megohm—1/10 Watt—20%—100 Volt Carbon	R26	.20
130-127	4 Megohm—1/10 Watt—20%—100 Volt Carbon	R27	.20
	COILS		
108-55	Input I.F. Coil Assembly Complete—Less Can	T7	2.50
108-62	Output I.F. Coil Assembly Complete—Less Can	T8	1.50
109-24	Broadcast R.F. Coil Assembly Complete—Less Can	T3	.50
109-25	Mid-Wave & Short Wave R.F. Coil Assembly Complete—Less Can	T4	1.50
110-32	Broadcast Oscillator Coil Assembly Complete—Less Can	T5	.50
110-33	Mid-Wave & Short Wave Oscillator Coil Assembly Complete—Less Can	T6	1.00
111-39	Mid-Wave & Short Wave Antenna Coil Assembly Complete—Less Can	T2	1.00
111-40	Broadcast Antenna Coil Assembly Complete—Less Can	T1	.75
	TRANSFORMERS		
104-43	50/60 Cycle Power Transformer		6.00
104-45	25 Cycle Power Transformer		7.00
104-46	Universal - 25 Cycle Primary		6.00
104-47	Universal - 40 Cycle Primary		7.50
104-50	50/60 Cycle - Special 135 Volt Power Transformer		7.00
	SOCKETS		
121-4	Five Prong Socket - "Speaker"		.10
121-12	Seven Prong Socket - "6K7"		.15
121-14	Seven Prong Socket - "6F6"		.15
121-16	Five Prong Socket - "5Z4"		.10
121-17	Six Prong Socket - "6C5"		.15
121-18	Seven Prong Socket - "6L7"		.15
121-19	Seven Prong Socket - "6H6"		.15
	SPEAKER		
114-29	Twelve Inch Dynamic (Field 1550 Ohm)	L	10.00
	MISCELLANEOUS		
101-36	Volume Control and Switch (1 Meg Ohm)	R11	1.35
101-40	Tone Control and Fidelity Switch (5M Ohm)	R20	1.35
102-23	Three Gang Variable Condenser		5.00
107-5	Line Cord and Plug		.50
115-35	Antenna, Oscillator & R. F. Shield		.15
115-36	I.F. Shield		.15
105-17	Audio Transformers	T9	1.85
124-27	J-3-4-D Series Dual Pad	C27, C28	.60
135-16	Wave Change Switch	S	.90
113-47	Fuse Clip Assembly		.15
128-51	Wood Knob with Spring		.15
131-34	2 Amp. Fuse - Type 3AG		.10

CATHODE-RAY TUNING INDICATOR PARTS

Part No.	Description	List Price Each
107-28	Cable and Socket Assembly	$0.75
112-158	Metal Oval Escutcheon	.25
117-57	Holder and Clamp	.25
130-110	1 Meg. Ohm—1/10 Watt—10%—100 Volt Carbon	.20

DIAL PARTS LIST

ASSEMBLIES

112-133 Belt Take-up Assembly—Including .... .35
- 1—No. 117-18 Take-up Arm
- 1—No. 117-21 Take-up Pulley
- 1—No. 117-24A Stud for Above
- 1—No. 117-22A Stud
- 1—No. 131-26 Spring Washer
- 2—No. 134-0 Horse Shoe Washer

112-134 Switch Assembly—Including: .... .65
- 2—No. 117-16 Band Indicator Arm
- 1—No. 117-15 Link
- 1—No. 117-14 Elbow
- 1—No. 117-13 Link
- 3—No. 162-5 Rivets
- 3—No. 131-30 Spring Washer
- 1—No. 117-33A Threaded Stud
- 1—No. 117-22A Stud
- Red Cellulose

112-135 Volume Indicator Assembly—Including: .... .75
- 1—No. 112-122 Pointer Disc
- 1—No. 117-26 Bushing
- 1—No. 120-5A Spring Clip
- 1—No. 120-7 Coil Spring
- No. 120-11 Fish Line
- 1—No. 117-28 Pulley
- 1—No. 154-2 Set Screw
- R Red Cellulose
- 1—No. 134-9 Horse Shoe Washer

112-136 Tone Indicator Assembly—Including: .... .75
- 1—No. 112-122 Pointer Disc
- 1—No. 117-26 Bushing
- 1—No. 120-5A Spring Clip
- 1—No. 120-7 Coil Spring
- No. 120-9 Fish Line
- 1—No. 117-32 Pulley
- 1—No. 154-2 Red Cellulose

112-137 Dial Plate Assembly—Including: 1.25
- 1—No. 117-17 Dial Plate
- 2—No. 117-11 Dial Bracket
- 4—No. 162-4 Rivets
- 2—No. 117-25A Volume & Tone Indicator Studs
- 1—No. 117-19 Bushing for Tuning Shaft
- No. 134-9 Horse Shoe Washer

112-138 Switch Arm Assembly—Including: .... .25
- 1—No. 117-12 Switch Arm
- 1—No. 117-35 Bushing
- 2—No. 132-18 Set Screw

DIAL PARTS ONLY

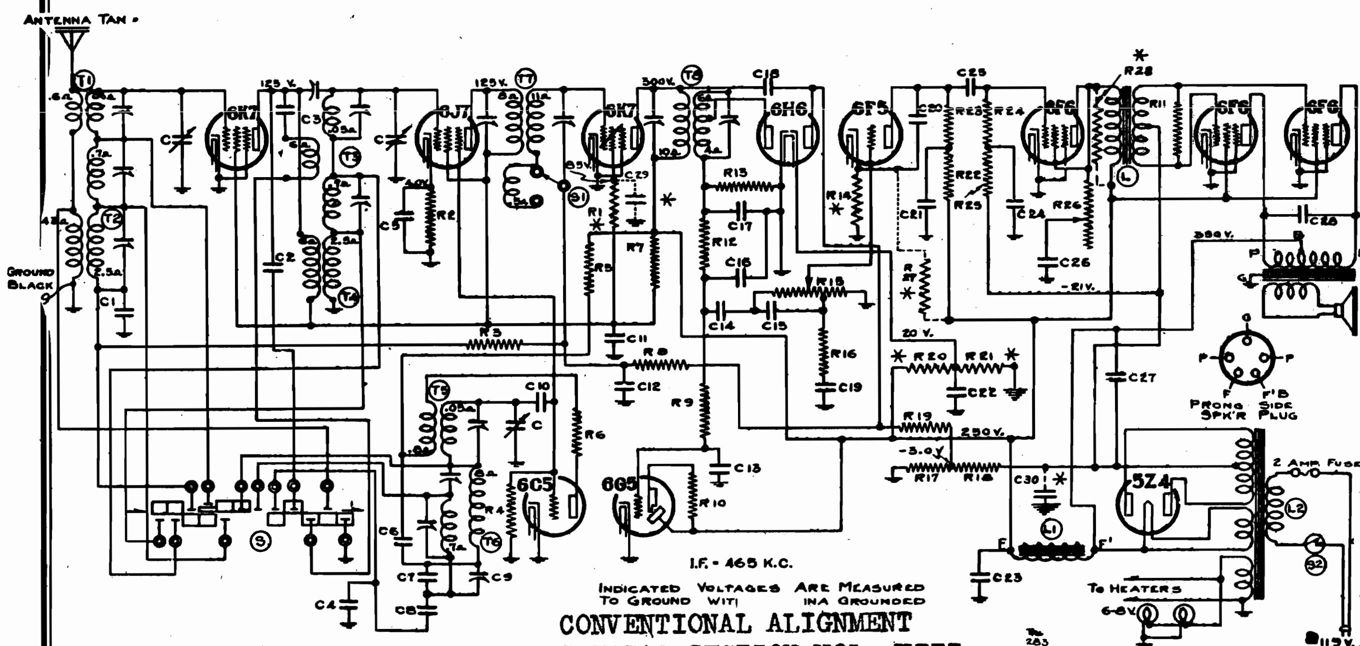
Part No.	Description	List Price Each
112-117A	Tuning Shaft	.05
112-118	Metal Oval Escutcheon Only	1.25
112-119	Dial Pointer with No. 132-8 Screw	.20
112-120	Band Spread Pointer Disc	.10
112-123	Oval Glass Crystal Only	.35
112-124	Glass Dial Scale	1.25
112-125	Drive Belt	.20
112-126	Pilot Light Socket	.10
112-127	Pilot Light Socket	.10
112-129	Oval Glass Retaining Ring	.10
107-14	6-8 Volt, T-46 Pilot Light	.10
117-20A	Drive Belt Pulley	.10
117-29	Background Plate (Specify if Blue or Brown Desired)	.25
117-30	Reflector Plate	.25
120-4	Drive Belt Take-up Coil Spring	.05
131-33	Glass Retaining Clips	.025

Trimmers, Alignment

MODELS 1170, 1171

Schematic, Socket

GOODYEAR TIRE & RUBBER CO., INC.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

BAND CHANGE SWITCH THREE POSITIONS, ROTATING CLOCKWISE ARE:
1st BROADCAST: 535-1720 K.C.
2nd MIDDLE WAVE: 1690-5300 K.C.
3rd SHORT WAVE: 5.2-18.1 M.C.

TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles.

Middle Wave Band
1690-5300 Kilocycles
Short Wave Band
5.2-18.1 Megacycles.

RESISTORS

No.	Part No.	Description
*R1	130-76	30M Ohm—⅓ Watt—20%—Carbon
R2	130-129	2500 Ohm—⅓ Watt—10%—Carbon
R3	130-20	100M Ohm—⅓ Watt—20%—Carbon
R4	130-12	50M Ohm—⅓ Watt—20%—Carbon
R5	130-77	10M Ohm—1 Watt—20%—Carbon
R6	130-60	100 Ohm—⅓ Watt—20%—Carbon
R7	130-88	10M Ohm—2 Watt—20%—Wire Wound
R8	130-19	1 meg Ohm—⅓ Watt—20%—Carbon
R9	130-4	3 meg Ohm—⅓ Watt—20%—Carbon
R10	130-110	1 meg Ohm—1/10 Watt—10%—Carbon
R11	130-21	20M Ohm—⅓ Watt—20%—Carbon
R12	130-20	100M Ohm—⅓ Watt—20%—Carbon
R13	130-20	100M Ohm—⅓ Watt—20%—Carbon
*R14	130-70	500 Ohm—⅓ Watt—10%—Carbon
R15	101-47	1 meg Ohm—Volume Control
R16	130-22	5M Ohm—⅓ Watt—20%—Carbon
R17	106-31	30 Ohm—Muter
R18	106-31	175 Ohm—Muter
R19	130-3	500M Ohm—⅓ Watt—20%—Carbon
*R20	130-130	100M Ohm—⅓ Watt—10%—Carbon
*R21	130-82	10M Ohm—⅓ Watt—10%—Carbon
R22	130-20	100M Ohm—⅓ Watt—20%—Carbon
R23	130-20	100M Ohm—⅓ Watt—20%—Carbon
R24	130-45	250M Ohm—⅓ Watt—20%—Carbon
R25	130-45	250M Ohm—⅓ Watt—20%—Carbon
R26	101-40	5000 Ohm Tone Control
*R27	130-130	100M Ohm—⅓ Watt—10%—Carbon
*R28	130-131	20M Ohm—⅓ Watt—10%—Carbon

NOTE: R17 and R18 in one Unit—No. 106-31.

CONDENSERS

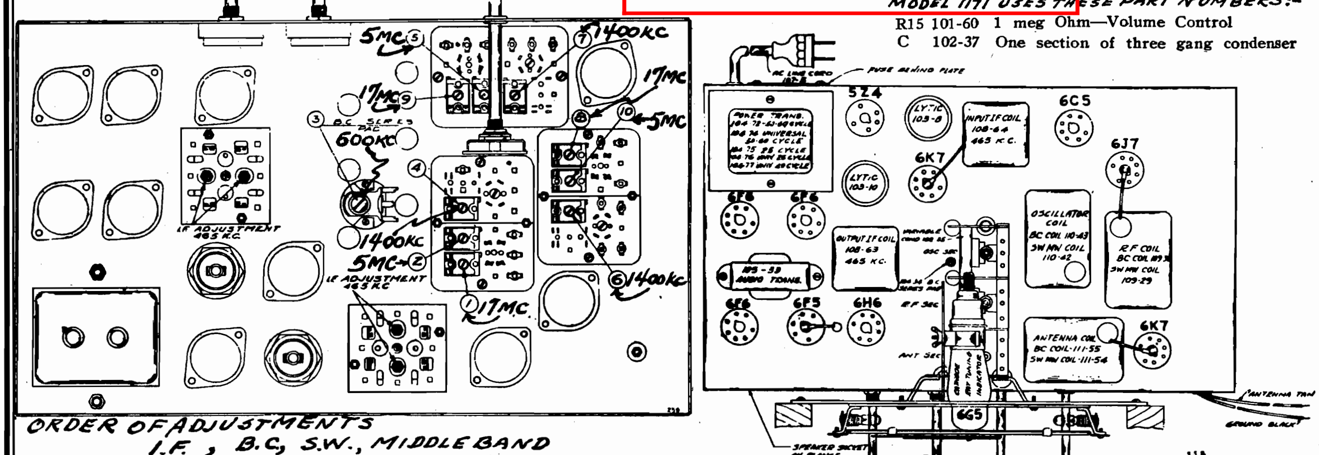
No.	Part No.	Description
C1	100-9	.05 x 200 Volt—25%
C2	129-59	.0003 Mica—5%—MT—0
C3	129-39	.00005 Mica—20%—MT—0
C4	129-69	.0023 Mica—2½%—MT—0
C5	100-9	.05 x 200 Volt—25%
C6	100-13	.05 x 400 Volt—25%
C7	129-57	.0005 Mica—5%—MT—0
C8	129-55	.0034 Mica—2½%—MT—0
C9	124-34	200 mmf. Working cap. adjustable Pad
C10	129-31	.000025 Mica—15%—MT—0
C11	100-41	.25 x 400 Volt—20%
C12	100-9	.05 x 200 Volt—25%
C13	100-11	.01 x 400 Volt—25%
C14	100-22	.05 x 200 Volt—25%
C15	129-12	.00025 Mica—20%—MT—0
C16	129-60	.00015 Mica—20%—MT—0
C17	129-60	.00015 Mica—20%—MT—0
C18	129-3	.00002 Mica—20%—MT—0
C19	100-9	.05 x 200 Volt—25%
C20	129-5	.0001 Mica—20%—MT—0
C21	100-20	.1 x 200 Volt—25%
C22	100-19	.006 x 600 Volt—25%
C23	103-8	14 mfd.—400 Volt—Electrolytic
C24	100-20	.1 x 200 Volt—25%
C25	100-13	.05 x 400 Volt—25%
C26	100-45	.1 x 600 Volt—25%
C27	103-10	30 mfd. x 450 Volt—Electrolytic
C28	100-32	.0005 x 1000 Volts—20%
*C29	100-11	.01 x 400 Volts—25%
*C30	100-20	.1 x 200 Volt—25%

PARTS

No.	Part No.	Description
C	102-35	One section of three gang condenser
T1	111-54	MW and SW Antenna Coil Assem.
T2	111-55	Broadcast Antenna Coil Assem.
T3	109-29	MW and SW R.F. Coil Assem.
T4	109-30	Broadcast R.F. Coil
T5	110-42	MW and SW Osc. Coil Assem.
T6	110-43	Broadcast Osc. Coil Assem.
T7	108-64	Input I.F. Coil—465 Kc.
T8	108-63	Output I.F. Coil—465 Kc.
L	105-33	Audio Transformer
L1	114-47C	Speaker (Field Resist. 1225 ohm) Hot
L2	104-72	Power Transformer (50-60 Cycle)
S	125-18	Band Switch
S1	101-40	Fidelity Switch on Tone Control
S2	101-47	On-Off Switch on Volume Control

NOTE: Resistors and Condensers which are prefixed with an asterisk (*) on the circuit diagram and parts list were added or the values changed during production to meet certain conditions.
Resistors R1, R27, R28, and Condensers C29, C30 were added to correct certain variances of tube characteristics. Resistors R14, R20, R21 the values were changed. In some chassis the values of these resistors are as follows:
R14—2500 Ohm—⅓ Watt
R20—200M Ohm—⅓ Watt
R21—20M Ohm—⅓ Watt
Present values of these resistors are:
R14—500 Ohm—⅓ Watt
R20—100M Ohm—⅓ Watt
R21—10M Ohm—⅓ Watt

MODEL 1171 USES THESE PART NUMBERS:—
R15 101-60 1 meg Ohm—Volume Control
C 102-37 One section of three gang condenser

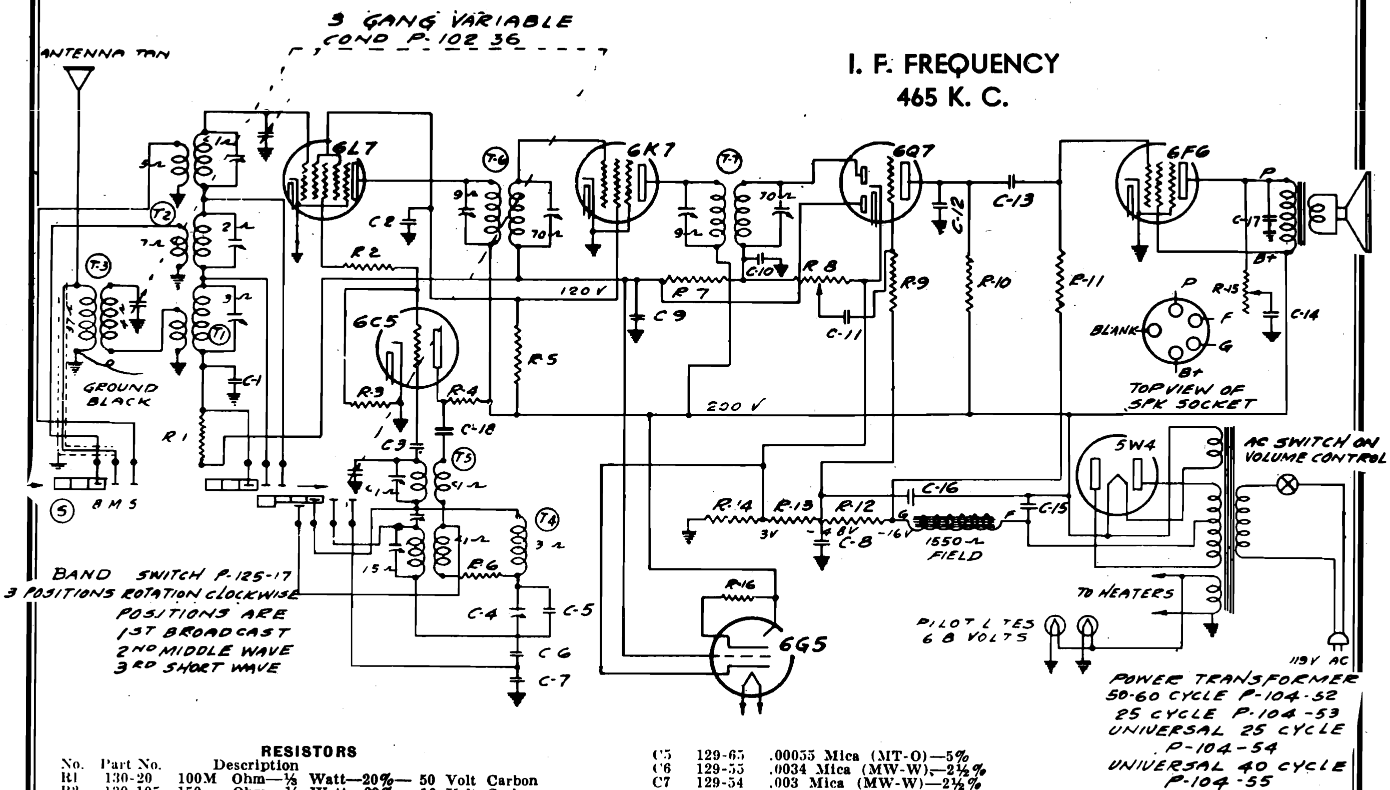


ORDER OF ADJUSTMENTS
I.F., B.C, S.W., MIDDLE BAND

FIG. 1—BOTTOM VIEW SHOWING TRIMMERS

MODEL 787
Schematic, Voltage
Socket, Trimmers

GOODYEAR TIRE & RUBBER CO., INC.



RESISTORS

No.	Part No.	Description
R1	130-20	100M Ohm—⅓ Watt—20%— 50 Volt Carbon
R2	130-105	150 Ohm—⅓ Watt—20%— 10 Volt Carbon
R3	130-12	50M Ohm—⅓ Watt—20%— 10 Volt Carbon
R4	130-104	9M Ohm— 1 Watt—20%—100 Volt Carbon
R5	130-34	19M Ohm— 1 Watt—20%—100 Volt Carbon
R6	130-27	50 Ohm—⅓ Watt—20%— 3 Volt Carbon
R7	130-19	1 Meg Ohm—⅓ Watt—20%—100 Volt Carbon
R8	101-46	1 Meg Ohm—Volume Control
R9	130-4	3 Meg Ohm—⅓ Watt—20%—100 Volt Carbon
R10	130-103	100M Ohm—⅓ Watt—20%— 50 Volt Carbon
R11	130-102	500M Ohm—⅓ Watt—10%— 50 Volt Carbon
R12	106-26	220 Ohm
R13	106-26	32 Ohm
R14	106-26	52 Ohm
R15	101-53	50M Ohm—Tone Control
R16	130-110	1 Meg Ohm—1/10 Watt—10%—100 Volt Carbon

CONDENSERS

No.	Part No.	Description
C1	100-22	.05x200 Volt—25%
C2	100-1	.1x400 Volt—+50%—10%
C3	129-39	.00005 Mica (MT-O)—20%
C4	124-28	Series Pad (80-225)
C5	129-65	.00055 Mica (MT-O)—5%
C6	129-55	.0034 Mica (MW-W)—2½%
C7	129-54	.003 Mica (MW-W)—2½%
C8	100-20	.1x200 Volt—25%
C9	100-22	.05x200 Volt—25%
C10	129-12	.00025 Mica (MT-0)—20%
C11	100-11	.01x400 Volt—25%
C12	129-2	.0005 Mica (MT-O)—20%
C13	100-11	.01x400 Volt —25%
C14	100-27	.025x600 Volt—25%
C15	103-6	8 Mfd. x 350 Volt Electrolytic
C16	103-7	8 Mfd. x 300 Volt Electrolytic
C17	100-25	.002x600 Volt—20%
C18	100-37	.003x600 Volt—10%

PARTS

No.	Part No.	Description
T1	111-49	Broadcast Antenna Coil
T2	111-50	S.W.-M.W. Antenna Coil
T3	111-51	B.C.-Pre-Selector Coil Assem.
T4	110-38	B.C. Oscillator Coil
T5	110-39	S.W.-M.W. Oscillator Coil
T6	108-74	Input I.F. - 465 K.C.
T7	108-73	Output I.F. - 465 K.C.
S	125-17	Wave Change Switch

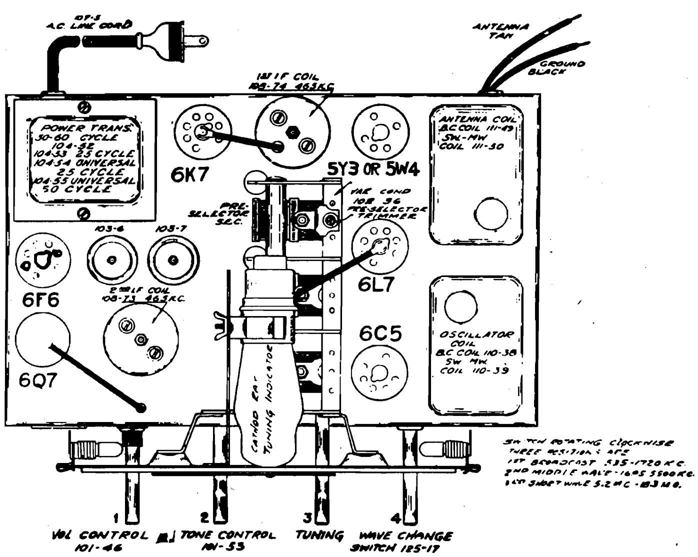
TUNING RANGE—

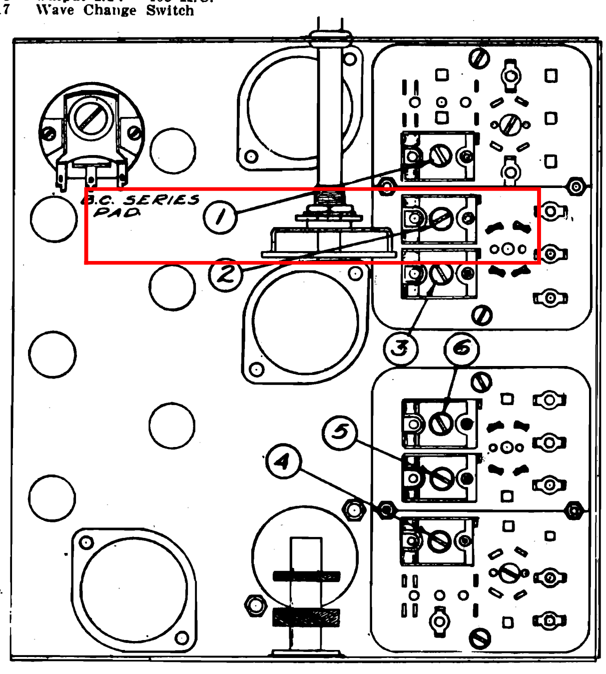
Standard Broadcast Band
535-1720 Kilocycles.

Middle Wave Band
1695-5500 Kilocycles.

Short Wave Band
5.2-18.3 Megacycles.

FOR ALIGNMENT
SEE INDEX

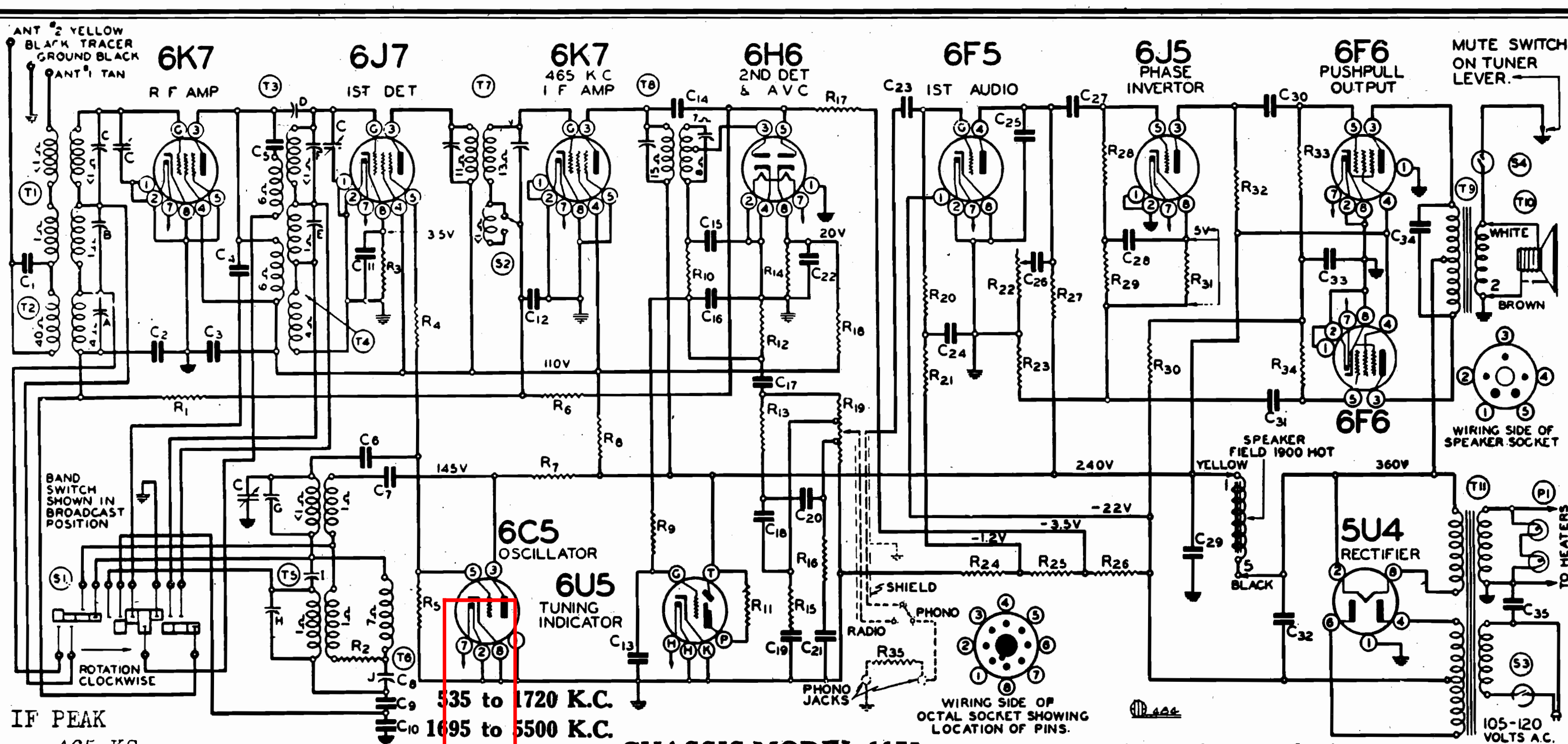




BOTTOM VIEW (Showing Trimmers)

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 1175
Schematic
Voltage



IF PEAK 465 KC.

FREQUENCY RANGE 535 to 1720 K.C. / 1695 to 5500 K.C. / 5.35 to 18.1 M.C.

CHASSIS MODEL 1175

(Serial No. 7M920500 and up)

RESISTORS

Code	Part No.	Description
R1	130-20	100M ohm - 1/3 w. - 20%
R2	130-166	150 ohm - 1/3 w. - 10%
R3	130-129	2500 ohm - 1/3 w. - 10%
R4	130-60	100 ohm - 1/3 w. - 20%
R5	130-12	50M ohm - 1/3 w. - 20%
R6	130-19	1 megohm - 1/3 w. - 20%
R7	130-133	15M ohm - 1/2 w. - 20%
R8	106-46	2900 ohm - resistor strip
R9	130-4	3 megohm - 1/3 w. - 20%
R10	130-201	25M ohm - 1/10 w. - 20%
R11	130-110	1 megohm - in tuning indicator socket 1/10 w. - 20%
R12	130-186	250M ohm - 1/10 w. - 20%
R13	130-12	50M ohm - 1/3 w. - 20%
R14	106-46	600 ohm - Resistor Strip
R15	130-22	5M ohm - 1/3 w. - 20%
R16	130-85	3M ohm - 1/3 w. - 20%
R17	130-3	500M ohm - 1/3 w. - 20%
R18	106-46	2500 ohm - resistor strip
R19	101-102	1 megohm - volume control
R20	130-37	750M ohm - 1/3 w. - 20%
R21	130-45	250M ohm - 1/3 w. - 20%
R22	101-103	300M ohm - Tone control
R23	130-103	100M ohm - 1/3 w. - 10%
R24	106-47	Resistor Strip - 11 ohm
R25	106-47	22 ohm - Resistor strip
R26	106-47	170 ohm - Resistor strip
R27	130-45	250M ohm - 1/3 w. - 20%
R28	130-37	750M ohm - 1/3 w. - 20%
R29	130-45	250M ohm - 1/3 w. - 20%
R30	130-103	100M ohm - 1/3 w. - 10%
R31	130-82	10M ohm - 1/3 w. - 10%
R32	130-103	100M ohm - 1/3 w. - 10%
R33	130-45	250M ohm - 1/3 w. - 20%
R34	130-45	250M ohm - 1/3 w. - 20%

R8, R14 and R18 in same unit
R24, R25 and R26 in same unit
R10 and R12 in output I.F. Can

CONDENSERS

Code	Part No.	Description
C	102-66	3 gang variable Condenser
C1	129-40	.0001 - 10% Mica
C2	100-22	.05 x 200 v. - 25%
C3	100-53	.25 x 400 v. - 20%
C4	129-34	.0002 - 5% Mica
C5	129-38	.00005 - 10% Mica
C6	129-38	.00005 - 10% Mica
C7	100-25	.002 x 600 v. - 25%
C8	124-35	.00074 Series Pad
C9	129-92	.0033 - 2-1/2% Compression type condenser
C10	129-90	.0023 - 2-1/2% Compression type condenser
C11	100-33	.1 x 200 v. - 50 - 10%
C12	100-22	.05 x 200 v. - 25%
C13	100-78	.01 x 200 v. - 25%
C14	129-3	.00002 - 20% Mica
C15	129-39	.00005 - 20% Ceramicon
C16	129-38	.00005 - 10% Mica
C17	100-9	.05 x 200 v. - 25%
C18	129-3	.00002 - 20% Mica
C19	100-22	.05 x 200 v. - 25%
C20	129-38	.00005 - 10% Mica
C21	100-19	.006 - 600 v. - 25%
C22	100-78	.01 x 200 v. - 25%
C23	100-11	.01 x 400 v. - 25%
C24	100-9	.05 x 200 v. - 25%
C25	129-40	.0001 - 10% Mica
C26	100-12	.003 x 600 v. - 25%
C27	100-26	.02 x 400 v. - 25%
C28	100-33	.1 x 200 v. - 50 - 10%
C29	103-10	30 mfd. - 450 w.v. lytic
C30	100-13	.05 x 400 v. - 25%
C31	100-80	.05 x 400 v. - 25%
C32	103-10	30 mfd. - 450 w.v. lytic
C33	100-33	.1 x 200 v. - 50 - 10%
C34	100-32	.0005 - 1000 v. - 20%
C35	100-61	.02 x 600 v. - 20% Bakelite

PARTS

Code	Part No.	Description
T1	111-90	SW - MW - Antenna Coil
T2	111-68	BC - Antenna Coil
T3	109-32B	SW - MW - R.F. Coil
T4	109-33	BC - R.F. Coil
T5	110-53B	SW - MW Oscillator Coil
T6	110-52B	BC - Oscillator Coil
T7	108-113	Input I.F. 465 kc.
T8	108-114	Output I.F. 465 kc.
T9	105-56	Output Transformer
T10	114-107	12" Dynamic Speaker
T11	104-117	Power Transformer 50/60 cycle
S1	125-44	Band Switch
S2		Hi Fi Switch on tone control
S3		Off-on switch on volume control
S4	125-14	Mute Switch
P1	107-94	6-8 v. Pilot lights

For conventional types of antennas connect the tan wire to the antenna lead and the **yellow with black tracer** and the **black** wire together to the ground lead.

When a doublet antenna is used connect the tan wire and **the yellow with black tracer** wire to the doublet antenna and the solid black wire to the ground lead. (See Fig. 1—Top View).

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

Receivers of this model which are to be used on voltages or frequencies other than 105-115 volts, 60 cycles are so marked. The power consumption of this receiver is 125 watts.

All voltages are to be measured with 115 volts on the primary of the power transformer.

MODEL 1175
Socket, Trimmers
Tuner Data

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 1175
(Serial No. 7M920500 and up)

The tube complement of this chassis consists of the following metal and octal base glass tubes which are interchangeable with metal tubes:

1—Type 6K7 Remote cut-off pentode R.F. amplifier
1—Type 6J7 Pentode first detector
1—Type 6C5 Oscillator
1—Type 6K7 Remote cut-off pentode I.F. amplifier
1—Type 6H6 Duplex diode second detector and A.V.C.
1—Type 6F5 First audio amplifier
1—Type 6J5 Phase Inverter stage
2—Type 6F6 Output pentodes in push-pull
1—Type 5U4 High vacuum rectifier
1—Type 6U5 Cathode-Ray Tuning Indicator.

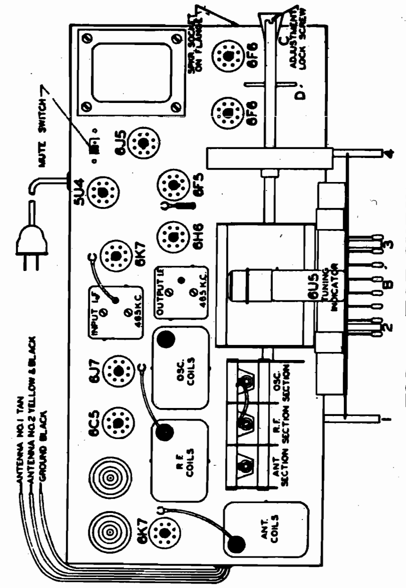


FIG. 1—TOP VIEW

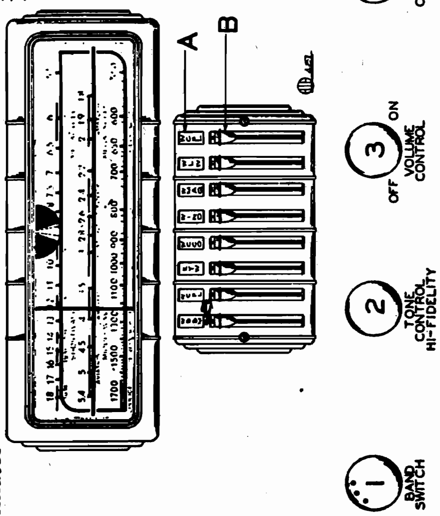


FIG. 2—FRONT VIEW

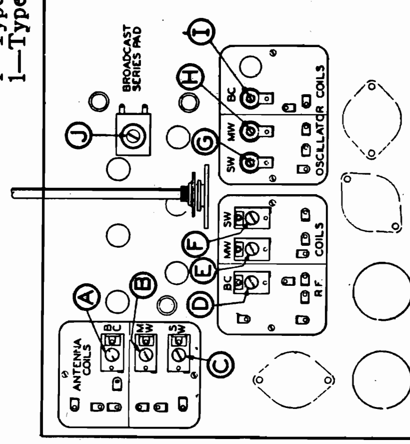


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

PROCEDURE FOR SETTING THE AUTOMATIC TUNER LEVERS:

IMPORTANT—READ CAREFULLY BEFORE SETTING THE AUTOMATIC LEVERS:

A mute feature has been incorporated in the automatic tuning mechanism of the Model 1175. The function of this feature is to permit SILENT TUNING from one station to another by means of the automatic tuning levers. When any one of the levers are pressed down, the speaker is automatically disconnected from the radio and NO SIGNAL is heard until the lever is RELEASED.

To facilitate an accurate adjustment of the levers it is desirable to hear the station being tuned in while the lever is being adjusted; therefore a MUTE SWITCH is provided to manually connect or disconnect the silent tuning feature.

Referring to the top view of the radio (Fig. 1 in this manual), THE POSITION OF THE SWITCH (located on the top of the radio chassis alongside the power transformer), IS IMPORTANT.

Set the switch as follows:

WHILE SETTING THE AUTOMATIC LEVERS:
Switch should be snapped to the right (white dot not visible).

AFTER AUTOMATIC LEVERS HAVE BEEN SET:
Switch should be snapped to the left (white dot showing).

There are eight levers on the dial by means of which eight stations may be selected, (See "B", Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including 8.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the escutcheon is provided for inserting the call letter tabs, (See "A" Fig. 2). Any order of grouping may be used, however, it is recommended that the left hand four automatic levers be used for high frequency stations (1750 to 1000 K.C.) and the right hand four automatic levers for low frequency stations (1000 to 540 K.C.).

Insert the call letter tabs in the rectangular openings in the escutcheon above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob No. 4 the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position), noting the width of the shadow indicated on the screen of the cathode-ray tuning eye. Minimum width on the eye indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Rotate the tuning knob No. 4 to the right (clockwise) as far as it will turn. Now remove from the right side of the cabinet the metal button, and, with a screw driver inserted through the hole, tighten the locking adjustment screw "C". It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT. If a screw driver is not available, the locking screw can be tightened by reaching in from the back of the cabinet, and, by means of the pin "D" (see Fig. 1), rotate the locking screw shaft to the right (clockwise) until thoroughly tight.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" four or five complete turns; select the new station as explained. (Note: If the dial mechanism works hard when setting up a new station for one of the automatic tuner levers, it is due to the locking screw being too tight. Loosen the locking screw "C" until the dial mechanism works freely with the tuner lever pressed down.)

BE SURE TO RETIGHTEN THE LOCKING SCREW; otherwise the stations you have selected will not stay adjusted to the levers.

Snap mute switch to silent tuning position (white dot showing)

MODEL 1175
Alignment
MODEL 01029
Tuner, Alignment

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 1175

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-114 Output I.F. Transformer
Part No. 108-113 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view Fig. 1).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1." to the control grid cap of the type 6K7 I.F. tube and adjust the output I.F. transformer 108-114 to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-113) to resonance.
   (c) With oscillator still connected to 6J7, re-adjust output I.F. transformer if necessary.

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 1720 Kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 1720 Kilocycles and adjust broadcast oscillator trimmer (adjustment I) to resonance. See bottom view, Fig. 3.
   (b) Re-set external oscillator to 1400 Kilocycles, move dial pointer to 1400 Kilocycles and adjust broadcast antenna trimmer, (adjustment A) and broadcast R.F. trimmer (adjustment D) to resonance.
   (c) With external oscillator set at 600 K.C. adjust broadcast series pad (adjustment J) to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained.
   (d) Repeat adjustments (a) and (c) until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1000 Kilocycles. UNDER NO CIRCUMSTANCES BEND PLATES OF VARIABLE CONDENSER TO CORRECT TRACKING.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 Megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 Megacycles and adjust short wave oscillator (adjustment G), short wave R.F. (adjustment F) and short wave antenna (adjustment C) to resonance.
   (b) Re-set external oscillator to 6 Megacycles and pick up signal by rotating variable condenser and check for sensitivity.

   NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. As an example of this a fundamental 17 megacycle signal can be tuned in not only at 17 on the dial, but also at approximately 16.1 megacycles.

MIDDLE WAVE ALIGNMENT:

1695 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 Megacycles connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Rotate condenser, pick up signal and adjust middle wave oscillator (adjustment H), middle wave R.F. (adjustment E) middle wave antenna (adjustment B) to resonance.
   (b) Re-check broadcast alignment and if it is found necessary; re-adjust either R.F. or antenna trimmers. Repeat the 17 megacycles short wave and 5 megacycles middle wave adjustments.

MODEL 01029 CHASSIS 860

(Serial No. 7L897400 and up)

PROCEDURE FOR SETTING THE AUTOMATIC TUNER LEVERS:

There are eight levers on the dial by means of which eight stations may be selected, (See "B", Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including 8.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

Above each automatic tuner lever an opening in the escutcheon is provided for inserting the call letter tabs, (See "A" Fig. 2). Any order of grouping may be used, however, it is recommended that the left hand four automatic levers be used for high frequency stations (1750 to 1000 K.C.) and the right hand four automatic levers for low frequency stations (1000 to 540 K.C.).

Insert the call letter tabs in the rectangular openings in the escutcheon above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 4) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) noting the width of the shadow indicated on the screen of the cathode-ray tuning eye. Minimum width on the eye indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Rotate the tuning knob (No. 4) to the right (clockwise) as far as it will turn. Now remove from the right side of the cabinet the metal button, and, with a screw driver inserted through the hole, tighten the locking adjustment screw "C". It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT. If a screw driver is not available, the locking screw can be tightened by reaching in from the back of the cabinet, and, by means of the pin "D" (see Fig. 1), rotate the locking screw shaft to the right (clockwise) until thoroughly tight.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" four or five complete turns; select the new station as explained. (Note: If the dial mechanism works hard when setting up a new station for one of the automatic tuner levers, it is due to the locking screw being too tight. Loosen the locking screw "C" until the dial mechanism works freely with the tuner lever pressed down.)

BE SURE TO RETIGHTEN the LOCKING SCREW; otherwise the stations you have selected will not stay adjusted to the levers.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-106E Output I.F. Transformer
Part No. 108-105D Input I.F. Transformer

These I. F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view, Fig. 1).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-106E) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6A8G and adjust input I.F. transformer (No. 108-105D) to resonance.

BROADCAST BAND ALIGNMENT:

540 to 1750 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
   (a) Set external oscillator to 1750 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment E'; see top view, Fig. 1).
   (b) Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment A') to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)
   (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (Adjustment F') to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained.
   (d) Repeat adjustments "a" and "c" until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1000 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

SHORT WAVE BAND ALIGNMENT:

5.5 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment G') and short wave antenna (Adjustment C') to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-set external oscillator and check set at 18.1 megacycles and 5.5 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 17 megacycle signal appears near 16.1 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

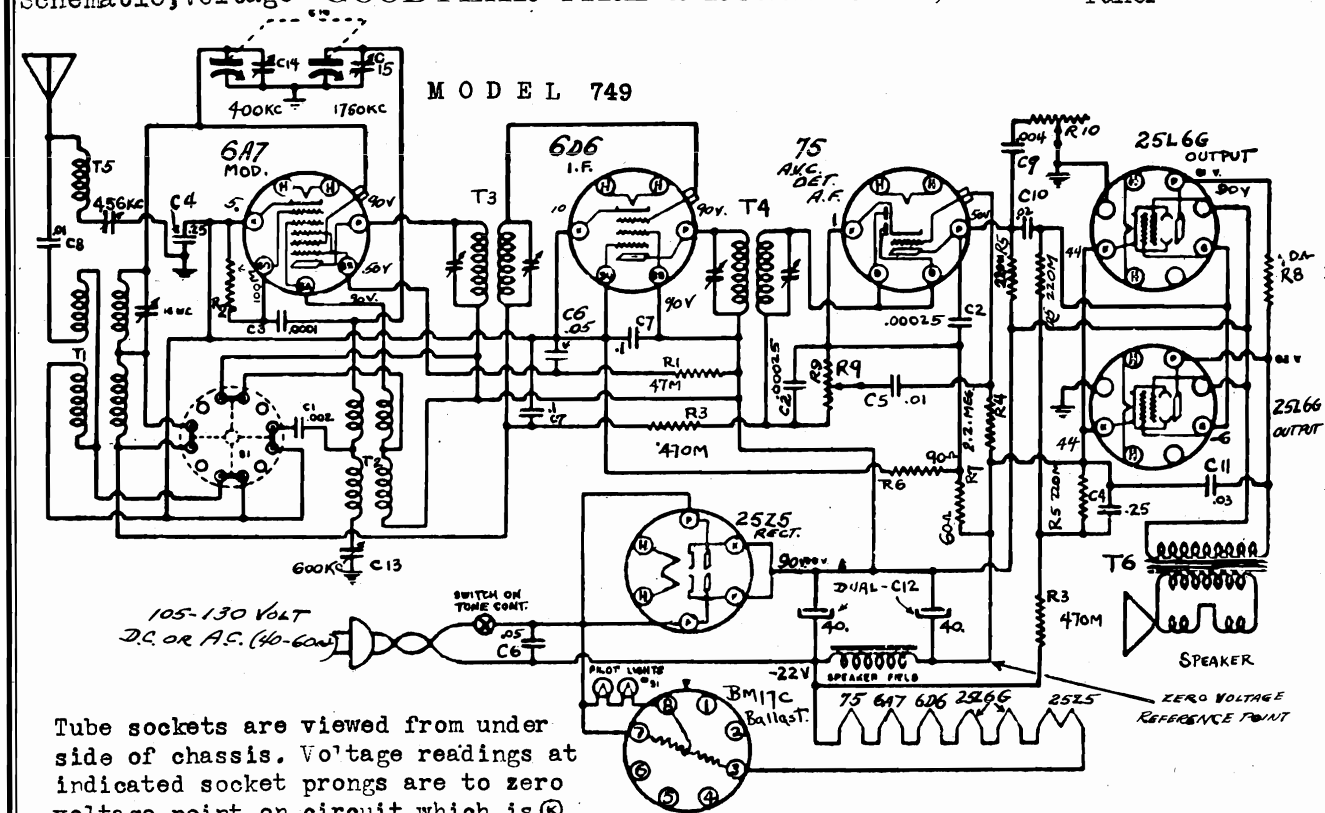
1730 to 5800 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment D') and middle wave antenna (Adjustment B') to resonance.
   (b) Re-set external oscillator to 1900 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
   (c) Re-check broadcast band alignment.

MODEL 749
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

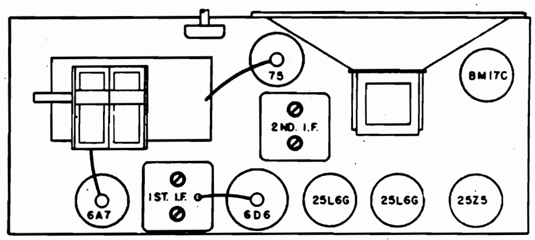
Socket, Trimmers
Tuner



Tube sockets are viewed from under side of chassis. Voltage readings at indicated socket prongs are to zero voltage point on circuit which is Ⓚ on 25L6G tube. Voltages must be measured with no signal. Alignment is to be made at the frequencies shown on the trimmer condensers.

Figures at cathodes are cathode currents in milliamperes. Capacity values are in microfarads.

Wave trap adjustment at 456 KC. Input is made to provide maximum reduction of signal. Where no voltage reading is shown at socket prongs, it indicates zero voltage or very low reading.



LOCATION OF PARTS ON TOP OF CHASSIS

IF PEAK 456 KC

SETTING PUSH-BUTTONS

1. By means of the Station Selector Knob, tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holder.

Follow through with this same procedure, setting up the other 5 stations in the order of their frequency—that is, the second station set up will be second lowest in frequency and the third station set up will be third lowest in frequency.

Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

No further adjustments are necessary to operate your radio automatically or manually. To receive any one of your six selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

To receive all other stations in the regular manner, push in the Station Selector Knob and turn it to the frequency of the station desired.

Alignment,Tuner
MODEL 01030
Tuner

GOODYEAR TIRE & RUBBER CO.,

MODEL 01009,Ch.526E
MODEL 01010,Ch.526I
Schematic,Socket
Voltage,Trimmers

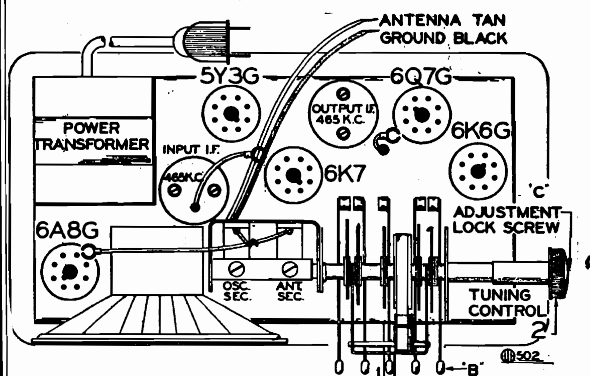
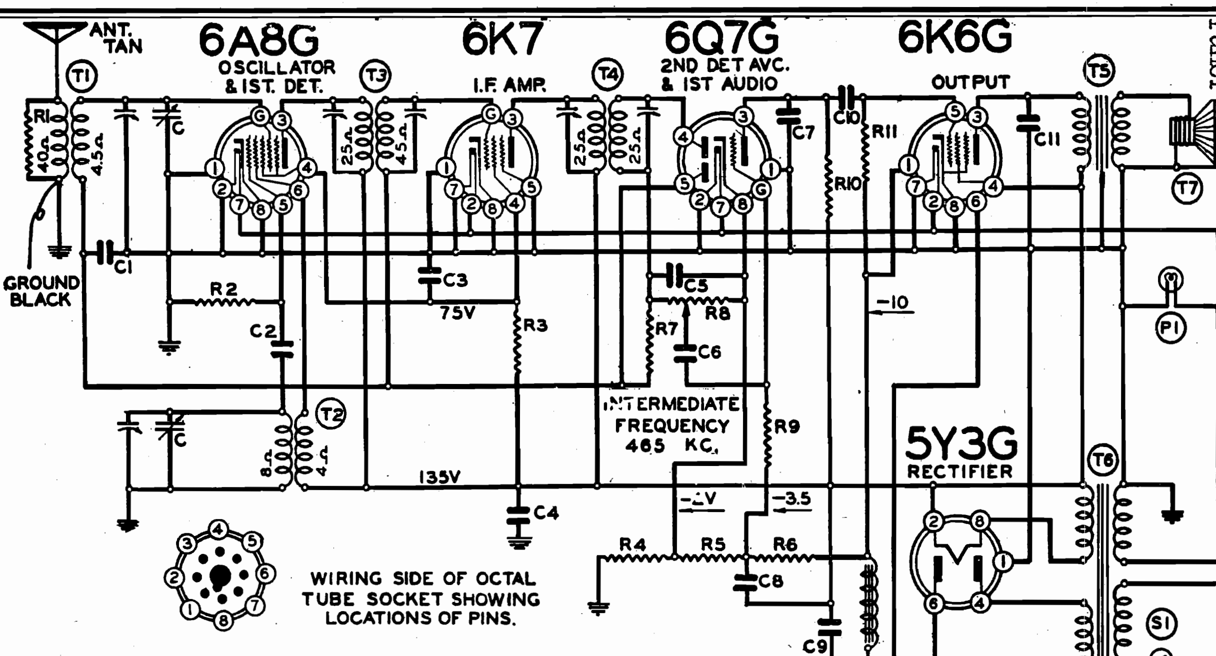


FIG. 1—TOP VIEW

Mica condensers are coded with an additional dot indicating tolerance.

Color of Dot	Tolerance percent
White	2½%
Green	5%
Blue	10%
Yellow	15%
Red	20%
None	More Than 20%



ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No.108-95B Output I.F. Transformer
Part No. 108-96 Input I. F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condensor, to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-95B) to resonance.
   (b) Move oscillator output clip from grid of 6K7 to grid of 6A8G and adjust input I.F. transformer (No. 108-96) to resonance.
   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-95B) if necessary.

1. R.F. ALIGNMENT: (535-1720 K.C.)

1. With the gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 100 mmf. condensor to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

PROCEDURE FOR SETTING THE AUTOMATI LEVERS:

There are five levers on the dial by means of which five stations may be selected,

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now hold tuning knob securely with left hand to prevent it from turning, or Rotate the tuning knob (No. 2) to the right (clockwise) as far as it will turn, and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 1).

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

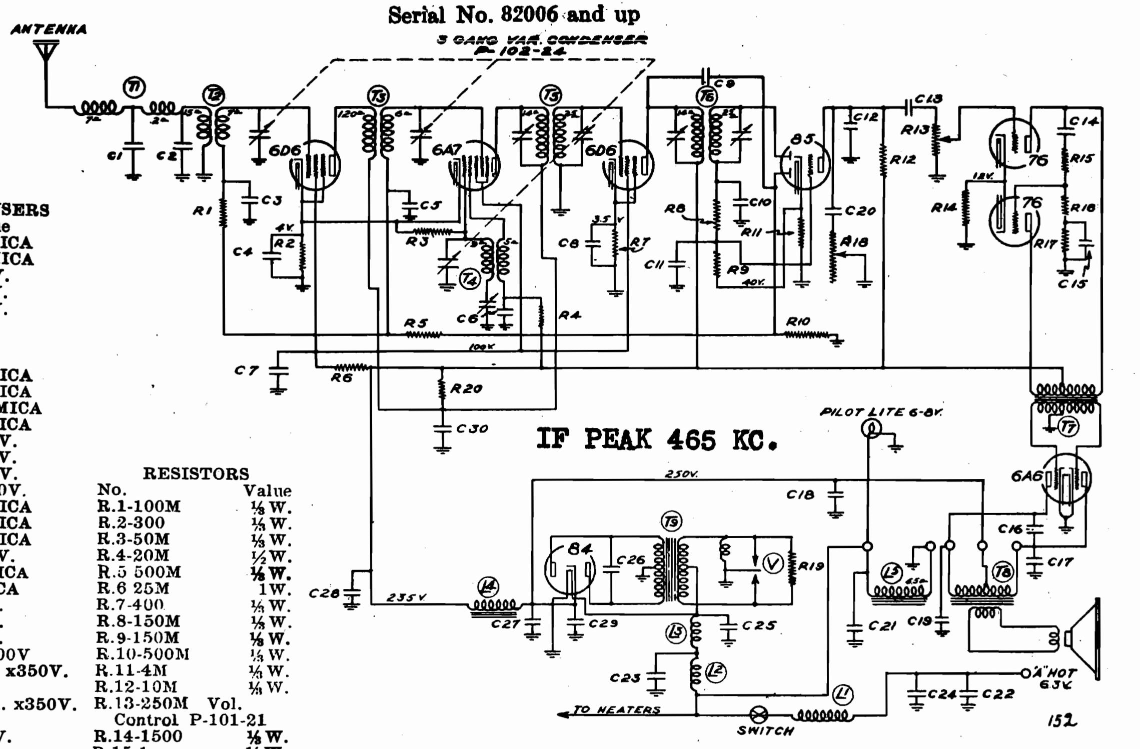
If you should desire to change any station you selected to another, hold the tuning knob No. 2 securely and with a coin loosen the locking screw "C" one or two turns; select the new station as explained. **Be sure to retighten the locking screw,** otherwise the stations you have selected will not stay adjusted to the levers.

Part No.	Diagram Reference	
		CONDENSORS
100-1	C3	.1 x 400 volt Tubular Condenser
100-9	C1	.05 x 200 volt Tubular Condenser
100-11	C6, C10	.01 x 400 volt Tubular Condenser
100-13	C4	.05 x 400 volt Tubular Condenser
100-19	C11	.006 x 600 volt Tubular Condenser
119-47D	C8, C9	Dual 5MFD x 250 W. V. Filter Condenser
129-2	C7	.0005 Mica Type Condenser — 20%
129-5	C5	.0001 Mica Type Condenser — 20%
129-12	C2	.00025 Mica Type Condenser — 20%
		RESISTORS
106-35	R4, R5, R6	65 Ohm, 45 Ohm, 220 Ohm Metal Clad
130-9	R10	200M Ohm — 1/3 Watt Resistor — 20%
130-12	R2	50M Ohm — 1/3 Watt Resistor — 20%
130-21	R1	20M Ohm — 1/3 Watt Resistor — 20%
130-118	R11	600M Ohm — 1/3 Watt Resistor — 20%
130-149	R3	15M Ohm — 1/3 Watt Resistor — 20%
130-170	R7, R9	3 Megohm — 1/3 Watt Resistor — 25%
		COILS
108-95B	T4	Output I.F. Coil Assembly Complete with can
108-96	T3	Input I.F. Coil Assembly Complete with can
110-73	T2	Oscillator Coil Assembly Complete
111-92	T1	Antenna Coil Assembly Complete
		SOCKETS
121-93		Eight Prong Octal Socket for "6K6"
121-93		Eight Prong Octal Socket for "6Q7"
121-93		Eight Prong Octal Socket for "6A8"
121-93		Eight Prong Octal Socket for "5Y3"
121-94		Seven Prong Octal Socket for "6K7"
		TRANSFORMERS
104-129	T6	50/60 Cycle Transformer 105-115 volt Primary
104-130		25/60 Cycle Transformer 105-115 volt Primary
		SPEAKER
114-111	T7	Five Inch Dynamic Speaker (Field 2000 Ohms)
105-55c	T5	Output Transformer for Speaker (Mounted on Chass
		MISCELLANEOUS
101-107	R8, S1	Volume Control and Switch (500M Ohms)
102-67	C	Two Gang Variable Condenser

MODEL 01018,Runs 1,2
Chassis 880
Schematic,Voltage
Socket,Trimmers
Alignment

GOODYEAR TIRE & RUBBER CO., INC.

Serial No. 82006 and up



CONDENSERS

No.	Value
C.1	.00009 MICA
C.2	.00002 MICA
C.3	.01x400V.
C.4	.25x200V.
C.5	.05x200V.
C.6	.1x200V.
C.7	.1x200V.
C.8	.1x200V.
C.9	.00002 MICA
C.10	.0001 MICA
C.11	.00005 MICA
C.12	.0001 MICA
C.13	.02x400V.
C.14	.02x400V.
C.15	.01x400V.
C.16	.006x600V.
C.17	.0005 MICA
C.18	.0005 MICA
C.19	.0005 MICA
C.20	.05x400V.
C.21	.0005 MICA
C.22	.002 MICA
C.23	.5x120V.
C.24	.5x120V.
C.25	.5x120V.
C.26	.015x1400V
C.27	8.0 mfd. x350V. P-119-16
C.28	12.0 mfd. x350V. P-119-16
C.29	.01x400V.
C.30	.1x400V.

117-2 Dash Mounting Bracket
117-1 Bracket Steering Column
Dash Mounting Assembly

RESISTORS

No.	Value	
R.1	100M	½ W.
R.2	300	½ W.
R.3	50M	½ W.
R.4	20M	½ W.
R.5	500M	½ W.
R.6	25M	1W.
R.7	400	½ W.
R.8	150M	½ W.
R.9	150M	½ W.
R.10	500M	½ W.
R.11	4M	½ W.
R.12	10M	½ W.
R.13	250M Vol. Control P-101-21	
R.14	1500	½ W.
R.15	1 meg	½ W.
R.16	91M	½ W.
R.17	75M	½ W.
R.18	100M Tone Control P-101-39	
R.19	200	½ W.
R.20	1500	½ W.

PARTS

No.	Part No.
T1-Antenna Filter	P-111-43
T2-Antenna Coil	P-111-42
T3-R.F. Coil	P-109-20
T4-Oscillator Coil	P-110-34
T5-Input I.F. Coil	P-108-56
T6-Output I.F. Coil	P-108-57
T7-Audio Trans.	P-105-13
T8-Output Trans.	
T9-Power Trans.	P-104-21
L1-"A" Choke	P-105-18
L2-"A" Choke	P-105-18
L3-"A" Choke	P.105-19
L4-Filter Choke	P-105-11
L5-Speaker Field	
V-Vibrator	142-4

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

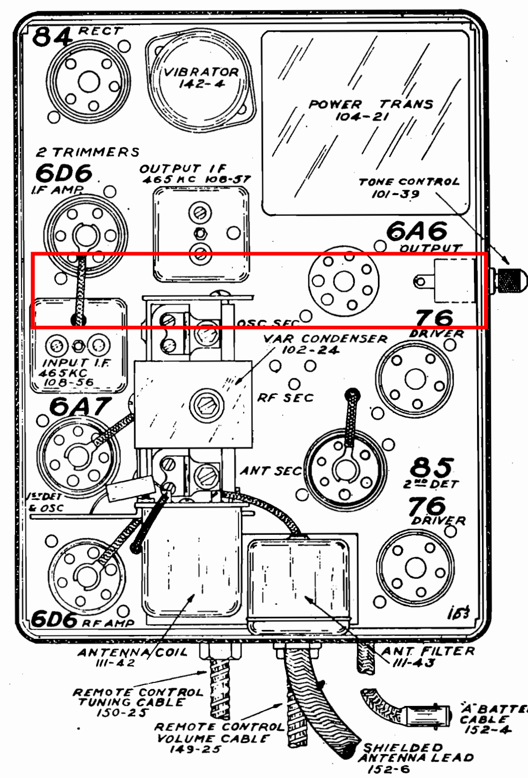
"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

I.F. ALIGNMENT:

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-56) and output (108-57) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

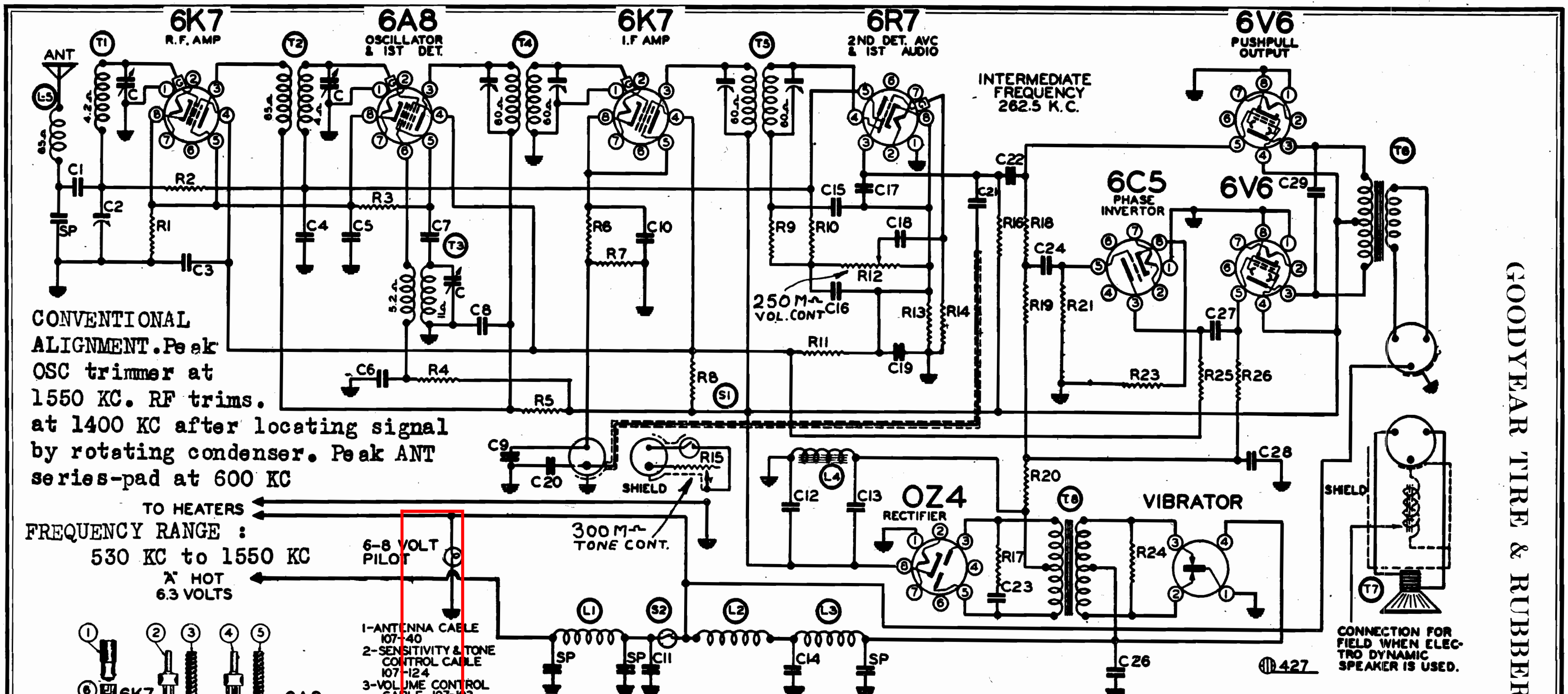
BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.
4. Re-set external oscillator to 600 K.C. and adjust series pad to resonance, rotate condenser and move dial pointer to 600 K.C. by gently rocking condenser to and fro. Pick up oscillator signal while adjusting series pad to resonance. This adjustment is accessible from the bottom of the chassis.
   (a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.



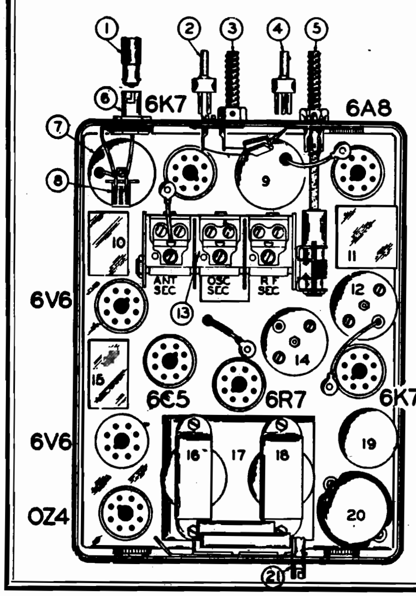
GOODYEAR TIRE & RUBBER CO., INC.

MODEL 01020
Chassis 881
Schematic, Socket
Trimmers, Alignment



CONVENTIONAL ALIGNMENT. Peak OSC trimmer at 1550 KC. RF trims. at 1400 KC after locating signal by rotating condenser. Peak ANT series-pad at 600 KC

FREQUENCY RANGE : 530 KC to 1550 KC



1-ANTENNA CABLE 107-40
2-SENSITIVITY & TONE CONTROL CABLE 107-124
3-VOLUME CONTROL CABLE 107-103
4-SPEAKER CABLE 107-133
5-TUNING CONTROL CABLE 107-104
6-ANTENNA FILTER ASSEMBLY 111-74
7-ANTENNA COIL 111-73A
8-ANTENNA FILTER CHOKE 111-76
9-R.F COIL 109-36
10-BY-PASS BLOCK 116-20B
11-BY-PASS BLOCK 116-19B
12-INPUT I F 262.5KC 108-101
13-VARIABLE CONDENSER 102-45A
14-OUTPUT I.F 262.5KC 108-102B
15-BY-PASS BLOCK 116-23
16-B FILTER CHOKE 105-48
17-POWER TRANSFORMER 104-112
18-OUTPUT TRANSFORMER 105-49
19-'LYTIC CONDENSER 119-43
20-VIBRATOR 126-1
21-A FILTER ASSEMBLY 105-50

R1	130-54	500 ohm - 1/3 w.
R2	130-141	250M ohm - 1/3 w.
R3	130-52	50M ohm - 1/3 w.
R4	130-138	50M ohm - 1/2 w.
R5	130-31	1500 ohm - 1/3 w.
R6	130-154	1000 ohm - 1/3 w.
R7	130-161	4M ohm - 1/3 w.
R8	130-185	20M ohm - 1/2 w.
R8	130-185	20M ohm - 1.2 w.
R9	130-162	50M ohm - 1/3 w.
R10	130-142	1 megohm - 1/3 w.
R11	130-139	40M ohm - 1/3 w.
R12	101-86	Volume control - head
R13	130-184	700 ohm - 1/3 w.
R14	130-142	1 megohm - 1/3 w.
R15	101-90	Tone control in control
R16	130-181	100M ohm - 1/3 w.
R17	130-22	5M ohm - 1/3 w.
R18	130-183	150M ohm - 1/3 w
R19	130-181	100M ohm 1/3 w.
R20	130-141	250M ohm - 1/3 w.
R21	130-190	30M ohm - 1/3 w.
R23	130-178	3M ohm - 1/3 w.
R24	130-87	200 ohm - 1/3 w.
R25	130-181	100M ohm - 1/3 w.
R26	130-141	250M ohm - 1/3 w.

CONDENSERS

C	102-45A	3 gang variable
C1	129-73	.002 - Mica
C2	124-36	350 mmf. Nominal - Series pad
C3	116-20B	.25 x 200 v. - Red
C4	116-19B	.05 x 200 v. - Yellow
C5	116-20B	.1 x 200 v. - Yellow
C6	116-19B	.1 x 400 v. - Red
C7	129-12	.00025 Mica
C8	116-19B	.1 x 200 v. - Green
C9	129-2	.0005 - Mica
C10	116-19B	.05 x 200 v. - Black
C11	100-31	.5 x 120 v.
C12	119-43	8.0 mfd. 'lytic
C13	119-43	12.0 mfd. 'lytic
C14	100-31	.5 x 120 v.
C15	129-5	.0001 Cer.
C16	129-5	.0001 Cer.
C17	129-5	.0001 Mica
C18	116-20B	.02 x 200 v. - Blue
C19	116-20B	.02 x 200 v. - Green
C20	129-2	.0005 - Mica
C21	100-13	.05 x 400
C22	116-23	.02 x 400 v. - White
C23	100-68	.003 x 1400 v.
C24	116-23	.1 x 200 v. - Red
C26	100-31	.5 x 120 v.
C27	116-23	.02 x 400 v. - Green
C28	116-23	.5 x 200 v. - Yellow
C29	100-58	.005 x 1200 v.

C3, C5, C18 and C19 in same unit
C4, C6, C8 and C10 in same unit
C22, C24, C27 and C28 in same unit

PARTS

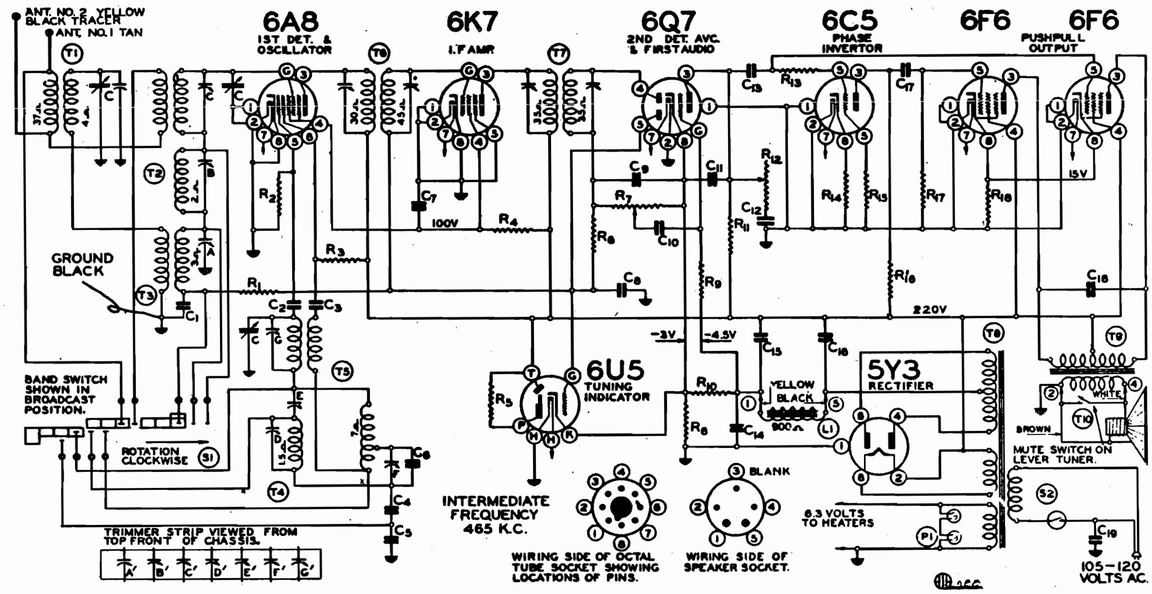
T1	111-73A	Antenna Coil
T2	109-36	R. F. Coil
T3	110-59	Oscillator Coil
T4	108-101	Input I. F. Coil
T5	108-102B	Output I. F. Coil
T6	105-49	Output Transformer
T7	114-94	8" Dynamic Speaker
T8	104-112	Power transformer
L1	105-26	RFA Choke
L2	105-24	RFA Choke
L3	105-19	A Choke
L4	105-48	B Choke
L5	111-76	Antenna Filter choke assembly
S1		Sensitivity switch in control head
S2		On-off Switch in control head

881
(Serial No. 88000 and up)

MODEL 01029
Chassis 860
Schematic, Voltage

Socket, Trimmers

GOODYEAR TIRE & RUBBER CO., INC.



Code No.	Part No.	Description
		RESISTORS
R1	130-103	100M ohm - 1/3 w. 10%
R2	130-12	50M ohm - 1/3 w. 20%
R3	130-123	15M ohm - 1/2 w. 10%
R4	130-196	30M ohm - 1 w. 10%
R5	130-110	1 megohm - 1/10 w. 20% In tuning indicator socket
R6	130-4	3 megohm -1/3 w. 20%
R7	101-97	1 megohm volume control
R8	130-198	40 ohm - 1/2 w. 10%
R9	130-4	3 megohm - 1/3 w. 20%
R10	130-197	20 ohm - 1/3 w. 10%
R11	130-103	100M ohm - 1/3 w. 10%
R12	101-98	300M ohm - tone control
R13	130-163	400M ohm - 1/3 w. 10%
R14	130-22	5M ohm - 1/3 w. 20%
R15	130-103	100M ohm - 1/3 w. 10%
R16	130-12	50M ohm - 1/3 w. 20%
R17	130-102	500M ohm - 1/3 w. 10%
R18	130-195	250 ohm - 1.2 w. 10%
		CONDENSERS
C	102-62	3 gang variable
C1	100-22	.05 x 200 v. - 25%
C2	129-67	.00004 Mica 10%
C3	100-25	.002 x 600 v. 25%
C4	129-83	.0027 Mica 2-1/2%
C5	129-84	.003 Mica 2-1/2%
C6	129-88	.0006 Mica 5%
C7	100-1	.1 x 400 v. - 50 - 10%
C8	100-26	.02 x 400 v. 25%
C9	129-5	.0001 Mica 20%
C10	100-26	.02 x 400 v. 25%
C11	129-2	.0005 Mica 20%
C12	100-57	.006 x 600 v. - 10 - 20%
C13	100-26	.02 x 400 v. 25%
C14	100-20	.1 x 200 v. 25%
C15	103-14	16 mfd. Regulating Lytic - 275 w.v.
C16	103-6	8 mfd. Lytic - 350 w.v.
C17	100-26	.02 x 400 v. 25%
C18	100-37	.003 x 600 v. 10%
C19	100-61	.02 x 600 v. 20% Bakelite
		PARTS
T1	111-88	B.C. Pre-selector complete
T2	111-87	S.W.M.W. Antenna Coil - complete
T3	111-86	B.C. Antenna Coil Complete
T4	110-69	M.W. Osc. Coil Complete
T5	110-70	S.W.B.C. Osc. Coil Complete
T6	108-105D	Input I.F. Coil - complete 465 kc.
T7	108-106E	Output I.F. Coil - complete 465 kc.
T8	104-87B	Power Transformer
T9	105-54	Output Transformer
T10	114-99	10" Dynamic speaker
L1		900 ohm speaker field
S1	125-42	Wave change switch
S2		Off-on switch on tone control
P1	107-94	6-8 volt pilot light

For conventional types of antennas connect the yellow wire to the antenna lead and the yellow with black tracer and the black wire together to the ground lead.

When a doublet antenna is used connect the yellow wire and the yellow with black tracer wire to the doublet antenna and the solid black wire to the ground lead. (See Fig. 1-Top View)

FOR ALIGNMENT AND TUNER DATA, SEE INDEX

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

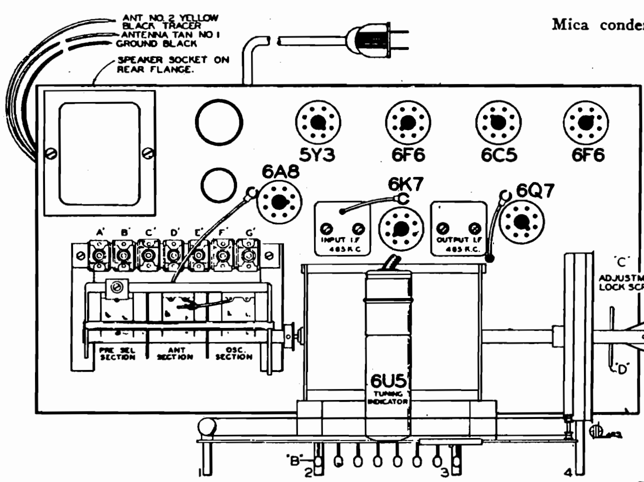


FIG. 1—TOP VIEW

FREQUENCY RANGE
540 to 1750 K.C.
1730 to 5800 K.C.
5.5 to 18.1 M.C.

CHASSIS MODEL 860

(Serial No. 7L897400 and up)

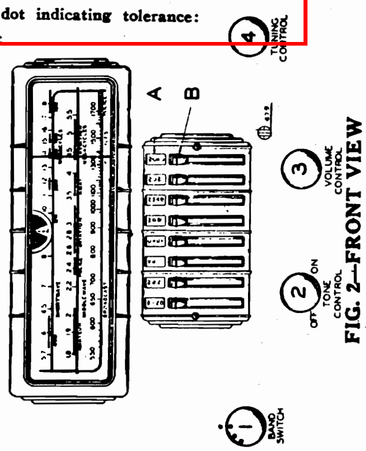
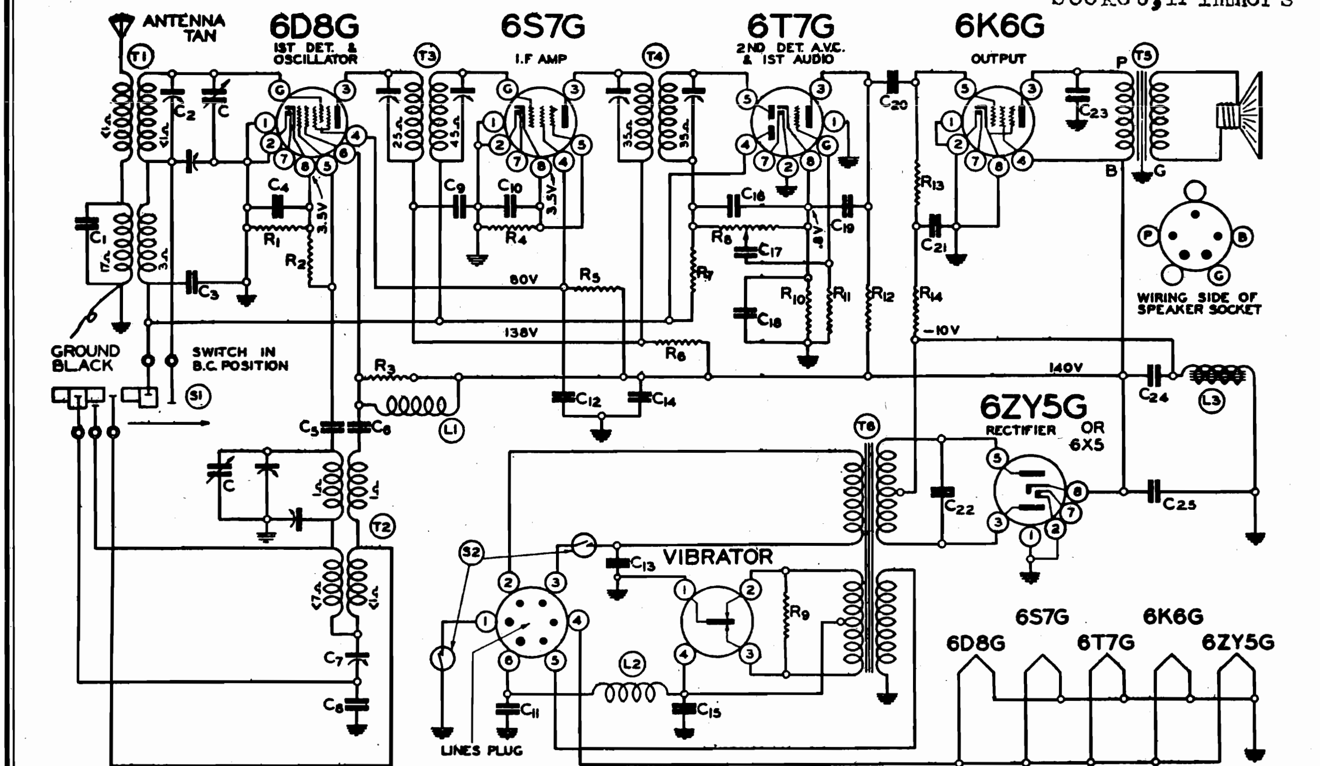


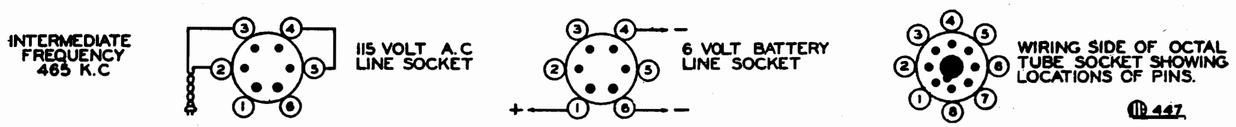
FIG. 2—FRONT VIEW

3-Band All-Wave A.C. Superheterodyne Receiver

MODEL 01554
Chassis 505
Schematic, Voltage
Socket, Trimmers

GOODYEAR TIRE & RUBBER CO., INC.





505 SERIES "A"

(Serial No. 7J851300 and up)

FOR ALIGNMENT SEE INDEX

R1	130-70	500 ohm - 1/3 w.
R2	130-12	50M ohm - 1/3 w.
R3	130-12	50M ohm - 1/3 w.
R4	130-92	1000 ohm - 1/3 w.
R5	130-149	15M ohm - 1/3 w.
R6	130-192	2M ohm - 1/3 w.
R7	130-170	3 megohm - 1/3 w.
R8	101-91	1 meg volume control
R9	130-84	200 ohm - 1/3 w.
R10	130-192	2M ohm - 1/3 w.
R11	130-19	1 meg - 1/3 w.
R12	130-100	150M ohm - 1/3 w.
R13	130-3	500M ohm - 1/3 w.
R14	130-11	250M ohm - 1/3 w.
C	102-43	2 gang variable
C1	129-5	.0001 Mica
C2	124-39B	Adj. condenser
C3	100-22	.05 x 200
C4	100-20	.1 x 200
C5	129-39	.00005 Mica
C6	100-25	.002 x 600
C7	124-38	Series Pad
C8	129-54	.003 Mica
C9	100-6	.25 x 200
C10	100-20	.1 x 200
C11	100-40	.5 x 200
C12	100-20	.1 x 200
C13	129-82	.003 Mica
C14	129-12	.00025 Mica
C15	100-40	.5 x 200
C16	129-5	.0001 Mica
C17	100-11	.01 x 400
C18	119-22	10 mfd. lytic 25 wv.
C19	129-12	.00025 Mica
C20	100-11	.01 x 400
C21	100-20	.1 x 200
C22	100-73	.008 x 1200
C23	100-37	.003 x 600
C24	119-24B	5 mfd. lytic
C25	119-24B	5 mfd. lytic

T1	111-83	Antenna Coil
T2	110-66B	Oscillator Coil
T3	108-105B	Input I.F.
T4	108-106B	Output I.F.
T5	114-95	or
	114-96	Speaker
T6	104-114	Power Transformer
L1	123-4	"B" Choke
L2	105-19	"A" Choke
S1	125-39	Wave band switch
S2		Off-On Switch on Volume Control
L3	105-52	300 ohm 4.5 henry filter choke

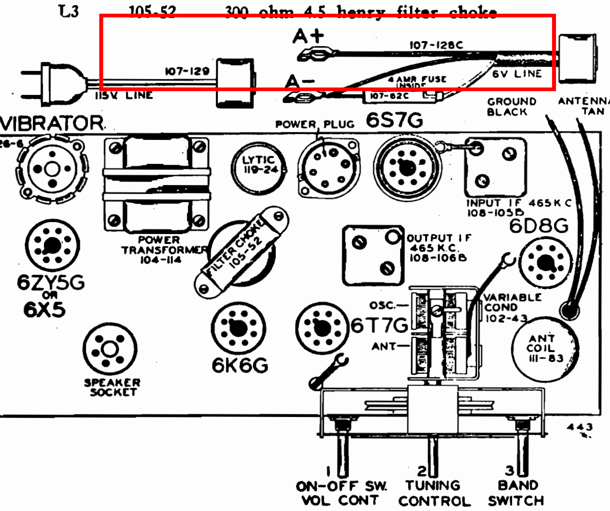


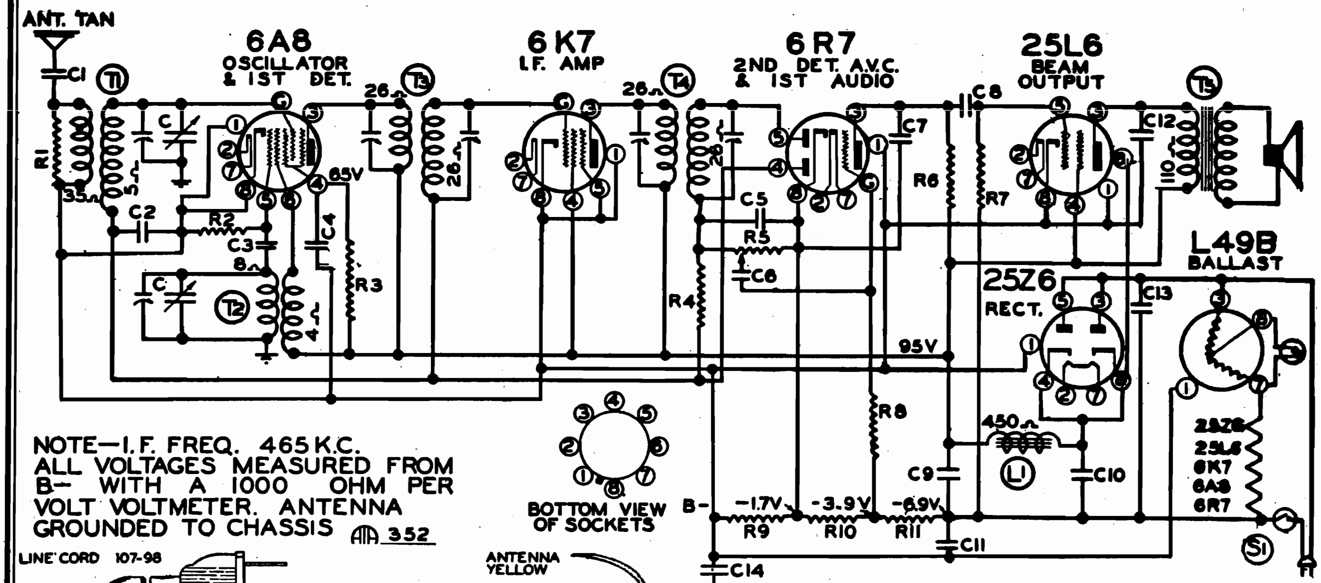
FIG. 1—TOP VIEW

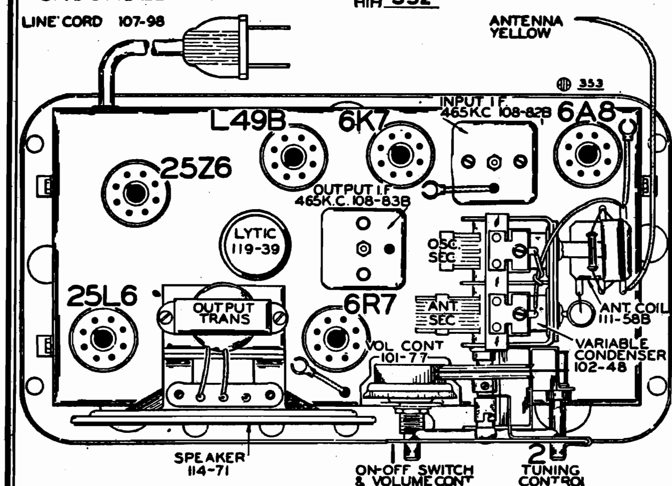
BAND DIAL SCALE FREQUENCY RANGE
Broadcast...... Upper......535 to 1720 K.C. (Kilocycles)
Short Wave.. Lower...... 5.5 to 18.1 M.C. (Megacycles)

MODEL 010211, Ch. 602E
MODEL 010222
Ch. 602I

GOODYEAR TIRE & RUBBER CO., INC.

Schematic, Voltage
Socket, Trimmers
Alignment





(a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).

(b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).

(c) Check sensitivity at 600 and 1000 kilocycles.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 119 volt A.C. or D.C. line.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-83B Output I.F. Transformer

Part No. 108-82B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83B) to resonance.

   (b) Move oscillator output clip from grid of 6K7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82B) to resonance.

   (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83B) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:

RESISTORS

No.	Part No.	Description	
R1	130-17	10M ohm - 1/3 w.	20%
R2	130-12	50M ohm - 1/3 w.	20%
R3	130-149	15M ohm - 1/3 w.	20%
R4	130-4	3 meg ohm - 1/3 w.	20%
R5	101-77	Volume Control (1 Meg)	
R6	130-12	50M ohm - 1/3 w.	20%
R7	130-20	100M ohm - 1/3 w.	20%
R8	130-19	1 megohm - 1/3 w.	20%
R9	106-38	30 ohm	
R10	106-38	40 ohm	
R11	106-38	55 ohm	
		R9, R10, and R11 in one unit	

CONDENSERS

C	102-48	2 gang variable	
C1	100-25	.002 x 600	25%
C2	100-9	.05 x 200	25%
C3	129-12	.00025 Mica	20%
C4	100-22	.05 x 200	25%
C5	129-5	.0001 Mica	20%
C6	100-11	.01 x 400	25%
C7	129-2	.0005 Mica	20%
C8	100-22	.05 x 200	25%
C9	119-39	20 mfd. lytic - 100 w.v.	
C10	119-39	15 mfd. lytic - 100 w.v.	
C11	100-20	.1 x 200	25%
C12	100-13	.05 x 400	25%
C13	100-39	.1 x 400	20%
C14	100-53	.25x400	20%

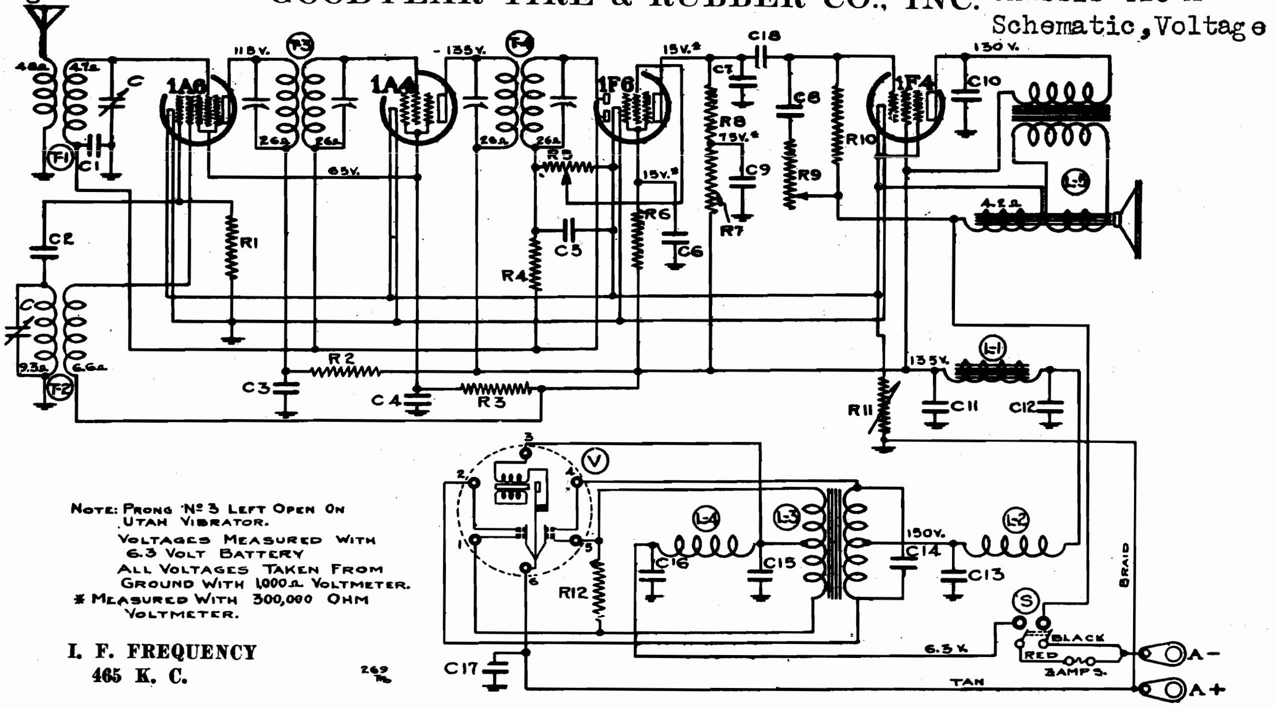
PARTS

T1	111-58B	Antenna Coil Complete
T2	110-46	Oscillator Coil Complete
T3	108-82B	Input I. F. Complete
T4	108-83B	Output I. F. Complete
T5	114-71	Dynamic Speaker
L1		450 ohm speaker field
S1		Switch on Volume Control

Socket, Trimmers
Alignment

MODEL 010219, Run 1
Chassis 415-A
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.



NOTE: PRONG No 3 LEFT OPEN ON UTAH VIBRATOR.
VOLTAGES MEASURED WITH 6.3 VOLT BATTERY
ALL VOLTAGES TAKEN FROM GROUND WITH 1,000 Ω. VOLTMETER.
* MEASURED WITH 300,000 OHM VOLTMETER.

I. F. FREQUENCY
465 K. C.

No.	Part No.	Description
		CONDENSERS
C1	100-10	.05 x 200 Volts
C2	129-12	.00025 Mica
C3	100-33	.1 x 200 Volts
C4	100-33	.1 x 200 Volts
C5	129-12	.00025 Mica
C6	100-33	.1 x 200 Volts
C7	129-5	.0001 Mica
C8	100-25	.002 x 600 Volts
C9	100-9	.05 x 200 Volts
C10	100-7	.005 x 600 Volts
C11	119-28	5 mfd. x 200 Working Voltage
C12	119-28	5 mfd. x 200 Working Voltage
C13	100-33	.1 x 200 Volts
C14	100-34	.005 x 1200 Volts
C15	100-40	.5 mfd. x 200 Working Voltage
C16	100-40	.5 mfd. x 200 Working Voltage
C17	100-35	.5 x 200 Volts
C18	100-11	.01 x 400 Volts

NOTE: C11 & C12 in one unit—No. 119-28

		RESISTORS
R1	130-94	50M Ohm—1/3 Watt
R2	130-17	10M Ohm—1/3 Watt
R3	130-123	15M Ohm—1/2 Watt
R4	130-121	3.2 megohm—1/3 Watt
R5	101-56	1 meg ohm—Volume Control
R6	130-19	1 meg ohm—1/3 Watt
R7	130-20	100M Ohm—1/3 Watt
R8	130-11	250M Ohm—1/3 Watt
R9	101-59	1 meg ohm—Tone Control
R10	130-37	750M Ohm—1/3 Watt
R11	101-44	4.75 Ohm—Filament Rheostat
R12	130-124	200 Ohm—1/2 Watt

		MISCELLANEOUS PARTS
C	102-38	One Section of Two Gang
T1	111-66	Antenna Coil
T2	110-45	Oscillator Coil
T3	108-84	Input I.F.—465 Kc.
T4	108-85	Output I.F.—465 Kc.
L1	105-30	Filter Choke
L2	123-3	R.F. Choke Coil
L3	104-62	Power Transformer
L4	105-19	"A" Choke
L5	114-50	6" Spkr. (Field Res. 4.2 Ohms)
S	101-56	On Volume Control
V	126-4	Vibrator Unit

NOTE: R11, Part No. 101-44 Variable Filament Rheostat is adjusted at the factory to keep the filament voltage of the tubes at 2 volts.

TUBES:

The tube complement of this chassis consists of the following tubes:

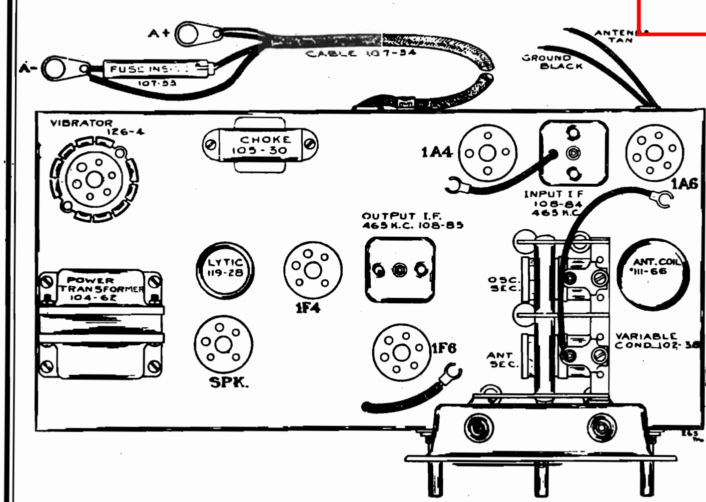
The type and function of each tube is as follows:

1—Type 1A6 Pentagrid Mixer, First Detector-oscillator.

1—Type 1A4 Super Control R. F. Tetrode I. F. Amplifier (465 K.C.)

1—Type 1F6 Duplex Diode Pentode, Second Detector, A.V.C. and First Audio.

1—Type 1F4 Pentode Output Amplifier.



ALIGNING I.F. TRANSFORMERS: (465 K. C.):

Part No. 108-85 Output I.F. Transformer.
Part No. 108-84 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view)

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 1A4 tube, and adjust the output I.F. transformer (No. 108-85) to resonance.

   (b) Move oscillator output clip from grid of 1A4 to grid cap of 1A6 and adjust input I.F. transformer (No. 108-84) to resonance.

   (c) With oscillator still connected to 1A6, readjust output I.F. transformer (108-85) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to tan antenna and black ground leads and make the following adjustments:

   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).

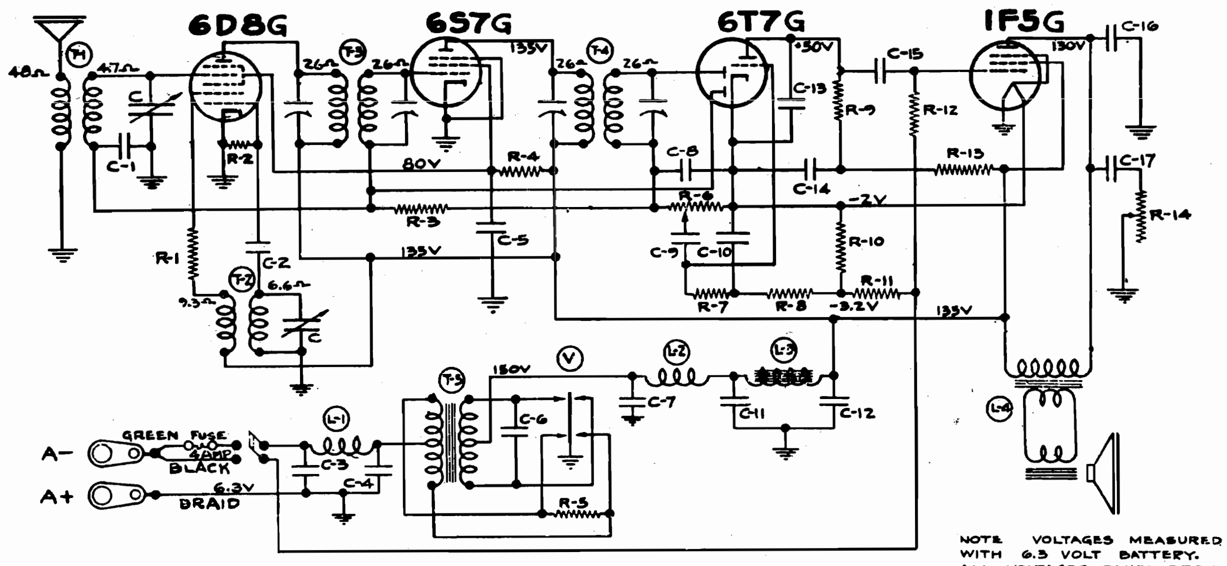
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).

   (c) Check sensitivity at 600 and 1000 kilocycles.

MODEL 010219, Run 2
Chassis 415-B
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

Socket, Trimmers
Alignment



NOTE VOLTAGES MEASURED WITH 6.3 VOLT BATTERY. ALL VOLTAGES TAKEN FROM GROUND WITH 1000Ω PER VOLT METER. * MEASURED WITH 0-300V SCALE.

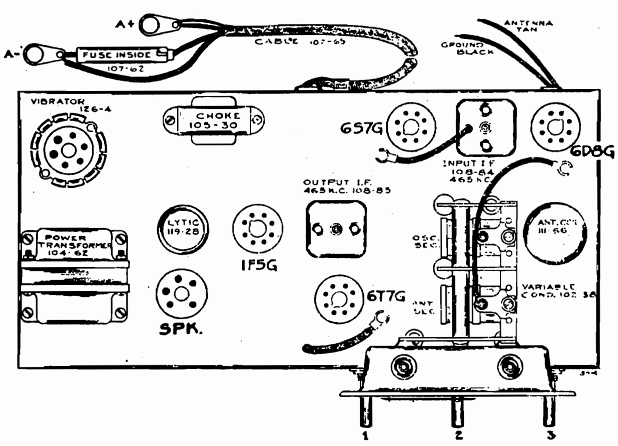
IF PEAK 465 KC

305

No.	Part No.	DESCRIPTION RESISTORS
R1	130-23	2M-1/3
R2	130-76	30M-1/3
R3	130-121	3.2 meg-1/3
R4	130-123	15M-1/2
R5	130-84	200-1/3
R6	101-56	1 meg-Volume Control
R7	130-19	1 meg-1/3
R8	130-19	1 meg-1/3
R9	130-100	150M-1/3
R10	106-36	10 Ohm Muter
R11	106-36	25 Ohm Muter
R12	130-19	1 meg-1/3
R13	130-20	100M-1/3
R14	101-72	300M-Tone control

No.	Part No.	CONDENSERS
C1	100-9	.05-200 v.
C2	129-39	.00005-Mica
C3	100-40	.5-200 v.
C4	100-40	.5-200 v.
C5	100-33	.1-200 v.
C6	100-34	.005-1200 v.
C7	100-33	.1-200 v.
C8	129-5	.0001-Mica
C9	100-11	.01-400 v.
C10	100-11	.01-400 v.
C11	119-28	5. Electrolytic-200 wv.
C12	119-28	5. Electrolytic-200 wv.
C13	129-12	.00025-Mica
C14	100-33	.1-200 v.
C15	100-11	.01-400 v.
C16	100-37	.003-600 v.
C17	100-11	.01-400 v.

No.	Part No.	PARTS
T1	111-66	Antenna Coil
T2	110-45	Oscillator Coil
T3	108-84	Input I. F. Coil
T4	108-85	Output I. F. Coil
T5	104-62	Power Transformer
L1	105-19	"A" Choke
L2	123-3	RF "B" Choke
L3	105-30	Filter Choke
L4	114-63	Speaker (P. M. Dynamic)
V	126-4	Vibrator
C	102-38	Variable Condenser



The type and function of each tube is as follows:

1—Type 6D8G Pentagrid Mixer, First Detector-oscillator.

1—Type 6S7G Remote Cut-off Pentode I. F. Amplifier (465 K.C.)

1—Type 6T7G Duplex Diode Triode, Second Detector, A.V.C. and First Audio.

1—Type 1F5G Pentode Output Amplifier.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 1F5G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS: (465 K. C.):

Part No. 108-85 Output I.F. Transformer.
Part No. 108-84 Input I.F. Transformer.

These I.F. Transformers have two adjustments, both of which are accessible from the top of chassis (see fig. 1, top view page 2).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments.

   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-85) to resonance.

   (b) Move oscillator output clip from grid of 6S7G to grid cap of 6D8G and adjust input I.F. transformer (No. 108-84) to resonance.

   (c) With oscillator still connected to 6D8G readjust output I.F. transformer (108-85) if necessary.

R. F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to tan antenna and black ground leads and make the following adjustments:

   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).

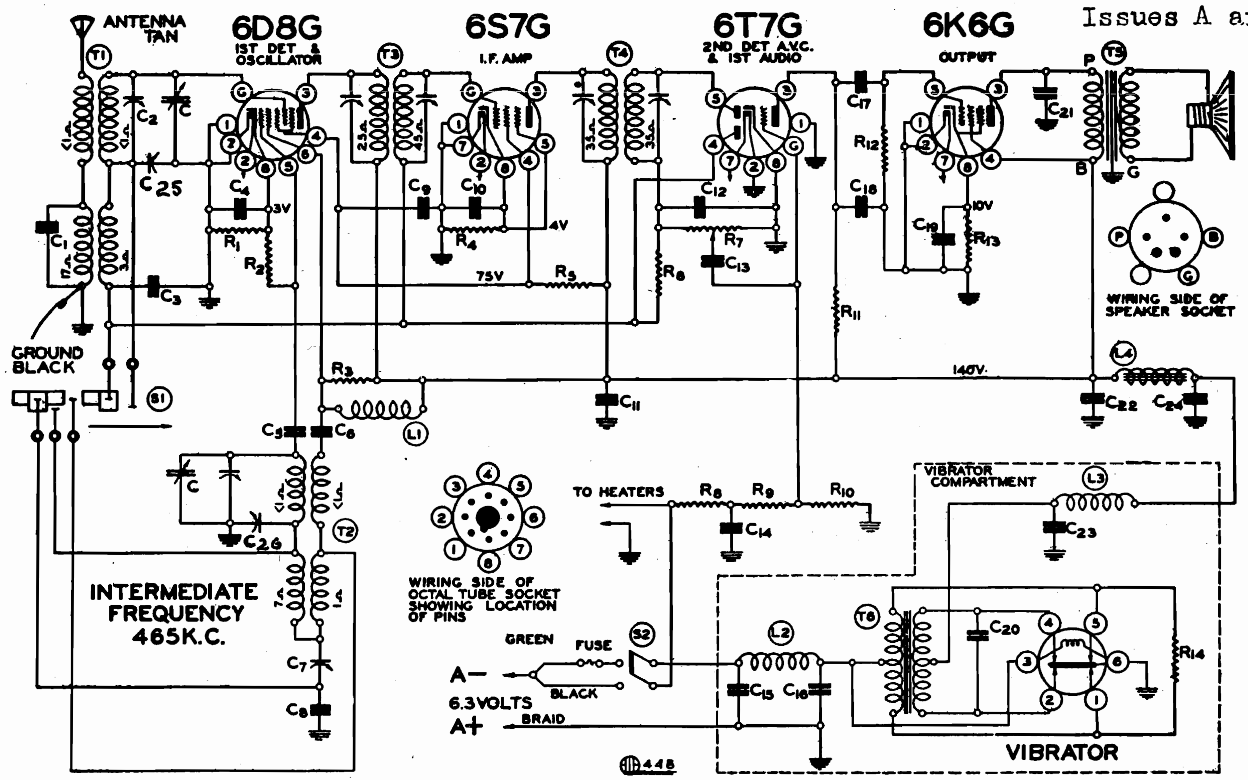
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick-up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).

   (c) Check sensitivity at 600 and 1000 kilocycles.

Schematic, Voltage
Socket, Trimmers

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 010219
Runs 3,4
Chassis 489
Series A
Issues A and B



RESISTORS

R1	130-54	500 ohm - 1/3 w.
R2	130-12	50M ohm - 1/3 w.
R3	130-12	50M ohm - 1/3 w.
R4	130-26	1000 ohm - 1/3 w.
R5	130-149	15M ohm - 1/3 w.
R6	130-4	3 megohm - 1/3 w.
R7	101-91	1 meg volume control
R8	130-191	1.5 megohm - 1/3 w.
R9	130-4	3 megohm - 1/3 w.
R11	130-9	200M ohm - 1/3 w.
R12	130-3	500M ohm - 1/3 w.
R13	130-153	700 ohm - 1/3 w.
R14	130-84	200 ohm - 1/3 w.
R10	130-191	1.5 meg - 1/3 w.

CONDENSERS

C	102-43	2 gang variable
C1	129-5	.0001 Mica
C2	124-39B	Adj. Cond. 2-25 mmf.
C3	100-22	.05 x 200
C4	100-20	.1 x 200
C5	129-39	.00005 Mica
C6	100-25	.002 x 600
C7	124-38	Series pad 600 mmf. W. C.
C8	129-54	.003 Mica
C9	100-20	.1 x 200
C10	100-20	.1 x 200
C11	100-11	.01 x 400
C12	129-5	.0001 Mica
C13	100-11	.01 x 400
C14	100-11	.01 x 400
C15	100-40	.5 x 200
C16	100-40	.5 x 200
C17	100-26	.02 x 400
C18	129-2	.0005 Mica
C19	119-22	10.0 mfd. 25 v. lytic
C20	100-34	.005 x 1200
C21	100-19	.006 x 600
C22	119-28B	5.0 mfd. lytic
C23	100-20	.1 x 200
C24	119-28B	5.0 mfd. lytic

C22 - C24 in same unit

C25	124-30B	Adjustable Trimmer, 2-20 mmf.
C26	124-30B	Adjustable Trimmer, 2-20 mmf.

C25 and C26 in same unit

(Serial No. 7J852300 and up)
ISSUE B (Serial No. 8C136800 and up)

PARTS

T1	111-83	Antenna coil complete
T2	110-66B	Oscillator coil complete
T3	108-105B	Input I.F. complete 465 kc.
T4	108-106B	Output I.F. complete 465 kc.
T5	114-96	6" speaker (P.M.)
T6	104-62E	Power Transformer
L1	123-4	R. F. "B" Choke
L2	105-19	A Choke
L3	123-3	R. F. "B" Choke
L4	105-30E	"B" Filter Choke (400 ohms)
S1	125-39	Wave Band Switch
S2		Switch on volume control

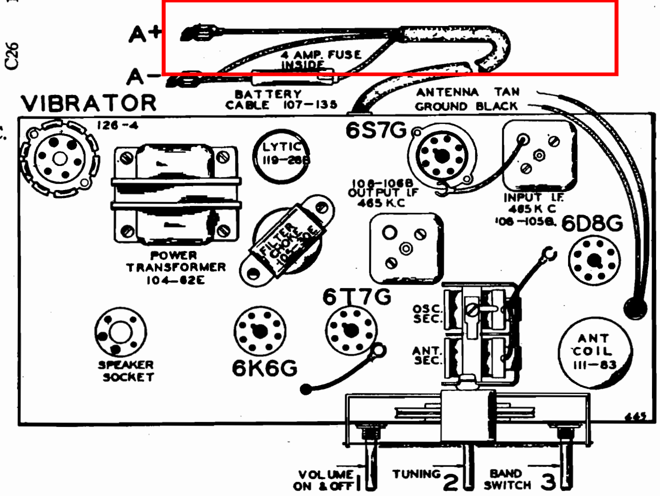


FIG. 1—TOP VIEW

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	535 to 1720 K.C. (Kilocycles)
Short Wave	Lower	5.5 to 18.1 M.C. (Megacycles)

MODEL 010219
Runs 3,4
Chassis 489
Series A
Issues A and B
Socket, Trimmers
Alignment

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 01554
Trimmers
Alignment

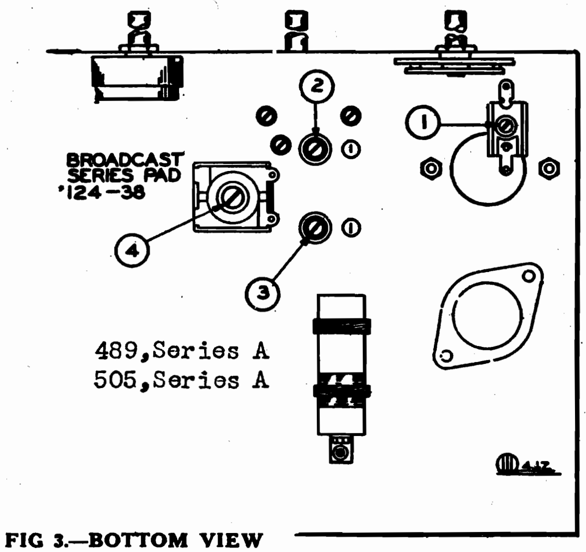


FIG 3.—BOTTOM VIEW

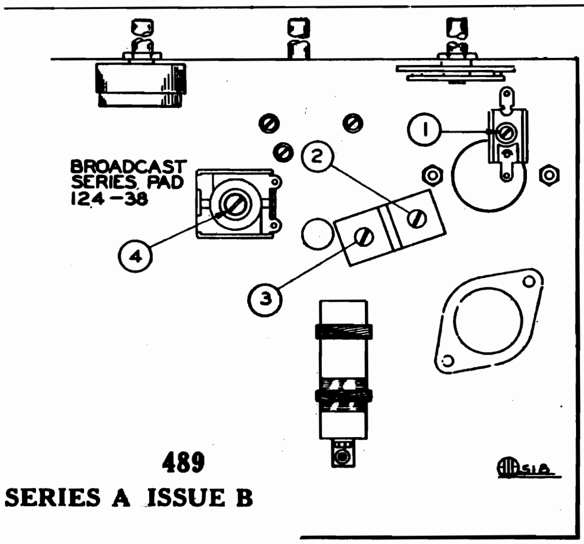


FIG 3.—BOTTOM VIEW

(Serial No. 8C136800 and up)

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K. C.):

Part No. 108-106B Output I.F. Transformer
Part No. 108-105B Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser in its minimum capacity position, plates entirely out of mesh, make the following adjustments:

(a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-106B) to resonance.

(b) With "Dummy 1" still connected, move oscillator output clip from grid of 6S7G to grid cap of 6D8G and adjust input I.F. transformer (No. 108-105B) to resonance.

SHORT WAVE BAND ALIGNMENT:
5.5 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:

(a) Move dial pointer to 17 megacycles and adjust short wave oscillator trimmer to resonance.

This adjustment is the trimmer mounted on the top of rear section of the variable gang condenser (see Fig. 1, top view).

(b) Adjust short wave antenna trimmer (Adjustment Number 1), to resonance (see Fig. 3, bottom view).

BROADCAST BAND ALIGNMENT:
535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground leads make following adjustments:

(a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 3, see bottom view of chassis, Fig. 3).

(b) Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 2), to resonance.

(c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 4), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).

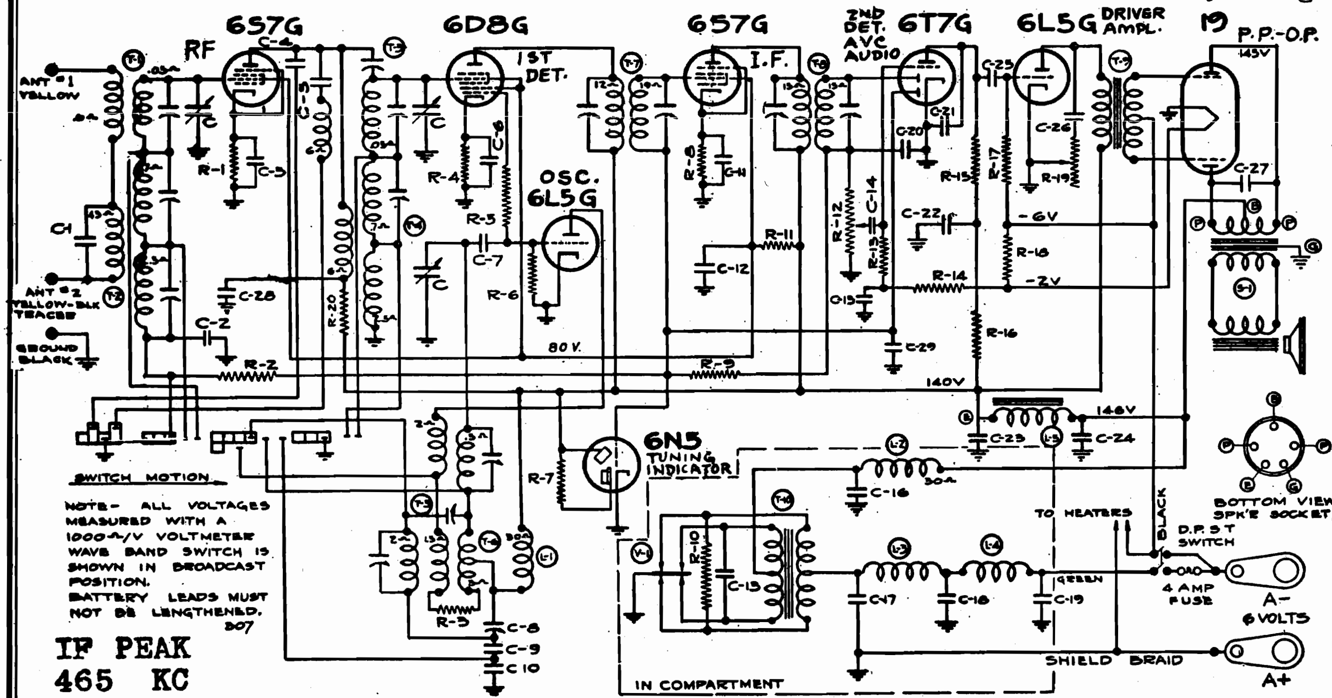
(d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

(e) Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

Socket, Trimmers

GOODYEAR TIRE & RUBBER CO., INC.

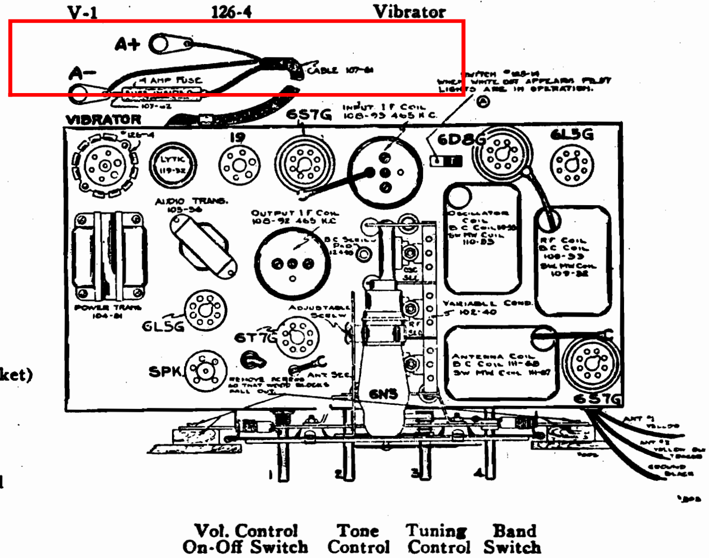
MODEL 010221
Chassis 804
Schematic, Voltage



IF PEAK 465 KC

No.	Part No.	Description	
		CONDENSERS	
C	102-40	Variable Condenser	
C1	129-5	.0001 Mica—MO—O—20%	
C2	100-9	.05 x 200 v.—25%	
C3	100-9	.05 x 200 v.—25%	
C4	129-72	.0004 Mica—MT—W—5%	
C5	129-38	.00005 Mica—MO—O—10%	
C6	100-9	.05 x 200 v.—25%	
C7	129-38	.00005 Mica—MO—O—10%	
C8	124-35	J.S. Series Pad	
C9	129-70	.004 Mica MW—J—2½%	
C10	129-71	.002—Mica MW—W—2½%	
C11	100-20	.1 x 200v.—25%	
C12	100-20	.1 x 200v.—25%	
C13	100-34	.005 x 1200 v.—10%	
C14	100-11	.01 x 400 v.—25%	
C15	100-11	.01 x 400 v.—25%	
C16	100-14	.1 x 200 v.—25%	
C17	100-56	.5 x 200 v.—50%—10%	
C18	100-56	.5 x 200 v.—50%—10%	
C19	100-25	.002 x 600 v.—25%	
C20	129-5	.0001 Mica MO—O—20%	
C21	129-2	.0005 Mica MT—O—20%	
C22	100-20	.1 x 200 v.—25%	
C23	119-32	4. mfd. 200 w. v. Lytic	
C24	119-32	8. mfd. 200 w. v. Lytic.	
C25	100-11	.01 x 400 v.—25%	
C26	100-26	.02 x 400 v.— 25%	
C27	100-25	.002 x 600 v.—25%	
C28	100-50	.25 x 200 v.—20%	
C29	100-22	.05 x 200 v.—25%	
		RESISTORS	
R1	130-140	1200 ohm	1/3 w.—20%
R2	130-20	100M	1/3 w.—20%
R3	130-27	50	1/3 w.—20%
R4	130-54	500 ohm	1/3 w.—20%
R5	130-27	50	1/3 w.—20%
R6	130-2	75 M	1/3 w.—20%
R7		½ meg	(in m. e. socket)
R8	130-140	1200 ohm	1/3 w.—20%
R9	130-38	2 meg	1/3 w.—20%
R10	130-84	200 ohm	1/3 w.—20%
R11	130-157	12M	½ w.—10%
R12	101-66	500M	Volume Control
R13	130-19	1 meg	1/3 w.—20%
R14	130-19	1 meg	1/3 w.—20%
R15	130-20	100M	1/3 w.—20%
R16	130-20	100M	1/3 w.—20%
R17	130-4	3 meg	1/3 w.—20%
R18	130-158	16 ohm	1 w.—Insulated
R19	101-67	100M	Tone Control
R20	130-85	3 M	1/3 w.—20%

No.	Part No.	Description
		PARTS
T1	111-67	S.W. M.W. Ant. Coil
T2	111-68	B.C. Antenna Coil
T3	109-32	S.W. M. W. R.F. Coil
T4	109-33	B.C. R.F. Coil
T5	110-53	S.W. M.W. Osc. Coil
T6	110-55	B.C. Osc. Coil
T7	108-93	Input I.F. Coil
T8	108-92	Output I.F. Coil
T9	105-36	Audio Input Transformer
T10	104-81	Power Transformer
S1	114	P.M. Dynamic Spkr. 8"
L-1	123-3	Osc. "B" Choke
L-2	123-3	R.F. "B" Choke
L-3	105-19	"A" Choke
L-4	105-19	"A" Choke
L-5	105-30	"B" Filter Choke
V-1	126-4	Vibrator



MODEL 010221
Chassis 804
Trimmers, Alignment

GOODYEAR TIRE & RUBBER CO., INC.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the two plate terminals of the type 19 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-92 Output I.F. Transformer
Part No. 108-93 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-92) to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6S7G to grid cap to 6D8G and adjust input I.F. transformer (No. 108-93) to resonance.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 18 megacycles and connected in series with "Dummy 3" to the antenna and ground posts, make the following adjustments:
   (a) Move dial pointer to 18 megacycles and adjust short wave oscillator trimmer (adjustment number 1) to resonance.
   (b) Re-set external oscillator to 17 megacycles and pick up signal by rotating variable condenser and adjust short wave R.F. trimmer (adjustment number 8), and short wave antenna trimmer (adjustment number 9), to resonance.
   (c) Re-set external oscillator and check set at 18.1 megacycles and 6 megacycles for band coverage and sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 18.3 megacycle signal can be tuned in not only at 18.3 on the dial but also at approximately 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5.5 megacycles and connected in series with "Dummy 3" to the antenna and ground posts make the following adjustments:
   (a) Move dial pointer to 5.5 megacycles and adjust middle wave oscillator trimmer (adjustment number 2) to resonance.
   (b) Re-set external oscillator to 5 megacycles and pick up signal by rotating variable condenser and adjust middle wave R.F. trimmer (adjustment number 10), and middle wave antenna trimmer (adjustment number 5), to resonance.
   (c) Re-set external oscillator and check sensitivity at 1700 kilocycles.

BROADCAST BAND ALIGNMENT:

540 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground posts, make following adjustments:
   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 4; see bottom view of coil assembly, Fig. 3)
   (b) Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast R.F. trimmer (adjustment number 6) and broadcast antenna trimmer (adjustment number 7) to resonance.
   (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 3), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
   (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
   (e) Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. **Under no circumstances bend plates of variable condenser sections to correct tracking.**

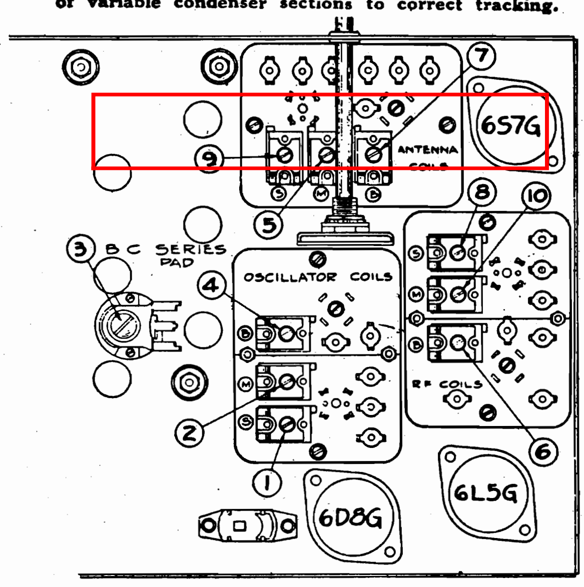
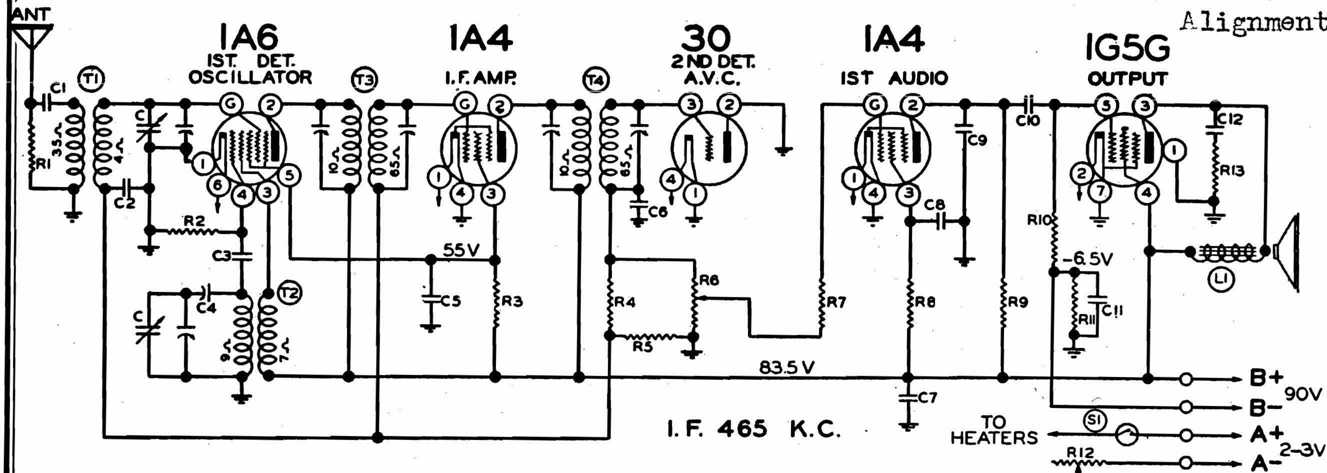


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

MODEL 010220 Run 2
Chassis 523B
Schematic, Voltage
Socket, Trimmers
Alignment

GOODYEAR TIRE & RUBBER CO., INC.



No.	Part No.	Description	
		CONDENSERS	
C	102-56	2 Gang Variable Condenser	
C1	100-11	.01 x 400 v.	25%
C2	100-22	.05 x 200 v.	25%
C3	129-12	.00025 Mica	20%
C4	124-14	Series Pad	
C5	100-9	.05 x 200 v.	25%
C6	129-5	.0001 Mica	20%
C7	100-48	.25 x 200 v.	20%
C8	100-9	.05 x 200 v.	25%
C9	129-2	.0005 Mica	20%
C10	100-11	.01 x 400 v.	25%
C11	119-22	10.0 mfd. x 25 w. v.	
C12	100-11	.01 x 400 v.	25%
		RESISTORS	
R1	130-17	10M ohm - 1/3 w.	20%
R2	130-52	50M ohm - 1/3 w.	20%
R3	130-17	10M ohm - 1/3 w.	20%
R4	130-38	2 megohm - 1/3 w.	20%
R5	130-38	2 megohm - 1/3 w.	20%
R6	101-69	1 megohm Volume Control	
R7	130-52	50M ohm - 1/3 w.	20%
R8	130-19	1 megohm - 1/3 w.	20%
R9	130-9	200M ohm - 1/3 w.	20%
R10	130-19	1 megohm - 1/3 w.	20%
R11	130-93	450 ohm - 1/3 w.	10%
R12	101-44	475 ohm Rheostat	
R13	130-52	50M ohm - 1/3 w.	20%
		PARTS	
T1	111-46	Antenna Coil Complete	
T2	110-36	Oscillator Coil Complete	
T3	108-67	Input I.F. Coil Complete	
T4	108-68	Output I.F.Complete	
L1	114-76	6" P. M. Speaker	
L1	114-19	Speaker - 6" Magnetic	
S1		Switch on Volume Control	

ALIGNING I.F. TRANSFORMERS: (465 K.C.)

1. With volume control full on and with variable condenser at its minimum capacity position, plates entirely out of mesh, and wth external oscillator set at 465 K.C. connected in series with a .1 mfd. condenser, to the grid of the 1A6 tube (cap at top of tube), adjust I.F. transformers, parts number 108-67 and 108-68, to resonance. Both of these transformers have two (2) adjustments each, they are accessible from the tops of the cans (for location see top view).

   Use as a resonance indicator an output meter connected across the outside terminals of the speaker or by means of an adapter to the plate and screen of the type 1G5G output tube. Maximum deflection of the volt meter indicates resonance.

   Use only enough signal to get a readily readable output.

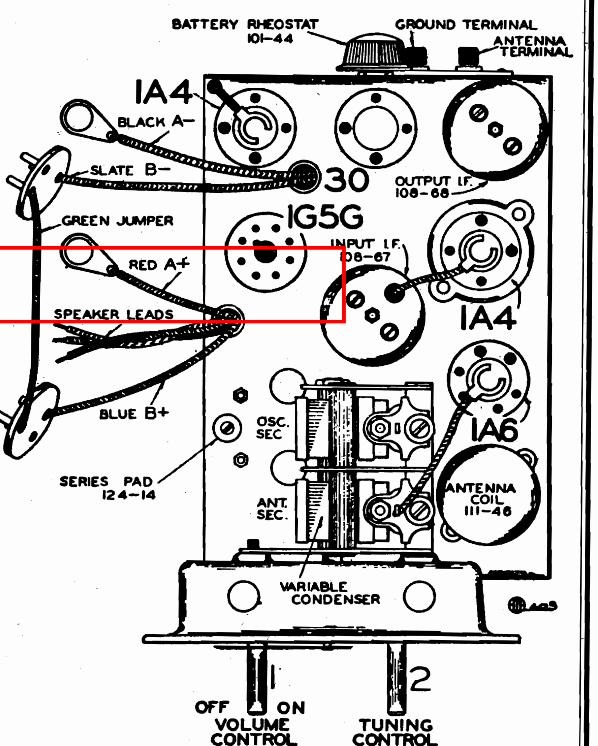
   A low range output meter or the low scale of a multi-range meter should be used.

BROADCAST BAND ALIGNMENT:

1. Set external oscillator to 1720 K.C. and connect it in series with a 200 mmfd. condenser to the antenna and ground posts.
   (a) With variable condenser in its minimum capacity position, plates entirely out of mesh, adjust oscillator trimmer (rear section of variable condenser) to resonance.
   (b) Re-set external oscillator to 1400 K.C. Rotate variable condenser, pick up signal and adjust antenna trimmer (front section of variable condenser) to resonance.
   (c) Re -set external oscillator to 600 K.C., move dial pointer to 600 K.C., and adjust series pad, part number 124-14 (see top view), to resonance. While making this adjustment, slowly rock variable condenser to and fro until maximum output is obtained.
   (d) Check for sensitivity at 1400, 1000, 600 K.C. DO NOT BEND PLATES.

FOR BEST OPERATION THIS RECEIVER MUST HAVE AN OUTSIDE AERIAL NOT OVER FIFTY FEET LONG INCLUDING THE LEAD IN.

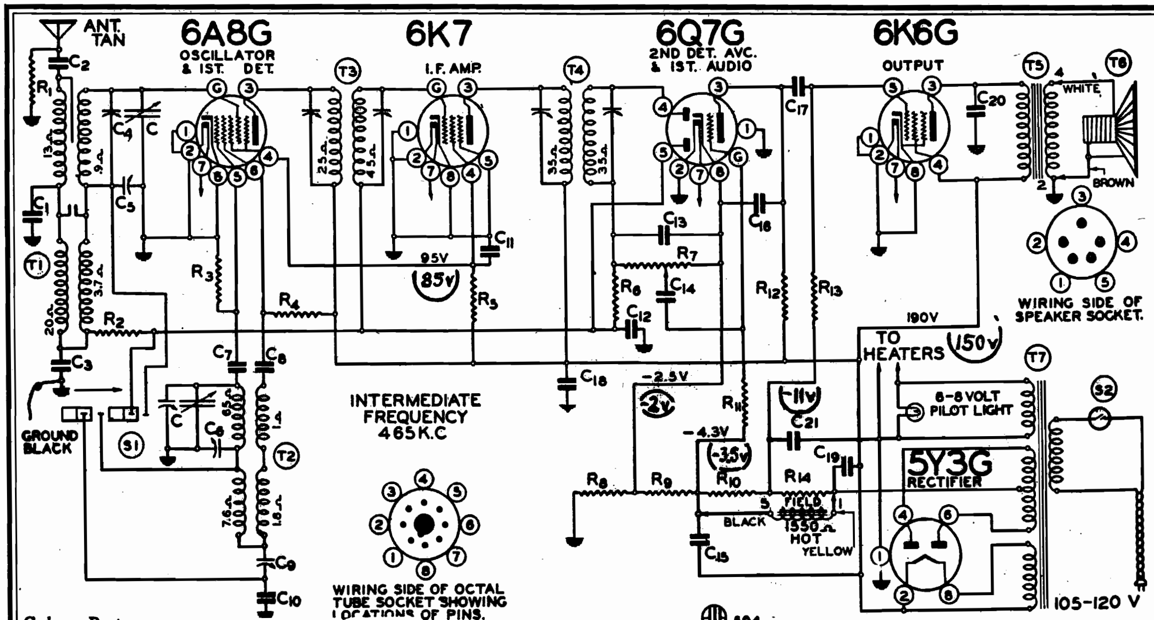
Frequency Range 535-1720 Kilocycles



MODEL 01030
Runs 1,2
Chassis 582
Series A,B

GOODYEAR TIRE & RUBBER CO., INC.

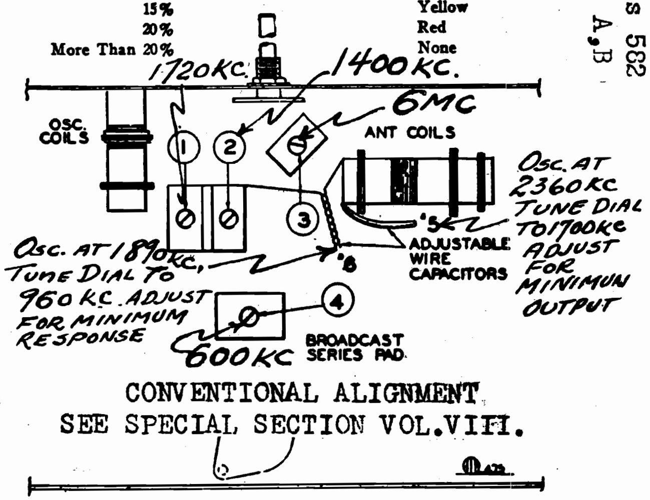
Schematic, Voltage
Socket, Trimmers
Alignment



Voltages in Circles are for Series "A"

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance percent	Color of Dot
2½ %	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL.VIII.

FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

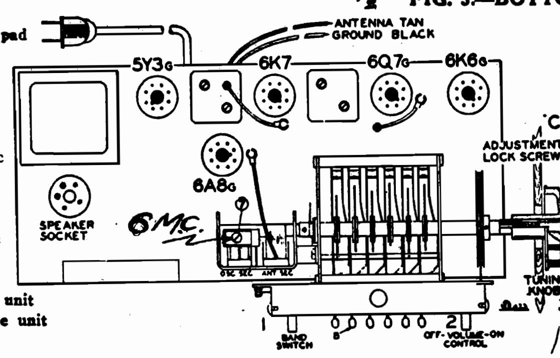


FIG. 1—TOP VIEW

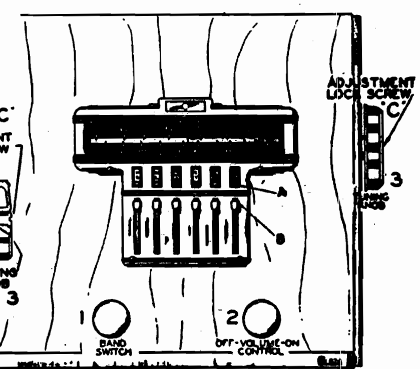


FIG. 2—FRONT VIEW

Code No.	Part No.	Description
		RESISTORS
R1	130-17	10M ohm - 1/3 w. 20%
R2	130-20	100M ohm - 1/3 w. 20%
R3	130-12	50M ohm - 1/3 w. 20%
R4	130-17	10M ohm - 1/3 w. 20%
R5	130-42	20M ohm - ½ w. 20%
R6	130-4	3 megohm - 1/3 w. 20%
R7	101-100	1 megohm - Volume Control
R8	130-204	55 ohm - 1/3 w. 10%
R9	130-203	40 ohm - 1/3 w. 10%
R10	130-205	100M ohm - ⅛ w. 10%
R11	130-4	3 megohm - 1/3 w. 20%
R12	130-9	200M ohm - 1/3 w. 20%
R13	130-102	500M ohm - 1/3 w. 10%
R14	130-46	800M ohm - 1/3 w. 10%
		CONDENSERS
C	102-63	2 Gang Variable
C1	129-86	.000038 Mica 5%
C2	129-87	.000105 Mica 10%
C3	100-77	.00304 x 600 v. 5%
C4	124-39C	2-25 mmf. Adjustable Condenser
C5	124-30B	2-20 mmf. Dual Adjustable Condenser
C6	124-30B	2-20 mmf. Dual Adjustable Condenser
C7	129-5	.0001 Mica 20%
C8	100-12	.003 x 600 25%
C9	124-44	450 wkg. cap. - Series pad
C10	129-85	.0014 - 2½ % Mica
C11	100-79	.25 x 400 v. 50 - 10%
C12	100-9	.05 x 200 v. 25%
C13	129-5	.0001 Mica 20%
C14	100-11	.01 x 400 v. 25%
C15	119-48	8 mfd. x 350 w. v. lytic
C16	129-2	.0005 Mica 20%
C17	100-16	.01 x 400 v. 10%
C18	100-13	.05 - 400 v. 25%
C19	119-48	4 mfd. x 350 w. v. lytic
C20	100-19	.006 x 600 v. 25%
C21	100-4	.1 x 200 v. 10%
		C5 and C6 in same unit
		C15 and C19 in same unit
		PARTS
T1	111-39	Antenna Coil Complete
T2	110-71	Oscillator Coil Complete
T3	108-105E	Input I.F. 465 kc. Complete
T4	108-106F	Output I.F. 465 kc. Complete
T5	105-57	Output Transformer
T6	114-110	6" Dynamic speaker (1550 Ohm Field)
T7	104-124	Power Transformer
S1	125-13	Wave band switch
S2		Switch on volume control

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

All voltages are to be measured with 115 volts on the primary of the power transformer.

MODEL 582

535 to 1720 K.C.

2000 to 7000 K.C.

FOR TUNER DATA, SEE INDEX

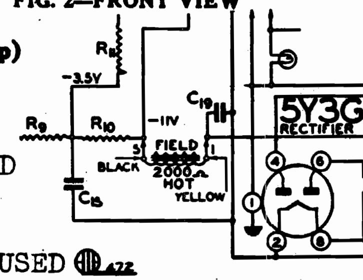
SERIES "A" (Serial No. 7L894500 and up)

R5	130-149	15M ohm - 1/3 w. 20%
R8	106-45	65 ohm 10%
R9	106-45	45 ohm 10%
R10	106-45	220 ohm 10%

R14 Grid Bias Res. NOT USED

C15	119-47	5.0 mfd. 250 w. v. lytic
C19	119-47	5.0 mfd. 250 w. v. lytic
C20	100-12	.003 x 600 v. 25%

C21 Bias-Filter Cond. NOT USED

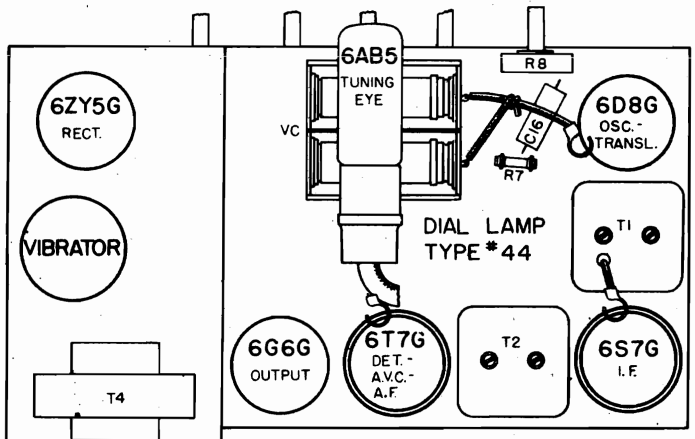


MODEL 015130
Socket, Trimmers

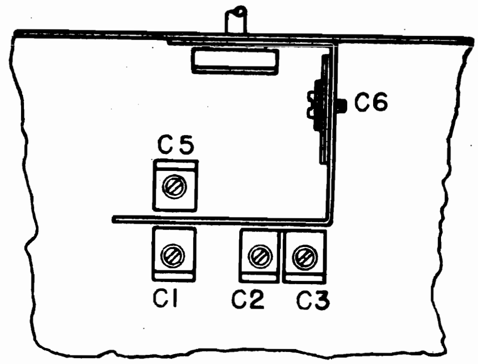
GOODYEAR TIRE & RUBBER CO., INC.

MODEL 015040
Schematic, Voltage
Socket, Trimmers
Alignment

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. CAPACITY VALUES ARE IN MICROFARADS.



LOCATIONS OF PARTS ON TOP OF CHASSIS.

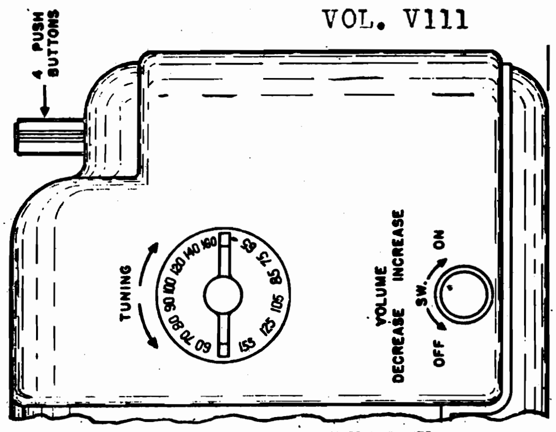


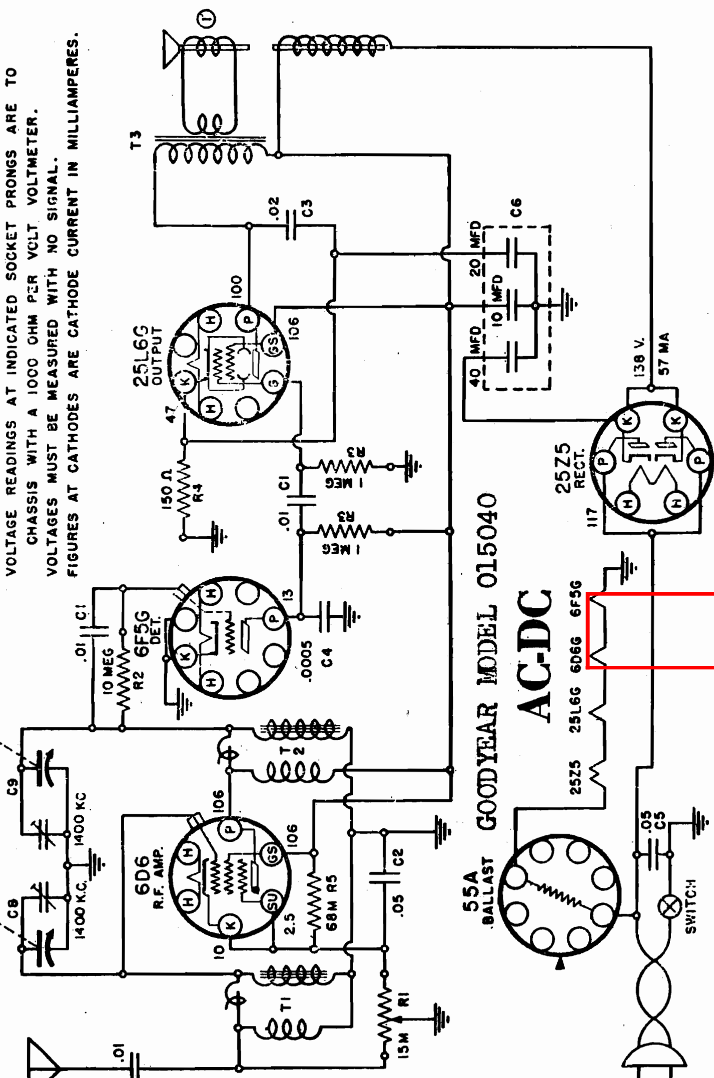
LOCATIONS OF TRIMMERS UNDER CHASSIS

GOODYEAR MODEL 015130.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. V111

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS WITH A 1000 OHM PER VOLT VOLTMETER. VOLTAGES MUST BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

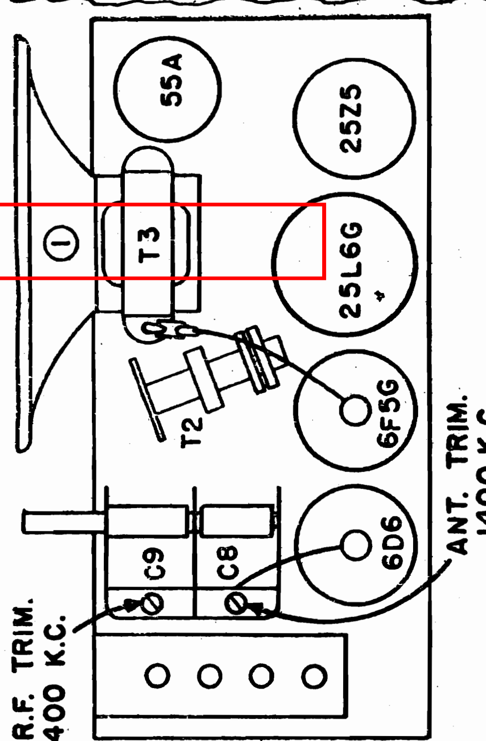




GOODYEAR MODEL 015040

AC-DC

A ground connection is of no importance and therefore has been eliminated



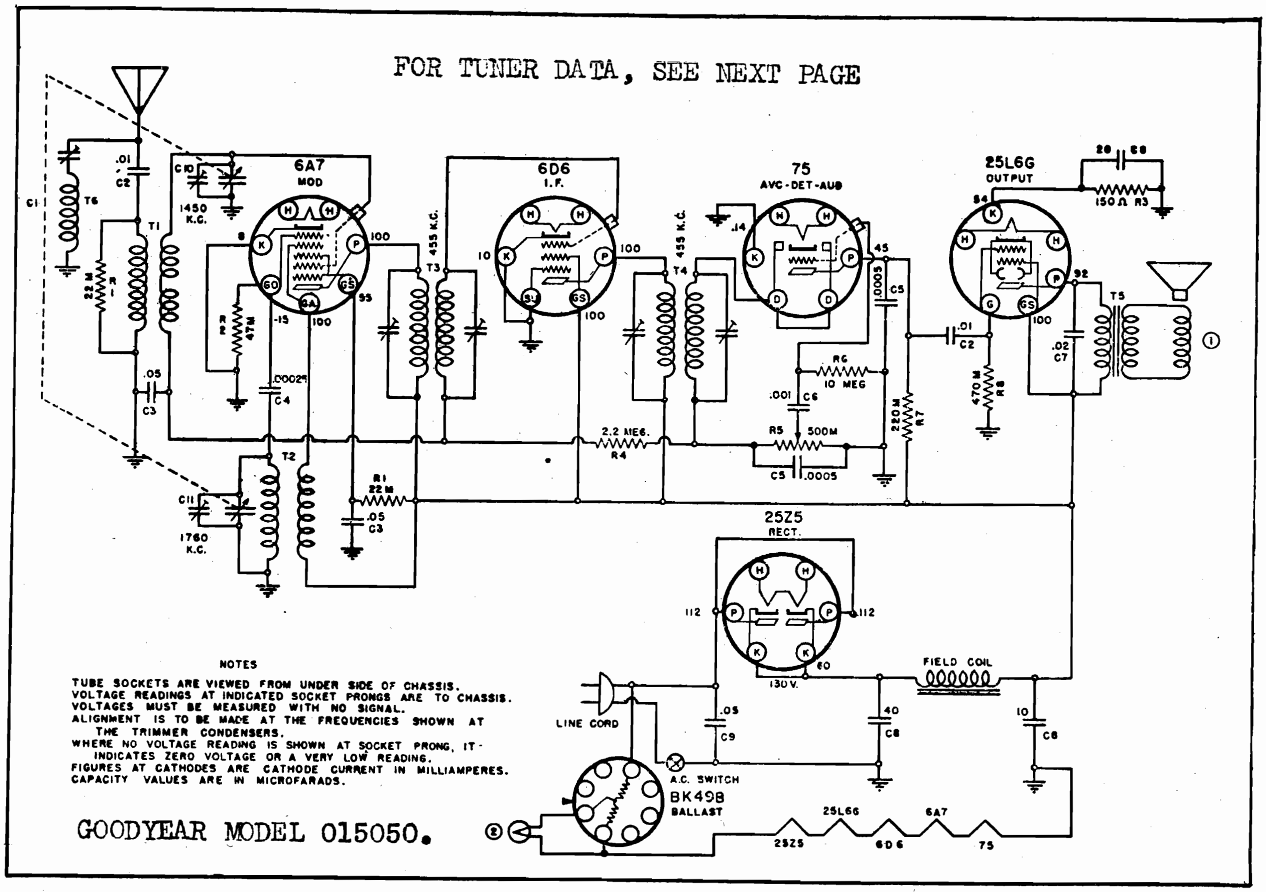
R.F. TRIM. 1400 K.C.

ANT. TRIM. 1400 K.C.

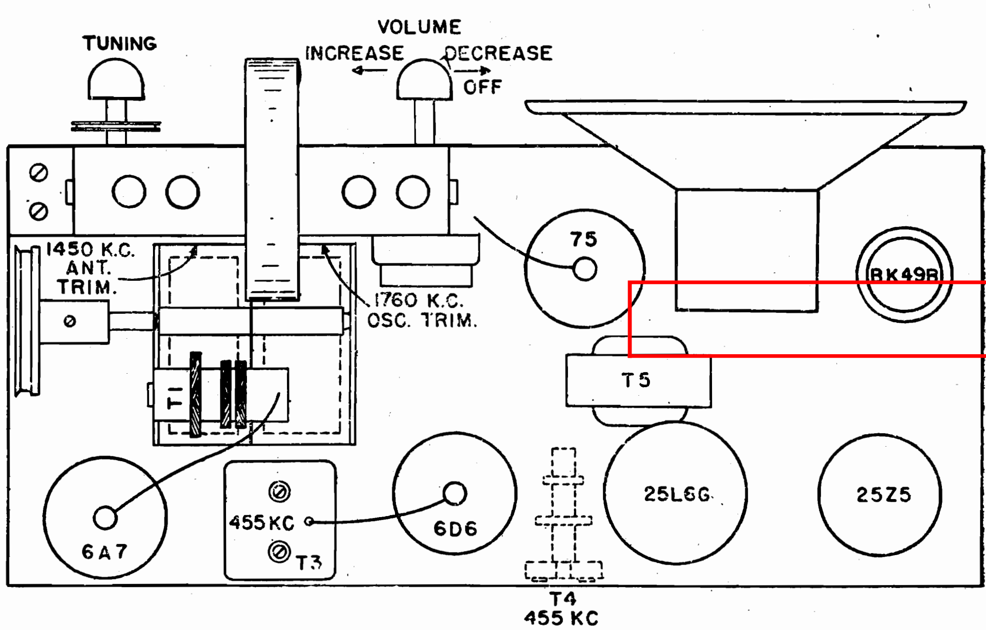
For SETTING PUSH BUTTONS see MODEL 015050.

MODEL 015050
Schematic, Voltage
Socket, Trimmers
Alignment

GOODYEAR TIRE & RUBBER CO., INC.



FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. V111



IF PEAK 456 KC

POWER SUPPLY

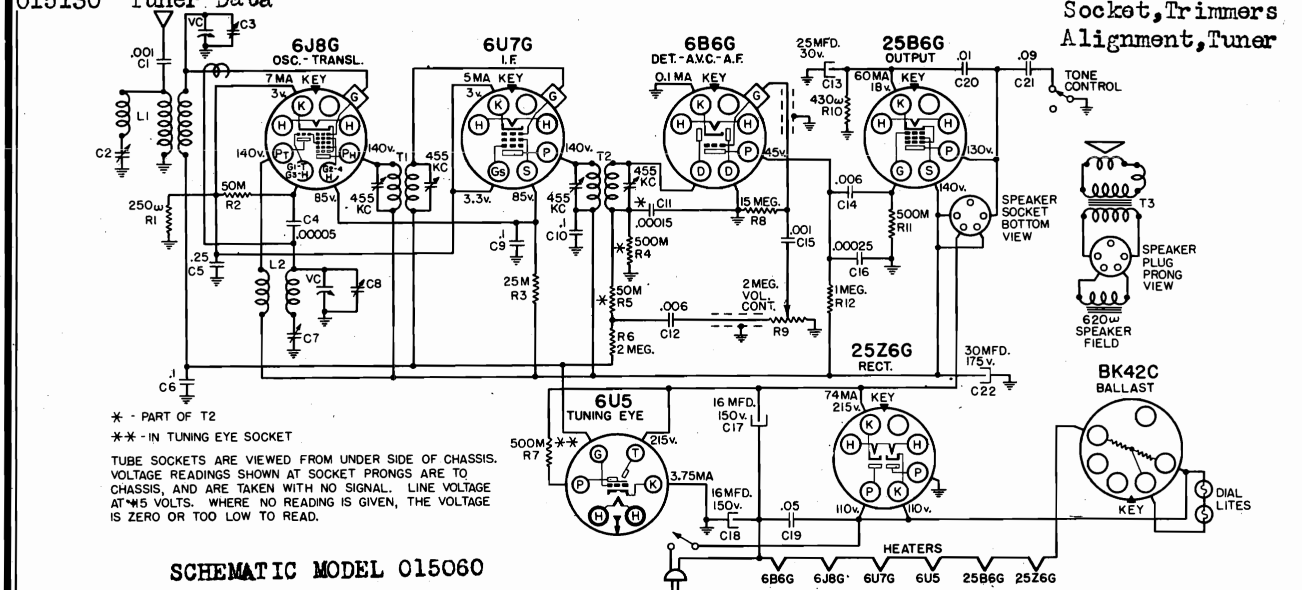
The receiver is designed for operation from 105-130 volt Alternating Current (A.C.) supply or a 105-130 volt Direct Current (D.C.) supply. Never connect the receiver to any supply having a higher voltage than that specified on the sticker. If you are not sure of the power supply voltage at your home, your Power Company will furnish the information.

When using a D.C. supply allow sufficient time for tubes to warm up (approximately 1½ minutes), and if at that time the receiver does not operate, remove the line cord plug from the socket and reverse. Replace plug in the reverse position and allow tubes to warm up, at which time the receiver will operate.

MODELS 015040, 015050
015100, 015110, 015120
015130 Tuner Data

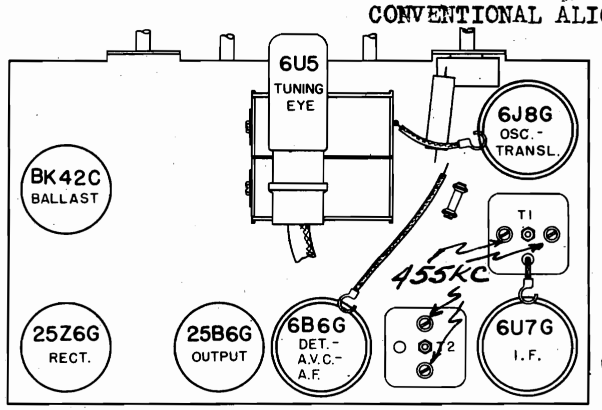
GOODYEAR TIRE & RUBBER CO., INC.

MODEL 015060
Schematic, Voltage
Socket, Trimmers
Alignment, Tuner

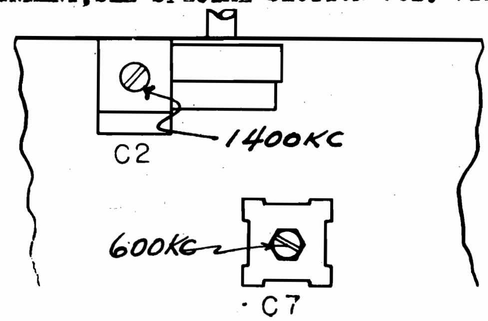


SCHEMATIC MODEL 015060

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOL. VIII



LOCATION OF PARTS ON TOP OF CHASSIS



GOODYEAR MODEL 015060.
LOCATION OF TRIMMERS
UNDER CHASSIS

PUSH BUTTON TUNING FOR MODELS 015040, 015050, 0151C0, 015110

SETTING PUSH-BUTTONS

1. By means of the Station Selector Knob, tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is, your selected station which is tuned in nearest number 160 on the Station Selector Knob.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of highest frequency and the Call Letter Tab for this station should be in the Push-button nearest the rear of the receiver.

Follow through with this same procedure, setting up the other 3 stations in the order of their frequency—that is, the second station set up will be second highest in frequency and the third station set up will be third highest in frequency.

Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

No further adjustments are necessary to operate your radio automatically or manually. To receive any one of your selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

To receive all other stations in the regular manner turn the tuning knob to the frequency of the station desired.

PUSH BUTTON TUNING FOR MODELS 015060, 015120, 015130

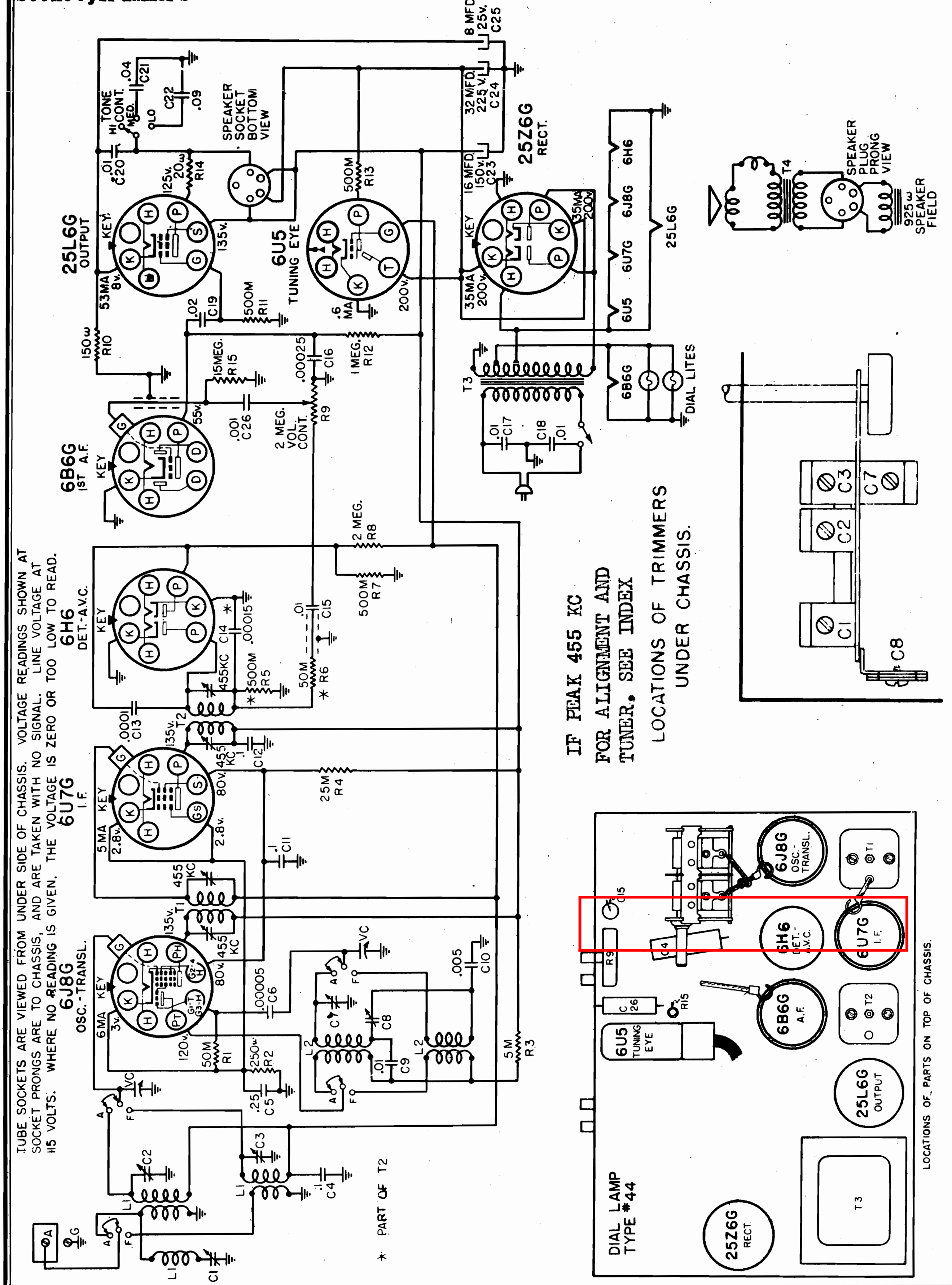
SETTING UP:

Unscrew (turn counter-clockwise) the push button two or three turns. (Use a token or screwdriver in the button slot to unscrew it, if necessary.) Push the button all the way in. Hold it in firmly and at the same time tune in your desired station. With your station tuned in, lock the adjustment by securely tightening (turn clockwise) the push button knob, using token or screwdriver. Hold the button in while tightening it. Unless the button is tightened securely, the adjustments may slip. Punch out the station's call letters from the sheet supplied and insert the call letters in the recess in the button. Then cover the call letters with one of the clear celluloid discs supplied.

Proceed in the same manner for the remaining buttons. If a change in selection of stations is desired, the old call letters can be removed with a pin inserted in the slot under the call letters.

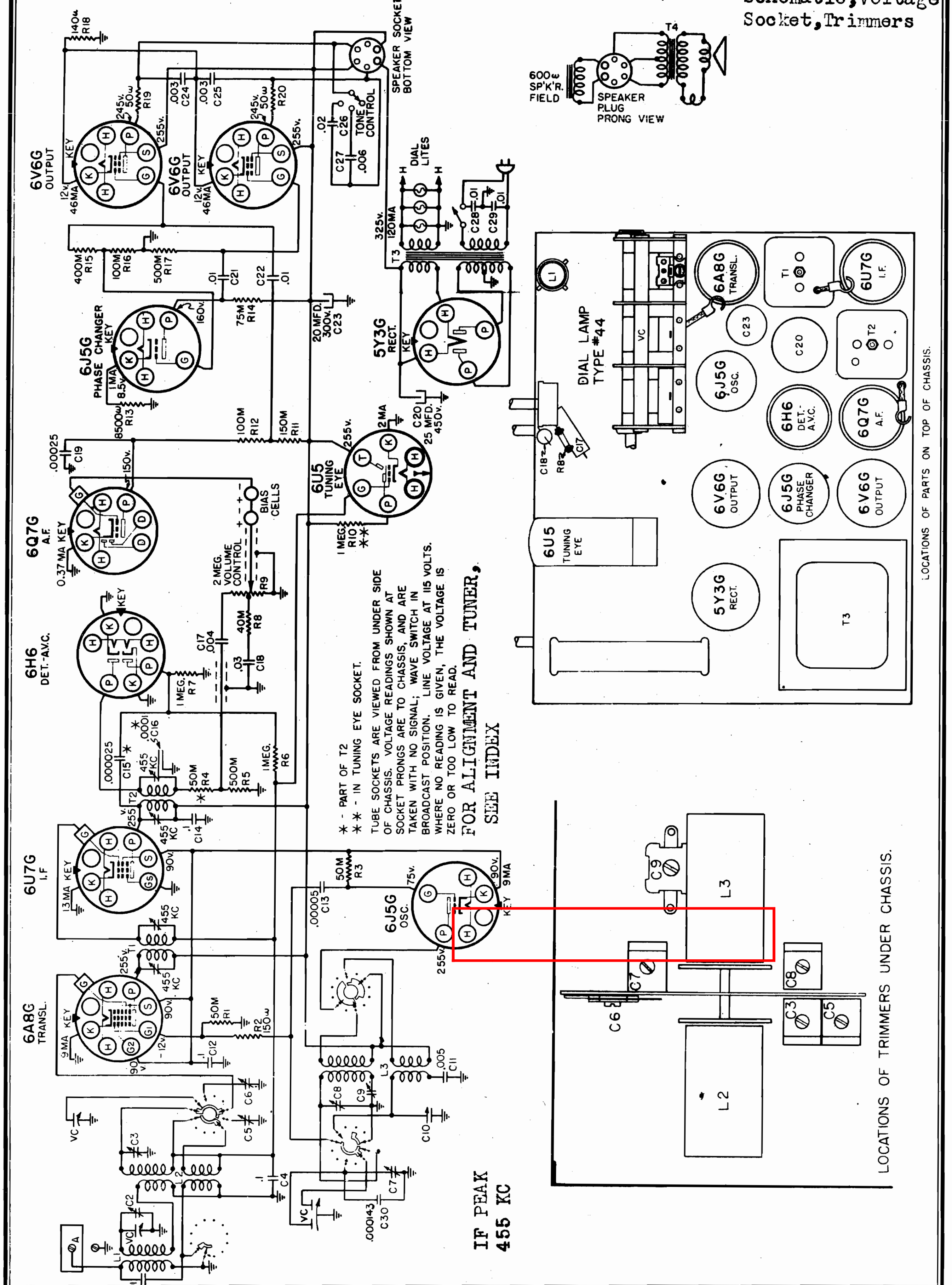
MODEL 015070
Schematic, Voltage
Socket, Trimmers

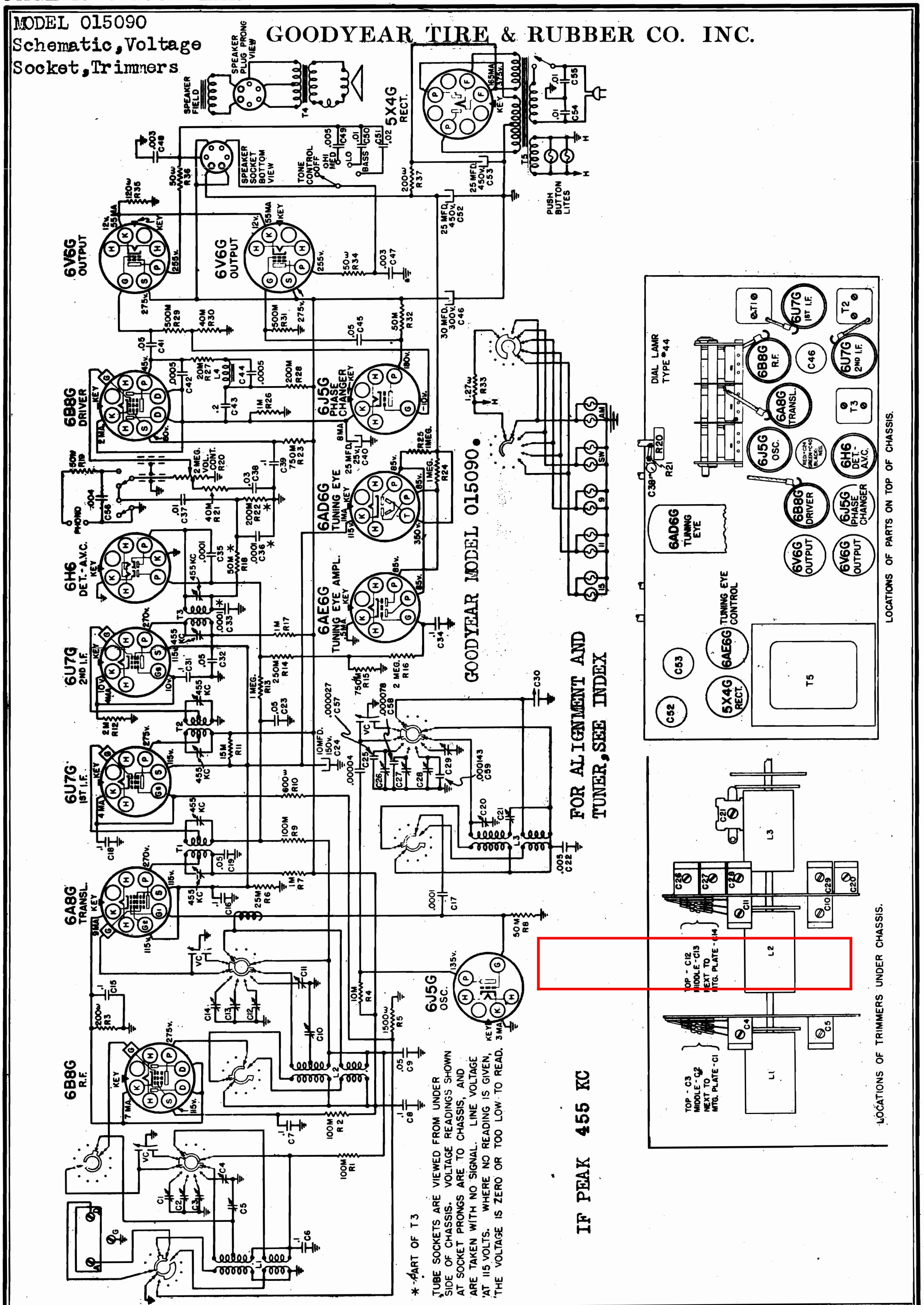
GOODYEAR TIRE & RUBBER CO., INC.



GOODYEAR TIRE & RUBBER CO., INC.

MODEL 015080
Schematic, Voltage
Socket, Trimmers




MODEL 015090
Schematic, Voltage
Socket, Trimmers
GOODYEAR TIRE & RUBBER CO. INC.
GOODYEAR MODEL 015090
FOR ALIGNMENT AND
TUNER, SEE INDEX
IF PEAK 455 KC
* PART OF T3
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.
LOCATIONS OF PARTS ON TOP OF CHASSIS.
LOCATIONS OF TRIMMERS UNDER CHASSIS.

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 015070
MODEL 015080
MODEL 015120
MODEL 015130
Alignment

GOODYEAR MODEL 015120

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.37 volts
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . Horizontal

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	1070 Grid	T2, T1	IF Output IF Input
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C6, C2	Osc.,Transl.
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7	Padder
"SW"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C4	Transl.

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

PUSH BUTTON TUNING

FOR SETTING UP PUSH BUTTONS
SEE GOODYEAR MODEL 015060

GOODYEAR MODEL 015070

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.23 volts
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . . . Center of first mark to left of 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	6J8G Grid	T2, T1	IF Output IF Input
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap
"AM"	Fully open	1730 kc	.0002 mfd.	Ant. Term.	C7	Oscillator
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C2	Translator
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C8	Padder
"SW"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C3	Translator

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

GOODYEAR MODEL 015130

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across Loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.32 volts
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . . Horizontal. To be along first heavy line below 550 kc

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	6D8G Grid	T2, T1	IF Output IF Input
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap
"AM"	1500 kc	1500 kc	.0002 mfd.	Ant. Term.	C5, C2	Os.,Transl.
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C6	Padder
"SW"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C3	Transl.

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

GOODYEAR MODEL 015080

ALIGNMENT PROCEDURE

PRELIMINARY.

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 0.98 volts
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . Center of block to left of 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	6A8G Grid	T2, T1	IF Output IF Input
"SW"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C5	Translator
"9MC"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C7* C6	Oscillator Translator
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C8,C3,C2	Osc.,Trans,Ant.
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C9	Padder

IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.

*Two peaks can be had, one with the trimmer screwed further out than the other. The correct adjustment is with the trimmer screwed further out. The other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

MODEL 015070
MODEL 015080
MODEL 015090
Tuner Data

GOODYEAR TIRE & RUBBER CO., INC.

MODELS 015080 and 015090

PUSH BUTTON TUNING

SETTING UP:

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

1. Make a list of the stations that you want to set up for push button tuning. It is helpful to arrange the stations in the order of their frequency (kilocycles); that is, the station of lowest frequency will be #1, the station of next higher frequency #2, etc. The top left push button can be used for station #1, the lower left one for station #2, the next upper one for station #3, etc. If you wish, short wave stations that can be tuned in on a SPREAD BAND scale can be set up for push button tuning. The stations selected must give strong and reliable reception.

2. Remove the four screws that hold the plate through which the push buttons protrude, and remove the plate. (This plate is called the "escutcheon".)

3. Push the tuning knob in and turn it so that the dial pointer comes to the left end of the dial. Engage the small screw driver, supplied, with the slotted shaft that is between the tuning knob and the push buttons. Unlock the mechanism by pushing the shaft in and unscrewing it (turn counter-clockwise) about four turns. Then remove the screw driver.

4. Push the button that you wish to use for your #1 station, all the way in and hold it in firmly. Push the tuning knob in and turn it until your #1 station is tuned in exactly, as indicated by the tuning eye. Be as exact as possible in tuning your station since this will determine how accurately your station will be tuned whenever you use the push button. Then let go of the push button before turning the tuning knob again. If properly done, the tuning eye indication will not change when you let go of the push button.

5. Push in your #2 button. Hold it in firmly and tune in your #2 station accurately. Then let go of the push button; then the tuning knob. Proceed in the same manner for the other stations on your list.

CAUTION: Use the small screw driver supplied for performing the next operation. Use of a larger screw driver than the one supplied will result in too much force being applied. The locking mechanism must not be turned too far to the right. Otherwise it may be impossible to obtain proper operation of the push buttons and the mechanism is liable to be permanently damaged.

6. After the last station has been set up, lock the mechanism by pushing the slotted shaft in and securely tightening it (turn clockwise), using the small screw driver, supplied. (Pushing the slotted shaft in will release the last push button. The dial pointer will move to the right end of the dial as the slotted shaft is turned.) Then remove the screw driver. If the slotted shaft remains pushed in when the screw driver is removed, turning it back and forth very slightly will release it.

After locking the mechanism, test the setting of each button by pushing it in. Then see if the station can be tuned still more accurately by using the tuning knob. Increased accuracy of tuning with the knob will be indicated by a narrower shadow of the tuning eye. If you find any stations that have not been correctly set up, unlock the mechanism, as described in Step 3, and readjust the setting. Be sure to lock the mechanism again before tuning any stations.

7. Punch out the call letters of your desired stations from the call letter sheets supplied. Insert the call letters in the recesses in the front of the push buttons. Cover the call letters with the clear celluloid tabs supplied. Replace the escutcheon.

8. You may change your choice of stations at any time by unlocking the mechanism as described in Step 3 and adjusting the button to the new station, as described in Step 4. Then relock the mechanism as described in Step 6. The call letters of the new station should be inserted in the proper push button.

OPERATION:

Push the button, indicated for your desired station, all the way in. Your station then will be tuned in. If you have selected short wave stations for push button tuning, be sure the band switch is turned to the proper band. The button will remain part way in, indicating what station is tuned in, until you push another button or until you push the tuning knob.

GOODYEAR 015070

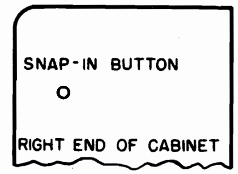
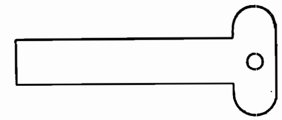


FIG. 1



KEY FOR LOCKING AND UNLOCKING PUSH-BUTTON MECHANISM.

FIG. 2

SETTING UP:

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

1. Make a list of the stations that you want to set up for push button tuning. It is advisable, but not necessary, to arrange the stations in the order of their frequency (kilocycles); that is, the station of lowest frequency will be #1, the station of next higher frequency #2, etc. The top left push button can be used for station #1, the lower left one for station #2, the next upper one for station #3, etc. If you wish, short wave stations can be set up for approximate push button tuning and then tuned accurately with the tuning knob. The stations selected must give strong and reliable reception.

2. Remove the four screws that hold the plate through which the push buttons protrude, and remove the plate. (This plate is called the "escutcheon".) If your radio is a table model (not a console), remove the snap-in button at the right side of the cabinet. See Fig. 1

3. Push the tuning knob in and turn it so that the dial pointer comes to the right end of the dial. If your radio is a table model, a key, illustrated in Fig. 2, will be found in the Instruction Leaflet envelope. Insert this key in the hole in the side of the cabinet from which the snap-in button was removed and engage the key with the slot at the end of the push button locking mechanism. Unscrew (turn counter-clockwise) the key a few turns, unlocking the mechanism. (A screw driver can be used for unlocking the mechanism instead of the key supplied.)

If yours is a console model, the mechanism can be unlocked by reaching in from the back of the cabinet and unscrewing (turning counter-clockwise) the wing nut, at the end of the mechanism, a few turns. (This can be done by hand.)

4. Push the button that you wish to use for your #1 station, all the way in and hold it in firmly. Push the tuning knob in and turn it until your #1 station is tuned in exactly. Then let go of the push button, making sure not to turn the tuning knob until you have let go of the button. (Turning the knob while the button is pushed in would spoil the accuracy of the adjustment.) Be as exact as possible in tuning your station since this will determine how accurately your station will be tuned whenever you use the push button.

5. Push in your #2 button. Hold it in firmly and tune in your #2 station accurately. Then let go of the push button and then the tuning knob. Proceed in the same manner for the other stations on your list.

6. When all of the stations have been set up, push the tuning knob in and turn it so that the dial pointer comes to the left end of the dial. Then lock the mechanism by tightening (turning clockwise) the wing nut for console models or by using the key for table models. If yours is a table model, replace the snap-in button in the side of the cabinet.

7. Punch out the call letters of your desired stations from the call letter sheets supplied. Insert the call letters in the celluloid holders at the back of the escutcheon. Be sure to insert the call letters so that they are opposite their respective push buttons. Then replace the escutcheon.

8. You may change your choice of stations at any time by unlocking the mechanism as described in Step 3 and adjusting the button to the new station, as described in Step 4. Then relock the mechanism as described in Step 6. The call letters of the new station should be inserted in the call letter holder in their proper position.

MODEL 015090
Alignment
MODEL 015120
Socket, Trimmers

GOODYEAR TIRE & RUBBER CO., INC.

ALIGNMENT GOODYEAR MODEL 015090

Output meter connection .... Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts...............1.06 volts
Generator ground lead connection ....Receiver chassis
Dummy antenna value to be in series with generator output, See chart below
Connection of generator output lead...................... See chart below
Generator modulation.................................... 30%, 400 cycles
Position of volume control............................... Fully clockwise
Position of tone control.. HI
Position of dial pointer(variable closed) .... Center of block to left of 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION
"AM"	Closed	455 kc	.1 mfd.	6A8G Grid	T3, T2, T1	IF Output, IF Interstage, IF Input.
"SW"	18 mc	18 mc	400 ohms	Ant. Term.	C39*	Oscillator
"SW"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C11, C4	Translator, RF
"9"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C38* C12 C3	Oscillator Translator RF
"11"	11.7 mc	11.7 mc	400 ohms	Ant. Term.	C37* C13 C2	Oscillator Translator RF
"15"	14.9 mc	14.9 mc	400 ohms	Ant. Term.	C36* C14 C1	Oscillator Translator RF
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C30 C10 C5	Oscillator Translator RF
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C31	Padder

IMPORTANT ALIGNMENT NOTES

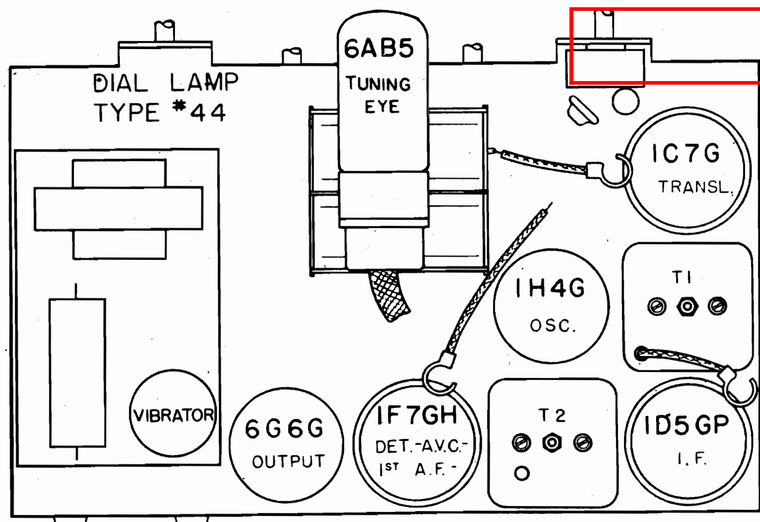
The alignment must be done in the order given.

*Two peaks can be had, one with the trimmer screwed further out than the other. The correct adjustment is with the trimmer screwed further out. The other peak is the image.

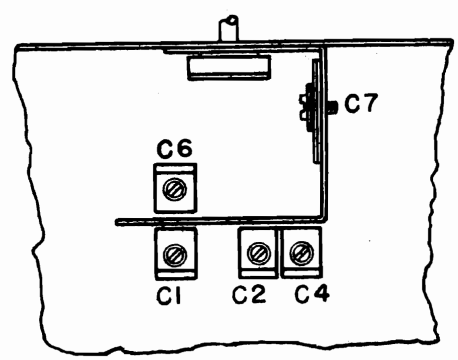
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

MODEL 015120



LOCATION OF PARTS ON TOP OF CHASSIS



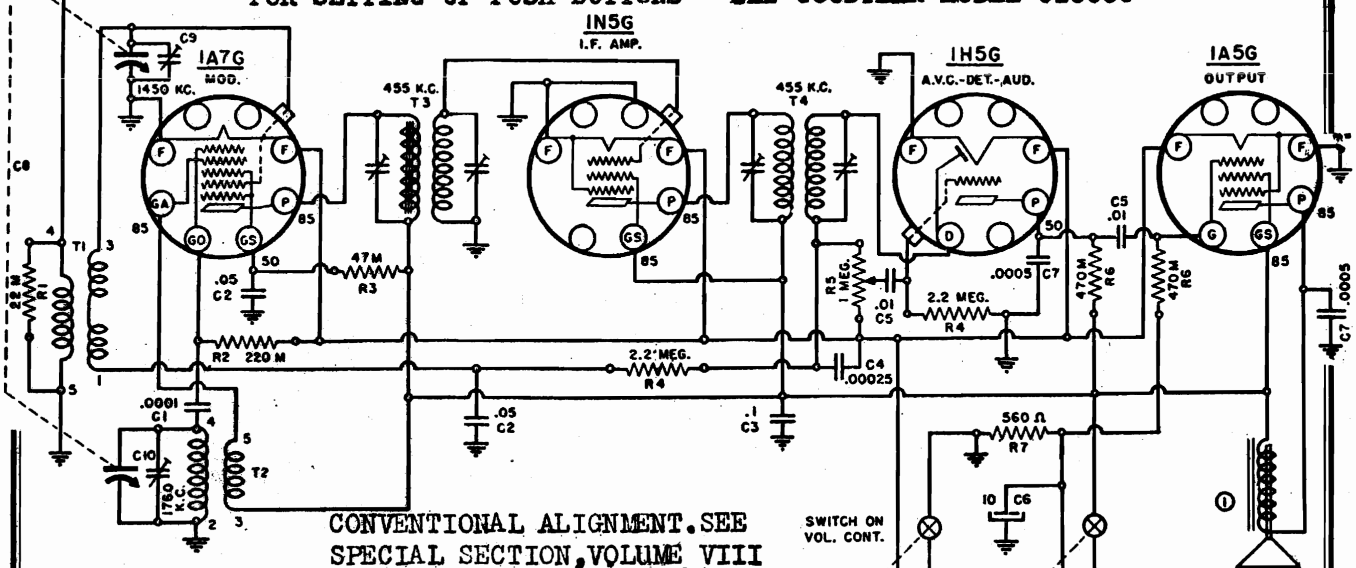
LOCATIONS OF TRIMMERS UNDER CHASSIS

MODEL 015100
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

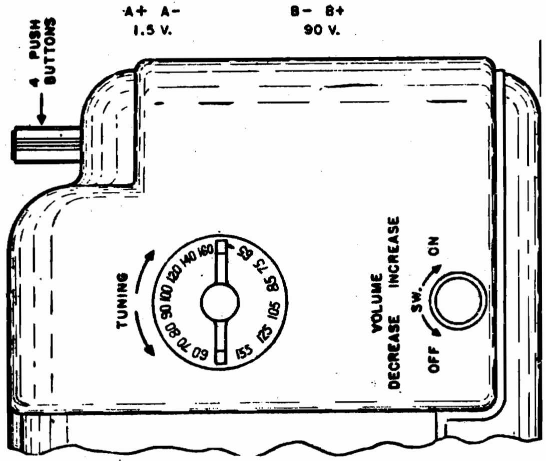
Socket, Trimmers
Alignment

FOR SETTING UP PUSH BUTTONS - SEE GOODYEAR MODEL 015050



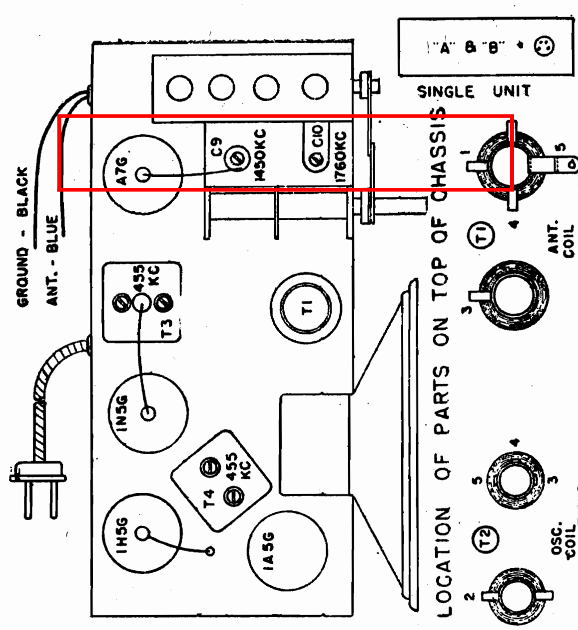
CONVENTIONAL ALIGNMENT. SEE
SPECIAL SECTION, VOLUME VIII

TUBE SOCKETS ARE VIEWED FROM ~~UNDER~~ SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
CAPACITY VALUES ARE IN MICROFARADS.



Schematic Location	Part No.	Description	Price Each
	10141463	Booklet—Call Letter	.25
	101419422	Booklet—Instruction	.25
	1011242184	Cabinet—Molded, Ivory	4.70
	1011242184	Cabinet—Molded, Walnut	2.65
	1011323130	Cable—Battery	.62
	101373509	Clips—Grid .... Doz.	.15
C1		Condenser—.0001 mfd. Mica	.25
C2		Condenser—.05 mfd. 200 V. Tub.	.25
C3		Condenser—.1 mfd. 200 V. Tub.	.25
C4		Condenser—.00025 mfd. Mica	.25
C5		Condenser—.01 mfd. 400 V. Tub.	.25
C6	1012118235	Condenser—Elec. 10 mfd. 35 Volts	.50
C7		Condenser—.0005 mfd. Mica	.25
C8	1012019134	Condenser—Variable C9 and C10	.80
R5	1012524126	Control—Volume 1 meg ohm	.90
	101374710	Grommet—Rubber 3/8" .... Doz.	.20
	101374700	Grommet—Rubber 1/4" .... Doz.	.20
	1014067367	Knob—Tuning, Ivory or Cream & Tan	.38
	1014052116	Knob—Volume, Ivory or Cream & Tan	.15
	1012752129	Knob—(Push Button) & Stem, Ivory or Cream and Tan	.15
	1012739251	Lever—Driven	.15
	1012739252	Lever—Driver	.10
	1012739253	Link—Connecting	.05
	10137862	Lockwasher—3/8" .... Doz.	.05
	1013756102	Nut—Hex 3/8" .... Doz.	.15
	1013783118	Panel—Back	.20
R1		Resistor—22 M ohm 1/3 W	.20
R2		Resistor—220 M ohm 1/3 W	.20
R3		Resistor—47 M ohm 1/3 W	.20
R4		Resistor—2.2 meg ohm 1/3 W	.20
R6		Resistor—470 M ohm 1/3 W	.20
R7		Resistor—560 ohm 1/3 W	.20
	10127654	Rivets—Shoulder .... Doz.	.10
	1012774117	Screws—Set 8/32 hex hd. cup. pt. ... Doz.	.20
	101386855	Socket—8 Prong	.10
1	10151179260	Speaker—5" Permanic	2.40
	1012770109	Spring	.05
T1	1011810258	Transformer—Antenna	.75
T2	1011810257	Transformer—Oscillator	.75
T3	1015510251	Transformer—1st I.F.	1.50
T4	1015710259	Transformer—2nd I.F.	1.25
	1013722112	Tri-points—Back panel .... Doz.	.15
	101289956	Tuner	1.30

ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE



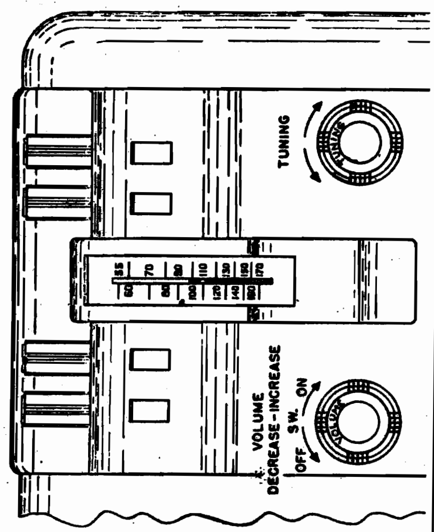
MODEL 015110
Schematic, Voltage
Socket, Trimmers
Alignment

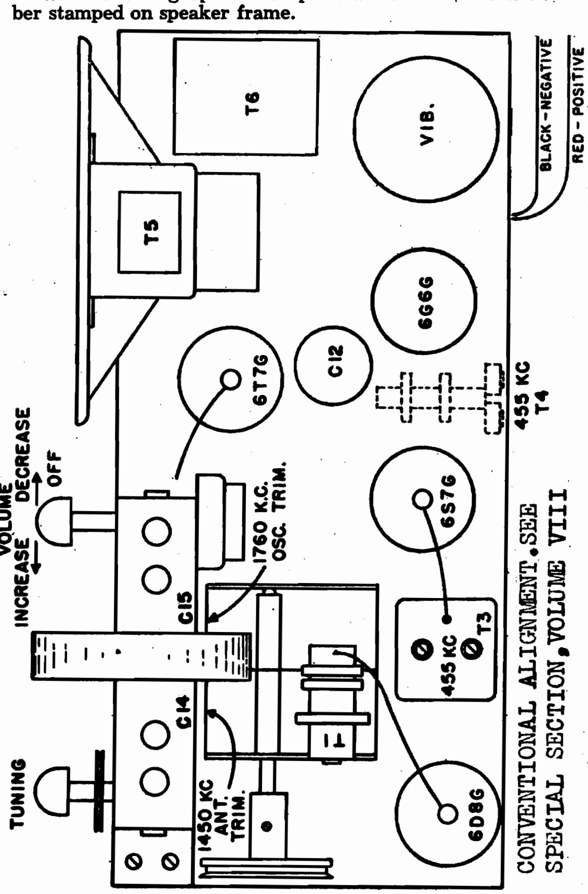
GOODYEAR TIRE & RUBBER CO., INC.

Schematic Location	Part No.	Description	Selling Price Each
	1011323128	Cable—Battery	.45
	101373509	Caps—Grid Small ... Doz.	.10
	1012739257	Drum & Lever Assem.	.40
	1014052127	Knob—Tuning, Ivory or Cream & Tan	.15
	1014052132	Knob—Volume, Ivory or Cream & Tan	.15
	101318901	Lamp—Pilot No. 40	.15
	1012739248	Lever—Driver	.05
	1012739247	Link—Connecting	.05
L3	1011633218	Choke—Filament	.20
L2	1011610246	Choke—R.F. (B)	.20
L1	1011633217	Choke—Vibrator	.20
	101373516	Clamps—Battery	.20
C1	1012216127	Condenser—Buffer .004 mfd. 1000V	.25
C2		Condenser—.05 mfd. 400V Tub.	.25
C3		Condenser—.004 mfd. 400V Tub.	.25
C4		Condenser—.001 mfd. 400V Tub.	.25
C5		Condenser—.5 mfd. 200V Tub.	.25
C6		Condenser—.25 mfd. 200V Tub.	.25
C7		Condenser—.1 mfd. 200V Tub.	.25
C8		Condenser—.05 mfd. 200V Tub.	.25
C9		Condenser—.0005 mfd. Mica	.25
C10		Condenser—.00025 mfd. Mica	.25
C11		Condenser—.0001 mfd. Mica	.25
C12	1012118236	Condenser—Electrolytic 40x16 mfd. 200V	1.00
C13	1012019132	Condenser—Variable C14 & C15	2.05
	1012524124	Control—Volume 500M ohm	.75
1	1015179256	Speaker—5" P.M. with	5.00
T5	*	Output Transformer	
	1012770110	Spring—Drive	.05
	1012670111	Spring—Ribbon	.05
	1012770105	Spring—String	.05
T1	1011810239	Transformer—Antenna	.45
T2	1011810240	Transformer—Oscillator	.30
T3	1015510253	Transformer—1st I.F.	1.25
T4	1015710252	Transformer—2nd I.F.	.80
T6	1016580160	Transformer—Power, Virb.	1.75
	1013722112	Tripoints—Back Panel ... Doz.	.15
	1013722103	Tripoints—Ribbon ... Doz.	.15
	10127957	Tuner—4 Button	1.20
2	1016234103	Vibrator	4.00
	10128866	Washers—"C" ... Doz.	.10
	1012752131	Push Button & Stems, Cream & Tan or Ivory	.15
R1		Resistors—10 meg ohm 1/3W	.20
R2		Resistors—1 meg ohm 1/3W	.20
R3		Resistors—220M ohm 1/3W	.20
R4		Resistors—47M ohm 1/3W	.20
R5		Resistors—22M ohm 1/3W	.20
R6		Resistors—15M ohm 1/3W	.20
R7		Resistors—100 ohm 1/3W	.20
R8		Resistors—1500 ohm 1/2W	.20
R9		Resistors—220 ohm 1/2W	.20
	101468844	Ribbon—Eyelet Assem. (Pointer)	.15
	101276504	Rivets—Shoulder ... Doz.	.10
	10127845	Roller & Shaft Assem.	.35
	1012667394	Scale-Dial	.15
	1012774117	Screws—Set 8/32x3/8 hex. hd. cup. pt. ... Doz.	.10
	10128846	Shaft Assem.—Drive	.35
	101497717	Shield—Tube	.10
	101386852	Socket—6 Prong	.10
	101386855	Socket—8 Point	.10
	101388875	Socket—Pilot Light	.10

*When ordering Speaker output transformer refer to number stamped on speaker frame.

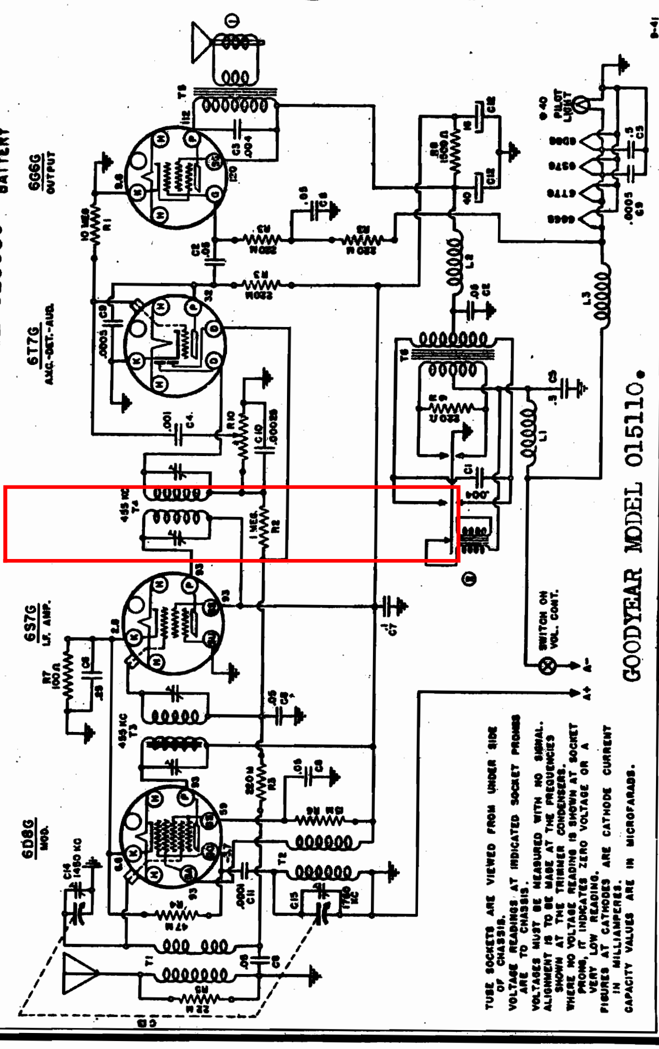
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE





CONVENTIONAL ALIGNMENT. SEE SPECIAL SECTION, VOLUME VIII

FOR SETTING UP PUSH BUTTONS - SEE GOODYEAR MODEL 015050

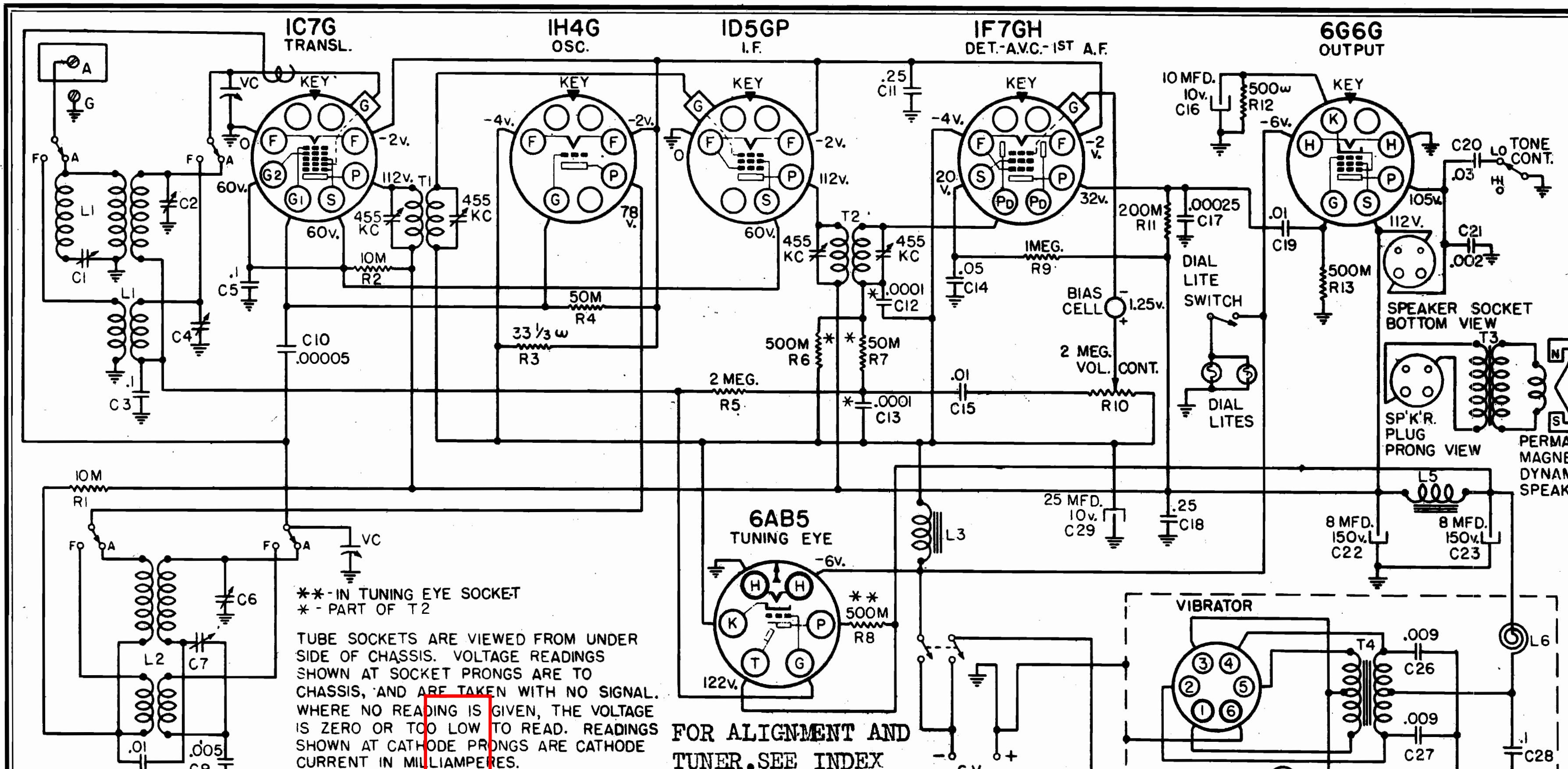


TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.

GOODYEAR MODEL 015110.

MODEL 015120
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.



FOR ALIGNMENT AND TUNER, SEE INDEX

WHEN ORDERING PARTS, ALWAYS GIVE:

The PART NUMBER and the DESCRIPTION. THE SELLING PRICE. THE IDENTIFICATION NUMBER of your radio.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
	1034019749	Knob - Volume	.14
	1034019992	Knob - On-off and tone	.16
	1033114914	Lamp - Dial, type #44	.12
	10213181871	Lead - Battery, red, with clip	.33
	10213197811	Lead - Battery, black, with clip	.31
	1034119859	Leaflet - Instruction	.20
	1034119663	Log - Station	.03
	1033718112	Mounting - Bias cell	.06
	1034518114	Pointer - Dial	.09
R5		Resistor - 2 megohms, 1/3 watt	.15
R9		Resistor - 1 megohm, 1/3 watt	.15
R13		Resistor - 500M ohms, 1/3 watt	.15
R11		Resistor - 200M ohms, 1/3 watt	.15
R4		Resistor - 50M ohms, 1/3 watt	.15
R1, R2		Resistor - 10M ohms, 1/3 watt	.15
R12		Resistor - 500 ohms, 1/3 watt	.15
R3		Resistor - 33-1/3 ohms, 1/3 watt	.15
	1033619930	Sheet - Station call letters	.15
	1033817981	Socket - Speaker	.07
	1033817983	Socket - Vibrator	.08
	1033817986	Socket - 7 prong	.09
	1033819820	Socket - 6 prong	.07
	1033817987	Socket - 8 prong	.10

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
	10338174361	Socket - 8 prong, rubber mounting	.37
	1035118312	Speaker - 6" PM Dynamic	3.93
	1035018313	Cone and voice coil	.94
T3	1036118314	Transformer	1.05
	1035118458	Speaker - 8" PM Dynamic	4.68
	1035018574	Cone and voice coil	1.50
T3	1036118575	Transformer	1.57
	1035218885	Switch - Wave	.40
	1035319793	Switch - On-off and tone	.54
T1	10355197871	Transformer - IF Input	.87
T2	1035718125	Transformer - IF Output	1.02
T4	1036518193	Transformer - Power	1.08
	1032018931	Tuner - Push button, with var. cond.	4.06
	1036214840	Vibrator	3.39
	1031317998	Board - Antenna connection	.03
	1033713951	Button - Snap, dial mounting	.01
	1033719822	Button - Push	.07
	1031319794	Cable - Tuning eye, with socket	.36
	1031517915	Cell - Bias, 1.25 volts	.09
	1033714310	Clip - Battery lead	.12
	1033816578	Clip - Dial light socket	.11
L1	1031818176	Coil - Antenna	.66
L2	1031819824	Coil - Oscillator	.61
L3	1031718182	Coil - "A" Choke	.49
L6	1031611995	Coil - RF Choke	.13
L5	1031718183	Coil - "B" Choke	.57
L4	10316154331	Coil - Choke	.16

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
C16,C22,C23	1032119788	Condenser - Electrolytic	.61
C29	1032118373	Condenser - Electrolytic, 25 mfd., 10 V.	.26
C1,C2,C4	1031918185	Condenser - Trimmer, triple	.39
C6	1031918197	Condenser - Trimmer	.10
C7	1031918196	Condenser - Padder	.18
C24,C25		Condenser - .5 mfd., 200 volts	.29
C11,C18		Condenser - .25 mfd., 200 volts	.18
C3,C5,C28		Condenser - .1 mfd., 200 volts	.16
C14		Condenser - .05 mfd., 200 volts	.13
C20		Condenser - .03 mfd., 400 volts	.08
C15,C19		Condenser - .01 mfd., 400 volts	.08
C8		Condenser - .01 mfd., 200 volts	.13
C26,C27		Condenser - .009 mfd., 1000 volts	.09
C9		Condenser - .005 mfd., mica	.25
C21		Condenser - .002 mfd., 400 volts	.10
C17		Condenser - .00025 mfd., mica	.09
C10		Condenser - .00005 mfd., mica	.07
R10	1032519789	Control - Volume	.50
	1032518822	Cover - Celluloid, station call letters	.05
	1032619790	Dial	.16
	1033919708	Escutcheon - Dial	.49
	1033919825	Escutcheon - Push button	.09
	1034019748	Knob - Tuning	.14
	1034019751	Knob - Wave switch	.16

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 100502
Double Eagle
Above Serial 42,000
Schematic, Changes, Tuner

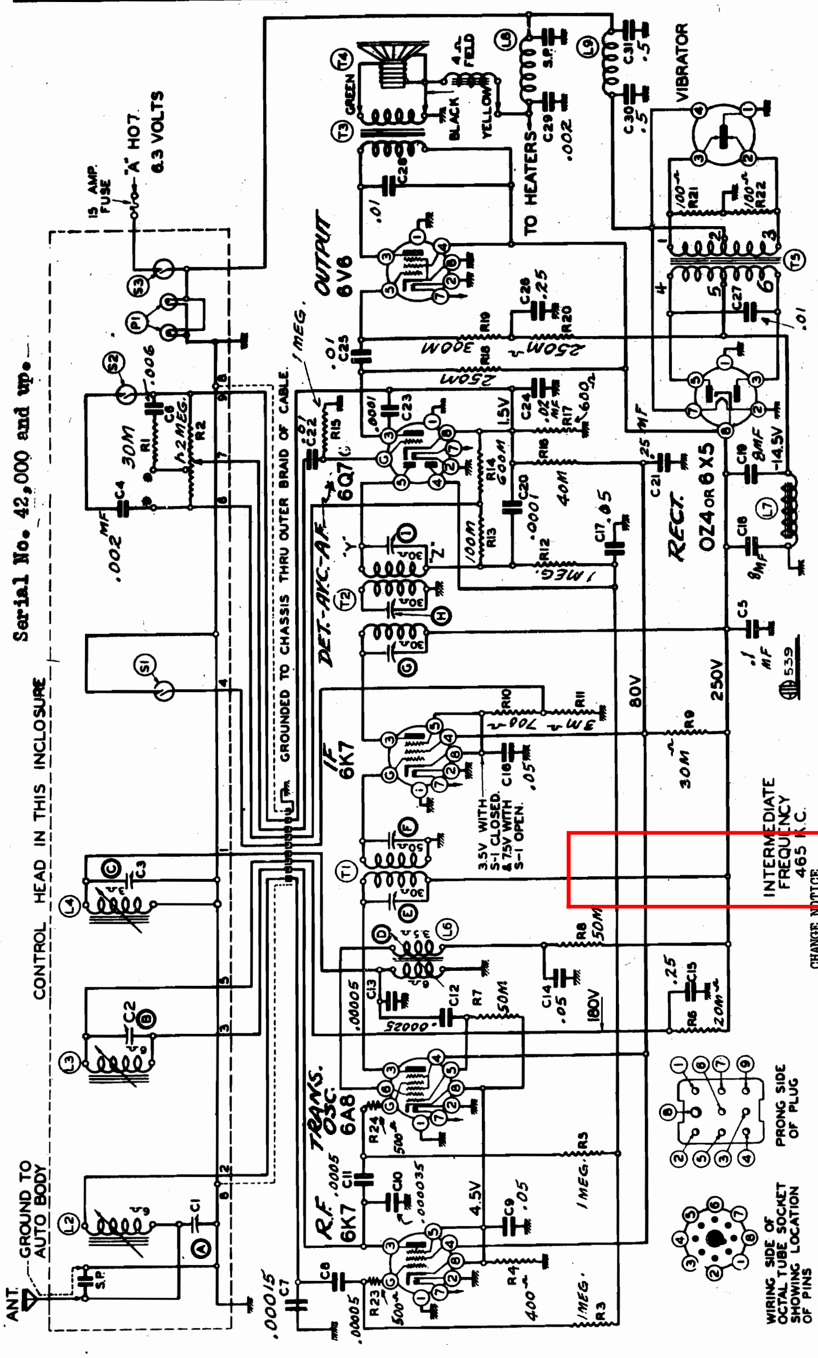
SETTING THE AUTOMATIC TUNER LEVERS TO STATIONS:

When setting up stations for the tuner levers it is important that the lever is pressed all the way down and held firmly in this position until the station is carefully selected by means of the manual tuning control.

This same procedure is followed until all the levers have been set up for stations, then the locking screw should be turned until it is absolutely tight. This is extremely important inasmuch as if the locking screw is not tight the cams on the cam shaft will slip and the stations will not stay adjusted to the tuner lever settings.

To reset one or more tuner levers to other stations it is only necessary to loosen the locking screw sufficiently to permit the mechanism to turn freely when the lever is pressed down as explained above and select the new station for the particular lever, however, make sure to re-tighten the locking screw again to lock the cams back in place.

DIAGRAM FOR GOODYEAR CHASSIS 100502



POWER TRANS COLOR CODE

1-YELLOW	4-BLUE
2-YELLOW (DOUBLE CONDUCTOR)	5- RED
3-YELLOW	6-BLUE

FOR EARLY SCHEMATIC OF COILS, SEE NEXT PAGE

CHANGE NOTICE

The antenna tuning coil assembly and oscillator tuning coil assembly contained in the remote tuner unit on all models, starting with serial No. 42,000, were revised slightly from the coils used on radios serial numbered from 30,000 to 40,500.

The two groups of coils are interchangeable, however, it is recommended that in cases where replacement of a coil is necessary, that the early type coils be used on radios serial numbered from 30,000 to 40,500 and the later type coils on radios serial numbered from 42,000 up, it is apparent that L1 and L5 have been eliminated in the later type coils.

The part numbers of the coils were changed and following is a list giving the part number for both groups of coils.

Schematic Location	Part Number	Description	Selling Price Each
		SERIAL NO. 30,000 to 40,500	
L1, L2	1001811196	Antenna tuning coil assembly complete with antenna trimmer assembly, antenna choke coil, iron slug and shield can	2.60
L4, L5	1001811077	Oscillator tuning coil assembly, complete with trimmer assembly, series oscillator coil, iron slug and shield can	2.60
		SERIAL NO. 42,000 AND UP	
L2	1001811100	Antenna tuning coil assembly, complete with antenna trimmer assembly, iron slug and shield can	2.60
L4	1001811084	Oscillator tuning coil assembly, complete with trimmer assembly, iron slug and shield can	2.60

POWER SUPPLY:
"A" . . 6 volt, Automobile storage battery.
"B" . . . . Vibrator-Rectifier

"A" Drain . . . . 7.5 amperes
"B" Drain . . . . 57 ma

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna & R.F. Trimmer	Shunt Oscillator Trimmer
1560 kc	1400 kc	600 kc

LOUD SPEAKER:
Type . . . . Dynamic
Size . . . . 8"
Approximate Field Resistance . . 4 ohms

POWER OUTPUT:
Type . . . . Beam Tube
Undistorted . . . . 4 watts
Maximum . . . . 7 watts

FREQUENCY RANGE:
Broadcast . . . . 535-1560 kc

Model 100502
Double Eagle
Early Schematic of Coils

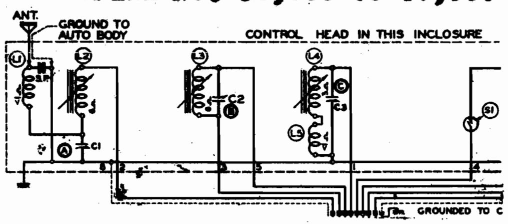
GOODYEAR TIRE & RUBBER CO., INC.

Early, Late
Alignment, Socket, Trimmers

ALIGNMENT PROCEDURE

WIRING DIAGRAM FOR GOODYEAR WINGS 100502

Serial No. 30,000 to 40,500



Preliminary:

Output meter connections........................Across voice coil leads
Output meter readings to indicate 1 watt output..............1.78 volts
Average sensitivity in microvolts for 1 watt output.......3 micro volts
Dummy antenna value to be in series with generator output See chart below
Connection of generator output lead....................See chart below
Connection of generator ground lead.........................To chassis
Generator modulation.................................30%, 400 cycles
Position of volume control...........................Fully clockwise
Position of tone control...............................Snapped to "Hi"
Position of local-distance switch.......... Snapped to Distance position

Dial setting of remote tuner unit	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (in order shown)	Trimmer Function	Adjustment	Approximate Microvolts
1400 K.C.	465 K.C.	.5 mfd.	Grid of 6K7 I.F. tube	G, H See note "A" below	Output I.F.	Adjust to maximum output	20,000
1400 K.C.	465 K.C.	.5 mfd.	Grid of 6K7 I.F. tube	I See "B" below	Output I.F.	Adjust to maximum output	20,000
1400 K.C.	465 K.C.	.5 mfd.	Grid of 6A8 Converter Tube	E,F	Input I.F.	Adjust to maximum output	512
1560 K.C.	1560 K.C.	.000175 mfd.	Antenna Lead	C. See Fig. 11	Oscillator	Adjust to resonance	512
1400 K.C.	1400 K.C.	.000175 mfd.	Antenna Lead	A, B See Fig. 11	Antenna and R.F.	Adjust to maximum output	3
600 K.C.	600 K.C.	.000175 mfd.	Antenna Lead	D See Fig. 10	Shunt oscillator Series adjustment	Adjust to maximum output Rock dial See note "C"	1.5

IMPORTANT ALIGNMENT NOTES

A- To align the output I.F. transformer without using a cathode ray oscillograph, a 10M ohm resistor must be shunted across one winding of the output I.F. coil assembly while adjustment to trimmers G and H are being made.

Connect the resistor as indicated by points "Y" and "Z" on the circuit diagram as follows:

Locate the wires coming from the bottom of the output I.F. coil assembly on the underside of the radio chassis.

The white lead with green tracer which is connected to diode plate terminal No. 5 on the 6Q7 tube socket is one point and the white lead with brown tracer which is connected to the end terminal of the terminal strip is the other point.

B- Disconnect the 10M ohm resistor before adjusting trimmer "I". If a cathode ray oscillograph is used it will not be necessary to connect a 10M ohm resistor across a portion of the I.F. coil as explained.

C- When adjusting the shunt oscillator trimmer "D", which is mounted on the base of the radio receiver unit (See Fig. #10), the dial on the remote tuner unit should be rotated slightly to and fro at the same time adjusting trimmer "D" for maximum gain.

It is advisable to repeat the entire alignment procedure to insure greater accuracy.

Always keep the output from the test generator (oscillator) at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

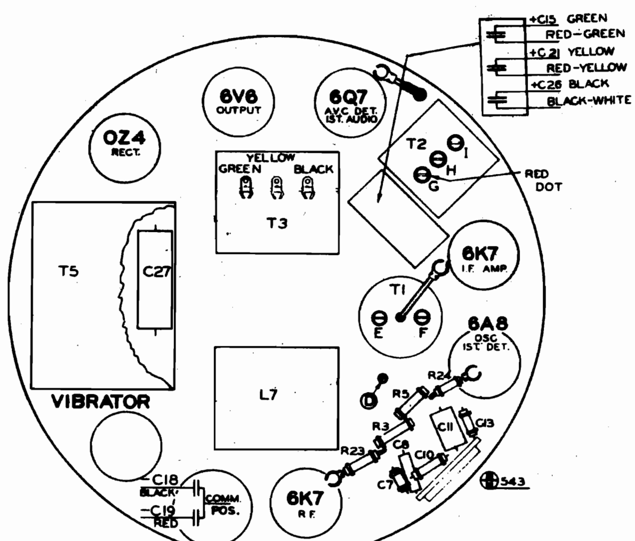


FIG. 10

LOCATIONS OF PARTS ON TOP OF CHASSIS

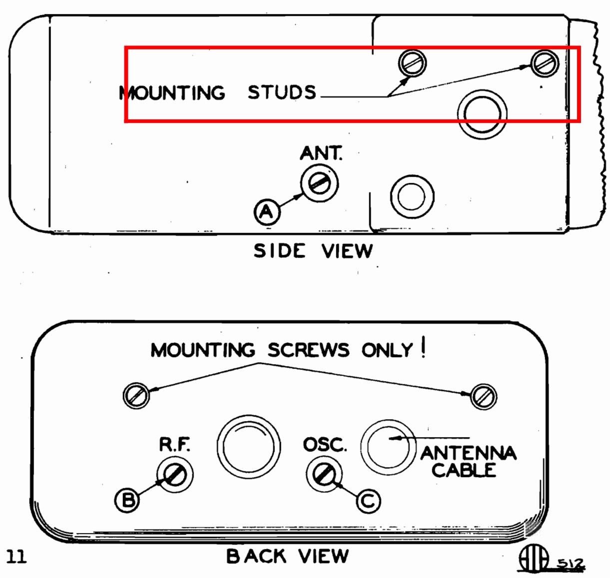
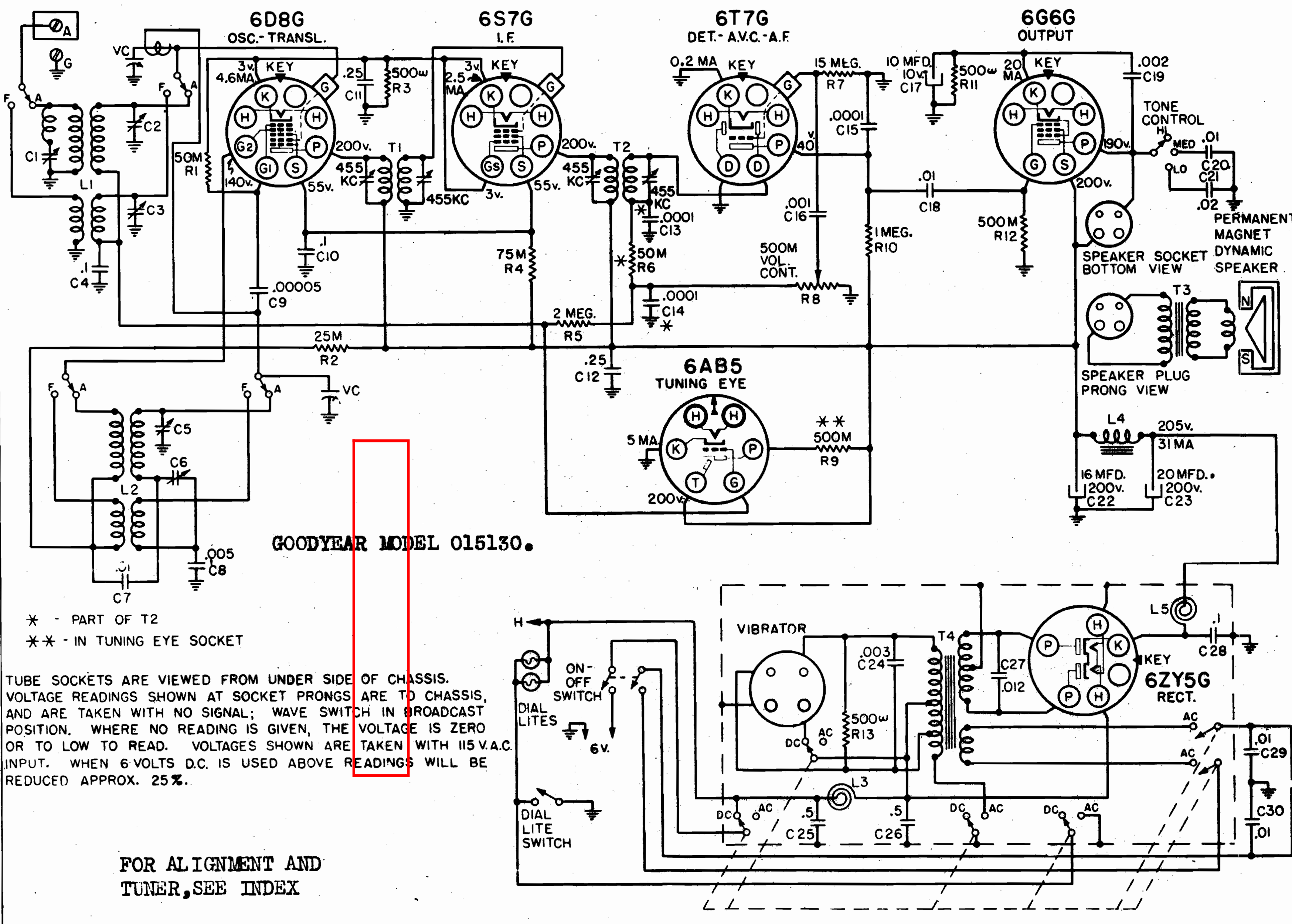


FIG. 11

MODEL 015130
Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.



GOODYEAR MODEL 015130.

* - PART OF T2

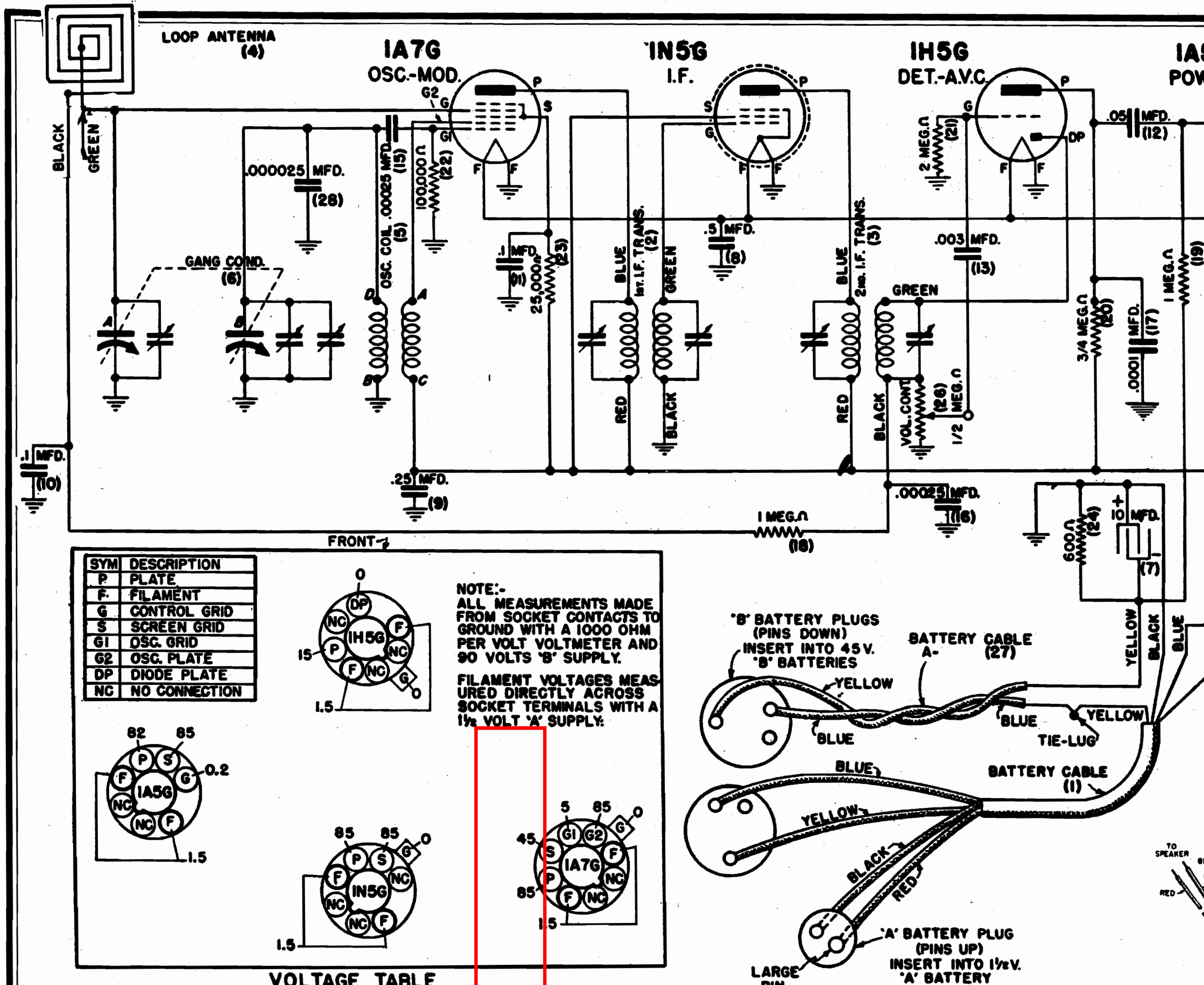
** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TO LOW TO READ. VOLTAGES SHOWN ARE TAKEN WITH 115 V.A.C. INPUT. WHEN 6 VOLTS D.C. IS USED ABOVE READINGS WILL BE REDUCED APPROX. 25%.

FOR ALIGNMENT AND TUNER, SEE INDEX

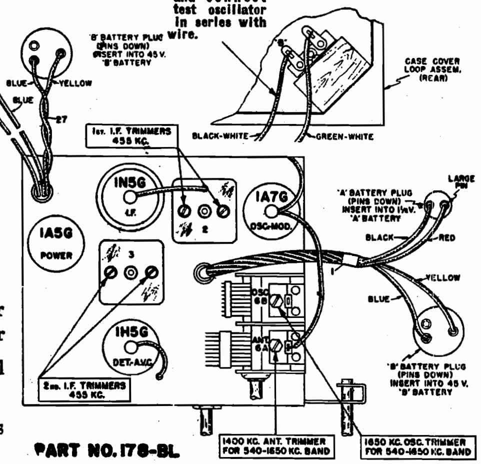
MODEL 103533
Schematic, Socket
Trimmers, Voltage
Alignment

GOODYEAR TIRE & RUBBER CO., INC.



SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)



PART NO. 178-BL

ALIGNMENT PROCEDURE

PRELIMINARY:

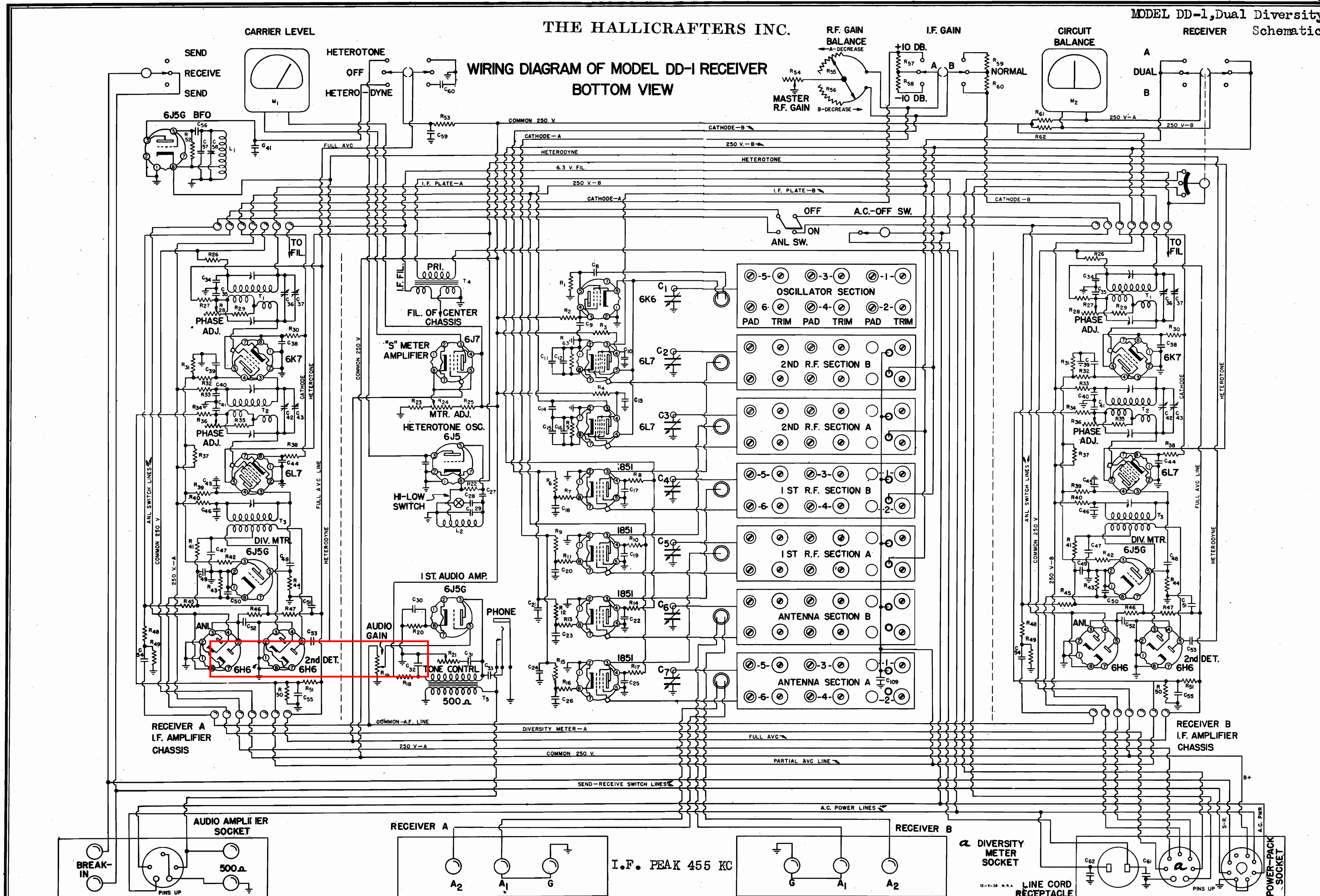
Output Meter Connections—Across "P" & "S" of 1A5G Tube
Output Meter Reading to Indicate 100 milli watt............43 Volts
Generator Ground Lead Connection....................Receiver Chassis
Connection of Generator Output Lead...............See Chart Below
Generator Modulation..30% 400 Cycles
Position of Volume Control...Fully On

Position of Variable	Generator Frequency	Dummy Antenna	Generator Connections	Trimmer Adjustment (In Order Shown)	Trimmer Function
Closed	455 KC	.1 mfd.	1A7G Grid	No. 2 & 3	I.F.
Fully Open	1650 KC	None	A-B	6B	Osc. Trimmer
1400 KC	1400 KC	None	A-B	6A	Ant. Trimmer

This alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

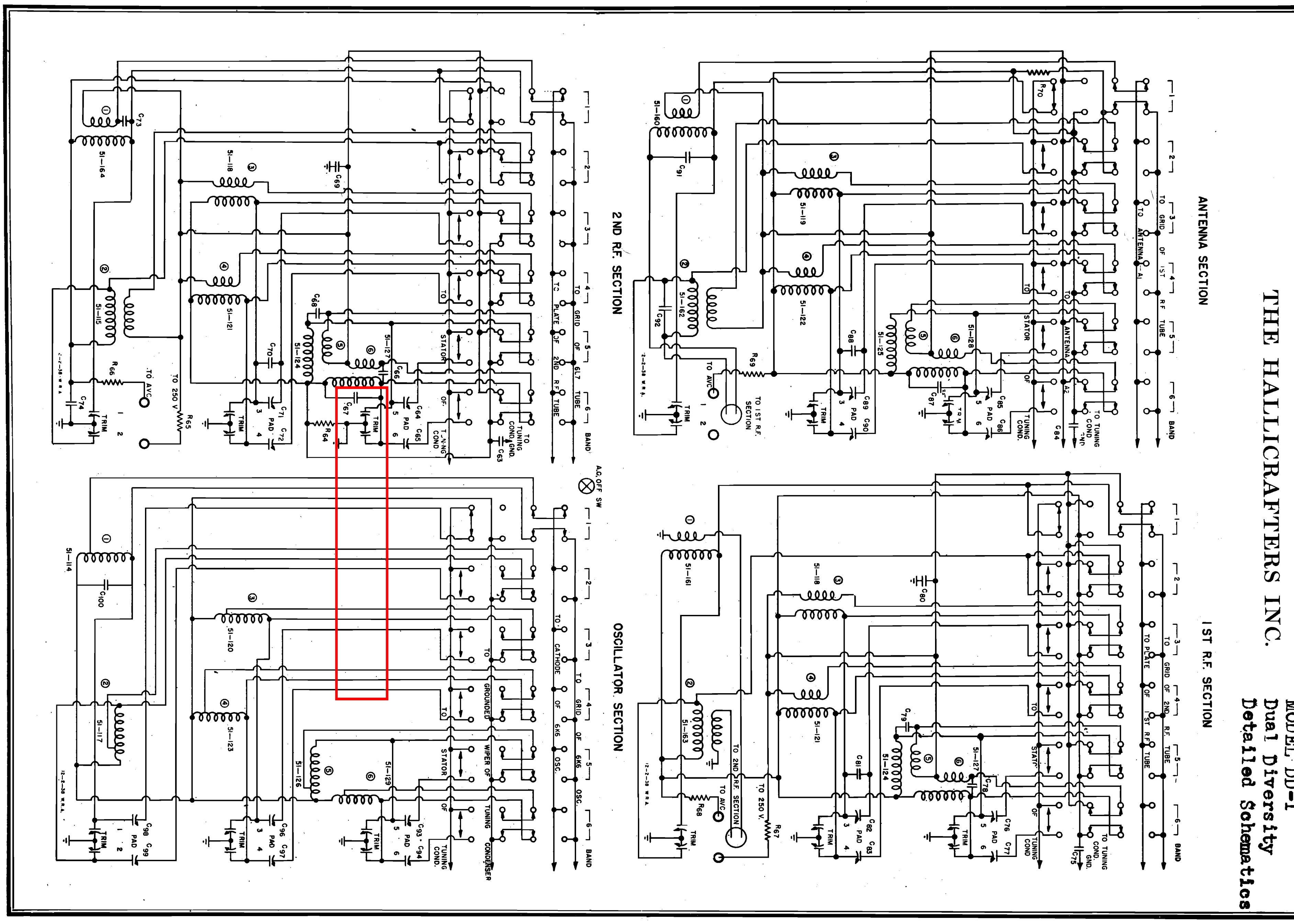
Always keep the output power from the generator at its lowest possible value to prevent the A.V.C.

MODEL DD-1, Dual Diversity Schematic



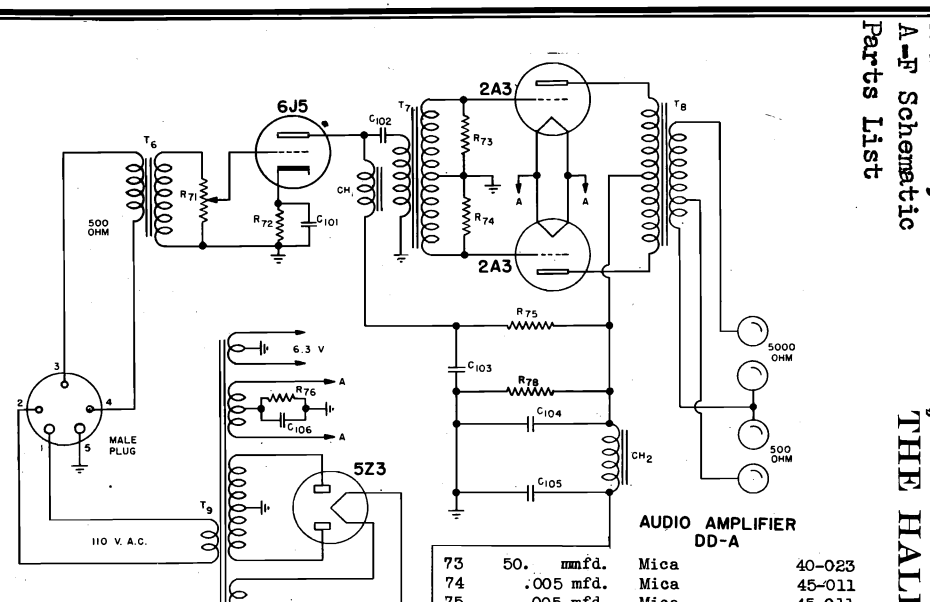
THE HALLICRAFTERS INC.

MODEL DD-1
Dual Diversity
Detailed Schematics



MODEL DD-1, Dual Diversity
A-F Schematic
Parts List

THE HALLICRAFTERS INC.



AUDIO AMPLIFIER
DD-A

RESISTOR PARTS LIST MODEL DD-1

NO.	VALUE OHMS	WATTAGE	PARTS NO.
R1	50,000	1/3	20-084
2	3,500	2	22-126
3	30,000	1	22-075
4	30,000	1	22-075
5	600	1/3	22-128
6	120	1/3	22-127
7	35	1/3	20-115
8	60,000	1/3	22-056
9	120	1/3	22-127
10	60,000	1/3	22-056
11	35	1/3	20-115
12	120	1/3	20-116
13	35	1/3	20-115
14	60,000	1/3	22-056
15	120	1/3	22-127
16	35	1/3	20-115
17	60,000	1/3	22-056
18	5,000	1	22-051
19	500,000	Audio Gain	25-038
20	4,000	1/3	22-050
21	100,000	Tone Control	25-037
22	50,000	1/3	20-084
23	400	1/3	22-023
24	500	1/3	22-026
25	50,000	1	22-081
26	1,000	1/3	20-033
27	1,000	1/3	20-033
28	15,000	1/3	22-068
29	30,000	1/3	22-077
30	300	1/3	22-020
31	20,000	1	20-072
32	1,000	1/3	20-033
33	1,000	1/3	20-033
34	1,000	1/3	20-033
35	25,000	1/3	22-074
36	15,000	1/3	22-068
37	15,000	2	22-129
38	300	1/3	22-020
39	1,000	1/3	20-033
40	1,000	1/3	20-033
41	20,000	1/3	20-072
42	5,000	1/3	22-053
43	10,000	1/3	20-063
44	1,000,000	1/3	20-108
45	100,000	1/3	20-093
46	1,000,000	1/3	20-108
47	500,000	1/3	22-098
48	100,000	1/3	20-093
49	250,000	1/3	20-099
50	750,000	1/3	22-104
51	500,000	1/3	22-098
52	50,000	1/3	20-084
53	20,000	1	20-070
54	2,500	Mas. R.F. Gain	25-122
55	1,000	Bal. Control	25-035
56	1,000	Bal. Control	
57	600	1/3	22-125
58	600	1/3	22-125
59	600	1/3	22-125
60	600	1/3	22-125
61	200	1/3	22-014
62	200	1/3	22-014
63	600	1/3	22-125
64	100,000	1/3	20-093
65	1,000	1/3	20-033
66	100,000	1/3	20-093
67	1,000	1/3	20-033
68	100,000	1/3	20-093
69	100,000	1/3	20-093
70	100,000	1/3	20-093
71	250,000	A.F. Gain Con.	25-038
72	1,000	1	22-030
73	100,000	1/2	22-091
74	100,000	1/2	22-091
75	10,000	2	24-042
76	750	10	26-000
77	10,000	20	26-002
78	30,000	20	26-001

CONDENSER PARTS LIST MODEL DD-1

NO.	CAPACITY	TYPE	VOLTAGE	PART NO.
C1				
2		Main		48-023
3	440 mmfd.			
4	per section	Tunive		
5	" "			48-024
6	" "	Gang		
7	" "			
8	100 mmfd.	Mica		40-011
9	.01 mfd.		600	45-002
10	.05 mfd.		400	41-005
11	.01 mfd.	Mica		43-022
12	.05 mfd.		200	41-004
13	.05 mfd.		400	41-005
14	15 mmfd.	Mica		40-022
15	.01 mfd.	Mica		43-022
16	.05 mfd.		200	41-004
17	.05 mfd.		400	41-005
18	.01 mfd.	Mica		43-022
19	.05 mfd.		400	41-005
20	.01 mfd.	Mica		43-022
21	1 mfd.		200	41-012
22	.05 mfd.		400	41-005
23	.01 mfd.	Mica		41-022
24	1 mfd.		200	41-012
25	.05 mfd.		400	41-005
26	.01 mfd.	Mica		43-022
27	.01 mfd.		400	41-001
28	.01 mfd.	Mica		41-022
29	.01 mfd.	Mica		41-022
30	20. mfd.		25	42-025
31	.02 mfd.		200	41-002
32	10. mfd.	Elec.	250	42-007
33	.02 mfd.		400	41-003
34	.05 mfd.		600	45-007
35	.01 mfd.		400	41-001
36	25. mmfd.	Air		48-012
37	1. mmfd.	Air		48-027
38	.05 mfd.		400	41-005
39	.05 mfd.		400	41-005
40	.05 mfd.		600	45-007
41	.01 mfd.		400	41-001
42	25. mmfd.	Air		48-012
43	1. mmfd.	Air		48-027
44	.05 mfd.		400	41-005
45	.05 mfd.		400	41-005
46	.05 mfd.		600	45-007
47	50. mmfd.	Mica		40-023
48	100. mmfd.	Mica		40-011
49	50. mmfd.	Mica		40-023
50	.05 mfd.		400	41-005
51	.05 mfd.		400	41-005
52	.05 mfd.		400	41-005
53	10. mmfd.			40-021
54	.05 mfd.		400	41-005
55	.05 mfd.		400	41-005
56	100. mmfd.	Mica		40-007
57	400. mmfd.	Pad		44-036
58	25. mmfd.	Air		48-034
59	10. mfd.	Elec.	400	42-007
60	8. mfd.		150	45-012
61	.01 mfd.		600	45-002
62	.01 mfd.		600	45-002
63	.005 mfd.	Mica		45-011
64	315. mmfd.	Pad		44-028
65	100. mmfd.	Pad		
66	15. mmfd.	Mica		40-022
67	10. mmfd.			40-021
68	10. mmfd.			40-021
69	.002 mfd.	Mica		40-013
70	1500. mmfd.	Mica		43-021
71	2200. mmfd.	Pad		44-029
72	440 mmfd.	Pad		
73	50. mmfd.	Mica		40-023
74	.005 mfd.	Mica		45-011
75	.005 mfd.	Mica		45-011
76	315. mmfd.	Pad		44-028
77	100. mmfd.	Pad		
78	15. mmfd.	Mica		40-022
79	10. mmfd.	Mica		40-021
80	.002 mfd.	Mica		40-013
81	1500. mmfd.	Mica		43-021
82	2200. mmfd.	Pad		44-029
83	440. mmfd.	Pad		
84	.005 mfd.	Mica		45-011
85	315. mmfd.	Pad		44-028
86	100. mmfd.	Pad		
87	25. mmfd.	Mica		40-024
88	1000. mmfd.	Mica		40-011
89	2200. mmfd.	Pad		44-029
90	440. mmfd.	Pad		
91	25. mmfd.	Mica		40-024
92	25. mmfd.	Mica		40-024
93	230. mmfd.	Pad		44-030
94	90. mmfd.	Pad		
95				
96	1120. mmfd.	Pad		44-031
97	340. mmfd.	Pad		
98	540. mmfd.	Pad		44-032
99	1.070 mmfd.	Pad		
100	6 mmfd.	Mica		40-025
101	10. mfd.	Elec.	50	42-003
102	.1 mfd.		600	45-008
103	1. mfd.		400	41-013
104	16. mfd.		475	42-022
105	16. mfd.		475	42-022
106	20. mfd.		100	42-023
107	16. mfd.		400	42-019
108	16. mfd.		400	42-019
109	.1 mfd.		200	41-006

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MODEL DD-1, Dual Diversity
Alignment
S.P.U. Schematic

**ALIGNMENT & SERVICING INSTRUCTIONS
FOR
SKYRIDER DIVERSITY RECEIVER
MODEL DD1**

SWITCHING ARRANGEMENT

For speed, ease and accuracy in aligning the Duel Diversity receiver, it is recommended that the output of the signal generator be terminated in a switching box in which you have installed a double throw single pole switch. From this switching box enclosed in a shielded cable which will serve as ground, run two leads one of which is connected appropriately to section "A" and the other to Section "B". Operation of the switch will readily allow you to switch the signal generator to either receiver section being aligned for a quick comparative check.

INTERMEDIATE FREQUENCY ALIGNMENT

Have controls set as follows:-
Have I.F. gain switch in NORMAL position.
Receiver switch to "A" side.
Set rejector control to 3 KC marking.
Balance control in center position.
All other gain controls adjusted for maximum gain.

IN ALIGNING "A" SECTION:-

Connect signal generator to the grid of the "A" section 6L7 converter (see diagram for location.) Adjust the signal generator for 455 KC output. Adjust I.F. transformers in the "A" receiver until they are peaked for maximum gain.

In Aligning "B" Section:-

Connect the signal generator as indicated above to the 6L7 converter tube in the "B" receiver and duplicate the adjustments done to the I.F. transformers of section "A". The receiver switch will necessarily be switched to the "B" side.

REJECTOR ADJUSTMENT

Before aligning the I.F. Rejector Circuit, the variable rejector condensers found below the chassis and driven by the long flexible copper cable, should be set as follows: With the rejector pointer set at ± 3 KC, check the first rejector condenser (closest to front panel in each I.F. section). It should have its rotor plates about 80% in mesh. The second rejector condenser (farthest from front panel) should have its plates about 20% in mesh. The same relationship should also exist between the condensers in the other I.F. section. When turning the rejector control from ± 3 KC toward ± 18 KC, the plates on the first rejector condenser should unmesh at the same time the plates on the second rejector condenser are meshing.

To correctly adjust the rejector circuit it is necessary to have two signals available which are accurately removed from the 455 KC fundamental by 3 KC on each side. The most satisfactory way to accomplish this is to use two crystals, one for 452 KC output and the other for 458 KC output. In the event, however, that crystals of those frequencies are not available, a satisfactory substitute can be used which consists of the following procedure: Put the BFO switch in the heterodyne position. Feed 455 KC from the signal generator into either 6L7 converter. Remove modulation from the signal being delivered by the generator. Obtain zero beat on the B.F.O. by operating the pitch control knob. Tune the generator slowly away from the 455 KC setting until a beat note of 3000 cycles (+ or − of 455 KC) is heard. Remember the pitch of that note. It will be necessary in adjusting the signal generator to a frequency 3000 cycles on the other side of 455 KC. A little practice will enable you to reset to each side of 455 KC by the 3 KC difference quite accurately and when signals of 452 and 458 KC are then available by this method, these signals should be used to properly peak the rejection circuit. This method is recommended only when a closely calibrated signal generator or a crystal controlled signal generator are not available.

Begin with receiver B. Set signal generator to 458 KC output. Adjust the 2nd Rejector Control (shown in the top chassis view) for minimum response. There should be two points of minimum output. If there is only one minimum point, rotate the adjusting nut on this control approximately 1/4 turn from the minimum, and very, very carefully adjust the 1st rejector control until a minimum occurs. After this has been accomplished, adjust the 2nd rejector control for minimum response. Now adjust the first phasing control (screw driver shaft nearest front panel), for minimum response. Readjust the 2nd rejector control carefully for minimum response. Repeat with "A" side without changing setting of the signal generator, connecting the signal generator to the "A" side 6L7, and switching the receiver to the "A" side. Readjust signal generator to 452 KC. Make similar adjustments on Rejector Controls 3 and 4 and the rear phasing control. Switch over to the "B" receiver and repeat these adjustments on the "B" side.

Now retune signal generator to 455 KC (still connected to "B" side). Carefully repeat each of the I. F. transformer trimming condensers. Switch signal generator output to 6L7 in "A" side and repeat the above operation.

NOTE: The gain of each receiver should be approximately the same, variation between receiver sections should not exceed 25% as shown on output meter readings. If gain-balance is far off, interchanging the 6L7 I.F. amplifier tubes sometimes improves it.

R. F. ALIGNMENT

Adjust receiver to Band 1, set "A". Have all gain controls at maximum, balance control in center position.

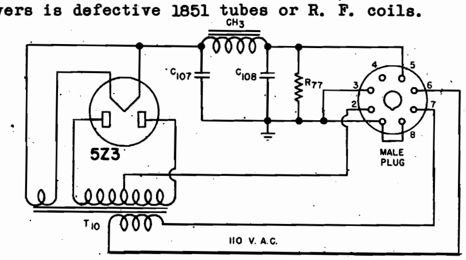
Now connect signal generator to antenna post of "A" receiver section through a 400 ohm resistor. Be sure shorting strap from A2 to G remains connected. During all adjustments the grounded side of the generator should be connected to the ground post on the receiver.

Set band spread dial to "0" and leave it there during entire alignment. Adjust generator to 1400 KC. Set dial on receiver to that frequency. Align oscillator, 2nd R. F., 1st R. F. and antenna trimmers in the order named for maximum gain. Switch over to Receiver "B" and repeat the above operations with the exception of the oscillator section which does not require readjustment this time. Set generator and receiver to 600 KC. Adjust oscillator padder for maximum response. Retrim oscillator at 1400 KC. Repeat the above procedure on the remaining bands, except that on bands 3-4-5-6 the R. F. padders should also be adjusted for maximum response at the low frequency ends of each band.

Care should be exercised in avoiding alignment on the image frequency. In every case, the image will be heard approximately 1 megacycle lower in frequency when adjusting the main tuning dial.

The greatest caution should be taken when adjusting the No. 6 hand oscillator padder because only a slight change causes a large variation in frequency and may throw the oscillator frequency completely out of the band. The relative sensitivities of receivers "A" and "B" should not vary more than 50%. A frequent cause of unbalance between receivers is defective 1851 tubes or R. F. coils.

POWER PACK
DD-P



MODEL DD-1,Dual Diversity
Socket,Trimmers
Alignment,Part 2

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BEAT FREQUENCY OSCILLATOR ADJUSTMENTS

Place the B.F.O. Key in the Heterodyne position.

With 455 KC signal from generator feeding into the "A" 6L7 converter and receiver "A" functioning, and the chassis standing on its left end (looking at set from the front) adjust the padding condenser inside the B.F.O. Shield can until zero beat is reached. The B.F.O. shield can is located directly behind the pitch control. Prior to making this adjustment assure yourself that the PITCH CONTROL condenser is at 50% capacity pointer on control positioned vertically). When properly adjusted, rotation of the pitch control condenser will show two beat note signals 180 degrees apart.

S METER ADJUSTMENT

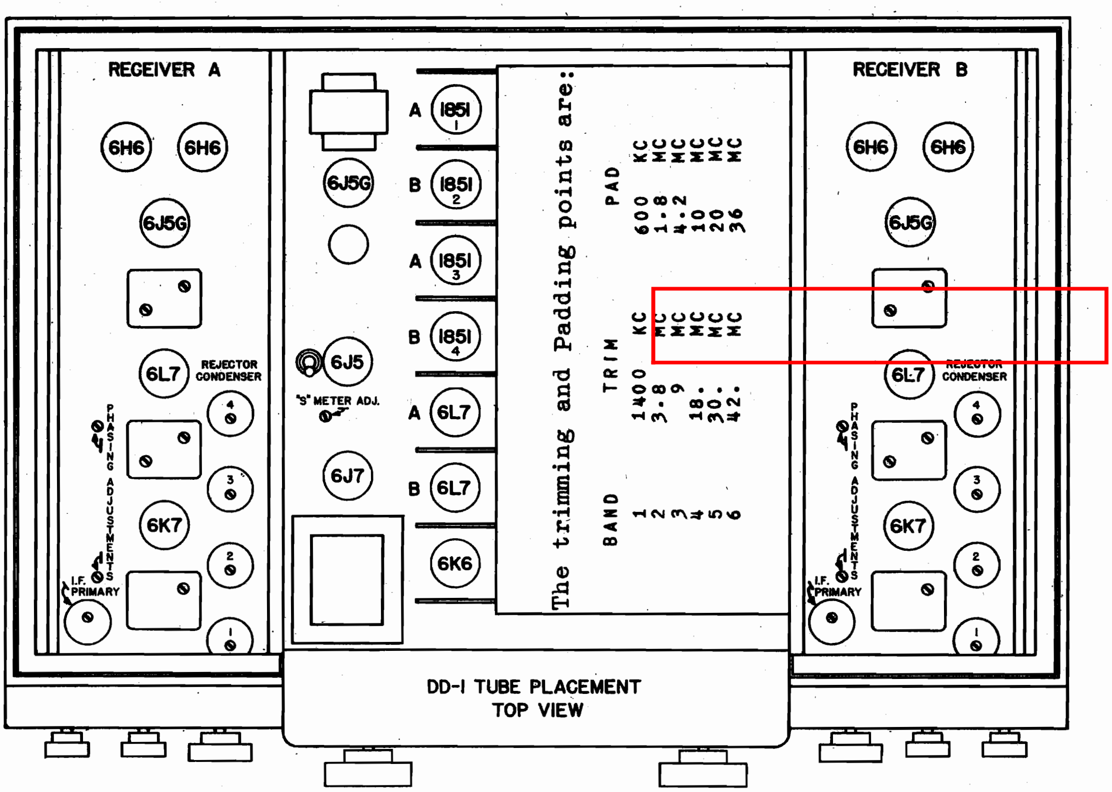
Push in No. 6 Band Button. With gain controls at maximum, adjust the zero reset control on all meters for zero.

NOTES:

If overload occurs on the broadcast band it might be advisable to shorten the length of the receiving antennas. If this recommendation is of little help check for a short to ground in the A.V.C. circuit.

Should the occasion of examining the coil units arise, exercise extreme care in moving the heavy leads attached to the switch terminals. Excessive movement of one of these leads may cause the contacting portion of the switch to be thrown out of alignment and provide improper contact.

If it becomes difficult to properly heterodyne a strong signal when listening to C. W. reception, reduce the overall gain with the master gain control 'till a satisfactory note is obtained.



The trimming and Padding points are:

BAND	TRIM	PAD
1	1400 KC	600 KC
2	3.8 MC	1.8 MC
3	9 MC	4.2 MC
4	18. MC	10 MC
5	30. MC	20 MC
6	42. MC	36 MC

DD-I TUBE PLACEMENT
TOP VIEW

MODEL S-19R, Sky Buddy
Schematic

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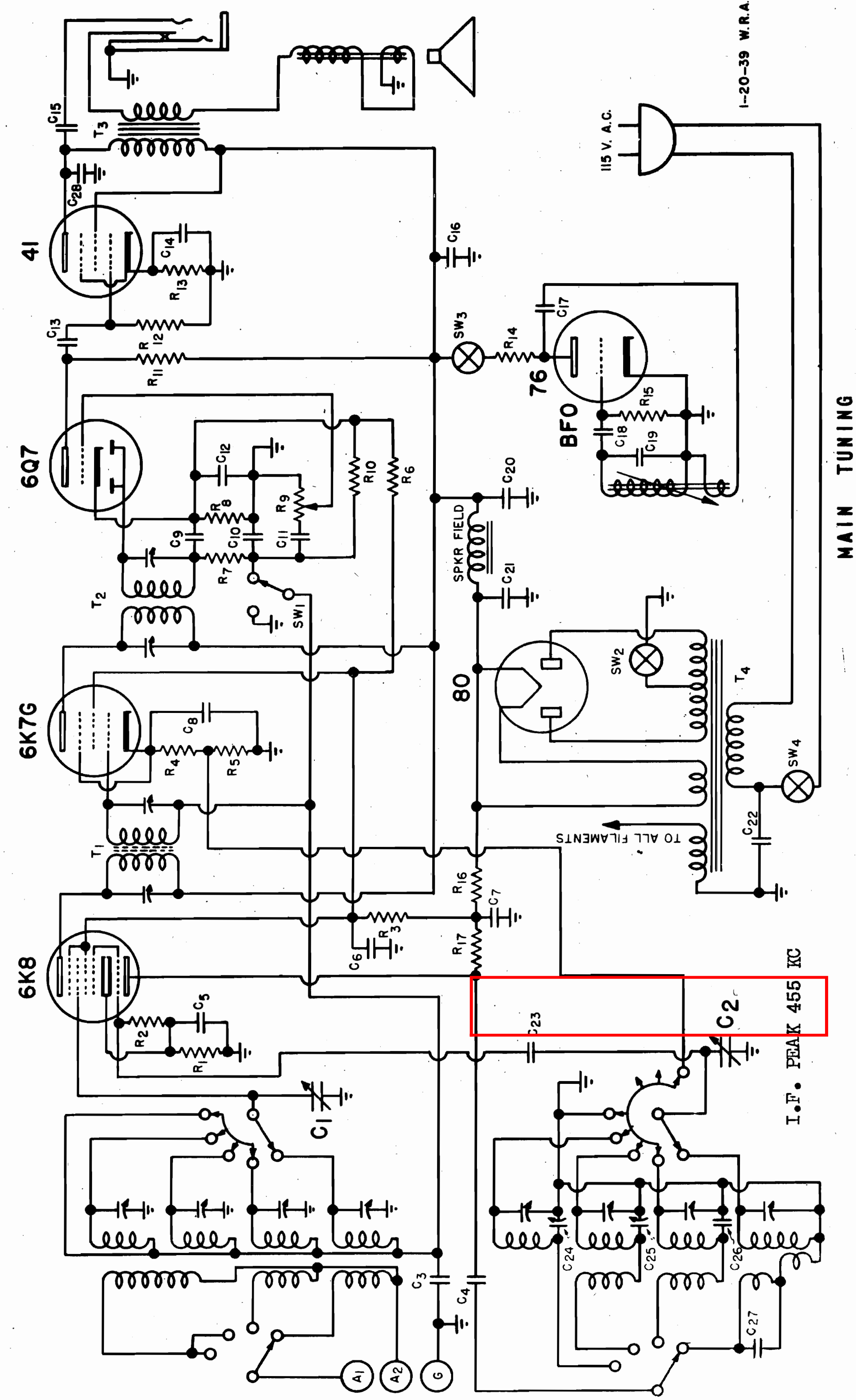


This control rotates the large calibrated dial so that the desired frequency can be easily located. The accuracy of calibration is held to close tolerances. This calibration will be correct, however, only if the "Bandspread" dial is set at "0" or minimum capacity.

SCHEMATIC DIAGRAM
SKY BUDDY-MODEL S-19R

MODEL S-19R, Sky Buddy
Socket, Trimmers, Parts

THE HALLICRAFTERS INC.

Sky Buddy Model S19-R

The model S19-R Sky Buddy is a 6 tube 4 band superheterodyne receiver covering the following frequencies:

Band 1 - 540 KC to 1700 KC
2 - 1.7 MC to 5.5 MC
3 - 5.5 MC to 17.0 MC
4 - 16.0 MC to 46.0 MC

S19R CONDENSER PARTS LIST

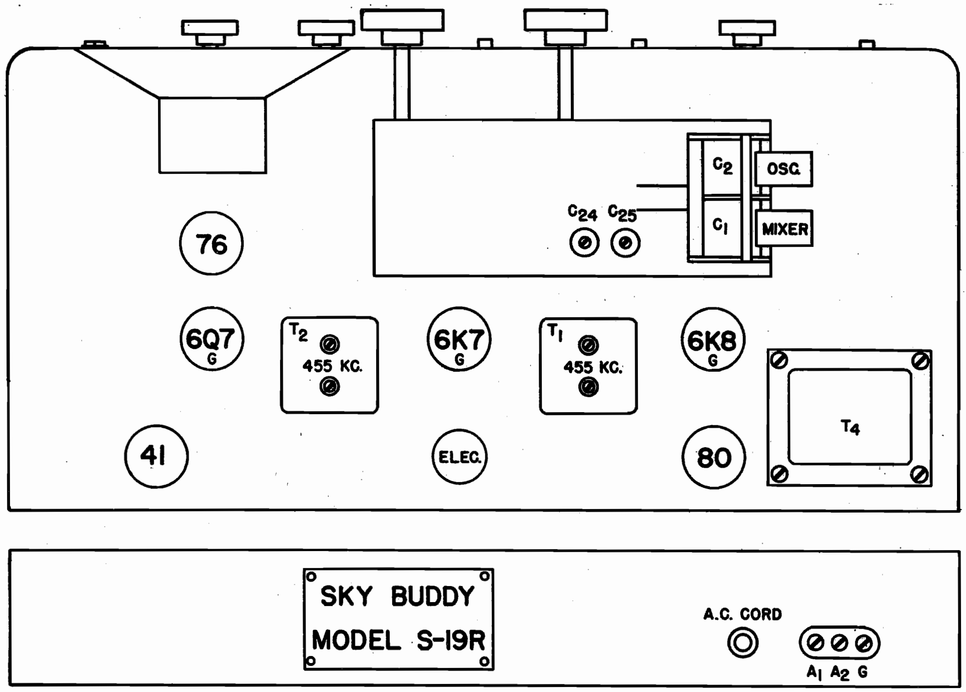
NO.	CAPACITY		TYPE	VOLTAGE
C1	.000375	mfd.		
2	"	"	Maintaining	
3	.05	"		200
4	.01	"		400
5	.05	"		200
6	.05	"		200
7	10	"		300
8	.05	"		200
9	.0001	"	Mica	
10	.0001	"	"	
11	.02	"		200
12	.1	"		200
13	.02	"		200
14	10	"		25
15	.01	"		600
16	.1	"		400
17	.01	"		400
18	.0001	"	Mica	
19	.0005	"	"	
20	10	"		300
21	10	"		350
22	.01	"		600
23	.0001	"	Ceramic	
24	.000375	"	Pad	
25	.001	"	"	
26	.0043	"		
27	.0001	"	Mica	
28	.01	"		600

S19R RESISTOR PARTS LIST

NO.	OHMS	WATTAGE
R1	300	1/3
2	50000	"
3	10000	1
4	500	1/3
5	3500	"
6	25000	1
7	50000	1/3
8	300	"
9	1000000	Variable
10	500000	1/3
11	250000	"
12	1000000	"
13	600	1/2
14	50000	1/3
15	50000	"
16	3000	1/2
17	10000	1/2

SWITCHES

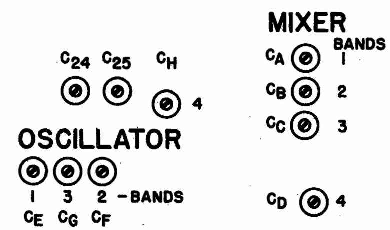
SW	
1	A.V.C. on - off
2	Send - Receive
3	BFO on - off



The tube lineup of the S19-R Sky Buddy is as follows:

6K8G 1st Detector - mixer
6K7G IF Amplifier
6Q7G 2nd Detector - 1st stage of audio
41 2nd Audio Amplifier
76 BFO
80 Rectifier

The Sky Buddy, model S19-R draws 50 watts at 117 volts, 60 cycles A.C.



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ANTENNA

For successful operation of the receiver throughout its tuning range very satisfactory results can be obtained with an inverted "L" type antenna 75 feet long overall. When this type of antenna is used the jumper should remain connected between A2 and G.

If the operator should wish to obtain the maximum in performance from the receiver on any one frequency, it is suggested that a half wave doublet antenna cut for that frequency be installed.

The formula for calculating the overall length of this antenna is:

$$\text{Length in feet} = \frac{463}{\text{Frequency in megacycles}}$$

The antenna is cut in the center and connected to a twisted pair transmission line having a characteristic impedance of 75 ohms. The other end of this line is connected to the A1 and A2 antenna posts.

This antenna will not perform well at harmonic frequencies but should be better than the inverted "L" on the frequency for which it has been designed. Performance on the #4 band, even with a suitable antenna, is subject to varying conditions of the time of the day and year.

A ground is usually not necessary for satisfactory performance of the model S19-R Sky Buddy receiver. If a ground does prove helpful it is connected to the "G" post of the antenna terminal strip.

"BANDSPREAD"

In no other similar receiver but the S19-R Sky Buddy can be found such extremely smooth and satisfactory electrical bandspread action. The stator plates are an integral part of the main condenser and the separate rotor sections are driven by a gearless mechanism through the separate bandspread knob.

The controls along the bottom edge of the receiver are:

SEND-RECEIVE SWITCH which, when in the "send" position, removes plate voltage from the tubes.

The BAND SWITCH allows selection of any one of the four ranges covered by the receiver. The newly incorporated 10 meter band will prove to be most interesting when conditions are favorable for reception on that range.

The B.F.O. "ON-OFF" SWITCH allows optional use of the Beat Frequency Oscillator and is used when the operator is copying code signals. It will be of additional help in locating weak fone signals by first locating their carrier. Once located, the B.F.O. may then be turned off to eliminate the whistle.

The PITCH-CONTROL Knob allows the operator to vary the pitch of the beat note - when the BFO switch is in the "on" position. Selection of the pitch of the beat note most pleasing to the operator will be of help in copying through interference. The A.V.C. "OFF" and "ON" Switch is for optional use of automatic volume control. Should the strength of the telephone signal be so strong as to block the receiver the A.V.C. switch should be "on". For maximum sensitivity leave the AVC switch "off" and manually adjust the gain of the receiver with the audio gain control.

The receiver is turned on and off with this control and additionally provides variation of the volume delivered by the receiver to suit the requirements of the listener.

A Headphone Jack is mounted on the panel to the right of the Pitch Control Knob. When headphones are used, inserting the phone plug in the jack automatically disconnects the speaker.

ALIGNMENT PROCEDURE FOR SKY BUDDY MODEL S19-R

I. F. ALIGNMENT

Have the controls set as follows:

Audio gain control at maximum

A.V.C. switch "on".

Range switch on Band #2.

Set main dial to minimum capacity 5.5 M.C. position

Remove 6K8 grid cap and connect signal generator to this tube.

Set signal generator for 455 KC output.

Adjust trimmers on transformers T1, T2 for maximum output.

For adjustment of the B.F.O., place the BFO switch in the "on" position. Remove the knob from the pitch control shaft. You will see a small adjustment screw in the center of this shaft. On the under-chassis side of this shaft you will see a set screw which should be loosened in order to allow adjustment of the screw in the center of the pitch control shaft. Adjust to zero beat. Tighten the set screw and replace the knob. Should the BFO still fail to operate check the .0005 condenser in the BFO circuit, or the 76 BFO tube.

R. F. ALIGNMENT

Connect the generator to the A1 terminal on the antenna terminal strip found on the rear apron of the chassis through a 400 ohm resistor. Leave the jumper connected between A2 and G. The trim and pad points for the 4 bands are indicated below:

Set the signal generator to the required frequencies for each band, adjust the main tuning dial to those frequencies (with the bandspread condenser at minimum capacity) and then adjust the indicated trimmers and padders to resonance.

Trim	Band	Pad
1400 KC Adjust C_A C_E	Band 1	600 KC Adjust C_{24}
4 MC Adjust C_B C_F	Band 2	2 MC Adjust C_{25}
14 MC Adjust C_C	Band 3	None-check at 7 MC
30 MC Adjust C_D C_H	Band 4	None-check at 18 MC

On the two high frequency bands where no padding adjustments are found, the checking frequencies should fall within 1 division of the dial calibration with no further adjustments.

During the R.F. alignment process it is advisable to "Rock" the main tuning condenser across the frequency on which you are making adjustments to the receiver. Once the exact point of maximum output is obtained further adjustment is unnecessary.

MODEL SX23
Super Skyrider
Operating Data
Antenna Notes

THE HALLICRAFTERS INC.

MODEL SX24
Skyrider Defiant
Antenna Notes

ANTENNA: SUPER SKYRIDER MODEL SX23

The SKYRIDER 23 has an antenna input circuit which will allow the use of either a doublet or Marconi (inverted "L") antenna. The approximate antenna input impedance of the SKYRIDER 23 is 400 ohms.

A very serviceable antenna will be the inverted "L", or Marconi type. This antenna should be approximately 75 feet long overall, including the lead-in to the set. Satisfactory operation of the SKYRIDER 23 is obtained throughout its tuning range with this type of antenna and because of that fact as well as its ease of construction it is highly recommended. Should a doublet antenna be used it is suggested that a transmission line of 400 ohms value of impedance be constructed so that a most efficient transfer of energy is obtained. The commercially available all wave doublet antennas are usually provided with a coupling transformer which matches the transmission line to the receiver. This transformer connects to the A_1 and A_2 terminals on the antenna strip. The half-wave length-doublet antenna cut for a particular frequency can be computed by the following formula:

$$\text{Length in feet} = \frac{463}{\text{Frequency in megacycles}}$$

This type of antenna is broken in the center with an insulator and has the transmission line connected to each resulting quarter wave section at that point. This antenna is a very good performer, in a direction broadside to its length, only on the relatively narrow group of frequencies for which it was cut. It does not function well on harmonic frequencies.

When using either type of doublet antennas the transmission line should be connected to A_1 and A_2 binding posts. The wire connecting the A_2 to ground or G can be left connected if the performance of the receiver is improved.

CONTROLS AND OPERATION

Each of the controls is identified by appropriate marking on the panel. The "Tone Control" turns the receiver "on" and "off", and also allow the operator to make adjustments for the type of reproduction most pleasing to him. Treble reproduction is to the far left position, just after the set is turned on, while the base is at the extreme right. Intermediate positions allow for any desired degree of mixing.

The "Pitch Control" is to be used when code or CW signals are being received. In its counter clockwise position the Beat Frequency Oscillator is "off". Rotating the control clockwise turns on the B.F.O. in addition to varying the pitch of the beat note to the operator's taste.

Directly below the two controls mentioned will be found the "Phone Jack". Any type of high impedance headphones may be used because no direct current flows in the headphone circuit. The strength of the signal in the headphones will be found to be at the proper level for most comfortable headphone reception. When headphones are used the speaker is automatically disconnected.

The "AF Gain" control adjusts the volume of the receiver by varying the output of the audio amplifier. Volume is controlled in both the headphone and loud speaker circuits and the setting of this control is optional with the user of the receiver for the amount of volume desired.

"AVC Off" positions, an extremely strong signal will cause the receiver to block. Because of the unusually low residual noise level of the SKYRIDER 23 it is advised to adjust all controls carefully in familiarizing yourself with their functions and effects.

The "Stand-By" or "Send-Receive" switch when in the "Send" position removes plate voltage from the tubes. This allows the receiver to be made temporarily inoperative should it be used in conjunction with a transmitter.

The hand-wheel marked "Tuning", is for adjusting the main dial to the frequency desired. The mechanism is quiet in operation and free from back lash. The conveniently located control will give the greatest tuning ease after continued hours of operation.

The "ANL" or Automatic Noise Limiter control turns the noise limiter "on" or "off". No modern communications receiver is complete without an effective noise limiter. With the A.N.L. switch in the "on" position the noise limiter will prove to be of great assistance and frequently mean the difference between hearing a signal which otherwise would be inaudible on the higher frequencies where ignition and other pulsating types of interference are most aggravating.

The "RF Gain" control adjusts the sensitivity of the receiver by varying the cathode bias on the RF and IF amplifiers. Maximum sensitivity will be obtained with this control rotated clockwise as far as it will go. When this is done a switch will be operated, the function of which will be described under S meter.

When using the receiver under varying local conditions of noise, it will be advisable to adjust both the "RF" and "AF" gain controls until the most favorable signal to noise ratio is found. Until such a time as you have become thoroughly familiar with the function of all controls it is suggested that the R. F. gain be advanced until the white dot on the knob is pointing approximately at the "S" on SKYRIDER. Later experiment to find the best position for a given signal bearing in mind that with the selectivity switch in any of the

CRYSTAL OPERATION

There are three controls which must be properly adjusted for most satisfactory crystal filter operation. Their operation shall be treated in the order in which they are called upon to perform their functions in the receiver.

Selectivity Switch -

There are three positions of selectivity with the Automatic Volume Control circuit operating. For high fidelity broadcast reception the selectivity switch should be rotated to the "IF Broad" position.

With the switch placed in the "IF Sharp" position the selectivity is greatly increased at no apparent sacrifice in tone reproduction.

The "Phone Crystal" position affords maximum selectivity with automatic volume control. The receiver will have to be accurately resonated on each desired signal because this step of selectivity greatly attenuates the side-bands of a modulated carrier. You will notice the apparent slot into which the signal falls, only in the exact center of which will intelligibility of a good order be maintained. The "Phone Crystal" position is recommended under conditions of extreme interference where adjacent channel stations are causing objectionable heterodynes.

Rotating the switch in a counter-clockwise position still farther allows the receiver to be used in the three selectivity positions with the A.V.C. circuit disconnected. When the selectivity switch is so adjusted it is then necessary to manually adjust the "RF Gain" to keep the signal under control.

In the "CW Crystal" position the maximum selectivity of the set is obtained. The drop in background noise is immediately apparent. This position is recommended only for the reception of CW or code signals because the selectivity is so great phone signals are practically unreadable. To realize the maximum in performance from the SKYRIDER 23 crystal circuit, the following two controls should be adjusted as described. First tune in an extremely strong CW signal.

The "Pitch Control" should be turned until a beat note is audible. Then adjust the main tuning control and go across the signal. Two distinct signals will be heard either side of zero beat, or the null position in the center tuning through which no signal is audible. See whether the low or the high frequency side of the signal (that which appears either side of zero beat) is the weaker. Leave the receiver set on whichever of the two signals is the weaker. Now very carefully adjust the "Phasing Control" until you have eliminated that signal as much as possible. As an additional step to see whether you have chosen the proper low or high frequency image to reject, rotate the "Pitch Control" through zero beat to the other side so that a beat note of approximately the same pitch as before is obtained. Now retune the receiver and it will be apparent that the signal on the other side of zero beat (as referred to the markings on the dial at which this signal was first tuned in) is reduced in volume. Again carefully adjust the "Phasing Control" and compare the strength of the audio image when this side has been phased out, or rejected. When you have demonstrated that the phasing or rejection is better on either the low or high frequency audio image the phasing control is left in that position and you then have the SKYRIDER 23 adjusted for the extremely selective crystal action for which it is noted.

The "Pitch and Phasing Controls" should be called upon frequently to demonstrate how, through proper adjustment, extreme conditions of interference can be coped with. Frequently, a slight adjustment of the pitch control will place a desired signal in the clear when the two signals differ in frequency by only a few hundred cycles. Minute adjustment of the phasing control will frequently obliterate an interferring signal by dropping it in the crystal slot.

THE HALLICRAFTERS INC.

MODEL SX23
Super Skyrider
Schematic,Notes

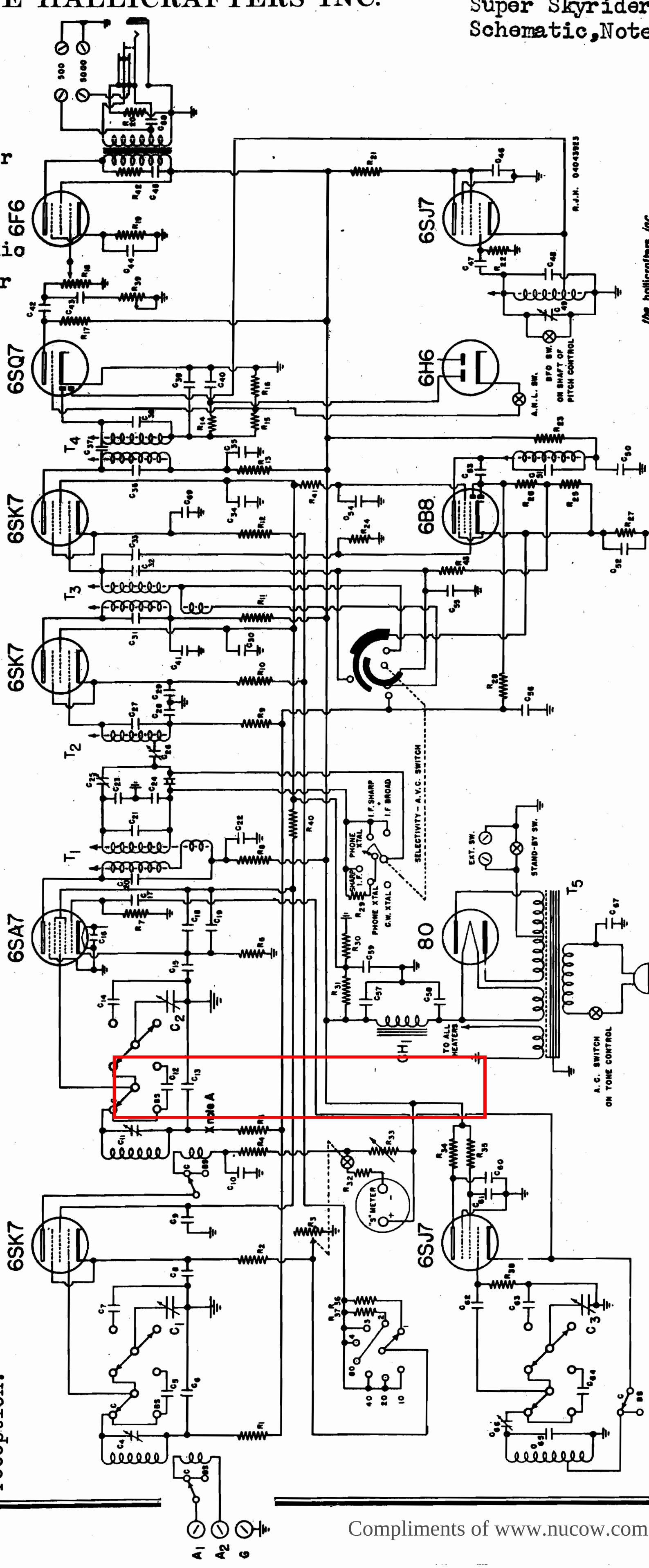
TUBE LINE-UP

6SK7 R.F. Amplifier
6SA7 1st Detector-Mixer
6SJ7 High Frequency Oscillator
6SK7 1st I.F. Amplifier
6SK7 2nd I.F. Amplifier
6SQ7 2nd Detector, 1st Stage of Audio
6F6 2nd Stage of Audio
6SJ7 Beat Frequency Oscillator
6H6 Automatic Noise Limiter
6B8 Amplified A.V.C.
80 Rectifier

S METER

Close to the license tag on the rear of the receiver will be found a knurled shaft which is to be used in adjusting the "S" meter. Prior to adjusting this control the R. F. gain control must be in the maximum gain position, or rotated clockwise until a switch which is mounted on this control, is heard to operate. Additionally, the Selectivity Switch must be in any one of the three "A.V.C. On" selectivity positions. When the above two conditions are filled the meter is in the circuit and should be adjusted as follows: Disconnect the antenna from the receiver, being sure no strong local signal is being picked up by the receiver with the antenna removed. Now adjust the S meter shaft until the meter rests at zero. Reconnecting the antenna will then show the meter indicating relative carrier strength in both S units as well as DB's or decibels. Should most accurate S meter indication be desired, it is recommended that the meter be adjusted with the Selectivity Switch in the step of selectivity most frequently used.

The S meter does not function with the Selectivity Switch in the "A.V.C. Off" position because the meter is connected in the A.V.C. circuit which preferably is used for telephone reception.

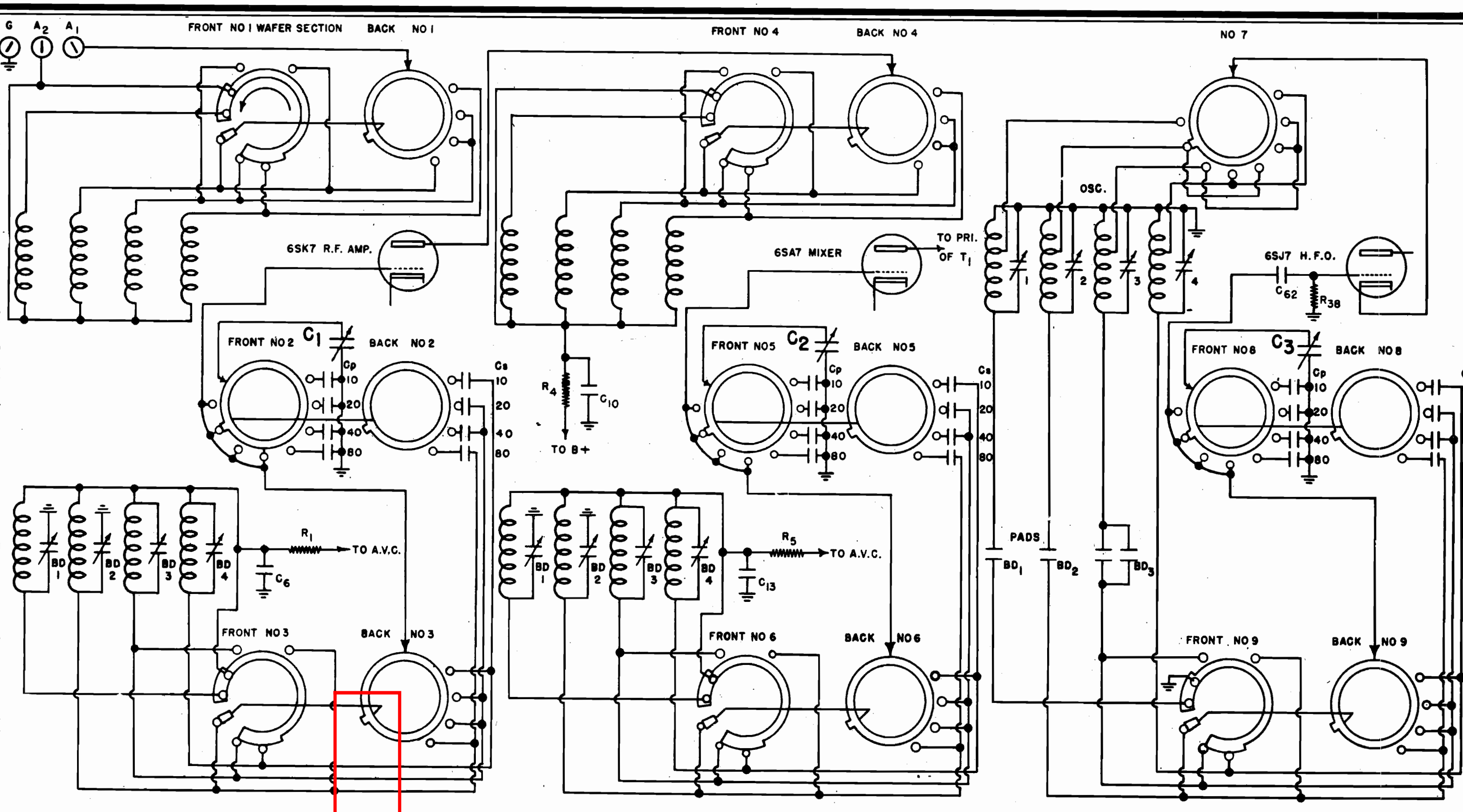


SCHEMATIC DIAGRAM—SKYRIDER 23

The SKYRIDER 23 draws 110 watts at 115 volts 60 cycles alternating current.

MODEL SX23, Super Skyrider
R-F Switching Schematic
Notes

THE HALLICRAFTERS INC.



NO. I WAFER IS FARTHEST FROM THE FRONT PANEL AND SELECTS ANTENNA PRIMARIES

R.J.H. 04113923

Cp (CONDENSERS PARALLEL)

10	59.7	mmfd	CERAMICON
20	104.4	"	"
40	571.	"	"
80	94.3	"	"

Cs (CONDENSERS SERIES)

10	51.4	mmfd	CERAMICON
20	38.	"	"
40	313.6	"	"
80	99.5	"	"

DETAILED SCHEMATIC R.F. SWITCHING SECTION

On the rear apron of the chassis you will find output terminal strips marked 500 and 5000 ohms. The Hallicrafters permanent magnet dynamic matching S23 speaker should be connected to the 5000 ohm terminals. The 500 ohm contacts can be connected to a separate speaker or a load of that impedance value. The terminals marked "EXT SW" should be connected to an external switch, a portion of which is used to turn "on" and "off" your transmitter. The "EXT SW" terminals are paralleled with the front panel "Send Receive" switch. In order to make the external switch operate the "Send Receive" switch must be left in the "send" position. In viewing the receiver from the back the right hand "EXT SW" contact is grounded. When connecting to associated equipment this point should be borne in mind so that no potential difference will arise between it and the receiver.

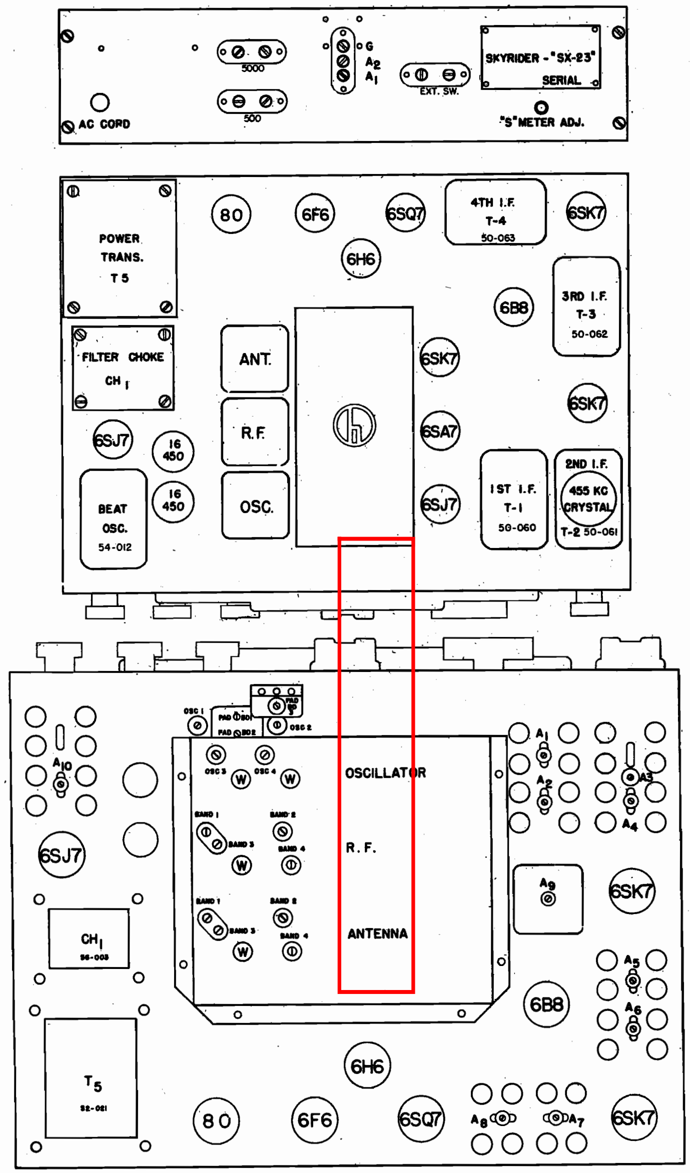
FREQUENCY RANGE

Band 1	-	540 KC	-	1,700 KC
2	-	1.7 MC	-	5.2 MC
3	-	5.2 MC	-	16.5 MC
4	-	11 MC	-	34.0 MC

Unless otherwise specified the SKYRIDER 23 operates on 110-125 volts 60 cycle alternating current. A universal transformer model is available which will operate on 25-60 cycle current. This transformer is provided with taps to cover in 5 steps a voltage range from 110 to 250 volts. Actual operation is identical with either the 25 or 60 cycle transformer.

MODEL SX23, Super Skyridor
Socket, Trimmers, Parts

THE HALLICRAFTERS INC.



LIST OF CONDENSERS SKYRIDER 23

NO.	VALUE	VOLTAGE	TYPE
1, 2, 3	437 mmfd.		Main tuning gang
4	1.2-12.0 "		R.F. Circuit trimmer
5	Series padding for Band Spread See detailed Schematic.		
6	.05 mfd.	200	Paper
7	Parallel padding for Band Spread See detailed Schematic.		
8	.05 mfd.	200	Paper
9	.01 "	400	"
10	.05 "	"	"
11	1.2-12 mmfd.		R.F. Circuit trimmer
12	Series padding for Band Spread		
13	.05 mfd.	200	Paper
14	Parallel Padding for Band Spread		
15	.05 mfd.	200	Paper
16	.002 "		Mica
17	50 mmfd.		Ceramic
18	.01 mfd.	400	Paper
19	.002 "		Mica
20	250 mmfd.		Ceramic
21	200 "		"
22	.05 mfd.	400	Paper
23	100 mmfd.		Ceramic
24	100 "		"
25	2-25 "	Variable	
26	5-50 "	"	Mica
27	250 "		Ceramic
28	.05 mfd.	200	Paper
29	.01 "	"	"
30	.05 "	"	"
31	250 mmfd.		Ceramic
32	250 "		"
33	250 "		Mica
34	.05 mfd.	200	Paper

NO.	VALUE	VOLTAGE	TYPE
35	.05 mfd.	400	Paper
36	250 mmfd.		Ceramic
37	3 "		Gimmick
38	100 "		Ceramic
39	50 "		Ceramic
40	.05 mfd.	200	Paper
41	.05 "	400	"
42	.01 "	"	"
43	.01 "	"	"
44	20 "	25	Electrolytic
45	.002 "		Mica
46	.01 "	400	Paper
47	250 mmfd.		Mica
48	500 "		Ceramic
49	2-25 "		Variable
50	.05 mfd.	400	Paper
51	150 mmfd.		Ceramic
52	.1 mfd.	200	Paper
53	250 mmfd.		Mica
54	.05 mfd.	"	Paper
55	.05 "	"	"
56	.05 "	"	"
57	16 "	475	Electrolytic
58	16 "	"	"
59	.25 "	200	Paper
60	.002 "		Mica
61	.002 "		"
62	50 mmfd.		Ceramic
63	Parallel padding for Band Spread		
64	Series " " "		
65	1.2-12 mmfd.		O & C trimmer
66	.002 mfd. in 3rd Band OSC Series tracking pad		
67	.01 "	400	Paper
68	.02 "	200	"
69	.1 "	"	"

LIST OF RESISTORS SKYRIDER 23

NO.	OHMS	WATTAGE	TOLERANCE
R1	100,000	1/3	20%
2	1,000	"	10%
3	10,000	R.F. Gain Control	
4	5,000	1/3	20%
5	100,000	"	"
6	600	"	10%
7	20,000	"	20%
8	5,000	"	"
9	100,000	"	"
10	1,000	"	10%
11	5,000	"	20%
12	1,000	"	10%
13	5,000	"	20%
14	1,000,000	"	"
15	200,000	"	10%
16	400,000	"	"
17	500,000	"	20%
18	500,000	A.F. Gain Control	
19	400	1	10%
20	5,000	2	20%
21	50,000	1	"
22	50,000	1/3	"

NO.	OHMS	WATTAGE	TOLERANCE
R23	5,000	1/3	20%
24	500,000	"	"
25	250,000	"	10%
26	200,000	"	"
27	500	"	"
28	1,000,000	"	20%
29	25,000	"	"
30	5,000	2	
31	6,500	7	
32	500	1/3	10%
33	500	"S" Meter Adjustment	
34	15,000	1	20%
35	25,000	"	"
36	3,000	1/3	10%
37	500	"	"
38	50,000	"	20%
39	500,000	Tone Control	
40	1,000	1/3	10%
41	1,000	"	"
42	10,000	1/2	20%
43	100,000	1/3	"

MODEL SX23, Super Skyrider
Alignment, Notes

THE HALLICRAFTERS INC.

BAND SPREAD

Realizing that reset accuracy is a very desirable feature the SKYRIDER 23 was designed so that only the amateur bands from 10 to 80 meters could be bandspread. The switch mechanism and associated temperature compensated condensers are unique and eliminate the necessity of accurately resetting the main tuning dial whenever it is desired to band spread the amateur frequencies.

The four "Band Spread" positions found on the SKYRIDER 23 cover the frequencies indicated below:

Band 10 - 28 MC to 30 MC	40 - 7 MC to 7.30 MC
20 - 14 MC to 14.4 MC	80 - 3.50 MC to 4.00 MC

When operating the receiver in the band spread position it will be noticed that more than just the frequencies of each amateur band are covered. This has been found advisable for the reception of signals being sent on frequencies outside the amateur bands, as well as the reception of commercial stations for marker purposes, inasmuch as their exact frequency is usually known.

Each amateur band is spread over a sufficient number of divisions on the band spread scale to make tuning on that particular band effortless and accurate.

In addition to the frequency range in the circuit being identified by the Hallicrafters band switch knob under the main tuning dial, that particular band is also shown by referring to the illuminated indicator directly to the right of the main dial.

ALIGNMENT PROCEDURE

The alignment of the S23 is straightforward and requires no equipment other than the usual signal generator, or other signal source, and an output meter.

I. F. ALIGNMENT

No. 1 - Remove the "Bottom Pan" from the cabinet and then the square "RF Coil Shield Bottom" so that the RF oscillator and mixer tube bases, switch and coils are accessible.

No. 2 - Unsolder the control grid wire from 6SA7 tube base at the point at which it connects to switch section No. 6. Signal is applied to this grid for alignment of I. F. AVC and BFO circuits. An output meter is connected across 5000 ohm speaker terminals.

No. 3 - Connect the signal generator to the control grid of the 6SA7 mixer through a .01 mfd condenser. Now connect a 100,000, 1/3 watt, resistor from the control grid of the 6SA7 to AVC Return on the mixer RF coil form. (See note "A" Schematic).

No. 4 - Place the selectivity switch in "AVC Off IF Sharp" position; the wave band switch in #5.2-16.0 megacycle position or #3 band, volume and RF controls in maximum gain position.

No. 5 - Apply 455 KC signal of sufficient strength to give an approximate output of 500 milliwatt and adjust trimmers A1, A2, A4, A5, A6, A7 and A8 to maximum deflection of output meter.

B.F.O. ADJUSTMENT

Turn the BFO control so that the dot on the knob is pointing to the top of the cabinet and then adjust A10 until the beat note is zero frequency.

CRYSTAL ALIGNMENT

No. 6 - For alignment of crystal, place selectivity switch in CW crystal position, remove modulation from signal source, adjust BFO pitch control until a beat note of approximately 1000 cycles is attained. Detune the signal source from 455 KC and then adjust the crystal phasing control to a point where the hiss noise from the speaker is reduced to a minimum. Now vary the frequency of the signal source from about 453 to 457 KC. At some frequency between these points a sharp increase in speaker output will be noted. This is the resonant frequency of the crystal. The signal generator should be adjusted to this point of crystal resonance for maximum meter deflection. Touch up all trimmers, No. A2, A4, A5, A6, A7 and A8 for precise alignment to the crystal frequency. Assuming the output beat note is still set at approximately 1000 cycles, and leaving all controls on the receiver as previously adjusted, change the frequency of the signal generator until the output beat note is reduced from 1000 cycles down thru zero beat and up to the other side to a frequency of approximately 400 cycles. Now balance A1, and the crystal phasing control until the rejection slot is at minimum. It will be necessary to increase the output of the signal generator for this adjustment in order to obtain a satisfactory output level.

Note: A3 is a coupling condenser which should never need adjustment as it will not effect the alignment of the set but only vary the gain of the I. F. unit.

No. 7 - To adjust the AVC, turn the BFO pitch control to "off" position, the selectivity switch to "AVC On I. F. Sharp" position. Adjust the frequency of the modulated signal source to the resonant frequency of the I. F. unit with the signal strength sufficient to set up about 500 milliwatts in output meter. Now adjust A9 until the output is reduced to a minimum, which is the point where the AVC is resonant and operating properly.

Resolder the grid wire of the 6SA7 to the switch section contact and replace the R.F. coil shield bottom.

R.F. ALIGNMENT

The holes in the "RF Coil Box Cover" marked "W" as shown in the instruction book are to permit the insertion of a "Wand" into the coil forms for checking of alignment. The "Wand" is a rod of insulating material having a brass slug in one end and a powdered iron slug in the other. When the iron slug is placed in field of coil the inductance is increased, and when the brass slug is used, the inductance is decreased.

NOTE: When checking points of alignment the meter deflection should decrease when either end of "Wand" is used, if the set is properly aligned. If the meter deflection increases when the "Iron" end of "Wand" is in the field then the trimmer capacity should be increased. If, however, the meter reading increases when the "Brass" end of "Wand" is used then the trimmer capacity will have to be reduced.

When the condenser gang is fully closed be certain that the indicating line on the dial window is in line with the zero mark on the band spread calibration and the small line below the 550 KC calibration point. Place selectivity control in the "I. F. Sharp-AVC off" position. R. F. and Audio gain controls adjusted for maximum gain and signal of sufficient strength fed to the receiver to give approximately 500 milliwatts output.

Band No. 1 - "545 KC to 1700 KC"

Connect a wire between A2 and ground terminal or "G" on the antenna strip. Connect the ground side of the signal generator to the ground terminal of antenna strip and connect the high side of signal generator to A1 thru a 200 mmfd condenser.
Set the receiver dial and signal generator dial to 1500 KC - align trimmer indicated as Osc. 1 to resonance with this signal frequency and then adjust RF trimmer and antenna trimmer as indicated Band No. 1 to obtain maximum deflection on output meter. Next set the generator signal and receiver to 600 KC and while rocking the main tuning knob adjust low frequency pad (indicated as Pad BD1) until the output is maximum. Recheck alignment at 1500 KC and then the 600 KC position again for precise alignment.

Band No. 2 - "1700 KC to 5.2 Megacycles"

Note: Replace the 200 mmfd condenser with a 400 ohm resistor for alignment of Bands Nos. 2, 4 and 5.

Following same procedure as Band No. 1, align first at 4000 KC, using trimmers indicated as "Osc. 2" and R. F. trimmers "Band 2". The low frequency end is checked at 1800 KC by rocking condenser gang while adjusting pad BD2 until maximum output is obtained.

Band No. 3 - "5.2 Megacycles to 16 Megacycles"

The high frequency end of this band is aligned at 14 megacycles, using oscillator Trimmer "Osc-3" and RF trimmers indicating Band 3. The low frequency end is padded at 7. megacycles using series pad indicated "Pad BD3".

Band No. 4 - "10 Megacycles to 34. Megacycles"

This band is aligned at 30 megacycles first by setting dial at 30 megacycles and adjust Osc. 4 until signal is received, then by "rocking" condenser gang slightly and adjusting ("Band 4") RF trimmer until maximum output is obtained. Antenna trimmer, Band 4, is not aligned until the oscillator and R. F. trimmers are first adjusted for maximum output. It is not necessary to adjust the oscillator for low frequency tracking as this is adjusted at factory and should be permanent.

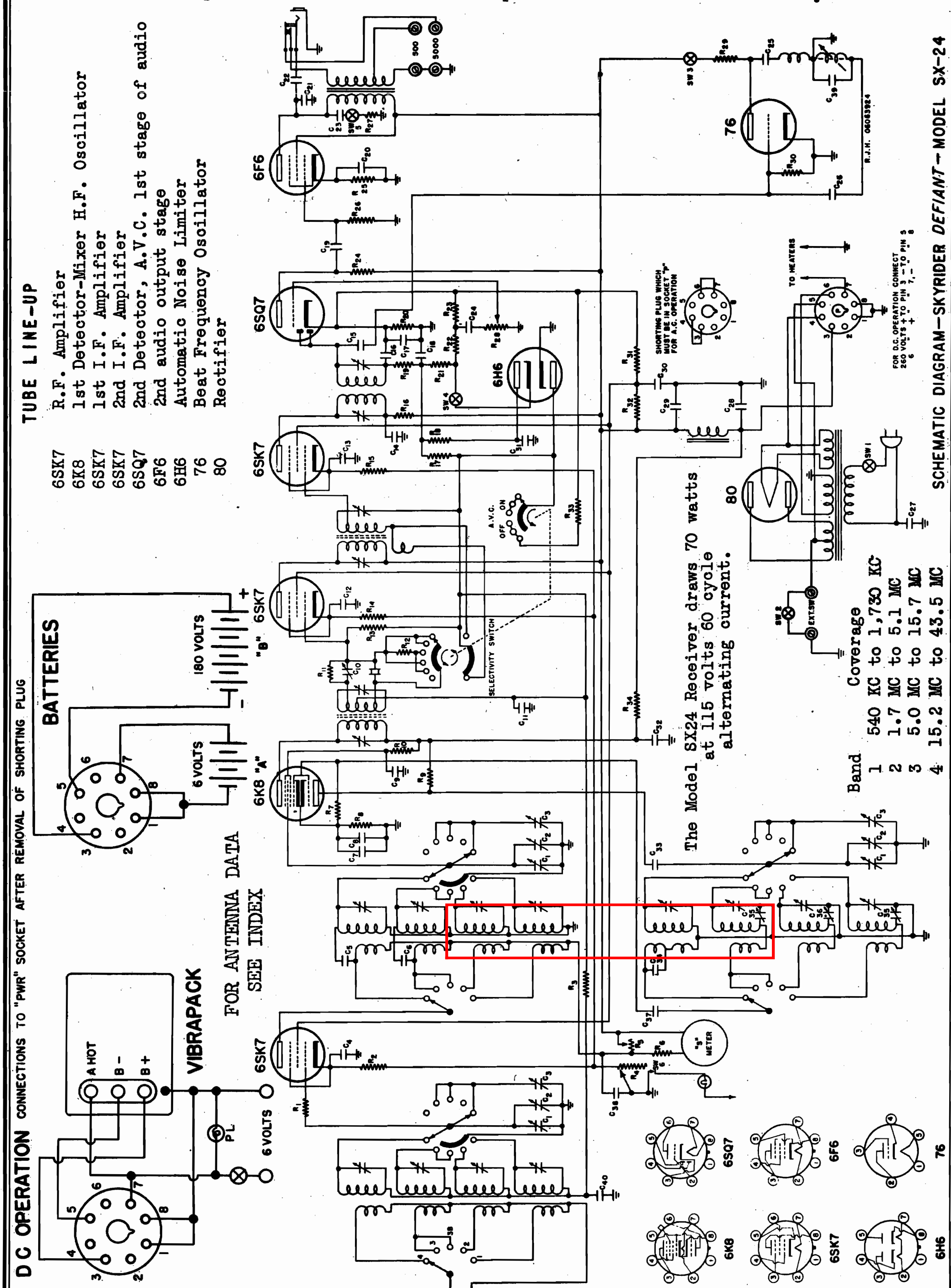
The band spread positions do not require alignment as the alignment for band coverage position also takes care of band spread alignment.

Schematic

THE HALLICRAFTERS INC.

MODEL SX24
Skyrider Defiant

Unless otherwise specified the SX24 Receiver operates on 100-125 volt 50-60 cycle current.



MODEL SX24, Skyrider Defiant
Socket, Trimmers
Parts List
Alignment

THE HALLICRAFTERS INC.

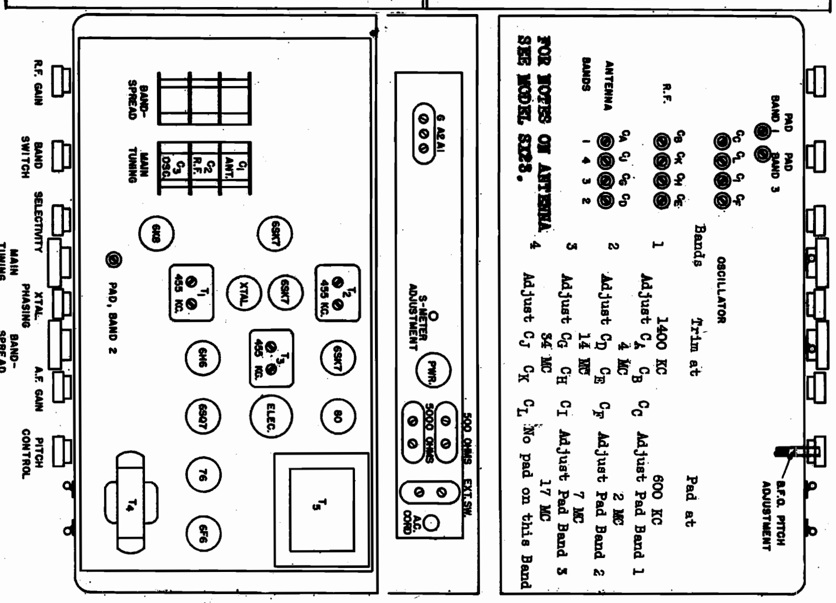
RESISTORS

NO.	OHMS	WATTAGE
1	30	1/3
2	200	"
3	100,000	"
4	10,000	R.F. Gain Control
5	500	Variable
6	400	1/3
7	50,000	"
8	200	"
9	15,000	1
10	30,000	1
11	2,000,000	1/3
12	50,000	"
13	500,000	"
14	300	"
15	300	"
16	1,000	"
17	1,000,000	"
18	1,000,000	1/3
19	50,000	"
20	100	"
21	250,000	"
22	100,000	"
23	250,000	"
24	250,000	"
25	500	1
26	500,000	1/3
27	5,000	1
28	500,000	A.F. Gain Control
29	20,000	1
30	50,000	1/3
31	20,000	1
32	15,000	1
33	150	1/3
34	5,000	1

CONDENSERS

NO.	CAPACITY	VOLTAGE	TYPE
1	440 mmfd	Per Section	
2	4 "	" "	
3	26 "	" "	
4	.05 mfd	200	Paper
5	25. mmfd		Ceramicon
6	10. "		"
7	.002 mfd		Mica
8	.05 "	200	Paper
9	.05 "	400	"
10	25. mmfd	Crystal Phasing	Air
11	.02 "	200	Paper
12	.05 "	"	"
13	.05 "	"	"
14	.02 "	400	"
15	3. "	Twisted Pair	
16	100. "		Mica
17	10. mfd	25	Electrolytic
18	50. mmfd		Mica
19	.05 mfd	400	Paper
20	10. "	25	Electrolytic
21	.005 mfd	600	Paper
22	.01 "	400	"
23	.02 "	600	"
24	.02 "	200	"
25	.01 "	400	"
26	100. mmfd		Mica
27	.01 mfd	600	Paper
28	30. "	350	Electrolytic
29	10. "	"	Electrolytic
30	.1 "	400	Paper
31	.05 "	200	"
32	10. "	350	"
33	100 mmfd		Mica
34	105 "		Ceramicon
35	2200 / 450 "	Dual Pad	
36	1400 "	"	
37	.002 mfd		Mica
38	.05 "	400	Paper
39	.0005 "		Mica
40	.05 "	200	Paper

SW1 – AC Switch On AF Gain
SW2 – Send RC Switch
SW3 – B.F.O. on & OFF
SW4 – A.N.L. on & OFF
SW5 – Hi-Low Tone Switch
SW6 – S-Meter



Note: The accuracy of the main dial calibration will hold only if the BAND SPREAD condenser is set at minimum capacity, or the position indicated by "0" on the Band Spread dial which has been approached by turning the Band Spread Knob in a clockwise direction, or to the right, as far as it will go.

ALIGNMENT PROCEDURE

455 KC, Intermediate-Frequency Alignment.
Have the controls set as follows:
AF and RF gain controls for maximum volume.
B.F.O. switch in the "ON" position.
Set band switch to #2 band.
Set main dial to 2 megacycles, band spread to zero.
Selectivity switch in "CW Sharp" position.
Remove 6K8 grid cap and connect the hot side of your 455 KC generator to this tube. Connect the ground terminal of the signal generator to the chassis of the receiver. Now feed a 455 KC signal into the receiver and set the pitch control to give a beat note of approximately 1000 cycles. Adjust all I.F. transformer trimmers for maximum gain with the exception of the secondary trimmer on transformer T1. In adjusting this trimmer it will be noted that the output reaches a maximum goes through a dip and then back to maximum again. Wobbulate the IF frequency and align to the dip between the two maximum points. A distinct change in the crystal note sounding like an apparent broadening of the crystal action will be noted when the correct adjustment has been reached. Now repeat carefully the other trimmers for maximum gain.

R. F. ALIGNMENT

Re-connect the grid cap to the 6K8 tube. Connect the hot side of the generator to the A_1 antenna terminal on the rear of the chassis. Be sure a jumper is connected to A_2 and G. Leave signal generator ground connected to the chassis of the receiver.

The location of the following trimmers and padders can be determined by referring to the top and bottom chassis views. All pad adjustments are for the low frequency end of each band while the trimmers are for the high frequency ends.

In order to get at the RF trimmers the guarantee card can be removed by placing a knife under the small snap fasteners holding it in place. So that most satisfactory adjustment of the trimmers and padders can be made, it is advisable to "Rock" the condenser gang across the signal being delivered by the generator until that particular circuit has been accurately peaked.

"S" METER

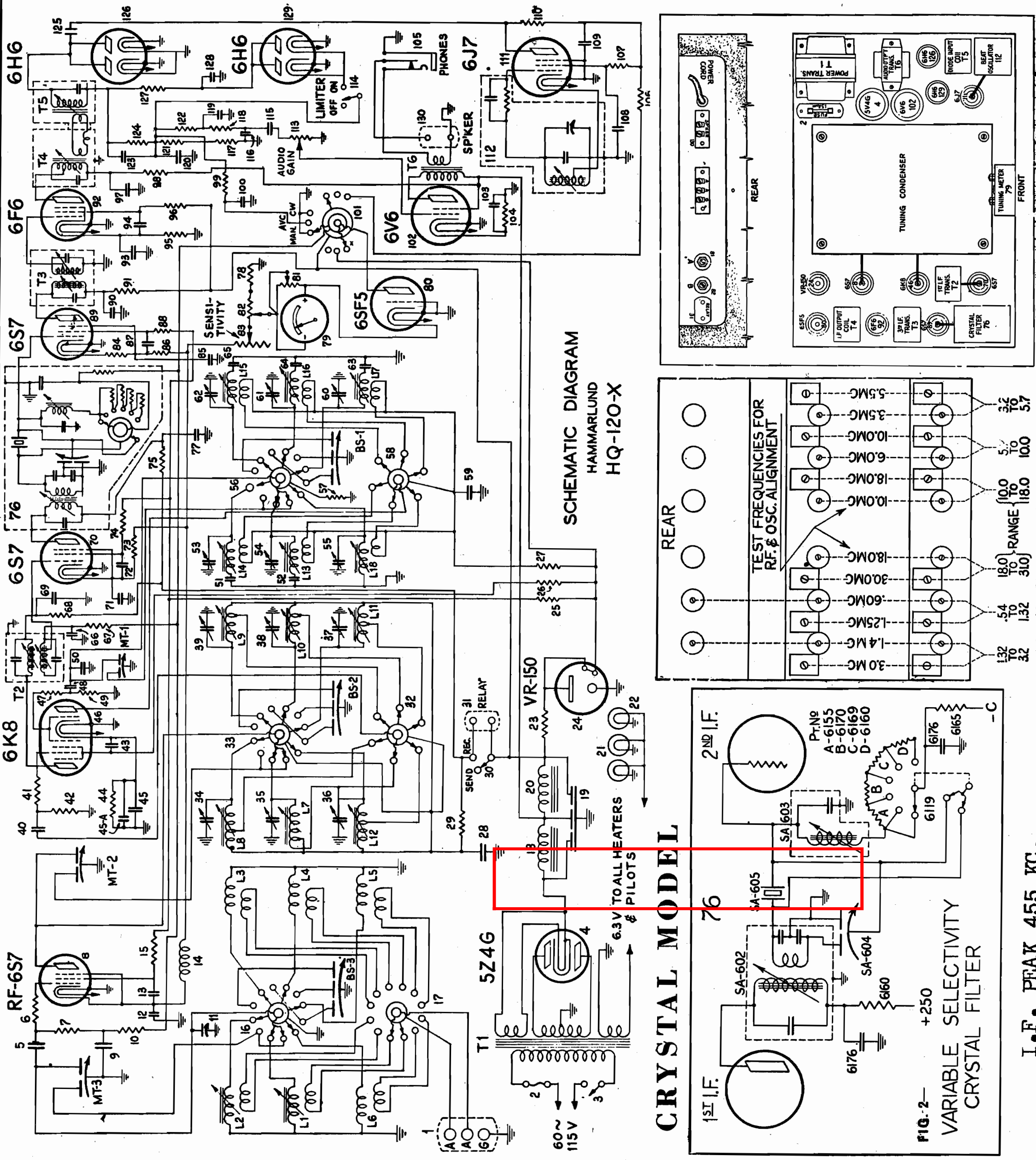
When the R.F. gain control is advanced until a switch is heard to operate, a light will appear behind the translucent scale of the meter itself. Only when this light is on will the meter indicate in "S" units. With the R.F. gain control backed off from maximum the meter is still in the circuit but will not indicate carrier level accurately. When so adjusted the meter can be used as a resonance indicator. On the rear apron of the chassis is the "S" meter adjustment screw. To set the "S" meter, disconnect the antenna and have the R.F. Gain Control on full and the selectivity switch in the "I.F. sharp A.V.C. on" position. Now, adjust this knurled knob until the meter reads zero. Reconnecting the antenna and tuning in a station will show its relative carrier intensity.

The 500 and 5000 ohm terminals are for connections to a loud speaker or other load of those impedance values. The matching SX23 speaker should be connected to the 5000 ohm strip. When headphones are plugged into the phone jack the 5000 ohm speaker connection is automatically disconnected.

HAMMARLUND MFG. CO.

MODEL HQ-120X, Crystal
Schematic, Socket
Trimmers, Notes

12-tube superheterodyne covers a continuous range of from 31 to .54 mc. (9.7 to 555 meters) in 6 steps, thus taking in all important communication, amateur and broadcast bands.



ANTENNA REQUIREMENTS

The input of the "HQ-120" is arranged so that various types of antennas may be employed. The average input impedance is 400 to 600 ohms. The most common type of antenna used generally by the amateur and short wave listener is the Marconi, consisting of a single wire and ground connection.

HQ-120-X

MODEL HQ-120X, Crystal Circuit Data, Voltage Alignment

HAMMARLUND MFG. CO.

CIRCUIT ARRANGEMENT

PRE-SELECTION: The pre-selector stage in this receiver is extremely high in gain due to its tuned grid and tuned plate circuits. An additional feature has been included in this stage in order to compensate for various types of antennas which may be used with the receiver. The adjustable compensating control which appears on the panel, directly underneath the meter, provides an external adjustment for perfectly aligning the circuits with any given antenna system. This is highly desirable for it is almost impossible to maintain fixed circuit alignment when antennas are frequently changed. Also, because the selectivity is thus improved and the gain considerably increased, this feature affords maximum signal-to-noise ratio and maximum image rejection. See Fig. 1.

BAND SPREAD: Much of the detail as to the band-spread arrangement has been covered in the introduction of this book. The band-spread control has five scales. The first is an arbitrary scale reading 0 to 200 for calibration in any of the bands covered by the receiver. This dial also includes four other scales calibrated in megacycles for the 80, 40, 20, and 10 meter amateur bands. It is rather unusual to find a band-spread dial calibrated directly in megacycles. However, due to the excellent stability of the receiver in general, and the outstanding design of the tuning condenser assembly, this has proved absolutely practical and, to say the least, most convenient.

CONVERTER STAGE: The converter stage uses the newly developed 6K8 tube which, incidentally, becomes more efficient as the frequency increases. The converter stage in this receiver has been treated in such a manner that the overall RF gain is relatively constant not only from one end of a particular amateur band to the other, but also from one band to the other. This is done because it can be readily seen that if the RF gain is not relatively uniform throughout each band and from one band to the other, the "S" meter reading will not be a true indication of signal strength. In some bands it would require a stronger signal to indicate "S-8" on the meter than in others. This has for a long time been a common ailment in receivers and a barrier to true meter readings. However, in the case of the "HQ-120-X" circuit adjustment has been made to permit accurate meter readings.

In order to increase stability, the oscillator is operated from a controlled voltage circuit employing the VR 150 voltage regulator tube. It is a well-known fact that fluctuations in power line voltage in many cases induce a frequency change in the high frequency oscillator stage. The use of the voltage regulator tube in a very effective circuit eliminates all danger from this source because the voltage applied to the oscillator portion of the converter remains constant regardless of power line changes. Also, the calibration of the receiver is maintained more accurately.

CRYSTAL FILTER: The crystal filter included in the "HQ-120-X" is an outstanding HAMMARLUND development. Unlike most other crystal filters, this one has five ranges of selectivity. These five degrees of selectivity are controllable directly from the panel by operation of a rotary switch. And, these degrees of selectivity remain permanent regardless of the rejector control setting. These five steps include 1, 2, and 3 for phone reception, varying from broad to fairly sharp, in convenient steps. The fourth and fifth are for CW or code reception. Four, being moderately selective and "five" the maximum selectivity of the crystal filter. The crystal can also be cut out for general use, by the sixth contact on the switch; see diagram in Fig. 2. Various curves showing the selectivity for these settings of the selectivity control are indicated in Fig. 3. There is absolutely no interlocking of the controls in this crystal filter. The rejector or phasing control can be set to eliminate a heterodyne of some particular frequency within its range, and will not require re-adjustment when the selectivity control of the filter is changed. Also, the output, or overall gain, of the receiver is not noticeably affected by changes in selectivity of the filter. This feature is extremely desirable, especially from the standpoint of accurately determining the strength of incoming signals. It is not necessary to make allowances for usual attenuation in the crystal filter, should it be necessary to change the selectivity in order to eliminate interference.

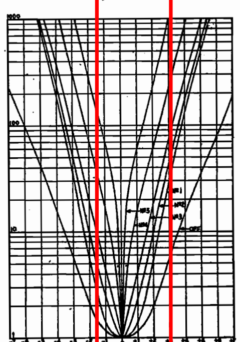


FIG. 3—Overall selectivity curves for 455 kc. I. F. amplifier and crystal filter. Labeling of the curves corresponds to the markings on the panel.

I. F. AMPLIFIER: The intermediate frequency amplifier consists of three stages employing iron core permeability-tuned transformers. The intermediate frequency is 455 kc. which has now become the R.M.A. standard. Overall selectivity curves for the I. F. amplifier with crystal filter are shown in Fig. 3. The A.V.C. arrangement in this amplifier provides remarkably smooth operation. There is a switch for cutting out the A.V.C. and providing manual control of volume or sensitivity.

NOISE LIMITER: The automatic noise limiter faithfully follows the carrier signal strength. It is intended to eliminate automobile-ignition interference and other similar disturbances. It works with the A.V.C. either on or off and is so arranged that its operation does not affect the intelligibility of the received signal by altering the audio form. Its effect on modulation is negligible. There is also a switch on the panel for cutting out the noise limiter when it is not required, although it can be left in the circuit permanently without ill effects.

"S" METER: The "S" meter is calibrated to read in "S" units from 1 to 9. "S-1" corresponds to approximately .39 microvolts input at the antenna terminals. "S-9" corresponds to 100 microvolts. The meter is also calibrated up to 40 DB. above "S-9." "S-8" equals 50 M.V., "S-7"—25, "S-6"—12.5, etc. Special compensating controls for the meter are provided so that, regardless of particular local conditions, corrections can always be made for irregularities. These controls and the adjustment of them are thoroughly discussed under "Operation."

BEAT FREQUENCY OSCILLATOR: The beat frequency oscillator circuit is designed to effectively heterodyne signals of varied signal level. This oscillator is so isolated that it has no material effect on the operation of the I.F. amplifier. The variable control on the panel provides a wide selection of beat frequencies. A switch is also provided for cutting the oscillator off.

A. F. AMPLIFIER: The A.F. amplifier consists of a 6V6 tube with an output of approximately 4 watts. A manual gain control is provided in this stage in order that the operator may choose the proper amount of amplification. The output impedance is 6 ohms, and the output terminals connect directly to the voice coil of a permanent-magnet dynamic speaker.

POWER SUPPLY: Special care has been exercised in the design of this part of the receiver. Components used have a very large safety factor in order to insure satisfactory operation over a long period of time. A two-section filter is employed with a total inductance of 40 henries, and a total capacity of 40 microfarads. This heavy duty filter provides humless operation.

REALIGNMENT PROCEDURE

I. F. AMPLIFIER: The "HQ-120-X" receiver is aligned by the usual oscillographic method during final inspection. Its I. F. circuits are of an extremely stable type employing high grade silver-plated mica fixed condensers which are practically unaffected by even extreme changes in temperature or humidity. Accurate circuit alignment is accomplished by adjusting the position of the iron dust cores in the I. F. coils by means of the slotted screws protruding from the sides of the I. F. transformers T2, T3, T4, and T5 and the crystal filter shield 76. This construction results in tuned circuits that hold their adjustment regardless of mechanical shocks or atmospheric conditions. For these reasons it is extremely unlikely that realignment will be necessary and it should not be attempted unless there is very good reason to suspect trouble in the I. F. end of the receiver. Slight misalignment of transformers T2 and T3 will have the most marked effect on sensitivity and selectivity and their adjustment can be checked as follows:

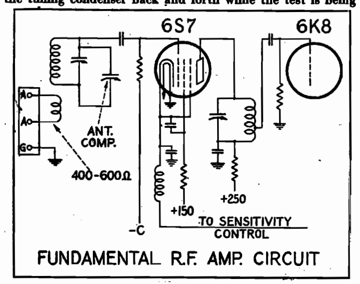
Connect an output meter across the speaker voice coil leads. A low reading copper-oxide rectifier meter is quite suitable for this purpose. Connect a test oscillator (modulated) to the input terminals of the receiver. The frequency of this test oscillator may be anything within the range of the receiver, but its output must be steady. Then tune in its signal on the receiver with the crystal selectivity switch set on No. 1 (phasing control at centerscale) and adjust sensitivity (MAN) until a reading of approximately 1 volt is obtained on the output meter. It will now be found that the output meter reading is very sensitive to slight changes in tuning. After adjusting the tuning dial for peak output meter reading, check each adjusting screw on I. F. transformers T2 and T3. If any great change occurs readjust the tuning dial and again check the four I. F. adjustments. When no further improvement can be made T2 and T3 will be perfectly aligned. The lower, or plate circuit adjusting screw of the Crystal Filter transformer 76 may be checked at the same time and in the same manner.

To *perfectly* align the upper, or grid circuit of the crystal filter 76 an oscillograph and sweep oscillator are required. When such equipment is available the Crystal Selectivity switch may be set on No. 3 or No. 4 and the sweep frequency oscillator adjusted to coincide with the quartz crystal resonant frequency (phasing control at centerscale). Then, with Crystal Selectivity switch on No. 1, adjust the upper screw of Crystal Filter 76 for symmetrical pattern on the oscillograph screen. When such visual aligning equipment is not available a fairly satisfactory setting of this upper screw may be made as follows: After checking the alignment of T2, T3 and the lower screw of Crystal Filter 76 with the output meter as previously outlined, leave the Crystal Selectivity switch on No. 1 and tune in a broadcast station. Then adjust the upper screw in Crystal Filter 76 for best quality of reproduction of speech and music. In making this adjustment no attention should be paid to loudness. On either side of the correct setting, the speech and music will sound low and drummy, with a conspicuous absence of high audio frequencies. The correct setting can be checked by means of the tuning dial, by slowly turning it back and forth across resonance. When the upper screw is properly adjusted, the signal will tune in and out smoothly and there will be no peaks or loudspots as the dial is turned. In fact, the signal should tune in and out just as *smoothly* as with the Crystal "off" except that the band width will be noticeably *narrower*.

R. F. AND H. F. OSCILLATOR: Before attempting to realign these circuits the following instructions should be read through very carefully. As in the case of the I. F. amplifier, these circuits have also been accurately aligned during final inspection and great care has been taken in their design to insure stability and permanence of adjustment. Therefore, they should not be disturbed unless it is absolutely certain that readjustment is necessary. Even in that case, only very slight alterations will be necessary to restore the receiver to its original efficiency. In general, a small fraction of a turn on either inductance adjuster or trimmer condenser will suffice. These adjustments, together with their respective test frequencies, are clearly shown on the chart (Fig. 10). On the bands from 3.2 mc. to 31 mc. it is extremely important to have the band spread dial set at 200, since that is the setting at which the main dial has been calibrated. Naturally, the alignment of the receiver cannot be more accurate than the source of the test signal. The aligning during final inspection at the factory is accomplished with special test oscillators which are frequently compared with standard frequency crystals. The front row of adjustments shown on the chart on page 13 control the high frequency oscillator circuits and consequently the dial calibration. These adjustments should be disturbed *only* if the calibration of the main dial (with band spread dial at 200) is known to be off. As clearly indicated in the diagram, the inductance should be adjusted at the low test frequency in each band and the trimmer capacitor at the high test frequency. These adjustments mutually affect each other, therefore, if any considerable change is made at one end of a band the other end of the same band must be readjusted. This procedure must be repeated until no further readjustment at either end is necessary.

The adjustments in the middle row control the first detector input circuits. No great accuracy of test signal is required to check their correctness. Set the oscillator approximately to the frequency shown on the chart and tune in on the receiver (using the output meter). Then adjust for peak meter reading by means of the inductance adjuster at the low test frequency and the trimmer capacitor at the high frequency end. At 30 mc. there is a certain amount of interlock between the detector and H. F. oscillator, so in order to avoid a false setting of the trimmer capacitor in this range, it will be necessary to rock the tuning condenser back and forth while the test is being made.

FIG. 1—Fundamental R.F. amplifier diagram showing antenna compensating condenser.



MAINTENANCE

This chart provides information as to the various voltages which will appear between certain tube socket prongs and the ground or B-negative side of the circuit. A slight explanation of the chart might be in order. As an example, when checking the R.F. tube (6S7) we find that the reading from pin 3 to ground should be 200 volts if read on a 0–250 scale meter. The scale that should be used for making the check is contained in the parentheses below the voltage. In the course of making this check it may be found that the voltage will vary slightly in some cases. This, of course, will be due to varying line voltage conditions in the particular location where the receiver is being tested. The voltage values indicated should be found in cases where the line voltage is exactly 117 volts. A meter having a resistance of 1000 ohms per volt with scales approximately as indicated can be used for the checking.

In compiling the parts lists, an endeavor has been made to indicate all values of parts readily obtainable in the open market. For instance, such common items as .02 mf. paper condensers with 500 volt ratings and 10,000 ohm ½w. resistors are standard items. Other parts whose values are not standard should be obtained by writing to the factory. Such parts as 5.5 mmf. silver mica condenser, of course, are not readily obtainable. However, in many cases these special items are located in parts of the circuit where it is almost impossible for them to become defective through ordinary operation of the receiver.

	SWITCH ON MAN.							SWITCH ON CW	SWITCH ON AVC
TUBE	RF 6S7	Conv. 6K8	1–IF 6S7	2–IF 6S7	3–IF 6F6	Audio 6V6-G	REG VR150	B.O. 6J7	Meter 6F5
Pin 3 to ground	200 (250)	215 (250)	215 (250)	210 (250)	270 (500)	260 (500)	...	35. (250)	...
Pin 4 to ground	115 (250)	105 (250)	115 (250)	115 (250)	122 (250)	275 (500)	...	75. (250)	150 (250)
Pin 5 to ground	...	...	...	...	...	...	150 (250)	...	...
Pin 6 to ground	...	115 (250)	...	...	...	...	...	...	...
Pin 8 to ground	3.2 (10)	3.2 (10)	6.2 (10)	6.2 (10)	9.3 (10)	16. (100)	...	...	1.8 (10)

HAMMARLUND MFG. CO.

HO-120-X

OPERATION

After unpacking the receiver check the chassis carefully to determine that all tubes are properly fitted into their respective sockets. Also, be certain that all grid clips are in place on the tops of the tubes. It is possible that the grid clips or tubes may have been dislodged during transportation.

This receiver, unless it is a special model, operates on 105 to 125 volts AC at 50 to 60 cycles. If you are uncertain as to the type of power available for operating the receiver, check with your local power company office. An attempt to operate the set on other types of power is liable to ruin it. Next, connect the speaker to the receiver. Two wires from the permanent magnetic dynamic speaker connect to the two terminals on the rear edge of the chassis marked "speaker." The main power supply switch that turns the receiver on and off is operated in conjunction with the "audio gain" control. When this control is in the "off" position, the receiver is completely inoperative. So, the next operation is to turn this control on slightly and wait for the tubes to heat up to their operating temperature. In the meantime, set the band selector switch in the .54–1.32 megacycle position; this is the major part of the standard broadcast band, the remainder is covered in the 1.32 to 3.2 mc. band. Also, set the control marked "MAN-AVC.-BFO." in the AVC position. The crystal selectivity control knob should be set in the "off" position. This is the broadest setting. The control in the lower left-hand corner of the panel should be set in the "REC" position. This latter control turns the receiver on and off for stand-by and transmitting periods during communication, but does not disconnect the receiver from the power line thus leaving the tubes heated and ready for instant use. By this time, the receiver is in operation—tubes having had ample time to heat up. We can now tune in broadcast stations by turning the sensitivity control full on and advancing the audio gain control to the point permitting the desired volume. All tuning in the broadcast band is done with the "main tuning" control. The band-spread control does not operate in the first two ranges. For accurate tuning, it will be necessary to watch the "S" meter. At this point it might be well to mention that it is possible that the meter may not be operating properly and may require adjustment. Along the rear edge of the chassis we find two screw driver adjustments (see Fig. 11) marked "A" and "B." These are for aligning the meter so that it operates properly. First, with the receiver turned off the indicator on the meter should rest to the extreme left, at the beginning of the scale to the left of the first arrow. If not, the zero adjustment on the meter (the small screw in the lower central portion) should be adjusted and the receiver turned on again. Also, it might be wise to short-circuit the two antenna posts to ground in order to eliminate signal pickup because in adjusting the meter no signal should be present. With the receiver in the AVC position and the sensitivity control set on zero, the screw driver adjustment "A" on the rear of the chassis should be adjusted so that the indicating needle of the meter is opposite the arrow at the extreme right of the scale. With the "sensitivity" control turned to 10, adjust "B" so that the meter needle is opposite the small arrow at the left of the scale. This should be rechecked because there is a slight interlocking of these controls. It may be necessary to repeat the operation two or three times.

After the meter circuit has been properly aligned and the antenna system connected to the receiver (see chapter on antenna requirements) the main tuning control should be adjusted for maximum reading of the meter on any particular station. The antenna compensating control is the final tuning adjustment. This should be set also for maximum meter reading. If, for any reason, automatic volume control is not desired, the switch so marked should be set in the "MAN" (or manual) position. In this case, sensitivity is controlled with the control thus marked and then the audio control should be turned all the way on.

A jack is provided in the lower right-hand corner of the panel for those who desire to use head-phones. This jack cuts the speaker out of the circuit. On the rear of the chassis, will be found terminals marked "relay." These pin jacks are in parallel with the "send-receive" switch and can be connected to a send-receive relay for break-in operation.

Operation on the remaining high frequency bands is essentially the same, except that the band spread dial comes into use. There are five scales on the band-spread dial. The 0–200 scale is for general coverage and is an arbitrary scale for accurately logging in any one of the various short wave broadcast bands. The other scales are for each of the amateur bands from 80 to 10 meters inclusive, and are calibrated in megacycles. The main tuning dial is also calibrated in megacycles and this calibration holds true when the band-spread dial is set at 200 on the arbitrary scale.

In short wave reception of either amateur or short wave broadcast stations, other features of the receiver are brought into use. For instance, the beat frequency oscillator is used for CW code reception and also for logging weak phone stations. This oscillator is only available without the AVC action and, when turned on, brings the main sensitivity control into operation. The beat oscillator tuning control provides wide variety of tones—the selection of which will depend upon the operator. Also in short wave reception we may need the noise limiter. There is a switch on the panel which provides this feature. The noise limiter operates independent of the setting of any of the other controls on the panel. Its purpose is to limit the interference caused by automobile ignition and similar disturbances.

The next important feature is the crystal filter. Detailed description and diagram can be found under "Circuit Arrangement." The variable feature permits the operator to select the band width that best suits receiving conditions. Normally, the phasing control should be set at the arrow in the center of its scale. Adjustment of this control will cut out interference from stations on either side of the desired signal in any of the five selectivity ranges of the crystal filter. When using the crystal filter, select the band width that provides the greatest fidelity with a minimum of interference. The selectivity of the filter increases as the switch is rotated clockwise. The first three positions of the selectivity control are intended for phone reception, although they can also be used for code in cases where interference is not too severe. The remaining positions are, of course, for single signal code reception in extremely crowded bands.

HQ-120-X PARTS LIST

DIAGRAM	DESCRIPTION	PART NO.
L-1	Antenna coil .54–1.32 mc. range	6007
L-2	Antenna coil 1.32–3.2 mc. range	6010
L-3	Antenna coil 3.2–5.7 mc. range	6013
L-4	Antenna coil 5.7–10 mc. range	6016
L-5	Antenna coil 10–18 mc. range	6019
L-6	Antenna coil 18–31 mc. range	6022
L-7	R.F. coil .54–1.32 mc. range	6008
L-8	R.F. coil 1.32–3.2 mc. range	6011
L-9	R.F. coil 3.2–5.7 mc. range	6014

DIAGRAM	DESCRIPTION	PART NO.
28	.005 mf. mica condenser	6056
30-114	Send-Receive and Limiter switches	6098
31	Relay pin jack	6142
32	Det. grid tap and osc. plate switch wafers	6064
34-35-36-37-38-39-53-54-55-60-61-62	Special MEX trimmer cond.	6055
42-49-117-118-121-122-124	50,000 ohm resistor (½ W.)	6075
44	230 ohm resistor (½ W.)	6156
45-71-85-94-100-108-109	.05 mf. condenser (500 V.)	6174
45A	.005 mf. mica condenser	6194
46	Tube socket 6K8-Conv. (iso.)	6107
47	15 ohm resistor (½ W.)	6154
48	50. mmf. condenser (silver)	6074
50	5.5 mmf. condenser (silver)	6151
51	673 mmf. condenser (silver)	6061
52	300 mmf. condenser (silver)	6060
56	H.F. osc. grid switch wafer	6132
57	10. ohm resistor (½ W.)	6089
64	.0015 mf. mica condenser	6058
65	.001 mf. mica condenser	6059
70-89	Tube socket 6S7	6109
73	700. ohm resistor (½ W.)	6159
76	Crystal filter	SA-600
78	50. ohm resistor ½ (W.)	6170
79	Tuning meter	6139
80	Tube socket 6SF-5	6106
81-82	80. ohm meter circ. potentiometers	6140
83	Sensitivity control 10,000 ohms	6096
84	400 ohm resistor (½ W.)	6168
86	300. ohm resistor (½ W.)	6169
92	Tube socket 6F6	6108
93-128	.1 mf. condenser (500 V.)	6173
95	600 ohm resistor (½ W.)	6158
96	50,000 ohm resistor 1 watt	6166
99-127	1-meg. resistor (½ W.)	6167
101	AVC-MAN-BFO switch	6097
102	Tube socket 6V6—Audio	6113
103	40 mf. electrolytic condenser	6171
104	350. ohm resistor (1 W.)	6157
105	Phone jack	6087
107-110	100,000 ohm resistor (½ W.)	6135
111	Tube socket 6J7	6112
112	Beat oscillator	SA-680
113	Audio gain control (500,000 ohm combined with power switch)	6095
115	.01 mf. condenser (500 V.)	6175
116-119-120	100. mmf. mica condenser	6191
123	1000. mmf. mica condenser	6177
125	10. mmf. mica condenser	6178
126-129	Tube socket 6H6	6111
130	Speaker terminal strip	3843
L-10	R.F. coil 5.7–10 mc. range	6017
L-11	R.F. coil 10–18 mc. range	6020
L-12	R.F. coil 18–31 mc. range	6023
L-13	H.F. osc. coil .54–1.32 mc. range	6009
L-14	H.F. osc. coil 1.32–3.2 mc. range	6012
L-15	H.F. osc. coil 3.2–5.7 mc. range	6015
L-16	H.F. osc. coil 5.7–10 mc. range	6018
L-17	H.F. osc. coil 10–18 mc. range	6021
L-18	H.F. osc. coil 18–31 mc. range	6024
T-1	Power transformer 50–60 cycle, 115 V	6082
T-2	First I.F. transformer	6116
T-3	Third I.F. transformer	6118
T-4	I.F. output coil assembly	SA-660
T-5	Diode input coil	SA-670
T-6	Audio output transformer 6 ohm	6086
1	Antenna terminal strip	6088
2	Fuse block (1.5A fuse Pt. No. 6065)	3859
3	Power switch (comb. with audio gain control), 500,000 ohm	6095
4	Rectifier tube socket 5V4-G	6114
5-40	600 mmf. grid coupling condensers	6073
6-41	25. ohm resistor (½ W.)	6155
7	500,000 ohm resistor (½ W.)	6076
8	Tube socket 6S7-RF (iso.)	6107
9-12-13-43-59-66-69-72-77-87-90-97	.02 mf. paper cond. (500 V.)	6176
10-67-106	10,000 ohm resistor (½ W.)	6165
11	Antenna compensating condenser	SA-617
14	R.F. choke	CHX
15-29-68-74-75-88-91-98	2000 ohm resistor (½ W.)	6160
16-33	R.F. and detector grid switch wafer	6063
17	Antenna switch wafer	6062
18	First filter choke	6083
19	Filter condenser	6085
20	Second filter choke	6084
21	.15 amp. pilot lamps (6-8 V.)	6036
22	Dial and meter lamps socket assembly	6045
23	3000 ohm resistor (10 W. wire wound)	6161
24	Tube socket VR-150	6115
25	6000 ohm resistor (1 W.)	6163
26	7000 ohm resistor (1 W.)	6164
27	10,000 ohm resistor (1 W.)	6162

MODEL 4B
Schematic, Voltage
Notes

HOWARD RADIO CO.

MODEL 4B - BATTERY RECEIVER

This model must not be confused with the Model 4BT. Electrically they are much the same but the Model 4B is built into an upright table cabinet with an oval dial, whereas the 4BT is a flat type cabinet with straight line dial.

The function of the tubes is as follows: 1A7G - Modulator, 1N5G - IF Amplifier, 1H5G - Diode Det. AVC, 1C5G - Output.

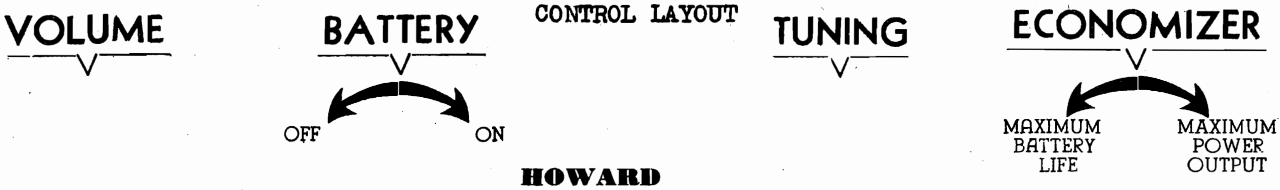
The trimmers for the antenna and oscillator coils are mounted directly on each coil.

The output is rated at .180 to .360 milliwatts.

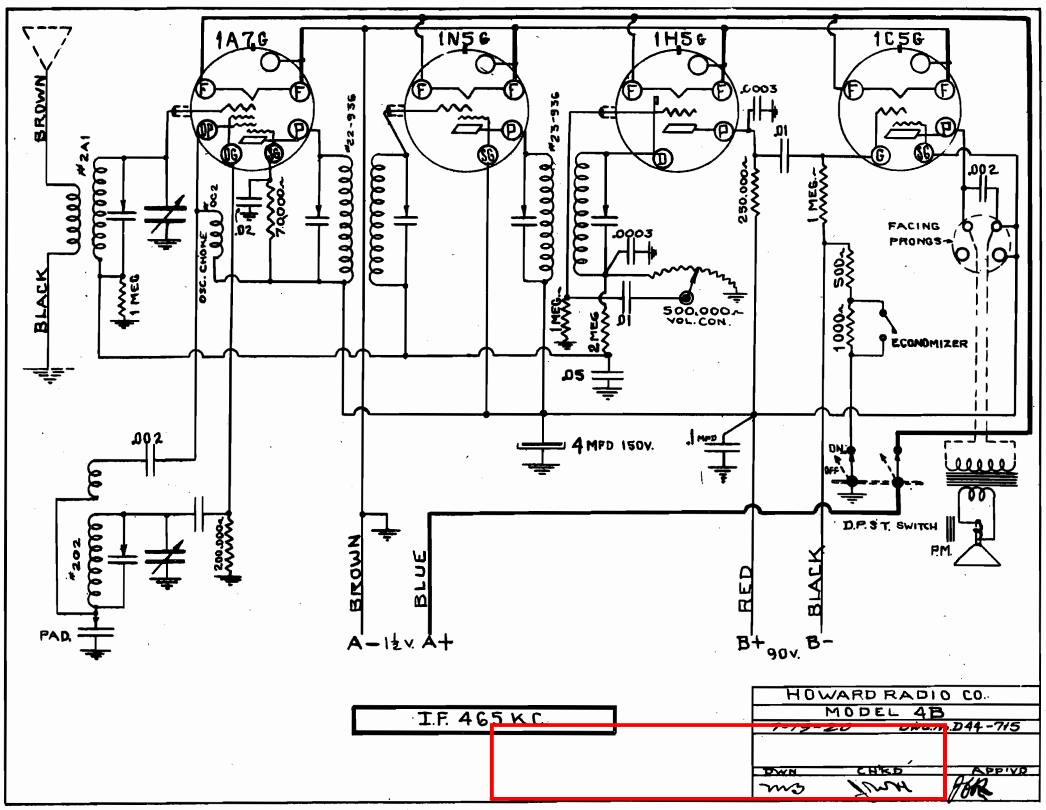
"A" Battery Drain at $1\frac{1}{4}$ volts - .25 amps.

"B" Battery Drain at 90 volts - .012 mils., or 7 mils. when using the "Economizer".

CONTROL LAYOUT



HOWARD



PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
18-190T	Cabinet	21-720X	Drive Shaft with Friction Discs
21-270	Condenser - 2 Gang	10-328X	Drive Disc - 5-1/8 OD with Hub
36-266	Condenser - "E" Filter -	16-352	Escutcheon
	Dual 10 Mfd. 200 V.	22-936	I.F. Assembly - 1st
49-262	Condenser - Padding	23-936	I.F. Assembly - 2nd
8218-3	Condenser - Trimmer, 3-30 Mmfd.	18-490	Knob - 1", Brown Bakelite
23-281	Control - Volume	8-490	Knob - 13/16", Brown Bakelite
OC2	Choke - Oscillator	17-602	Plug - 3 Prong, "B" Circuit
2A1	Coil - Antenna	18-602	Plub - 2 Prong, "A" Circuit
202	Coil - Oscillator	1-806	Speaker - 6", PM Type
7-427B	Dial Glass - 1 Band	12-917	Switch - S.P.S.T. for Economizer
4059	Dial Hand	16-917	Switch - D.P.S.T. - OFF-ON

MODEL 4BT
Schematic, Voltage
Notes

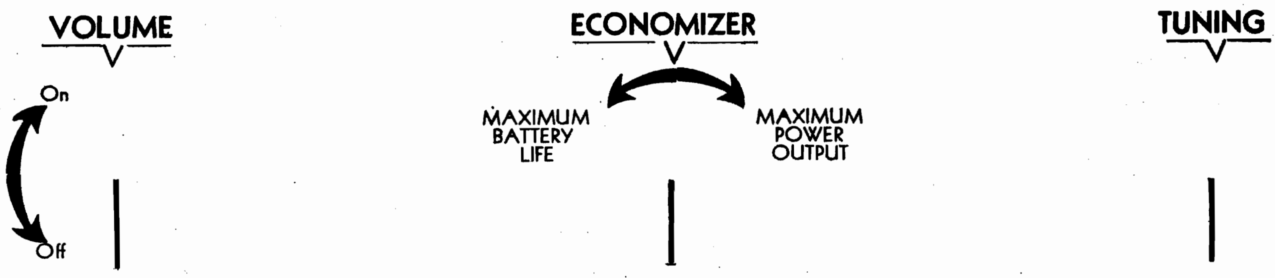
HOWARD RADIO CO.

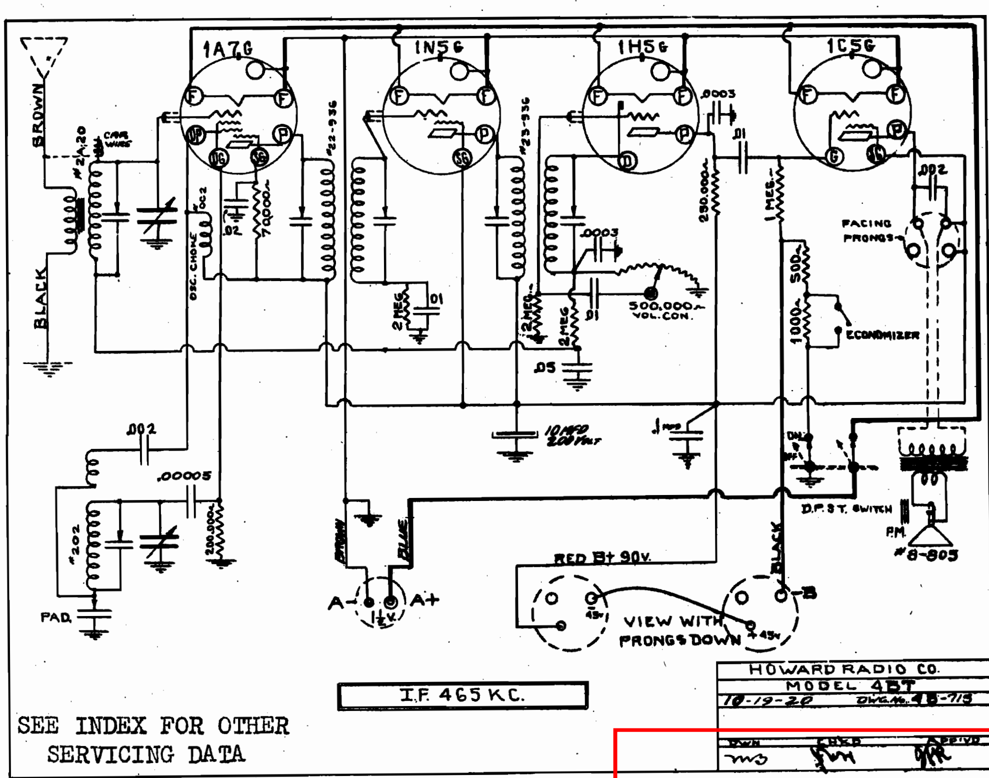
MODEL 4BT - BATTERY RECEIVER

This receiver is designed on the 220 style chassis.
"A" Battery Drain at $1\frac{1}{4}$ volts - .25 amps.
"B" Battery Drain at 90 volts - .012 mils., or 7 mils. when using the "Economizer".
Output - .180 to .360 milliwatts, maximum.

The set is equipped with plugs that are inserted directly into the "A" and "B" batteries of the socket type construction since most all batteries are made that way at this time.

CONTROL LAYOUT





SEE INDEX FOR OTHER
SERVICING DATA

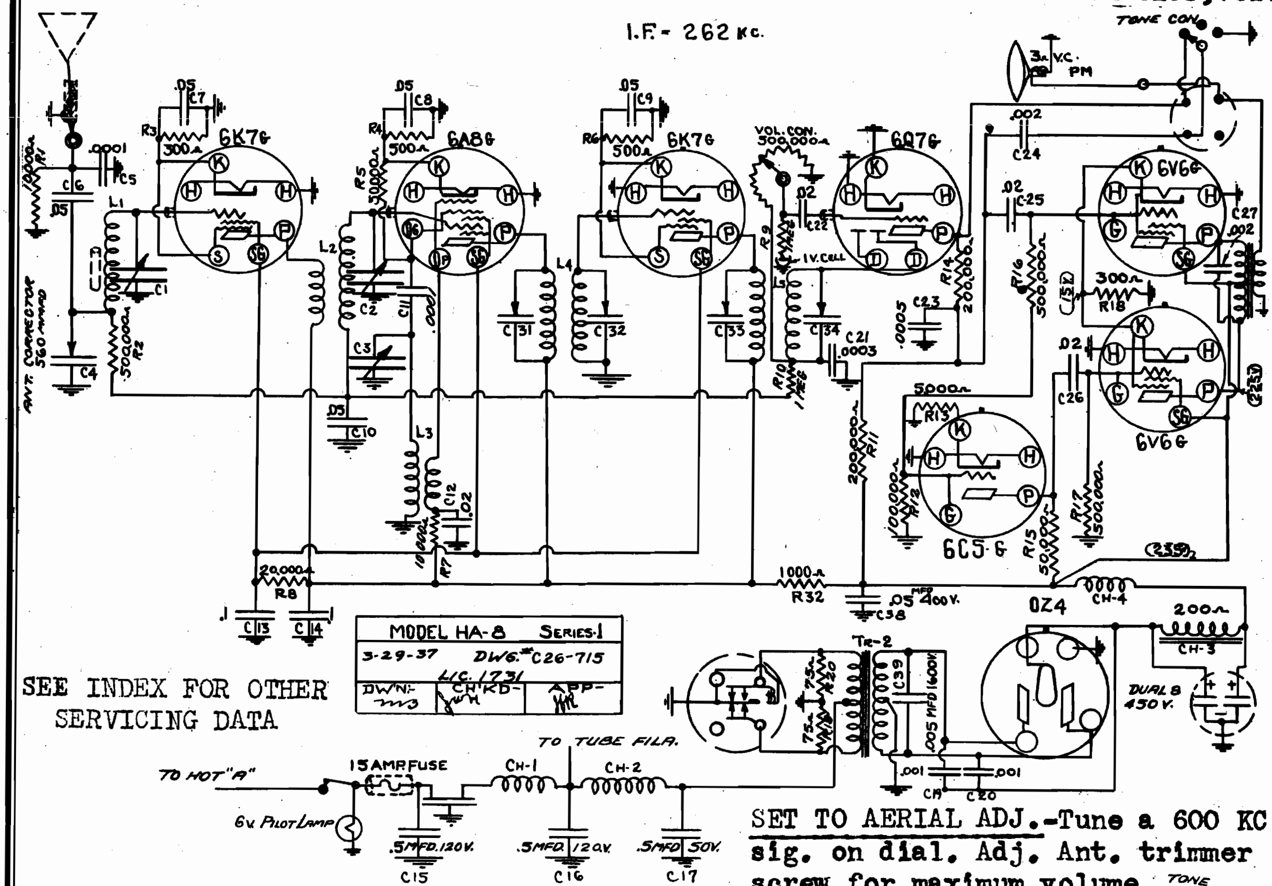
REPLACEMENT PARTS LIST - MODEL 4BT

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
38-270	Condenser - 2 Gang for Model 4BT	17-829	Drive Cord Spring
36-266	Condenser - "E" Filter - Dual 10 Mfd. 200 V.	34-720X	Drive Shaft with Wood Hub
		4-429	Drive Shaft Grommet
49-262	Condenser - Padding	12-788	Drive Shaft & Wood Hub
39-281	Control - Volume, with Switch	22-936	I.F. Assembly
56-188	Cabinet	23-936	I.F. Assembly
2A20	Coil - Antenna	18-490	Knob - 1" Diameter - Brown Bakelite
202	Coil - Oscillator	1-609X	Pulley with 4-425 Gear Assembly
OC2	Choke - Oscillator	3-609	Pulleys for Drive Cord
62-310	Dial Glass - 1 Band	J8-805	Speaker - 5" with Transformer - PM
20-448	Dial Hand finished with Eyelet	17-917	Switch, Rotary Shaft
1-288	Drive Cord - 36"		

Alignment

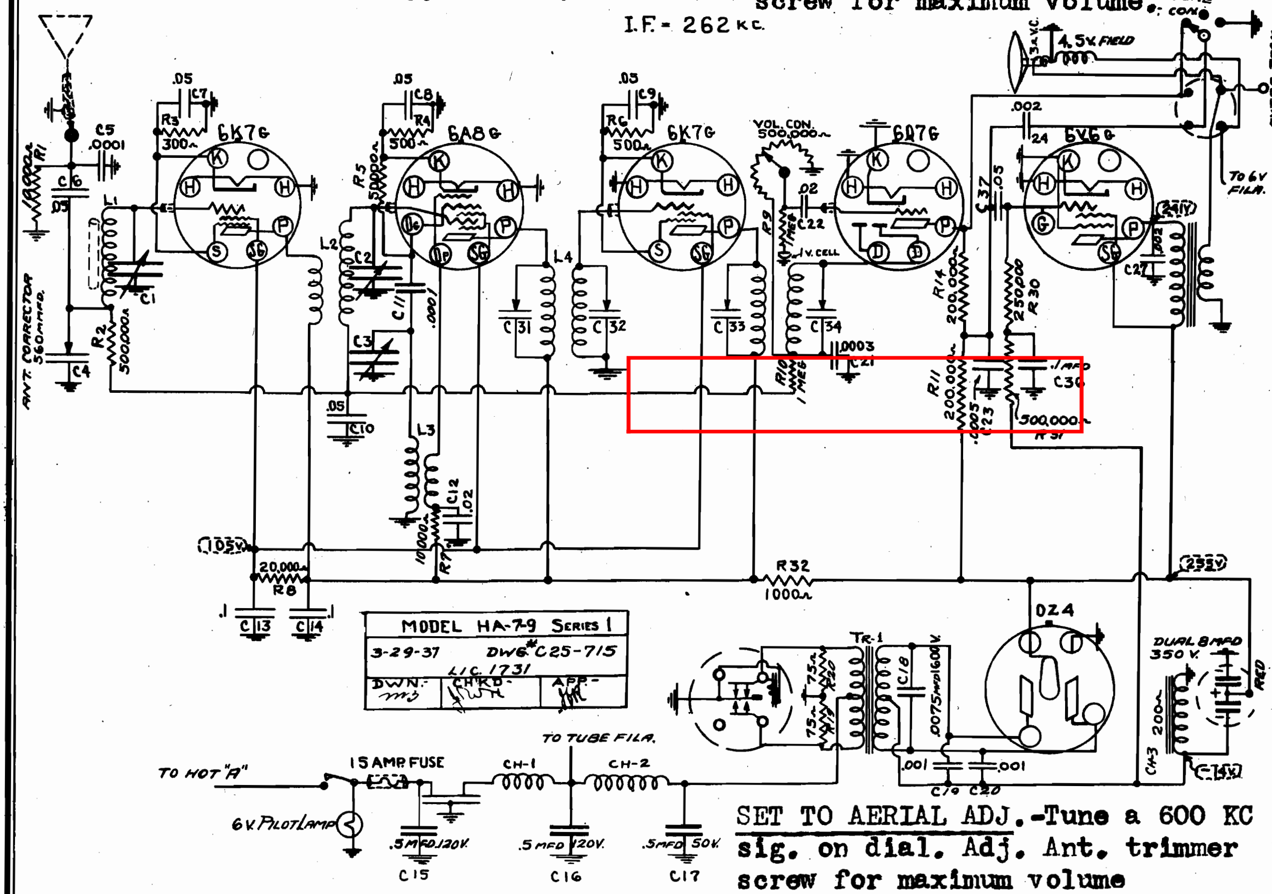
HOWARD RADIO CO.

MODELS HA7, HA9
MODEL HA8
Schematics, Voltage



SEE INDEX FOR OTHER SERVICING DATA

SET TO AERIAL ADJ.-Tune a 600 KC sig. on dial. Adj. Ant. trimmer screw for maximum volume.

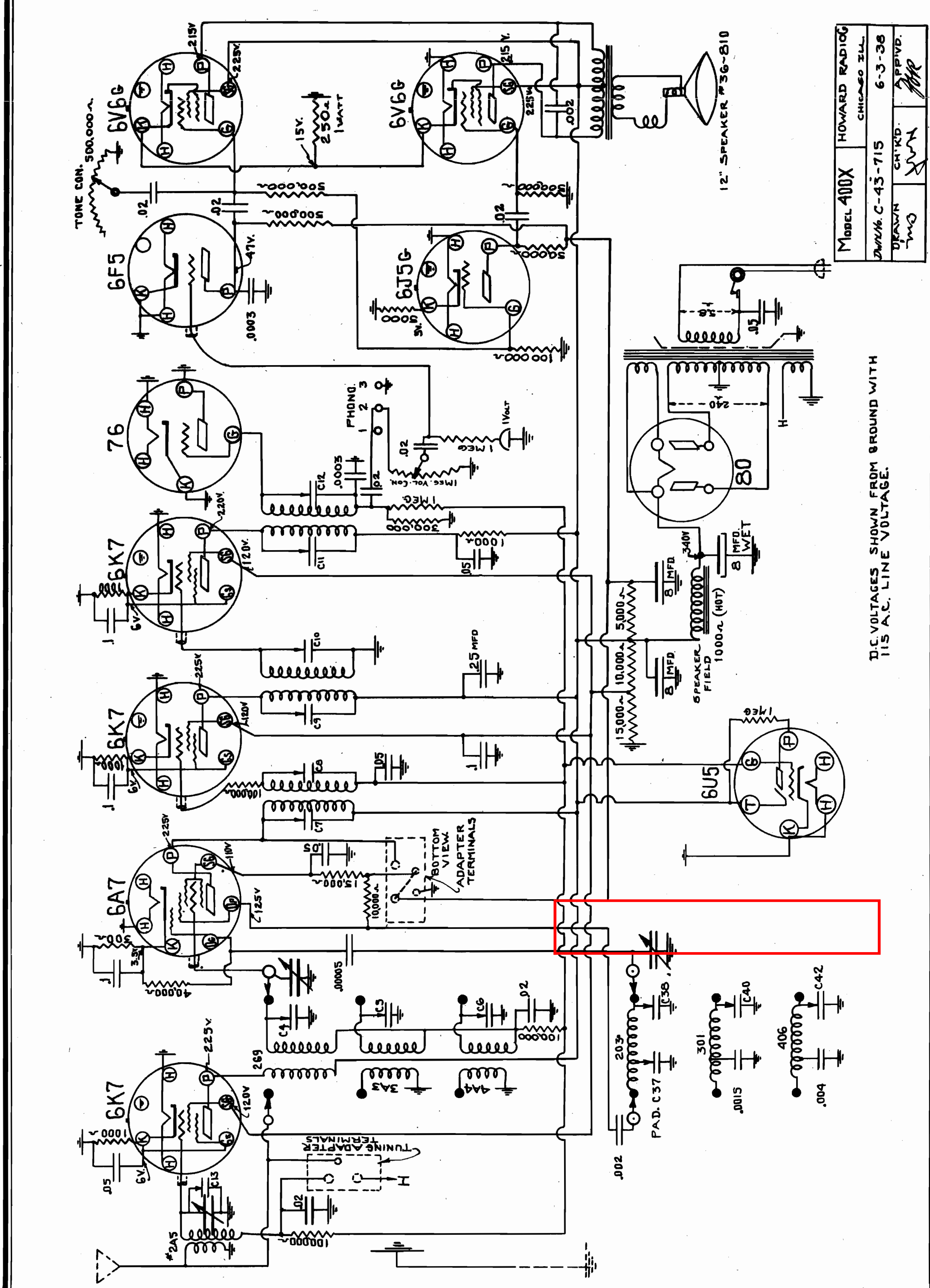


SET TO AERIAL ADJ.-Tune a 600 KC sig. on dial. Adj. Ant. trimmer screw for maximum volume

At any future date should the tubes be checked and changed it is very important that the same type tubes as specified be substituted. Do not substitute a metal tube for the glass type, especially in the 6V6G position.

MODEL 400X
Schematic, Voltage

HOWARD RADIO CO.



HOWARD RADIO CO.

MODEL 210
Push Button Adapter
Schematic, Instructions
Parts List

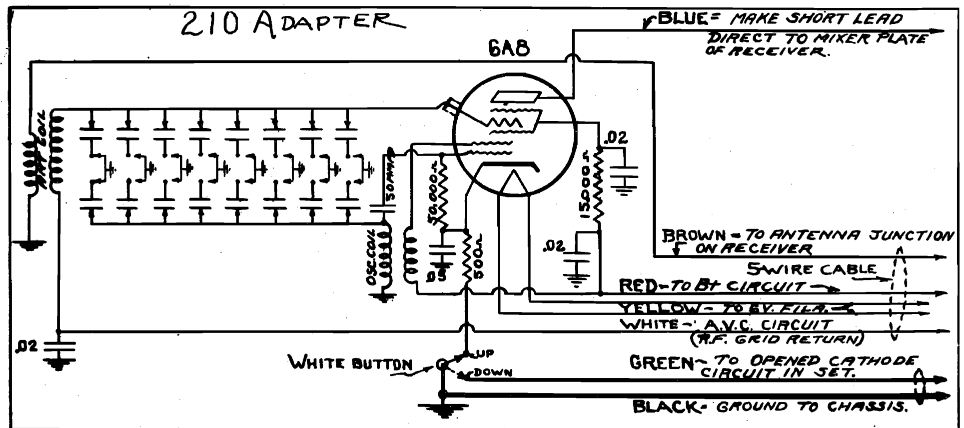
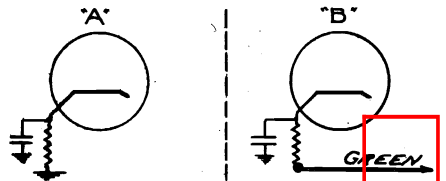
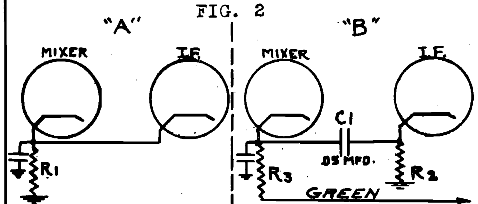


FIG. 1



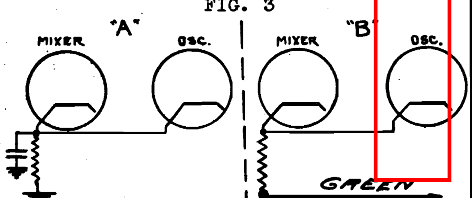
CATHODE CIRCUIT OF THE 6A7 OR 6A8 TUBES WHERE NO OTHER CATHODES ARE COMMON - MERELY REMOVE RESISTOR FROM GROUND AND ATTACH GREEN WIRE TO THE RESISTOR.
NOTE-SHOULD CATHODE BE ALREADY DIRECT TO GROUND - REMOVE GROUND AND CONNECT GREEN WIRE DIRECT TO CATHODE TERMINAL.

FIG. 2



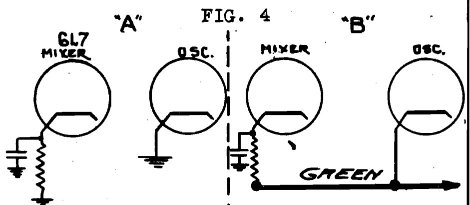
CIRCUITS IN WHICH I. F. CATHODES ARE CONNECTED COMMON TO MIXER CATHODE — SUBSTITUTE RESISTORS R2 AND R3 FOR R1 OF SUCH VALUES TO OBTAIN ORIGINAL CATHODE VOLTAGE. ADD C1 CONDENSER (.05 MFD 200 V.) BETWEEN CATHODES AS SHOWN, AND CONNECT GREEN WIRE TO END OF R3 RESISTOR.

FIG. 3



THE ABOVE ARRANGEMENT IS USED WHEN OSCILLATOR CATHODE AND THE MIXER CATHODE ARE COMMONLY COUPLED BY RESISTOR - MERELY REMOVE GROUND AND ATTACH GREEN WIRE AS SHOWN.

FIG. 4



WITH CIRCUITS AS SHOWN ABOVE WHERE 6L7 CATHODE USES BIAS RESISTOR AND THE SEPARATE OSCILLATOR CATHODE IS GROUNDED - TIE CATHODES TOGETHER SO THAT GREEN WIRE CONTROLS THE GROUND RETURN FOR BOTH.

H.R.CO.
DWG No 41-715

PARTS LIST FOR MODEL "210" ADAPTER

QUANTITY PER SET	PART NO.	LIST PRICE	DESCRIPTION
1	2A12	.40	Coil - Antenna
1	2011	.40	Coil - Oscillator
1	20-266	1.10	Condenser - 16-8 Mfd. Electrolytic
1		.16	Condenser - .02 Mfd. 200 Volt
2		.16	Condenser - .02 Mfd. 400 Volt
1		.16	Condenser - .05 Mfd. 200 Volt
1		.16	Condenser - .00005 Mfd. Mica
1	39-262	.40	Condenser - Dual Trimmer
1	40-262	.40	Condenser - Dual Trimmer
1	41-262	.40	Condenser - Dual Trimmer
1	42-262	.40	Condenser - Dual Trimmer
1	43-262	.40	Condenser - Dual Trimmer
1	44-262	.40	Condenser - Dual Trimmer
1	45-262	.40	Condenser - Dual Trimmer
1	46-262	.40	Condenser - Dual Trimmer
1	22-352	.35	Escutcheon Plate
2	2-114	.25	Moulded Bar Trim
1	14-602	.15	Plug with shell, 3 prong
1	15-602	.15	Plug with shell, 4 prong
8		.05	Push Buttons - Brown
1		.05	Push Buttons - White
1		.15	Resistor - 500 Ohm 1/2 Watt
1		.15	Resistor - 15,000 Ohm 1/2 Watt
1		.12	Resistor - 40,000 Ohm 1/3 Watt
1		.15	Socket - 8 Prong
1	9-772	.15	Socket - 3 Prong for part # 14-602
1	10-772	.15	Socket - 4 Prong for part # 15-602
1		.30	Station Tab Sheet
4	7-658	.05	Filister Head Screws - 6-32 x 3/4 Long
4	1-182	.05	Cinch Buttons
4	17-844	.03	Friction Strip
4		.02	Wood Spacer - 1/4" long 3/8 OD
1	10-917	3.30	Switch - Push Button complete (less knobs)
			REPLACEMENT PARTS FOR ABOVE
1		.10	Selector Key "Off" position
8	4-488	.08	Selector Keys
1	5-114	.10	Latch Bar
1	11-829	.05	Bronze Spring for latch bar
1	10-829	.05	Coil Type Spring 1" for key
8	9-829	.05	Coil Type Spring 13/16" for 4-488 keys
9	21-972	.02	Felt Washers
18	7-829	.04	Main Contact springs, silver finish

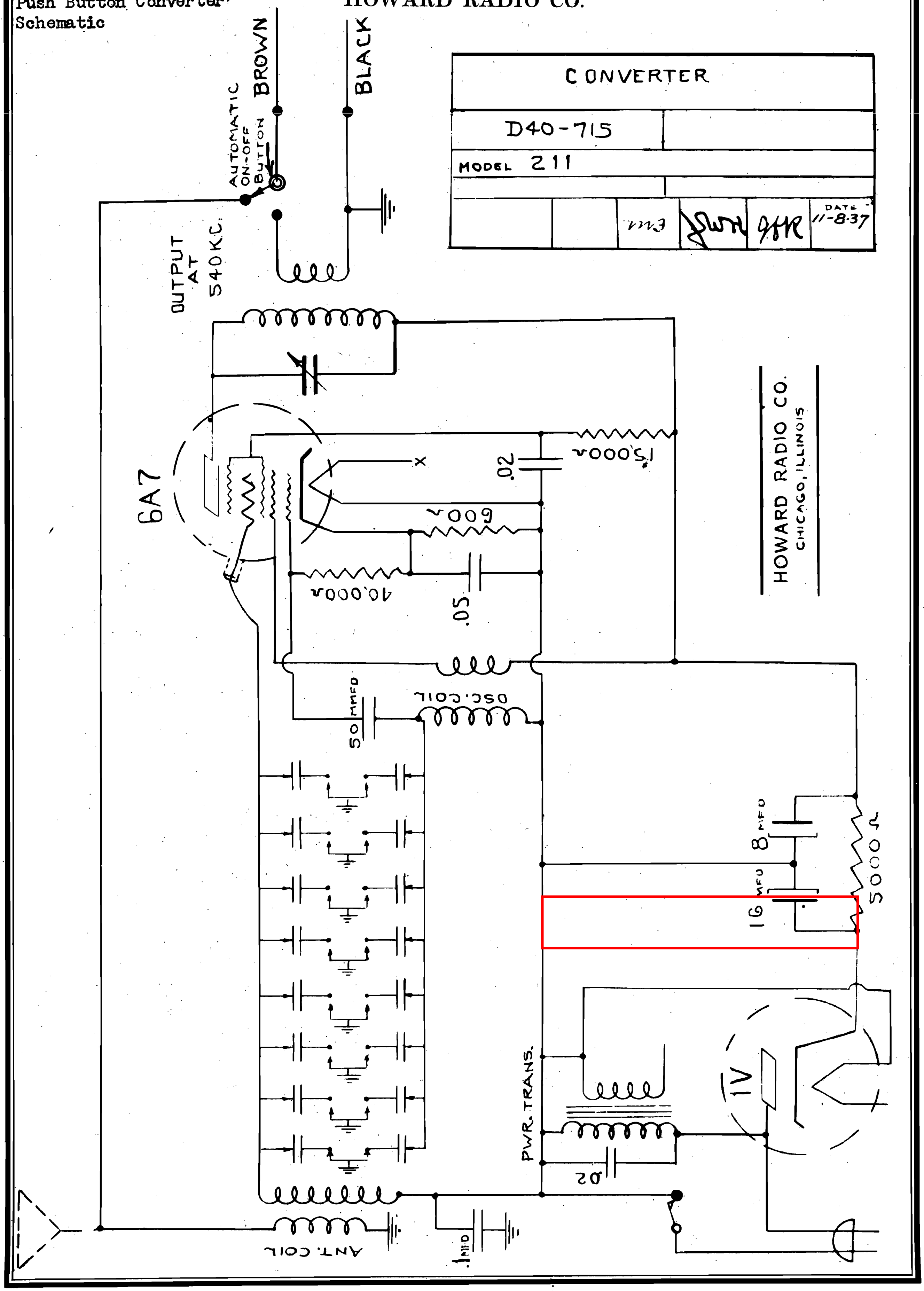
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

NOTE:

See installation instructions for the operation of this adapter.

MODEL 211
Push Button Converter
Schematic

HOWARD RADIO CO.



MODEL 210
MODEL 211
Instructions

HOWARD RADIO CO.

MODEL 4B
MODEL 4BT
MODELS 220,270
MODELS 221,271
Alignment

MODELS 220, 221, 270, 271, 4B, 4BT

ALIGNMENT CHART

MODELS	CHECK BAND SWITCH POSITION & SET DIAL TO	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS FOR 50 MILLIWATT OUTPUT
220} 221}	Maximum Capacity	465 KC	Grid of 6A7	C31,C32, C33,C34 Fig. 2	IF	27
220} 221}	107 MC (1700 KC)	1700 KC	Antenna Lead	T10,T11 Fig. 2	Osc. & RF	9
220} 221}	600 KC	600 KC	Antenna Lead	P 12	Osc. Pad. (Rock Dial)	10
270} 271}	Maximum Capacity	465 KC	Grid of 6A7	C31,C32, C33,C34 Fig. 2	IF	27
270} 271}	18 MC	18 MC	Antenna Lead	T1, T2 Fig. 3	Osc. & RF	20
270} 271}	1.7 MC (1700 KC)	1.7 MC	Antenna Lead	T3, T4 Fig. 3	Osc. & RF	9
270} 271}	600 KC	600 KC	Antenna Lead	P 12	Osc. Pad. (Rock Dial)	10
4BT	Maximum Capacity	465 KC	Grid of 1A7G	C31,C32, C33,C34 Fig. 2	IF	50-75
4BT	1.7 MC	1.7 MC	Antenna Lead	T10,T11	Osc. & RF	29
4BT	600 KC	600 KC	Antenna Lead	P 12 Fig. 2	Osc. Pad. (Rock Dial)	30

NOTE 1: When aligning the I.F. channel, a condenser of .05 MFD may be used in series with the generator lead.

NOTE 2: When aligning the broadcast band, a 250 MMFD condenser may be used in series with the signal generator.

NOTE 3: When aligning the short wave bands, a 400 ohm resistor may be used in series with the signal generator.

NOTE 4: Check for an image signal about .9 mc. lower in frequency. For example:- If a peak has been made at 6 mc. an image should be heard at about 5.1 mc. Otherwise the original setting was not correct.

BATTERY RECOMMENDATIONS

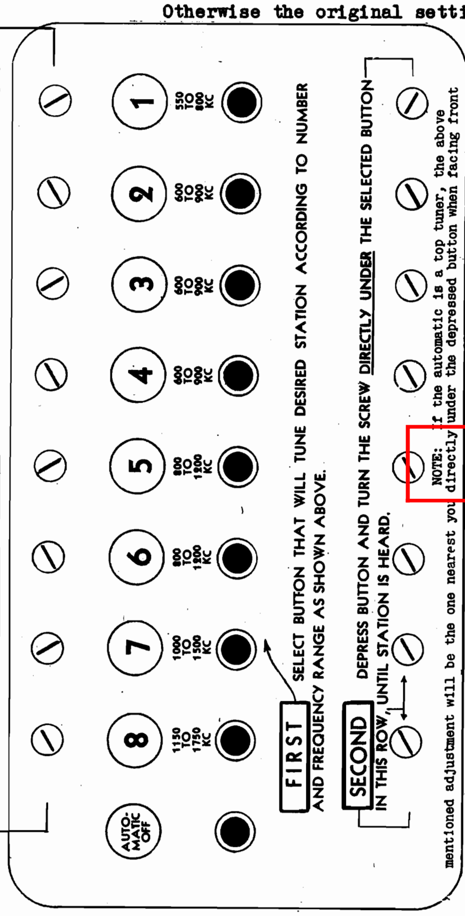
The color code for the battery leads for the Models 4B or 4BT

Red	B+	90 volts
Black	B—	90 volts
Blue	A+	1½ volts
Brown	A—	1½ volts

SET-UP INSTRUCTIONS—HOWARD AUTOMATIC

MODELS 210 & 211

THIRD MOVE THE SCREW ADJUSTMENT DIRECTLY ABOVE THE DEPRESSED BUTTON UNTIL TUNING EYE, OR TUNING INDICATOR REGISTERS MAXIMUM DEFLECTION. NOW RE-ADJUST THE SCREW MENTIONED IN SECOND OPERATION FOR MAXIMUM TUNING INDICATION.



FIRST SELECT BUTTON THAT WILL TUNE DESIRED STATION ACCORDING TO NUMBER AND FREQUENCY RANGE AS SHOWN ABOVE.

SECOND DEPRESS BUTTON AND TURN THE SCREW DIRECTLY UNDER THE SELECTED BUTTON IN THIS ROW, UNTIL STATION IS HEARD.

NOTE: If the automatic is a top tuner, the above mentioned adjustment will be the one nearest you directly under the depressed button when facing front of cabinet. Should the adjustment holes be covered with a trim, pry the trim up with a screw driver and remove while making adjustments.

FOURTH Insert the station call letter tab over button number just selected. Repeat this procedure for the remaining buttons. Replace trim.

TO USE RADIO IN THE CONVENTIONAL MANNER, DEPRESS BUTTON MARKED "AUTOMATIC OFF".

EXAMPLE

Station desired, WGN: Frequency is 720 KC, therefore button 2, 3, or 4 can be used. Button 3 is depressed, the lower adjustment is moved until WGN is heard. The adjustment above #3 button is then adjusted for maximum eye deflection. The lower adjustment is again checked for maximum deflection.

WGN tab is removed from tab sheet and inserted in escutcheon over #3. Insert tab by pushing in place with finger-tip.

SUGGESTIONS

FIRST: Do not try to extend the adjustments beyond their frequency rating.

SECOND: Move adjustments slowly.

THIRD: Double-check before moving any adjustment to make sure the adjustment about to be moved corresponds to the depressed button. Carelessness will cause you to misadjust adjustments already completed.

FOURTH: Check adjustments occasionally for maximum deflection of eye or tuning indicator, while receiver is in service. This will not have to be done often but it is good assurance that your receiver is always tuned perfectly.

A good method to identify the station being set up, is to tune the station in by dial on radio set, then switch to automatic by depressing the button on which set-up is being made and tune in by adjustment same program as heard when tuned in by dial as mentioned above.

When selecting a station automatically it is only necessary to depress button carrying the desired station call letters.

To use manual tuning depress "Automatic OFF" button.

8-541

MODEL 4B
MODEL 4BT
MODELS 220,270
MODELS 221,271

HOWARD RADIO CO.

Socket,Trimmers
Tuner Data,Dial

HOW TO SET AUTOMATIC TUNING BUTTONS

(1) From the rear of the tuning mechanism within the cabinet extends a slotted screw; loosen this screw by turning it to the left.
(2) Tune set in the regular way and decide upon what four stations are used the most in your locality.
(3) With a station exactly in tune press one button ALL THE WAY DOWN which will set the adjustment, then the button will spring back in its original position.
(4) Repeat this procedure for each of the remaining three buttons, being careful not to touch any other buttons while pressing down on one.
(5) Now tighten the rear screw, using a coin in the slot when tightening, if necessary, to make sure it will not loosen. Insert station letters into top of buttons.

THE GEAR ADJUSTMENT between the gear on the selector unit and the gear on the variable condenser is located on the top of the variable condenser in the form of a screw. The selector unit always tends to press against this screw head due to the mounting at point "A". See Fig. 2

To lower or raise the selector unit to change the gear spacing, loosen the hex nut that locks the adjustment screw and adjust as required.

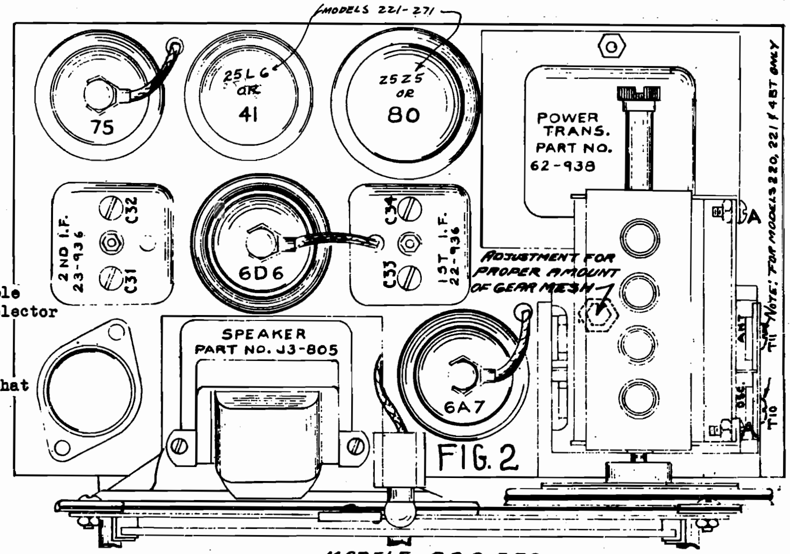


FIG. 2

MODELS 220,270

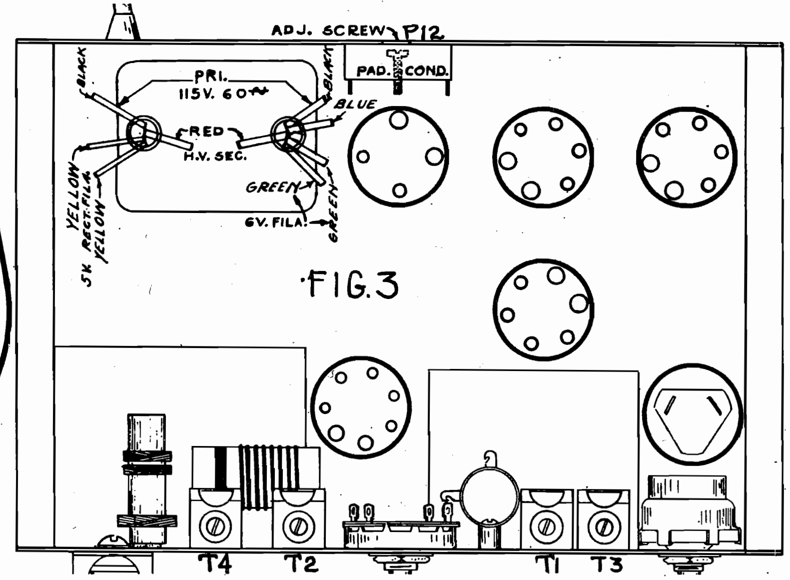
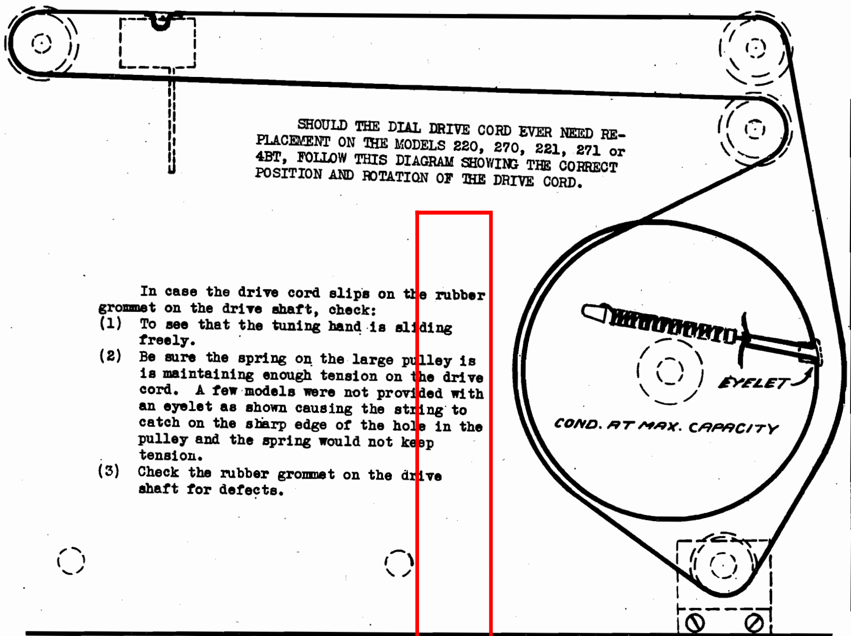


FIG.3

MODEL 270
DIAGRAM ALSO REFERRED TO FOR TRIMMER LOCATIONS FOR OTHER MODELS



SHOULD THE DIAL DRIVE CORD EVER NEED REPLACEMENT ON THE MODELS 220, 270, 221, 271 or 4BT, FOLLOW THIS DIAGRAM SHOWING THE CORRECT POSITION AND ROTATION OF THE DRIVE CORD.

In case the drive cord slips on the rubber grommet on the drive shaft, check:
(1) To see that the tuning band is sliding freely.
(2) Be sure the spring on the large pulley is is maintaining enough tension on the drive cord. A few models were not provided with an eyelet as shown causing the string to catch on the sharp edge of the hole in the pulley and the spring would not keep tension.
(3) Check the rubber grommet on the drive shaft for defects.

HOWARD RADIO CO.

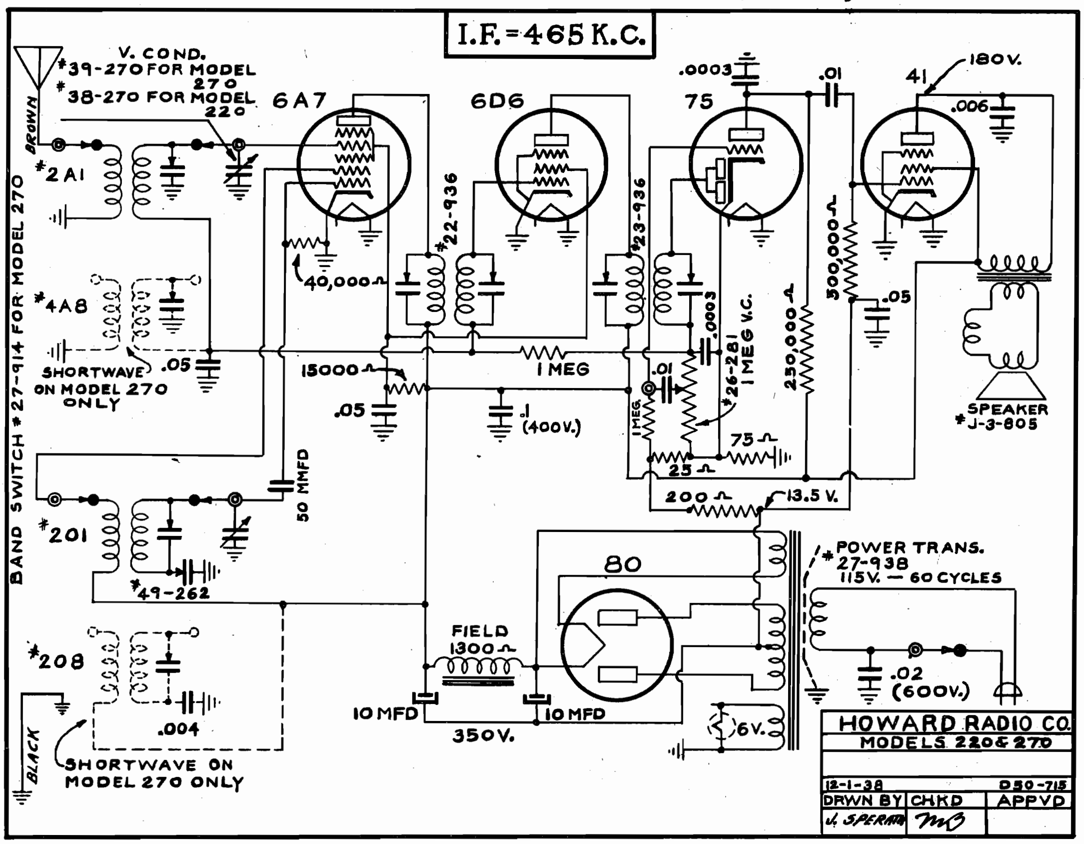
GENERAL DESCRIPTION - MODELS 220 and 270
FOR USE ON ALTERNATING CURRENT ONLY

The schematic diagram below covers both models 220 and 270, the main difference being the use of the short wave band for Model 270. The circuit is conventional with 6A7 mixer, 6D6, IF amplifier, 75 Diode Det. AVC, 41 Output, 80 Rectifier. The cathode circuit of the filter system is not grounded direct, the bias voltages are obtained by resistors from C.T. of high voltage to ground.

The output to be obtained will be from 1-1/2 to 2/25 watts, maximum.

For the models having four push buttons, a mechanical type tuner, the proper set-up is given on the following page.

FOR OTHER SERVICING
DATA, SEE INDEX



REPLACEMENT PARTS LIST - MODELS 220 - 270

PART NUMBER	DESCRIPTION
27-914	Band Switch for Model 270
39-270	Condenser - 2 Gang for Model 270
38-270	Condenser - 2 Gang for Model 220
31-277	Condenser - "E" Filter - Dual 10 Mfd. 350 V.
50-262	Condenser - Single Trimmer 3-30 Mfd.
49-262	Condenser - Padding
36-281	Control - Volume, with Switch
53-188	Cabinet - Model 270
54-188	Cabinet - Model 220
62-310	Dial Glass - Model 220 - 1 Band
61-310	Dial Glass - Model 270 - 2 Band
20-448	Dial Hand finished with Eyelet
1-288	Drive Cord - 36"
17-829	Drive Cord Spring

PART NUMBER	DESCRIPTION
34-720X	Drive Shaft with Wood Hub
4-429	Drive Shaft Grommet
12-788	Drive Shaft & Wood Hub
6-425X	Gear with Hub for Selector Unit
18-490	Knob - 1" Diameter - Brown Bakelite
36-290	Push Buttons
2-276	Push Button Selector Unit
1-609X	Pulley with 4-425 Gear Assembly
3-609	Pulleys for Drive Cord
11-786	Pilot Light Sockets
2-498	Pilot Light - 6 V. Bayonet Type
J3-805	Speaker - 5-1/2" with Transformer 1300 Ohm Field
27-938	Transformer - Power 115 V. 60 Cycle

REFER TO SCHEMATIC DIAGRAM FOR REPLACEMENT PARTS NOT SHOWN IN ABOVE LIST.

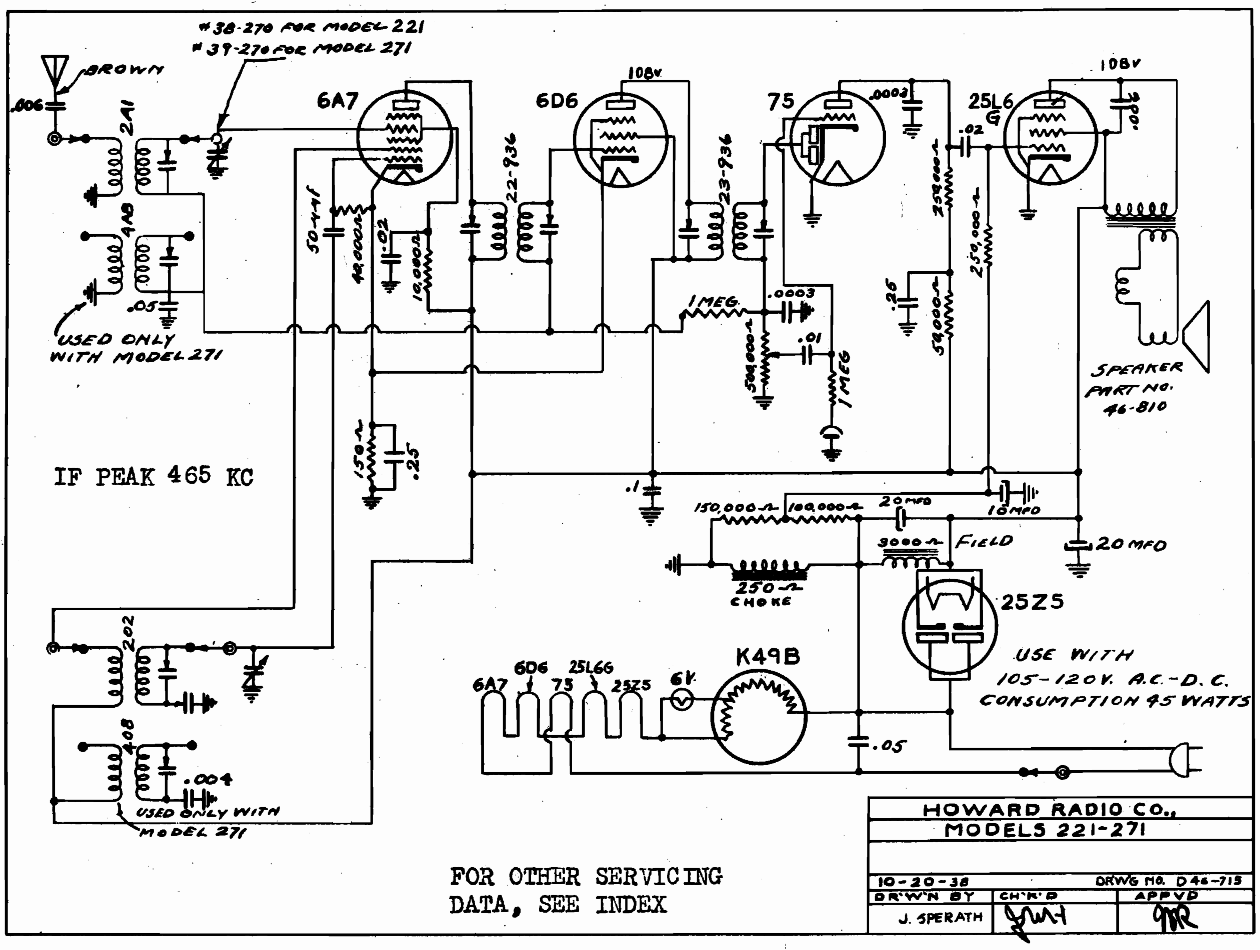
MODELS 221,271
Schematic,Voltage
Notes

HOWARD RADIO CO.

GENERAL DESCRIPTION - MODELS 221 and 271
FOR USE ON EITHER DIRECT OR ALTERNATING CURRENT

The schematic diagram below covers both 221 and 271 AC-DC Models, the main difference being that the 271 has a short wave band. Mechanical specifications are similar to the 220 - 270 series.

The maximum power output to be obtained is 2.7 watts, 1.7 watts undistorted.



REPLACEMENT PARTS LIST .- MODELS 221 - 271

PART NUMBER	DESCRIPTION
27-914	Band Switch for Model 271
39-270	Condenser - 2 Gang for Model 271
38-270	Condenser - 2 Gang for Model 221
32-266	Condenser - "E" Filter - Dual 20 Mfd. 150 Volt
50-262	Condenser - Single Trimmer 3-30 Mfd.
49-262	Condenser - Padding
36-281	Control - Volume, with Switch
53-188	Cabinet - Model 271
54-188	Cabinet - Model 221
62-310	Dial Glass - Model 221 - 1 Band
61-310	Dial Glass - Model 271 - 2 Band
20-448	Dial Hand finished with Eyelet
1-288	Drive Cord - 36"
17-829	Drive Cord Spring

PART NUMBER	DESCRIPTION
34-720X	Drive Shaft with Wood Hub
4-429	Drive Shaft Grommet
12-788	Drive Shaft and Wood Hub
19-212	Filter Choke - 240 Ohms
6-425X	Gear with Hub for Selector Unit
18-490	Knob - 1" Diameter - Brown Bakelite
36-290	Push Buttons
2-276	Push Button Selector Unit
1-609X	Pulley with 4-425 Gear Assembly
3-609	Pulleys for Drive Cord
2-498	Pilot Light - 6 V. Bayonet Type
46-810	Speaker - 5-1/2" with Transformer 3000 Ohm Field

REFER TO SCHEMATIC DIAGRAM FOR REPLACEMENT PARTS NOT SHOWN IN ABOVE LIST.

MODEL X275
Schematic, Voltage

HOWARD RADIO CO.

Each of the three bands has a separate antenna and oscillator coil.

The intermediate frequency stages are tuned to 465 KC and have a sensitivity of about 27 microvolts. (for 50 milliwatt output)

The maximum output is rated at about 5 watts, and 3.5 watts undistorted.

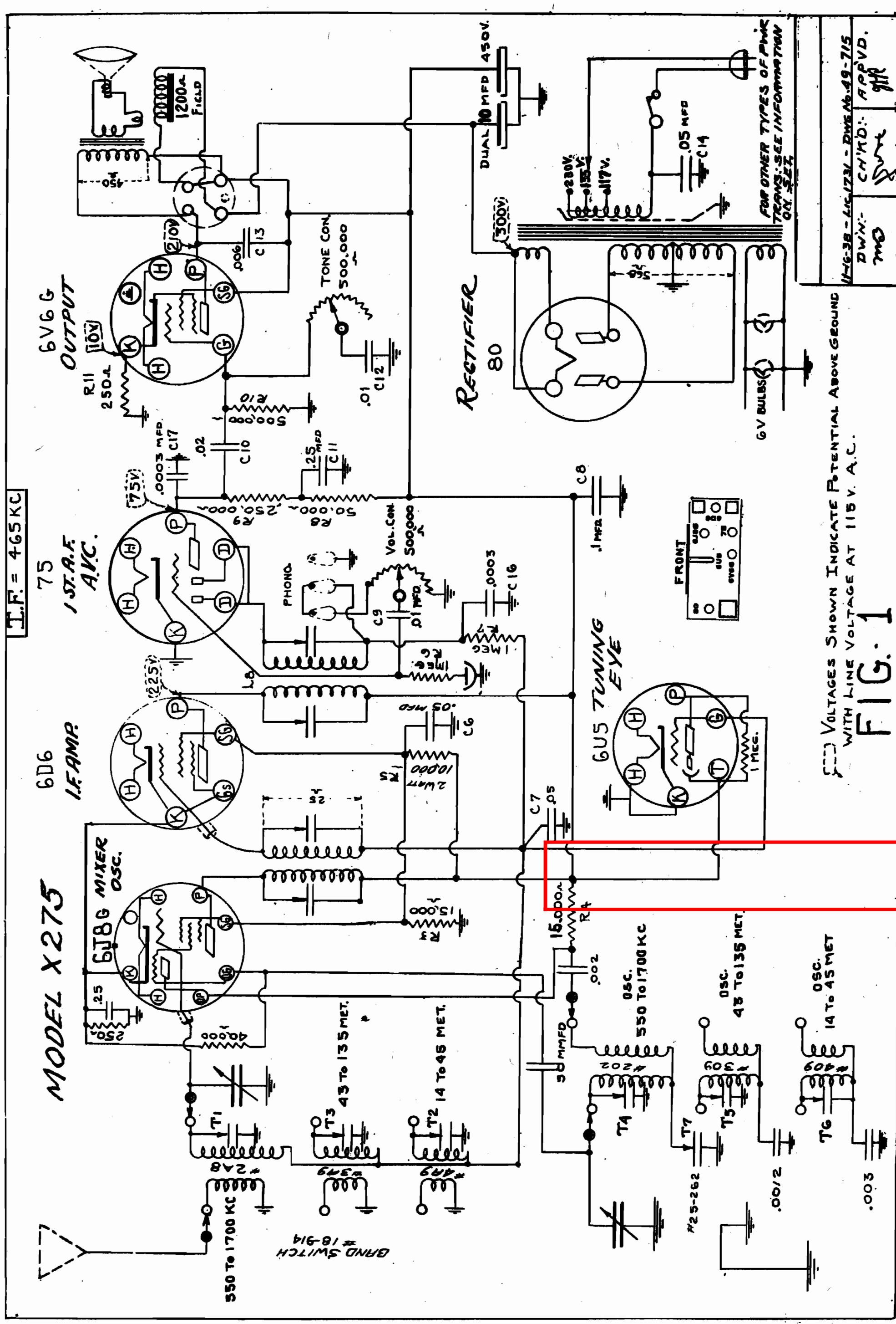


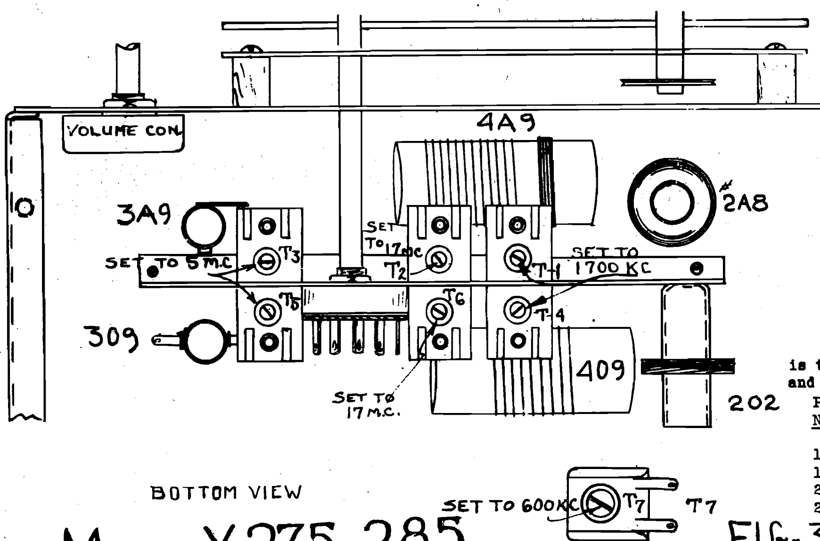
FIG. 1

Use this receiver only with Alternating Current, 40-60 Cycles. The receiver is adaptable to three line voltages; determine the line voltage with which the set is to be used, then check the adjustable plug position on top of the power transformer, with the coded socket for 117, 135 and 240 volts. Insert plug in the correct socket before turning on set. REFER TO INSTRUCTION TAG ATTACHED TO POWER TRANSFORMER.

If any other type transformer is being used, a different tag will explain the correct connections.

MODEL X275
MODEL 285
Trimmers, Alignment
Parts List

HOWARD RADIO CO.



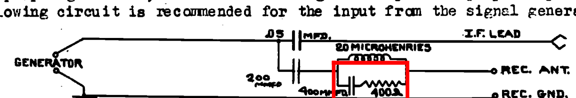
BOTTOM VIEW

MODEL X275, 285 FIG. 3

ALIGNMENT

No change should be made with the I.F. or R.F. adjustments unless it is certain that such adjustments are necessary.

The following instructions are given with the assumption that the service station has the proper generator, means of measuring the output and proper input connections. The following circuit is recommended for the input from the signal generator.



See that the dial hand is straight across when the condenser is at full capacity.

After aligning the four trimmers of the IF system to 465 KC, refer to Fig. 3 showing the position of the R.F. trimmer and the frequency to which they are to be adjusted. Although the dial is calibrated in meters, there will be found on the dial extra points representing the frequency in kilocycles corresponding to the trimmer adjustments as shown in Fig. 3.

N O T E S:

Always peak the oscillator circuit first and recheck after the antenna circuit is adjusted.

Be certain the alignment is not made at an image frequency.

Seal trimmers after final adjustment.

The normal voltages are shown on the schematic circuit taken from the various points to ground.

THE ADAPTATION OF THE SET FOR USE WITH PHONOGRAPH

Out of the back of the chassis there extends three lugs labeled "Phono" 1-2-3. For phonograph use, the jumper is removed and the pick-up leads from the pick-up are connected to Nos. 1 and 2 terminals, with the overall wire shield grounded to No. 3 terminal. A single pole double throw switch may be used to change from Radio to "Phono". See Fig. 2.

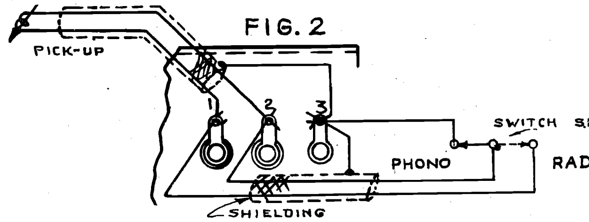


FIG. 2

NOTE:

With certain models, the chassis is floated on cushion rubber. In shipment the chassis is tightened on corner wood strips. To release, loosen the four bottom screws, remove strips and let chassis float free

REPLACEMENT PARTS LIST MODEL 285

PART NUMBER	DESCRIPTION	PART NO.	DESCRIPTION
18-914	Band Switch - 4 pole, 3 position	285	Dial Glass - Specify name on glass
19-212	Choke - 340 Ohm	2-498	Dial Lamp - 6 V. Bayonet Type
22-936	Coil Assembly	12-768	Dial Lamp Socket Assembly
23-936	Coil Assembly	9-328	Drive Disc - 2-3/4" dia. with hub & friction assembly
2A8	Coil - B.C. Antenna	11-328	Drive Disc for mounting on V. Cond.
202	Coil - B.C. Oscillator	285	Drive Shaft with friction discs
4A9	Coil - S.W. Antenna	18-490	Knob for Controls
409	Coil - S.W. Oscillator	2-625	Resistor - Candohm 50 Ohms
3A9	Coil - P.B. Antenna	3-191	Resistance Line Cord, 215 Ohms
309	Coil - P.B. Oscillator	J5-806	Speaker
OC-2	Choke - Oscillator Plate		
32-266	Condenser - Dual 30 Mfd. 150 Volt		
8218-3	Condenser - Single Trimmer		
25-262	Condenser - Padding, 5 Plate		
23-281	Control - Volume		
11-278	Control - Tone & Switch		

REPLACEMENT PARTS LIST MODEL X275

PART NUMBER	DESCRIPTION
18-914	Band Switch - 4 pole, 3 position
22-936A	Coil - 1st I.F. Complete
23-936A	Coil - 2nd I.F. Complete
8547	Coil - P.B. Oscillator (301)
30-266	Condenser, Electrolytic Dual 10, 450 V.
8218-3	Condenser, Single Trimmer
25-262	Condenser, Padding
21-270	Condenser, Variable 2 Gang
11-278	Control - Volume
23-281	Control - Tone & Switch
X275	Dial Glass - Calibrated, specify name on glass
2-498	Dial Lamp - 6 V. Bayonet Type
11-768	Dial Lamp Socket Assembly
11-328	Drive Disc - for mounting on V. Cond. Shaft
9-328	Drive Disc - 2-3/4" dia. with hub & friction assembly
X275	Drive Shaft with friction discs
18-490	Knob for Controls
6-771	Socket and Cable for Tuning Eye
35-810	Speaker - 6-1/2"
52-938	Transformer - 40-60 Cycle, 3 tap Primary
37-938	Transformer - 40-60 Cycle, 2 range Primary

2A8	Coil - B.C. Antenna
202	Coil - B.C. Oscillator
4A6	Coil - S.W. Antenna
406	Coil - S.W. Oscillator
8546	Coil - P.B. Antenna

MODEL 285
Schematic, Voltage
Notes

HOWARD RADIO CO.

THIS RECEIVER CAN BE USED ON EITHER ALTERNATING OR DIRECT CURRENT AND IS ADAPTABLE TO THREE DIFFERENT LINE VOLTAGES BY CHANGING THE TERMINAL ARRANGEMENT ON THE BACK OF THE CHASSIS.

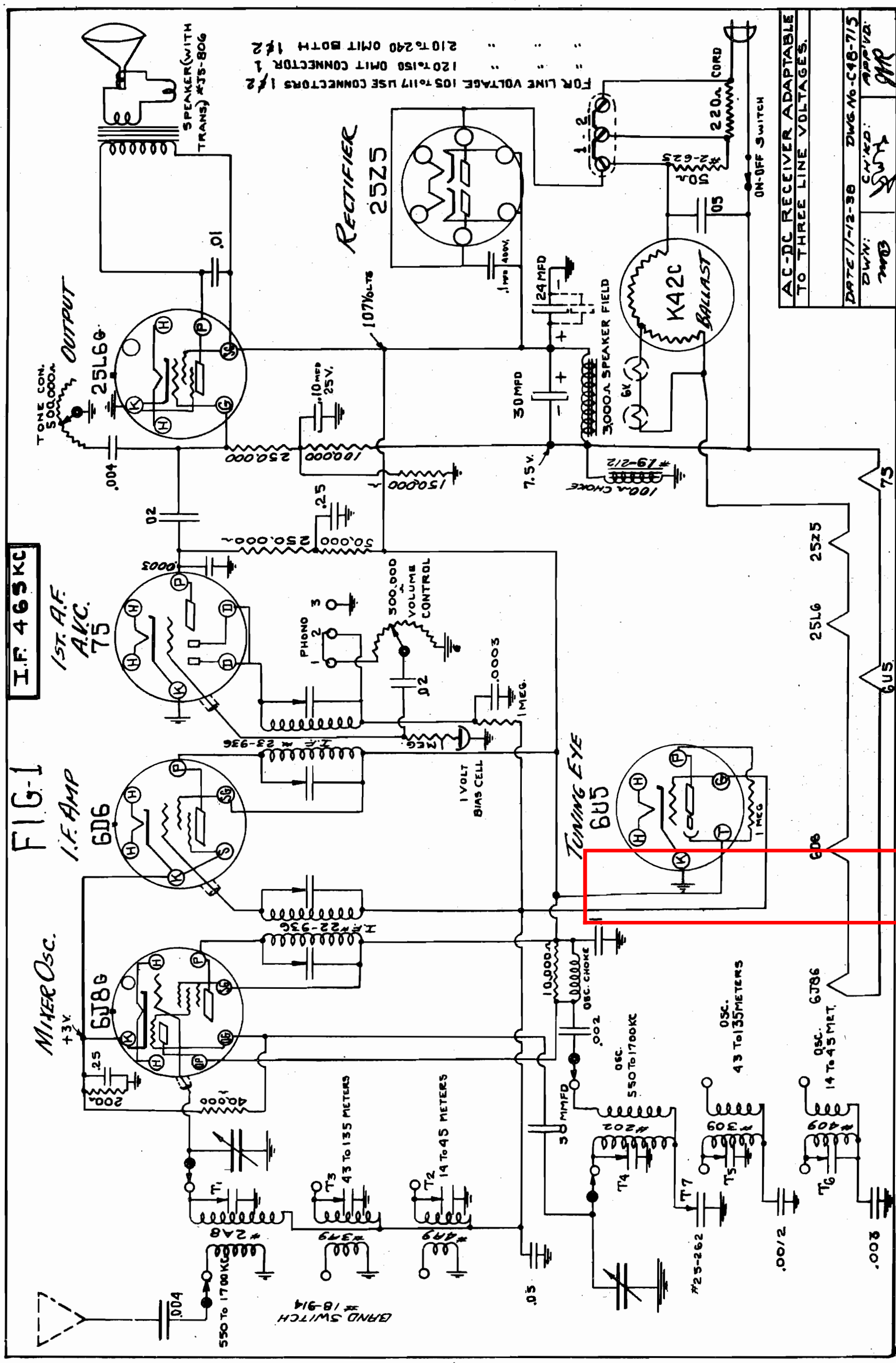
BEFORE CONNECTING RADIO, VERIFY THE VOLTAGE WITH WHICH THE RADIO IS TO BE USED, AND FOLLOW DIRECTIONS AS GIVEN ON CHASSIS, OR AS FOLLOWS:

FOR A LINE VOLTAGE BETWEEN 100 and 125 VOLTS, CONNECT ALL THREE TERMINALS TOGETHER.

FOR A LINE VOLTAGE FROM 125 to 150 VOLTS, OMIT JUMPER BETWEEN EXTREME LEFT TERMINAL AND CENTER TERMINAL.

FOR A LINE VOLTAGE BETWEEN 200 and 240 VOLTS, REMOVE ALL CONNECTIONS.

BE CAREFUL NOT TO LET LOOSE ENDS OF THE WIRES TOUCH THE CHASSIS



MODEL 285

DO NOT USE A GROUND ON THIS RECEIVER.

Each of the three bands has a separate antenna and oscillator coil.

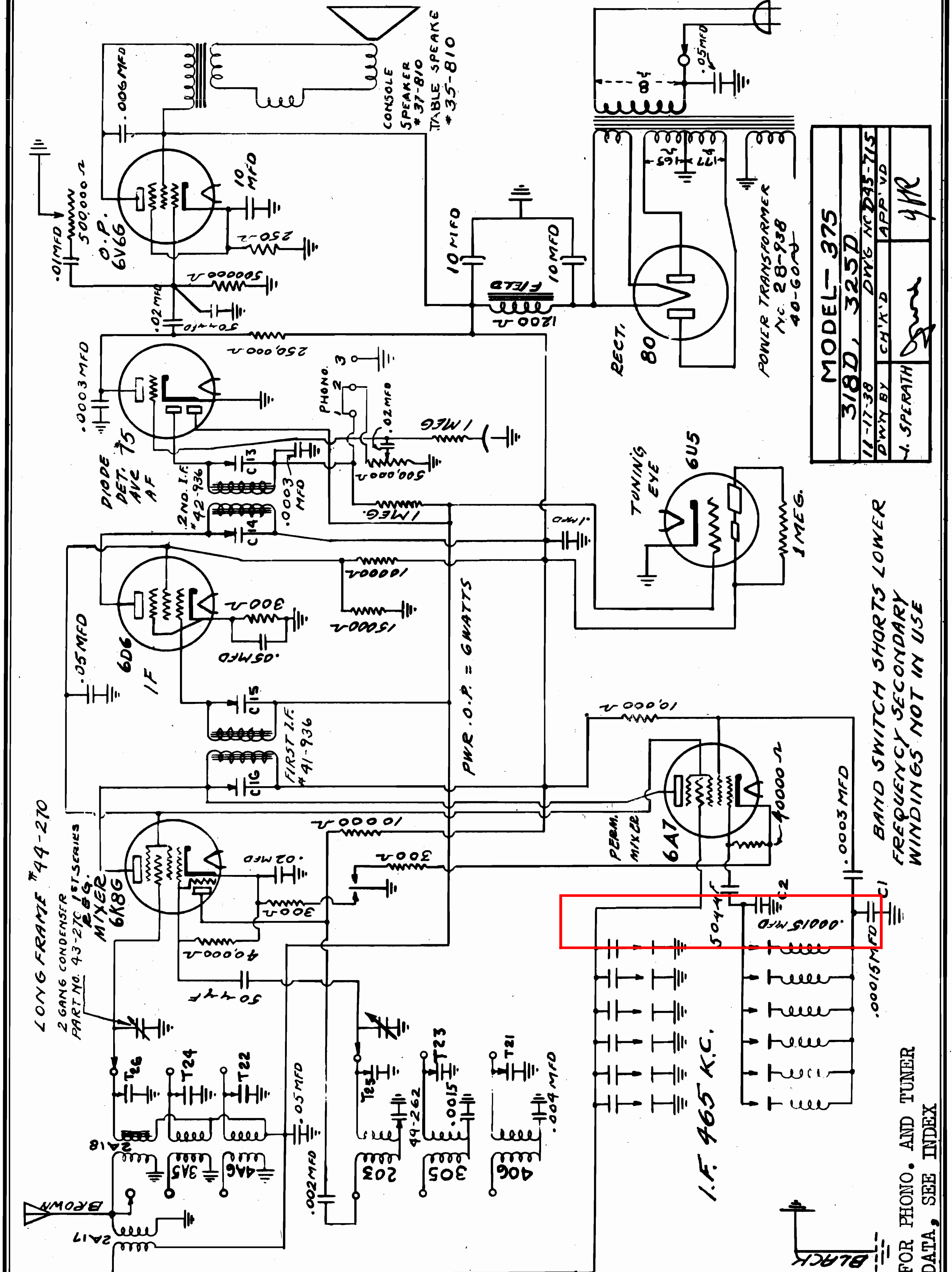
The intermediate frequency stages are tuned to 465 KC and have a sensitivity of about 27 microvolts. (for 50 milliwatt output)

The maximum output is rated at about 4-1/2 watts, and 2.4 watts undistorted.

The three line voltage ranges are obtained by use of the resistance cord, an extra resistor within the chassis, and the Ballast tube. See schematic diagram. The Ballast tube also provides necessary voltage for the two pilot lights connected in series.

MODELS 318D,325D,375
Schematic

HOWARD RADIO CO.



MODEL 377
Schematic, Voltage

HOWARD RADIO CO.

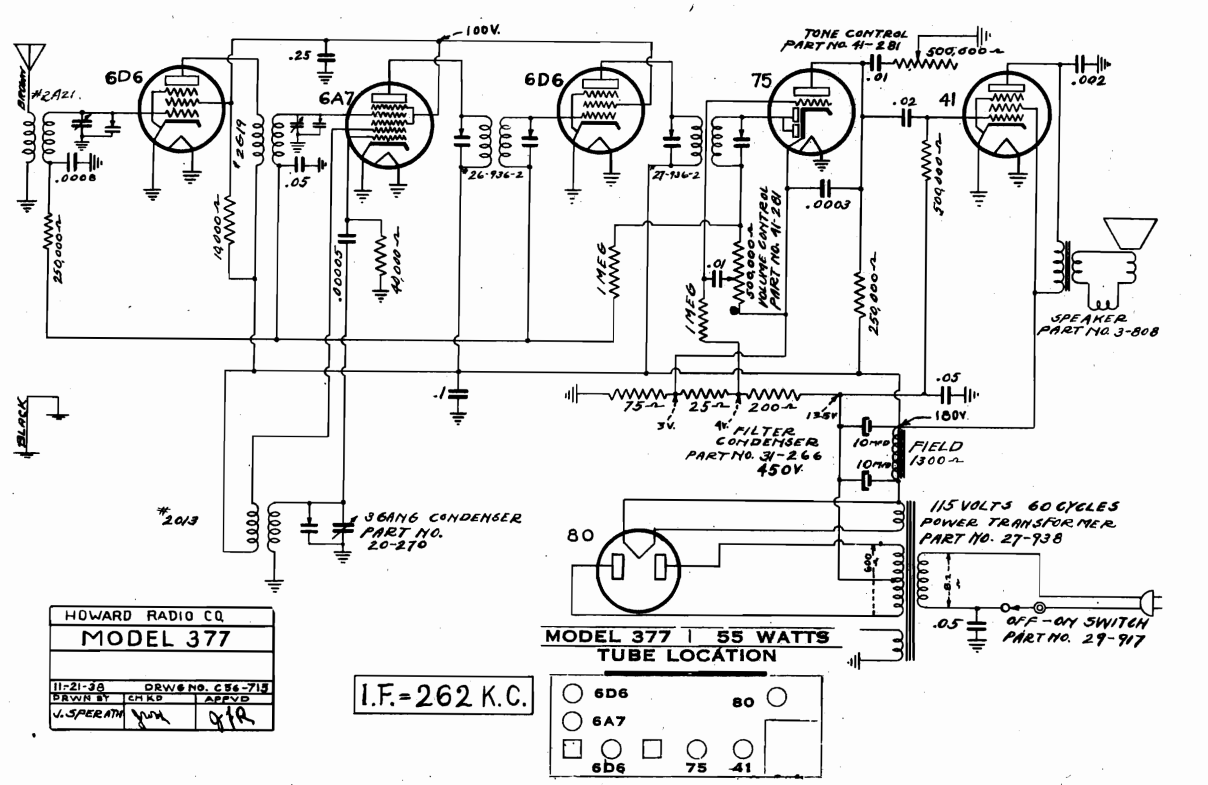
MODELS 318D, 325D, 375
Socket, Trimmers
Alignment

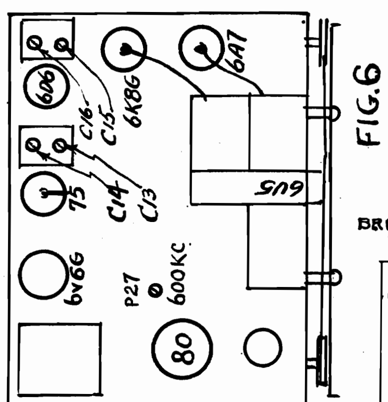
The Model 377 is designed as a single band for Broadcast reception. Three gang condenser is used to tune the Antenna, R.F. and Oscillator circuits. The Intermediate Frequency is 262 KC. The bias voltages are obtained by series resistors from the high voltage center tap to ground. The negative side of the filter is not grounded.

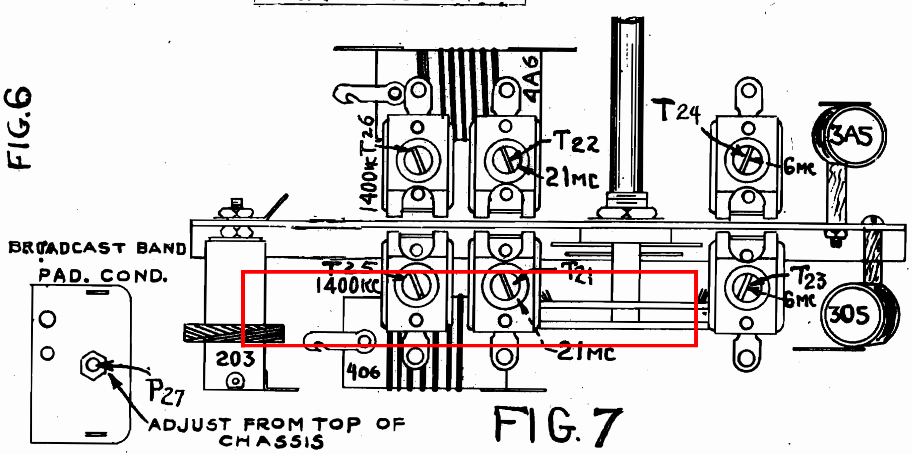
The maximum output obtainable is 2½ watts.

The variable condenser section for the oscillator circuit is the cut-plate type.

See circuit diagram for other specifications.







ALIGNMENT CHART FOR MODEL 375

CHECK BAND SWITCH POSITION & SET DIAL TO	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS FOR 50 MILLIWATT OUTPUT
540 KC	465 KC	Grid of 6K8G	C13, C14, C15, C16 Fig. 6	I.F.	20
21 MC	21 MC	Antenna Lead	T21, T22 Fig. 7	OSC. & ANT.	5
6 MC	6 MC	Antenna Lead	T23, T24	OSC. & ANT.	3
1400 KC	1400 KC	Antenna Lead	T25, T26	OSC. & ANT.	1
600 KC	600 KC	Antenna Lead	P27	OSC. PAD	1

MODELS 1 and 2
Perm-A-Matic Tuners
Adjustments

HOWARD RADIO CO.

SET-UP INSTRUCTIONS FOR HOWARD PERMA-MATIC AUTOMATIC TUNER NO 1

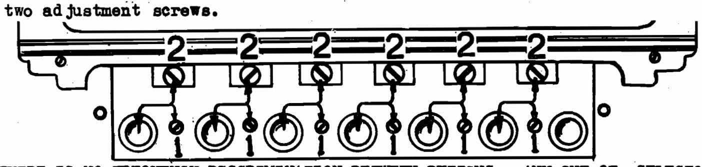
NOTE:-DO NOT ATTEMPT ANY ADJUSTMENTS UNTIL THE SET HAS BEEN TURNED ON AT LEAST 20 MINUTES.

(1) Remove the push-button escutcheon plate by prying forward from ends; taking care not to scratch cabinet.

(2) Depress any one of the selector buttons, tune the desired station in by turning slotted screw with small screw-driver (this screw is numbered 1 in the illustration and is always the screw adjacent to and right of depressed button.) This moves the iron core in oscillator circuits.

(3) Adjust the screw with slotted head for maximum electric eye deflection. This adjustment is numbered 2 in illustration and always the one directly above the station selector adjustment mentioned in above paragraph. If electric eye overlaps on strong stations, adjust for maximum overlap.

When making the two adjustments it is possible to obtain a strong deflection of the tuning eye apparently for a station and yet no station is present. THIS IS A NORMAL CONDITION and just means that the two adjustments are not close enough in relation to each other and can be corrected by varying the two adjustment screws.



THERE IS NO FREQUENCY DISCRIMINATION BETWEEN BUTTONS. ANY ONE OF SELECTORS WILL TUNE THE ENTIRE BROADCAST BAND (1600-540 KC).

NOTICE: DO NOT FORCE ANY ADJUSTMENTS if they tighten up in the course of adjustment, either the maximum or minimum has been reached and the adjustment should be made in opposite rotation.

It will be found easier to adjust if the low frequency stations are started on right side and progress toward high frequency stations to left. IN SAME ORDERS AS MAIN DIAL.

However, the above procedure is not absolutely necessary if there should be some preference for arranging stations otherwise.

AFTER ALL ADJUSTMENTS HAVE BEEN MADE -- GO OVER EACH ADJUSTMENT THE SECOND TIME TO MAKE CERTAIN THEY ARE CORRECT AND TO COMPENSATE FOR SUBSEQUENT ADJUSTMENTS.

It is a big help to tune the desired station in on mail dial while making adjustments, in order that the station can be quickly recognized by switching from manual back to button being adjusted.

It is not necessary to lock any of the adjustments as they are automatically locked.

Place station call letter tabs in escutcheon and replace escutcheon by pressing in place on cabinet.

NOTICE: Turning station selector screw clock-wise lowers the frequency.

Best results will be had when band switch is in broadcast position when using automatic tuning.

USED IN MODELS 318D,325D
375,418,468 AND 525

MECHANICAL ACTION OF THE HOWARD PERM-A-MATIC TUNER NO. 2
8-966
WITH SLIDE TYPE CONTACTS

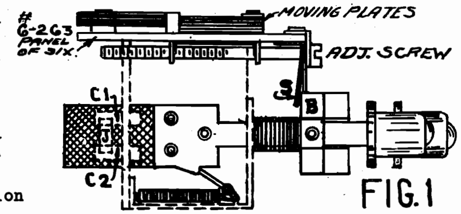


FIG. 1

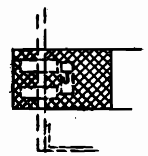


FIG. 2

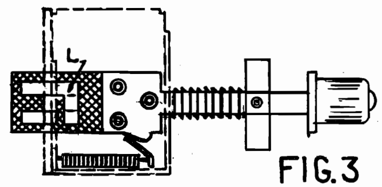


FIG. 3

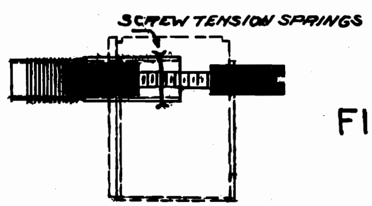


FIG. 4

Fig. 1 shows one of the buttons depressed for a station. The trimmer panel assembly (for the antenna circuit) is designed with spring fingers "S" that make contact with cross bar "B" completing the ground circuit of the R.F. Trimmer.

When making the original set-up, the adjusting screw may indicate two positions for resonance. This is due to the possibility of the small amount of play in the screw thread and is of no concern as long as it is set to the exact resonance point.

The jumper contact "J" connects C1 contact to C2 contact with the button "IN". This completes the oscillator circuit for that particular button.

Fig. 2 shows the jumper position with the button "OUT".

Fig. 3 shows the manual OFF-ON button in the "OUT" position.

The "L" shaped sliding contact is the common cathode return circuit and alternates the bias on the 6K8 for manual tuning or on the 6A7 for push button tuning.

Fig. 4 shows the iron core movement within the oscillator coil. Its position is held stationary by the small spring wire across the coil form. The position of this spring must be such that no spring action is apparent from the end of the adjustment stud due to pressure with a screwdriver. Otherwise, when the screwdriver is removed, the core will shift out of position.

The button is held down by action of the latch bar and is released when another key raises the latch bar on its way down.

If it is necessary to replace a coil, mount it in line with the other coils and cement it in place.

WHEN ORDERING ANY PARTS, SPECIFY PART NUMBER AND DETERMINE WHETHER THE PART IS FOR PERM-A-MATIC TUNER NO. 1 OR NO. 2. TUNER NO. 1 WAS CONSTRUCTED WITH THE SLOTTED BRASS SCREW FOR CORE ADJUSTMENT, WHEREAS TUNER NO. 2 CONSISTED OF THE BLACK RUBBER STUD AS SHOWN IN FIG. 4.

MODEL Perm-A-Matic Tuner
No.9-966 Changes

HOWARD RADIO CO.

REPLACE HOWARD PERM-A-MATIC TUNERS #7-966 or #8-966 WITH PERM-A-MATIC TUNER #9-966 WHICH REQUIRES THE CHANGE OF THE ANTENNA COIL ON THE CHASSIS AS EXPLAINED AT THE BOTTOM OF THIS PAGE.

There are six leads between the tuner and the receiver circuits to be unsoldered. UNSOLDER THE CONNECTIONS FROM THE RECEIVER TERMINALS AND NOT FROM THE TUNING UNIT AS THE NEW TUNER WILL HAVE THE NECESSARY LEADS.

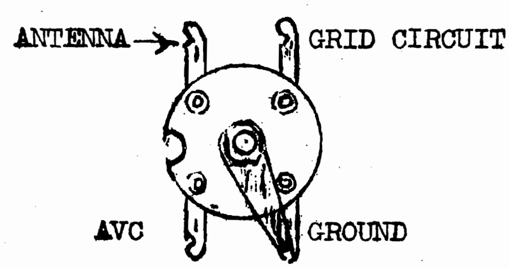
Mechanically, it is only necessary to remove two screws from the front plate to release the tuner.

Due to the fact that the two ceramic condensers (green in color), one each in the grid and plate circuits of the oscillator, are now a part of the new Tuner, they must be removed from within the receiver and returned with the tuner being replaced.

Since the colors of the leads are different in the two type tuners, it is advisable to follow the schematic diagram together with the following chart.

TUNER NO. 1 (7-966) LEAD COLOR	CIRCUIT	TUNER NO. 2 (8-966) TUNER NO. 3 (9-966) LEAD COLOR
Unsolder from ANTENNA COIL 2A17	GRID 6A7	SAME
WHITE WITH BLUE TRACER	CATHODE BIAS SWITCH	SAME
GREEN Unsolder from .0005 Condenser	OSCILLATOR GRID 6A7	SAME
GREEN Unsolder from .0003 Condenser	OSCILLATOR PLATE 6A7	BLUE
BROWN Unsolder from 6K8 Cathode	CATHODE RETURN FOR 6K8	BROWN WITH WHITE TRACER
BLUE	CATHODE RETURN FOR 6A7	GREEN WITH WHITE TRACER

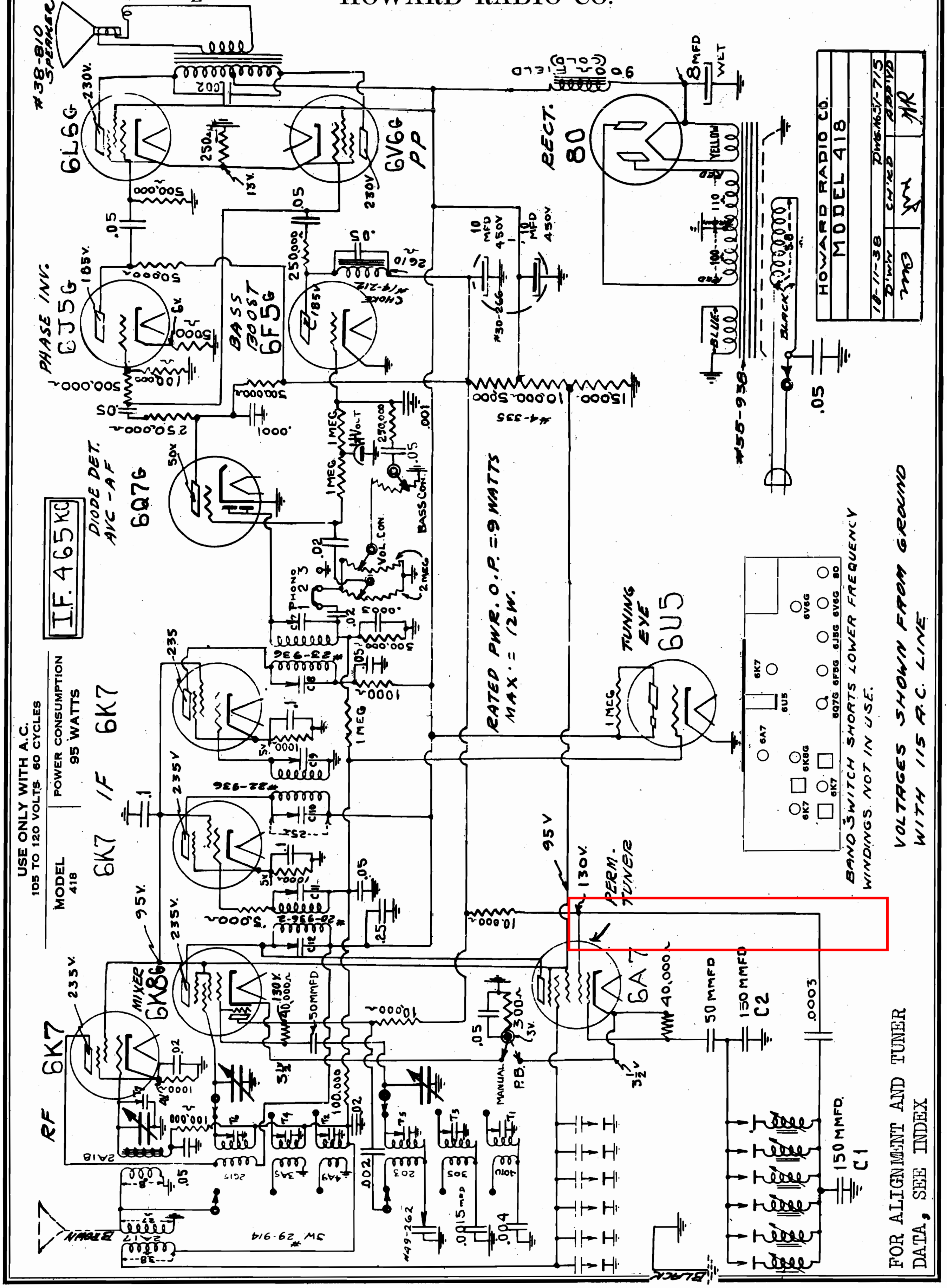
DUE TO THE FACT THAT THIS NEW UNIT, #9-966, HAS A DIFFERENT TRIMMER CAPACITY RANGE, THE ASSOCIATED ANTENNA COIL, 2A17, IN THIS CIRCUIT MUST BE CHANGED TO 2A23. THIS IS THE COIL ON THE LEFT SIDE WHEN FACING FRONT OF SET. FOLLOW DIAGRAM FOR TERMINAL ARRANGEMENT.

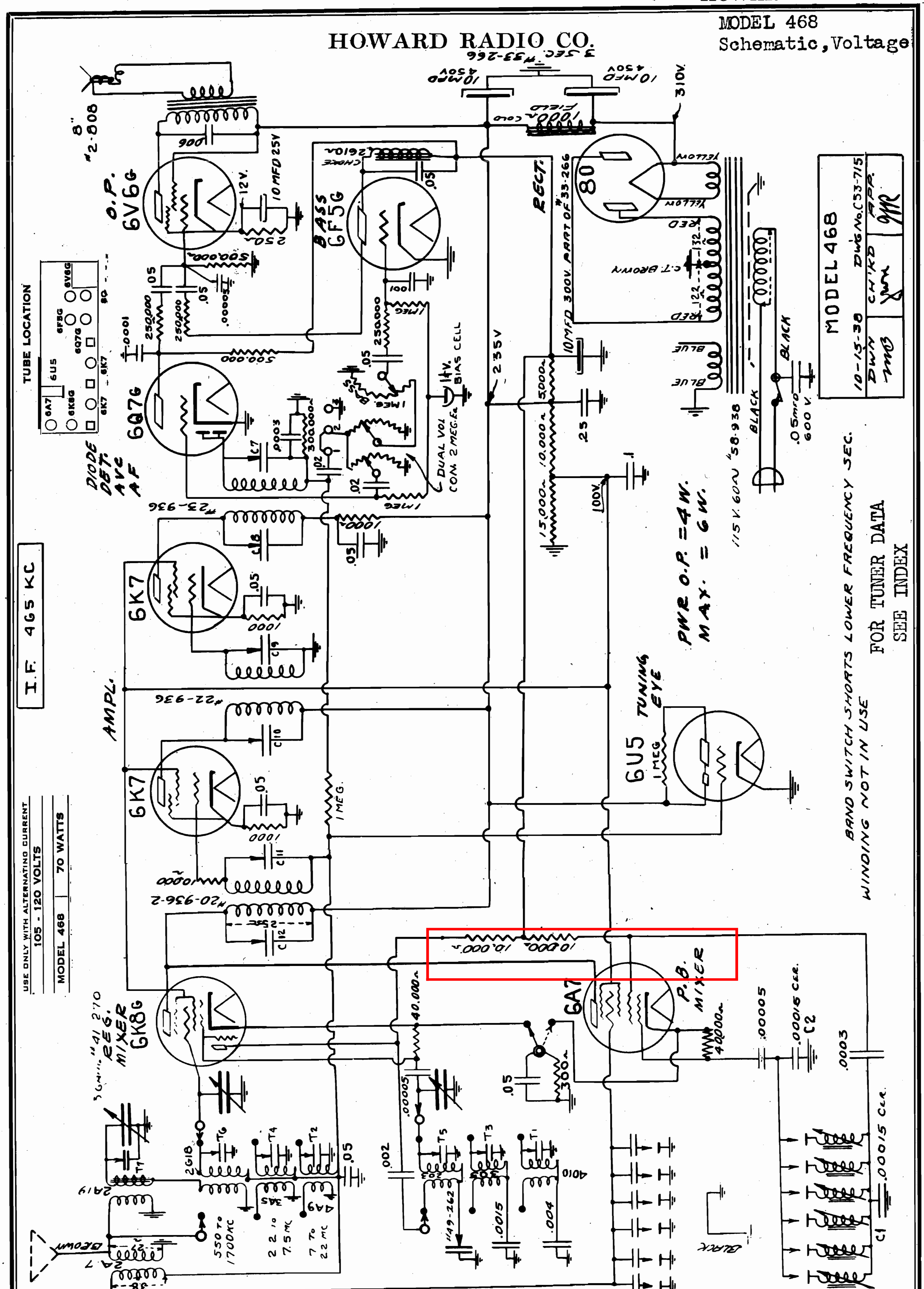


BOTTOM VIEW

MODEL 418
Schematic, Voltage

HOWARD RADIO CO.




HOWARD RADIO CO.
MODEL 468
Schematic, Voltage
MODEL 468
10-15-38
DWG No. C53-715
TUBE LOCATION
I.F. 465 KC
USE ONLY WITH ALTERNATING CURRENT
105 - 120 VOLTS
MODEL 468
70 WATTS
FOR TUNER DATA
SEE INDEX
BAND SWITCH SHORTS LOWER FREQUENCY SEC.
WINDING NOT IN USE
PWR. O.P. = 4W.
MAX. = 6W.
O.P. 6V6G
BASS 6F5G
RECT.
80
6Q7G
DIODE DET. AVC AF
6K7
AMPL.
6K7
6U5
TUNING EYE
6K8G
REG. MIXER
6A7
P.B. MIXER
550 To 1700 KC
2.2 To 7.5 MC
7 To 22 MC

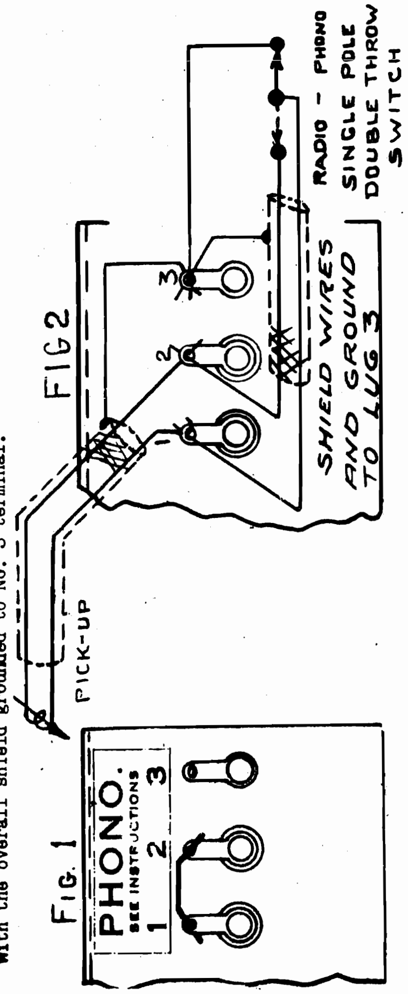
MODEL 418
MODEL 468
MODEL 525
Socket, Trimmers, Alignment
Phono. Data

HOWARD RADIO CO.

MODELS 318D, 325D, 375
Phono. Data

FOR ALL MODELS ADAPTABLE TO PHONOGRAPH CONNECTION

Out of the back of the chassis there extends three lugs as shown in Diagram Fig. 1. For phonograph use, the jumper is removed and a single pole, double throw switch is connected as shown in Fig. 2. The pick-up leads from the pick-up are connected to Nos. 1 and 2 terminals, with the overall shield grounded to No. 3 terminal.



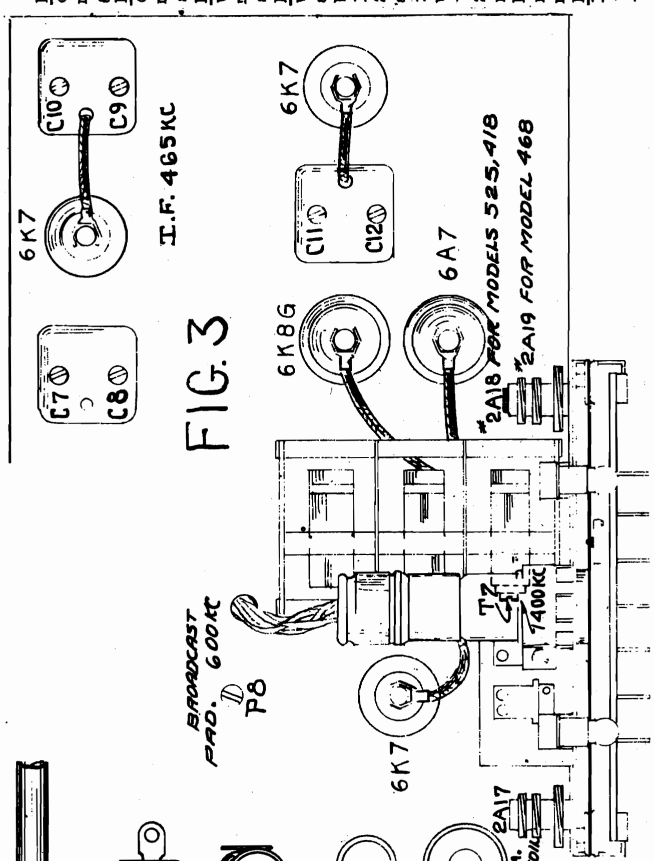
NOTE 1 - When aligning the I.F. channel, a condenser of .05 MFD may be used in series with the generator lead.

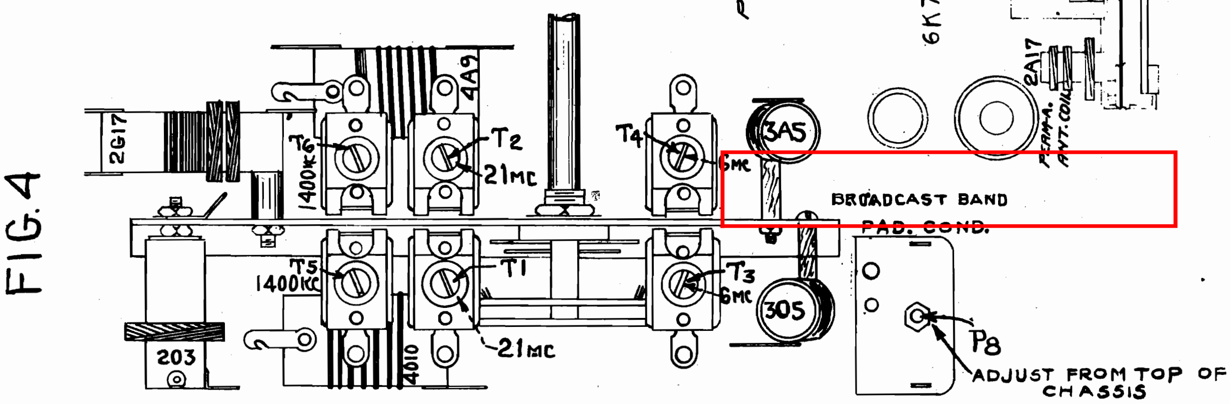
NOTE 2 - When aligning the broadcast band, a 250 MMFD condenser may be used in series with the signal generator.

NOTE 3 - When aligning the short wave bands, a 400 ohm resistor may be used in series with the signal generator.

NOTE 4 - When aligning the short wave band, be sure not to adjust at the image frequency. This can be checked as follows: If the signal generator is set for 21,000 KC, the signal will be heard at 21,000 KC on the dial. The image signal, which is much weaker, will be heard at 21,000 less 2 times the IF, 465, (930KC) or 20,070 KC on the dial. It may be necessary to increase the input to hear the image. If the image is not heard then, the original alignment was not made at the right peak.

NOTE 5 - If there is an apparent lack of sensitivity, especially on the short wave bands, first check the 6K8G tube by substituting one or more in its place.





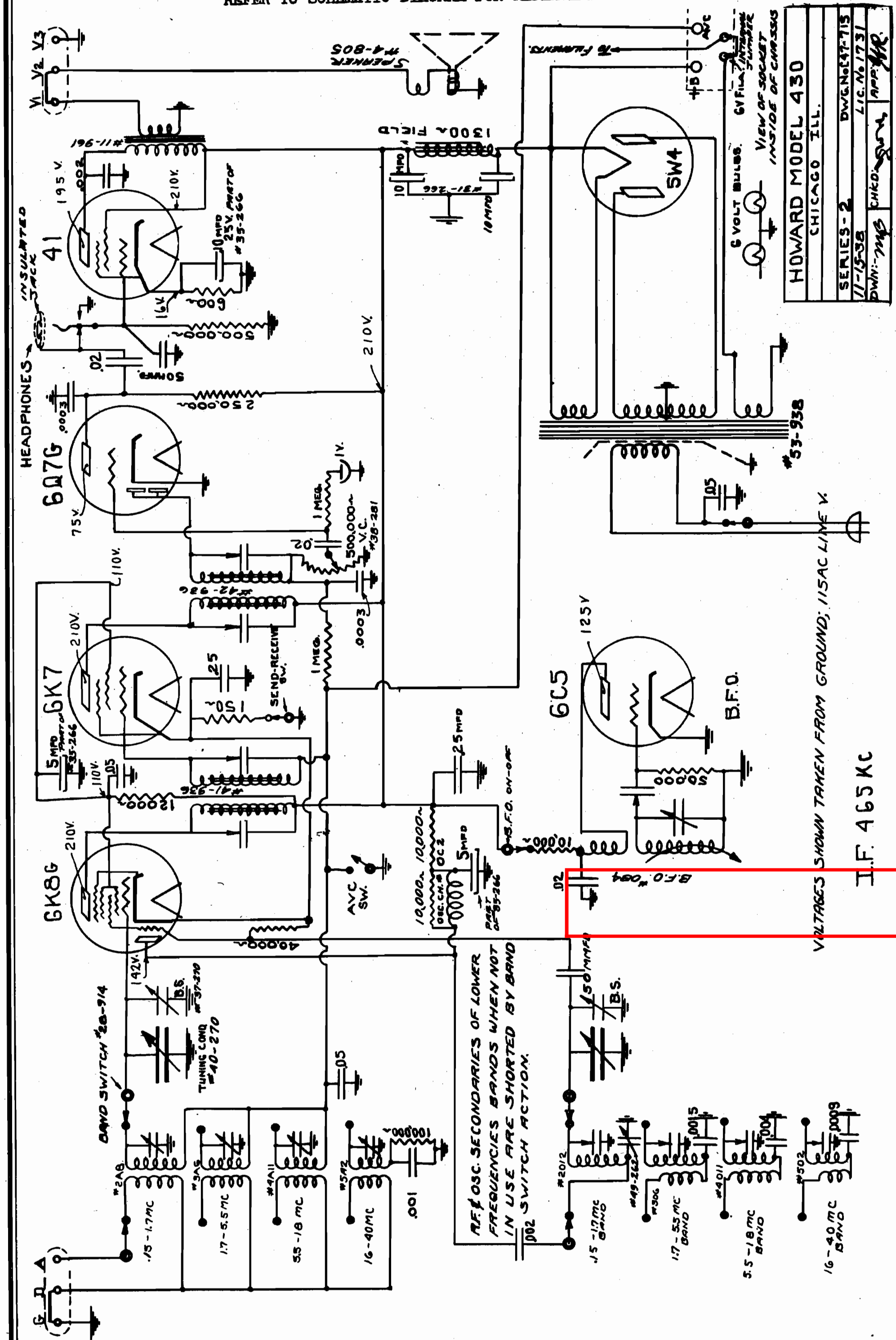
CHECK BAND SWITCH POSITION & SET DIAL TO	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS FOR 50 MILLIWATT OUTPUT
540 KC	465 KC	Grid of 6K8G	C7, C8, C9, C10, C11, C12 Fig. 3	I.F.	10 to 20
21 MC	21 MC	Antenna Lead	T1, T2 Fig. 4	OSC. & ANT.	1
6 MC	6 MC	Antenna Lead	T3, T4 Fig. 4	OSC. & ANT.	5
1400 KC	1400 KC	Antenna Lead	T5, T6, T7 Fig. 4	OSC., R.F. & ANT.	1
600 KC	600 KC	Antenna Lead	P8 Fig. 3	OSC. PAD (Rock Dial)	1

MODEL 430, Series 2
Schematic, Voltage

HOWARD RADIO CO

PART NUMBER	DESCRIPTION
9-132	Ball Bearing - 1/8" Dia.
7601	Bias Cell - 1¼ V.
52-188	Cabinet - Complete
17-829	Coil Spring for Drive Cord
50-262	Condenser - Single Trimmer
49-262	Condenser - Padding, BC Band
	Condenser - .0015 Mfd. - Mica
	Condenser - .0009 Mfd. - Mica
	Condenser - .004 Mfd. - Mica
40-270	Condenser - 2 Gang - Tuning
37-270	Condenser - 2 Gang - Band Spread
31-266	Condenser - "E", 10-10 Mfd. 350 V.
35-266	Condenser - "E", 10-5-5 Mfd. 350,350,25 V.
47-590	Dial Plate - Calibrated
1-288	Drive Cord
27-448	Tuning Hand
38-281	Volume Control - 1 Meg.
3-485	Headphone Jack
41-936	I.F. Assembly Complete (Input)
42-936	I.F. Assembly Complete (Output)
28-448	Indicator Pointer Hands
20-490	Knob - 1-1/8"
21-490	Knob - 1-9/16"
2-498	Pilot Light - 6 V. Bayonet
14-768	Pilot Light Socket - Bayonet
19-427	Pyralin Window
4-167	Rubber Mounting Feet
4-805	Speaker - 6½", Cord and Plug
15-829	Spring Clamp for Ball Bearing on Shaft
14-917	Toggle Switches - S.P.S.T.
53-938	Transformer - Power 115 V. 60 Cycles
11-961	Transformer - Output

REFER TO SCHEMATIC DIAGRAM FOR REPLACEMENT PARTS NOT SHOWN IN ABOVE LIST.

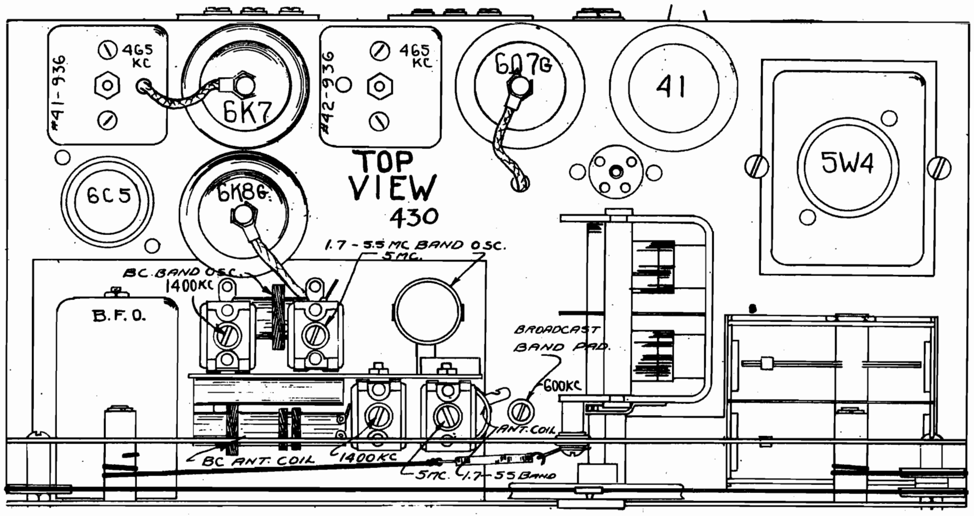


THE POWER OUTPUT for the Model 430 is about 1½ Watts, undistorted. Ceramic coil forms are used on the high frequency band. Ceramic trimmers are used throughout. The unused secondaries of the lower frequency bands are shorted as the band switch is shifted toward the higher frequency bands.

The frequency coverage from .55 to 42 megacycles is divided into four bands. The lower scale from 0 to 100 is for logging purposes. The left hand pointer indicates the band in operation. For correct tuning calibration, the Band Spread pointer must be at 100.

MODEL 430, Series 2
Alignment, Socket
Trimmers, Dial Data
MODEL 438
Dial Data

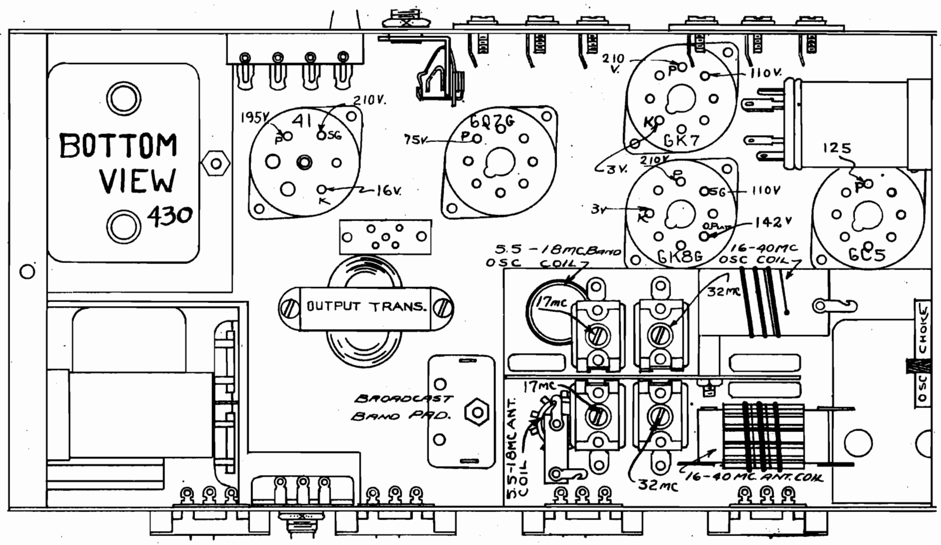
HOWARD RADIO CO.



NOTE 1: When aligning the I.F. channel, a condenser of .05 MFD may be used in series with the generator lead.

NOTE 2: When aligning the broadcast band, a 250 MMFD condenser may be used in series with the signal generator.

NOTE 3: When aligning the short wave bands, a 400 ohm resistor may be used in series with the signal generator.



NOTE 4: After the chassis has been removed from the cabinet, be sure when it is again assembled that the speaker plug is in place in the socket on top of the chassis and that the speaker cable wires do not lay back near the RF circuit, thus causing howling.

NOTE 5: Check for an image signal about .9 mc. lower in frequency. For example:- If a peak has been made at 6 mc. an image should be heard at about 5.1 mc. Otherwise the original setting was not correct.

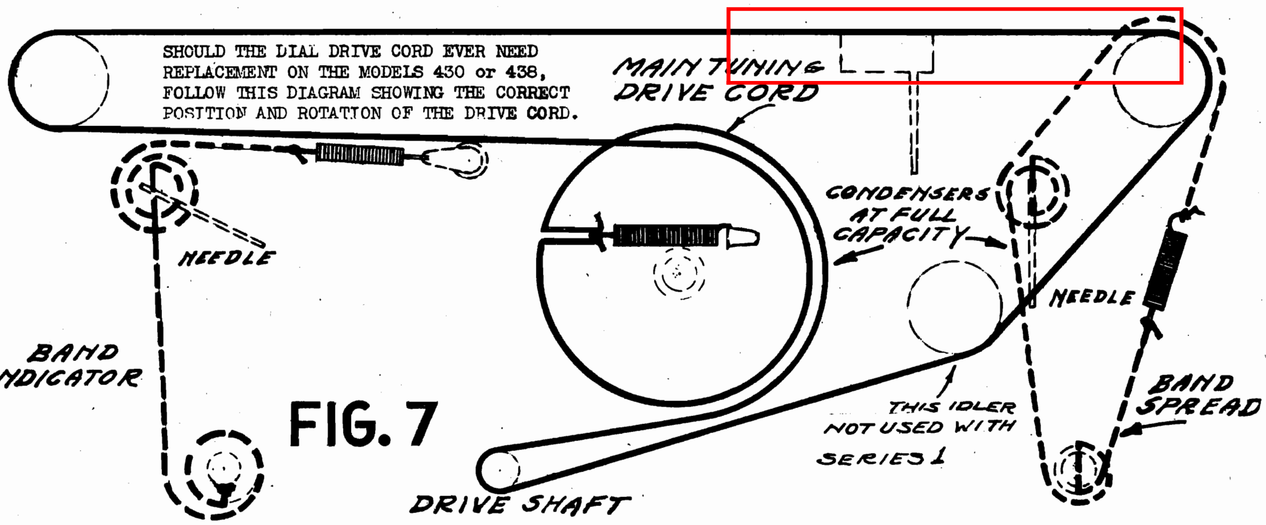
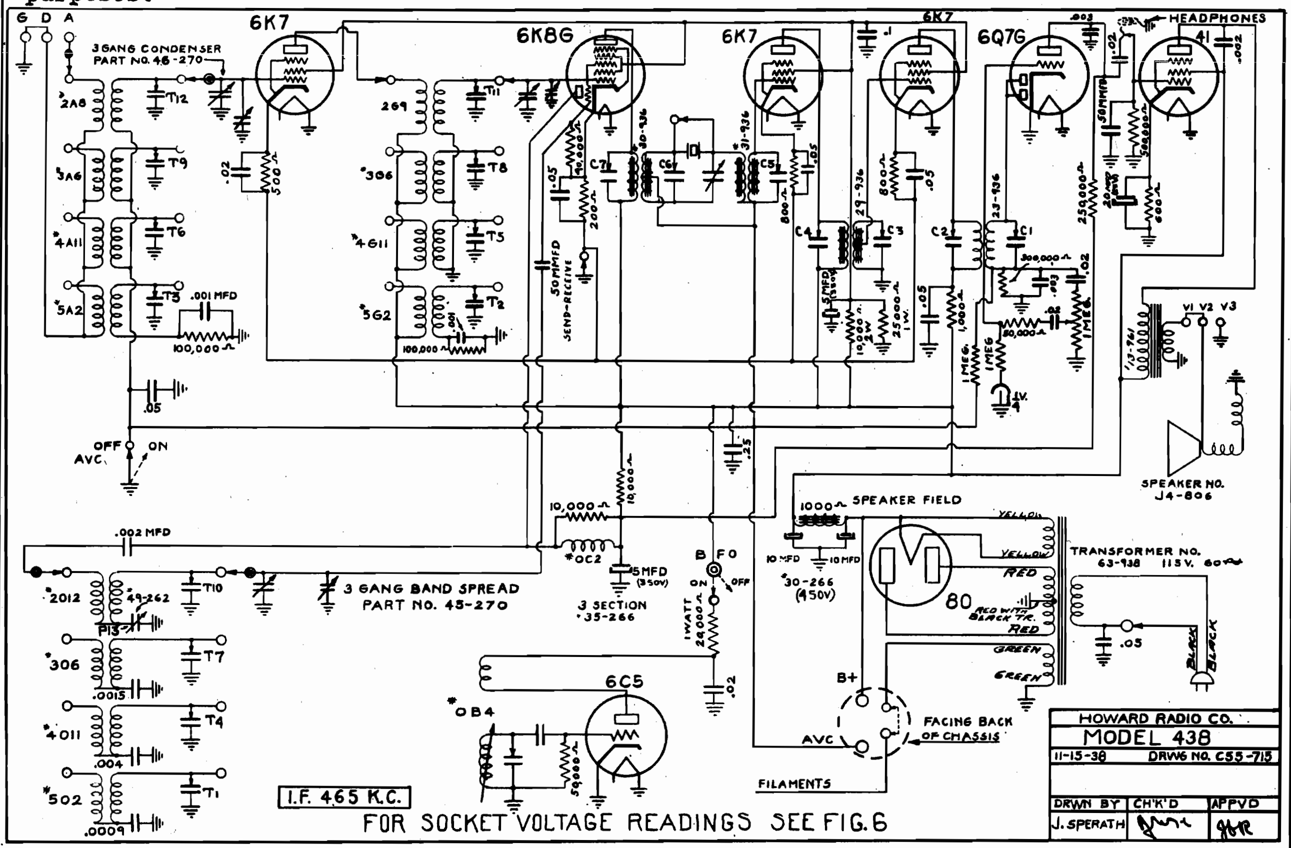


FIG. 7

MODEL 438
Schematic

HOWARD RADIO CO.

The frequency coverage from .55 to 42 megacycles is divided into four bands. The left-hand pointer indicates the band in operation. For correct tuning calibration, the band spread pointer must be set at 100. The lower scale 0 to 100 is for logging purposes.



FOR SOCKET VOLTAGE READINGS SEE FIG. 6

THE POWER OUTPUT will be about $2\frac{1}{2}$ watts, undistorted.

For each band there is a Radio Frequency stage with individual coils for the RF Oscillator and Mixer stages for each band.

Ceramic coil forms are used on the high frequency band. Ceramic trimmers are used throughout. The unused coil secondaries of the lower frequency bands are shorted as the band switch is shifted to the higher bands.

The Intermediate Frequency is 465 KC. The Crystal input, Crystal output, and the 2nd IF consist of windings wound on iron cores.

PART NO.	DESCRIPTION
9-132	Ball Bearing - 1/8" dia.
7601	Bias Cell - $1\frac{1}{4}$ V.
57-188	Cabinet - Complete
17-829	Coil Spring for Drive Cord
50-262	Condenser - Single Trimmer
58-262	Condenser - Variable Trimmer (Xtal Phase)
49-262	Condenser - Padding, BC Band
	Condenser - .0015 Mfd. - Mica
	Condenser - .0009 Mfd. - Mica
	Condenser - .004 Mfd. - Mica
1-303	Crystal - 465 KC
1-288	Drive Cord
35-268	Filter Condenser - 5,5,20 Mfd. 350,350 25 Volt
30-266	Filter Condenser - 10,10 Mfd. 450,450 Volt

PART NO.	DESCRIPTION
3-485	Headphone Jack
28-448	Indicator Pointer Hands
20-490	Knob - 1-1/8"
21-490	Knob - 1-9/16"
2-498	Pilot Light - 6 V. Bayonet
14-768	Pilot Light Socket - Bayonet
19-427	Pyralin Window
19-917	Rotary Switch
7-167	Rubber Mtg. Feet
J4-806	Speaker - $6\frac{1}{2}$", Cord and Plug
15-829	Spring Clamp for Ball Bearing on Shaft
14-917	Toggle Switches - S.P.S.T.
27-448	Tuning Hand
40-281	Volume Control - 1 Meg.

REFER TO SCHEMATIC DIAGRAM FOR REPLACEMENT PARTS NOT SHOWN IN ABOVE LIST.

MODEL 438
Alignment, Socket
Trimmers

HOWARD RADIO CO.

MODEL 440, Series 1,2
Crystal Alignment

NOTE: When using a Crystal set Phasing Control to almost minimum capacity. See special alignment instructions below for Crystal.

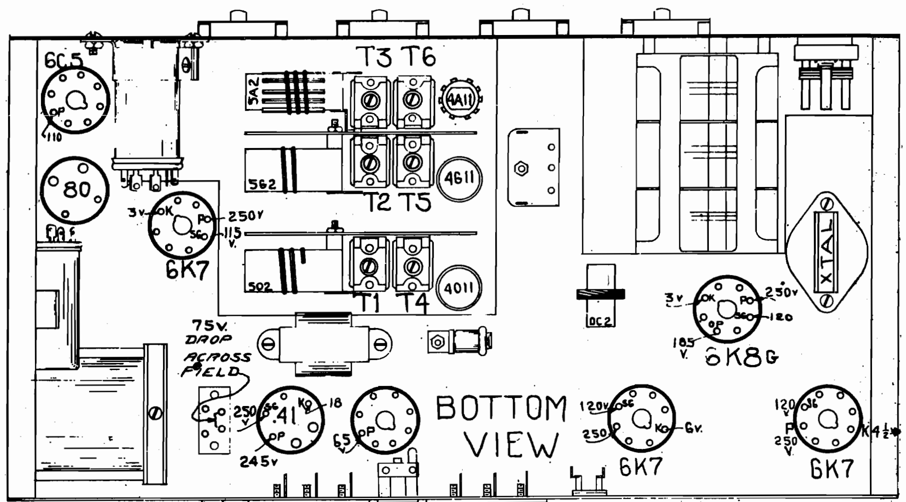


FIG. 5

NOTE 1: When aligning the I.F. channel, a condenser of .05 MFD may be used in series with the generator lead.

NOTE 2: When aligning the broadcast band, a 250 MMFD condenser may be used in series with the signal generator.

NOTE 3: When aligning the short wave bands, a 400 ohm resistor may be used in series with the signal generator.

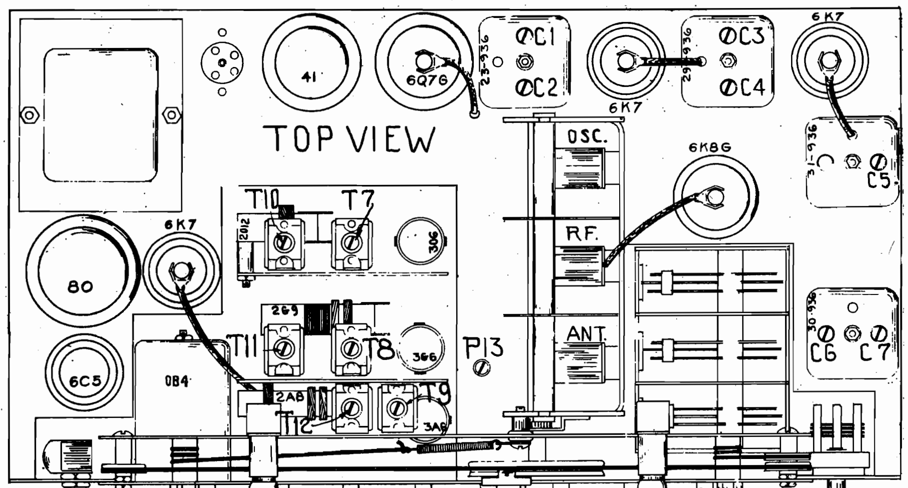


FIG. 6

NOTE 4: After the chassis has been removed from the cabinet, be sure when it is again assembled that the speaker plug is in place in the socket on top of the chassis and that the speaker cable wires do not lay back near the RF circuit, thus causing howling.

NOTE 5: Check for an image signal about .9 mc. lower in frequency. For example:- If a peak has been made at 6 mc. an image should be heard at about 5.1 mc. Otherwise the original setting was not correct.

ALIGNMENT CHART

BAND MC	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	APPROX. MICROVOLTS
IF	465 KC	Grid of 6K8G	See Fig. 6	C1, C2, C3, C4, C5, C6, C7	IF	15
42-16	32 MC	A and DG	See Fig. 5	T1, T2, T3	OSC. RF. ANT.	8
18- 5.5	17 MC	A and DG	See Fig. 5	T4, T5, T6	OSC. RF. ANT.	3
5.5- 1.7	5 MC	A and DG	See Fig. 6	T7, T8, T9	OSC. RF. ANT.	1
1.6- 5.5	1400 KC	A and DG	See Fig. 6	T10, T11, T12	OSC. RF. ANT.	1
1.6- 5.5	600 KC	A and DG	See Fig. 6	P13	OSC. PAD.	1

ALIGNMENT INSTRUCTIONS - FOR RECEIVERS EQUIPPED WITH CRYSTALS

(1) REMOVE CRYSTAL, set crystal phasing condenser to almost minimum capacity and throw "XTAL" switch to "IN" position.

(2) With the 465 KC signal, re-adjust the I.F. Trimmer C-6 by turning the screw counterclockwise. The signal now may be slightly weaker than before and sound "off-side". This, however, is a normal condition.

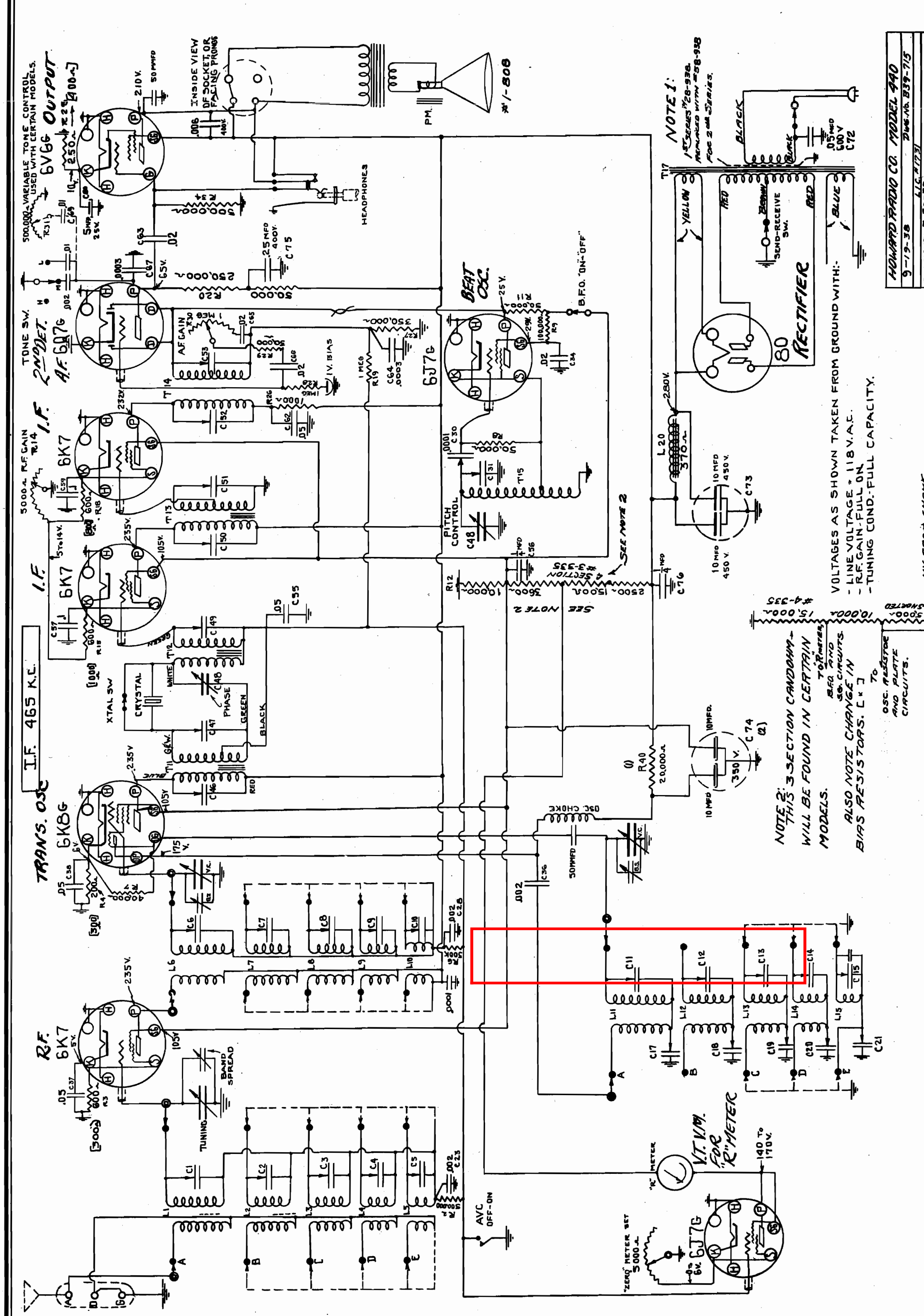
(3) REPLACE THE CRYSTAL - A very noticeable drop in signal strength may be noted due to the filtering action of the crystal and the frequency control of the signal generator must be "rocked" slowly back and forth until the increase in signal strength indicates the exact frequency of the crystal being used. Now re-align the entire I.F. system to this frequency.

(4) Adjust "XTAL" phasing condenser for the lowest pitched note possible and re-adjust signal generator frequency. Repeat and continue to repeat this alignment procedure until no further improvement in the alignment can be accomplished.

NOTE: If the "XTAL" switch should now be thrown to another position, an apparent rise in gain will be noticed, which is caused by the addition of higher frequencies and background noise, so it does not mean that the sensitivity of this set is impaired in any way by use of the crystal.

MODEL 440, Series 1,2
Schematic, Voltage

HOWARD RADIO CO.



USE THIS SET ON 105 TO 120 VOLTS, 60 CYCLE A.C. unless otherwise specified on the back of the set.

MODEL 440, Series 1, 2
Socket, Trimmers
Alignment

HOWARD RADIO CO.

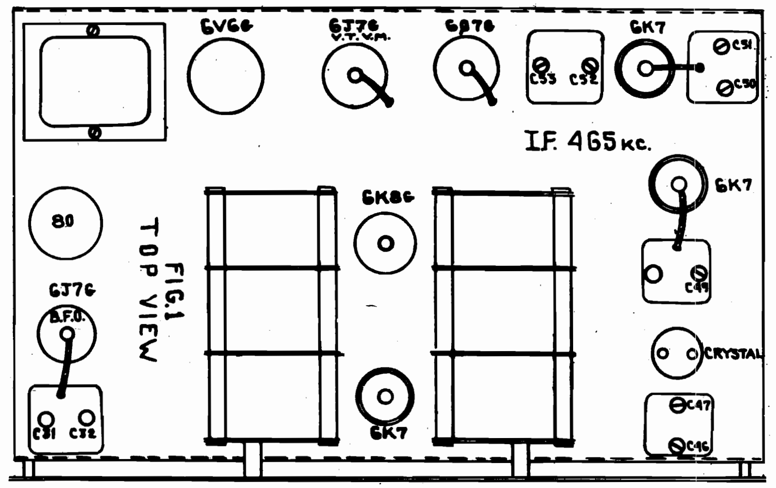


FIG.1
TOP VIEW

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection - 4000 ohm or more copper oxide meter across 5 ohm terminals. Shunt with speaker.

Output meter reading to indicate .5 watt . . . . 1.575 V.

Average sensitivity in microvolts for .5 watt output . . . . See chart below

Generator ground lead connection . . . . Direct to chassis

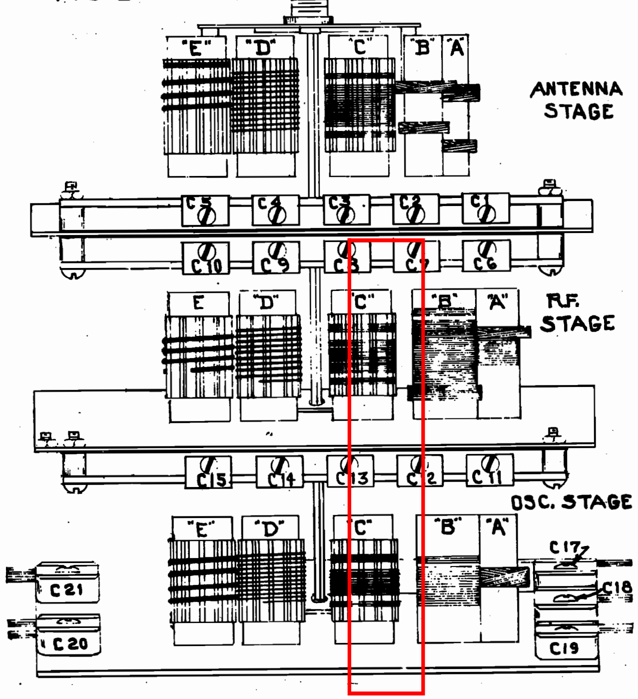
A.V.C. Switch . . . . On

Band spread dial set at 100 . . . . Min. Capacity

Generator modulation . . . . 30%, 400 cycles

Position of volume control A.F. gain Position of volume control R.F. gain . Full On

BOTTOM VIEW
FIG. 2



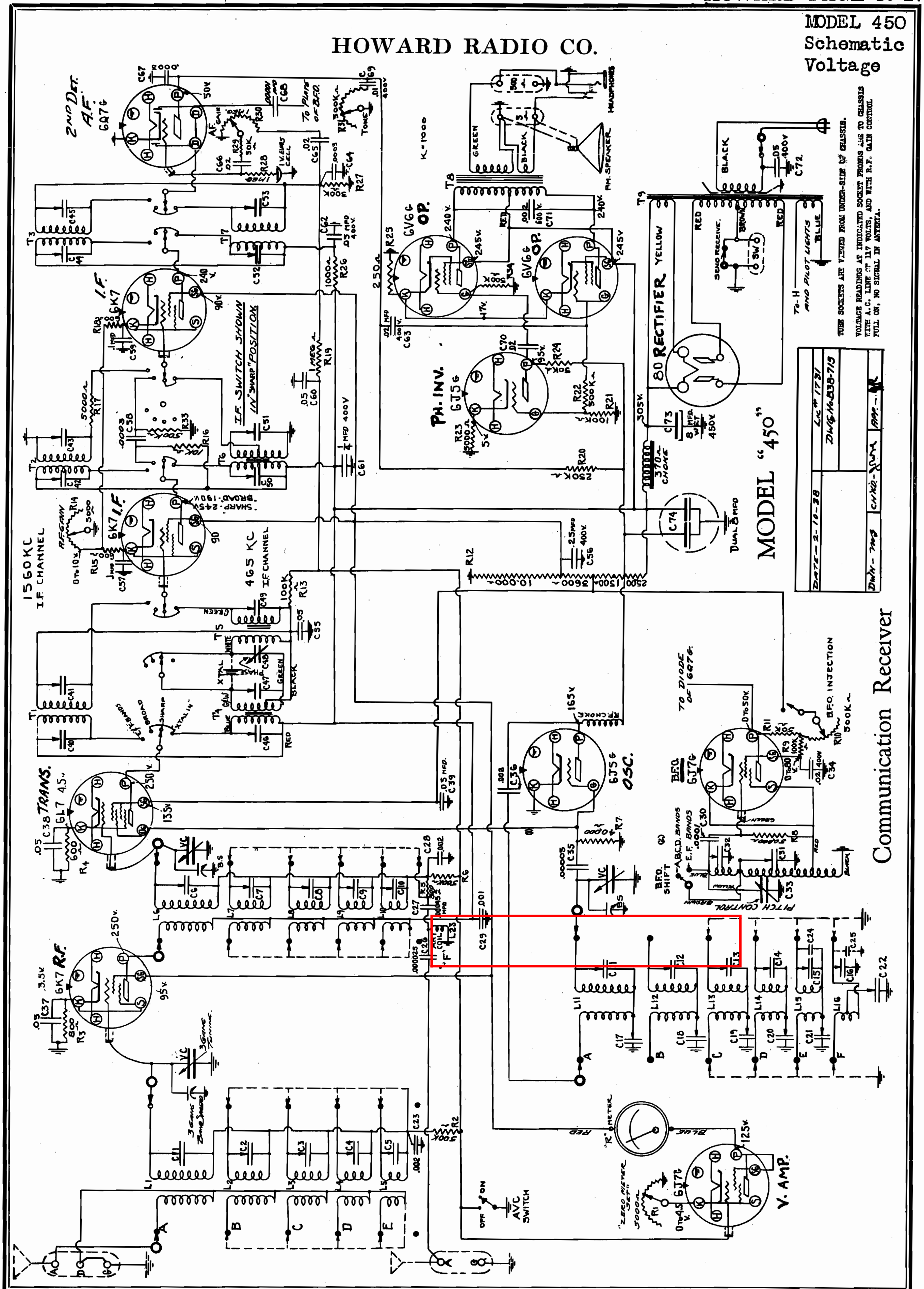
NOTE 1: When aligning the I.F. channel, a condenser of .05 MFD may be used in series with the generator lead.

NOTE 2: When aligning the broadcast band, a 250 MMFD condenser may be used in series with the signal generator.

NOTE 3: When aligning the short wave bands, a 400 ohm resistor may be used in series with the signal generator.

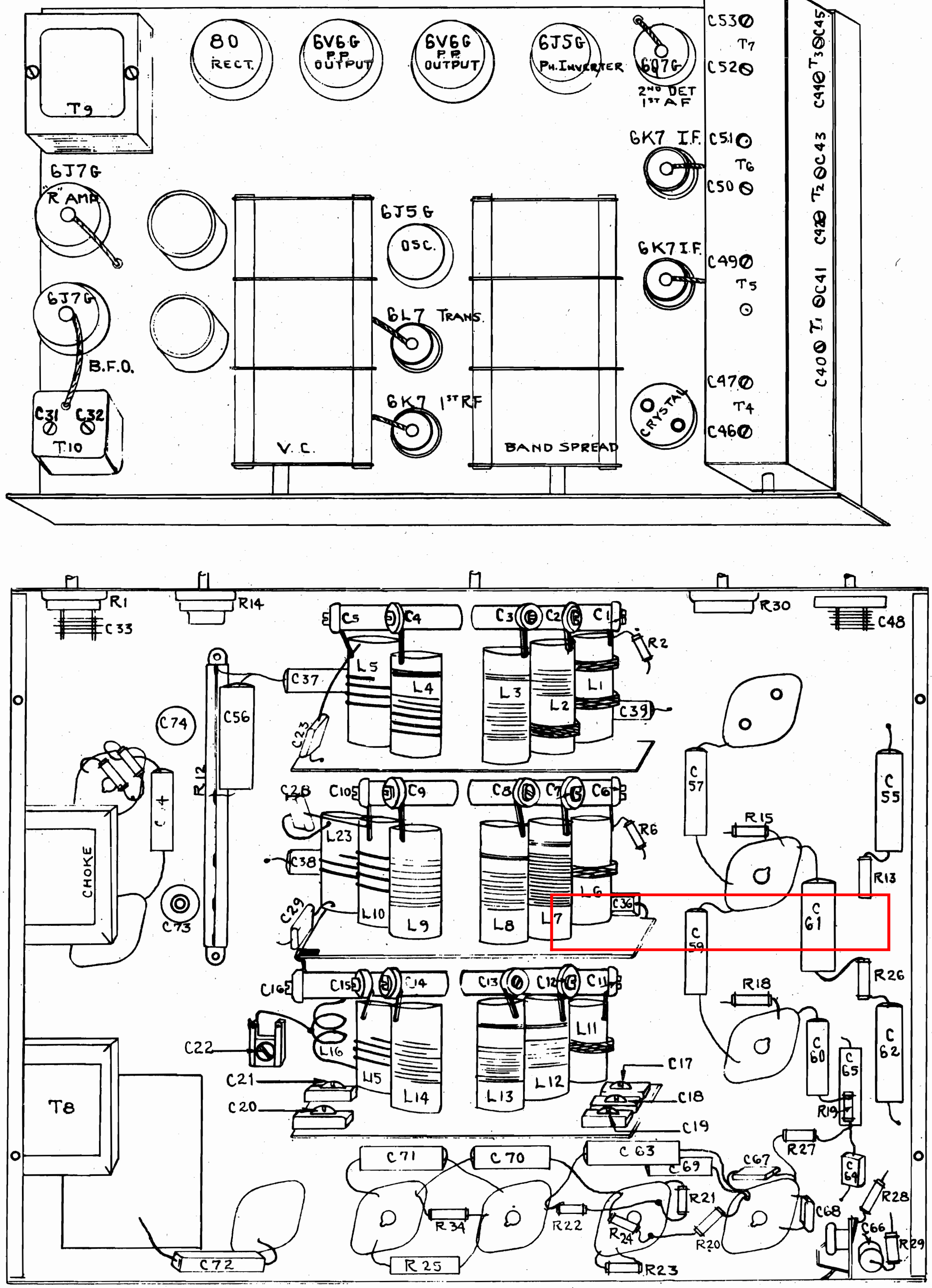
POSITION OF VARIABLE AND BAND SW.	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER ADJUSTMENTS IN ORDER	TRIMMER FUNCTION	APPROX. MICRO-VOLTS
Closed "A" Band	465 KC	6L7 Grid	See Fig.1	C53, 52, 51, 50, 49, 47, 46	I.F.	15
36 MC "E"	36 MC	A-D-G Ant. Term.	See Fig.2	C15, 10, 5	Osc. Trans. Ant.	3
16 MC "E"	16 MC	A-D-G Ant. Term.		C21	Padder	3
15 MC "D"	15 MC	A-D-G Ant. Term.	See Fig.2	C14, 9, 4	Osc. Trans. Ant.	1
7 MC "D"	7 MC	A-D-G Ant. Term.			Padder	1
6 MC "C"	6 MC	A-D-G Ant. Term.	See Fig.2	C13, 8, 3	Osc. Trans. Ant.	1
3 MC "C"	3 MC	A-D-G Ant. Term.		C19	Padder	1
2.6 MC "B"	2.6 MC	A-D-G Ant. Term.	See Fig.2	C12, 7, 2	Osc. Trans. Ant.	1
1.3 MC "B"	1.3 MC	A-D-G Ant. Term.		C18	Padder	1
1.2 MC "A"	1200 KC	A-D-G Ant. Term.	See Fig.2	C11, 6, 1	Osc. Trans. Ant.	1
.6 MC "A"	600 KC	A-D-G Ant. Term.		C17	Padder	1

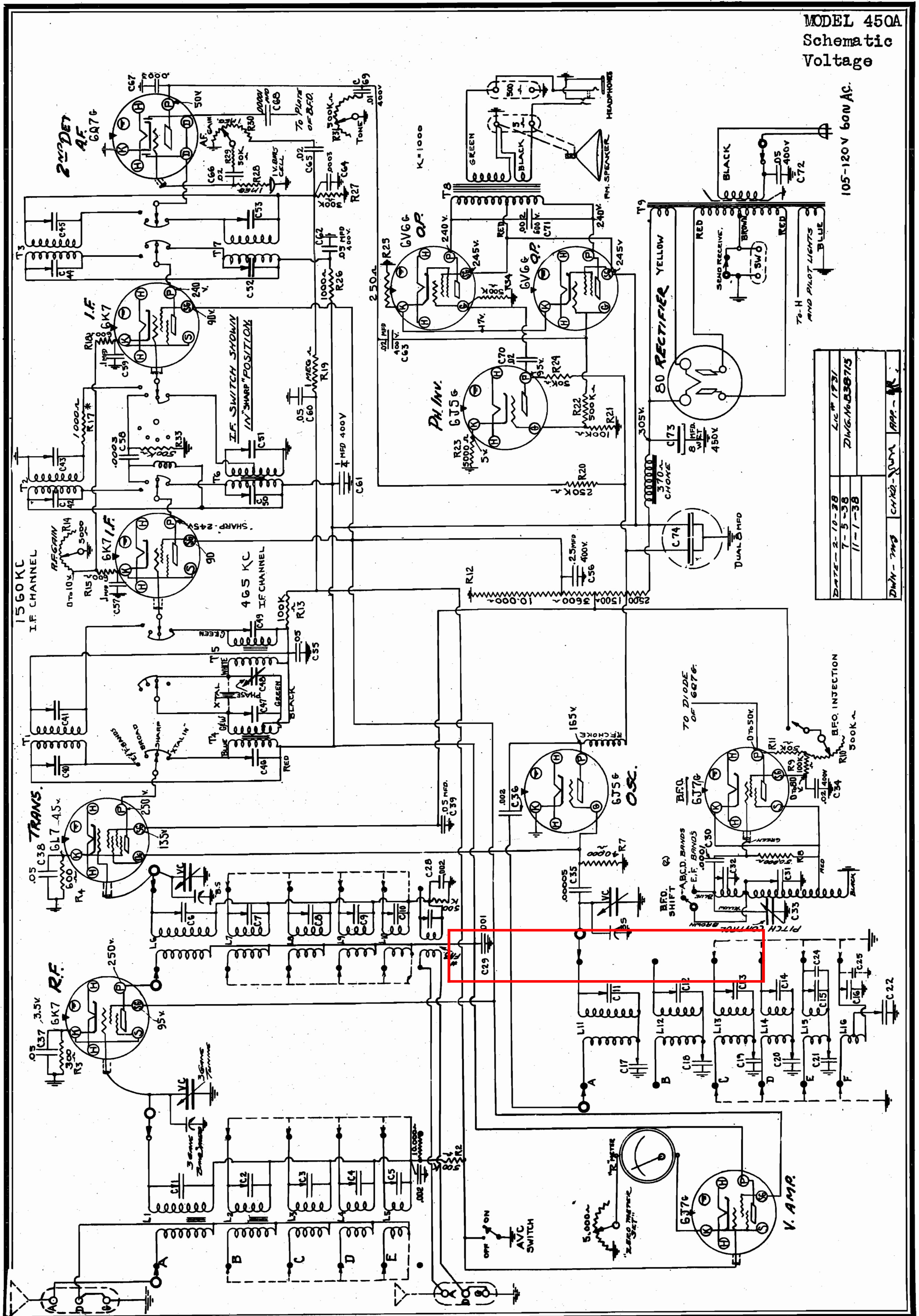
NOTE 4: When using a CRYSTAL, set PHASING CONTROL to almost minimum capacity. See special alignment instructions for Crystal MODEL 438


HOWARD RADIO CO.
MODEL 450
Schematic
Voltage
MODEL "450"
Communication Receiver

MODEL 450
MODEL 450A
Socket, Trimmers
Chassis

HOWARD RADIO CO.




MODEL 450A
Schematic
Voltage
2nd DET A.F. 6Q7G
I.F. 6K7
6K7 I.F.
TRANS. 6L7
R.F. 6K7
PH. INV. 6J5G
6V6G O.P.
6V6G O.P.
80 RECTIFIER
6J5G OSC.
B.F.O. 6J7G
6J7G V. AMP.
1560 KC I.F. CHANNEL
465 KC I.F. CHANNEL
I.F. SWITCH SHOWN IN "SHARP" POSITION
105-120 V 60~ AC.
HEADPHONES
P.M. SPEAKER
AVC SWITCH
B.F.O. INJECTION
B.F.O. SHIFT
PITCH CONTROL
SEND RECEIVE
DUAL 8 MFD

MODEL 450
MODEL 450A
Antenna Data

HOWARD RADIO CO.

Color Code Data

ALIGNMENT FREQUENCIES:

Band A	600 AND 1200	KC
Band B	1.3 AND 2.6	MC
Band C	3.0 AND 6.0	MC
Band D	7.0 AND 15	MC
Band E	16 AND 36	MC
Band F	40 AND 60	MC

BANDS E & F - . . . . 1560 KC

LOUD SPEAKER:

Type . . . . . . Permanent Magnet Dynamic
Size . . . . Within Separate Case 10 Inch

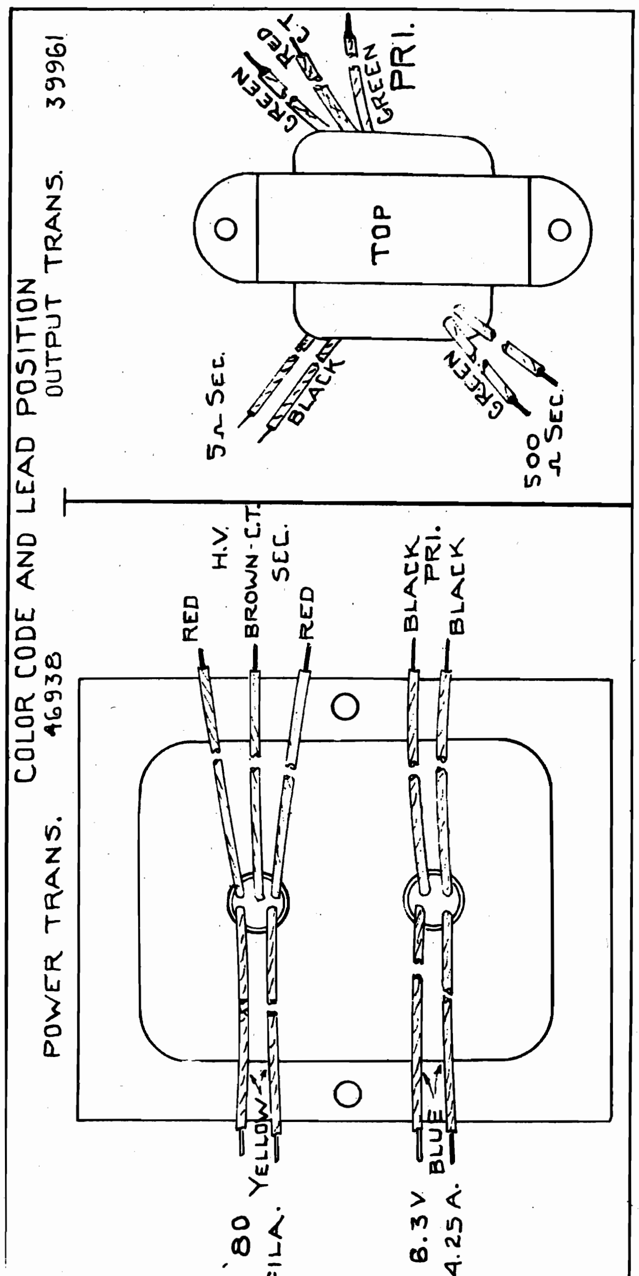
INTERMEDIATE FREQUENCY = BANDS A, B, C, & D - 465 KC

CHASSIS FEATURES:

SEND-RECEIVE terminals in rear of chassis for break-in connection.
RF Stages . . . . One
VARIABLE CONDENSER . . . . . . Three Gang
ANTENNAE . . . . TWO REQUIRED
TYPE . . . . SEE PAGE 3
HEADPHONE JACK . . . . ON FRONT PANEL
Crystal Phaser.
Beat Frequency Oscillator, Pitch Control.
B.F.O. OFF-ON Switch with Injection Control.
Two range B.F.O. switch

OPERATING FEATURES:

A.V.C. with ON-OFF Switch
Three Gang Electrical Band Spread
A.F. Gain or Audio Level
R.F. Gain or Sensitivity
Tone Control
"R" Meter Showing Signal Strength
"R" Meter Zero Adjustment
Four-position IF Setting: 1560 KC
Iron Core Broad 465 KC
Iron Core Sharp 465 KC
Crystal Filter-In Position



POWER OUTPUT:

Type . . . . Push Pull Output
Undistorted . . . . 9 Watts
Maximum . . . . 15 Watts

SPECIFICATIONS FOR A 5 METER ANTENNA

On the "F" band, we have found very good results by the use of a vertical rod 3/16" in diameter and about 59" long. Note that the lead from the base of this rod to the antenna terminal of the set should not be more than about eight inches.

The "G" terminal is for the connection to ground.

THE THREE TERMINALS - A, D, and G in the middle back of the chassis are for the ANTENNA AND GROUND connections. When using the conventional flat-top and lead-in type of antenna, CONNECT THE LEAD-IN TO THE TERMINAL MARKED "A", being sure that a wire jumper connects from D to G terminals. The G terminal is for the ground connection.

For any DOUBLET TYPE of antenna, remove the shorting jumper from D to G and connect the two leads of the doublet system to A and D.
Note* For maximum performance on short waves especially the two highest bands, a little experimenting can be done regarding the antenna location, length and type which is very important.
THE TERMINALS MARKED 500 OHMS which are connections from the out-put transformer can be connected when and if desired to any output load having 500 ohms impedance.
THE TERMINALS MARKED S W are for use of an external switch to turn the set on or off for a stand by This set of contacts may be connected to a relay or separate switch. Since these terminals are in the circuit across the panel switch for SEND and RECEIVE the switch would therefore have to be in the SEND position if the back CONTACTS are used in any way.

MODEL 450
MODEL 450A
Alignment

HOWARD RADIO CO.

PRELIMINARY:

ALIGNMENT PROCEDURE

Output meter connection......................4,000 ohm or more copper oxide meter across 5 ohm terminals. Shunt with speaker

Output meter reading to indicate .5 watt..1.575 V.

Average sensitivity in microvolts for .5 watt output..................................See chart below

Generator ground lead connection..Direct to chassis

Dummy antenna value in series with generator output...................................See Note 1 below

Connection of generator output lead...See Chart Below

Generator modulation..30%, 400 cycles

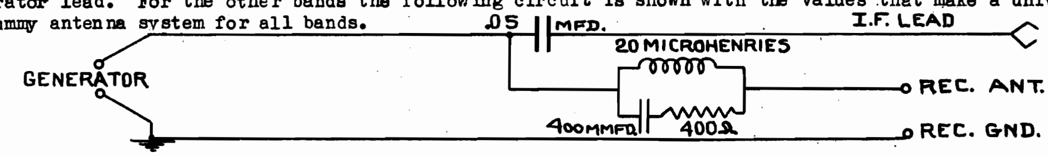
Position of volume control A.F. gain..Full on

Position of volume control R.F. gain..Full on

A.V.C. Switch...On

Band spread dial set at 100...Min. Capacity

NOTE 1 When aligning the two I.F. channels a condenser of .05 Mfd. may be used in series with the generator lead. For the other bands the following circuit is shown with the values that make a universal dummy antenna system for all bands.



POSITION OF VARIABLE AND BAND SW.	GENERATOR FREQ.	GENERATOR CONNECTION	POSITION OF I.F. BAND SWITCH	TRIMMER ADJUSTMENTS IN ORDER	TRIMMER FUNCTION	APPROX. MICROVOLTS
Closed "A" Band	465 KC	6L7 Grid	"XTAL" See Note 2	C53,52,51 50,49,47,46	I.F.	15
Closed "A" Band	1560 KC	6L7 Grid	"E" & "F"	C45,44,43 42,41,40	I.F.	15
60 MC "F"	60 MC	A-G Ant. Term.	"E" & "F"	C16	Osc.	Approx. 10
40 MC "F"	40 MC	A-G Ant. Term.	"E" & "F"	C22	Padder	Approx. 10
36 MC "E"	36 MC	A-D-G Ant. Term.	"E" & "F"	C15,10,5	Osc. Trans. Ant.	Approx. 3
16 MC "E"	16	A-D-G Ant. Term.	"E" & "F"	C21	Padder	Approx. 3
15 MC "D"	15 MC	A-D-G Ant. Term.	XTAL or "Sharp"	C14, 9,4	Osc. Trans. Ant.	Approx. 1
7 MC "D"	7 MC	A-D-G Ant. Term.	XTAL or "Sharp"	C20	Padder	Approx. 1
6 MC "C"	6 MC	A-D-G Ant. Term.	XTAL or "Sharp"	C13, 8,3	Osc. Trans. Ant.	Approx. 1
3 MC "C"	3 MC	A-D-G Ant. Term.	XTAL or "Sharp"	C19	Padder	Approx. 1
2.6MC "B"	2.6	A-D-G Ant. Term.	XTAL or "Sharp"	C12, 7,2	Osc. Trans. Ant.	Approx. 1
1.3MC "B"	1.3	A-D-G Ant. Term.	XTAL or "Sharp"	C18	Padder	Approx. 1
1.2MC "A"	1200 KC	A-D-G Ant. Term.	XTAL or "Sharp"	C11, 6,1	Osc. Trans. Ant.	Approx. 1
.6 MC "A"	600 KC	A-D-G Ant. Term.	XTAL or "Sharp"	C17	Padder	Approx. 1

NOTE 2: When using a CRYSTAL, set PHASING CONTROL to almost minimum capacity. See special alignment instructions below for Crystal. Align set in "sharp" position if set is without crystal.

ALIGNMENT INSTRUCTIONS - FOR RECEIVERS EQUIPPED WITH CRYSTALS

(A) REMOVE CRYSTAL, set crystal phasing condenser to almost minimum capacity and throw IF switch to "XTAL" position.

(B) With the 465 KC signal, re-adjust the I.F. Trimmer C-46 - the one nearest the front panel of the receiver - by turning the screw counter-clockwise. The signal now may be slightly weaker than before and sound "off-side". This, however, is a normal condition.

(C) REPLACE THE CRYSTAL - A very noticeable drop in signal strength may be noted, due to the filtering action of the crystal, and the frequency control of the signal generator must be "rocked" slowly back and forth, until the increase in signal strength indicates the exact frequency of the crystal being used. Now re-align the entire I.F. system to this frequency.

(D) Adjust "XTAL" phasing condenser for the lowest pitched note possible and re-adjust signal generator frequency. Repeat and continue to repeat this alignment procedure until no further improvement in the alignment can be accomplished.

NOTE: If the IF switch should now be thrown to another position, an apparent rise in gain will be noticed, which is caused by the addition of higher frequencies and background noise, so it does not mean that the sensitivity of this set is impaired in any way by use of the crystal.

NOTE 3: THE BEAT FREQUENCY OSCILLATOR is adjusted for the A, B, C, D, Bands with Trimmer C31. With models having an "E" & "F" Band B.F.O.--Adjust C32 with dial at 1560 on Band D to 1560 KC. Recheck C31. Set pitch control to half capacity.

SINCE THE BAND SPREAD SYSTEM is accomplished by means of a separate three-gang condenser, the spread in degrees over the assigned amateur bands is as follows:-

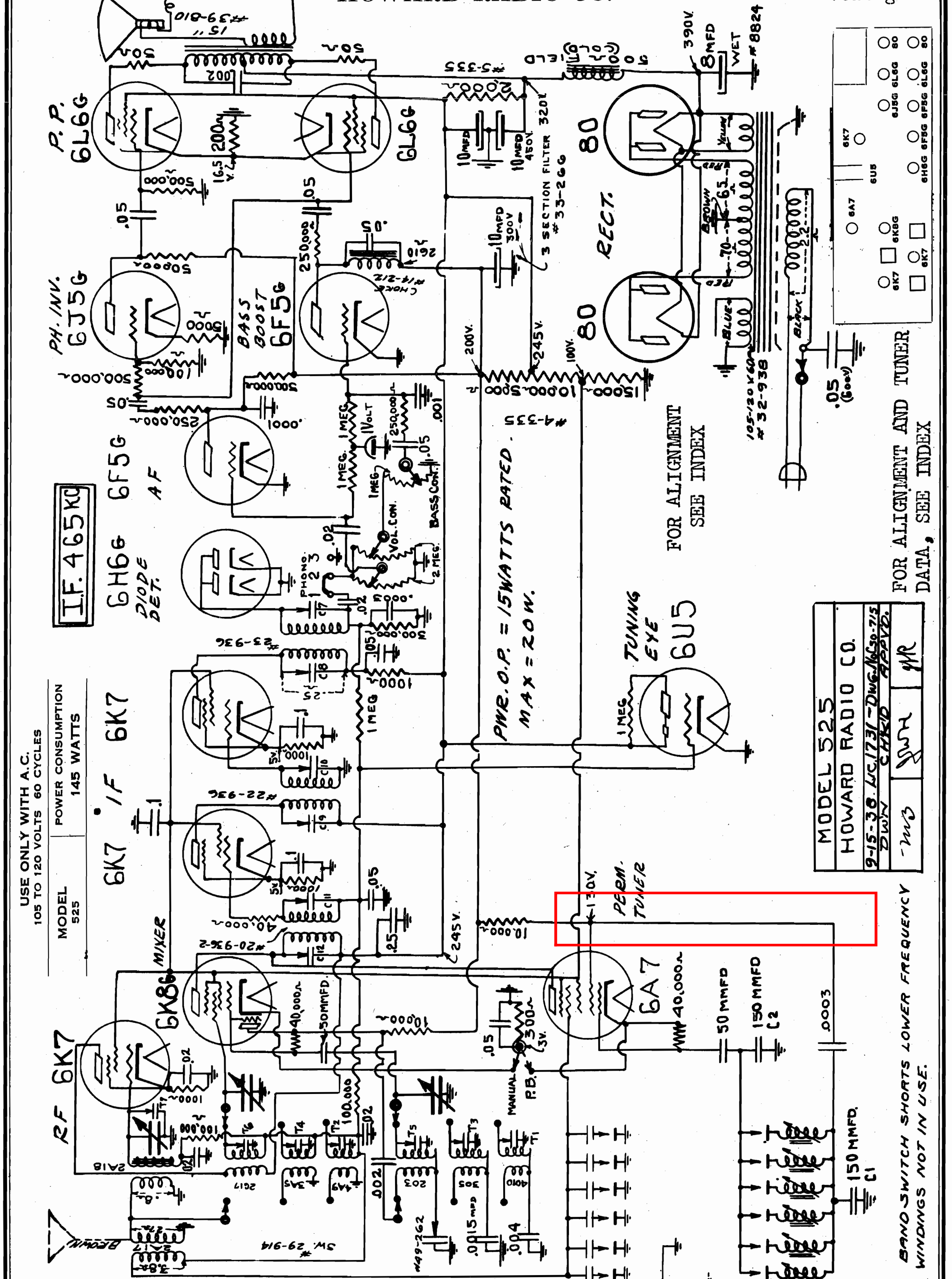
(3.5-4 MC = 540° + 126°)
(14.005-14.395 MC = 81°)
(1.716-2 MC = 360 + 162°)
(56-60 MC = 144°)
(7-7.3 MC = 150° + 186°)
(28-30 MC = 160°)

However, for those who wish to DOUBLE the amount of band spread, it is only necessary to remove one ROTOR plate from each section of the BAND SPREAD CONDENSER. This accomplished by merely cutting the separating link holding the two plates together and pulling the plate from the rotor shaft.

MODEL 525

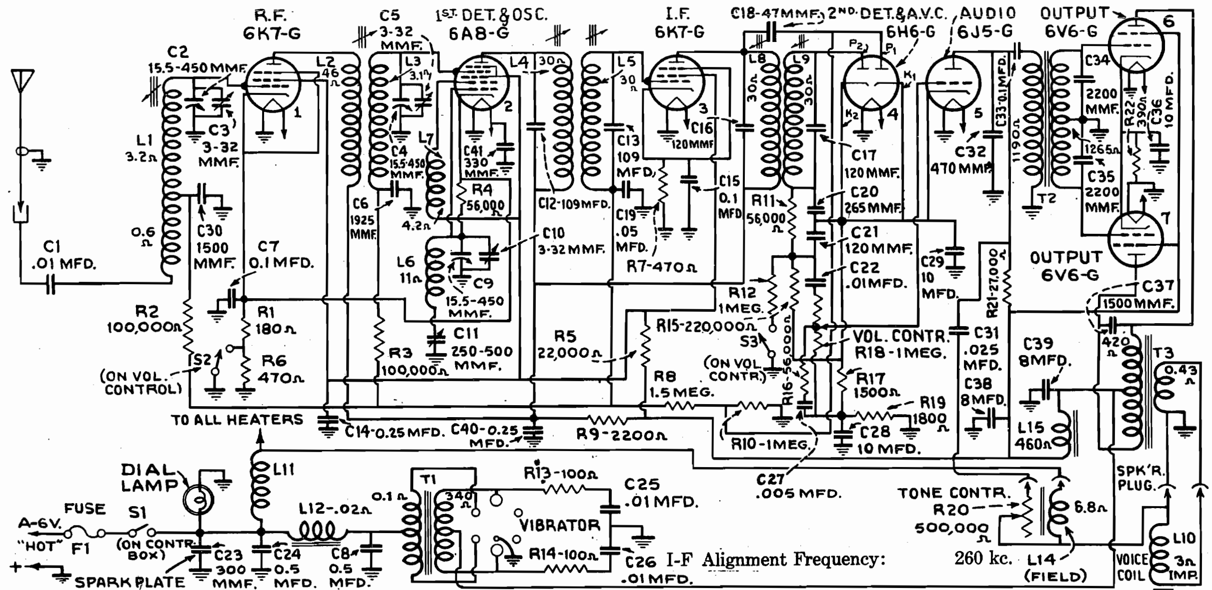
HOWARD RADIO CO.

Schematic
Voltage



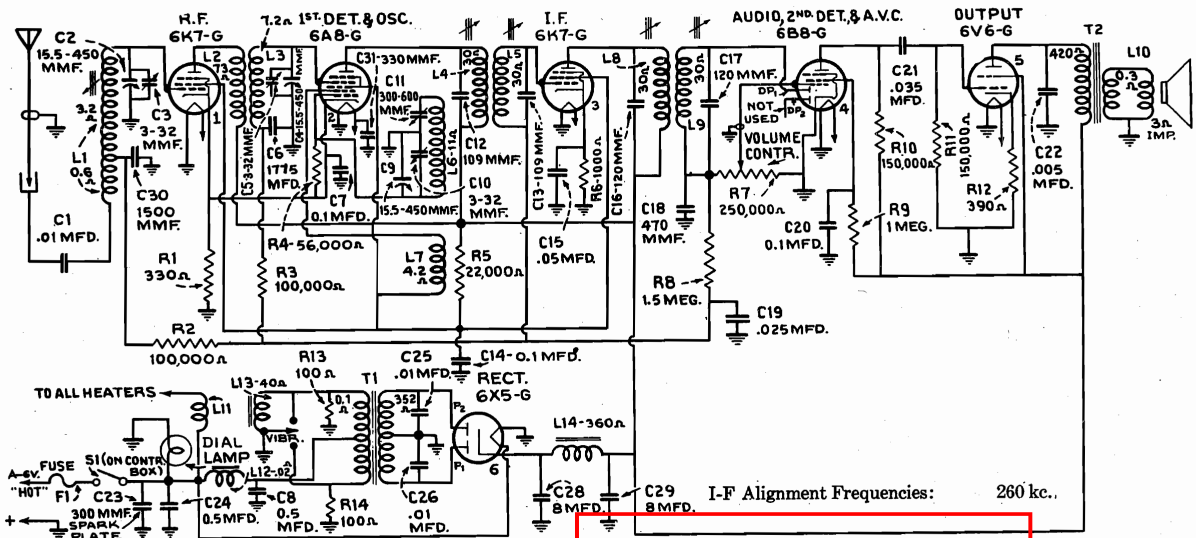
MODEL DB-38
MODEL SA-38
Schematics, Socket Trimmers, Alignment

HUDSON MOTOR CAR CO.



I-F Alignment Frequency: 260 kc.

Figure 2239—Schematic Circuit Diagram—Model DB-38



I-F Alignment Frequencies: 260 kc.

Figure 2237—Schematic Circuit Diagram—Model SA-38

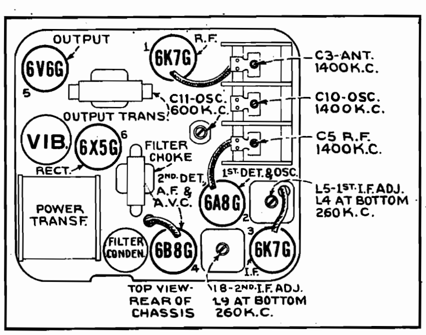


Figure 2235—Radiotron Location—Model SA-38

1938 HUDSON RADIOS
MODELS SA-38 AND DB-38

SA-38		DB-38	
(1)	6K7-G	(1)	6K7-G
(2)	6A8-G	(2)	6A8-G
(3)	6K7-G	(3)	6K7-G
(4)	6B8-G	(4)	6H6-G
		(5)	6J5-G
(5)	6V6-G	(6)	6V6-G
(6)	6X5-G	(7)	6V6-G

Tuning Range: 550 kc. to 1600 kc.
both models

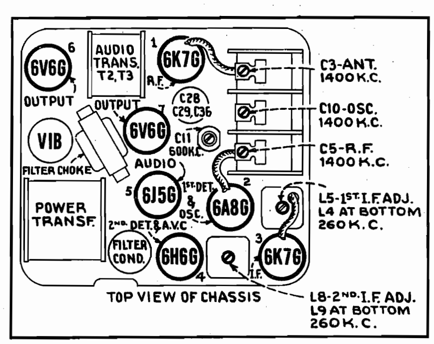


Figure 2236—Radiotron Location—Model DB-38

MODEL DB-38
Chassis Wiring
Voltage, Connections

HUDSON MOTOR CAR CO.

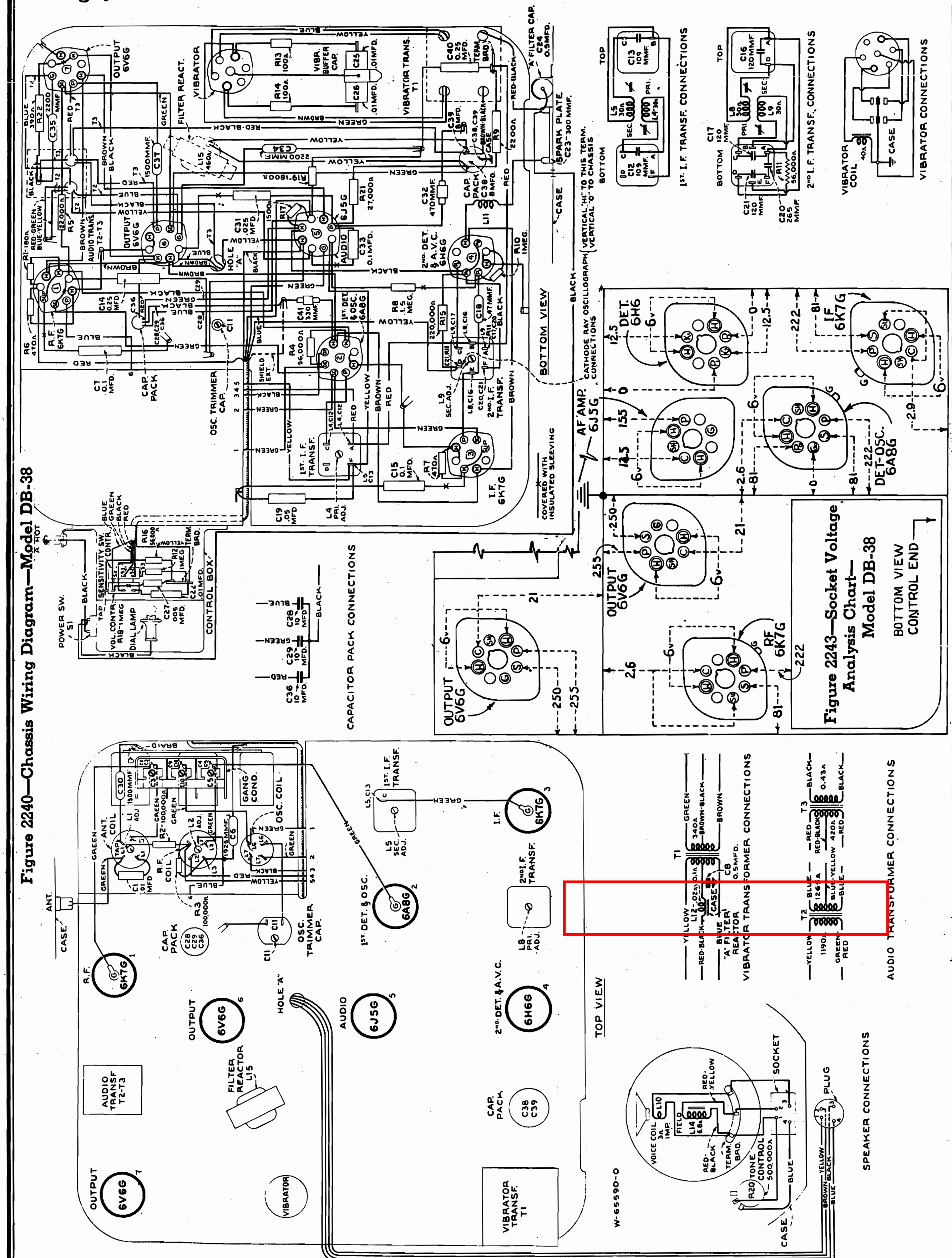


Figure 2240—Chassis Wiring Diagram—Model DB-38

Figure 2243—Socket Voltage Analysis Chart—Model DB-38

HUDSON MOTOR CAR CO.

MODEL SA-38
Chassis Wiring
Voltage, Connections

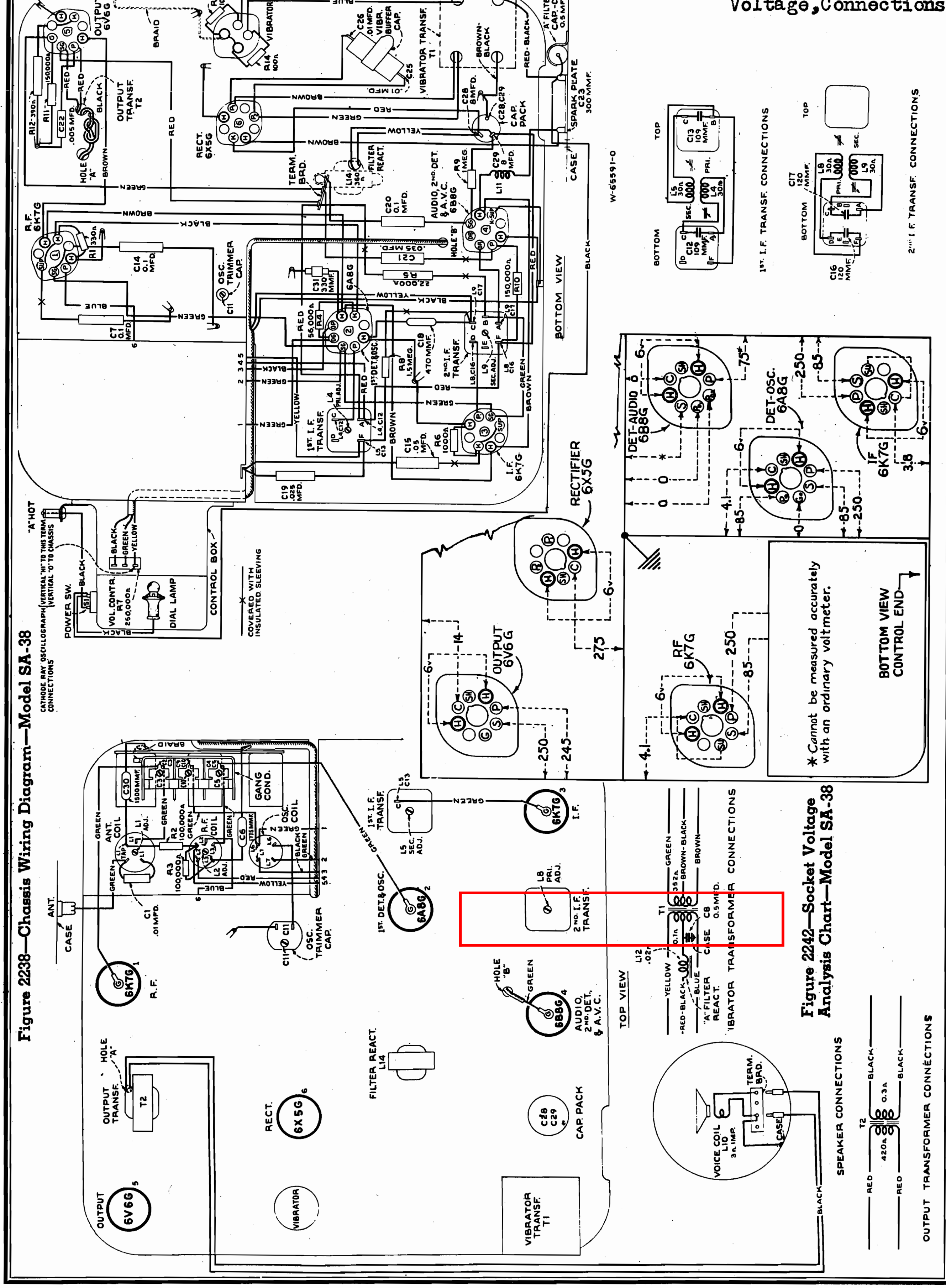


Figure 2238—Chassis Wiring Diagram—Model SA-38

Figure 2242—Socket Voltage Analysis Chart—Model SA-38

MODEL DB-38
MODEL SA-38

HUDSON MOTOR CAR CO.

Alignment Procedure

ALIGNMENT PROCEDURE

In readjusting the tuned circuits, it is important to apply a definite procedure and to use adequate and reliable test equipment. A standard test oscillator will be required as the source of signal at the specified alignment frequencies. Means for indication of the receiver output during alignment is also necessary to show accurately when the correct point of adjustment is reached. Two indication methods are applicable. One requires use of cathode-ray oscillograph equipment, and the other requires a voltmeter or output indicator. The cathode-ray alignment method is advantageous in that the indication provided is in the form of a wave image which represents the resonance characteristics of the circuits being tuned.

Adjust the control box by turning the tuning knob clockwise until a definite stop is reached at the high-frequency end of the dial scale. Then turn the tuning knob counter-clockwise until a definite stop is reached at the low-frequency end of the dial scale.

Figures 2235 and 2236 give the locations of the tubes and trimmer screws for adjustable capacitors and magnetite cores for models SA-38 and DB-38 respectively.

Place the receiver in operation with its two covers removed. Attach the output indicator across the loudspeaker voice coil circuit and advance the receiver volume control to full volume position. (If cathode-ray oscillograph is used for output indication, the vertical input terminals should be connected between the i-f transformer side of R15 (Figure 2240) and the receiver chassis for the DB-38 model, and between the high side of the volume control R7 (in control unit) (Figure 2238) and the receiver chassis for model SA-38. The cathode-ray oscillograph method of i-f alignment requires the conventional cathode-ray oscillograph, frequency modulator and signal generator set-up.)

For each adjusting operation, regulate the test oscillator output control so that the signal level is as low as possible and still observable on the indicating device. Use of such small signal will obviate broadness of tuning which would otherwise result from a.v.c. action on a stronger one.

I-F ADJUSTMENTS

1. Connect the "high" output of the test oscillator to the control grid cap of the i-f tube (6K7-G) through a 0.25 mfd. capacitor and connect the ground of the test oscillator to the receiver chassis. Adjust the frequency of the test oscillator to 260 kc. Tune the receiver to a point where no interference is received from the heterodyne oscillator or local stations.
2. Adjust the two screws L8 and L9 (attached to magnetite cores) of the second i-f transformer, one on top and one on bottom, until maximum output is produced on the indicating device.
3. Remove the test oscillator from the i-f tube input and connect it between the control grid cap of the first detector tube (6A8-G) and chassis ground, using the 0.25 mfd. capacitor as previously. Allow its tuning to remain at 260 kc. Tune the receiver to avoid interference as in 1.
4. Adjust the two screws L4 and L5 of the first i-f transformer for maximum (peak) receiver output.
5. Repeat procedures 1, 2, 3 and 4 as a check.

R-F ADJUSTMENTS

6. Connect the "high" output of the test oscillator to the antenna plug of the receiver through a 100 mmfd. capacitor, leaving the test oscillator ground connected to the receiver chassis. If the antenna lead-in is used, the value of this capacitor should be 50 mmfd. Tune the test oscillator to 1400 kc. Allow the output indicator to remain attached to the receiver as for i-f alignment.
7. Tune the receiver so that the dial reading is approximately halfway between 1300 and 1500 kc., which gives a 1400 kc. setting. Then adjust the oscillator, detector and antenna coil trimmers, C10, C5, and C3 respectively, adjusting each to the point producing maximum indicated receiver output.
8. Shift the test oscillator frequency to 600 kc. and tune the receiver to pick up this signal, disregarding the dial reading at which it is received. The oscillator series trimmer C11 should then be adjusted, simultaneously rocking the receiver tuning control backward and forward through the signal until maximum (peak) receiver output results from these combined operations.
9. The adjustment of C10, C5 and C3 should then be repeated as in operation 7 to correct for any change in their alignment due to the adjustment of C11.

NOTE: The antenna coil L1 has a magnetite core which is adjusted at the factory for the correct inductance. This adjustment should not be disturbed.

DB-38

Speaker:
Type: Electrodynamic 8″
Impedance (v.c.) 3 ohms. at 400 cycles
Vibrator: Synchronous
Power Output: Undistorted, 6 watts; maximum, 9 watts
Power Rating: Supply voltage 6.3 volts (storage battery)
Current drain 8.25 amperes at 6.3 volts
Fuse protection 15 amperes
R-F Alignment Frequencies:
~~Antenna coil 1400 kc.~~
Oscillator coil 600 kc. and 1400 kc.
Detector coil 1400 kc.

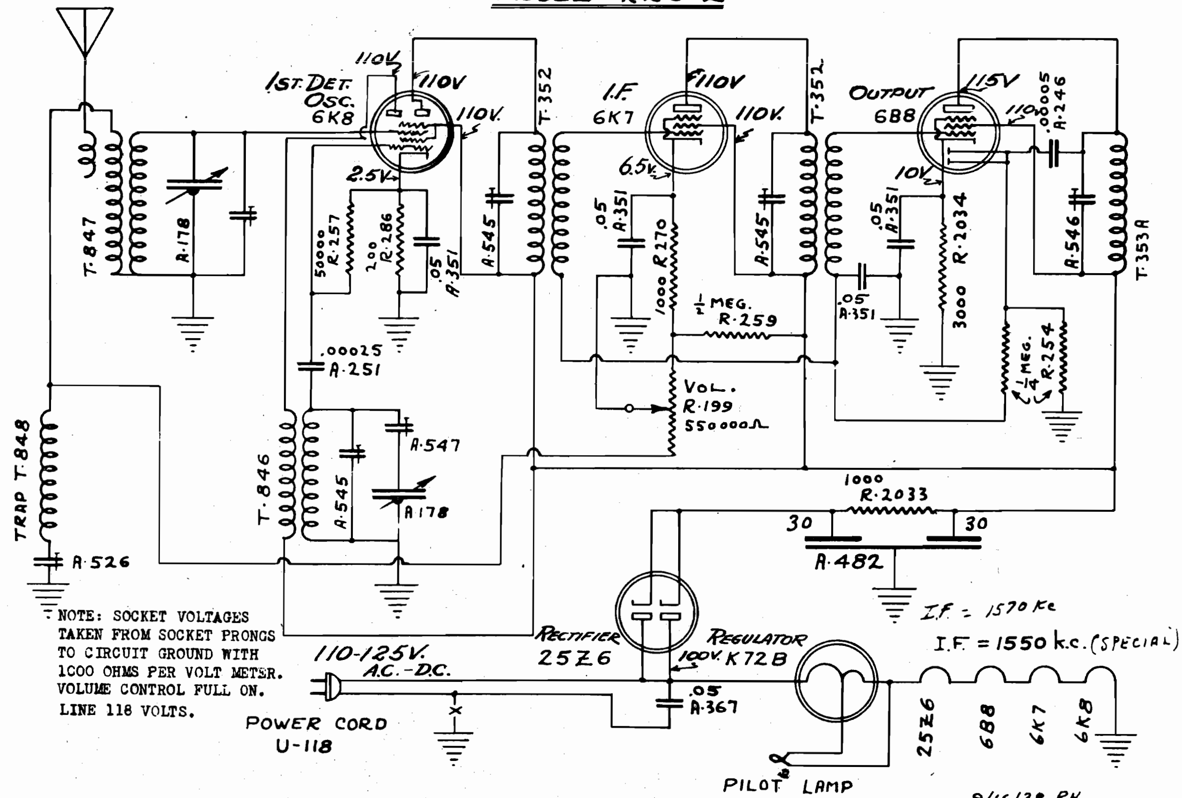
SA-38

Speaker:
Type: Six Inch Dynamic
Impedance (v.c.) 3 ohms. at 400 cycles
Vibrator: Non-synchronous
Power Output: Undistorted, 2.6 watts; maximum, 4 watts
Power Rating: Supply voltage 6.3 volts (storage battery)
Current drain 6.0 amperes at 6.3 volts
Fuse protection 15 amperes
R-F Alignment Frequencies:
Antenna coil 1400 kc.
Oscillator coil 600 and 1400 kc.
Detector coil 1400 kc.

MODEL KRC-2, Tunemaster
MODEL 845
Schematics

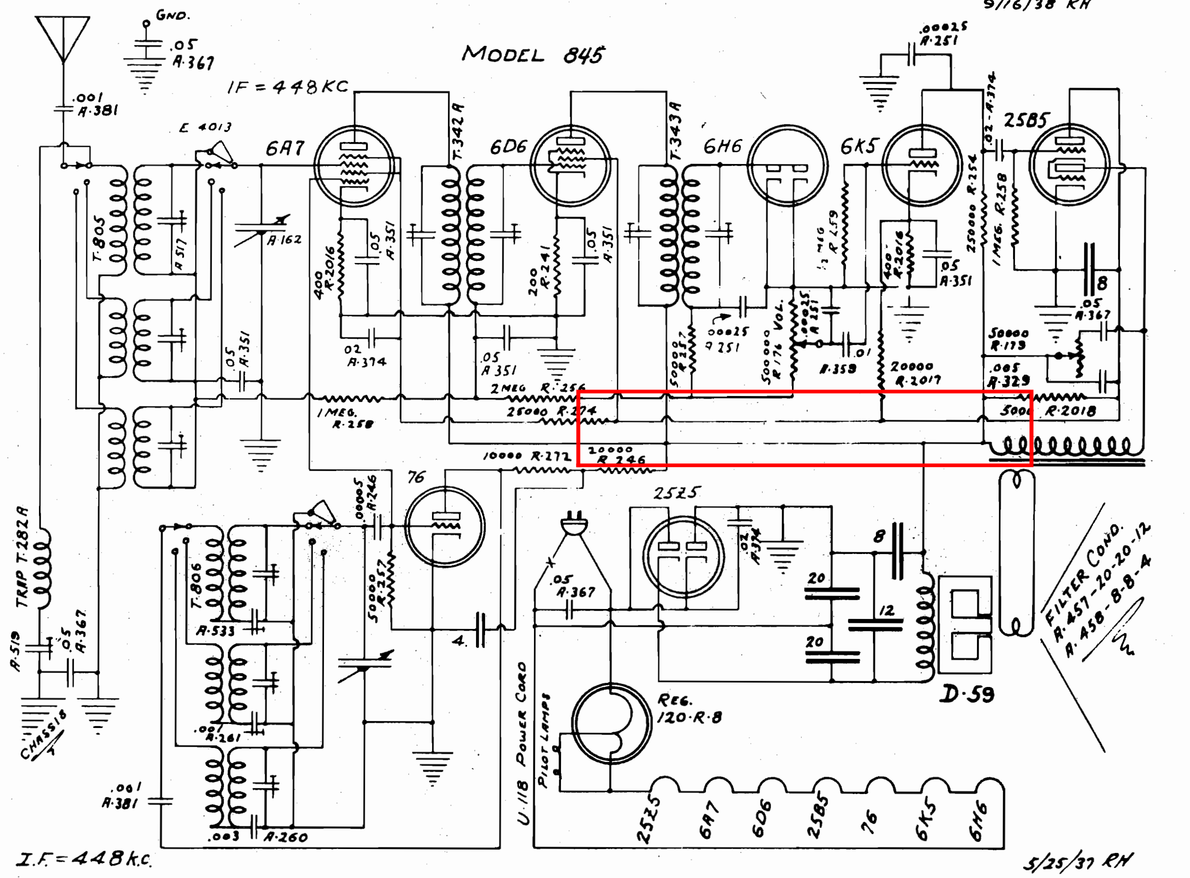
INTERNATIONAL INDUSTRIES, INC.

MODEL KRC-2



NOTE: SOCKET VOLTAGES TAKEN FROM SOCKET PRONGS TO CIRCUIT GROUND WITH 1000 OHMS PER VOLT METER. VOLUME CONTROL FULL ON. LINE 118 VOLTS.

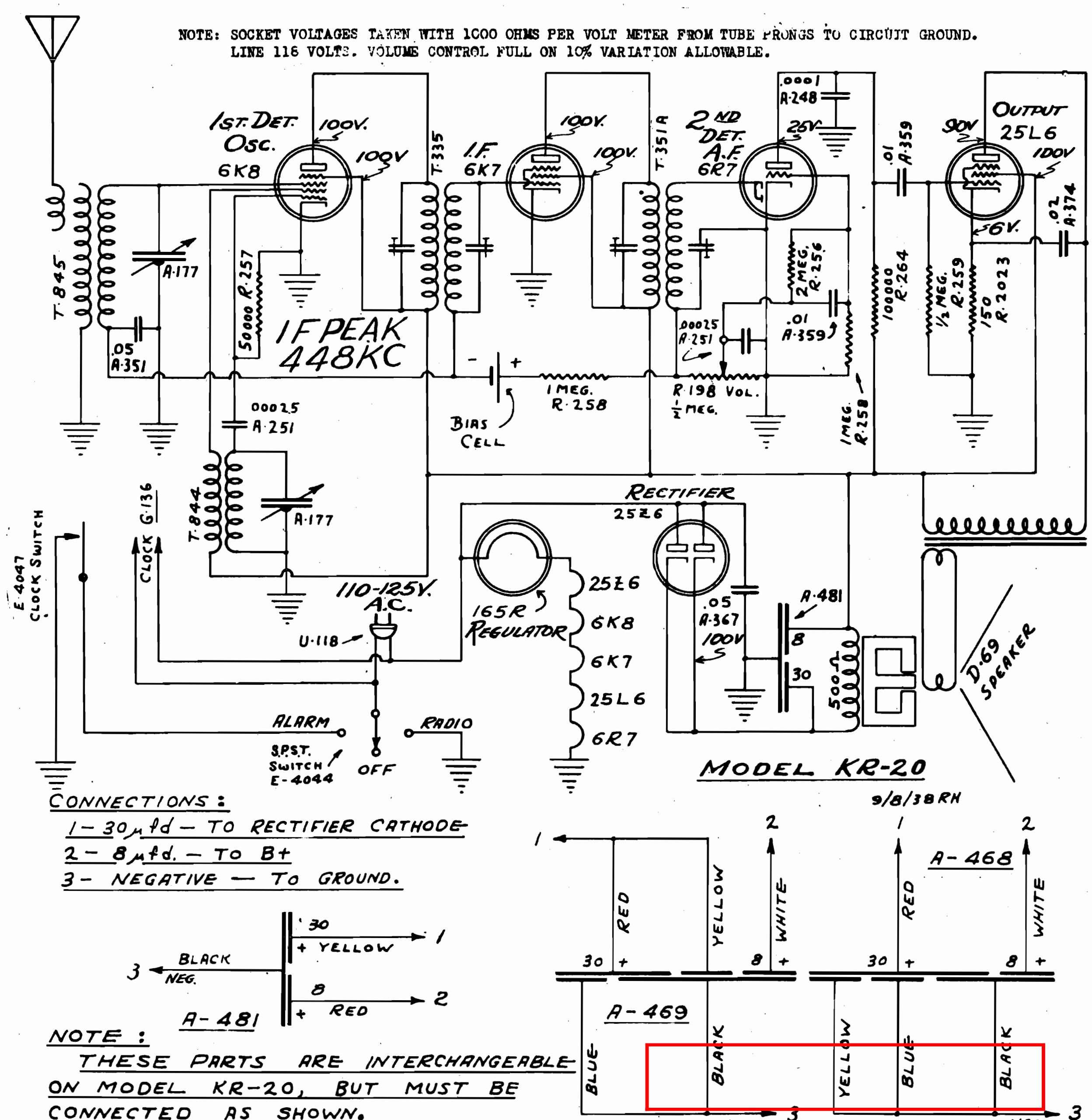
MODEL 845



MODEL KR-20,Autime
Schematic,Voltage
Alignment

INTERNATIONAL INDUSTRIES, INC.

MODEL KRC-2
Alignment



ALIGNMENT MODEL KRC-2

I. F. TRIMMERS: Feed 1570 Kc. modulated signal from signal generator directly to antenna of Tunemaster. Adjust both IF trimmers to maximum reading on output meter. Then adjust output coil trimmer to maximum.
R. F. TRIMMERS: Set Tunemaster dial at 1500 Kc. and feed 1500 Kc. signal from signal generator to antenna of Tunemaster. Set antenna trimmer approximately 1/4 turn from tight. Peak oscillator trimmer at 1500 Kc. Set dial at 600 Kc. and peak series oscillator trimmer. Move dial and series trimmer simultaneously by small amounts so as to get maximum output at 600 Kc. Tune back to 1500 Kc. and peak oscillator trimmer. Repeat previous peaking of series trimmer at 600 Kc. Retune to 1500 Kc. and peak oscillator trimmer. Set dial at approximately 1400 Kc. Tune signal generator to resonance with Tunemaster. Then peak antenna trimmer.

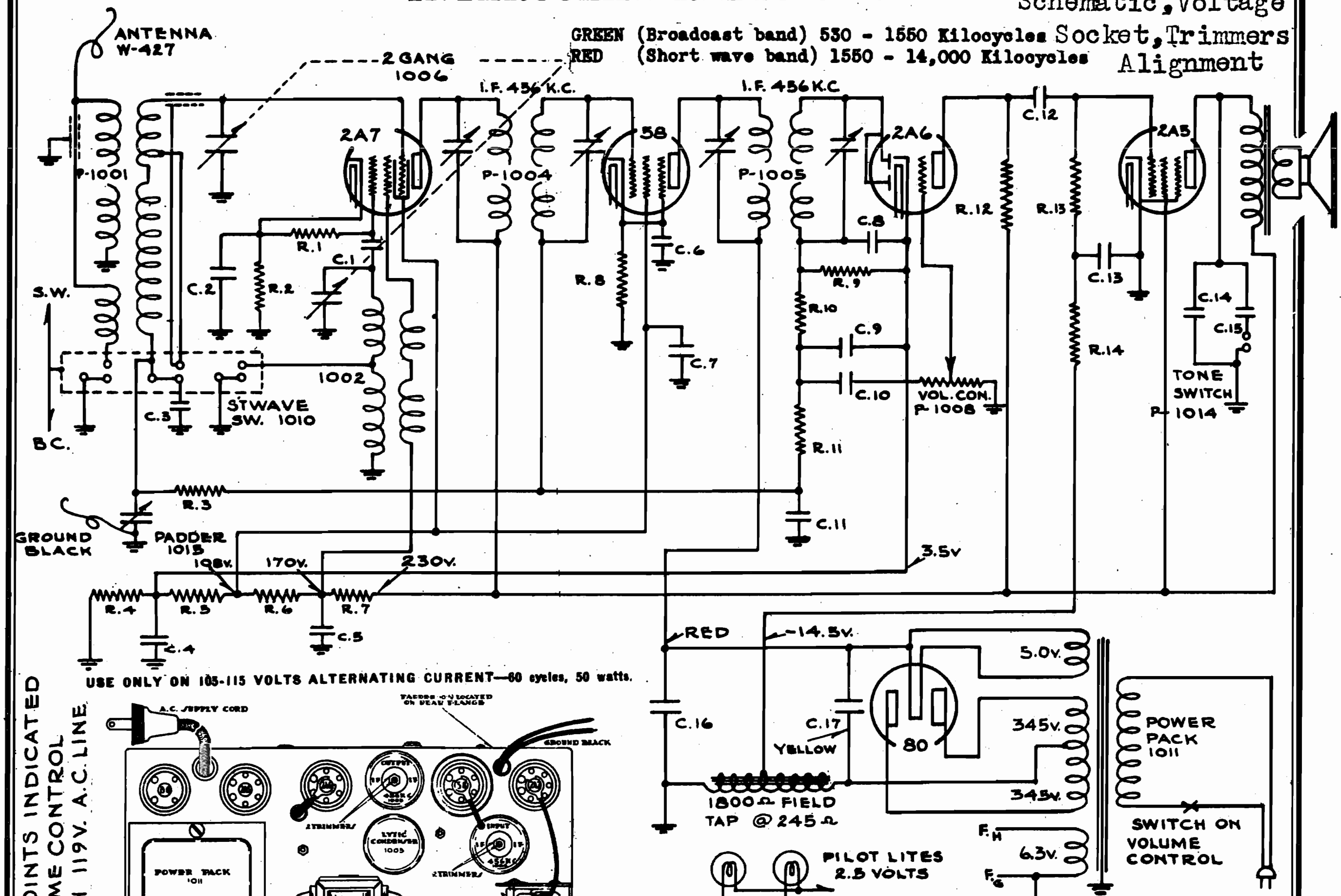
ALIGNMENT MODEL KR 20

I. F. TRIMMERS: To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I. F. transformer. If adjustments are not made accurately, selectivity will be poor and I. F. oscillation may result.
R. F. TRIMMERS: Turn the dial to 1500 Kc. and feed a very weak 1500 Kc. modulated signal from your signal generator to the antenna. Adjust the oscillator trimmer for maximum reading. Then peak the antenna trimmer to this setting. Aligning of broadcast band should be done on 1500, 1000 and 600 kilocycles. There is no adjustable padder condenser in this model so resonance on lower frequencies is accomplished by bending plates on tuning condensers.

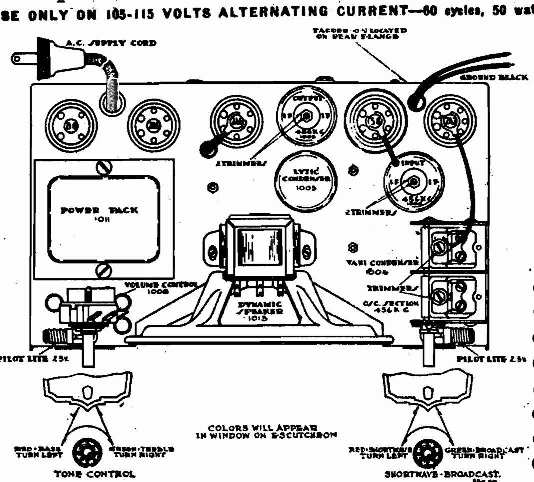
INTEROCEAN RADIO CORP.

MODEL 202
Schematic, Voltage
Socket, Trimmers
Alignment

GREEN (Broadcast band) 530 - 1550 Kilocycles
RED (Short wave band) 1550 - 14,000 Kilocycles



VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL VOLTAGES WITH 119V. A.C. LINE



Nº	VALUE
C.1:-	250MMF.
C.2:-	.05
C.3:-	.05
C.4:-	.05
C.5:-	.05
C.6:-	.05
C.7:-	.1
C.8:-	500MMF. X
C.9:-	500MMF. X
C.10:-	.01 X
C.11:-	.1
C.12:-	.01
C.13:-	.05
C.14:-	.01
C.15:-	.02
C.16:-	8MF. *
C.17:-	8MF. *

RESISTORS

Nº	VALUE	Nº	VALUE
R.1:-	50M	R.8:-	300 *
R.2:-	500 *	R.9:-	250M X
R.3:-	250M	R.10:-	50M X
R.4:-	250 *	R.11:-	250M X
R.5:-	20M *	R.12:-	250M
R.6:-	6M *	R.13:-	300M
R.7:-	4M *	R.14:-	250M.

* R.2, R.4, R.5, R.6, R.7 & R.8 IN ONE UNIT P-1012
* C.16 & C.17 IN ONE UNIT P-1003
X R.9, R.10, R.11, C.8, C.9 & C.10 IN I.F. CAN P-1005

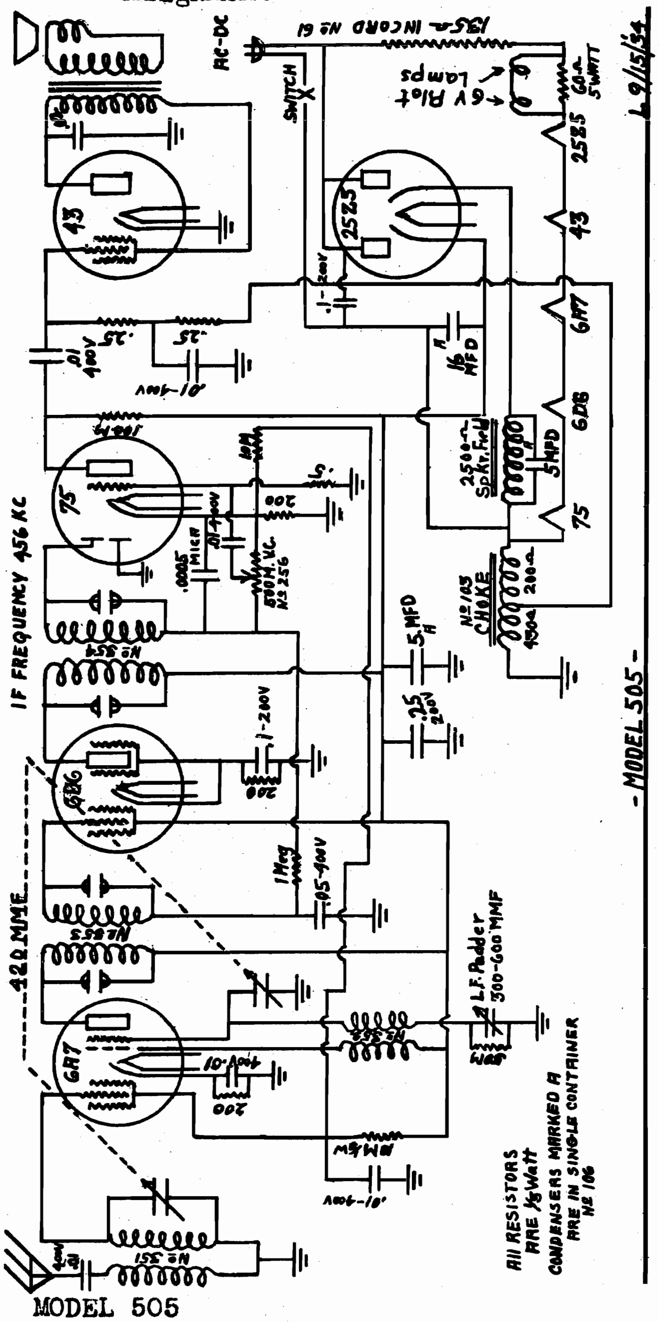
ALIGNMENT

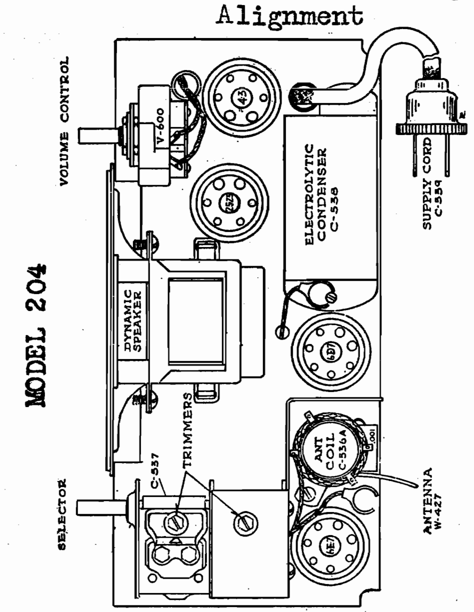
Connect oscillator at 456 KC to grid of 2A7 tube and ground wire. Variable condenser at minimum capacity, adjust four trimmers (one nut and one screw on each transformer trimmer) to resonance.
Broadcast band, wave changing switch to Green, variable condenser at minimum capacity. Disconnect antenna wire, connect 1550 KC oscillator to antenna coil in series with a 75 MMFD condenser. Adjust oscillator (front) section trimmer to resonance. Set oscillator to 1400 KC, rotate variable condenser until signal is tuned in, then adjust R.F. (rear) section trimmer to resonance. Check output at 1200, 1000, 800, and 600 Kilocycles if necessary bend plates (of rear R.F. section of variable only).
Short wave band, set wave changing switch to RED and with input oscillator connected as above and set at 1720 KC and at harmonics of 1000 KC (2000 KC), of 1200 KC (2400 KC), of 1400 KC (2800 KC), and 1720 KC (3440 KC). DO NOT BEND PLATES.
For failure to operate over both bands check 2A7 tube and connections to and contacts of wave changing switch.

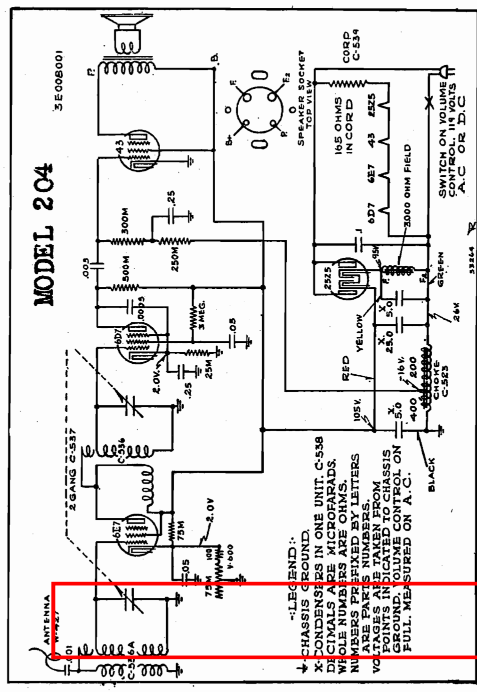
MODEL 505
Schematic, Alignment

INTEROCEAN RADIO CORP.

MODEL 204
Schematic, Socket
Trimmers, Voltage
Alignment







Schematic circuit diagram AC-DC Radio Receiver.

USE ONLY ON 105-115 VOLTS ALTERNATING (any cycles) or DIRECT CURRENT—35 WATTS.

Should it be necessary at any time to rebalance this set the procedure is as follows: Disconnect antenna wire and attach an oscillator in series with a 50 mmfd. condenser to the antenna coil. With variable condenser at its minimum capacity position—at the extreme left of its rotation-touch trimmer condensers for maximum deflection on an output meter connected across the primary of the speaker input transformer, check trimmer adjustment at 1400 kilocycles, then align at 1200-1000-800-600-540 kilocycles, bend slotted plates of variable condenser if necessary.

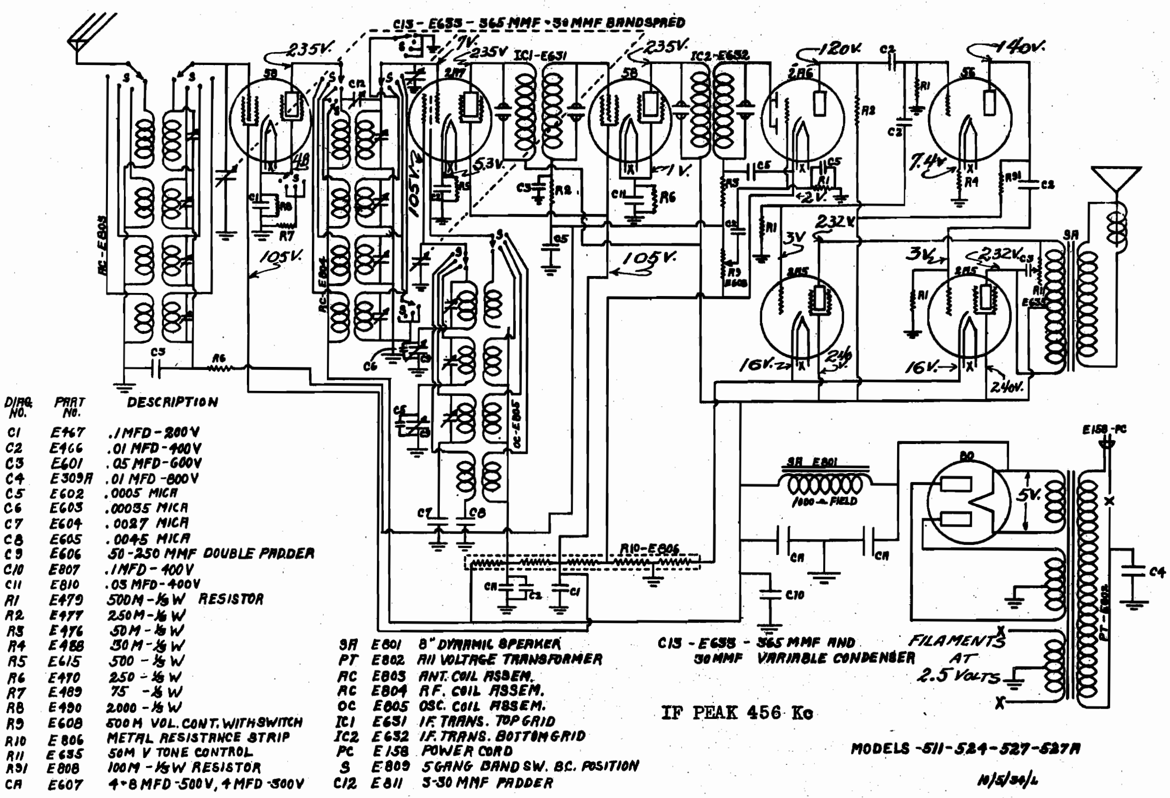
MODEL 505

1. I.F. Alignment -
   To peak I.F. transformers, apply an oscillator note of 456 KC to the grid of the 6A7 tube and adjust screws seen in tops of I.F. transformers until maximum peak is obtained.
2. Broadcast -
   Connect an oscillator adjusted to 1720 KC, to the antenna of set, then adjust trimmer of oscillator section first with variable condenser way open to peak output, next adjust antenna section trimmer on variable condenser to peak output.
3. Low Frequency Padder -
   Next apply a 600 KC note from oscillator and while rocking variable condenser back and forth across signal, adjust padder to maximum output.
4. Check alignment again at 1400 KC; 1000 KC and 800 KC. It will not be necessary to bend plates to align this receiver.

MODELS 508,522,525,525A
Chassis 508

INTEROCEAN RADIO CORP.

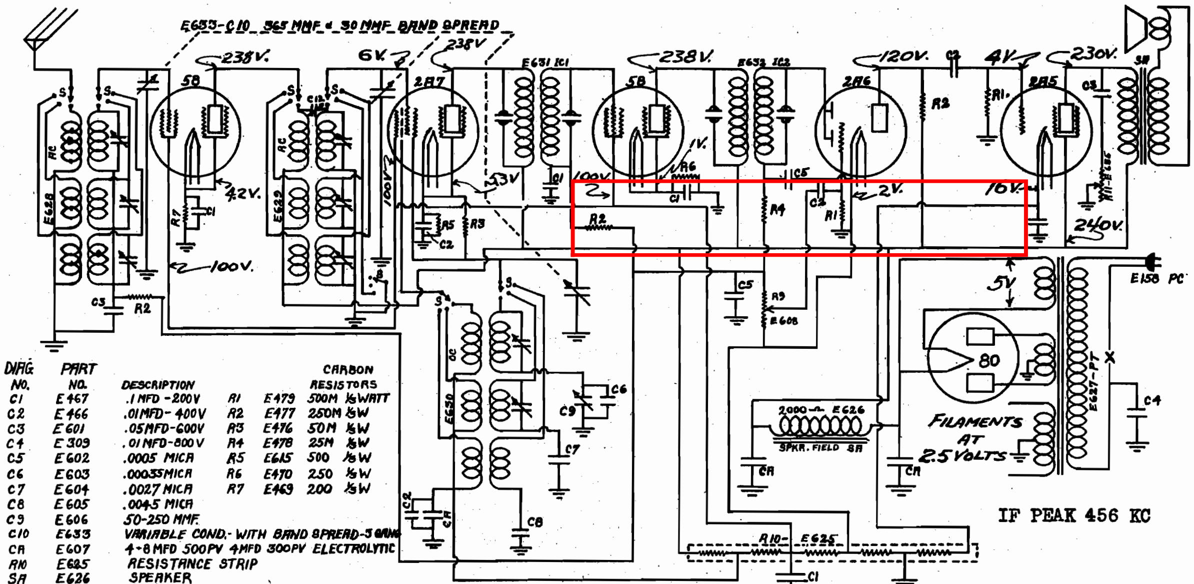
MODELS 511,524,527,527A
Chassis 511
Schematics, Voltage
Trimmers



DIAG. NO.	PART NO.	DESCRIPTION
C1	E467	.1 MFD - 200V
C2	E466	.01 MFD - 400V
C3	E601	.05 MFD - 600V
C4	E309A	.01 MFD - 800V
C5	E602	.0005 MICA
C6	E603	.00035 MICA
C7	E604	.0027 MICA
C8	E605	.0045 MICA
C9	E606	50-250 MMF DOUBLE PADDER
C10	E807	.1 MFD - 400V
C11	E810	.05 MFD - 400V
R1	E479	500M - 1/3W RESISTOR
R2	E477	250M - 1/3W
R3	E476	50M - 1/3W
R4	E488	30M - 1/3W
R5	E615	500 - 1/3W
R6	E470	250 - 1/3W
R7	E489	75 - 1/3W
R8	E490	2000 - 1/3W
R9	E608	500M VOL. CONT. WITH SWITCH
R10	E806	METAL RESISTANCE STRIP
R11	E635	50M V TONE CONTROL
R31	E808	100M - 1/3W RESISTOR
CA	E607	4-8 MFD - 500V, 4 MFD - 300V
SA	E801	8" DYNAMIC SPEAKER
PT	E802	All VOLTAGE TRANSFORMER
AC	E803	ANT. COIL ASSEM.
RC	E804	R.F. COIL ASSEM.
OC	E805	OSC. COIL ASSEM.
IC1	E631	I.F. TRANS. TOP GRID
IC2	E632	I.F. TRANS. BOTTOM GRID
PC	E158	POWER CORD
S	E809	5 GANG BAND SW. B.C. POSITION
C12	E811	3-30 MMF PADDER

TRIMMER LOCATION (BOTH MODELS)
CHASSIS 508:- BAND 1, TOPS OF RESPECTIVE CANS. BANDS 2 AND 3, BOTTOM OF CANS, (ANT., R.F., OSC.).
CHASSIS 511:-TRIMMERS WILL BE FOUND IN BOTTOM OF CANS, EXCEPT BAND 4 OSC (HAS NO TRIMMER).

NOTE:- THE VOLTAGES SHOWN ON BOTH SCHEMATICS ARE TAKEN WITH LINE 115 VOLTS. AERIAL AND GROUND DISCONNECTED, USING 1000 OHMS PER VOLT METER; TAKEN FROM POINTS INDICATED TO GROUND.



DIAG. NO.	PART NO.	DESCRIPTION			CARBON RESISTORS
C1	E467	.1 MFD - 200V	R1	E479	500M 1/3 WATT
C2	E466	.01 MFD - 400V	R2	E477	250M 1/3W
C3	E601	.05 MFD - 600V	R3	E476	50M 1/3W
C4	E309	.01 MFD - 800V	R4	E478	25M 1/3W
C5	E602	.0005 MICA	R5	E615	500 1/3W
C6	E603	.00035 MICA	R6	E470	250 1/3W
C7	E604	.0027 MICA	R7	E469	200 1/3W
C8	E605	.0045 MICA			
C9	E606	50-250 MMF.			
C10	E633	VARIABLE COND. - WITH BAND SPREAD - 3 GANG			
CA	E607	4-8 MFD 500PV 4MFD 300PV ELECTROLYTIC			
R10	E625	RESISTANCE STRIP			
SA	E626	SPEAKER			
PT	E627	POWER TRANSFORMER TAPS - 117-125-140-240 V			
AC	E628	ANT. COIL ASSEM.			
RC	E629	R.F. COIL ASSEM.			
OC	E630	OSC. COIL ASSEM.			
IC1	E631	I F TRANS. - TOP GRID.			
IC2	E632	I F TRANS. - BOTTOM GRID			
PC	E158	POWER CORD + PLUG			
R9	E608	500M Ω VOLUME CONTROL WITH SWITCH			

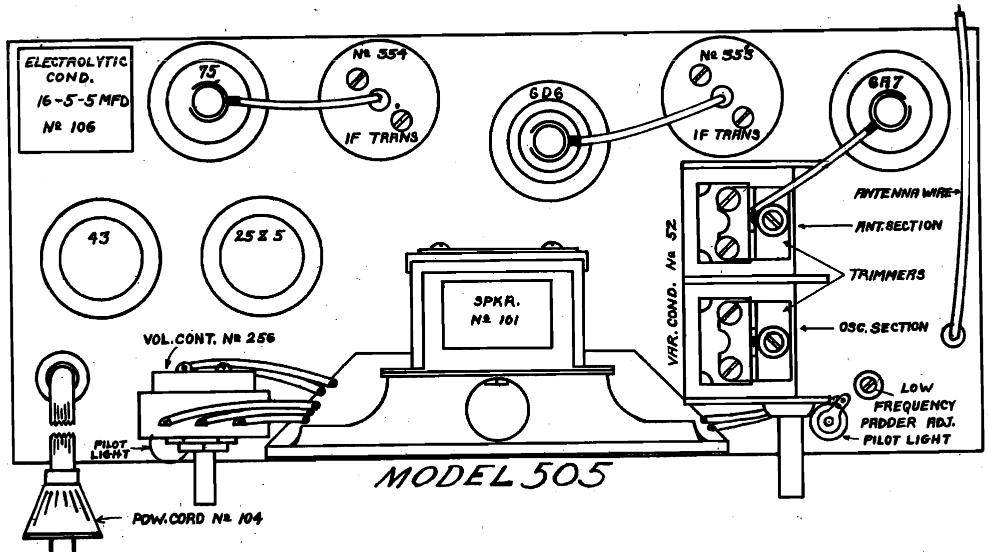
S - E634 - BAND SWITCH - B.C. POSITION
R11 - E635 - 50M Ω TONE CONTROL
C11 - E636 - 10 MFD 25V ELECTROLYTIC
C12 - E811 - 3-30 MMF PADDER

MODELS - 508-522-525-525A
10-5-34 L

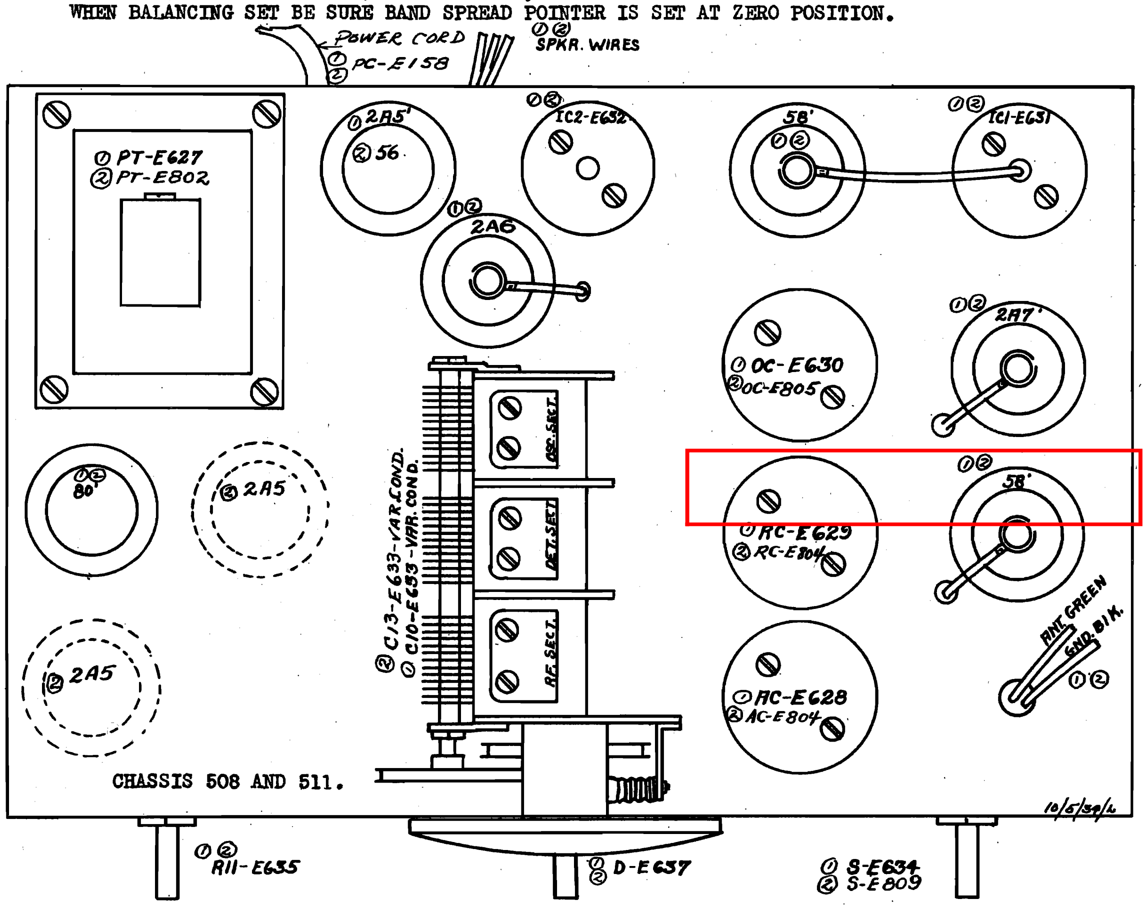
MODELS 508, 522, 525, 525A
MODELS 511, 524, 527, 527A
Socket, Trimmers
Alignment

INTEROCEAN RADIO CORP.

MODEL 505
Socket, Trimmers



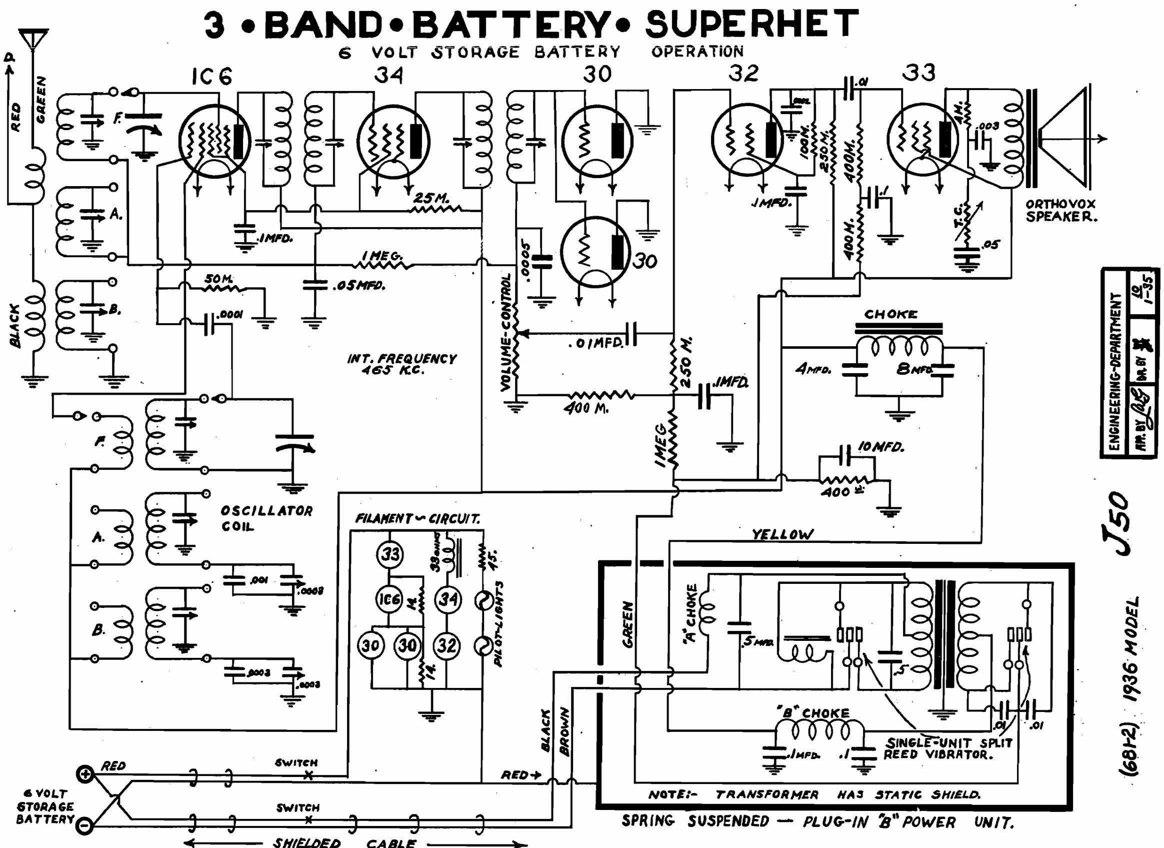
ALIGNMENT, CHASSIS 508 AND 511. IF PEAK 456 KC
BAND 1:- ADJUST TRIMMERS AT 1500 KC AND IF PADDER AT 600 KC(BOTH AT RIGHT OF CHASSIS).
BAND 2:-(CHASSIS 508 ONLY) ADJUST AT 9000KC (NO L.F. PADDER ON THIS BAND).
BAND 2:-(CHASSIS 511 ONLY) ADJUST AT 3700KC, L.F. PADDER AT 1700 KC.
BAND 3:-(CHASSIS 508 ONLY) ADJUST AT 21,000KC (NO L.F. PADDER ON THIS BAND)
BAND 3:-(CHASSIS 511 ONLY) ADJUST AT 9,000KC.
BAND 4:-(CHASSIS 511 ONLY) ADJUST AT 21,000KC.
WHEN BALANCING SET BE SURE BAND SPREAD POINTER IS SET AT ZERO POSITION.

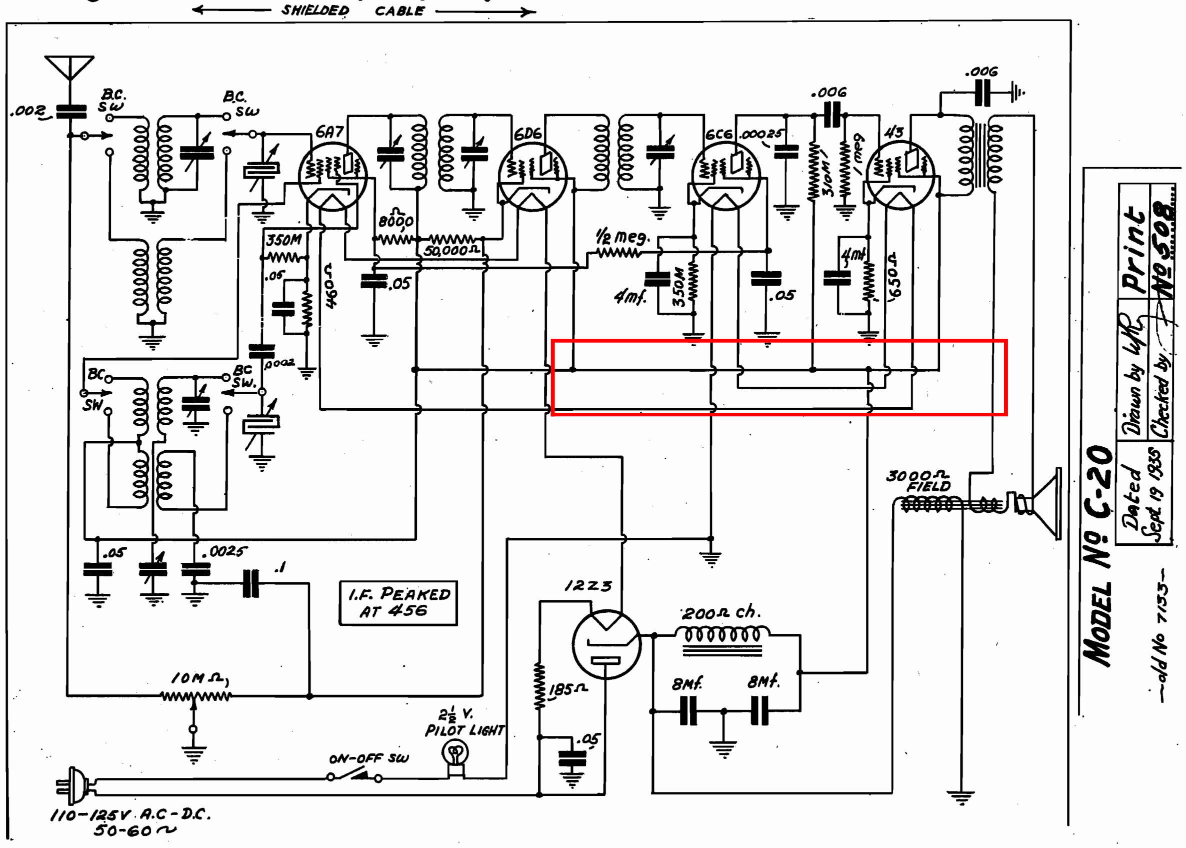


TUBE LAYOUT FOR MODELS 508-522-525-525A, CHASSIS 508 AND 511-524-527-527A, CHASSIS 511.
NOTE:- TUBES AND PARTS INDICATED① ARE FOR CHASSIS 508; ② INDICATES SAME FOR CHASSIS 511.

LAFAYETTE RADIO MFG. CO.

MODEL C20
MODEL J50
Schematics





MODELS B30,B32
Alignment
Resistances

LAFAYETTE RADIO MFG. CO.

Alignment and Calibration

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 5800, 5000, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used. If a station is tuned in with the selectivity control in the broad position and this control is then turned to the sharp position, the station may disappear. This is not an indication that the receiver is out of alignment.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator to the grid of the 1st detector through a 0.1 MF condenser.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band selector to the Range B position (standard wave band—purple dial color).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the A.V.C.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 5.

Range B Alignment

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band selector in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent the A.V.C. action.

Adjust the oscillator Range B trimmer (C38) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the 1st and 2nd interstage Range B trimmers (C8 and C13) and antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Be sure to use a non-metallic screwdriver for this adjustment.

Range C Alignment

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (1st short wave band—green dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range C trimmer (C40) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range C trimmers (C9 and C12) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (2nd short wave band—red dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range D trimmer (C41) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range D trimmers (C10 and C11) and antenna Range D trimmer (C4) to maximum.

When adjusting the 2nd interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Then go back and repeat the procedure as given for the 18,300 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Use a non-metallic screwdriver for this adjustment.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 Volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

D. C. Resistance of Windings

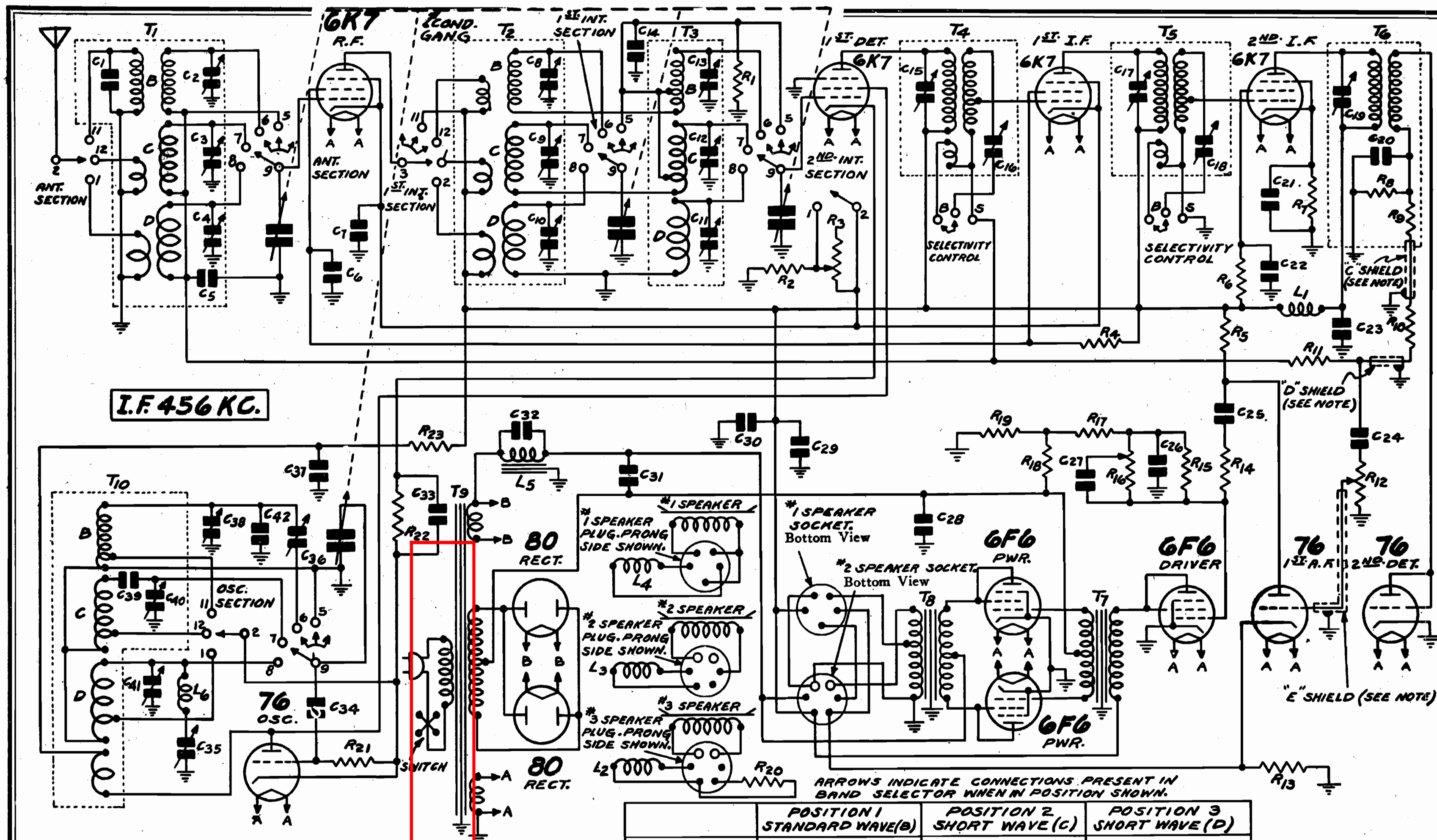
Part No.	Winding	Code	in Ohms
P-9A418	Antenna R. F. Transformer	T1	
	Range B Primary Winding		21.4
	Range C Primary Winding		0.3
	Range D Primary Winding		0.2
	Range B Secondary Winding		6.1
	Range C Secondary Winding		2.1
	Range D Secondary Winding		Small
P-9A411	1st Interstage R. F. Transformer	T2	
	Range B Primary Winding		3.6
	Range C Primary Winding		2.4
	Range D Primary Winding		0.5
	Range B Secondary Winding		5.8
	Range C Secondary Winding		2.1
	Range D Secondary Winding		Small
P-50X24	Audio Input Transformer	T7	
	Primary Winding		415.0
	Secondary Winding		
	Center Tap to Inside		211.7
	Center Tap to Outside		288.5
P-51X26	Audio Output Transformer	T8	
	Primary Winding		
	Center Tap to Inside		135.5
	Center Tap to Outside		155.3
	Secondary Winding		
	Tap to Upper Side		0.16
	Tap to Ground Side		0.12
P-53X82	Power Transformer (115 Volt-60 Cycle)	T9	
	Primary Winding		1.7
	Tube Filament Secondary (A-A)		Small
	Tube Filament Secondary (B-B) (80)		Small
	High Voltage Secondary Winding		
	Center Tap to Inside		97.9
	Center Tap to Outside		106.4
P-9A427	Oscillator Coils	T10	
	Range B Grid Coil		
	Red White Tap to White		3.1
	Red White Tap to Ground		0.7
	Range C Grid Coil		
	Green White Tap to Green		1.7
	Green White Tap to Ground		0.5
	Range D Grid Coil		
	Black White Tap to Black		Small
	Black White Tap to Ground		Small
	Oscillator Plate Coil		0.2
P-9A400	2nd I. F. Plate Isolating Reactor	L1	34.7
P-12A204	12" Dynamic Speaker (No. 1—See Fig. 2)		
	Speaker Field	L4	6400.
	Voice Coil		Small
P-12A205	12" Dynamic Speaker (No. 2—See Fig. 2)		
	Speaker Field	L3	1000.
	Voice Coil		Small
P-12A226	12" Dynamic Speaker (No. 3—See Fig. 2)		
	Speaker Field	L2	1000.
	Voice Coil		Small
P-52X39	Reactor Assembly	L5	143.6
P-9A391	High Frequency Oscillator Tracking Coil	L6	1.0
P-9A412	2nd Interstage R. F. Coils	T3	
	Range B Section		
	Long Portion		5.9
	Short Portion		0.2
	Range C Section		
	Long Portion		1.8
	Short Portion		0.2
	Range D Section		Small
P-9A413	1st I. F. Transformer	T4	
	Primary Winding		4.4
	Coupling Winding		0.3
	Secondary Winding		
	Tap to Condenser Side		2.3
	Tap to Switch Side		2.3
P-9A414	2nd I. F. Transformer	T5	
	Primary Winding		4.3
	Coupling Winding		0.3
	Secondary Winding		
	Tap to Condenser Side		2.3
	Tap to Switch Side		2.3
P-9A415	3rd I. F. Transformer	T6	
	Primary Winding		9.8
	Secondary Winding		30.0

MODELS B30, B32
Schematic

LAFAYETTE RADIO MFG. CO.

Power Consumption - 140 Watts (At 115 volts 60 cycles)
Power Output - - - - - - 15 Watts Undistorted

Tuning Frequency Range
B Range - - - - - - - - - 535 to 1730 KC.
C Range - - - - - - - - - 1715 to 5800 KC.
D Range - - - - - - - - - 5750 to 18300 KC.



October, 1935

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SELECTOR WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. AND ANT. SECTION	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 3 9
2ND. INT. SECTION	1 2 5 6 7 8 9	1 2 5 6 7 8 9	1 2 5 6 7 8 9
1ST. INT. SECTION	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9

CONTACT LOCATIONS 3, 4 AND 10 IN OSC. AND ANT. SECTIONS, 3, 4, 10, 11 AND 12 IN 2ND. INT. SECTION AND 4 AND 10 IN 1ST. INT. SECTION ARE BLANK.

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
"B" AND "S" ON SELECTIVITY CONTROL DENOTES "BROAD" AND "SHARP" RESPECTIVELY.
THE CAPACITY OF THE "C" SHIELD IS 20 μμf.
THE CAPACITY OF THE "D" SHIELD IS 70 μμf.
THE CAPACITY OF THE "E" SHIELD IS 16 μμf.
ON SETS USING ONE SPEAKER THE #3 SPEAKER IS FURNISHED.
ON SETS USING TWO SPEAKERS THE #1 AND #2 SPEAKERS ARE FURNISHED.

C 1	250 mmf.	
C 2	2-25 mmf.	
C 3	2-25 mmf.	
C 4	2-25 mmf.	
C 5	.05 mf. 180 V.	
C 6	.70 mf. 360 V.	
C 7	.25 mf. 180 V.	
C 8	2-25 mmf.	
C 9	2-25 mmf.	
C10	2-25 mmf.	
C11	2-25 mmf.	
C12	2-25 mmf.	
C13	2-25 mmf.	
C14	.05 mf. 180 V.	
C15	150-250 mmf.	One Unit
C16	150-250 mmf.	One Unit
C17	150-250 mmf.	One Unit
C18	150-250 mmf.	One Unit
C19	70-150 mmf.	
C20	50 mmf.	
C21	.05 mf. 180 V.	
C22	.05 mf. 360 V.	
C23	.10 mf. 360 V.	
C24	.01 mf. 480 V.	
C25	.05 mf. 360 V.	
C26	.25 mf. 180 V.	
C27	.004 mf. 600 V.	
C28	125.0 mf. 45 V.	Electrolytic
C29	18.0 mf. 290 V.	Electrolytic
C30	.25 mf. 360 V.	
C31	30.0 mf. 450 V.	Electrolytic
C32	.15 mf. 280 V. A. C.	
C33	.05 mf. 180 V.	
C34	35 mmf.	
C35	40-100 mmf.	One Unit
C36	300-600 mmf.	One Unit
C37	.25 mf. 360 V.	
C38	2-25 mmf.	
C39	1400 mmf.	
C40	2-25 mmf.	
C41	2-25 mmf.	
C42	10 mmf.	
R 1	25,000 ohm 0.2 watt	
R 2	150 ohm 0.2 watt	
R 3	2500 ohm	Dual Volume Control
R12	2.0 megohm	Dual Volume Control
R 4	50,000 ohm 1.0 watt	
R 5	60,000 ohm 0.5 watt	
R 6	100,000 ohm 0.5 watt	
R 7	500 ohm 0.2 watt	
R 8	200,000 ohm 0.5 watt	
R 9	100,000 ohm 0.2 watt	
R10	100,000 ohm 0.2 watt	
R11	2.0 megohm 0.2 watt	
R13	200 ohm 0.5 watt	
R14	250,000 ohm 0.2 watt	
R15	250,000 ohm 0.2 watt	
R16	3.0 megohm Tone Control	
R17	100,000 ohm 0.2 watt	
R18	128 ohm 2.5 watt	Armored Wire-Wound
R19	145 ohm 3.0 watt	Armored Wire-Wound
R20	7800 ohm 12.0 watt	
R21	80,000 ohm 0.2 watt	
R22	2,500 ohm 0.2 watt	
R23	27,000 ohm 1.0 watt	
T 1	Ant. R.F. Trans.	
T 2	1st Interstage R.F. Trans.	
T 3	2nd Interstage R.F. Trans.	
T 4	1st I.F. Trans.	
T 5	2nd I.F. Trans.	
T 6	3rd I.F. Trans.	
T 7	Push-Pull Input Trans.	
T 8	Push-Pull Output Trans.	
T 9	Power Trans.	
T10	Osc. Inductors	
L 1	2nd I. F. Plate Isolating Reactor	
L 2	No. 3 Speaker Field (1000 ohm)	
L 3	No. 2 Speaker Field (1000 ohm)	
L 4	No. 1 Speaker Field (6400 ohm)	
L 5	Choke Coil	
L 6	Osc. Tracking Coil	

MODELS B30,B32
Voltage,Socket,Coils
Trimmers,Phono.Data

LAFAYETTE RADIO MFG. CO.

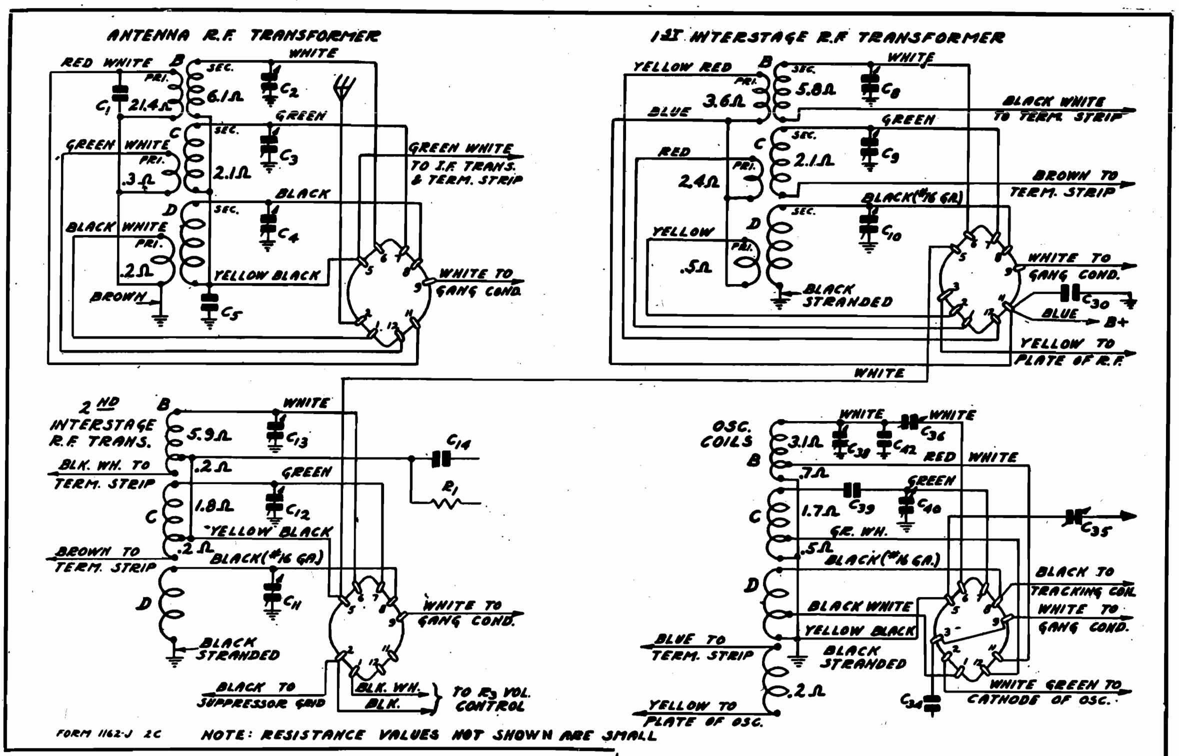
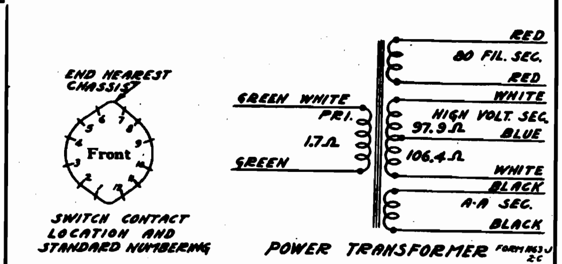


Fig. 4—Color Coding of Coil Wires and D. C. Resistance of Windings. (Also see complete D. C. Resistance List)



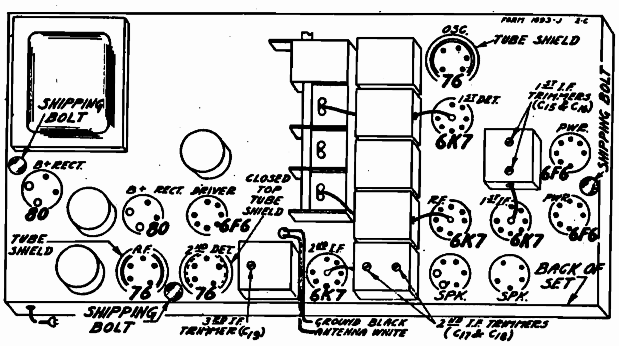


Fig. 5—Location of Tubes

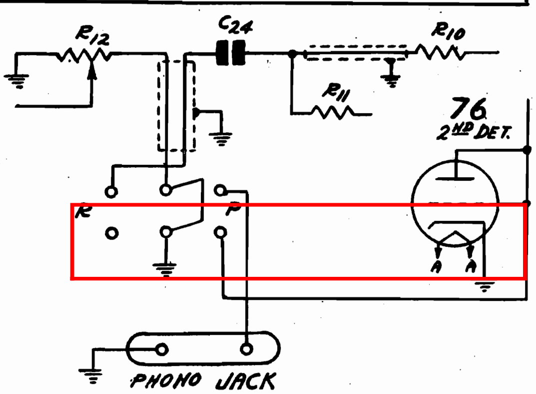


Fig. 7—Phonograph Connections

VOLTAGES AT SOCKETS
Line Voltage 115 - Antenna Shorted to Ground
Volume Control at Maximum

Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Cath. M A
6K7	R. F.	6.2	245	80	2.8	7.6
6K7	1st Det.	6.2	245	90	6.5	2.6
76	Osc.	6.2	90			5.3
6K7	1st I. F.	6.2	245	80	2.8	7.6
6K7	2nd I. F.	6.2	245	74	3.9	7.0
76	2nd Det.	6.2				
76	1st A. F.	6.2	110		5.6	2.1
6F6	Driver	6.2	235	230	20.0 (1)	27.0
6F6	Power	6.2	345	345	38.0 (2)	22.5
80	Rectifier	5.1	500 (3)			140.0 (4)

(1) As read across R19
(2) Grid to Ground
(3) Plate to Center Tap
(4) Two tubes in parallel

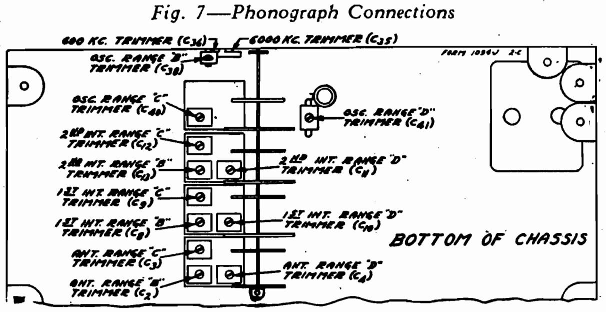


Fig. 3—Location of Trimmers

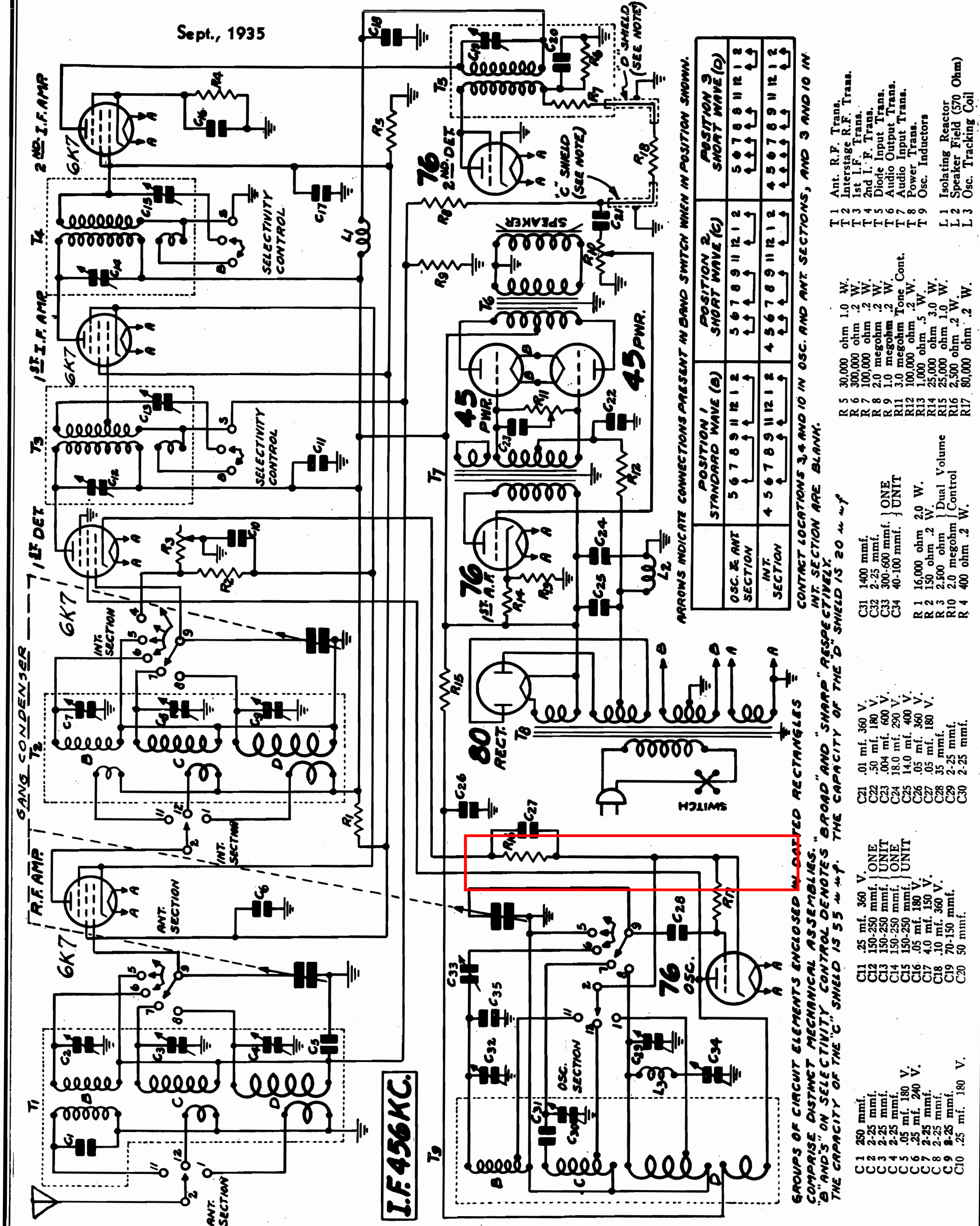
MODELS B35, B36
Schematic

LAFAYETTE RADIO MFG. CO.

Power Consumption - 90 Watts (At 115 volts 60 cycles)
Power Output - - - - - - - 5 Watts Undistorted
Selectivity - 22 KC Broad at 1000 times Signal (Sharp)

Tuning Frequency Range
B Range - - - - - - - - - - 535 to 1730 KC.
C Range - - - - - - - - - - 1715 to 5800 KC.
D Range - - - - - - - - - - 5750 to 18300 KC.

Sept., 1935



MODELS B35,B36
Voltage,Socket,Coils
Trimmers,Phono.Data

LAFAYETTE RADIO MFG. CO.

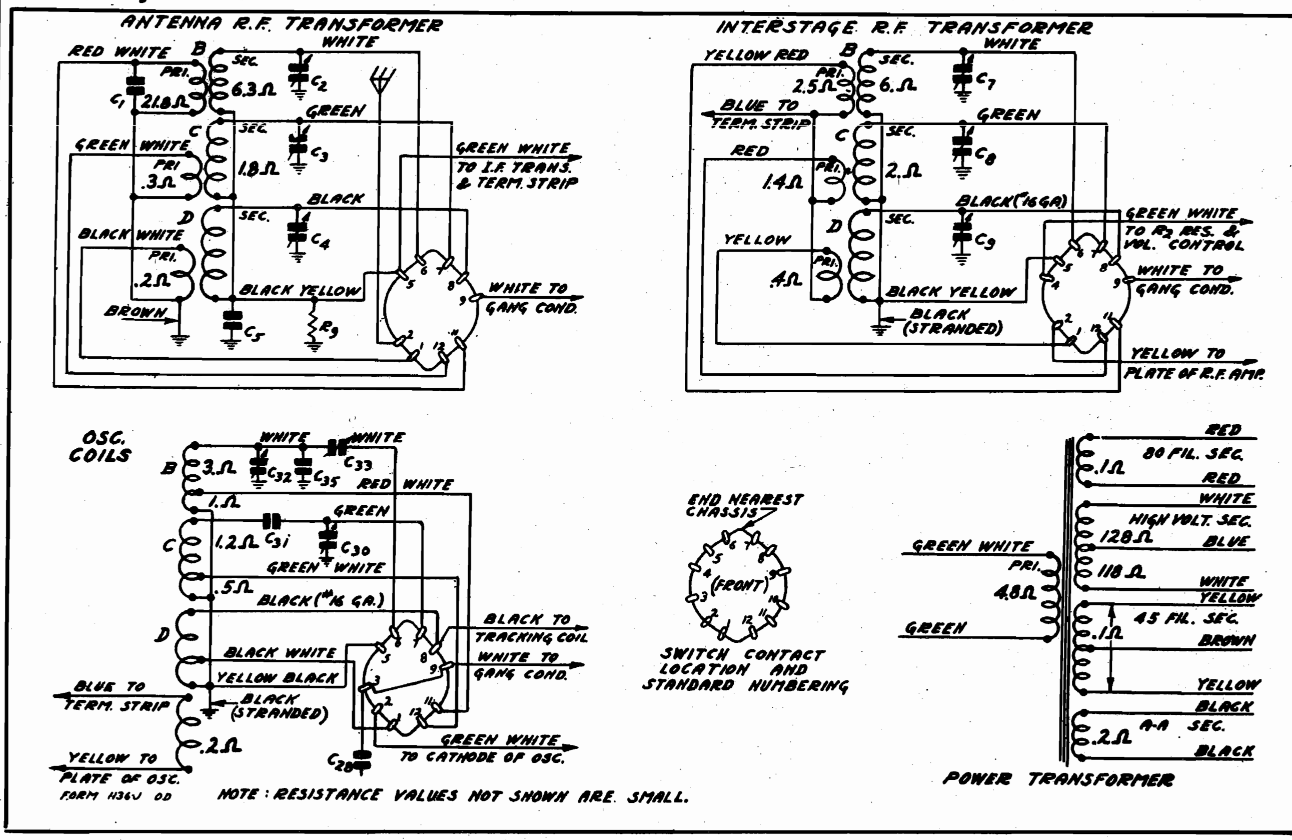


Fig. 4—Color Coding of Coil Wires and D. C. Resistance of Windings (Also see complete D. C. Resistance List in this Manual)

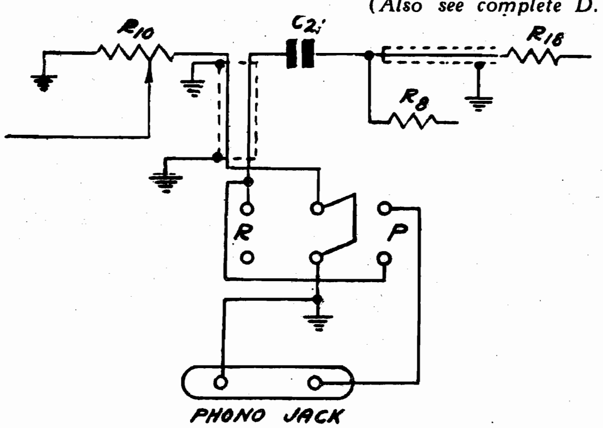


Fig. 7—Phonograph Connections

VOLTAGES AT SOCKETS

Line Voltage, 115 - Volume Control at Maximum
Antenna Shorted to Ground

Type of Tube	Function	Heater or Filam't	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode M. A.
6K7 (6D6)	R. F.	6.1	265	120	3.7	9.0
6K7 (6D6)	1st Det.	6.1	265	110	9.5	3.8
76	Osc.	6.1	110			5.8
6K7 (6D6)	1st. I. F.	6.1	265	120	3.7	9.0
6K7 (6D6)	2nd I. F.	6.1	265	120	3.7	9.0
76	2nd Det.	6.1				
76	1st A. F.	6.1	265		14.	5.0
45	Power	2.5	265		50.(1)	22.
80	Rectifier	4.9				90. (total)

(1) As read with 500 Volt Scale. Grid to Ground.

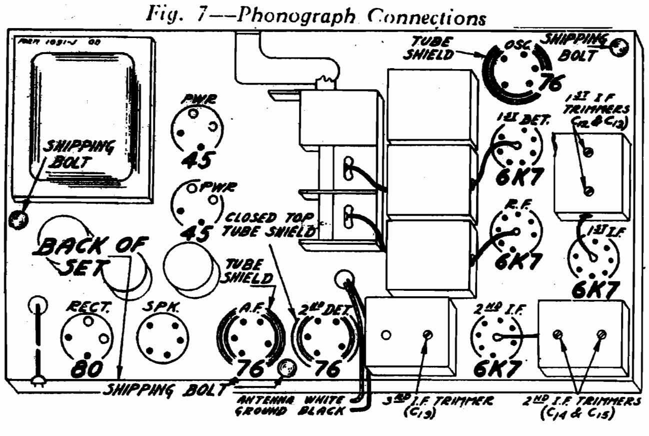


Fig. 5—Location of Tubes

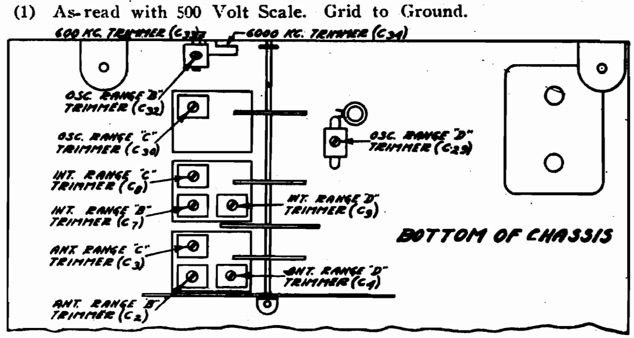


Fig. 3—Location of Trimmers

LAFAYETTE RADIO MFG. CO.

Alignment and Calibration

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 5800, 5000, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used. If a station is tuned in with the selectivity control in the broad position and this control is then turned to the sharp position, the station may disappear. This is not an indication that the receiver is out of alignment.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a 0.1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band selector to the Range B position (standard wave band—purple dial color).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the A.V.C.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 5.

Range B Alignment

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band selector in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range B trimmer (C32) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output

Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the interstage Range B trimmer (C7) and antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (1st short wave band—green dial color).

Adjust the oscillator Range C trimmer (C30) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C8) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (2nd short wave band—red dial color).

Adjust the oscillator Range D trimmer (C29) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C9) and antenna Range D trimmer (C4) to maximum.

When adjusting the interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Then go back and repeat the procedure as given for the 18,300 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

D. C. Resistance of Windings
Refer to Fig. 4.

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A405	Antenna R. F. Transformer	T1	
	Range B Primary Winding		21.8
	Range C Primary Winding		0.3
	Range D Primary Winding		0.2
	Range B Secondary Winding		6.3
	Range C Secondary Winding		1.8
	Range D Secondary Winding		Small
P-9A425	Interstage R. F. Transformer	T2	
	Range B Primary Winding		2.5
	Range C Primary Winding		1.4
	Range D Primary Winding		0.4
	Range B Secondary Winding		6.0
	Range C Secondary Winding		2.0
	Range D Secondary Winding		Small
P-9A426	Oscillator Coils	T9	
	Range B Grid Coil		
	Red White Tap to White		3.0
	Red White Tap to Ground		1.0
	Range C Grid Coil		
	Green White Tap to Green		1.2
	Green White Tap to Ground		0.5
	Range D Grid Coil		
	Black White Tap to Black		Small
	Black White Tap to Ground		Small
	Oscillator Plate Coil		0.2
P-9A397	1st I. F. Transformer	T3	
	Primary Winding		4.6
	Secondary Winding		
	Long Portion		3.4
	Short Portion		1.7
	Coupling Winding		0.2
P-9A398	2nd I. F. Transformer	T4	
	Primary Winding		9.4
	Secondary Winding		9.0
	Coupling Winding		0.5
P-9A399	3rd I. F. Transformer	T5	
	Primary Winding		10.2
	Secondary Winding		28.4
P-50X16	Audio Input Transformer	T7	
	Primary Winding		2350.
	Secondary Winding		
	Center Tap to Inside		2000.
	Center Tap to Outside		2690.
P-51X32	Audio Output Transformer	T6	
	Primary Winding		
	Center Tap to Inside		198.
	Center Tap to Outside		222.
	Secondary Winding		0.4
P-12A208	Dynamic Speaker (10")		
	Speaker Voice Coil		1.6
	Speaker Field	L2	570.
P-53X94	115 Volt 60 Cycle Power Trans.	T8	
	Primary Winding		4.8
	Tube Filament Secondary (A-A)		0.2
	Tube Filament Secondary (B-B) (45)		0.1
	Rectifier Filament Secondary		0.1
	High Voltage Secondary Winding		
	Center Tap to Inside		118.
	Center Tap to Outside		128.
P-9A400	2nd I. F. Plate Isolating Reactor	L1	36.
P-9A391	High Frequency Oscillator Tracking Coil	L3	1.2

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 Volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

Changes in Early Models

In the early models of this receiver the tone control resistor (R11) was connected as a series variable resistor connecting in series through the condenser C23 between the grids of the 45 tubes in the audio output stage. In the later models it is employed as a potentiometer in the manner shown in Fig. 2.

The 100,000 ohm resistor (R18) was not used in the early models. Condenser C21 was connected directly to resistor R7.

The type 6K7 metal tubes replace the type 6D6 glass tubes which were used in the early models.

Condenser C35 was added to the oscillator coil standard wave section in later models. It is not, however, used in all cases but only when this capacity is required in this circuit.

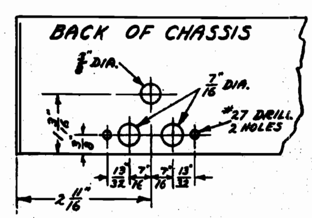


Fig. 8—Details of Panel Drilling for Phono Assembly

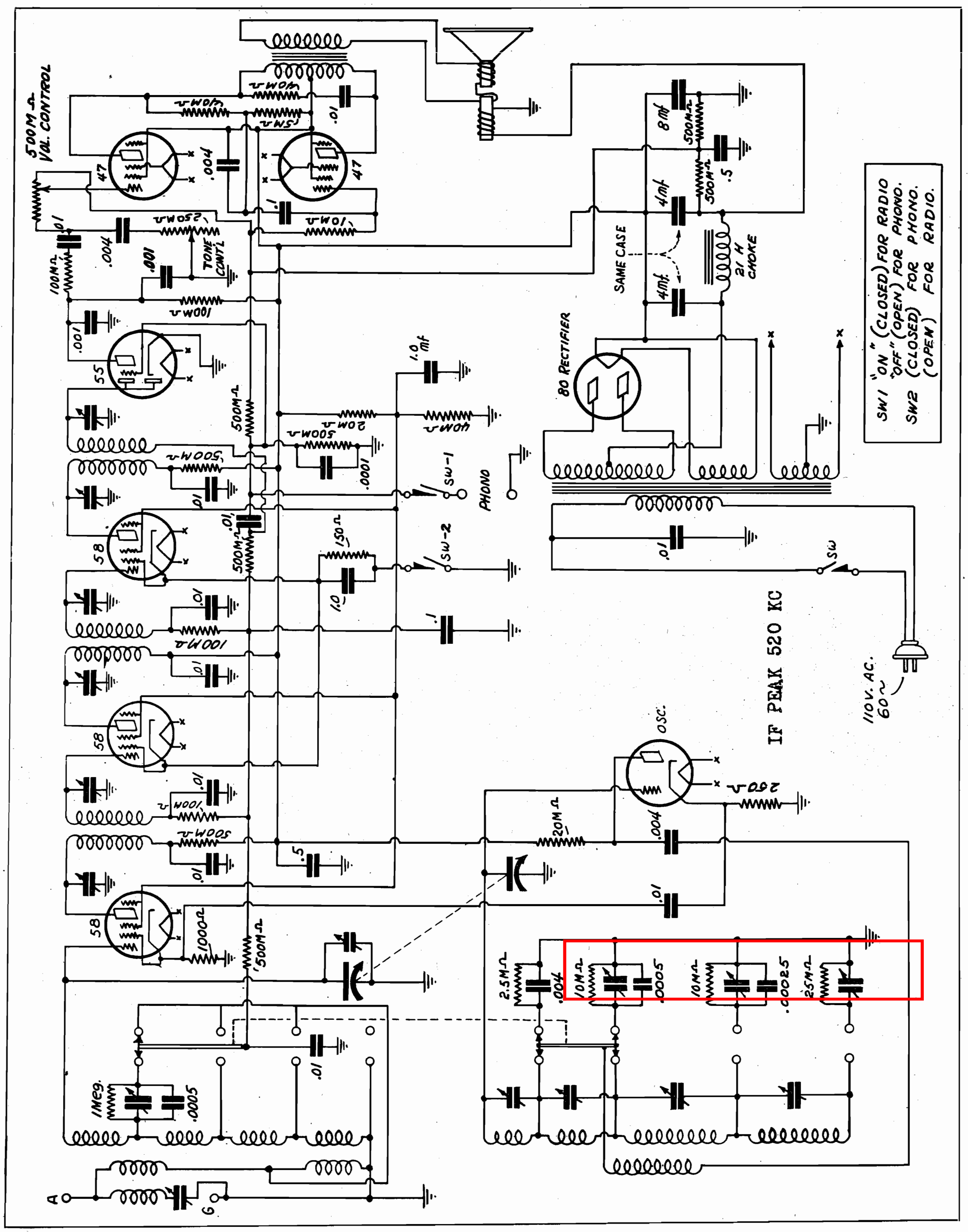
Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required to make this installation are shown in the parts list.

To mount the phono switch and phono jack, drill holes of a size and in the position shown in Fig. 8 at the left hand side (from back) of the rear panel of the chassis.

MODELS M41,M43
Schematic

LAFAYETTE RADIO MFG. CO.

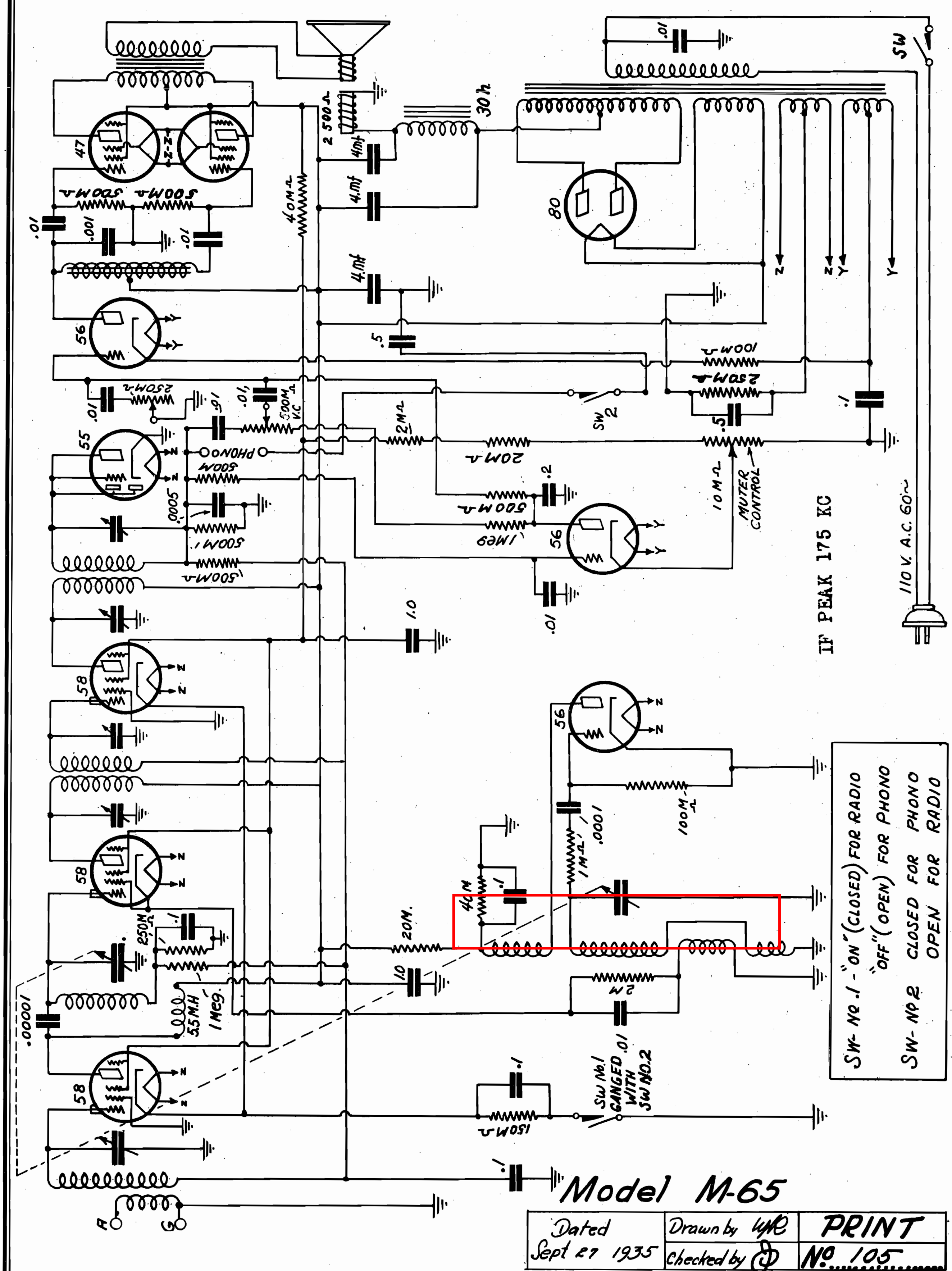


Lafayette DUAL WAVE M-41 - M-43
8 TUBE SUPERHET'

Dated	Drawn by	PRINT
Sept. 26 1935	Checked by	No. 110

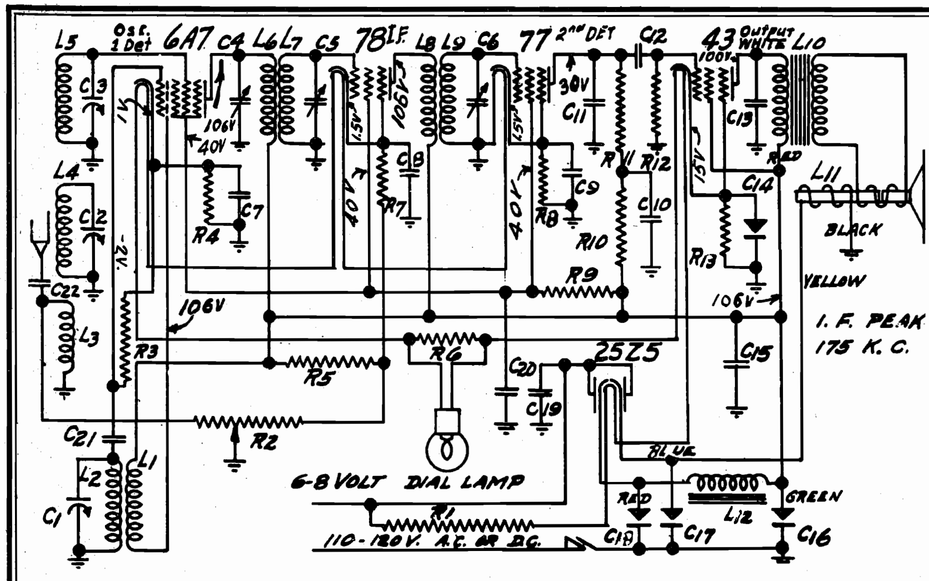
MODEL M65
Schematic

LAFAYETTE RADIO MFG. CO.



MODEL A77
MODELS A81,A81L
Schematics,Socket

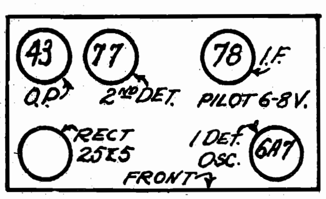
LAFAYETTE RADIO MFG. CO.



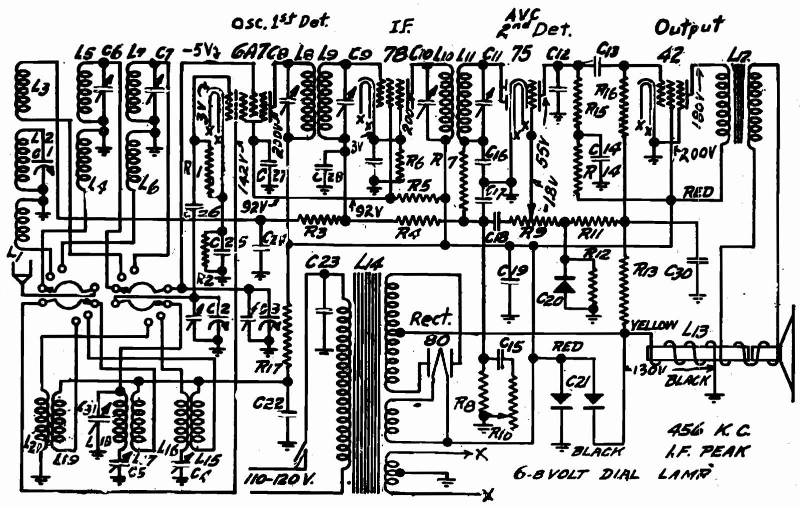
MODEL A77

R1	20-1125	130	Ohm Resistor in Power Cord
R2	19-1296	10,000	Ohm Volume Control & Switch
R3	53-898	50,000	Ohm Resistor Oscillator Grid
R4	53-1062	250	Ohm Resistor 6A7 Cathode
R5	53-922	75,000	Ohm Resistor I.F.Cathode Feed
R6	53-1308	20	Ohm Resistor Pilot Light Shunt
R7	53-1063	500	Ohm Resistor I.F.Cathode
R8	53-941	20,000	Ohm Resistor Second Detector Cathode
R9	53-921	40,000	Ohm Resistor Screen Feed
R10	53-923	100,000	Ohm 77 Plate Hum Resistor
R11	53-924	250,000	Ohm Resistor 77 Plate
R12	53-925	500,000	Ohm Resistor Output Grid
R13	53-1063	500	Ohm Resistor Output Cathode

C1	77-833	336 MMFD. Oscillator Section 3 Gang
C2	77-833	371 MMFD. Preselector Section 3 Gang
C3	77-833	371 MMFD. Preselector Section 3 Gang
C4	78-2008	First I.F. Primary Trimmer
C5	78-2007	First I.F. Secondary Trimmer
C6	78-788	Second I.F. Trimmer
C7	75-272A	.1 Mfd. 200 Volt 6A7 Cathode
C8	75-272A	.1 Mfd. 200 Volt 78 Cathode
C9	75-267A	5. Mfd. 200 Volt 77 Cathode
C10	75-272A	.1 Mfd. 200 Volt 77 Plate Hum Filter
C11	76-265	.001 Mfd. Mica 77 Plate By-Pass
C12	75-269A	.01 Mfd. 400 Volt Audio Feed Condenser
C13	75-343A	.004 Mfd. Paper Output Plate By-Pass
C14	18-928	25 Mfd. 25 Volt Output Cathode
C15	75-267A	.5 Mfd. 200 Volt B Supply By-Pass
C16	18-1085	4 Mfd. 150 Volt Dry Electrolytic Condenser
C17	18-1085	4 Mfd. 150 Volt Dry Electrolytic Condenser
C18	18-1085	10 Mfd. 150 Volt Dry Electrolytic Condenser
C19	75-272A	.1 Mfd. 200 Volt 110 Volt Line By-Pass
C20	75-272A	.1 Mfd. 200 Volt Screen By-Pass
C21	76-264	.00005 Mfd. Mica Oscillator Grid Condenser
C22	76-265	.001 Mfd. Mica Antenna Series Condenser
L11	64-1260	3000 Ohm Speaker Field
L12	14-940	20 Henry Choke



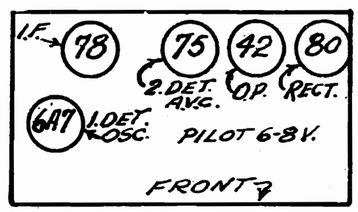
CHASSIS LAYOUT



MODEL A81,A81L

R1	53-941	20,000	Ohm Oscillator Grid Resistor
R2	53-1062	250	Ohm Oscillator Cathode Resistor
R3	53-923	100,000	Ohm A.V.C. Network
R4	53-926	1	Megohm A.V.C. Network
R5	53-1042	25,000	Ohm Screen Feed
R6	53-1063	500	Ohm I.F. Cathode
R7	53-898	50,000	Ohm Diode Filter
R8	53-925	500,000	Ohm Diode Load
R9	19-1291	500,000	Ohm Volume Control & Switch
R10	19-1317	250,000	Ohm Tone Control
R11	53-923	100,000	Ohm C Bias Network
R12	53-919	5,000	Ohm C Bias Network
R13	53-926	1	Megohm C Bias Network
R14	53-923	100,000	Ohm 75 Plate Hum Resistor
R15	53-924	250,000	Ohm 75 Plate
R16	53-925	500,000	Ohm 42 Grid
R17	53-277	10,000	Ohm Oscillator Plate Resistor

L1	17-20[illegible]	Broadcast Preselector Primary
L2	17-2031	Broadcast Preselector First Secondary
L3	17-2031	Broadcast Preselector Second Secondary
L4	17-2031	Long Wave Band Preselector Primary
L5	17-2031	Long Wave Band Preselector Secondary
L6	17-2017	Foreign Band Preselector Primary
L7	17-2017	Foreign Band Preselector Secondary
L8	17-2016	First I.F. Primary
L9	17-2016	First I.F. Secondary
L10	17-2016	Second I.F. Primary
L11	17-2016	Second I.F. Secondary
L12	64-2003	Single 42 Output Transformer
L13	-2003	2500 Ohm Speaker Field



CHASSIS LAYOUT

C1	77-1581	16-366 MMFD. Third Section of 3 Gang Condenser
C2	77-1581	16-366 MMFD. Oscillator Section of 3 Gang Condenser
C3	77-1581	16-366 MMFD. Second Section of 3 Gang Condenser
C4	78-1569	450 MMFD. Broadcast Oscillator Trimmer
C5	78-1569	140 MMFD. Long Wave Band Oscillator Trimmer
C6	78-1588	3-30 MMFD. Long Wave Band Preselector Trimmer
C7	78-1588	3-30 MMFD. Skip Band Preselector Trimmer
C8	78-2005	80 MMFD. First I.F. Primary Trimmer
C9	78-2005	80 MMFD. First I.F. Secondary Trimmer
C10	78-2005	80 MMFD. Second I.F. Primary Trimmer
C11	78-2005	80 MMFD. Second I.F. Secondary Trimmer
C12	76-265	.001 MFD. Mica Second Detector Plate
C13	75-269A	.01 MFD. 400 Volt Audio Feed Condenser
C14	75-1326A	.1 MFD. 400 Volt 75 Plate Hum Filter
C15	75-269A	.01 MFD. 400 Volt Tone Control Condenser
C16	76-339	.0001 MFD. Mica Diode Filter Network
C17	76-339	.0001 MFD. Mica Diode Filter Network
C18	75-269A	.01 MFD. 400 Volt Audio Feed Condenser
C19	75-266	1. MFD. 400 Volt B. Supply By-Pass
C20	18-928	25 MFD. 25 Volt C Bias
C21	18-1274	4-4 MFD. 450 Volt Dry Electrolytic Condenser
C22	75-269A	.01 MFD. 400 Volt Oscillator Plate By-Pass
C23	75-269A	.01 MFD. 400 Volt 110 Volt Line By-Pass
C24	75-272A	.1 MFD. 200 Volt A.V.C. Network By-Pass
C25	75-272A	.1 MFD. 200 Volt 6A7 Cathode By-Pass
C26	76-264	.00005 MFD. Mica Oscillator Grid Condenser
C27	75-272A	.1 MFD. 200 Volt Screen By-Pass
C28	75-272A	.1 MFD. 200 Volt A.V.C. Network By-Pass
C29	75-272A	.1 MFD. 200 Volt 78 Cathode By-Pass
C30	75-183A	.2 MFD. 200 Volt C Bias Network By-Pass
C31	78-1588	3-30 MMFD. Long Wave Band Oscillator Trimmer

MODEL B78
Schematic

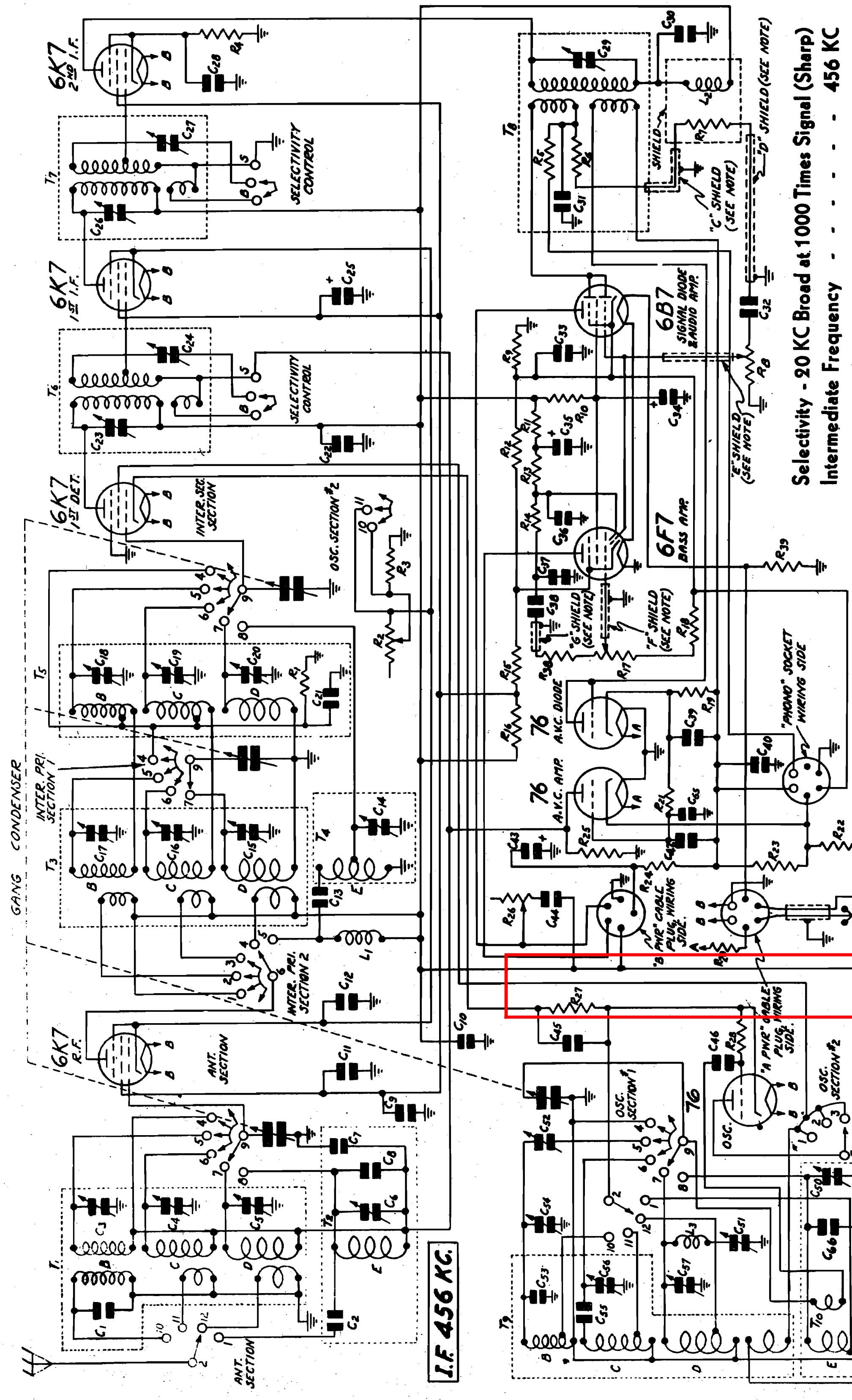
LAFAYETTE RADIO MFG. CO.

Power Consumption - - - - - - - 290 Watts
(At 115 Volts 60 Cycles)

Power Output - - - - - 30 Watts Undistorted

Sensitivity

B Range Average	- - -	0.5 Microvolts Absolute
C Range Average	- - -	1.0 Microvolts Absolute
D Range Average	- - -	2.0 Microvolts Absolute
E Range Average	- - -	40.0 Microvolts Absolute



Selectivity - 20 KC Broad at 1000 Times Signal (Sharp)
Intermediate Frequency - - - - - - 456 KC

C 1	250 mmf.	C21	.05 mf. 180 V.	C41	.02 mf. 600 V.
C 2	35 mmf.	C22	.25 mf. 480 V.	C42	.05 mf. 180 V.
C 3	2-25 mmf.	C23	150-250 mmf. } Dual	C44	.01 mf. 360 V.
C 4	2-25 mmf.	C24	150-250 mmf. } Dual	C45	.05 mf. 180 V.
C 5	2-25 mmf.	C25	60.0 mf. Electrolytic	C46	35 mmf.
C 6	2-25 mmf.	C26	150-250 mmf. } Dual	C48	.05 mf. 360 V.
C 7	.05 mf. 180 V.	C27	150-250 mmf. } Dual	C49	.10 mf. 360 V.
C 8	35 mmf.	C28	.05 mf. 180 V.	C50	2-25 mmf.
C 9	250 mmf.	C29	70-150 mmf.	C53	10 mmf.
C10	.05 mf. 480 V.	C30	.10 mf. 480 V.	C54	2-25 mmf.
C11	.25 mf. 180 V.	C31	50.0 mmf.	C55	1400 mmf.

C63	30. mf. 400 V. Electrolytic
C64	30. mf. 400 V. Electrolytic
C65	500 mmf.
C66	20 mmf.
C67	.70 mf. 280 V. (Block)
C68	.70 mf. 280 V. (Block)

R 5	100,000 ohm 0.2 watt
R 6	100,000 ohm 0.2 watt
R 7	100,000 ohm 0.2 watt
R10	60,000 ohm 1.0 watt
R11	10,000 ohm 0.5 watt
R13	60,000 ohm 0.5 watt
R14	40,000 ohm 0.2 watt
R18	150,000 ohm 0.2 watt
R19	100,000 ohm 0.2 watt
R20	2.0 ohm 1.0 watt armored wire wound

R25	500,000 ohm 0.2 watt	R 9	60 ohm } Armored Wire Wound	T10	"E" Range Osc. Inductor
R26	1.0 megohm Tone Control	R12	70 ohm } Armored Wire Wound	T11	Bias and Heater Power Trans.
R27	2,500 ohm 0.2 watt	R15	2,500 ohm } Armored Wire Wound	T12	"B" Power Trans.
R28	30,000 ohm 0.2 watt	R16	4,000 ohm } Armored Wire Wound	T13	P-P Input Trans.
R29	15,000 ohm 3.0 watt	R39	130 ohm 2.5 watt armored wire wound	T14	P-P Output Trans.
R30	50,000 ohm 0.2 watt	T 1	Ant. R.F. Trans.	B 1	Block Cond. and 10 KC Filter
R31	2,000 ohm 0.2 watt	T 2	"E" Range Ant. R.F. Trans.	L 1	"E" Range Int. Plate Reactor
R32	2,000 ohm 0.2 watt	T 3	1st Interstage R.F. Trans.	L 2	2nd I.F. Plate Isolating Reactor
R33	200,000 ohm 0.2 watt	T 4	"E" Range Int. R.F. Trans.	L 3	Osc. Tracking Coil
R34	200,000 ohm 0.2 watt	T 5	2nd Interstage R.F. Trans.	L 4	Filter Reactor
R35	2,000 ohm 0.2 watt				
R36	2,000 ohm 0.2 watt				
R37	150 ohm 0.2 watt				

MODEL B78
S.P.U. Schematic

LAFAYETTE RADIO MFG. CO.

Tuning Frequency Range
B Range - - - - - - - - - - - 535 to 1730 KC
C Range - - - - - - - - - - - 1715 to 5800 KC
D Range - - - - - - - - - - 5750 to 18300 KC
E Range - - - - - - - - - - 17500 to 48000 KC

Speaker - - - Two 12 Inch Auditorium Dynamics

R38 500,000 ohm 0.2 watt
R 2 2,500 ohm } Volume
R 8 2.0 megohm } Control
R17 1.0 megohm

T 6 1st I.F. Trans.
T 7 2nd I.F. Trans.
T 8 3rd I.F. Trans.
T 9 Osc. Inductors

L 5 Filter Reactor
L 6 Filter Reactor
L 7 Speaker Field 4500 ohm
L 8 Speaker Field 4500 ohm

R21 2.0 megohm 0.2 watt
R22 160,000 ohm 0.2 watt
R23 25,000 ohm 0.2 watt
R24 25,000 ohm 0.2 watt

C34 4.0 mf. 250 V. } Dry
C43 16.0 mf. 150 V. } Electrolytic
C47 4.0 mf. 250 V. } Block

C52 300-600 mmf. } Dual
C51 40-100 mmf.

R 1 25,000 ohm 0.2 watt
R 3 150 ohm 0.2 watt
R 4 500 ohm 0.2 watt

C56 2-25 mmf.
C57 2-25 mmf.
C58 60 mf. 150 V. Electrolytic

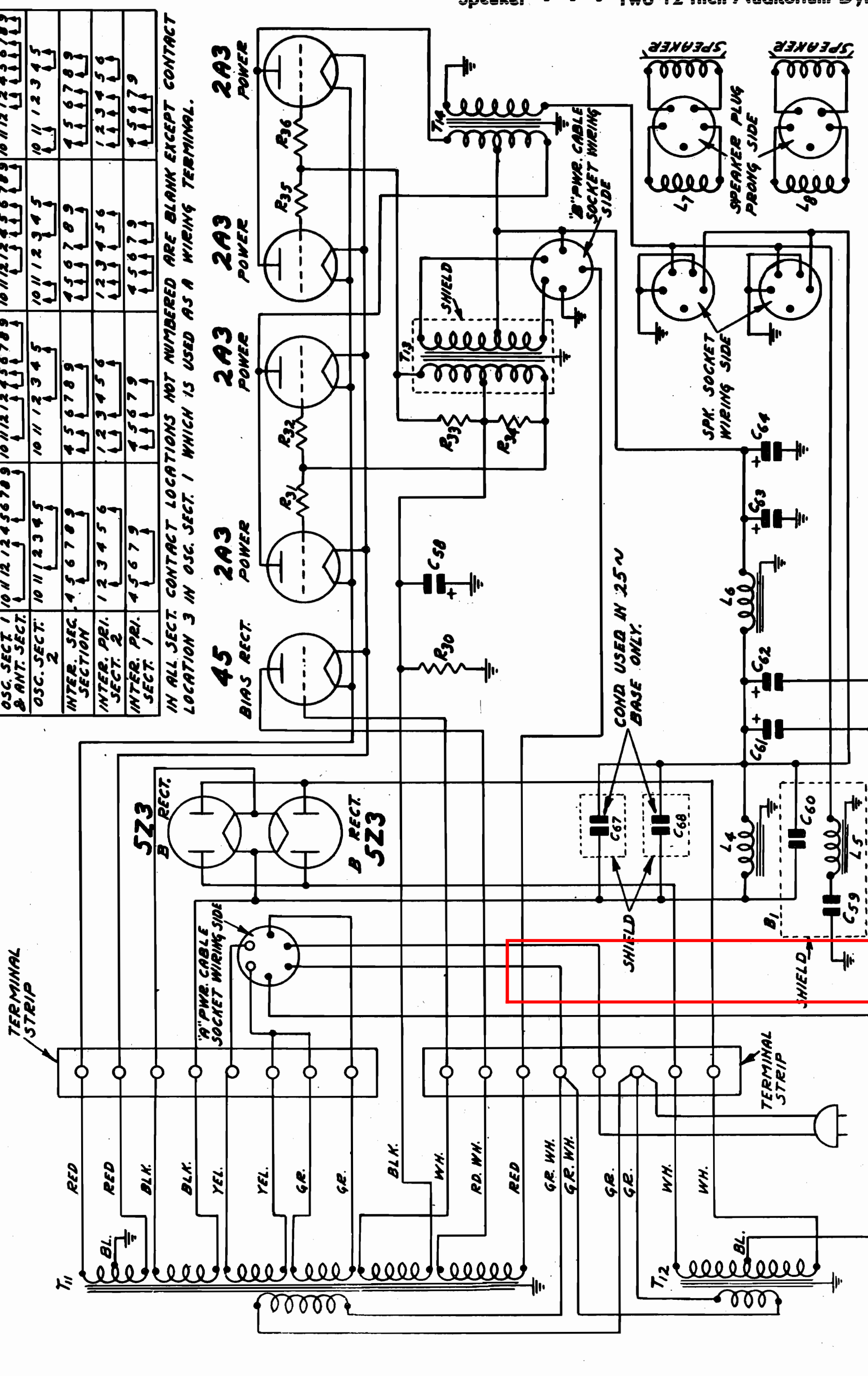
C59 .63 mf. 180 V.
C60 .35 mf. 280 V.
C61 30. mf. 400 V. Electrolytic
C62 30. mf. 400 V. Electrolytic

C32 .01 mf. 360 V.
C33 .05 mf. 180 V.
C35 12.0 mf. 300 V. Electrolytic

C36 .10 mf. 360 V.
C37 .02 mf. 360 V.
C38 .005 mf. 360 V.
C39 100 mmf.
C40 .50 mf. 180 V.

C12 .25 mf. 180 V.
C13 .05 mf. 480 V.
C14 2-25 mmf.
C15 2-25 mmf.
C16 2-25 mmf.
C17 2-25 mmf.
C18 2-25 mmf.
C19 2-25 mmf.
C20 2-25 mmf.

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SW. WHEN IN POS. SHOWN.



IN ALL SECT. CONTACT LOCATIONS NOT NUMBERED ARE BLANK EXCEPT CONTACT LOCATION 3 IN OSC. SECT. 1 WHICH IS USED AS A WIRING TERMINAL.

THE FOLLOWING NOTES APPLY TO THE RADIO FREQUENCY CHASSIS. GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. "B" AND "S" ON SELECTIVITY CONTROL DENOTES "BROAD" AND "SHARP" RESPECTIVELY. THE CAPACITY OF "C" SHIELD IS 20 MMF, THE CAPACITY OF "D" "F" & "G" SHIELDS IS 70 MMF EACH. THE CAPACITY OF "E" SHIELD IS 15 MMF.

MODEL B78
Voltage, Trimmers
Chassis

LAFAYETTE RADIO MFG. CO.

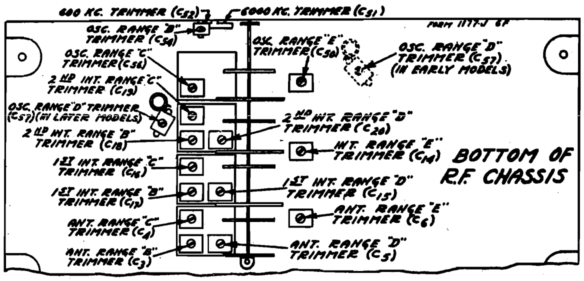


Fig. 6—Trimmer Location

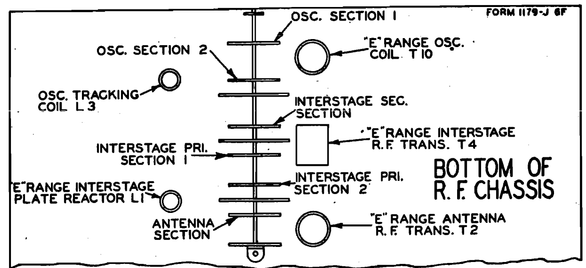


Fig. 5—Bottom View of Chassis Showing Coil and Switch Section Location

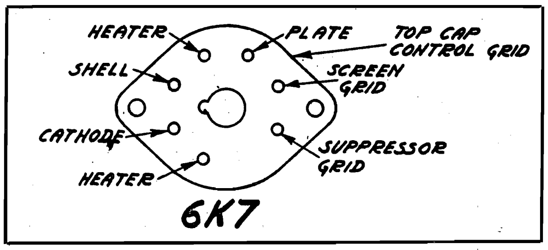


Fig. 7—Bottom View of Metal Tube Socket

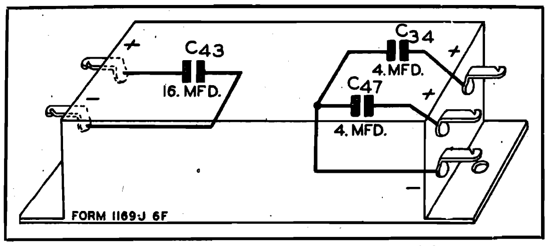


Fig. 8—Condenser Block Internal Wiring

VOLTAGES AT SOCKETS

Antenna Shorted to Ground - Line Voltage 110
Volume Control Maximum

Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode M. A.
6K7	R. F.	5.8	300	110	4.1	10.5
6K7	1st Det.	5.8	300	142	10.0	3.5
76	Osc.	5.8	142			10.0
6K7	1st I. F.	5.8	300	110	4.1	10.5
6K7	2nd I. F.	5.8	300	110	3.7	10.0
6B7	Sig. Diode & Audio Amp.	5.8(1) 5.6(2)	300	115	3.6	4.5
6F7	Bass Amp.	5.8(1) 5.6(2)	275(3) 125(4)	115	7.2	9.0
76	A.V.C. Diode	4.9				
76	A.V.C. Amp.	4.9	0		-62.0	
2A3	Power	2.35	300		60(5)	60.0(6)
5Z3	'B' Rect.	4.8				375.0(7)
45	Bias Rect.	2.4				

(1) Measured with A. C. Voltmeter—early models with letter "A" under chassis.
(2) Measured with D. C. Voltmeter—later models with letter "B" under chassis.
(3) Pentode Plate
(4) Triode Plate
(5) Control Grid to ground.
(6) Each Side of push-pull Circuit—120 Ma. total for 4 tubes.
(7) Total for both tubes—Milliameter in series with 1st Choke.

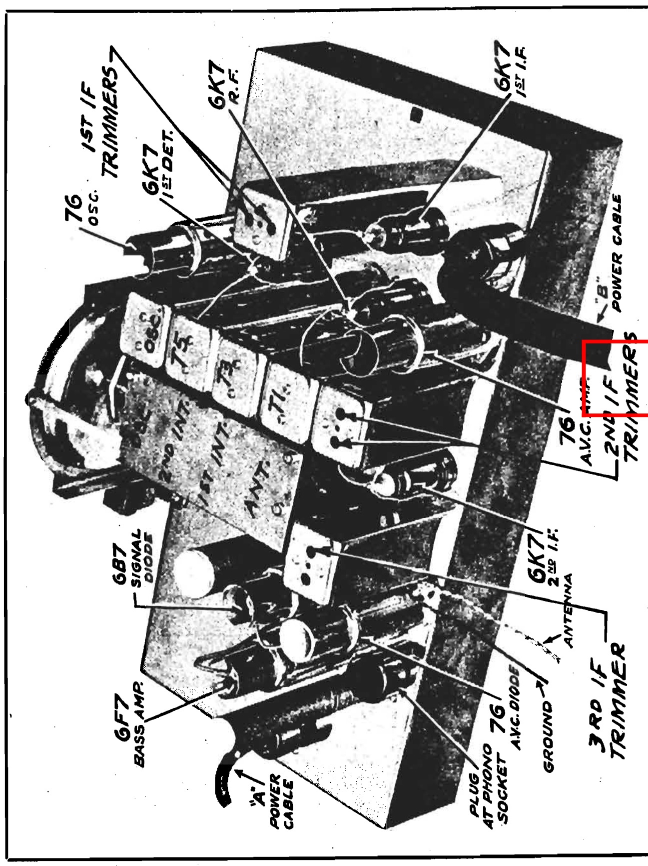


Fig. 10—Tube Arrangement in R.F. Chassis

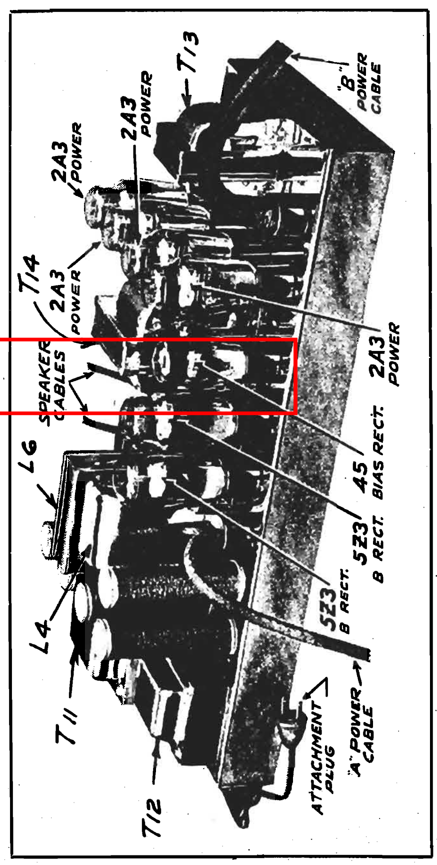


Fig. 11—Tube Arrangement in A.F. Chassis

MODEL B78
Trimmers, Color Code
Changes, Phono.

LAFAYETTE RADIO MFG. CO.

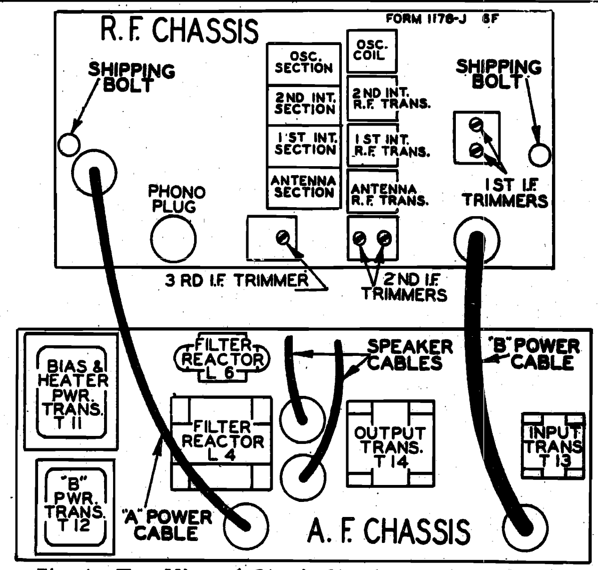


Fig. 4—Top View of Chassis Showing Location of Units

Changes in Early Models

In the early models condenser C65, shown in the R.F. Schematic Fig. 2, was not used. A 20 mmf. condenser, also designated as C65, was connected in parallel with condenser C14.

Condenser C10 from B+ to ground was not used in early models. Another condenser in the early models, also designated as C10 and 250 mmf. in value, was connected from the A.V.C. amplifier plate to ground.

Resistor R38 was not used in early models.

On the A.F. chassis the speaker sockets were wired with ground to the opposite side of voice coil.

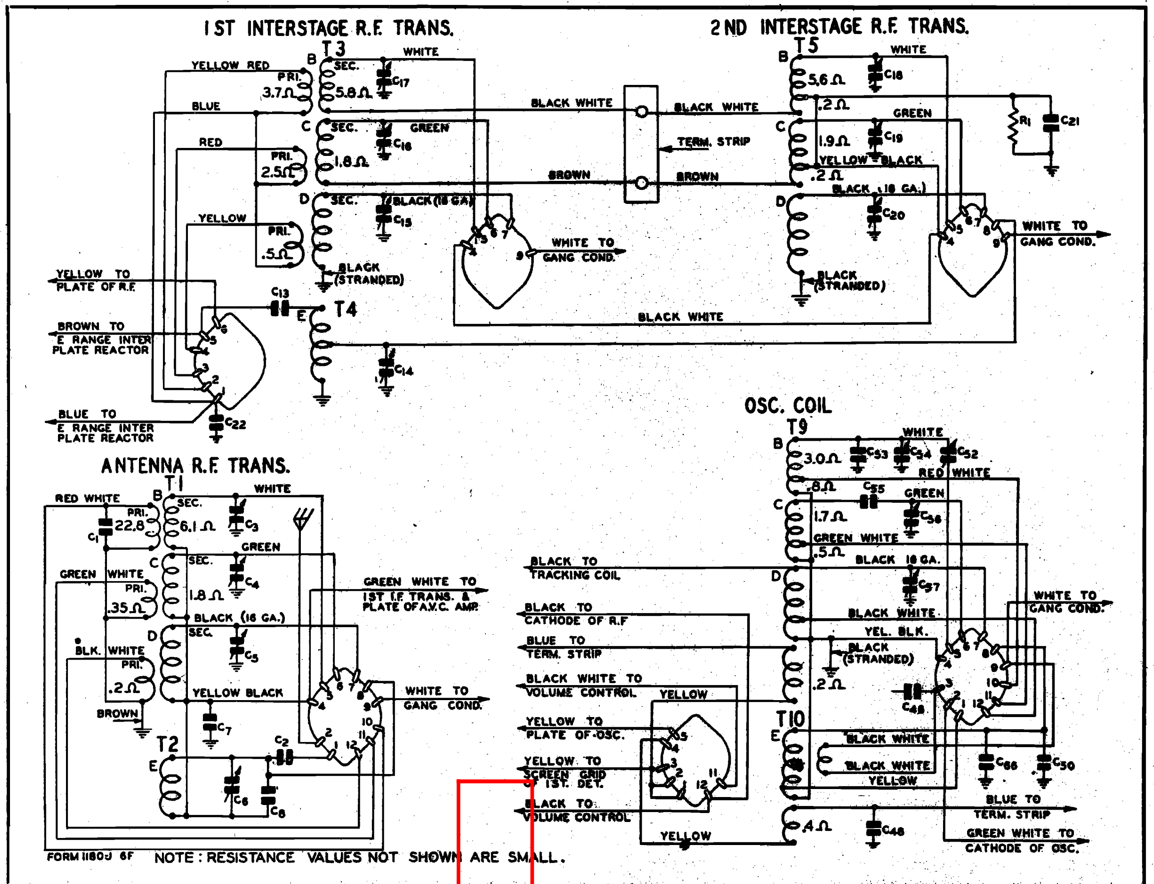


Fig. 12—Color Coding of Coil Wires and D. C. Resistances of Windings

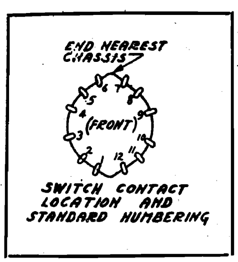


Fig. 9—Numbering of Switch Contacts

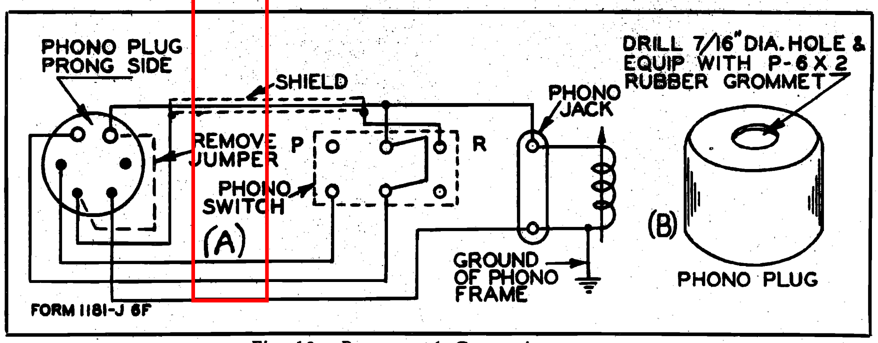


Fig. 13—Phonograph Connections

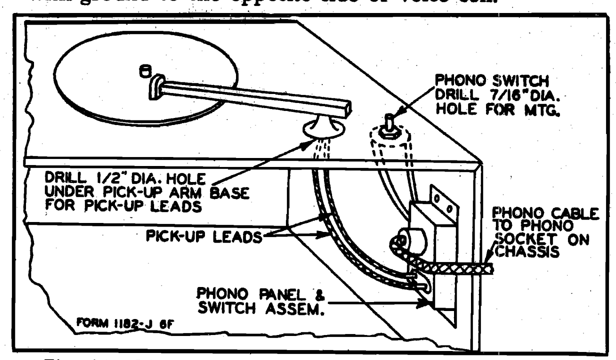


Fig. 14—Phonograph Connections Using Phono Cable and Panel Assembly

MODEL B78
Alignment
Resistances

LAFAYETTE RADIO MFG. CO.

D. C. Resistance of Windings
Refer to Figs. 12, 2 & 3.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A428	Antenna R.F. Transformer	T1	
	Range B Primary Winding		22.8
	Range C Primary Winding		0.35
	Range D Primary Winding		0.2
	Range B Secondary Winding		6.1
	Range C Secondary Winding		1.8
	Range D Secondary Winding		Small
P-9A435	"E" Range Antenna R.F. Coil	T2	Small
P-9A429	1st Interstage R.F. Transformer	T3	
	Range B Primary Winding		3.7
	Range C Primary Winding		2.5
	Range D Primary Winding		0.5
	Range B Secondary Winding		5.8
	Range C Secondary Winding		1.8
	Range D Secondary Winding		Small
P-9A436	"E" Range Interstage R.F. Coil	T4	
	Tap to either side		Small
P-53X85	"B" Power Transformer (115 Volts 60 Cycles)	T12	
	Primary Winding		1.9
	Secondary Winding		
	Center Tap to Inside		48.0
	Center Tap to Outside		53.1
P-50X25	Audio Input Transformer	T13	
	Primary Winding		
	Tap to Plate of 6F7		6600.
	Tap to Tone Control and Plate of 6B7		4650.
	Secondary Winding		
	Center Tap to Inside		2840.
	Center Tap to Outside		3260.
P-51X33	Audio Output Transformer	T14	
	Primary Winding		
	Center Tap to Inside		19.7
	Center Tap to Outside		22.4
	Secondary Winding		0.4
P-12A206	12" Dynamic Speaker		
	Speaker Voice Coil		6.3
	Speaker Field	L7	4500.
P-12A213	12" Dynamic Speaker		
	Speaker Voice Coil		6.3
	Speaker Field	L8	4500.
P-9A391	"E" Range Interstage Plate Reactor	L1	1.0
P-9A450	2nd I.F. Plate Isolating Reactor	L2	35.0
P-9A391	High Frequency Oscillator Tracking Coil	L3	1.0
P-52X35	Filter Reactor	L4	51.6
P-52X36	Filter Reactor	L6	11.2
P-48X201	Block Condenser & 10 KC Reactor Assembly	B1	
	10 KC Reactor	L5	0.6
P-9A430	2nd Interstage R.F. Coils	T5	
	Range B Section		
	Long Portion		5.6
	Short Portion		0.2
	Range C Section		
	Long Portion		1.9
	Short Portion		0.2
	Range D Section		Small
P-9A432	1st I.F. Transformer	T6	
	Primary Winding		4.4
	Coupling Winding		0.3
	Secondary Winding		
	Tap to Condenser Side		3.0
	Tap to Switch Side		1.3
P-9A433	2nd I.F. Transformer	T7	
	Primary Winding		4.4
	Coupling Winding		0.3
	Secondary Winding		
	Tap to Condenser Side		3.0
	Tap to Switch Side		1.3
P-9A434	3rd I.F. Transformer	T8	
	Primary Winding (Yellow to Blue)		9.7
	Signal Diode Secondary		12.4
	A.V.C. Secondary (Brown to Green)		7.0
P-9A431	Oscillator Coils	T9	
	Range B Grid Coil		
	Red-White tap to White		3.0
	Red-White tap to Black-Yellow		0.8
	Range C Grid Coil		
	Green-White tap to Green		1.7
	Green-White tap to Black-Yellow		0.5
	Range D Grid Coil		
	Black-White tap to Black		Small
	Black-White tap to Black-Yellow		Small
	Oscillator Range D Plate Coil		0.2
P-9A437	"E" Range Oscillator Coils	T10	
	Range E Grid Coil		Small
	Range E Plate Coil		.4
	Range E Series Grid Coil		Small
P-53X88	Filament Transformer (115 Volts 60 Cycles)	T11	
	Primary Winding		4.4
	Filament Transformer Secondaries, below		
	Red to Red		Small
	Black to Black		Small
	Yellow to Yellow		Small
	Green to Green		Small
	Black to White		22.8
	Red-White to Red		32.9

Phonograph in Separate Cabinet

For this assembly, a 5 conductor cable and a small metal panel assembly are supplied. This assembly has the radio-phono switch, tip jacks for pick-up leads and terminal plate for phono cable.

The phono panel is mounted at the most convenient place in the cabinet at which connections can be completed. The switch is secured to the motor board as illustrated in Fig. 14.

The socket at the end of the cable is secured to the terminal plate on the panel and the plug at the other end of the cable is inserted into the phono socket on the R.F. chassis.

When the switch is thrown to the radio side, the phono pick-up is excluded from the signal diode circuit. When it is thrown to the phono side, the signal diode circuit is opened and the phonograph connections completed to this circuit. Resistor R23 is short circuited. This brings the grid and cathode of the 76 A.V.C. amplifier to the same potential and causes a plate-current in this tube of sufficient intensity to bring the R.F. and 1st I.F. tubes to the point of cut off (See article on circuit for further information regarding operation of A.V.C. system).

Phonograph and Radio in Combination Cabinet

For this assembly, a number of separate items as shown in the parts list are supplied. The phono short circuiting plug supplied with the receiver is used after certain changes have been made.

First take off the shell of this plug by twisting the shell in either direction. The shell is then drilled and equipped with a rubber grommet as shown in Fig. 13 (B). Next unsolder and remove the jumper wire from the plug as shown in Fig. 13 (A). Extend the leads through the hole in the shell and solder the leads to the prongs on the plug as illustrated. Complete the connections to the switch and tip jacks as shown. The switch is mounted on the motor board and the tip jacks at the nearest convenient place.

The description of the connections as given for the separate phonograph cabinet also applies to the combination.

Alignment and Calibration

Correct alignment is extremely important in connection with all-wave receivers. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 5800, 5000, 18,300, 15,000, 6000, 48,000 and 40,000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used. If a station is tuned in with the selectivity control in the broad position and this control is then turned to the sharp position, the station may disappear. This is not an indication that the receiver is out of alignment.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator to the grid of the 1st detector through a 0.1 mf. condenser.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band selector to the Range B position (standard wave band—purple dial color).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the A.V.C.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 4.

Range B Alignment

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band selector in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signai generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range B trimmer (C54) until maximum output is obtained. The location of this trimmer is shown in Fig. 6.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Re-tighten the set screw.

Adjust the 1st and 2nd interstage Range B trimmers (C17 and C18) and antenna Range B trimmer (C3) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

Be sure to use a non-metallic screwdriver for this adjustment.

Range C Alignment

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (1st short wave band—green dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range C trimmer (C56) until maximum output is obtained. See Fig. 6 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range C trimmers (C16 and C19) and antenna Range C trimmer (C4) to maximum.

Do not change the setting of the oscillator Range C trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (2nd short wave band—red dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range D trimmer (C57) until maximum output is obtained. See Fig. 6 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range D trimmers (C15 and C20) and antenna Range D trimmer (C5) to maximum.

When adjusting the 2nd interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Then go back and repeat the procedure as given for the 18,300 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

Use a non-metallic screwdriver for this adjustment.

Range E Alignment

48,000 KC Adjustment

Set the signal generator for 48,000 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range E position (3rd short wave band—brown dial color).

Adjust the oscillator Range E trimmer (C50) until maximum output is obtained. See Fig. 6 for location of this trimmer.

40,000 KC Adjustment

Set the signal generator for 40,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range E trimmer (C14) and antenna Range E trimmer (C6) to maximum.

Do not change the setting of the oscillator Range E trimmer.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 9. In contact locations not used, the number applying to that particular location is not employed.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty cycle receiver in the fact that special twenty-five cycle filament and "B" power transformers must be used. It also has two additional condensers in the power unit—C67 and C68 as illustrated in Fig. 3. The twenty-five cycle transformers and the condensers are shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply if the two condensers C67 and C68 are removed. However, the reverse is not true, that is, a sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

115-230 Volt, 40 to 60 cycle filament and "B" power transformers are also available for this model.

MODEL B90(R)Early
Voltage,Socket
Trimmers,Coils
Resistances

LAFAYETTE RADIO MFG. CO.

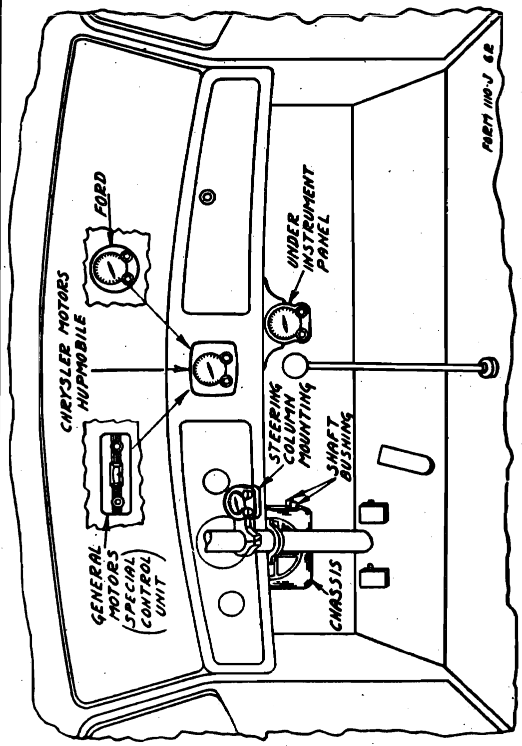


Fig. 5—Various Control Unit Mountings

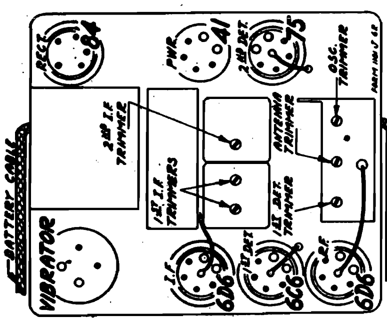


Fig. 2—Location of Tubes and Trimmers

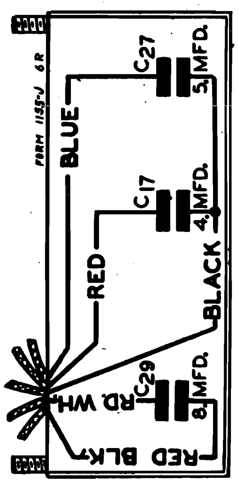


Fig. 4—Condenser Block—Internal Wiring

VOLTAGES AT SOCKETS

Antenna Disconnected **Battery 6 Volts Under Load**

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.8	220	90	4.5	6.3
6C6	1st Det. Osc.	5.8	220	90	0	2.4
6D6	I. F. Amp.	5.8	220	90	4.5	6.3
75	2nd Det.	5.8	130(1)		1.2	0.3
41	Power	5.8	210	220	16(2)	25.5
84	Rectifier	5.8				50.0

(1) With 250,000 Ohm Meter
(2) As read across filter choke.

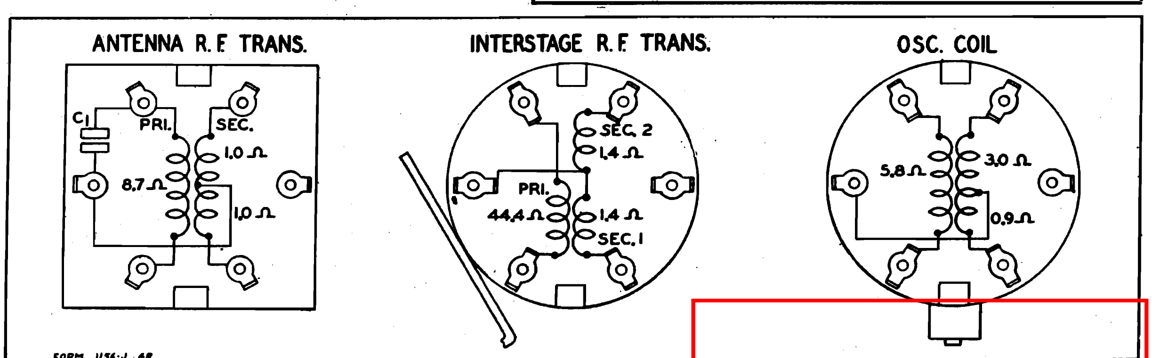


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A443	Antenna Transformer	T1	
	Primary Winding		8.7
	Secondary Winding—Either Portion		1.0
P-9A439	Interstage Transformer	T2	
	Primary Winding		44.4
	Secondary Winding—Either Portion		1.4
P-9A441	1st I. F. Transformer	T3	
	Primary Winding		93.5
	Secondary Winding		97.6
P-9A442	2nd I. F. Transformer	T4	
	Primary Winding		44.1
	Secondary Winding		49.6

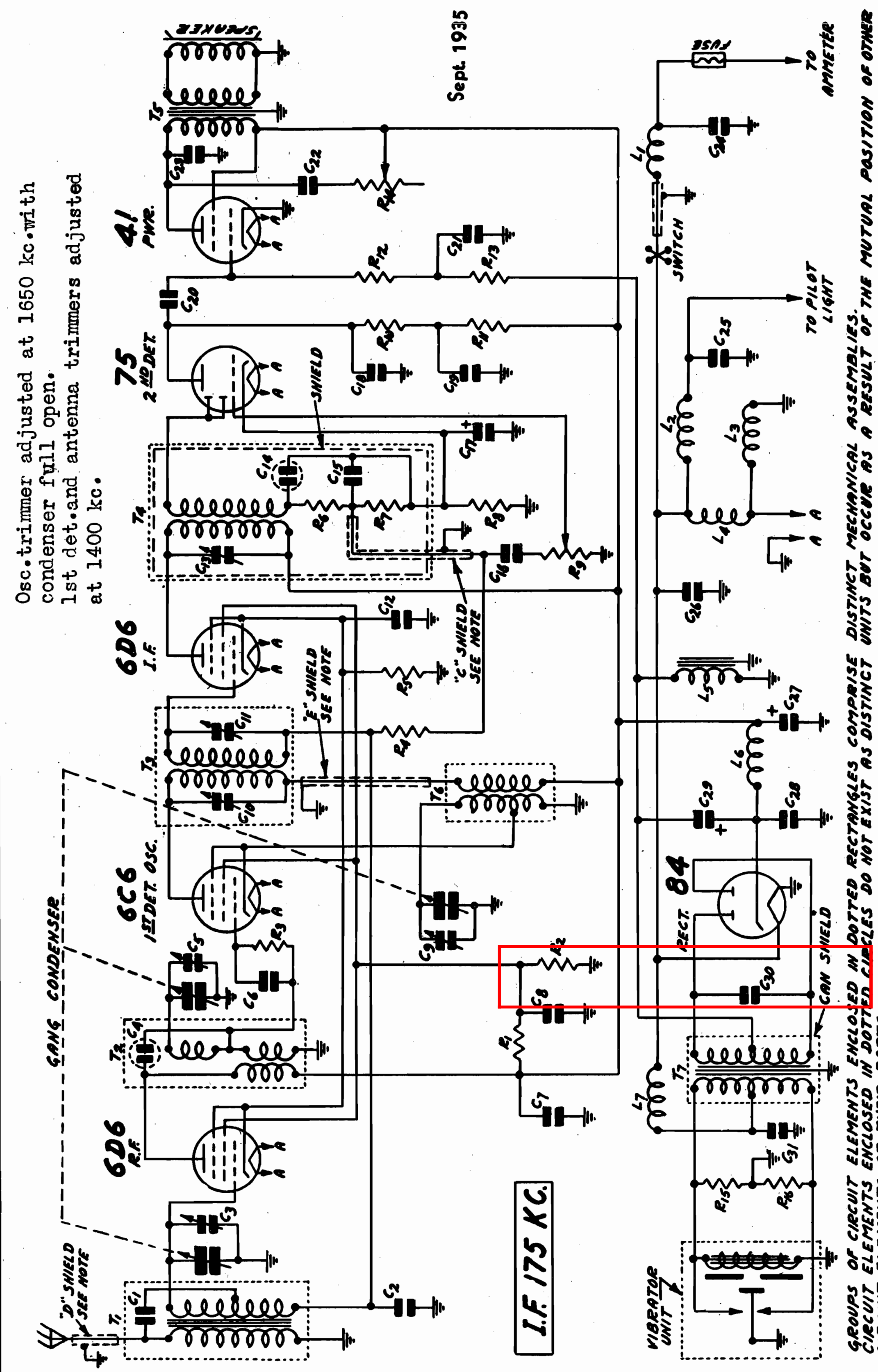
Part No.	Winding	Code	D. C. Resistance in Ohms
P-12A227	Dynamic Speaker		
	Output Transformer Primary	T5	416.6
	Output Transformer Secondary	T5	Small
	Speaker Field	L3	5.3
	Speaker Voice Coil		Small
P-9A440	Oscillator Coils	T6	
	Grid Coil		
	Long Portion		3.0
	Short Portion		0.9
	Plate Coil		5.8
P-53X108	Power Transformer	T7	
	Primary Winding		
	Center Tap to Inside		Small
	Center Tap to Outside		Small
	Secondary Winding		
	Center Tap to Inside		200.
	Center Tap to Outside		200.
P-9A444	Motor Noise Reactor	L1	Small
P-9A448	Pilot Light Line Reactor	L2	Small
P-9A446	Filament Reactor	L4	Small
P-52X42	Filter Choke	L5	312.5
P-9A447	R. F. "B" Plate Reactor	L6	4.1
P-9A445	Vibrator Filter Reactor	L7	Small

MODEL B90(R)Early
Schematic

LAFAYETTE RADIO MFG. CO.

Power Consumption - - 6.5 Amperes at 6.3 Volts
Power Output - - - - - 3 Watts Undistorted

Tuning Frequency Range - - - - 530-1650 KC



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS. THE CAPACITY OF "C" SHIELD IS 37 MMF. THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1	21 mmf.
C 2	.05 mf. 180 V.
C 3	Gang Trimmer
C 4	40 mmf.
C 5	Gang Trimmer
C 6	35 mmf.
C 7	.10 mf. 360 V.
C 8	.10 mf. 180 V.
C 9	Gang Trimmer
C10	70-150 mmf. } One Unit
C11	70-150 mmf. } One Unit
C12	.10 mf. 180 V.
C13	70-150 mmf.
C14	250 mmf.
C15	250 mmf.
C16	.01 mf. 360 V.
C18	250 mmf.
C19	.10 mf. 360 V.
C20	.01 mf. 360 V.
C21	.25 mf. 180 V.
C22	.02 mf. 600 V.
C23	.002 mf. 600 V.
C24	.50 mf. 180 V.
C25	2000 mmf.
C26	2000 mmf.
C28	.01 mf. 360 V.
C30	.0075 mf. 1600 V.
C31	.50 mf. 180 V.
C17	4.0 mf. 25 V. } Electrolytic Block
C27	5.0 mf. 350 V } Electrolytic Block
C29	8.0 mf. 350 V } Electrolytic Block

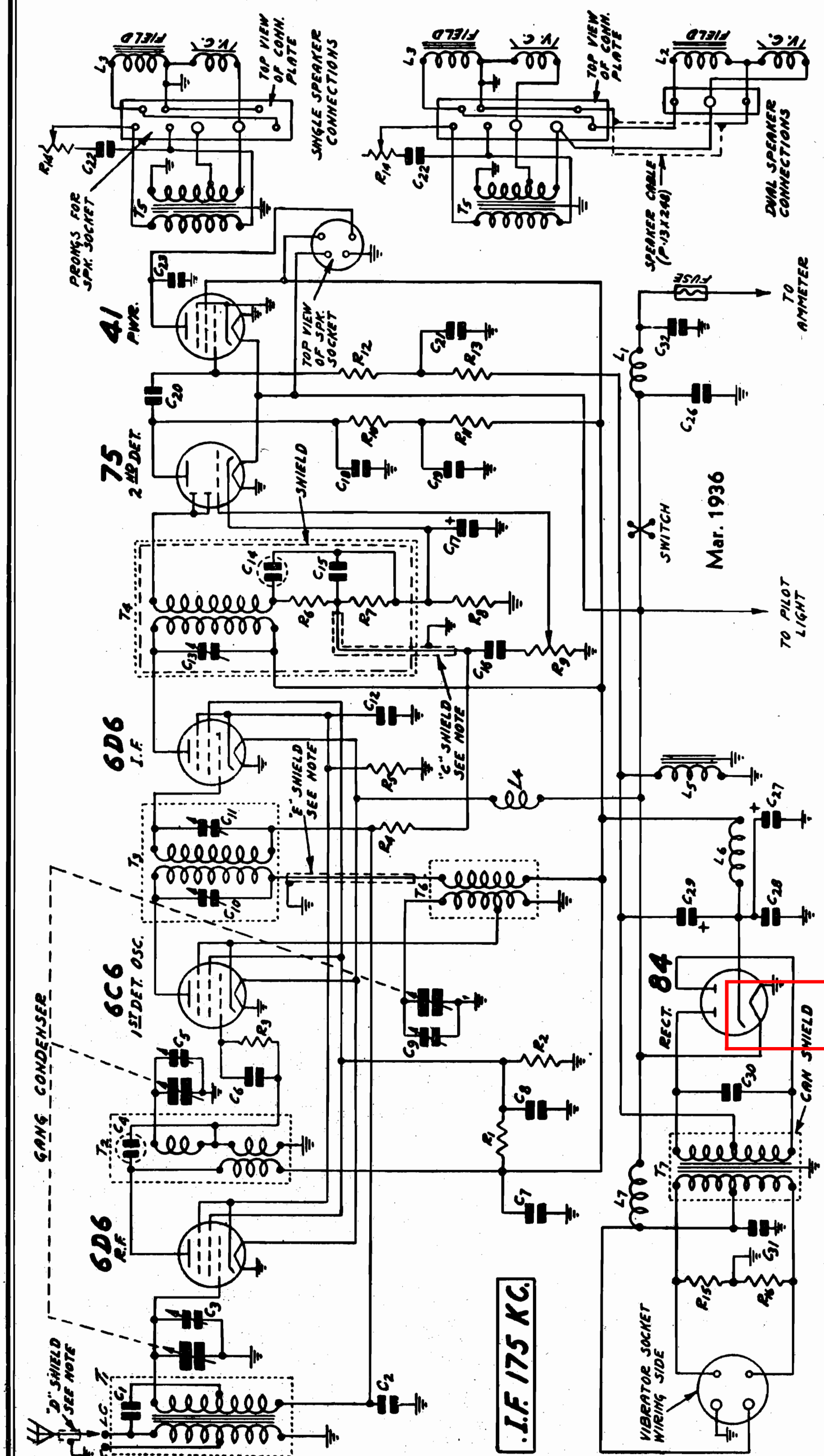
R 1	17000 ohm 1.0 W.
R 2	20000 ohm ohm .5 W.
R 3	.50 Megohm .2 W.
R 4	1.0 Megohm .2 W.
R 5	350 ohm .2 W.
R 6	50000 ohm .2 W.
R 7	500000 ohm .2 W.
R 8	6000 ohm .2 W.
R 9	2.0 Megohm Volume Control
R10	150000 ohm .2 W.
R11	50000 ohm .2 W.
R12	.50 Megohm .2 W.
R13	100000 ohm .2 W.
R14	150000 ohm Tone Control
R15	50 ohm .5 W.
R16	50 ohm .5 W.

T 1	Antenna Trans.
T 2	R. F. Interstage Trans.
T 3	1st I. F. Trans.
T 4	2nd I. F. Trans.
T 5	Output Trans.
T 6	Osc. Inductor
T 7	Power Trans.
L 1	Motor Noise Reactor
L 2	Pilot Light Reactor
L 3	Speaker Field 5.3
L 4	Filament Reactor
L 5	Filter Choke
L 6	"B" Reactor
L 7	Vibrator Reactor

MODEL B90(N)Late
Schematic,Socket
Trimmers

LAFAYETTE RADIO MFG. CO.

Power Consumption	7.0 Amperes at 6.0 Volts	Tuning Frequency Range	530 to 1650 KC
Power Output	3 Watts Undistorted	Intermediate Frequency	175 KC
Sensitivity	1.0 Microvolt Absolute	Speaker	6 inch Dynamic
Selectivity	45 KC Broad at 1000 Times Signal		



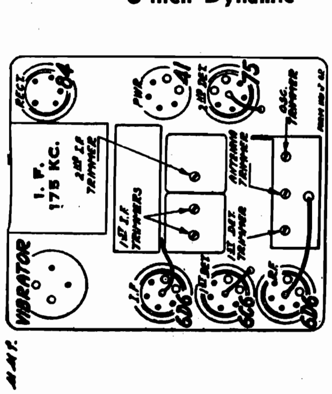


Fig. 2—Location of Tubes and Trimmers

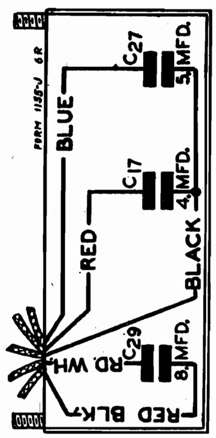


Fig. 4—Condenser Block—Internal Wiring

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1	10 mmf.
C 2	.05 mf. 180 V.
C 3	Gang Trimmer
C 4	40 mmf.
C 5	Gang Trimmer
C 6	35 mmf.
C 7	.10 mf. 360 V.
C 8	.10 mf. 180 V.
C 9	Gang Trimmer
C10	70-150 mmf. } Dual
C11	70-150 mmf. } Dual
C12	.10 mf. 180 V.
C13	70-150 mmf.
C14	250 mmf.
C15	250 mmf.
C16	.01 mf. 360 V.
C18	250 mmf.
C19	.10 mf. 360 V.
C20	.01 mf. 360 V.
C21	.25 mf. 180 V.
C22	.02 mf. 600 V.
C23	.002 mf. 600 V.
C26	2000 mmf.
C28	2000 mmf.
C30	.0075 mf. 1600 V.
C31	.50 mf. 180 V.
C32	2000 mmf.
C17	4.0 mf. 25 V. } Electrolytic Block
C27	5.0 mf. 350 V. } Electrolytic Block
C29	8.0 mf. 350 V. } Electrolytic Block
R 1	17000 ohm 1.0 W.
R 2	20000 ohm .5 W.
R 3	.50 Megohm .2 W.
R 4	1.0 Megohm .2 W.
R 5	350 ohm .2 W.
R 6	50000 ohm .2 W.
R 7	500000 ohm .2 W.
R 8	6000 ohm .2 W.
R 9	2.0 Megohm Vol. Control
R10	15000 ohm .2 W.
R11	50000 ohm .2 W.
R12	.50 Megohm .2 W.
R13	10000 ohm .2 W.
R14	15000 ohm Tone Control
R15	50 ohm .5 W.
R16	50 ohm .5 W.
T 1	Antenna Trans.
T 2	R.F. Inter. Trans.
T 3	1st I.F. Trans.
T 4	2nd I.F. Trans.
T 5	Output Trans.
T 6	Osc. Inductor
T 7	Power Trans.
L 1	Motor Noise Reactor
L 2	Speaker Field 4.9 ohm
L 3	Speaker Field 5.3 ohm
L 4	Filament Reactor
L 5	Filter Reactor
L 6	"B" Reactor
L 7	Vibrator Reactor

LAFAYETTE RADIO MFG. CO.

MODEL B90(N)Late
Voltage,Alignment
Coils,Resistances

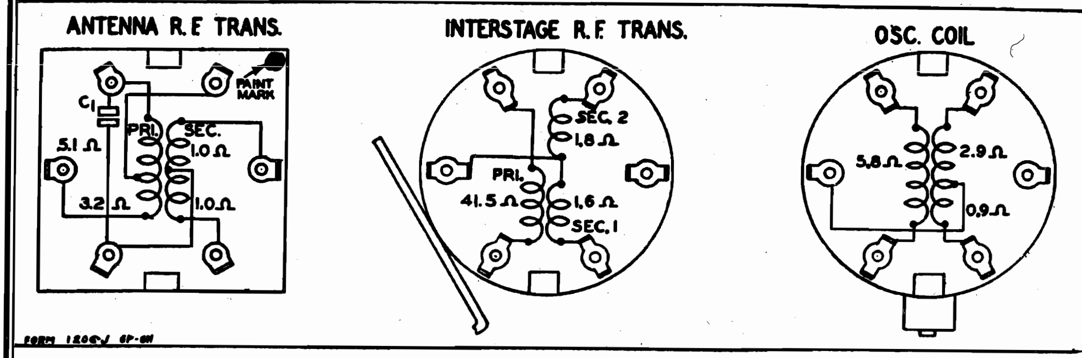


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Code	Winding	D. C. Resistance in Ohms
T1	Antenna Transformer	
	Primary Winding	
	Long Portion	5.1
	Short Portion	3.2
	Secondary Winding—Either Portion	1.0
T2	Interstage Transformer	
	Primary Winding	41.5
	Secondary Winding	
	No. 1	1.6
	No. 2	1.8
T3	1st I. F. Transformer	
	Primary Winding	88.0
	Secondary Winding	87.0
T4	2nd I. F. Transformer	
	Primary Winding	43.0
	Secondary Winding	48.2
	Dynamic Speaker	
T5	Output Transformer	
	Primary	416.6
	Secondary	Small
L3	Speaker Field	5.3
	Speaker Voice Coil	Small
T6	Oscillator Coils	
	Grid Coil	
	Long Portion	2.9
	Short Portion	0.9
	Plate Coil	5.8
T7	Power Transformer	
	Primary Winding	
	Center Tap to Inside	Small
	Center Tap to Outside	Small
	Secondary Winding	
	Center Tap to Inside	200.0
	Center Tap to Outside	200.0
L1	Motor Noise Reactor	Small
L4	Filament Reactor	.22
L5	Filter Choke	300.0
L6	R. F. "B" Plate Reactor	4.0
L7	Vibrator Filter Reactor	Small

VOLTAGES AT SOCKETS

Antenna Disconnected **Battery 6 Volts Under Load**

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.6	245	105	5.2	7.5
6C6	1st Det. Osc.	5.6	245	105	0	2.9
6D6	I. F. Amp.	5.6	245	105	5.2	7.5
75	2nd Det.	5.8	120(1)		1.4	0.14
41	Power	5.8	235	245	15.0(2)	30.0
84	Rectifier	5.8				52.0

(1) With 250,000 Ohm Meter
(2) Read Across Filter Choke

Antenna

IMPORTANT—If the car antenna is of high capacity (600 mmf. or higher) insert the antenna plug with the mark on the HC side—See Fig. 10. If it is a low capacity antenna, insert the plug with the mark on the LC side.

The General Motors cars have steel roofs, and a running board or other under car antenna must be used. These are low capacity antennas. The Chrysler motor cars (except Plymouth) have a steel roof separated from the body proper, which is used as an antenna. These are high capacity antennas. Other cars without steel roofs such as Ford and Plymouth have a built-in roof antenna which is of low capacity.

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. (See Fig. 2 for location of this section.) This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1650 KC Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.)

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is on the center tuning condenser section—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

If a running board or under-car antenna is used, it must be one which is covered with a suitable insulation, to prevent short circuiting in wet weather.

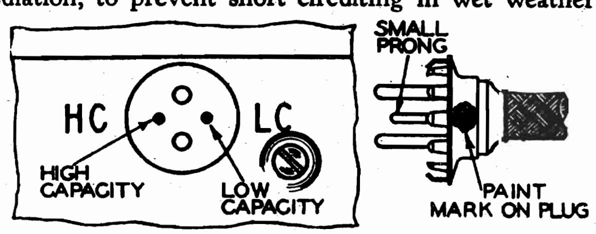


Fig. 10—Antenna Plug Insertion

MODEL B92(K)Early
Schematic,Socket

LAFAYETTE RADIO MFG. CO.

Coils,Alignment
Voltage,Trimmers

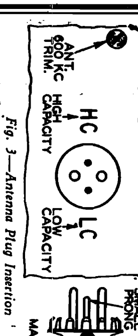


Fig. 3—Antenna Plug Insertion

Adjusting Antenna 600 KC Trimmer

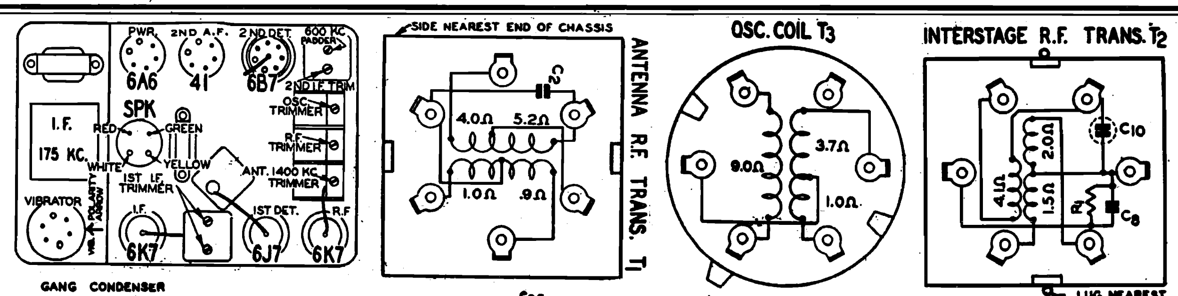
After the receiver is installed and the car antenna is connected, it will be necessary to adjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

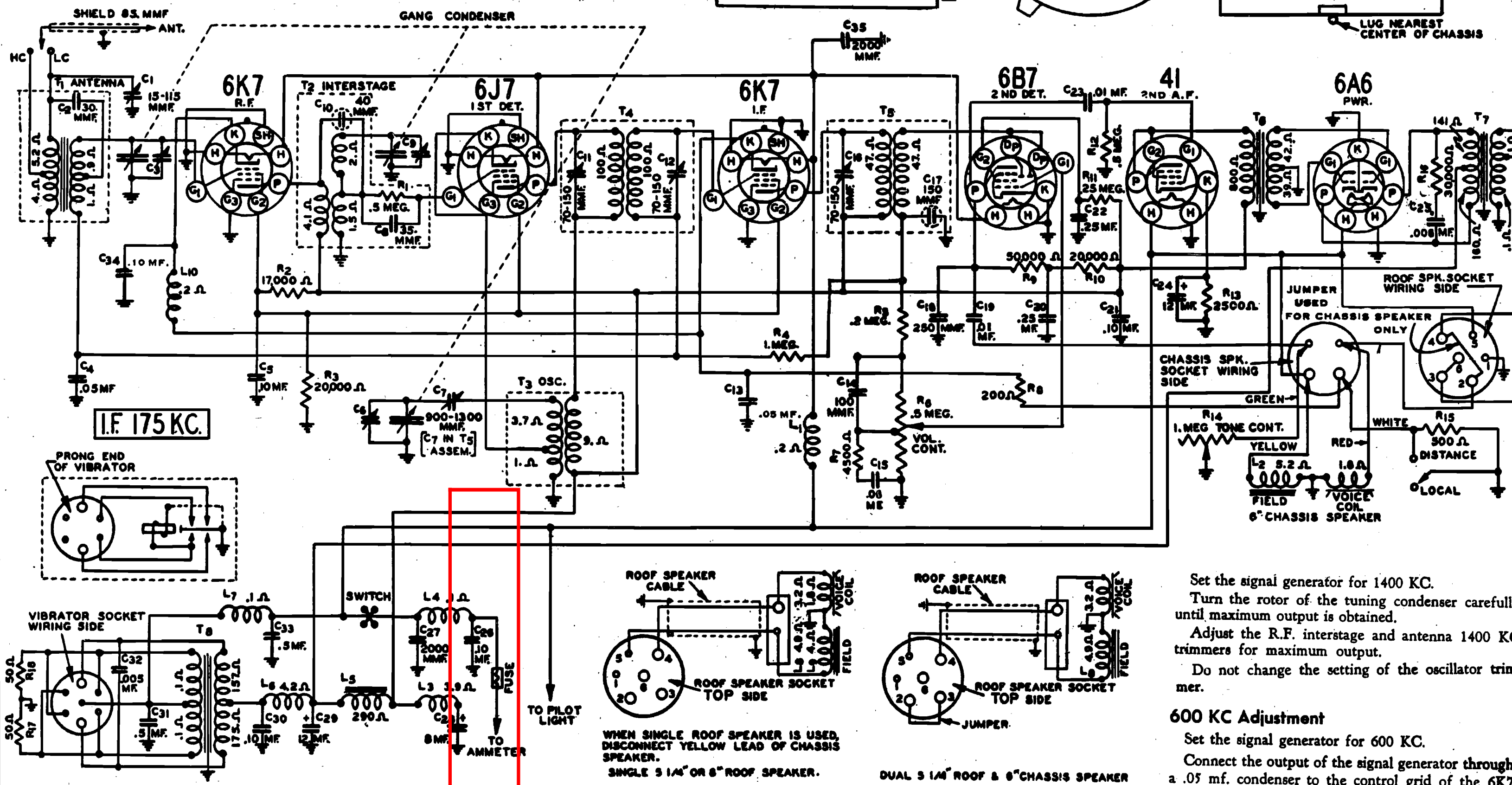
As shown in this illustration, the antenna plug is inserted in one of two ways, depending on whether the car has a high or low capacity antenna. Full instructions are in the installation manual packed with each radio.

VOLTAGES AT SOCKETS

Antenna Plug Withdrawn — L-D Switch in Distant Position — Battery 6.2 Volts under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	5.6	260	110	3
6J7	1st Det.	5.6	260	110	
6K7	I.F.	5.6	260	110	3
6B7	2nd Det.	5.6	55	50	
41	2nd A.F.	5.7	255	55	30
6A6	Pwr.	5.7	275		





I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the output of the signal generator through a .05 mf. condenser to the stator of the R.F. interstage section of the tuning condenser. (See Fig. 2 for location of this section.)

Connect the ground lead of the signal generator to the chassis ground.

Turn the Local-Distance switch to the Distance position and keep it in this position for all adjustments.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1575 KC Adjustment

Set the signal generator for 1575 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used, connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.) The antenna plug must be correctly inserted, dependent on the capacity of the antenna used.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the R.F. interstage and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Connect the output of the signal generator through a .05 mf. condenser to the control grid of the 6K7 R.F. tube.

Turn the tuning condenser rotor until maximum output is obtained. Then turn the tuning condenser rotor back and forth, at the same time adjusting the 600 KC padder (see Fig. 2) until the peak of greatest intensity is obtained.

Re-connect the output of the signal generator to the shielded antenna lead through a 150 mmf. condenser (1500 mmf. if antenna is high capacity).

Adjust the 600 KC antenna trimmer to maximum. This trimmer is reached from the outside of the case

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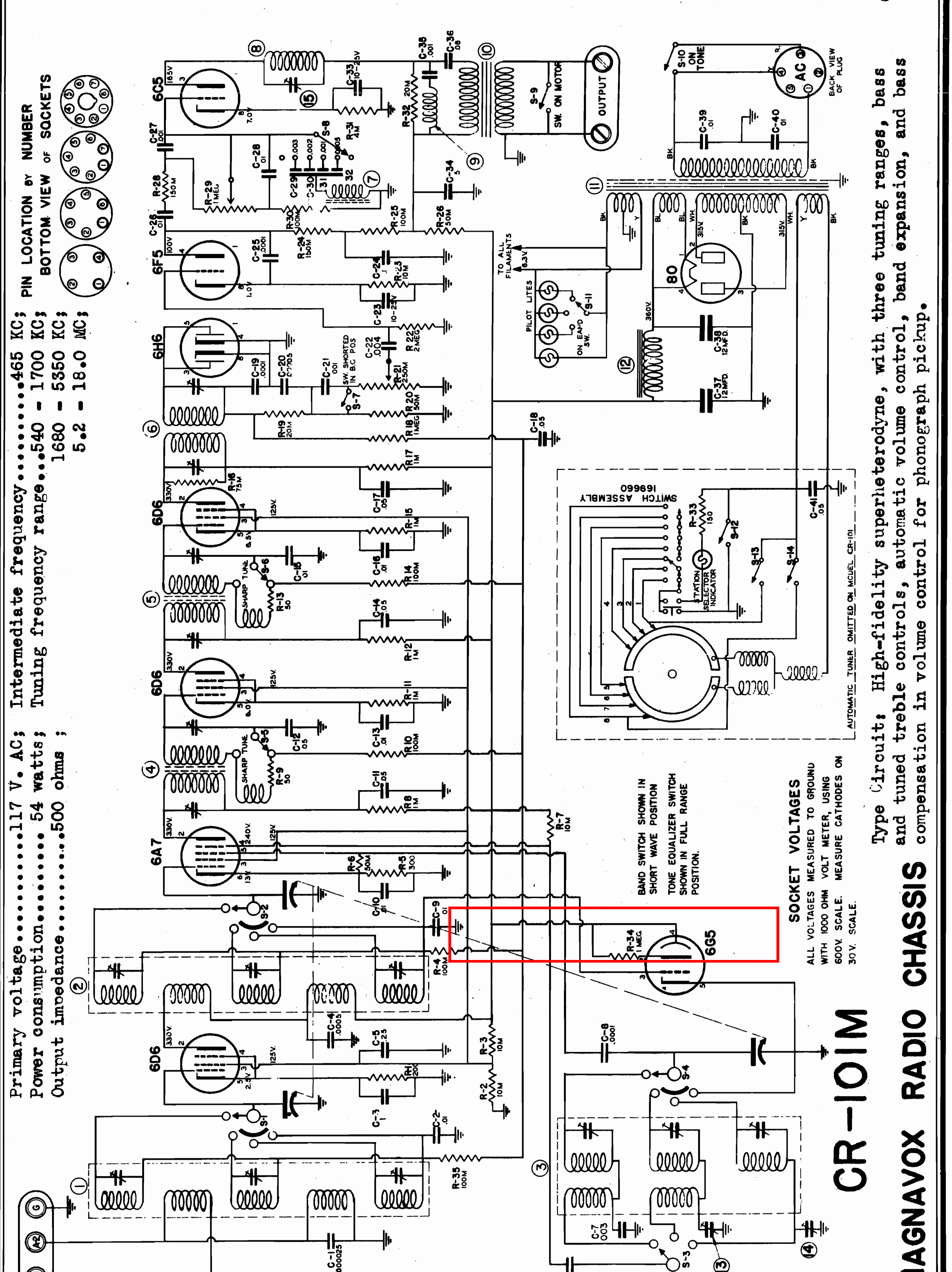
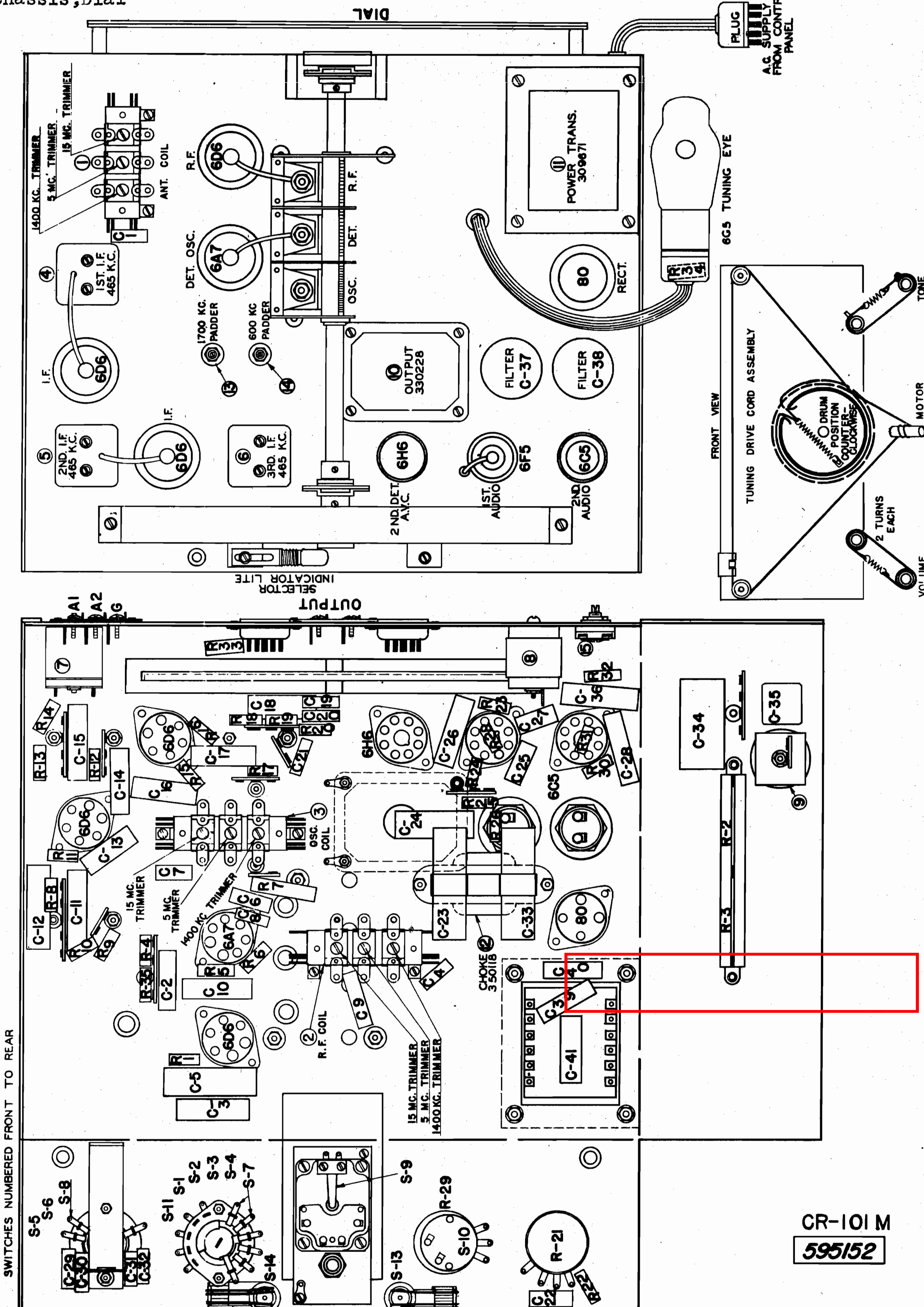
CHASSIS CR101,CR101M
Schematic,Voltage



CR-101M -- Used in Windsor combination.
Used in Regent combination.
CR-101 -- Used in RTR-308 remote tuner.

CHASSIS CR101,CR101M
Socket,Trimmers
Chassis,Dial

THE MAGNAVOX CO., INC.



It is important that EXACT replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies partiuclarly to ground points.

THE MAGNAVOX CO., INC.

ALIGNMENT PROCEDURE

It is absolutely necessary that an accurately calibrated test oscillator with some type of output measuring device be used when aligning the receiver.

ALIGNING THE I.F. STAGES AT 465 KILOCYCLES

1. Use a .00025 mfd. condenser in series with the signal generator output.
2. Connect an output meter across the voice coil of the speakers.
3. Turn the tone equalizer to the "sharp-tune" position.
4. Turn the volume control up to 10 or more, and adjust the signal generator output until a reading of one volt is obtained when a signal is applied.
5. Align the third I.F. transformer first by connecting the signal generator to the grid of the 6D6 second I.F. tube. Now adjust the third I.F. transformer until a maximum deflection is obtained on the output meter.
6. Align the second I.F. transformer by connecting the output of the signal generator to the grid of the 6D6, first I.F. tube. Readjust the output of the signal generator so that the output meter reading does not exceed one volt and adjust the second I.F. transformer until a maximum deflection of the output meter is obtained.
7. Connect the output of the signal generator to the grid of the 6A7 tube. Readjust the output of the signal generator so that the output meter reading does not exceed one volt and adjust the first I.F. transformer until a maximum deflection of the output meter is obtained.

ALIGNING THE 540-1700 KILOCYCLE BAND

1. Use a .00025 Mfd. condenser in series with the signal generator output.
2. Set the wave band switch for reception on the broadcast band.
3. Run the dial pointer to the extreme left position. This will adjust the tuning condensers to maximum capacity.
4. Holding the tuning condensers at maximum capacity, adjust the dial pointer to a position at the end of the horizontal scale. This is done by sliding the pointer on the dial string.
5. Connect the signal generator output to the grid of the 6A7 tube, tune the radio and signal generator to 600 KC and adjust the 600 KC padder for maximum deflection of the output meter.
6. Turn the signal generator and radio to 1400 KC and adjust the 1400 KC oscillator trimmer for maximum deflection of the output meter.
7. Leave the signal generator and radio set at 1400 KC, connect the signal generator output to the antenna binding post "A1", connect binding post "A2" to ground and adjust the 1400 KC R.F. trimmer and the 1400 KC antenna trimmer for maximum deflection of the output meter.

ALIGNING THE 1680-5350 KILOCYCLE BAND

1. Use a 400 ohm resistor in series with the signal generator output when connecting to the antenna binding post. Use both this resistor and a .00025 mfd. condenser when connecting to the 6A7 grid.
2. Set the band switch for reception on the foreign band.
3. Connect the output of the signal generator to the grid of the 6A7 tube, set the signal generator and the radio to 1700 KC and adjust the 1700 KC padder for maximum deflection on the output meter.
4. Set the signal generator and radio to 5000 KC and adjust the 5000 KC oscillator trimmer for maximum deflection of the output meter.
5. Leave the signal generator and radio set at 5000 KC, connect the signal generator output to the antenna binding post "A1" and adjust the 5000 KC R.F. trimmer and the 5000 KC antenna trimmer for maximum deflection of the output meter.

ALIGNING THE 5.6-18.0 MEGACYCLE BAND

1. Use a 400 ohm resistor in series with the signal generator when connecting to the antenna post. Use both this resistor and a .00025 Mfd. condenser when connecting to the 6A7 grid.
2. Set the band switch for reception on the foreign band.
3. Connect the signal generator output to the grid of the 6A7 tube, set the signal generator and the radio to 15 megacycles and adjust the 15 megacycle oscillator trimmer for maximum deflection of the output meter.
4. Leave the signal generator and radio set for 15 megacycles, connect the signal generator output to the antenna binding post "A1" and adjust the 15 megacycle R.F. trimmer and the 15 megacycle antenna trimmer for maximum deflection of the output meter.

RESTRINGING THE DIAL CABLE

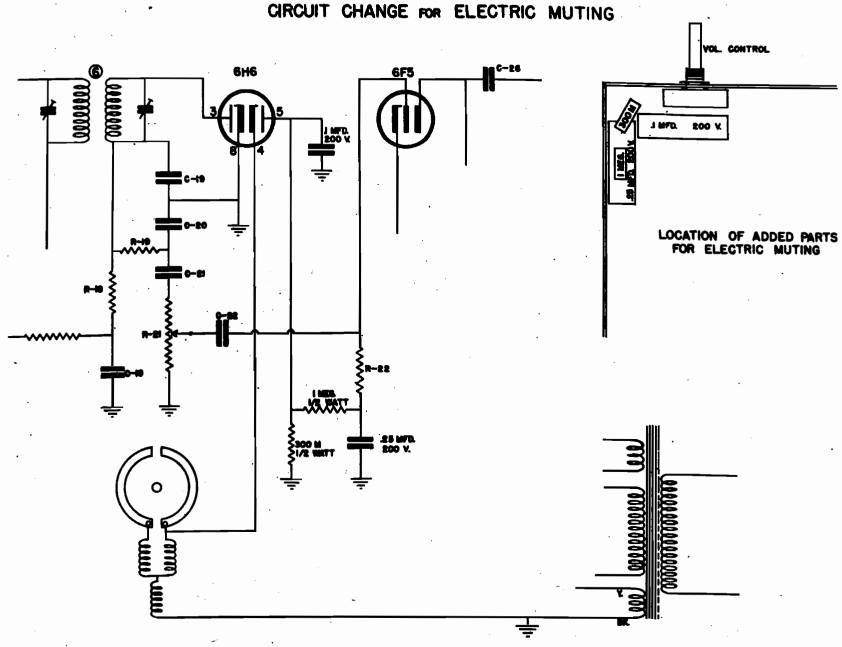
To restring the cable on this model, it is necessary first to remove the glass dial. Bend back the small metal ears that hold the glass in place, on the left and lower sides only. Slip the three dividing strips from the assembly and the four glass strips will be easily removable. Slip the brown backing from the assembly exposing the cable tension spring inside the disc.

Remove the spring "A" from the small hook "B", and tie one end of cable to the spring, lacing it through the opening in the groove of the disc, allowing about 1/2 inch between the end of the spring and the inside edge of the groove. Proceed around the disc in a clockwise direction for one complete revolution, continue around the drive shaft "C" for 2 1/2 turns in a clockwise direction up through the left-hand idler pulley "D", across the top and around the right-hand idler pulley "E"; downward around the disc in a clockwise direction, through the opening in the groove and secure it to the spring, until the other end can be secured to the hook. Replace the dial strips in their original locations and the operation is completed.

CHASSIS CR101,CR101M
Changes,Notes

THE MAGNAVOX CO., INC.

CIRCUIT CHANGE FOR ELECTRIC MUTING



LOCATION OF ADDED PARTS FOR ELECTRIC MUTING

Some of the earlier models were not equipped with electric muting. This feature may be incorporated by following the instructions outlined below.

1. Remove the two jumpers shunting the cathodes and plates of the 6H6 tube.

2. One cathode (8) is left at ground potential and the other cathode (4) is connected to the tuning motor as shown in the above schematic.

3. One plate (3) is left in its original circuit connection and the other plate (5) is connected to the junction of the 1 megohm and 300,000 ohm resistors that have been inserted in series with R-22 to ground.

4. Install one .25 Mfd. condenser from the junction of R-22 and the 1 megohm resistor to ground.

5. Ground the side of the transformer winding that connects to the tuning motor, completing the operation.

MISCELLANEOUS NOTES

The radio chassis must "float" freely and it is, therefore, important that none of the knobs touch the panel. The four holes in the radio support bracket "C" Fig. 1, are sufficiently large to permit adjustment of the chassis until it "floats" properly. Be sure that this "floating" condition exists before attempting to tighten the screws "A" Fig. 1, after replacing the chassis in the cabinet.

If one of the push-button switches does not function, remove the radio panel in the manner outlined in the foregoing instructions, and check the switch contacts. It is entirely probable that the trouble can be corrected by either cleaning the contacts or by bending them so that they form a solid connection.

When the release button on the radio push-button assembly is depressed, the switch arm nearest the end of the assembly must break one contact before making the other contact. Failure of the release button switch to operate in this manner will cause the "set-up" pilot lamp to burn out, in which case the arm of the switch should be bent until the "break-before-make" action is obtained.

Due to the extremely high sensitivity of the receiver, it is possible for some excessively strong signals to overload and cause distortion in the radio. This condition is very rare and occurs only on a very strong signal when the receiver has a very efficient antenna. This difficulty is recognized by distortion on a strong signal and being absent on weak signals. To correct this trouble, it is necessary to connect a 500 ohm resistor across the broadcast antenna primary to ground. The terminal for making this connection is available at the rear of the R.F. transformer on the top of the chassis. Connect the resistor from the lug having the red-with-blue tracer lead connected to it, to the ground bus wire which ties the three trimmer condensers together.

It is possible for the distortion mentioned above, to occur due to defective 6D6 I.F. tubes. The second I.F. tube is more susceptible to this difficulty and should be replaced before checking the first I.F. tube.

When push-button tuning is used, the dial pointer may have a tendency to "hunt" on either side of the desired frequency before coming to rest. This condition is caused by insufficient pressure of the small spring at the rear of the tuning motor, against the armature shaft. The spring should be "kinked" slightly to provide additional pressure, using a pair of long-nosed pliers to make the adjustment.

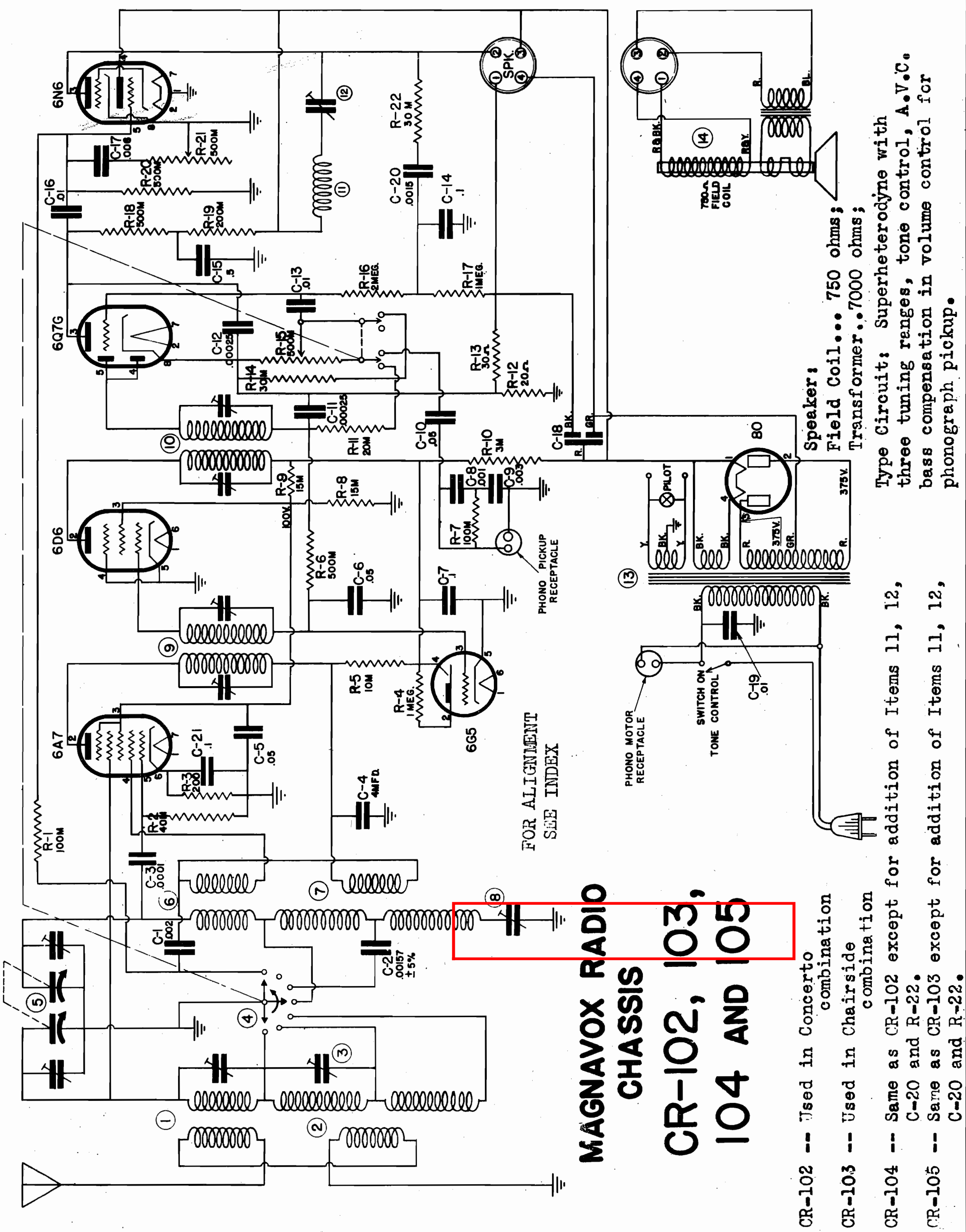
If a distinct hum is heard in the speakers when using the radio, the 6F5 tube should be replaced as a possible cure. It is extremely important that the grid lead of the 6F5 tube is shielded as near to the cap of the tube as is possible, or hum will be picked up in this lead.

The two .05 Mfd. condensers connected across the two motor push-button switches should be removed to prevent a "scraping" noise that may be apparent when the receiver is tuned manually.

The 1000 ohm bias resistor in the cathode circuit of the 6A7 tube should be replaced with a 300 ohm resistor to increase the stability of the receiver.

CHASSIS CR102,CR103
CR104,CR105
Schematic

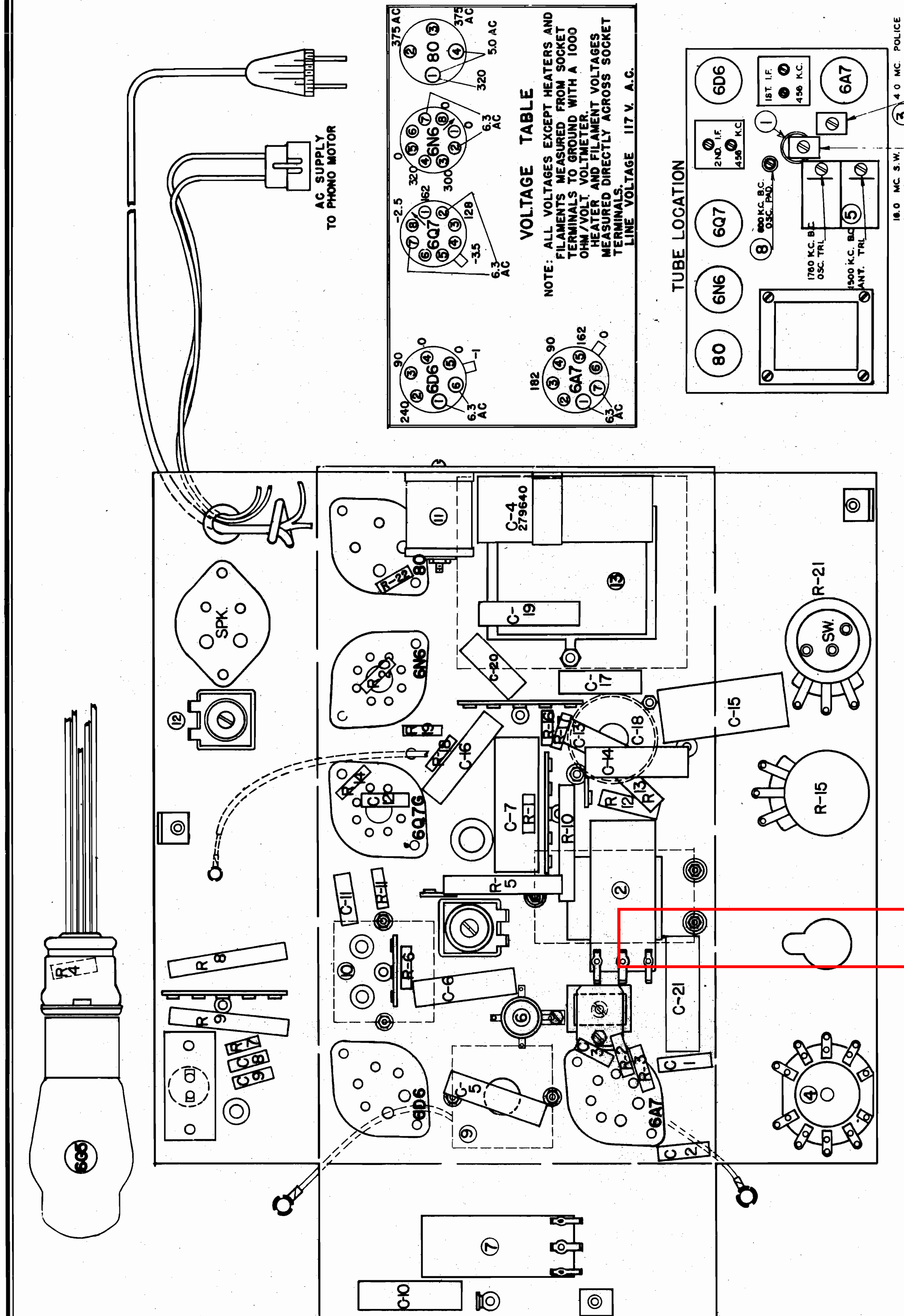
THE MAGNAVOX CO., INC.



Primary voltage.............117 V. AC;	Intermediate frequency.......456 KC;
Power consumption.......... 80 watts;	Tuning frequency range 540 -1760 KC;
Power output.............. 4 watts;	1.6 - 5.0 MC;
	5.0 - 19. MC;

CHASSIS CR102, CR103
CR104, CR105
Socket, Voltage
Chassis, Trimmers

THE MAGNAVOX CO., INC.



It is important that EXACT replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies particularly to ground points.

THE MAGNAVOX CO., INC.

CHASSIS CR106,CR109,CR111
Schematic,Voltage

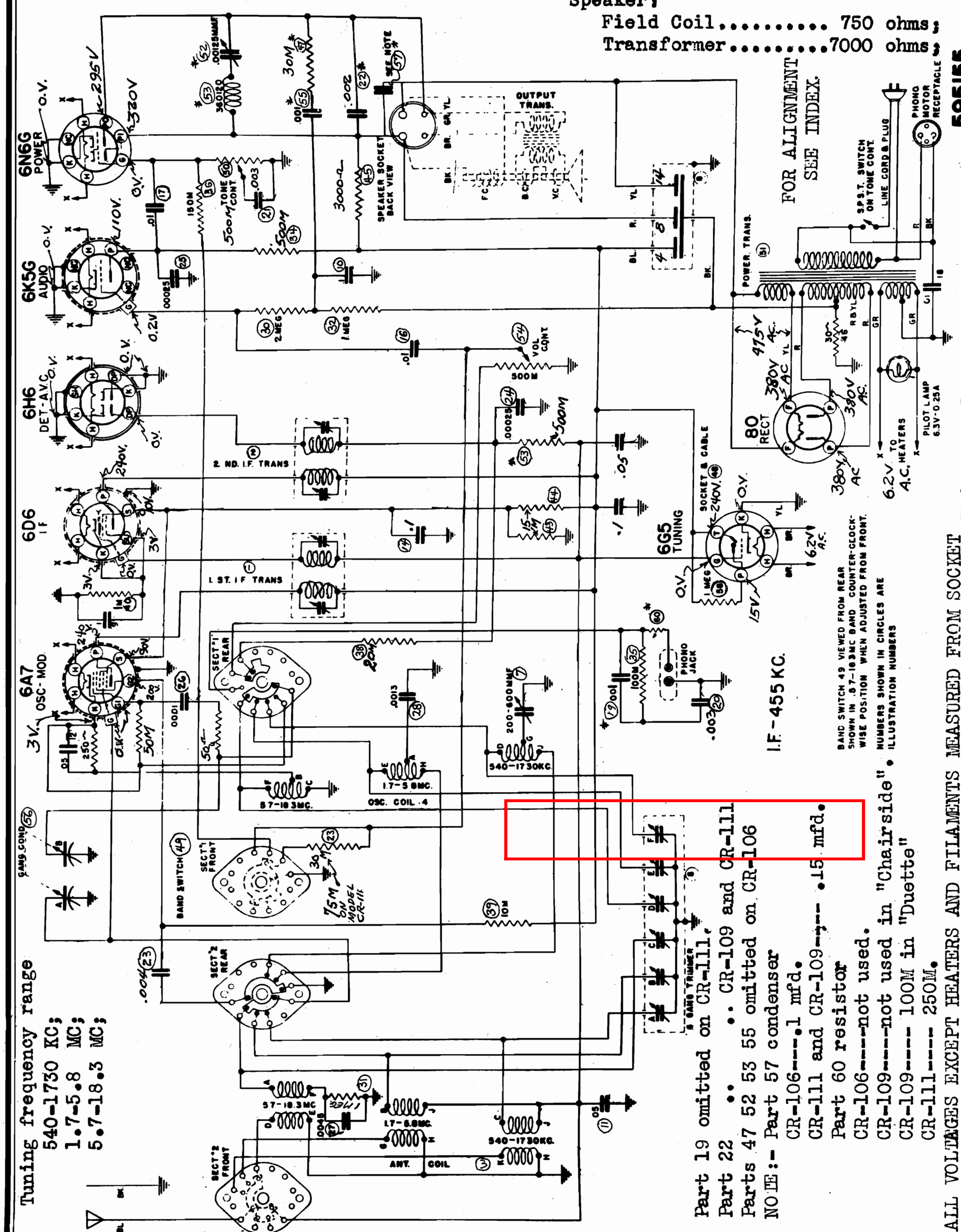
CR-106 -- Used in Concerto combination.

CR-109 -- Used in Chairside combination.

CR-111 -- Used in Berkeley combination.

Type Circuit: Superheterodyne with three tuning ranges, tone control, A.V.C. bass compensation in volume control for phonograph pickup.

Speaker:
Field Coil.......... 750 ohms;
Transformer.........7000 ohms;



FOR ALIGNMENT SEE INDEX.

595155 CR-106

Primary voltage........117 V. AC;
Power consumption........90 watts;
Power output........5.5 watts;

Tuning frequency range
540-1730 KC;
1.7-5.8 MC;
5.7-18.3 MC;

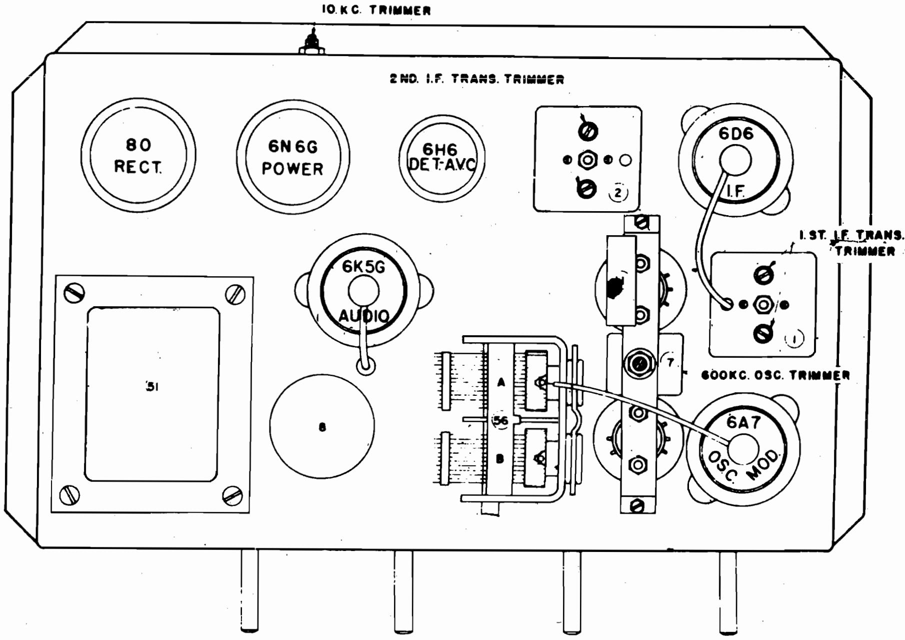
Part 19 omitted on CR-111,
Part 22 " " CR-109 and CR-111
Parts 47 52 53 55 omitted on CR-106
NOTE:- Part 57 condenser
CR-106---.1 mfd.
CR-111 and CR-109---- .15 mfd.
Part 60 resistor
CR-106---not used.
CR-109---not used in "Chairside".
CR-109---- 100M in "Duette"
CR-111---- 250M.

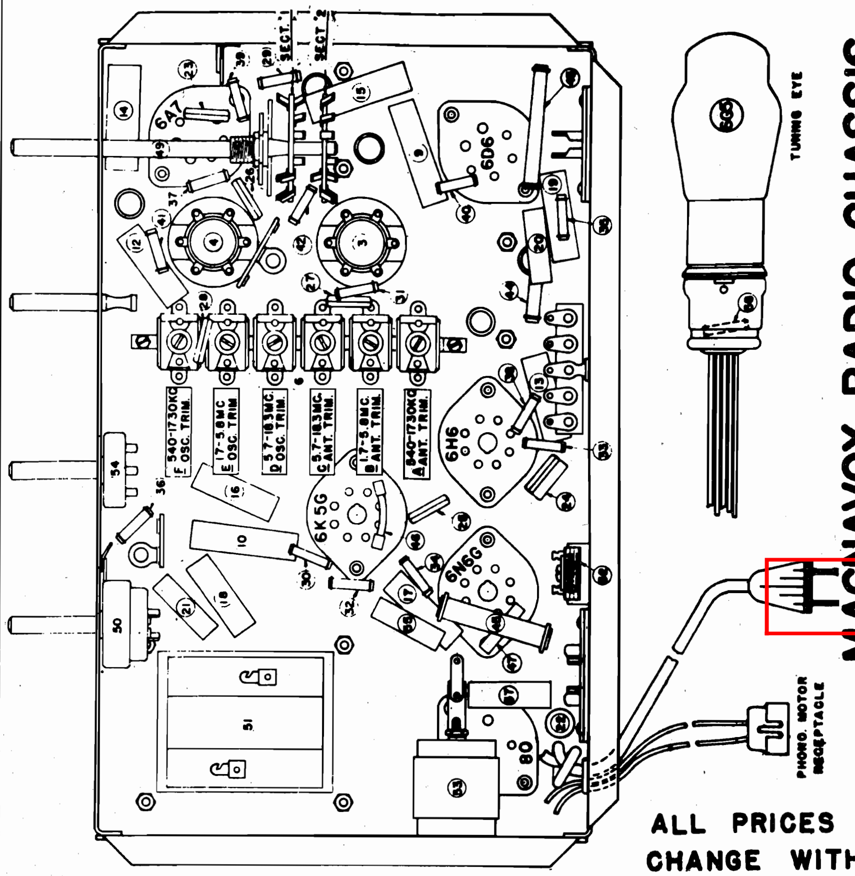
ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT METER.
HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
LINE VOLTAGE 115 VOLTS A.C.

CHASSIS CR106,CR109,CR111
Socket,Trimmers,Chassis
Filter Adjustment

THE MAGNAVOX CO., INC.

CHASSIS CR113,-114,-115
-118,-125
Filter Adjustments





MAGNAVOX RADIO CHASSIS CR-106, 109 AND 111

It is important that EXACT replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies particularly to ground points.

10 K.C. FILTER ADJUSTMENT

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser on the back of the chassis near the speaker socket.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

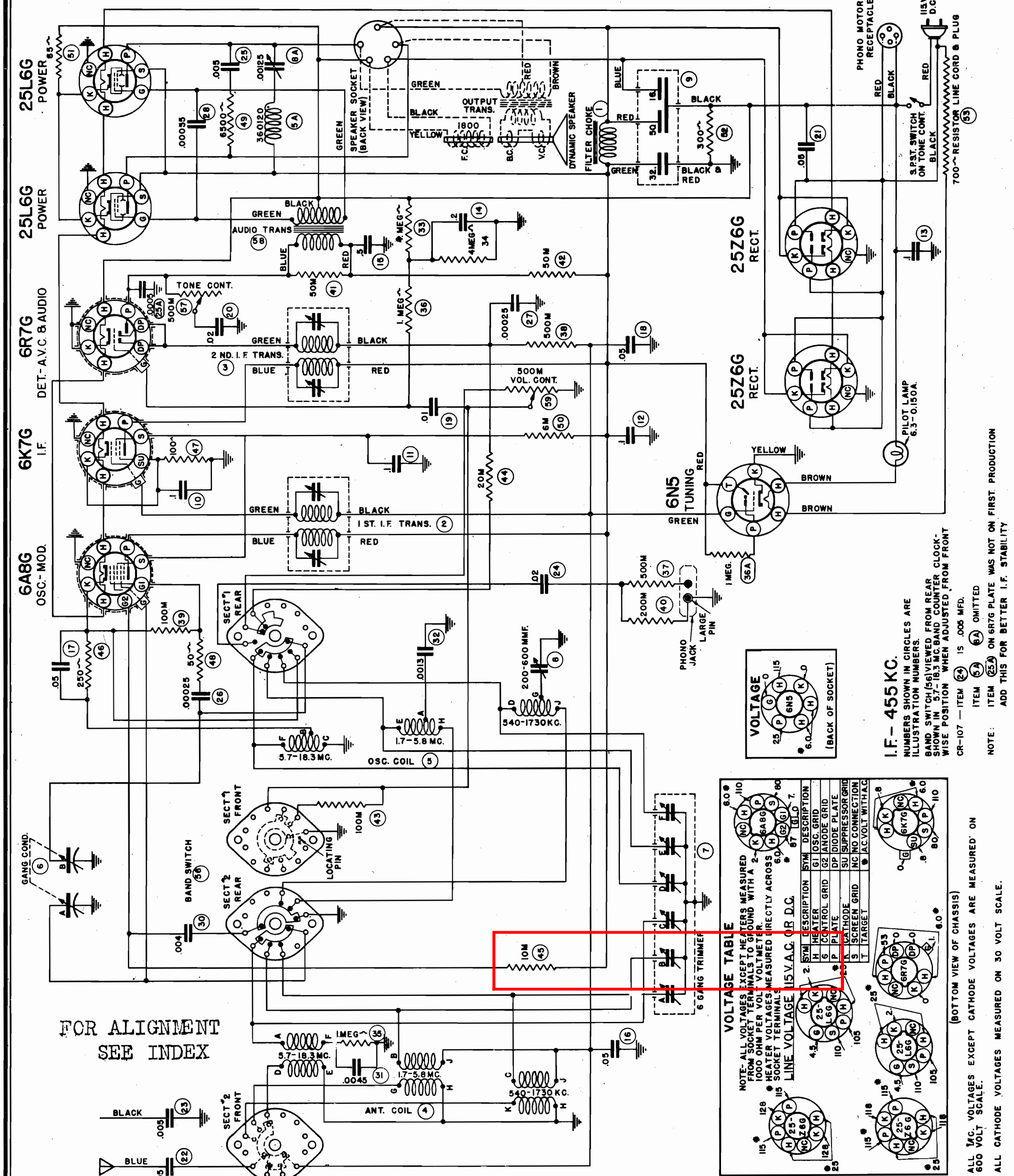
182592	Bulb	Pilot lamp, 6.3 volt .25 ampere	.15
103322	Washer	"C" washer, tuning shaft retainer	.05
449801	Cable	Dial drive cable	
883308	Dial Assb.	Complete assembly less glass scale	4.00
153238	Dial	Calibrated glass scale	1.20
153273	Escutcheon	Dial escutcheon with crystal	1.80
103321	Spring	Dial cord tension spring	.05

143267	Knob	"Tuning"	.15
143265	Knob	"Tone"	.15
143266	Knob	"Volume"	.15
143268	Knob	"o-B-P-F"	.15
633320	Pulley	Dial pulley	.10
633315	Shaft	Tuning shaft	.20

Schematic, Voltage Socket

THE MAGNAVOX CO., INC.

CHASSIS CR107,-110,-112 -119,-120,-126,-127



FOR ALIGNMENT SEE INDEX

Primary voltage........117 V. AC-DC;
Power consumption......... 80 watts;
Power output............ 6 watts;

Speaker;
Field coil............1800 ohms;
Transformer...........3000 ohms;

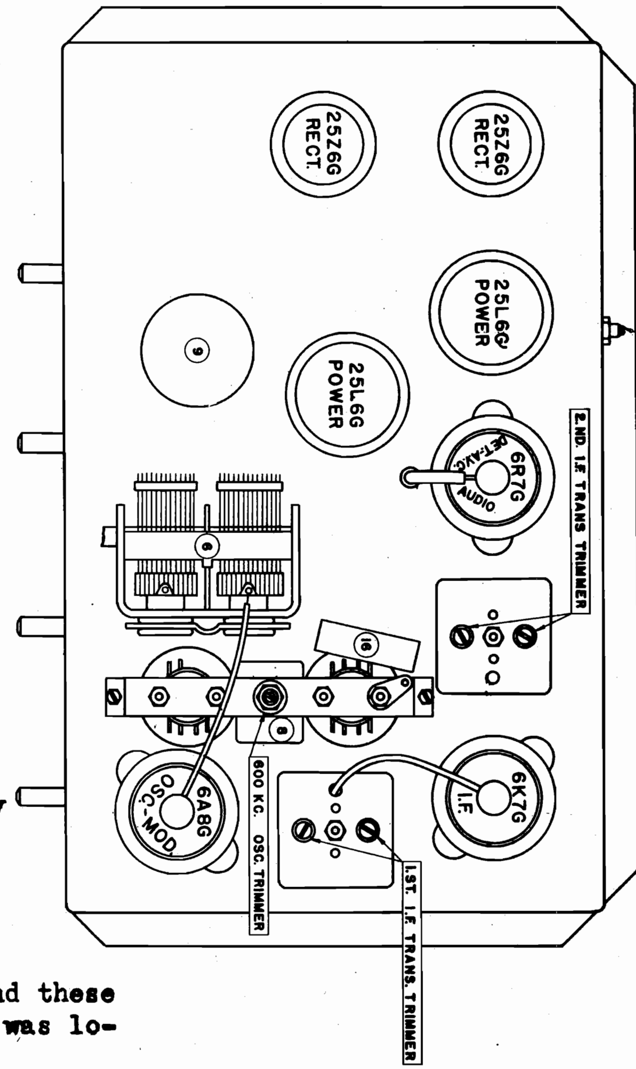
Tuning frequency range 540 - 1730 KC; 1.7 - 5.8 MC; 5.7 - 18.3 MC;

Type Circuit: Superheterodyne with three tuning ranges, tone control, A.V.C., bass compensation in volume control for phonograph pickup.

CHASSIS CR107,-110,-112
-119,-120,-126,-127
Socket,Trimmers,Chassis

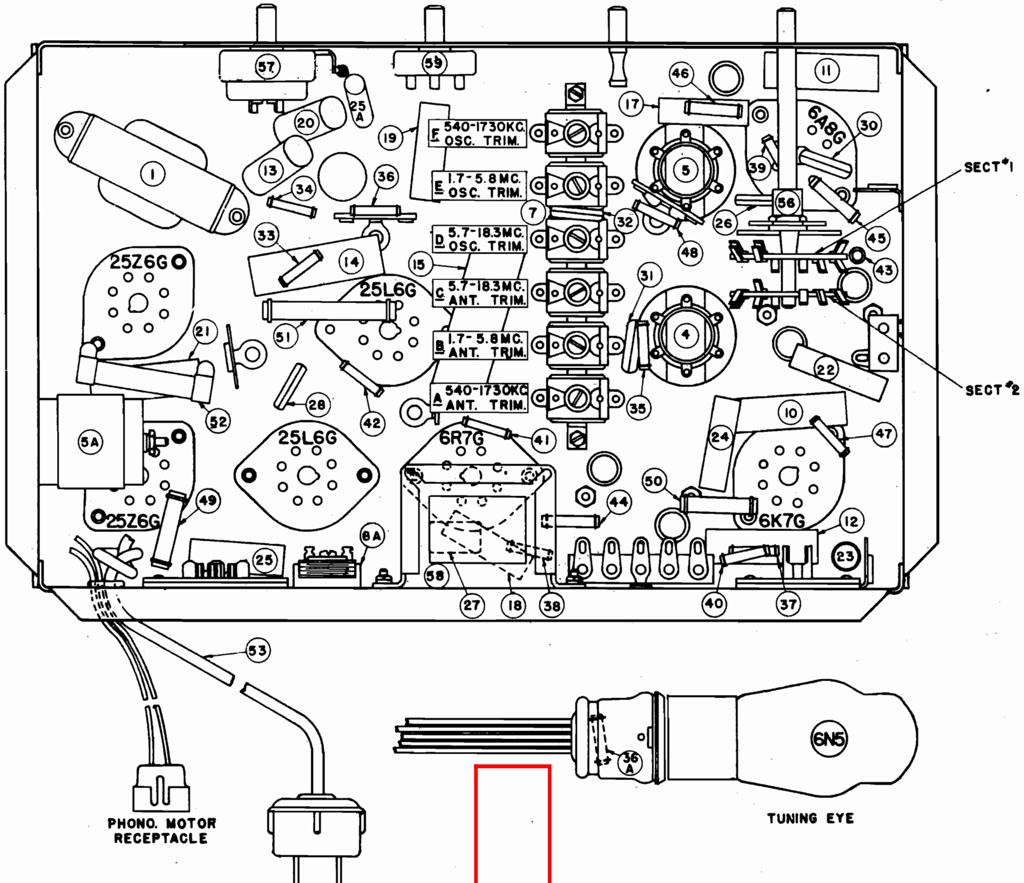
THE MAGNAVOX CO., INC.

MAGNAVOX RADIO CHASSIS CR-107, 110, 112, 119, 120, 126, 127



ALIGNMENT PROCEDURE

SEE CHASSIS CR-106.



CR-107 -- Used in AC-DC Concerto combination.
Has .005 mfd. condenser for item 24.
10 KC filter consisting of items 5A and 8A are omitted.

CR-110 -- Has brackets for mounting in Chairside cabinet.

CR-112 -- Has brackets insulated from chassis for mounting in Berkeley cabinet.

CR-120 -- Speaker mounted on the chassis for use in AC-DC Playfellow combination.

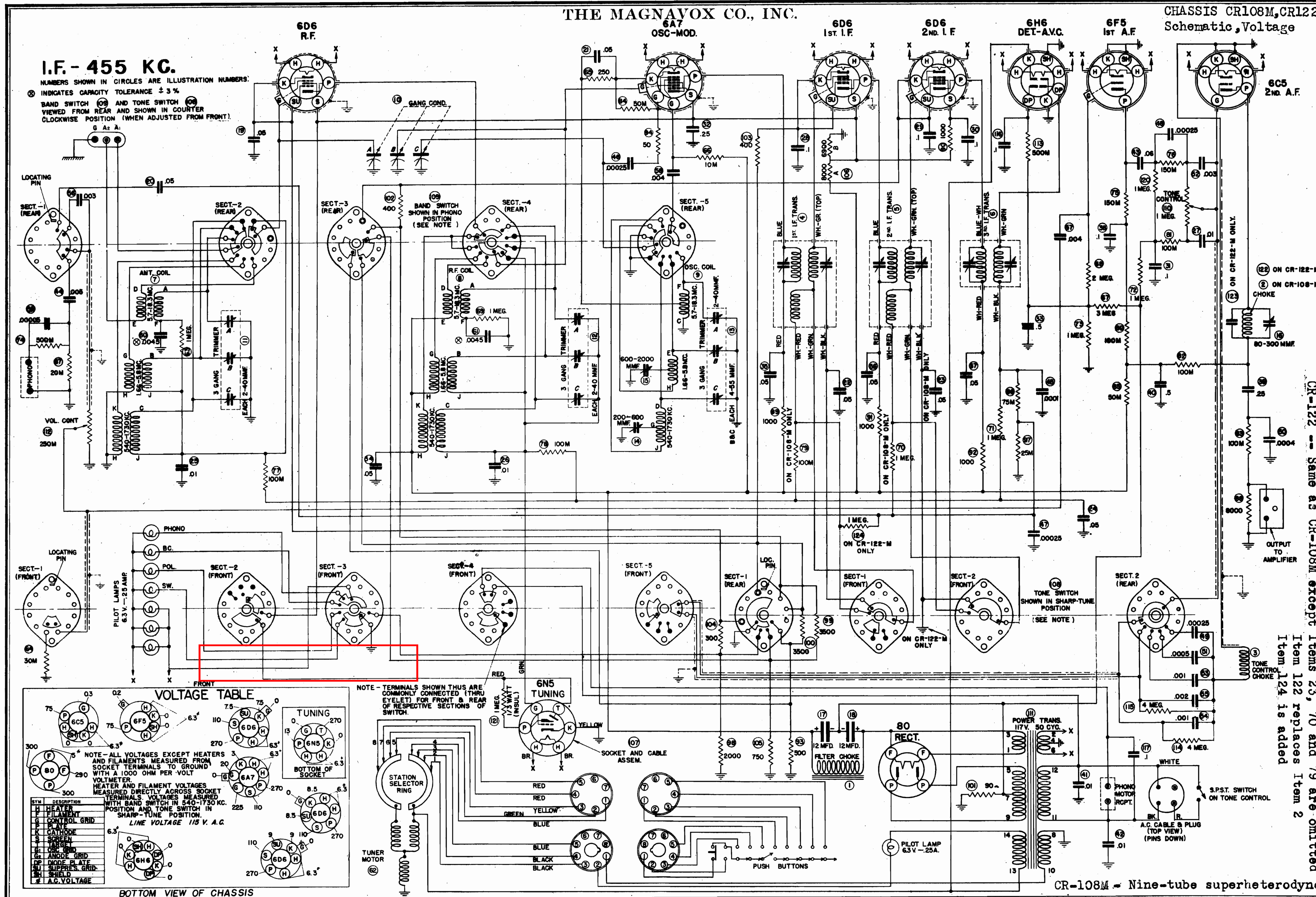
CR-126 -- Has brackets for mounting in Berkeley cabinet.

CR-127 -- Has brackets for mounting in Hepplewhite cabinet.

It is important that EXACT replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies particularly to ground points.

THE MAGNAVOX CO., INC.

CHASSIS CR108M,CR122
Schematic,Voltage



CHASSIS CR108M,CR122
Alignment,Notes

THE MAGNAVOX CO., INC.

ALIGNMENT PROCEDURE

It is absolutely necessary that an accurately calibrated test oscillator with some type of output measuring device be used when aligning the receiver.

ALIGNING THE I. F. STAGES AT 455 KILOCYCLES

1. Connect an output meter across the voice coil of the speakers.
2. Turn the tone equalizer to the sharp-tune position.
3. Turn the volume control up to 7 or more, and adjust the signal generator output until a reading of one volt is obtained on the output meter when a signal is applied.
4. Align the third I.F. transformer first, by connecting the signal generator to the grid of the 6A6, second I.F. tube; now adjust the third I.F. transformer until a maximum output meter deflection is obtained. THE OUTPUT OF THE SIGNAL GENERATOR IS TO BE CONNECTED THROUGH A .00025 MFD. CONDENSER AT ALL TIMES.
5. Align the second I.F. transformer first, by connecting the signal generator to the grid of the 6D6 first I.F. tube. Readjust the output of the signal generator so that the output meter reading does not exceed one volt and adjust the second I.F. transformer until a maximum deflection of the output meter is obtained.
6. Connect the output of the signal generator to the grid of the 6A7 tube. Readjust the output of the signal generator so that the output meter reading does not exceed one volt, and adjust the first I.F. transformer until a maximum deflection of the output meter is obtained.

ALIGNING THE 540-1730 K.C. BAND

1. Set the wave-band switch for reception on the broadcast band.
2. Run the dial pointer to the extreme left position. This will adjust the tuning condensers to maximum capacity.
3. Holding the tuning condensers at maximum capacity, adjust the dial pointer to a position at the end of the horizontal scale. This is done by sliding the pointer on the dial string.
4. Connect the signal generator output to the grid of the 6A7 tube, tune the radio and signal generator to 600 KC and adjust the 600 KC padder for maximum deflection of the output meter.
5. Turn the radio and signal generator to 1400 KC and adjust the 1400 KC trimmer for maximum deflection of the output meter.
6. Leave the signal generator and radio switch at 1400 KC, connect the signal generator output to the antenna binding post "A1" and adjust the 1400 KC R.F. stage trimmer for maximum deflection of the output meter.

ALIGNING THE 1660-5800 K.C. BAND

1. Set the band switch for reception on the police band.
2. Connect the output of the signal generator to the grid of the 6A7 tube, set the signal generator and radio to 1800 KC and adjust the 1800 KC padder for maximum deflection of the output meter.
3. Set the radio and the signal generator to 5000 KC and adjust the 5000 KC oscillator trimmer for maximum deflection of the output meter.
4. Leave the radio and signal generator set at 5000 KC, connect the signal generator output to the antenna binding post "A1", and adjust the 5000 KC first detector trimmer and the 5000 KC R.F. trimmer for maximum deflection of the output meter.

ALIGNING THE 5700-18300 K.C. BAND

1. Set the band switch for reception on the foreign band.
2. Connect the signal generator output to the grid of the 6A7 tube, set the radio and the signal generator to 15 megacycles and adjust the 15 megacycle oscillator trimmer for maximum deflection of the output meter.
3. Leave the signal generator and the radio set for 15 megacycles, connect the signal generator output to the antenna binding post "A1" and adjust the 15 megacycle first detector trimmer and the 15 megacycle oscillator trimmer for maximum deflection of the output meter.

MISCELLANEOUS NOTES

The radio chassis must "float" freely and it is therefore important that none of the knobs touch the panel. The four holes in the radio support bracket "C" Fig. 1, are sufficiently large to permit adjustment of the chassis until it "floats" properly. Be sure that this "floating" condition exists before attempting to tighten the screws "A" Fig. 1, after replacing the chassis in the cabinet.

If one of the push-button switches does not function, remove the radio panel in the manner outlined in the foregoing instructions, and check the switch contacts. It is entirely probably that the trouble can be corrected by either cleaning the contacts or by bending them so that they form a solid connection.

When the release button of the radio push-button assembly is depressed, the switch arm nearest the end of the assembly must break one contact before making the other contact. Failure of the release button to operate in this manner will cause the setup pilot lamp to burn out, in which case the arm of the switch should be bent until the "break-before-make" action is obtained.

Due to the extremely high sensitivity of the receiver, it is possible for some excessively strong signals to overload and cause distortion in the radio. This condition is very rare and occurs only on a very strong signal when the receiver has a very efficient antenna. This difficulty is recognized by distortion on a strong signal and being absent on weak signals. To correct this trouble, it is necessary to connect a 500 ohm resistor across the broadcast antenna primary to ground. The terminal for making this connection is accessible at the rear of the R.F. transformer on the top of the chassis. Connect the resistor from the lug having the red-with-blue tracer lead connected to it, to the ground bus wire which ties the three trimmer condensers together.

It is possible for the distortion mentioned above, to occur due to defective 6D6 I.F. tubes. The second I.F. tube is more susceptible to this difficulty and should be replaced before checking the first I.F. tube.

CHASSIS CR108M,CR122
Notes,Part 2,Dial Data

THE MAGNAVOX CO., INC.

MISCELLANEOUS NOTES (continued)

The tuning shaft "A" Fig. 2, can be bent very easily when the chassis is out of the cabinet if extreme care is not exercised. If the shaft is bent only slightly, it can possibly be bent back to its original shape, otherwise it should be replaced.

To replace the tuning shaft, first slip the dial cable from the front groove of the disc "B" Fig. 2, by releasing the spring holding that cable in place. Now rotate the disc until the dial pointer is at the extreme right end of the scale, at which point the hole "C" in the disc is in line with the hole in the shaft support bracket. Insert a small screw driver through the two holes and remove the motor mounting screw. Remove the other two motor mounting screws and lift the motor from the chassis.

Now remove the "C" washer from the shaft immediately to the front of the shaft support bracket, and slide the shaft toward the inside of the chassis. Insert a new shaft and gear, wrap 2 1/2 turns of the dial cable in the groove provided, and fasten the "C" washer in place. The method of properly stringing the dial cable is shown in detail in Fig. 2 and is fully described in the following paragraphs. Remount the motor with the three mounting screws. The holes through which these screws pass, are sufficiently large to permit adjustment of the motor so that the gears mesh properly. The procedure outlined above for replacing a tuning shaft may also be used in replacing a tuning motor.

To adjust the position of the volume or tone compensator semaphore discs, loosen the small set-screw on the brass bushing behind the disc, and slide the disc until the proper setting is obtained. Tighten the set-screw, and the operation is completed.

When push-button tuning is used, the dial pointer may have a tendency to "hunt" on either side of the desired frequency before coming to rest. This condition is caused by insufficient pressure of the small spring at the rear of the tuning motor, against the armature shaft. The spring should be "kinked" slightly to provide additional pressure, using a pair of long-nosed pliers to make the adjustment.

If a distinct hum is heard in the speakers when using the radio, the 6F5 tube should be replaced as a possible cure. It is extremely important that the grid lead of the 6F5 tube is shielded as near to the cap of the tube as is possible or hum will be picked up in this lead.

The shell of the cap on the phonograph input plug should not be allowed to contact the chassis or else a hum will be heard in the speakers with phonograph operation. A small felt washer is used between the plug and the receptacle to prevent this and should be replaced at any time that it is necessary to remove this plug from its receptacle.

RESTRINGING THE DIAL CABLE

To restring the pointer cable, first tie one end of the cable to the pointer tension spring, Fig. 2, after the spring has been removed from the small hook on disc "B". Lace the cord through the eyelet in the rear groove, allowing about 1/2 inch between the spring and the inside edge of the groove. Proceed around the idler pulley at the left end of the dial, across the front of the disc "B", through the back of the pointer clamp (see inset Fig. 2), around the right-end idler pulley and around the rear disc groove in a counter-clockwise direction threading it into the eyelet mentioned above. Knot the cable to the spring, bringing the spring toward the inside rim of the disc as close as possible. Now stretch the spring until the other end can be secured to the hook, completing the operation.

To restring the drive shaft cable, first tie one end of the cable to the drive shaft cable tension spring, after the spring has been removed from the small hook on disc "B". Lace the cord through the eyelet in the front groove allowing about 1/2 inch between the end of the spring and inside edge of the groove. Proceed around the disc in a counter-clockwise direction, wrap two and one-half turns around shaft "A" Fig. 2, in a clockwise direction and from front to rear. Continue around the groove in a counter-clockwise direction threading the cable through the eyelet near the spring. Knot the cable to the spring, bringing the spring toward the inside rim of the disc as close as possible. Stretch the spring until the other end can be secured to the hook, and the operation is completed.

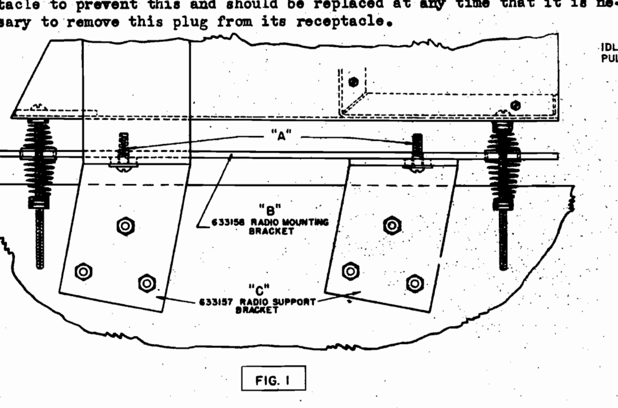


FIG. 1

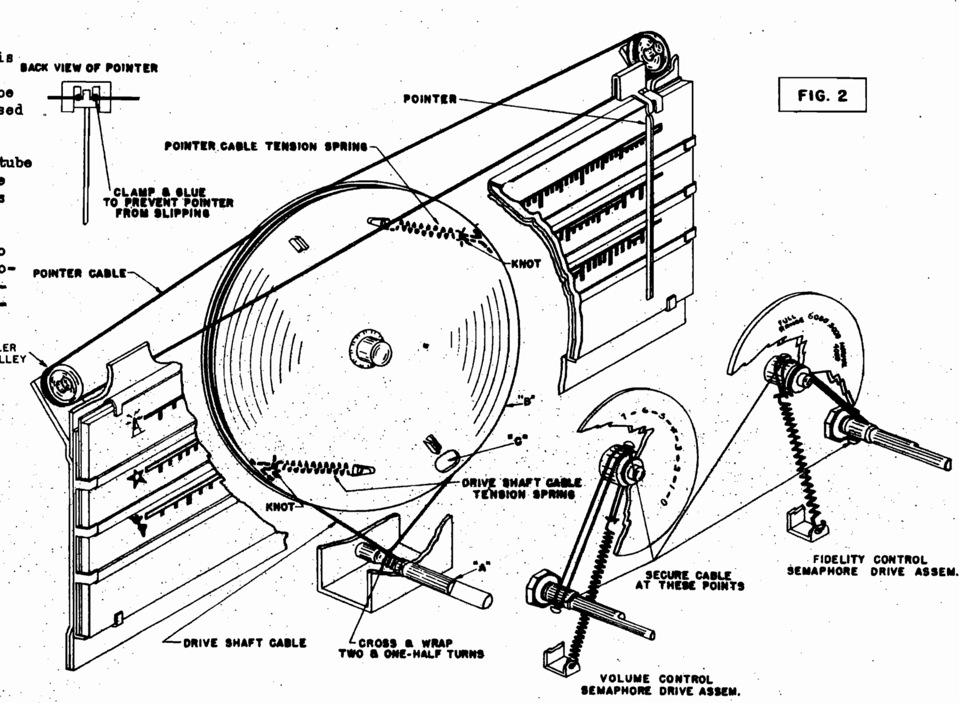
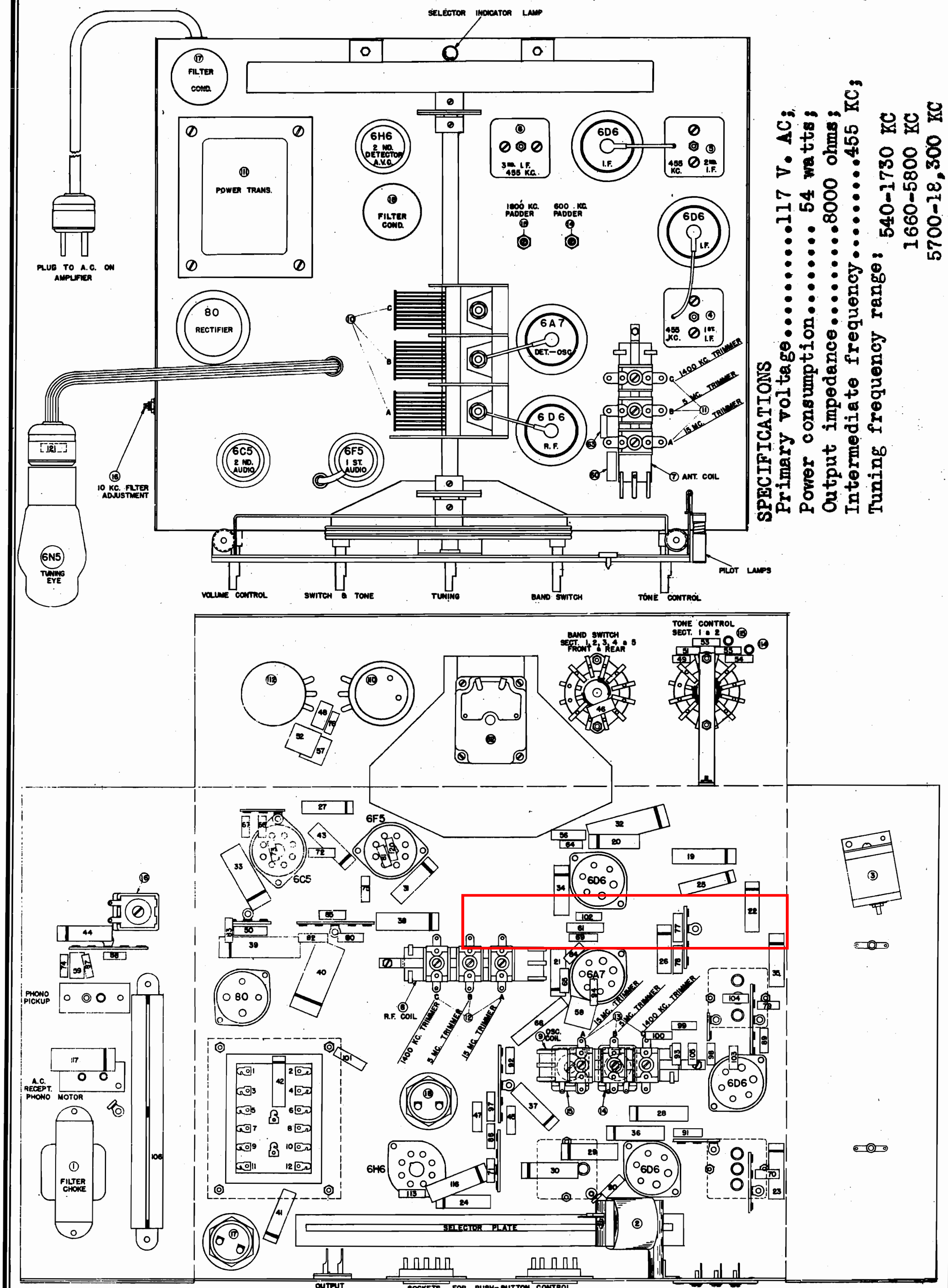


FIG. 2

THE MAGNAVOX CO., INC.

CHASSIS CR108M,CR122
Socket,Trimmers,Chassis



SPECIFICATIONS
Primary voltage..........117 V. AC;
Power consumption........ 54 watts;
Output impedance.........8000 ohms;
Intermediate frequency.........455 KC;
Tuning frequency range: 540-1730 KC
1660-5800 KC
5700-18,300 KC

CHASSIS CR102,-103,104,105
CHASSIS CR106,-109,-111
CHASSIS CR107,-110,-112,
-119,-120,-126,-127

THE MAGNAVOX CO., INC.

CHASSIS CR113,-114,-115,
-118,-125
CHASSIS 121,-124
Alignment

MODELS CR106, 109, 111; CR107, 110, 112, 119, 120, 126, 127;
CR113, 114, 115, 118, 125; CR121, 124

ALIGNING THE I.F. STAGES AT 455 K.C.

1. Connect the ground lead of the test oscillator to the chassis or radio ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .00025 mfd. series condenser. DO NOT REMOVE THE GRID CLIP.

2. Set the test oscillator to EXACTLY 455 kilocycles and turn the receiver volume to its maximum setting.

3. Peak each of the second I.F. transformer trimmer condensers.

4. Peak each of the first I.F. transformer trimmer condensers.

ALIGNING THE 540-1730 K.C. BAND

Remove the test oscillator lead from the grid of the 6A7 tube and connect it to the receiver antenna lead (blue) through a .00025 mfd. series condenser.

Set the test oscillator frequency and receiver dial to EXACTLY 1730 kilocycles. Adjust the 1730 kilocycle oscillator trimmer to bring in 1730 kilocycle test oscillator signal to maximum output.

Tune the receiver and test oscillator frequency to EXACTLY 1400 kilocycles and adjust the 1400 kilocycle antenna trimmer for maximum output as indicated on the output meter.

Set the test oscillator and receiver frequency to approximately 600 kilocycles. While rocking the gang condenser slightly to the right and to the left, adjust the 600 kilocycle oscillator padder for maximum signal.

ALIGNING THE 1.7-5.8 M.C. BAND

Substitute a 400 ohm resistor for the .00025 mfd. condenser in series with the antenna lead.

Tune the receiver and test oscillator frequency to EXACTLY 5 megacycles and adjust the 5 megacycle antenna trimmer for maximum output.

ALIGNING THE 5.7-18.3 M.C. BAND

Leave the 400 ohm resistor in series with the test oscillator lead and set the band selector switch for operation on the 5.7 - 18.3 megacycle band (short wave).

Set the receiver and test oscillator frequency to EXACTLY 18.3 megacycles.

Adjust the 18.3 megacycle oscillator trimmer for maximum signal as indicated on the output meter.

When adjusting this trimmer two peaks may be noticed, in which case CARE MUST BE TAKEN THAT THE PROPER PEAK IS USED FOR ALIGNING THE RECEIVER AT 18.3 MC. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the second peak -- if more than one is noticed -- which is the correct one to use, is tuned in.

Set the receiver and test oscillator frequency to EXACTLY 15 megacycles.

Rock the gang condenser slightly to the right and to the left, adjusting the 15 megacycle antenna trimmer for maximum signal as indicated on the output meter.

MODELS CR102, 103, 104, 105

ALIGNING THE I.F. AT 456 KILOCYCLES

1. Connect the ground lead of the test oscillator to the chassis or set ground lead (black). Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .00025 Mfd. condenser.

2. Set the band switch for reception on the broadcast band and set the dial pointer to 1,000 kilocycles, adjusting the receiver volume control to its maximum setting.

3. Now feed a 456 kilocycle signal from the test oscillator and peak each of the second I.F. trimmer condensers.

4. Peak each of the first I.F. trimmer condensers, repeating the adjustments several times for most accurate setting.

ALIGNING THE 540-1760 KILOCYCLE BAND

1. Remove the test oscillator lead from the grid of the 6A7 tube and connect it to the receiver antenna lead (blue) through a .00025 mfd. condenser.

2. Check the tuning dial adjustment by turning the gang condenser until the plates are completely meshed at which point the dial pointer must be exactly even with the last line at the low frequency end of the band (540 KC).

3. With the band selector set for reception on the broadcast band, set the dial pointer to the extreme high frequency end of the band (1760 KC) and feed a 1760 KC signal from the signal generator, adjusting the 1760 kilocycle oscillator trimmer for maximum output.

4. Now set the receiver and test oscillator frequency to 1500 KC and adjust the 1500 KC antenna trimmer for maximum output.

5. Set the receiver and test oscillator frequency to 600 KC and adjust the 600 KC oscillator padder to maximum output while tuning the receiver back and forth across the signal. This completes the alignment of the broadcast band.

ALIGNING THE 1600-5000 KILOCYCLE BAND

1. Set the band selector for operation on the police band.

2. Set the receiver and test oscillator frequency to 4 megacycles and adjust the 4 megacycle antenna trimmer for maximum output.

ALIGNING THE 4.0-19.0 MEGACYCLE BAND

1. Set the band selector for operation on the foreign band.

2. Set the receiver and test oscillator frequency to 15 megacycles and adjust the 15 megacycle antenna trimmer for maximum output.

10 KILOCYCLE FILTER ADJUSTMENT

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser on the rear of the chassis adjacent to the speaker socket.

CHASSIS CR113,-114,-115
CR118,-125
Schematic,Voltage

THE MAGNAVOX CO., INC.

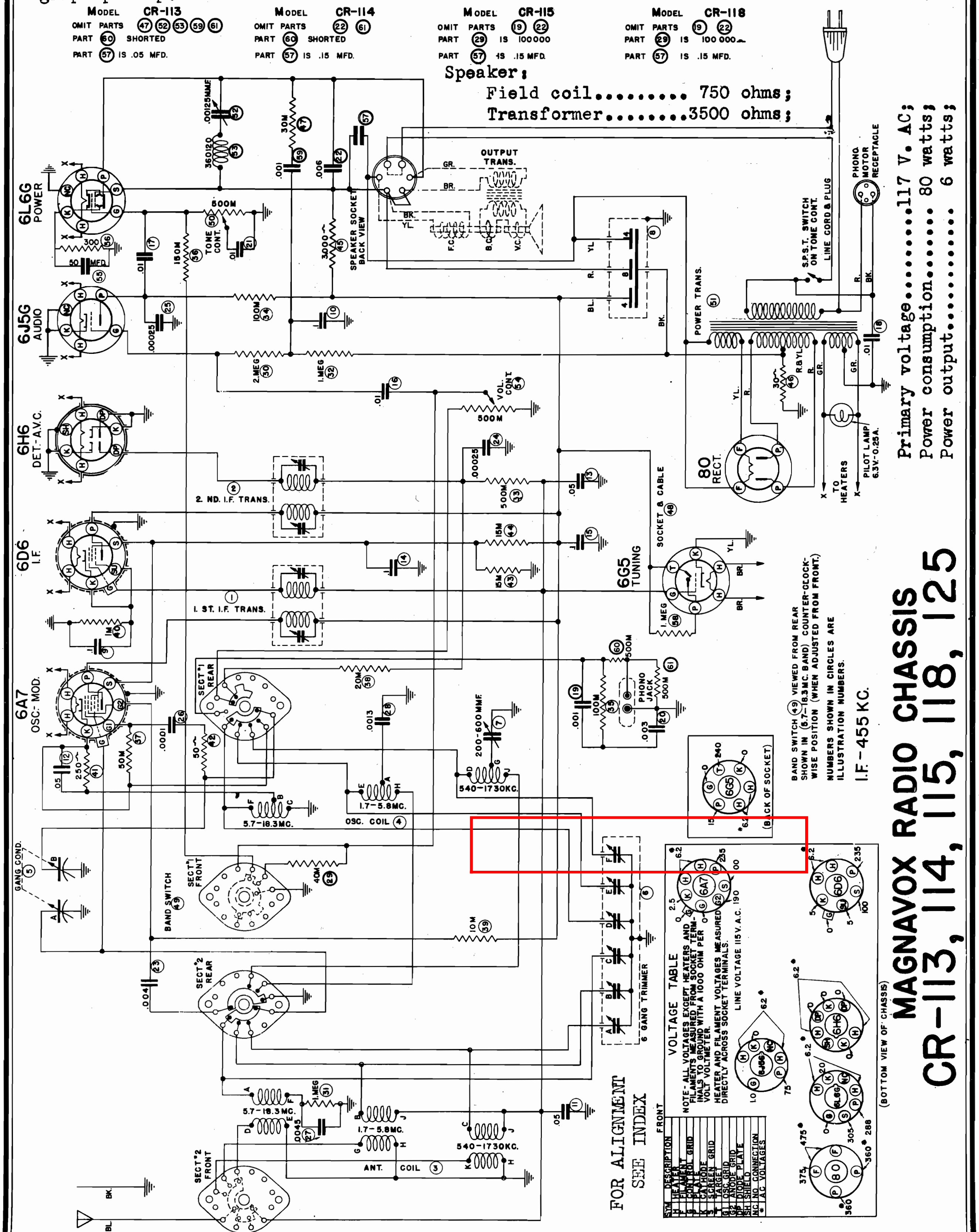
Type circuit: Superheterodyne with three tuning ranges, tone control, A.V.C., bass compensation in volume control for phonograph pickup.

Intermediate frequency............455 KC;
Tuning frequency range 540 - 1730 KC;
1.7 - 5.8 MC;
5.7 - 18.3 MC;

MODEL CR-113	MODEL CR-114	MODEL CR-115	MODEL CR-118
OMIT PARTS 47 52 53 59 61	OMIT PARTS 22 61	OMIT PARTS 19 22	OMIT PARTS 19 22
PART 60 SHORTED	PART 60 SHORTED	PART 29 IS 100000	PART 29 IS 100 000
PART 57 IS .05 MFD.	PART 57 IS .15 MFD.	PART 57 IS .15 MFD.	PART 57 IS .15 MFD.

Speaker:
Field coil......... 750 ohms;
Transformer........3500 ohms;

Primary voltage.........117 V. AC;
Power consumption........ 80 watts;
Power output............. 6 watts;



SYM.	DESCRIPTION
H	HEATER
F	FILAMENT
G	CONTROL GRID
K	CATHODE
S	SCREEN GRID
T	TARGET
G1	OSC. GRID
G2	ANODE GRID
DP	DIODE PLATE
SH	SHIELD
NC	NO CONNECTION
*	A.C. VOLTAGES

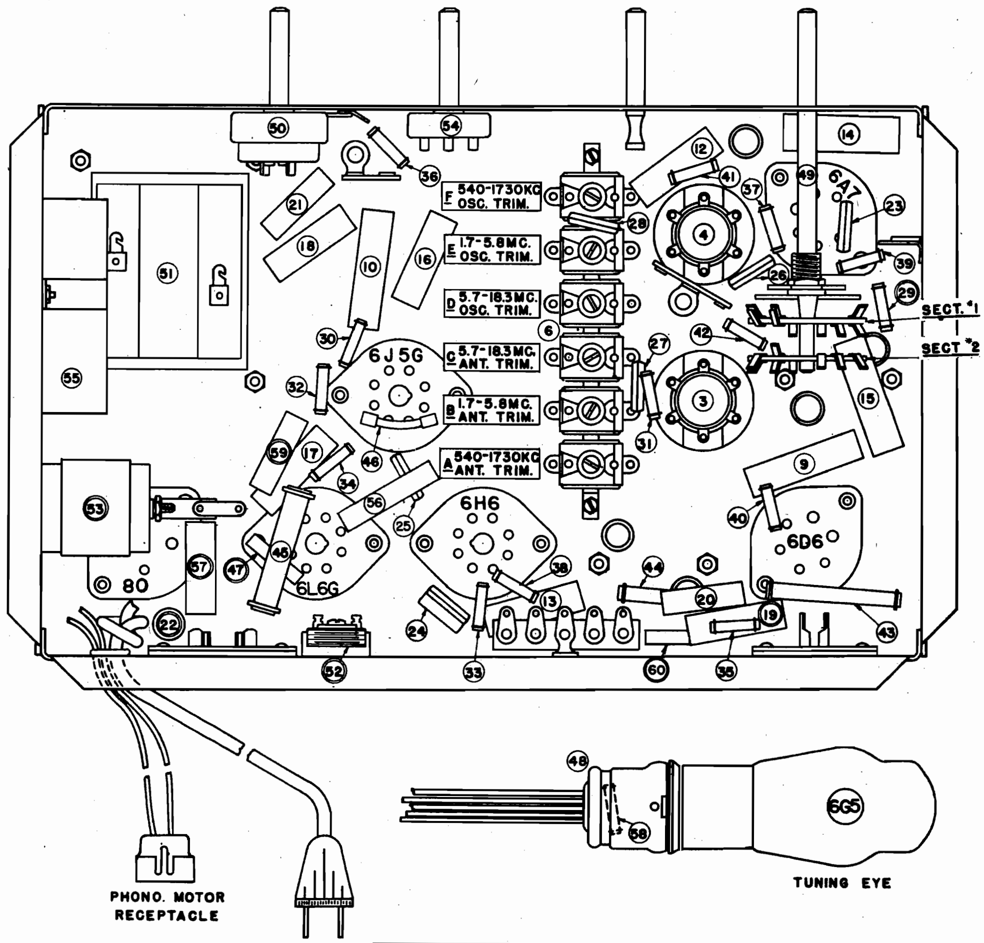
FOR ALIGNMENT SEE INDEX

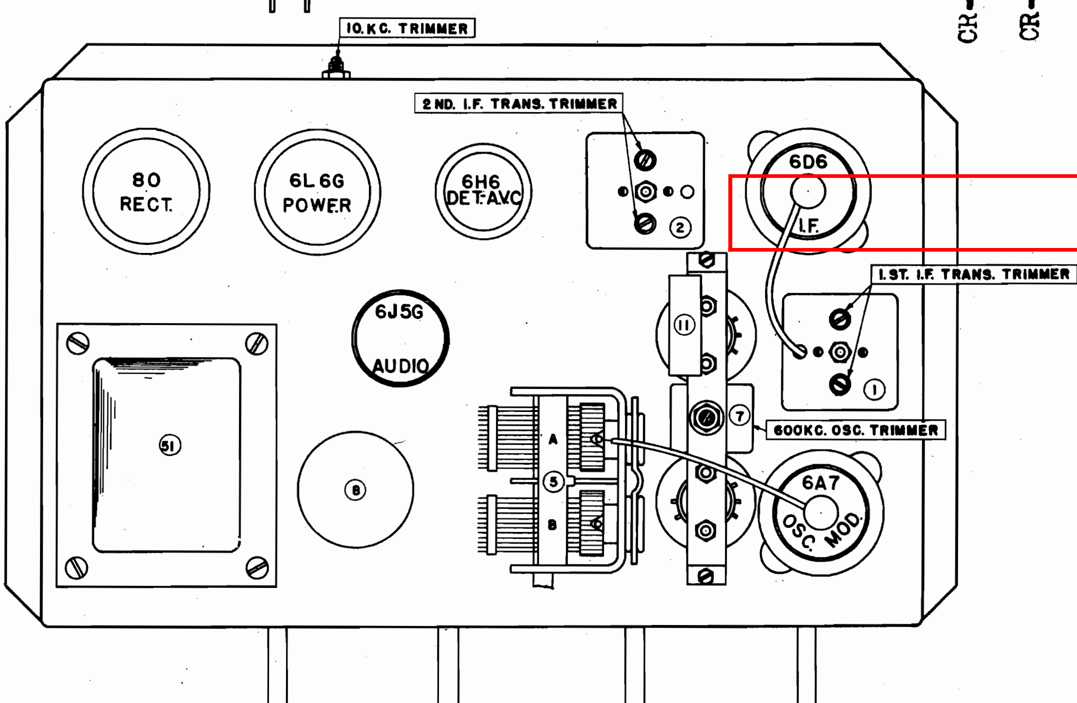
MAGNAVOX RADIO CHASSIS CR-113, 114, 115, 118, 125

CHASSIS CR113,-114,-115
CR118,-125
Socket,Trimmers,Chassis

THE MAGNAVOX CO., INC.

It is important that EXACT replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies particularly to ground points.





CR-114 -- Has brackets for mounting in Chairside combination.
Omit items 22 and 61.

CR-115 -- Has brackets for mounting in Duette combination.
Omit items 19 and 22.
Item 29 is 100,000 ohms.
Item 57 is .15 mfd.

CR-118 -- Has brackets for mounting in Berkeley combination.
Omit items 19 and 22.
Item 29 is 100,000 ohms.
Item 57 is .15 mfd.

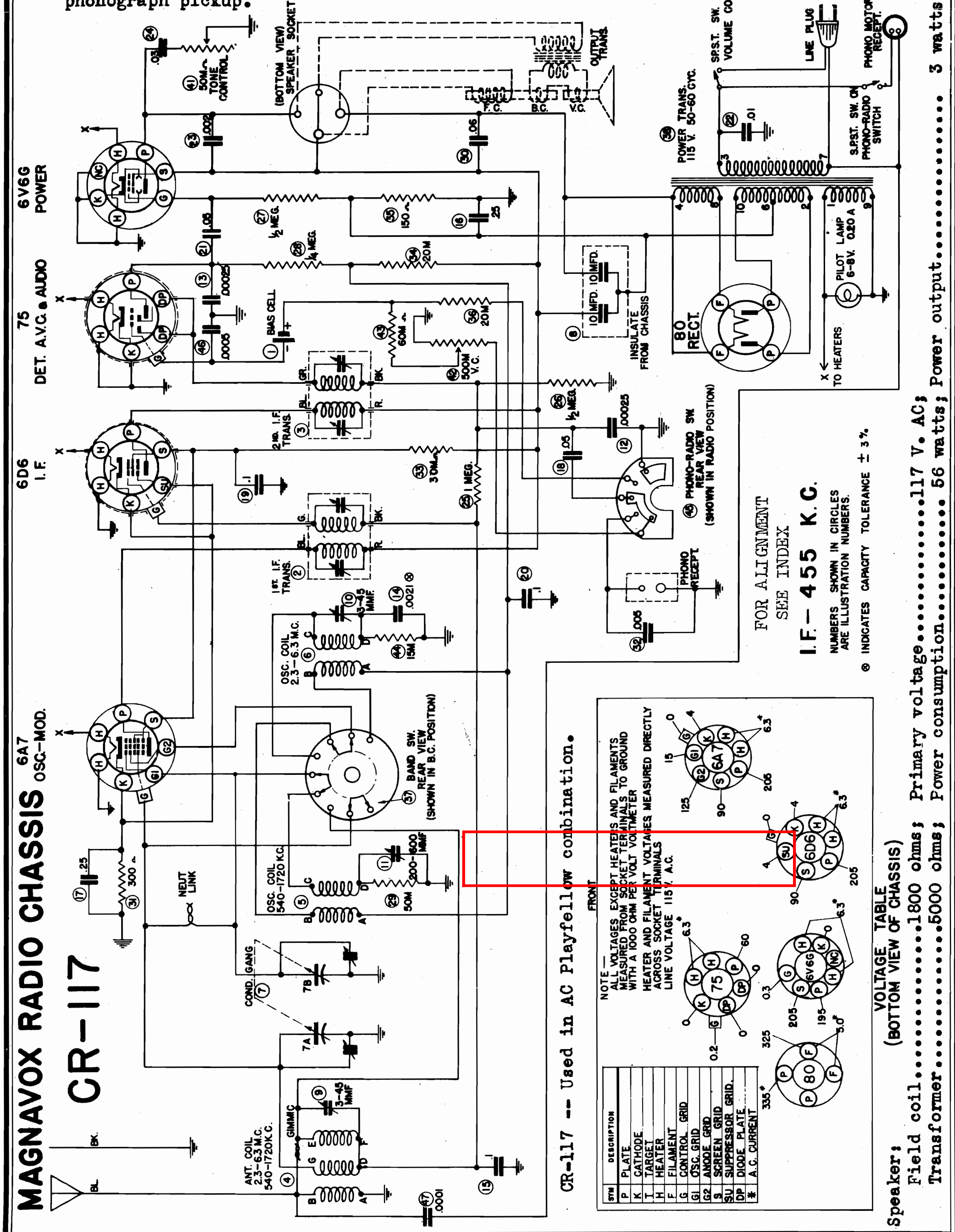
CR-113 -- Used in Concerto combination.
Omit items 47, 52, 53, 59 and 61.
Item 60 is shorted.
Item 57 is .05 mfd.

CHASSIS CR117
Schematic,Voltage

THE MAGNAVOX CO., INC.

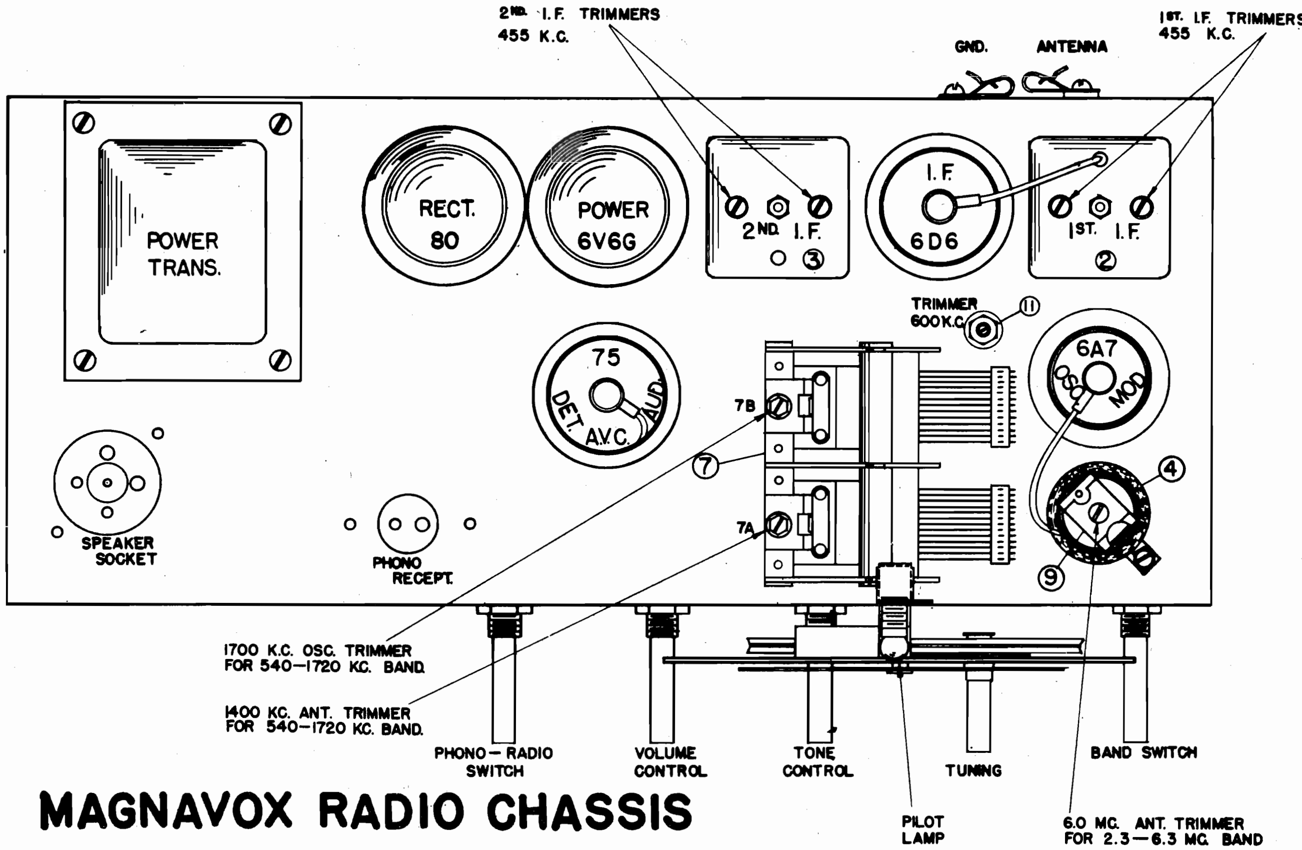
Type Circuit: Superheterodyne with two tuning ranges, tone control, A.V.C. bass compensation in volume control for phonograph pickup.

Tuning frequency range....540-1720 KC
2.3-6.3 MC



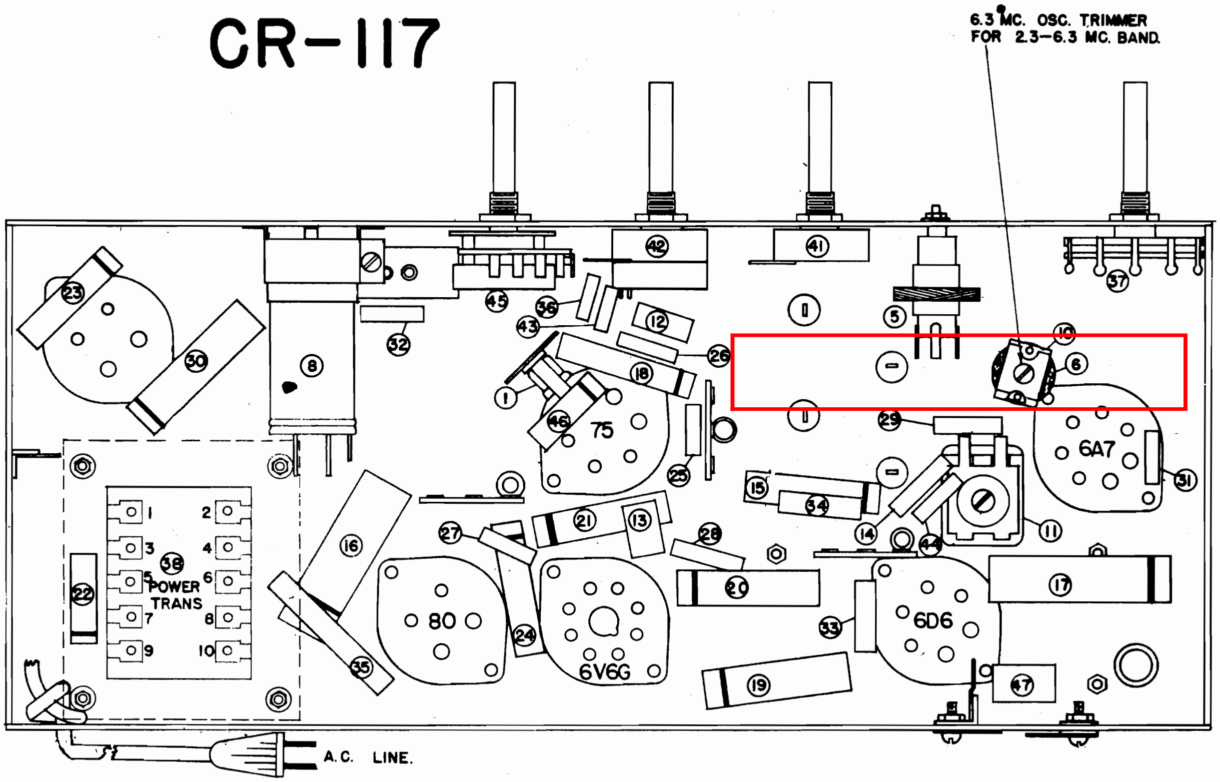
CHASSIS CR117
Socket,Trimmers
Chassis

THE MAGNAVOX CO., INC.



MAGNAVOX RADIO CHASSIS

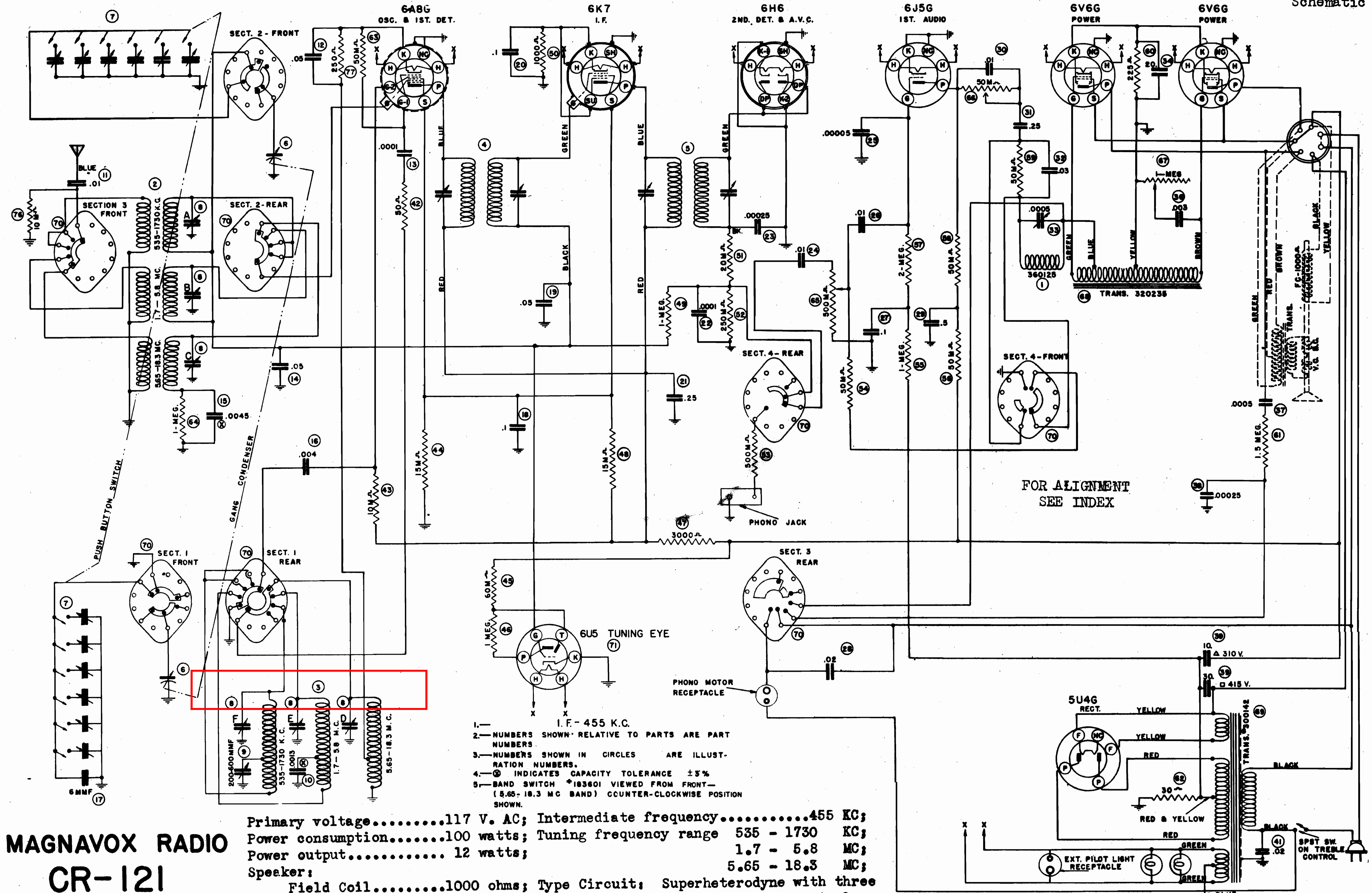
CR-117



It is important that **EXACT** replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies particularly to ground points.

CHASSIS CR121
Schematic

THE MAGNAVOX CO., INC.



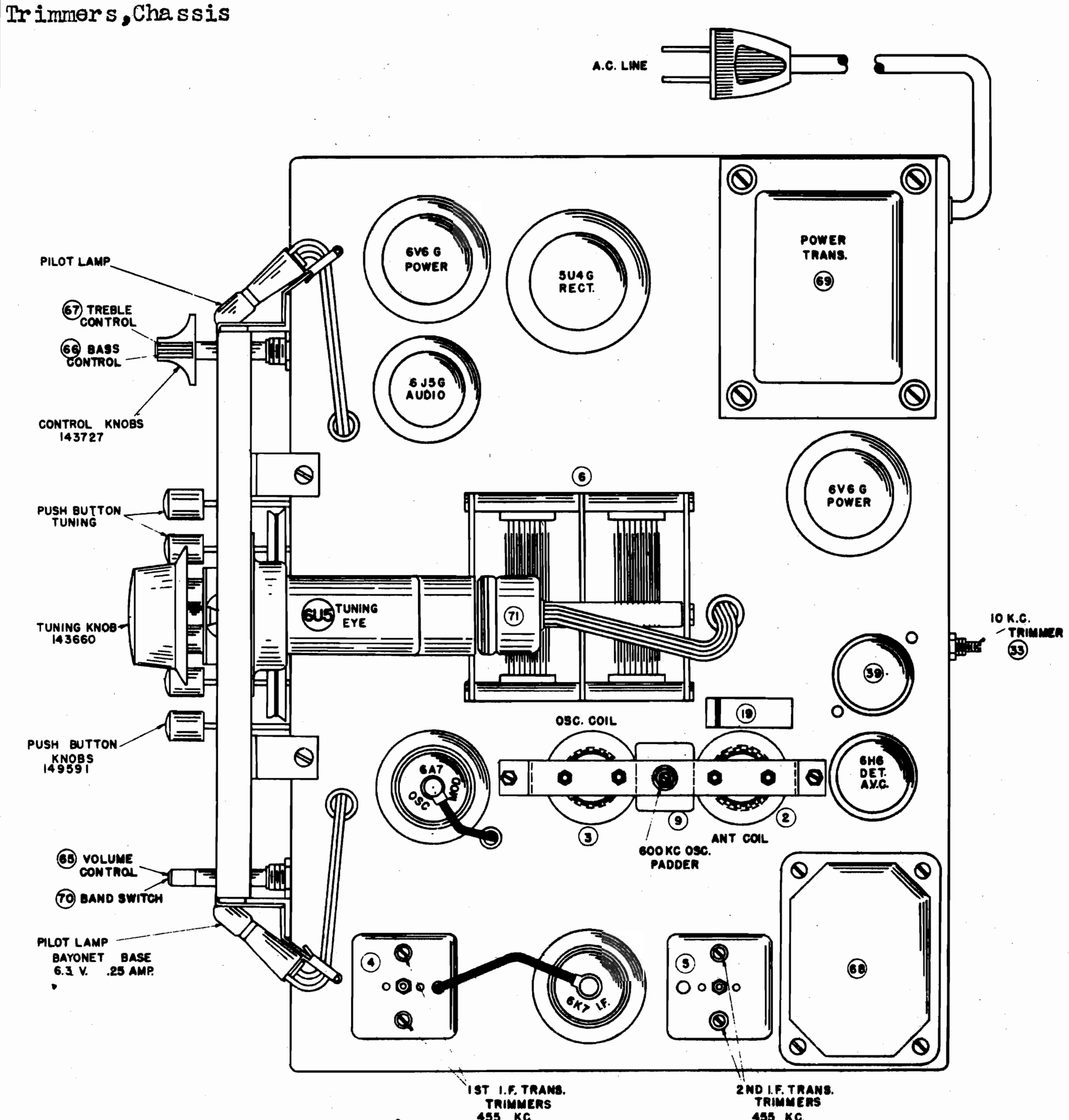
MAGNAVOX RADIO CR-121 CHASSIS

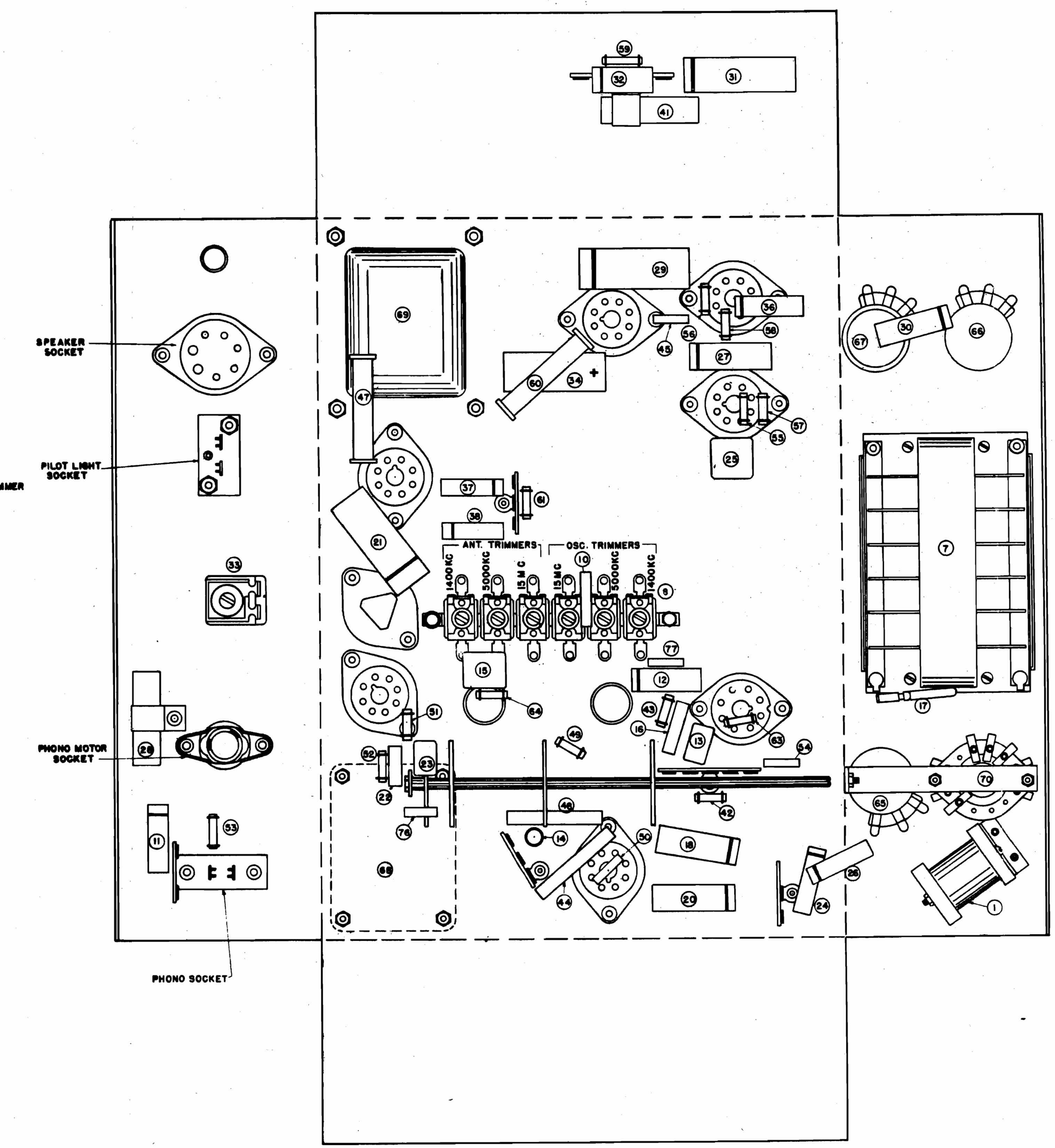
Primary voltage.........117 V. AC; Intermediate frequency...........455 KC;
Power consumption.......100 watts; Tuning frequency range 535 - 1730 KC;
Power output............ 12 watts; 1.7 - 5.8 MC;
5.65 - 18.3 MC;
Speaker:
Field Coil.........1000 ohms; Type Circuit: Superheterodyne with three
Transformer........8000 ohms; tuning ranges, treble and bass controls, A.V.C., bass compensation in volume control for phonograph pickup.

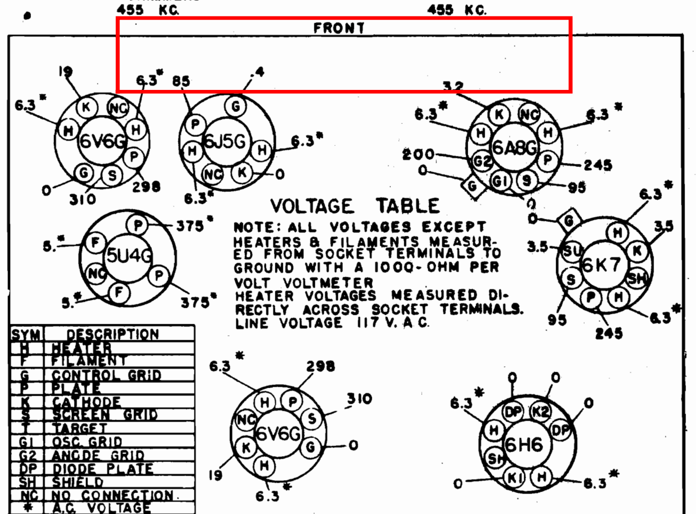
CR-121 -- Used in AC Hepplewhite Manual combination.
Used in AC Berkeley combination.

CHASSIS CR121
Voltage, Socket
Trimmers, Chassis

THE MAGNAVOX CO., INC.



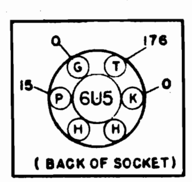




VOLTAGE TABLE

NOTE: ALL VOLTAGES EXCEPT HEATERS & FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000-OHM PER VOLT VOLTMETER
HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
LINE VOLTAGE 117 V. A.C.

SYM	DESCRIPTION
H	HEATER
F	FILAMENT
G	CONTROL GRID
P	PLATE
K	CATHODE
S	SCREEN GRID
T	TARGET
G1	OSC. GRID
G2	ANODE GRID
DP	DIODE PLATE
SH	SHIELD
NC	NO CONNECTION
*	A.C. VOLTAGE
SU	SUPPRESSOR

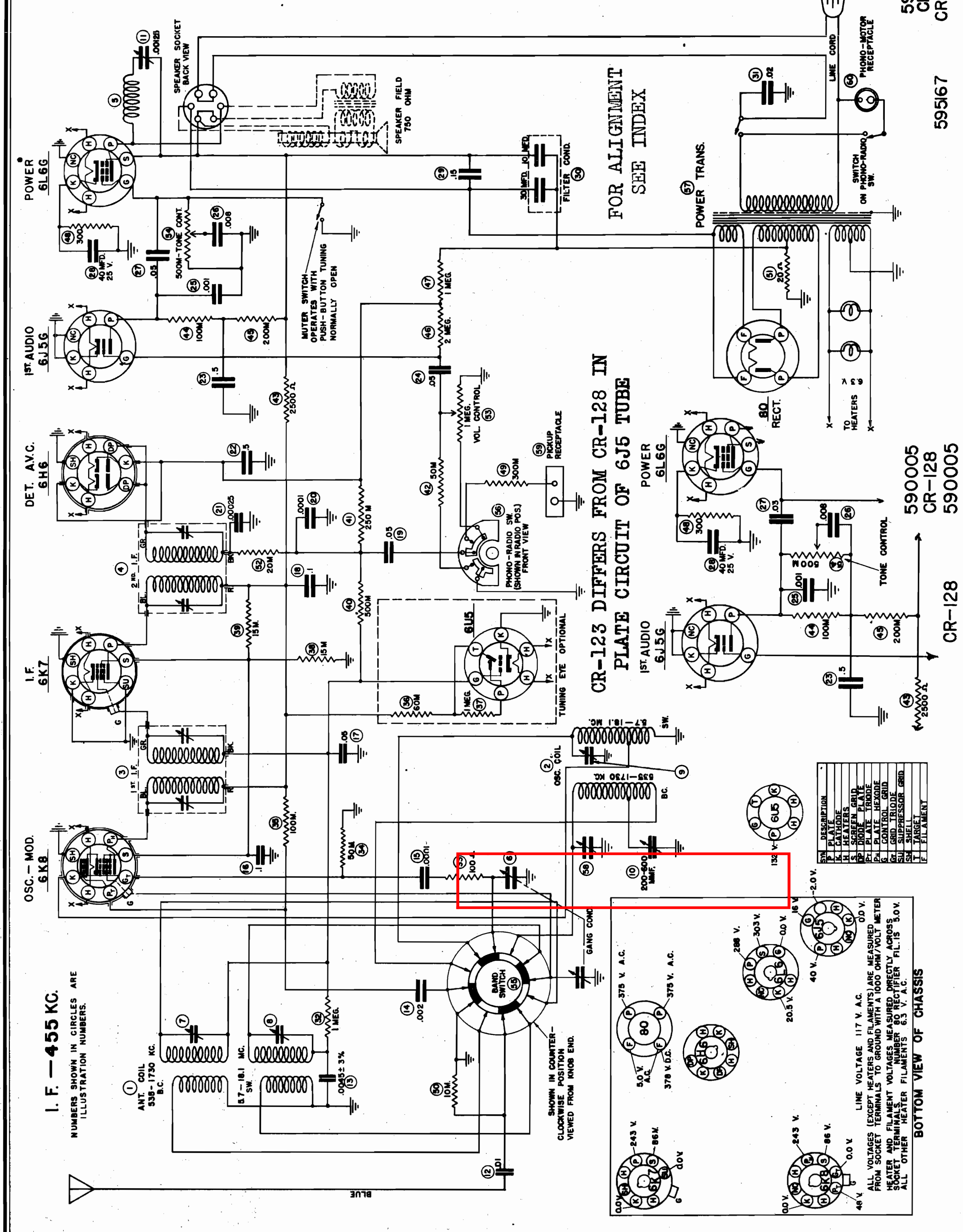


It is important that EXACT replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies particularly to ground points.

CHASSIS CR123, CR128
Schematic, Voltage

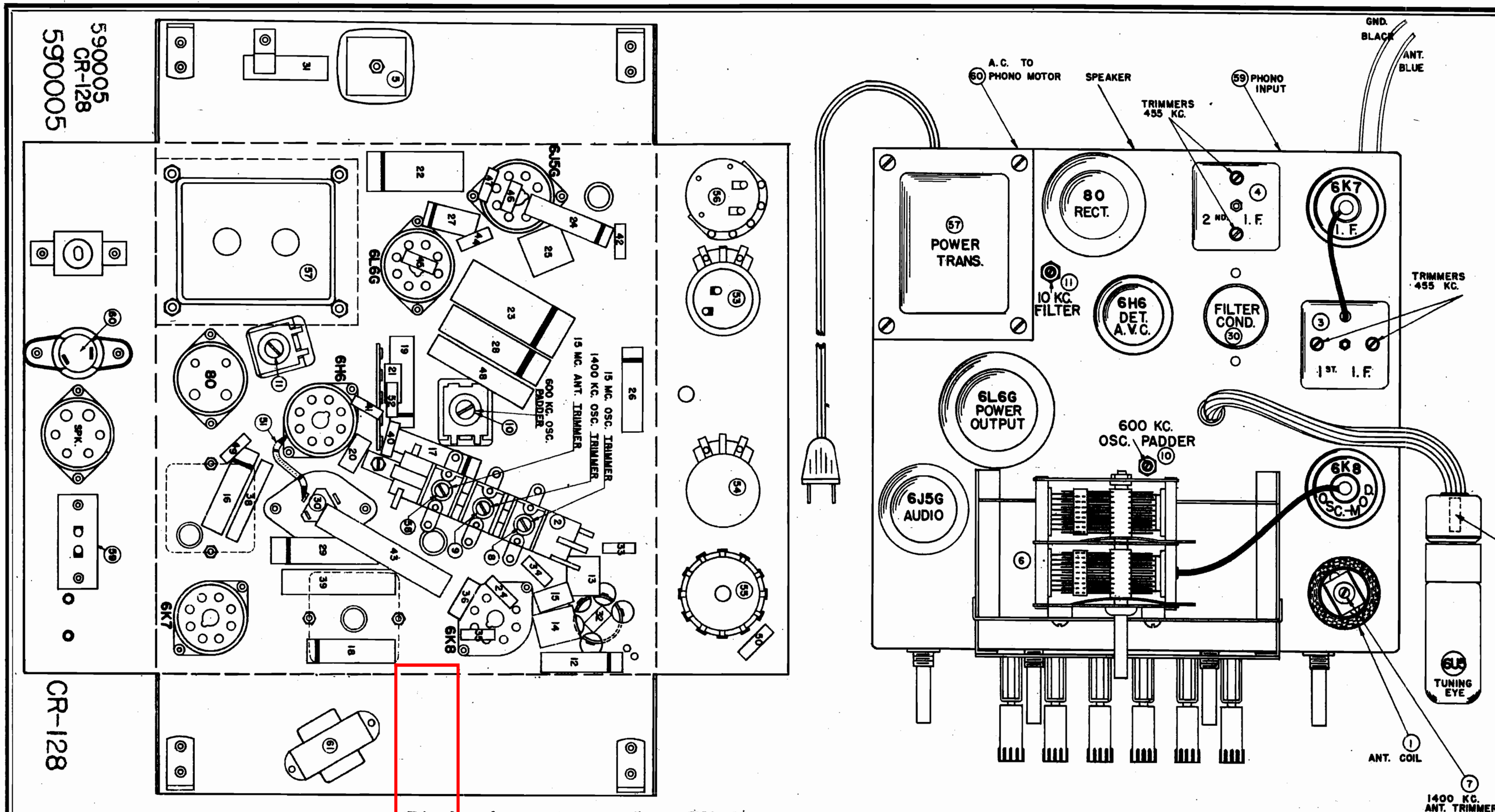
THE MAGNAVOX CO., INC.

TO REMOVE THE CHASSIS FROM THE CABINET: SEE CHASSIS CR-106.



CHASSIS CR123,CR128
Socket,Trimmers
Chassis,Notes

THE MAGNAVOX CO., INC.



CR-123, 128

It is important that EXACT replacement parts be used when necessary and these parts must be located in exactly the same way that the original part was located and connected. This applies particularly to ground points.

Intermediate frequency.........455 KC;
Tuning frequency range: 535 - 1730 KC;
5.7 - 18.1 MC;

Circuit: Superheterodyne with two tuning ranges, treble control, A. V. C.; bass compensation in volume control for phonograph pickup; push-button condenser-type tuner.

Speaker:
Field Coil.... 750 ohms;
Transformer...3500 ohms;

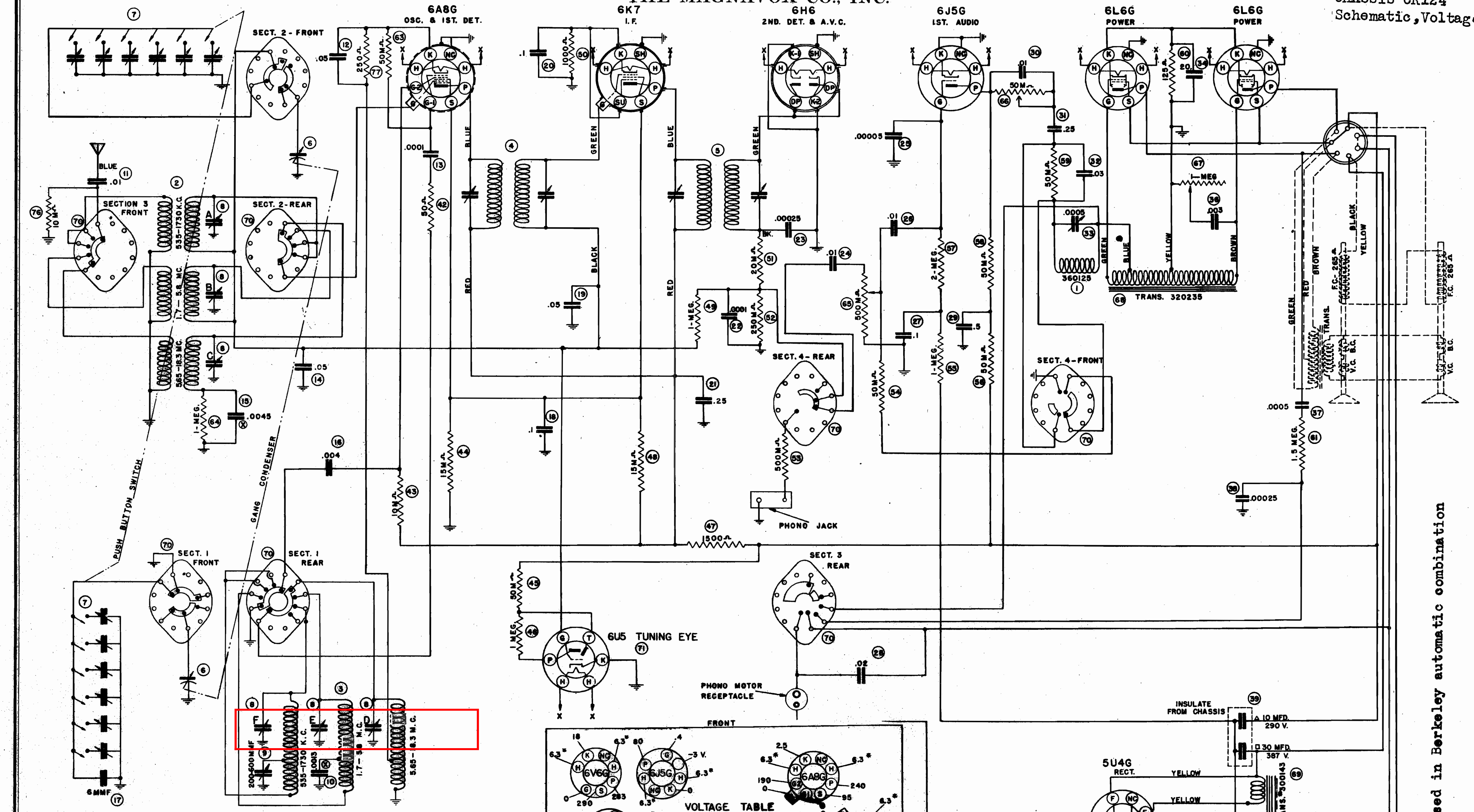
Primary voltage...........117 V. AC;
Power consumption......... 90 watts;
Power output............... 6 watts;

CR-123 -- Used in Concerto, Chairside and Hepplewhite combinations.
Same as CR-128 except:
Item 61 is eliminated.
Item 27 is .03 mfd.

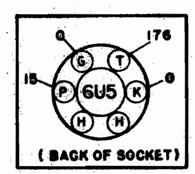
CR-128 -- Used in Hepplewhite automatic combination.

THE MAGNAVOX CO., INC.

CHASSIS CR124
Schematic,Voltage

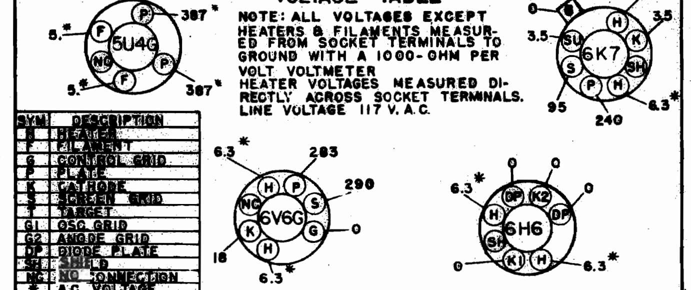


MAGNAVOX RADIO CHASSIS
CR-124



1.— I. F. - 455 K.C.
2.—NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3.—NUMBERS SHOWN IN CIRCLES ARE ILLUSTRATION NUMBERS.
4.—⓪ INDICATES CAPACITY TOLERANCE ±5%
5.—BAND SWITCH *183601 VIEWED FROM FRONT— (5.65- 18.3 MC BAND) COUNTER-CLOCKWISE POSITION SHOWN.

FOR ALIGNMENT SEE INDEX



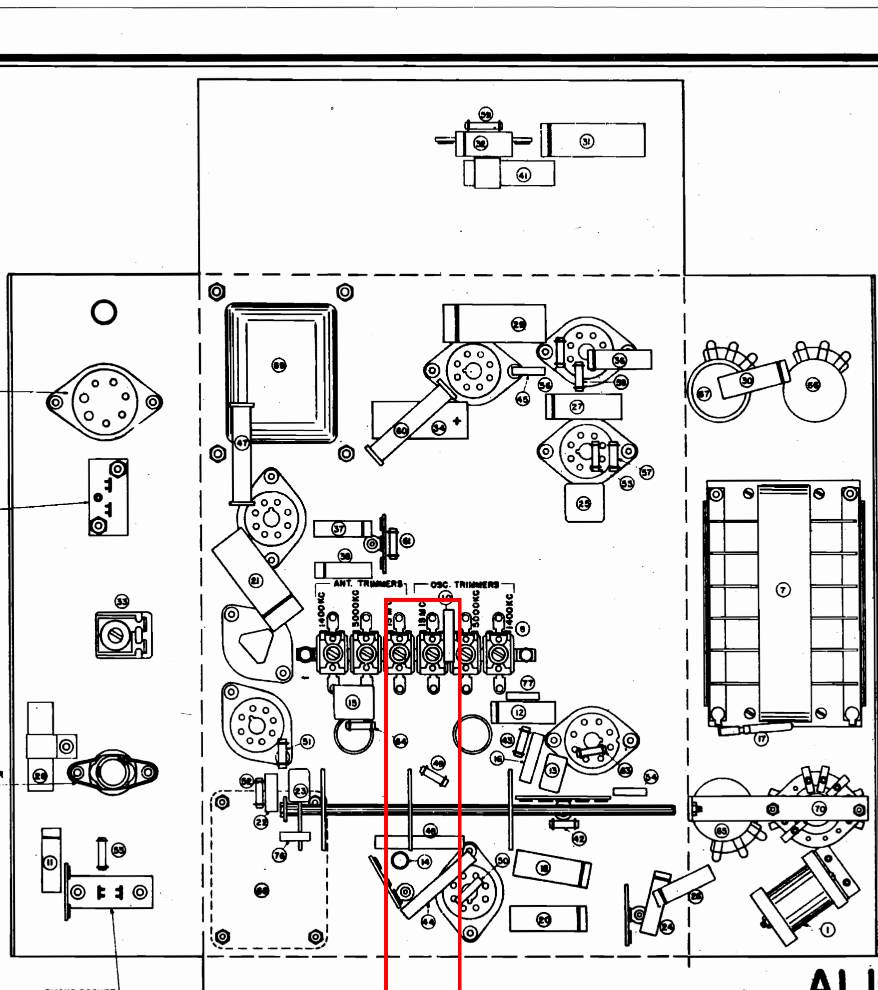
VOLTAGE TABLE

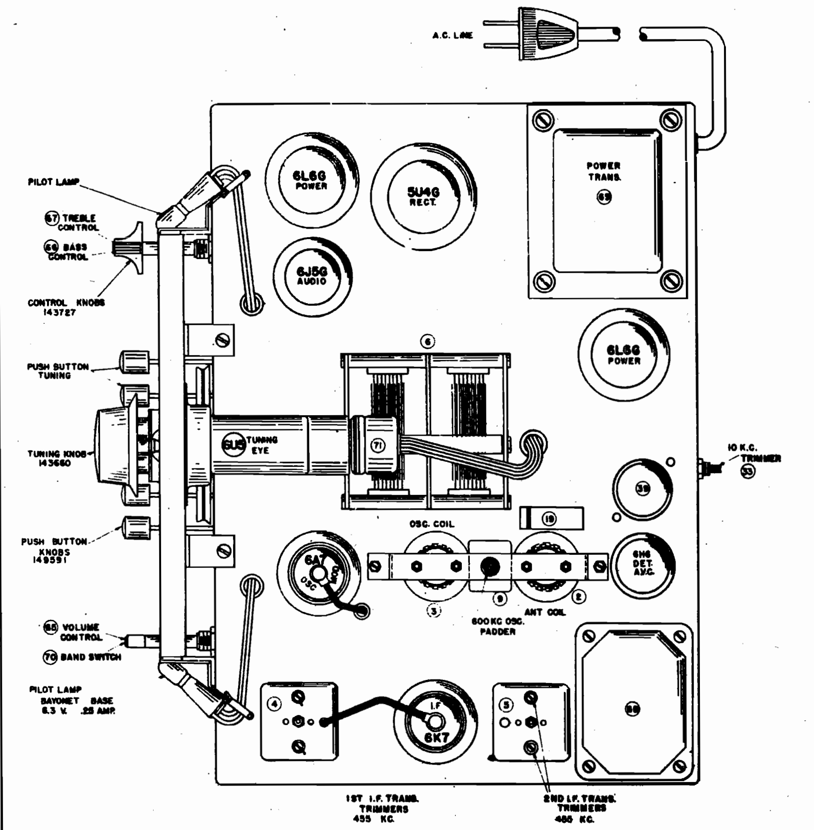
NOTE: ALL VOLTAGES EXCEPT HEATERS & FILAMENTS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000-OHM PER VOLT VOLTMETER
HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
LINE VOLTAGE 117 V. A.C.

SYM	DESCRIPTION
H	HEATER
F	FILAMENT
G	CONTROL GRID
P	PLATE
K	CATHODE
S	SCREEN GRID
T	TARGET
G1	OSC GRID
G2	ANODE GRID
DP	DIODE PLATE
SH	SHIELD
NC	NO CONNECTION
*	A.C. VOLTAGE
SU	SUPPRESSOR

THE MAGNAVOX CO., INC.

CHASSIS CR124
Socket, Trimmers
Chassis





Primary voltage...........117 V. AC;
Power consumption.........165 watts;
Power output.............. 17 watts;
Circuit; Superheterodyne with three tuning ranges, treble and bass controls A.V.C., bass compensation in volume control for phonograph pickup.
Speaker (302);
Field Coil..............250 ohms ;
Transformer.............10M ohms ;
Speaker (12C131);
Field Coil..............250 ohms ;
Transformer............ None

ALIGNMENT PROCEDURE

It is absolutely necessary that an accurately calibrated test oscillator with some type of output measuring device be used when aligning the receiver.

TUNING FREQUENCY RANGE: 535 - 1730 KC; 1.7 - 5.8 and 5.65 - 18.3 MC.

FOLLOW ALIGNMENT PROCEDURE OF MAGNAVOX CHASSIS CR-106.

10 K.C. FILTER ADJUSTMENT

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser at the rear center of the chassis.

CHASSIS CR117
CHASSIS CR123,CR128
Alignment

THE MAGNAVOX CO., INC.

MODEL CR 117

ALIGNING THE I.F. STAGES AT 455 KILOCYCLES

1. Connect the ground lead of the test oscillator to the chassis or radio ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .00025 mfd. series condenser. DO NOT REMOVE THE GRID CLIP.
2. Set the test oscillator to EXACTLY 455 kilocycles and turn the receiver volume to maximum setting.
3. Peak each of the second I.F. transformer trimmer condensers.
4. Peak each of the first I.F. transformer trimmer condensers.

To insure most accurate trimmer setting, repeat the above adjustment several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING THE 540-1720 KILOCYCLE BAND

1. Remove the test oscillator lead from the grid of the 6A7 tube and attach it to the receiver antenna lead (blue) through a .00025 mfd. series condenser.
2. Check tuning dial adjustment by turning the gang condenser until plates are completely meshed, at which point the dial pointer must be exactly even with the last line at the low frequency end of the dial calibration.
3. Set the receiver and test oscillator frequency to EXACTLY 1700 kilocycles.
4. Adjust the oscillator trimmer "7B" Fig. 2, for maximum output as indicated on the output meter.
5. Set the receiver and test oscillator frequency to EXACTLY 1400 kilocycles.
6. Adjust the antenna trimmer "7A" Fig. 2, for maximum output, as indicated on the output meter.
7. Now set the receiver and test oscillator frequency to 600 kilocycles, and adjust the oscillator padder condenser "11" Fig. 2, accessible from the top of the chassis, for maximum output.

ALIGNING THE 2.3-6.3 MEGACYCLE BAND

1. Substitute a 400 ohm resistor for the .00025 mfd. condenser in series with the antenna lead.
2. Adjust the band selector switch for short-wave band and tune the receiver and test oscillator frequency to EXACTLY 6.3 megacycles.
3. Now adjust the 6.3 megacycle oscillator trimmer "10" Fig. 2, for maximum deflection on the output meter.
4. Set the receiver and test oscillator frequency to EXACTLY 6 megacycles, and adjust the 6 MC antenna trimmer "9" Fig. 2, for maximum deflection on the output meter.

MODELS CR 123, CR 128

ALIGNING THE I.F. AT 455 KILOCYCLES

1. Connect the ground lead of the test oscillator to the chassis or radio ground lead. Connect the other lead of the test oscillator to the grid of the 6K8 tube through a .00025 Mfd. series condenser. DO NOT REMOVE THE GRID CLIP.
2. Set the test oscillator to EXACTLY 455 kilocycles and turn the receiver volume to maximum setting.
3. Peak each of the second I.F. transformer trimmer condensers.
4. Peak each of the first I.F. transformer trimmer condensers.

ALIGNING THE 535-1730 KILOCYCLE BAND

1. Remove the test oscillator lead from the grid of the 6K8 tube and connect it to the receiver antenna lead (blue) through a .00025 Mfd. series condenser.
2. Check the tuning dial adjustment by turning the gang condenser until the plates are completely meshed, at which point the dial pointer must be exactly even with the last line at the low frequency end of the dial calibration.
3. Adjust the band selector switch for operation on the 535-1730 kilocycle (broadcast) band.
4. Set the test oscillator frequency and receiver dial to EXACTLY 1400 kilocycles. Adjust the 1400 kilocycle oscillator trimmer and the antenna trimmer to bring in the 1400 kilocycle test oscillator signal to maximum output.
5. Set the test oscillator and receiver frequency to 600 kilocycles. While rocking the gang condenser slightly to the right and to the left, adjust the 600 kilocycle oscillator padder for maximum output.

ALIGNING THE 5.7-18.1 MEGACYCLE BAND

1. Substitute a 400 ohm resistor for the .00025 Mfd. condenser in series with the antenna lead.
2. -Adjust the band selector switch to the 5.7-18.1 megacycle (foreign) band, tune the receiver and test oscillator frequency to EXACTLY 15 megacycles and adjust the 15 megacycle oscillator trimmer and antenna trimmer for maximum output as indicated on the output meter.

While adjusting the oscillator trimmer, two peaks may be noticed, in which case care must be taken so that the proper peak is used for aligning the receiver at 15 megacycles. Always back off the trimmer to minimum capacity, then screw down the trimmer until the second peak (if more than one is noticed) which is the correct one, is tuned in.

10 K.C. FILTER ADJUSTMENT

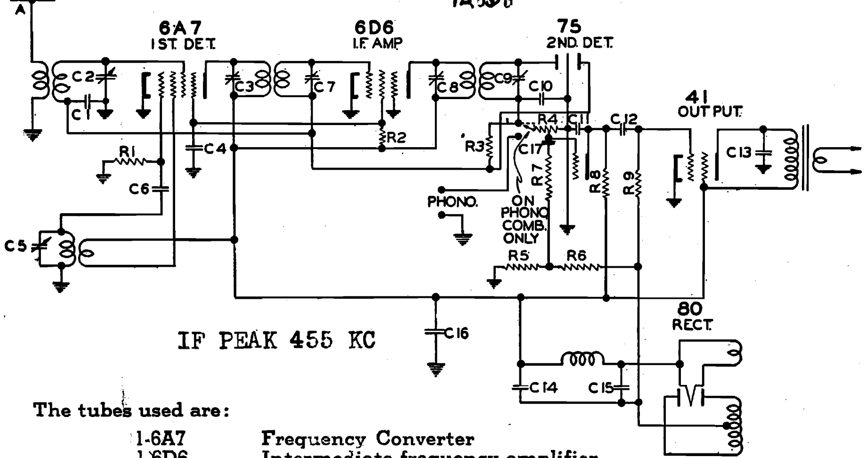
With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser at the rear center of the chassis.

Schematics, Socket Trimmers, Alignment

MAJESTIC RADIO & TELEV. CORP.

MODELS 1A59, 1A59B, P1A59 1B59, P1B59
MODELS 149I, 149N, 149W

SCHEMATIC DIAGRAM MODELS 1A59 - P1A59 - 1B59 AND P1B59 1A59B



IF PEAK 455 KC

The tubes used are:

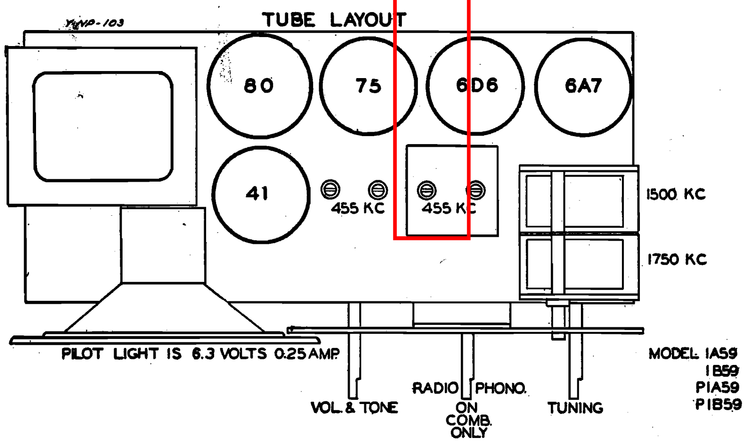
1-6A7	Frequency Converter
1-6D6	Intermediate frequency amplifier
1-75	Second detector, AVC, and audio frequency amplifier
1-41	Output
1-80	Rectifier

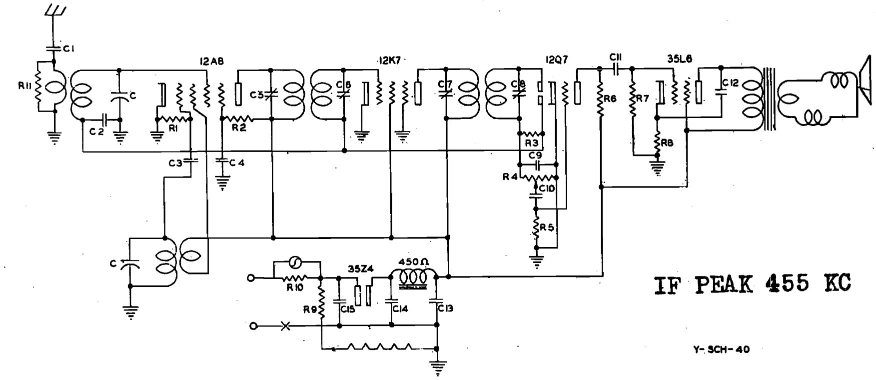
PARTS LIST FOR MODEL NO. 1A59

Schematic Location	Part No.	Description
C1	C-15752	.05 mfd. 200V
C4,C16	C-15756	.05 mfd. 400V
C12,C17	C-15754	.01 mfd. 400V
C13	C-25	.006 mfd. 400V
C2,C5	Y-CV-30	Gang condenser
C3,C7	Y-CT-1	1st I. F. Trimmer
C8,C9	Y-CT-23	2nd I. F. Trimmer
C10	CM-30	250 mmf. Mica
C11	CM-31	100 mmf. Mica
C6	CM-29	50 mmf. Mica
C14,C15	Y-CE-51	8 8 mfd. 300V Electrolytic

Schematic Location	Part No.	Description
R1	R-15511	50K ¼W 20%
R2	R-83	35K 1W 20%
R3	R-15500	2 meg ¼W 20%
R5	R-82	35 ohms ¼W 20%
R6	R-27	250 ohms ½W 20%
R7	R-15517	1 meg ¼W 20%
R8	R-15520	500K ¼W 20%
R9	R-62	400K ¼W 20%
R4	Y-VC-30	Volume Control

TUBE LAYOUT





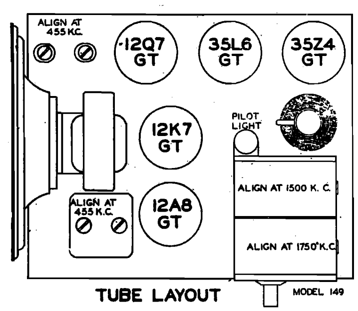
IF PEAK 455 KC

PARTS LIST FOR MODELS 149-W, 149-I, 149-N

Schematic Location	Part No.	Description
C1,C11	C-15754	Tubular cond. .01 mfd. 400V
C2,C4	C-15752	Tubular cond. .05 mfd. 200V
C3	CM-29	Mica cond. 50 mmf. 30%
C9	CM-30	Mica cond 250 mmf. 30%
C10	C-15774	Tubular cond. .002 mfd. 400V
C12,C15	C-15760	Tubular cond. .02 mfd. 400V
C5,C6	Y-CT-18	Trimmer cond. 1st I. F. Trans.
C7,C8	Y-CT-23	Trimmer cond. 2nd I. F. Trans.
C13,C14	Y-CE-50	Electr. 16 mfd. 24 mfd. 150V

Schematic Location	Part No.	Description
R1	R-15511	Carbon resistor 50K ¼W20%
R2	R-15516	Carbon resistor 15K ¼W20%
R3	R-15500	Carbon resistor 2 meg. ¼W20%
R4	Y-VC-29	Volume Control
R5	R-79	Carbon resistor 1½meg ¼W20%
R6,R7	R-15520	Carbon resistor 500K ¼W20%
R8	R 80	Carbon res. 110 ohm ½W20%
R9	R-86	Flexible res 70 ohm 2W20%
R11	R-15531	Carbon res. 10K ohm ¼W20%
R10	R-85	Carbon res 35 ohm 1W20%
		Pilot Lite Mazda #40 .15 amp.
	Y-CR-16	Antenna Coil
	Y-CR-17	Oscillator Coil
	Y-CI-31	1st I. F. Transformer
	Y-CI-32	2nd I. F. Transformer
	Y-SP-37	Speaker
	Y-CV-27	Variable Condenser

TUBE LOCATION CHART



TUBE LAYOUT

MODEL 149

This receiver is a 5-tube, super-heterodyne using two double purpose tubes.

It operates on either AC or DC current, of 105 to 125 volts. It receives stations lying between 535 and 1750 Kilocycles. This includes standard broadcast and most police stations.

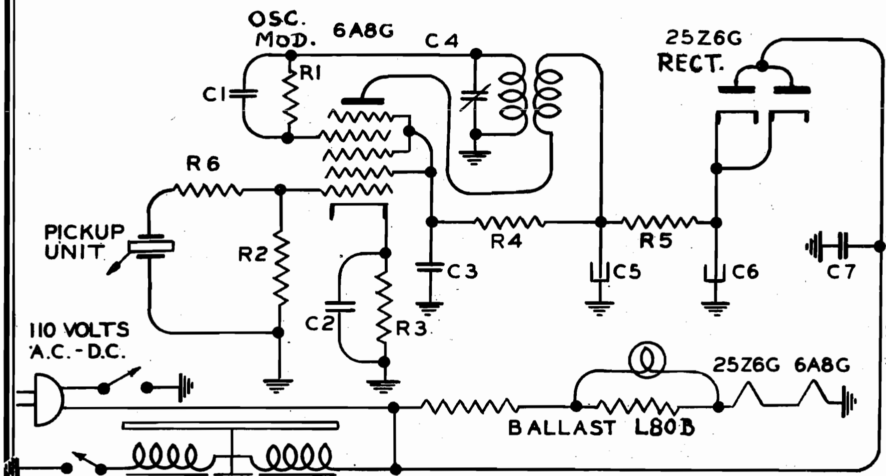
The tubes used are:

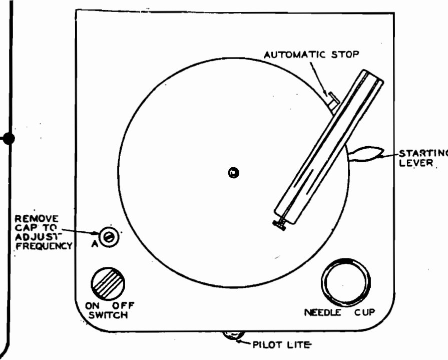
1-12A8GT	Combined oscillator and first detector
1-12K7GT	Intermediate frequency amplifier
1-12Q7GT	Second detector, automatic volume control, gas gate, and audio amplifier
1-35L6GT	Beam power output
1-35Z4GT	Rectifier

MODEL 3PW Record Player Schematic, Socket

MAJESTIC RADIO & TELEV CORP.

MODEL 651 Schematic, Socket Trimmers, Alignment





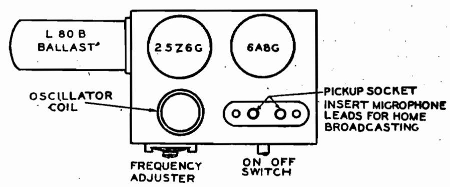
FREQ. RANGE 525-900 KC.

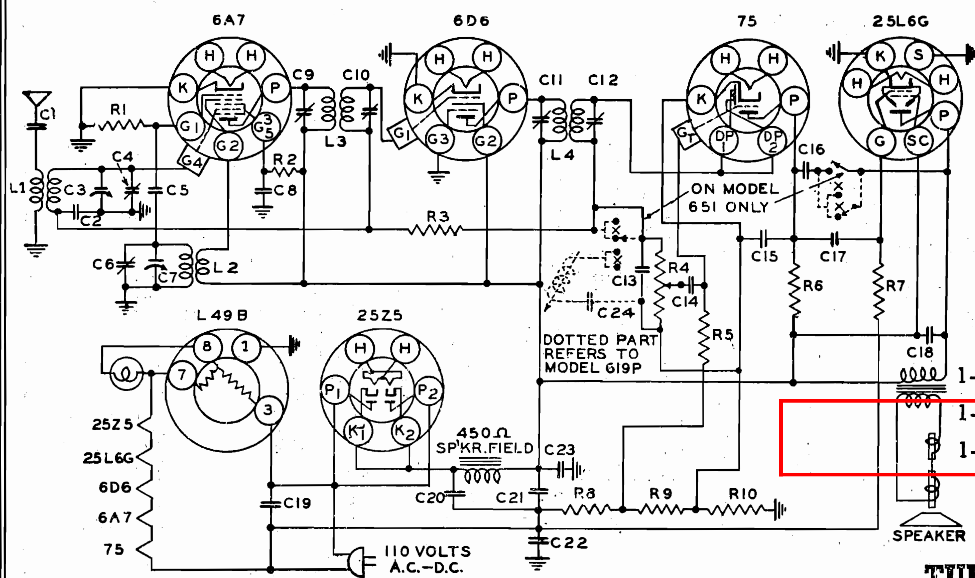
RECORD PLAYER MODEL 3-PW

REPLACEMENT PARTS LIST FOR MODEL 3-PW

Schematic Location	Part No.	Description
R4,R5	R-2	Carbon resistor 5K ¼W20%
R1	R-65	Carbon resistor 10K ¼W20%
R3	R-15542	Carbon resistor 1K ¼W20%
R6	R-15512	Carbon resistor 250K ¼W20%
R2	R-15515	Carbon resistor 100K ¼W20%
C5,C6	CE-47	Elect. cond. 8.16 mfd. 150V
C4	Y-CT-6	Adj. padder cond.
C7	C-15757	Paper cond. .1 mfd. 400V
C2,C3	C-15761	Paper cond. .1 mfd. 200V
C1	CM-15929	Mica cond. 50 mmf. 20%

TUBE LOCATION CHART





The tubes used are:

1-6A7 Frequency Converter

1-6D6 Intermediate frequency amplifier

1-75 Second detector, AVC, and audio driver

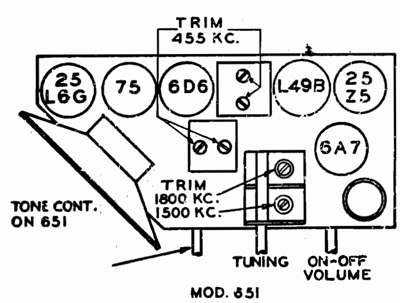
1-25L6G Beam power output

1-25Z5 Rectifier

1-L49B Plug-in ballast resistor

IF PEAK 455 KC

TUBE LOCATION CHART

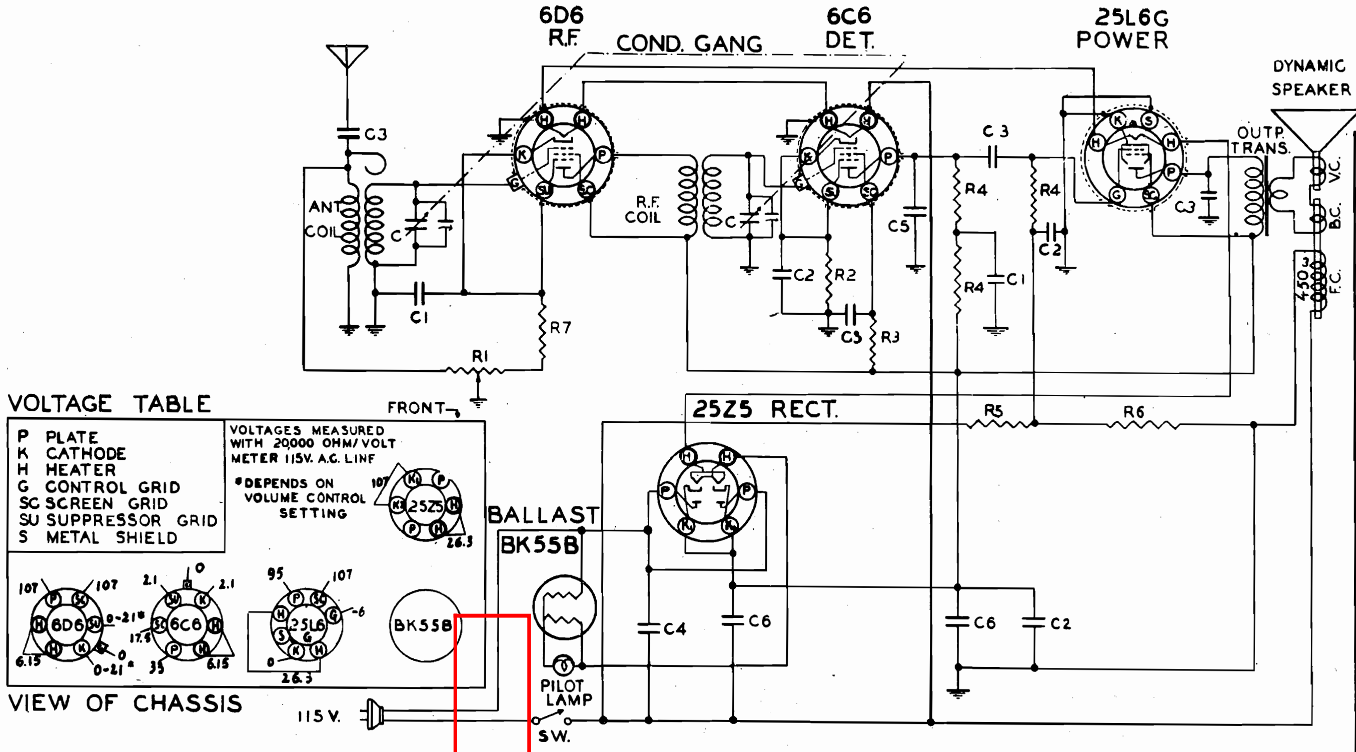


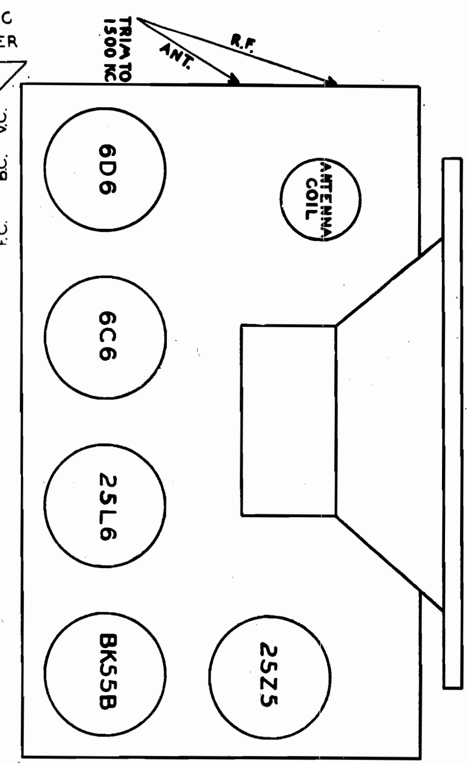
REPLACEMENT PARTS LIST FOR MODEL 651

Schematic Location	Part No.	Description	Schematic Location	Part No.	Description
C1,C14,C17	C-15754	Tubular cond. .01 mfd 400V	R1	R-15511	Carbon resistor 50K ¼W20%
C2,C8,C23	C-15752	Tubular cond. .05 mfd, 200V	R2	R-15516	Carbon resistor 15K ¼W20%
C18	C-15760	Tubular cond. .02 mfd. 400V	R3	R-15500	Carbon resistor 2 meg. ¼W20%
C19	C-15757	Tubular cond. 1 mfd, 400V	R5	R-15517	Carbon resistor 1 Meg ¼W20%
C24	C-15750	Tubular cond. .25 mfd. 400V	R6	R-15512	Carbon resistor 250K ¼W20%
C5	CM-15929	Mica cond. 50 mmf.	R7	R-15528	Carbon resistor 400K ¼W20%
C15	CM-15928	Mica cond 250 mmf.	R8		Candohn 50 ohms
C13,C16	CM-15918	Mica cond. 100 mmf.	R9	Y-RC-8	Candohn 20 ohms
C3	Y-CV-22	Variable cond.(Signal Section)	R10		Candohn 50 ohms
C7		Variable cond.(Osc. Section)	R4	Y-VC-21	Volume control 500K ohms
C4		Trimmer cond. (Signal Section)	L1	Y-CS-33	Antenna Coil
C6		Trimmer cond. (Osc. Section)	L2	Y-CS-46	Oscillator Coil
C9 C10	Y-CT-1	Trimmer cond 1st I. F. Trans.	L3	Y-CI-15	1st I. F Transformer
C11 C12	Y-CT-1	Trimmer cond. 2nd I. F. Trans.	L4	Y-CI-28	2nd I. F. Transformer
C20		Electr. cond. 40 mfd 150WV			
C21	Y-CE-46	Electr. cond 16 mfd. 150WV			
C22		Electr. cond. 20 mfd 25WV			

MAJESTIC RADIO & TELEV. CORP.

MODELS 51B, 51P, 51W
Chassis 151
Schematic, Voltage
Socket, Trimmers





REPLACEMENTS PARTS LIST—MODEL 51

Schematic Location	Part No.	Description
C	Y-CV-2	Condenser Variable Gang
C1	C-15761	Cond. Tub. .1 MFD 200 V.
C2	C-15751	Cond. Tub. .25 MFD 200 V.
C3	C-15754	Cond. Tub. .01 MFD 400 V.
C4	C-15757	Cond. Tub. .1 MFD 400 V.
C5	CM-15939	Cond. Mica 1000 MMF 20%
C6	Y-CE-2	Cond. Dry Electrolytic 20 MFD 175 V.
R1	Y-VC-2	Volume Control 50,000 Ohms
R2	R-3	Resistor Carbon 18,000 Ohms 1/4W 20%
R3	R-15559	Resistor Carbon 3 Megohms 1/4W 20%
R4	R-15512	Resistor Carbon 250,000 Ohms 1/4W 20%
R5	R-15528	Resistor Carbon 400,000 Ohms 1/4W 20%
R6	R-8	Resistor Car. 120,000 Ohms 1/4W 10%
R7	R-22	Resistor Carbon 450 Ohms 1/4W 20%
	Y-CR-1	Antenna Coil
	Y-CR-2	R. F. Coil
	Y-SP-2	Dynamic Speaker 5½"
	Y-PA-10	Pilot Light Indicator

TUBES

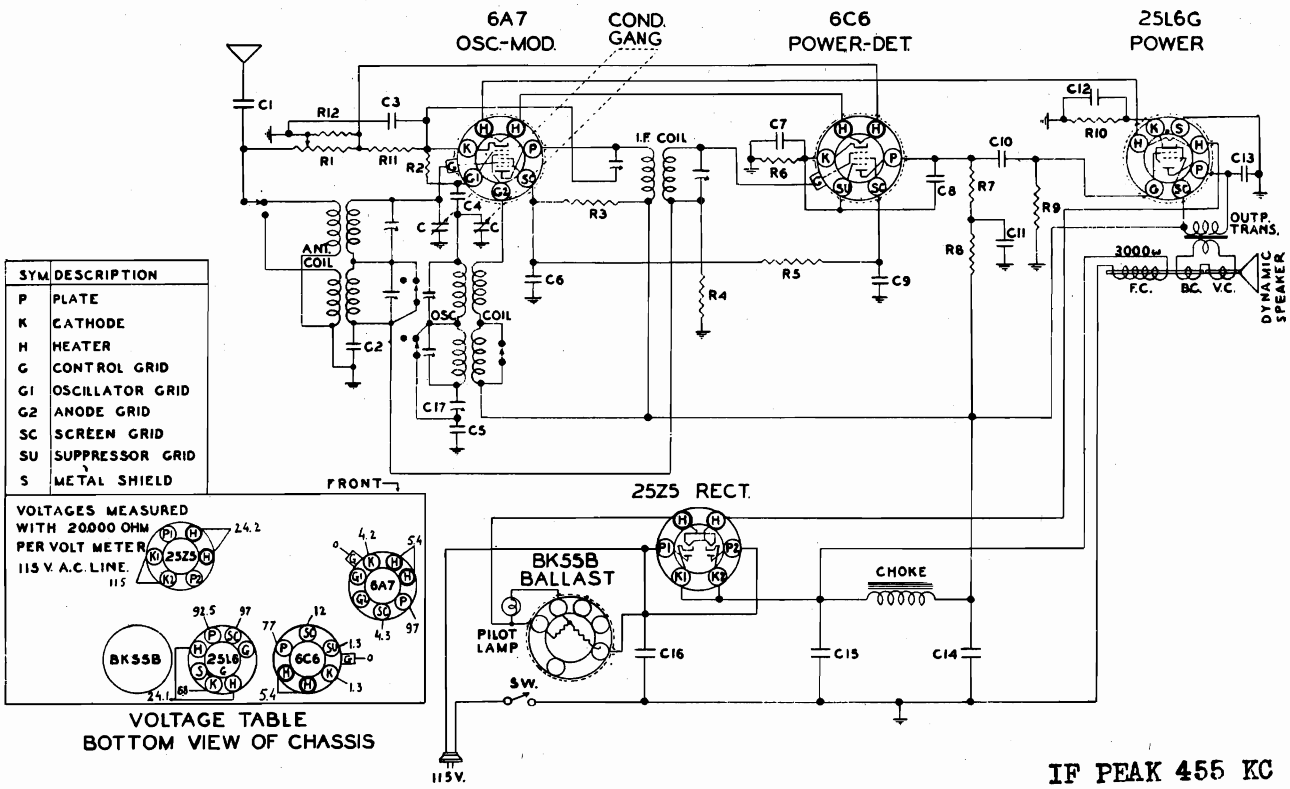
The following tube numbers are employed:

Tube	Purpose	Kind
6D6	Radio frequency amplifier	GLASS
6C6	Power detector	GLASS
25L6G	Beam Power Output	GLASS
25Z5	Rectifier	GLASS
YTU9 (BK55B)	Line Ballast Tube	METAL

This receiver is a 5 tube AC-DC compact type radio receiver employing tuned radio frequency circuit. The tuning range covers all frequencies between 528 kilocycles and 1750 kilocycles (171 meters to 565 meters). These frequencies cover the standard broadcast band and in addition police calls and some amateur transmitters. This receiver is designed to operate on 50-60 cycle AC or DC at voltages between 105 and 130. These are standard voltages used practically all over the United States and in some foreign countries. The audio power output of the receiver is a maximum of 2 watts. The receiver should not be connected to any power line having higher voltage than mentioned above. On DC operation reverse plug if receiver does not commence operating one minute after switch is turned on. On AC operation reversal of the plug in some cases may reduce hum.

MODELS 55B,55P,55W
Chassis 155
Schematic,Socket
Trimmers,Alignment

MAJESTIC RADIO & TELEV. CORP.

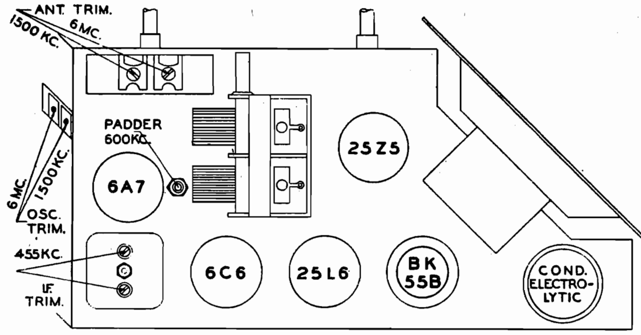


IF PEAK 455 KC

REPLACEMENTS PARTS LIST—MODEL 55

Schematic Location	Part No.	Description
C	Y-CV-3	Condenser Variable Gang
C1, C3, C9, C10	C-15754	Condenser Tubular .01 Mfd. 400 V.
C2, C6	C-15752	Condenser Tubular .05 Mfd. 200 V.
C7	C-15751	Condenser Tubular .25 Mfd. 200 V.
C11	C-15761	Condenser Tubular .1 Mfd. 200 V.
C13	C-4	Condenser Tubular .025 Mfd. 400 V.
C16	C-15757	Condenser Tubular .1 Mfd. 400 V.
C4	CM-15929	Condenser Mica 50 Mmf —20%
C5	CM-15942	Condenser Mica 1710 Mmf. 5%
C8	CM-15928	Condenser Mica 250 Mmf. 20%

Schematic Location	Part No.	Description
C12	Y-CE-4	Condenser Electrolytic Dry 12 Mfd. 25 V.
C14		Condenser Electrolytic Dry 16 Mfd. 150 V.
C15		Condenser Electrolytic Dry 35 Mfd. 150 V.
C17	Y-CP-16472	Condenser Padder
R1	Y-VC-2	Volume Control 50,000 Ohms
R2, R3	R-15511	Resistor Carbon 50,000 Ohms ¼ W. 20%
R4	R-15559	Resistor Carbon 3 Meg. ¼ W. 20%
R5	R-7	Resistor Carbon 1½ Meg. ¼ W. 20%
R6	R-11	Resistor Carbon 18,000 Ohms ¼ W. 10%
R7	R-15517	Resistor Carbon 1 Meg. ¼ W. 20%
R8	R-15512	Resistor Carbon ¼ Meg. ¼ W. 20%
R9	R-15520	Resistor Carbon ½ Meg. ¼ W. 20%



CHASSIS LAYOUT
MODEL 55.

Schematic Location	Part No.	Description
R10	R-12	Res. Car. 170 Ohms ½ W. 10%
R11	R-22	Res. Car. 450 Ohms ¼ W. 20%
R12	R-15564	Res. Car. 1,500 Ohms ¼ W. 20%
	Y-CK-4	Filter Choke
	Y-CS-1	Antenna Coil
	Y-CS-8	Oscillator Coil
	Y-C1-11	I. F. Coil
	Y-SP-4	Dynamic Speaker 5½"
	SPA-2	Speaker V. C. and Cone
	SPA-3	Speaker Transformer
	P-16885	Pilot Lamp

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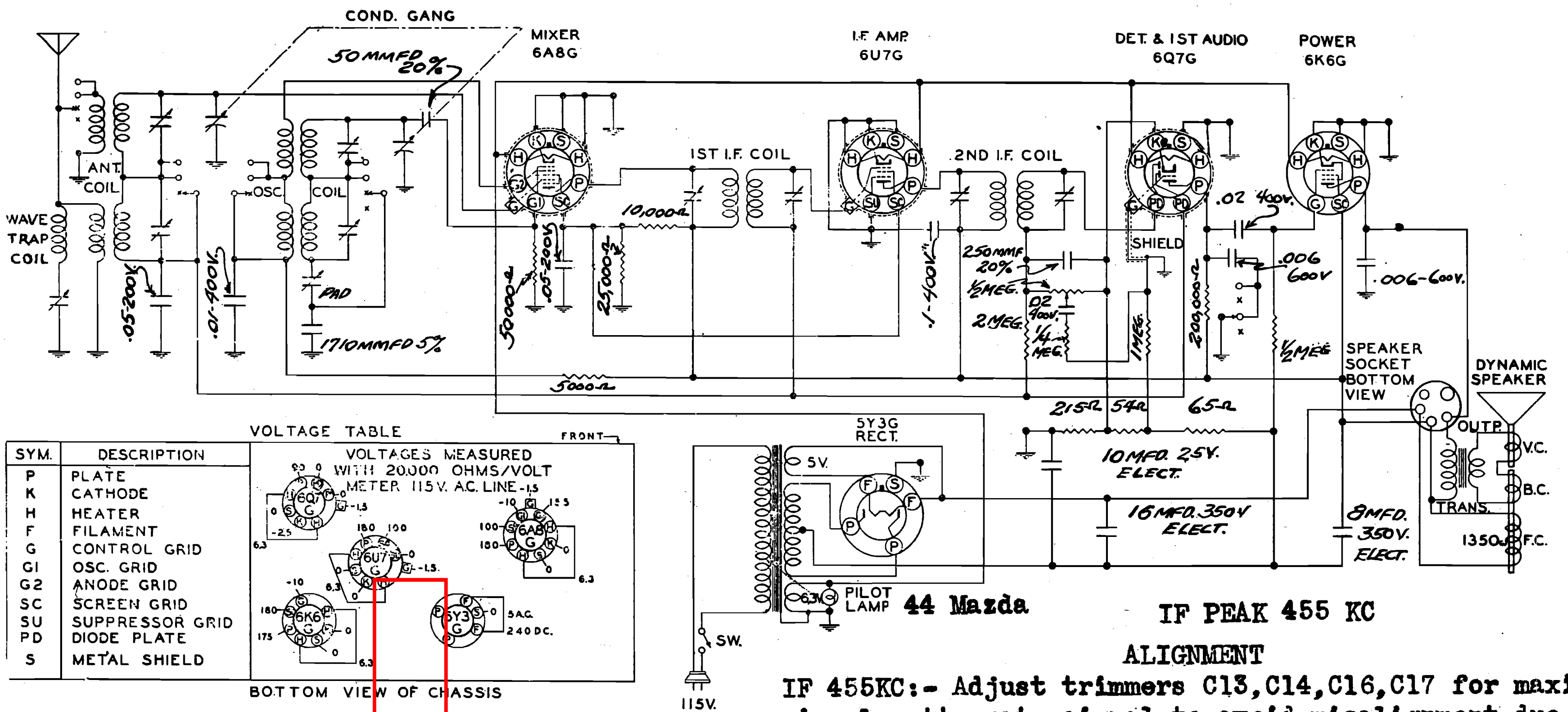
In a super-heterodyne it is very important when realigning the receiver, to use the same frequencies as are used at the factory. Alignment is best accomplished by using an output meter across the voice coil and aligning for maximum. The I. F. frequency is 455 K. C. The short wave must be aligned before the broadcast band. This is done at only one frequency, 6 megacycles. On the broadcast band the alignment frequencies are 1500 and 600 K. C. 1500 K. C. is the first to be aligned using the shunt trimmers. When aligning 600 K. C., adjust the series pad, rocking the gang condenser to assure proper alignment.

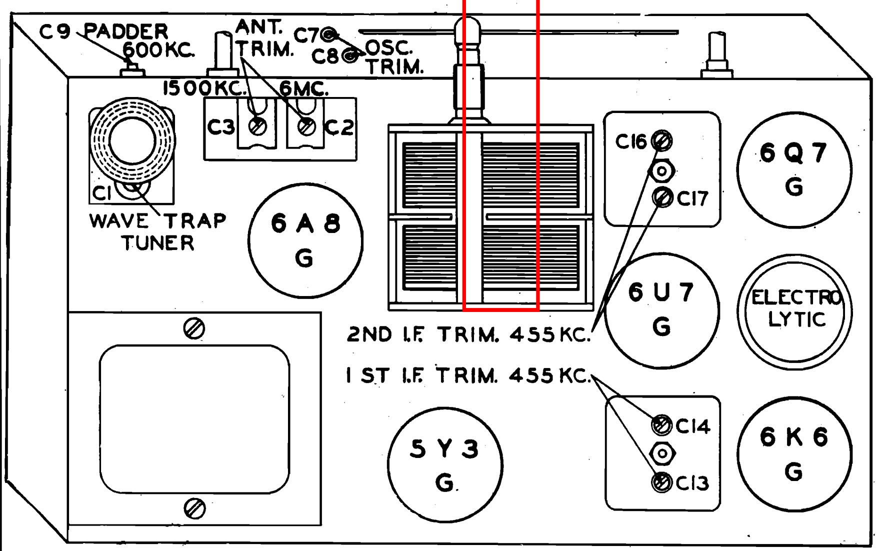
Socket, Trimmers Alignment

MAJESTIC RADIO & TELEV. CORP.

MODEL 56
Chassis 156
Schematic, Voltage



IF PEAK 455 KC



ALIGNMENT

IF 455KC:- Adjust trimmers C13,C14,C16,C17 for maximum signal; attenuate signal to avoid misalignment due to A.V.C.

SW BAND:- Ground signal gen. to chassis through .1 mf cond. Osc. at 7.2 MC through 400 ohm carbon resistor to Ant. lead (blue). Turn band selector clockwise to 3rd pos. from extreme left. Variable fully open; set C7 at minimum cap. tighten to signal. Osc. at 6 MC tune receiver to signal, adjust C2 to max. and adjust dial calibration. Check band at 4.25 and 2.40 MC.

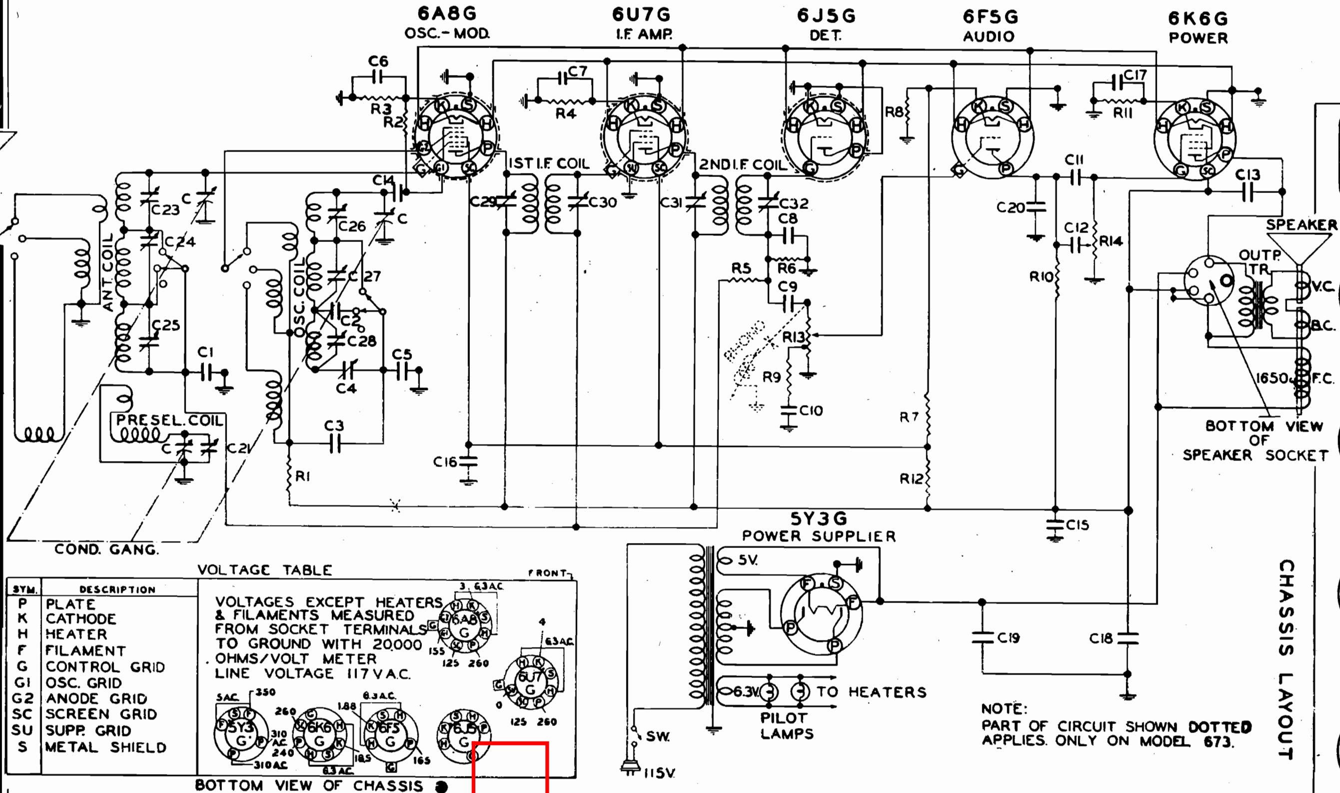
BC BAND:-Band selector and tone control switch to extreme left. Apply 600 KC through 200 mmf cond to Ant. lead, dial at 600 KC; adj. C9 to max. signal. Osc. at 1750 KC; dial at 1750 KC; adj. C8 to max. sig. Signal at 1500KC, dial to signal, adj. C3 to max. sig. Osc. at 600 KC adjust C9 to max. sig. with variable. Osc at 1500 KC, tune to max. sig., readjust C3 to maximum signal.

WAVE TRAP:- Band sw. in BC position, dial below 650KC where no station is heard. Apply 455KC, Adj. C1 to min.

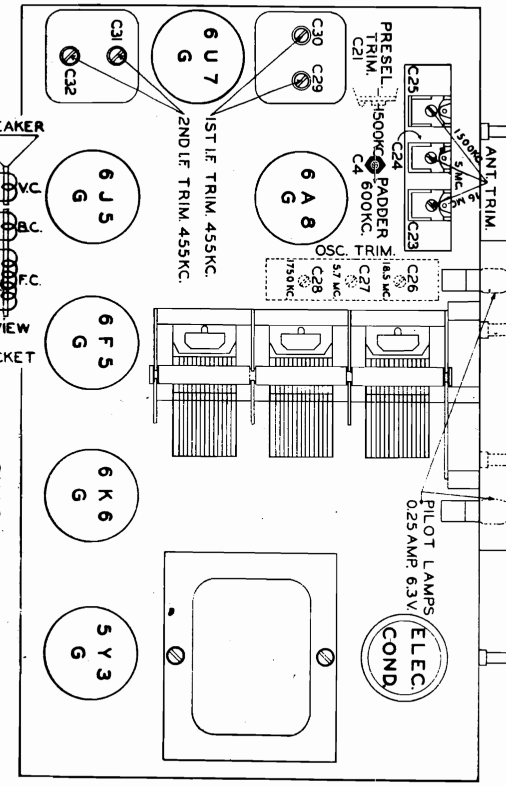
MODELS 67,68,670,671
672,673
Chassis 167 and 1673

MAJESTIC RADIO & TELEV. CORP.

Schematic, Voltage
Socket, Trimmers
Alignment



SYM.	DESCRIPTION
P	PLATE
K	CATHODE
H	HEATER
F	FILAMENT
G	CONTROL GRID
GI	OSC. GRID
G2	ANODE GRID
SC	SCREEN GRID
SU	SUPP. GRID
S	METAL SHIELD



CHASSIS LAYOUT

IF PEAK 455 KC

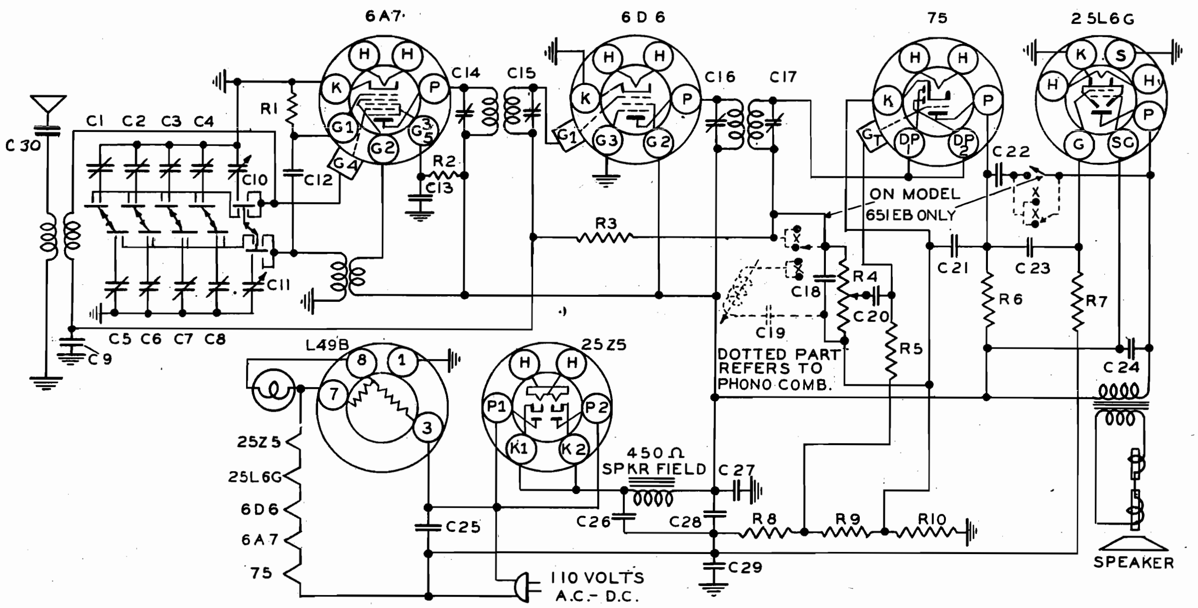
Correct alignment is extremely important. The receiver is properly aligned at the factory and should not be disturbed unless it is absolutely necessary The procedure is as follows: Turn wave change switch to broadcast position (full counter clock wise) and rotate variable condenser until it is about 50% engaged. Apply a 455 KC signal to the grid of 6A8G mixer tube through a tubular condenser on the order of .1 MFD. Referring to chassis layout, adjust C30, C29, C31 and C32 for maximum signal using of course some sort of indicating device such as an AC volt meter or output meter across the voice coil of the speaker. It may be necessary to apply a very strong signal to "find" the signal until alignment is approached. It is advisable to maintain as low a signal imput as conveniently possible in order to minimize the possibility of misalignment resulting from A.V.C. and overload effects. If a squeal is heard while tuning, rotate the gang condenser slightly and it should disappear. Naturally, the ground side of the generator should be connected to the chassis either directly or through the .1 MFD. condenser.

SHORT WAVE BAND

Rotate the wave band switch to full clock wise position. Connect high side of generator output to antenna lead through a 400 ohm dummy antenna. Completely disengage variable condenser. Apply 18.5 meg. signal. Unscrew trimmer C26 to a minimum capacity, slowly turn the screw so that the trimmer capacity increases until the signal is heard. Apply 16 meg. signal, rotate gang condenser until this signal is heard. Adjust C23 for maximum response. It may be found advisable to "rock" generator frequency back and forth through signal to offset detuning effect from inter action between imput and oscillator circuits at high frequencies. Check alignment through medium of sensitivity at 11 meg. and 6

MAJESTIC RADIO & TELEV. CORP.

MODEL 651-EB
Schematic, Tuner



REPLACEMENT PARTS LIST—MODEL 651-EB

Schematic Location	Part No.	Description
C20,C23,C30	C-15754	Tubular cond. .01 mfd. 400 V
C24	C-15760	Tubular cond. .02 mfd. 400V
C9,C13,C27	C-15752	Tubular cond. .05 mfd. 200V
C25	C-15757	Tubular cond. .1 mfd. 400V
C19	C-15750	Tubular cond. .25 mfd. 400V
C12	CM-15929	Mica cond. 50 mmf. Type "O"
C18,C22	CM-15918	Mica cond. 100 mmf. Type "O"
C21	CM-15928	Mica cond. 250 mmf. Type "O"

Schematic Location	Part No.	Description
C14,C15	Y-CT-1	Trimmer cond. 1st I.F.
C16,C17	Y-CT-1	Trimmer cond. 2nd I.F.
C10,C11	Y-CV-24	Variable 2 gang condenser
C26		Elect. cond. 40 mfd. 150WV
C28	Y-CE-46	Elect. cond. 16 mfd. 150WV
C29		Elect. cond. 20 mfd. 25WV
C1,C2,C3,C4 C5,C6,C7,C8	Y-CT-20	Trimmer cond. strip

Schematic Location	Part No.	Description
R1	R-15511	Carbon resistor 50K ¼W 20%
R2	R-15516	Carbon resistor 15K ¼W 20%
R3	R-15500	Carbon resistor 2meg ¼W 20%
R5	R-15517	Carbon resistor 1meg ¼W 20%
R6	R-15512	Carbon resistor 250K ¼W 20%
R7	R-15528	Carbon resistor 400K ¼W 20%
R8		Candohm 50 ohms
R9	Y-RC-8	Candohm 20 ohms
R10		Candohm 50 ohms
R4	Y-VC-21	Volume control 500K

I.F. PEAK 455 KC.

The tubes used are:

1-6A7	Frequency Converter
1-6D6	Intermediate frequency amplifier
1-75	Second detector, AVC, and audio driver
1-25L6G	Beam power output
1-25Z5	Rectifier
1-L49B	Plug-in ballast resistor

ADJUSTMENT OF PUSH BUTTONS

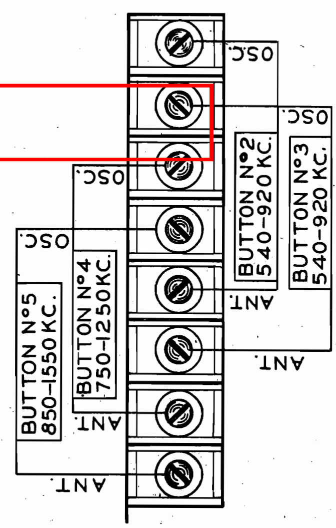
1—Determine which four stations you desire to set up on the push buttons.
2—Determine the frequency of these stations.
3—Determine the proper push button on which these stations should be set up from the following table.

No. 1 Push button is for manual tuning.
No. 2 " " is for stations lying between 540 and 920 KC's.
No. 3 " " is for stations lying between 540 and 920 KC's.
No. 4 " " is for stations lying between 750 and 1200 KC's.
No. 5 " " is for stations lying between 850 and 1550 KC's.

4—Push the proper push button.
5—Using an insulated screw driver adjust the oscillator trimmer corresponding to the proper push button as shown in Fig. 2 until your station is tuned in with best tonal response.
6—Adjust the antenna trimmer corresponding to the proper push button until the station already heard is received with maximum volume.
7—Repeat steps 4, 5, and 6 for the other push buttons.

It may be desirable to check the push buttons occasionally for proper adjustment as extreme climatic variations may affect the push buttons set on high frequency stations.

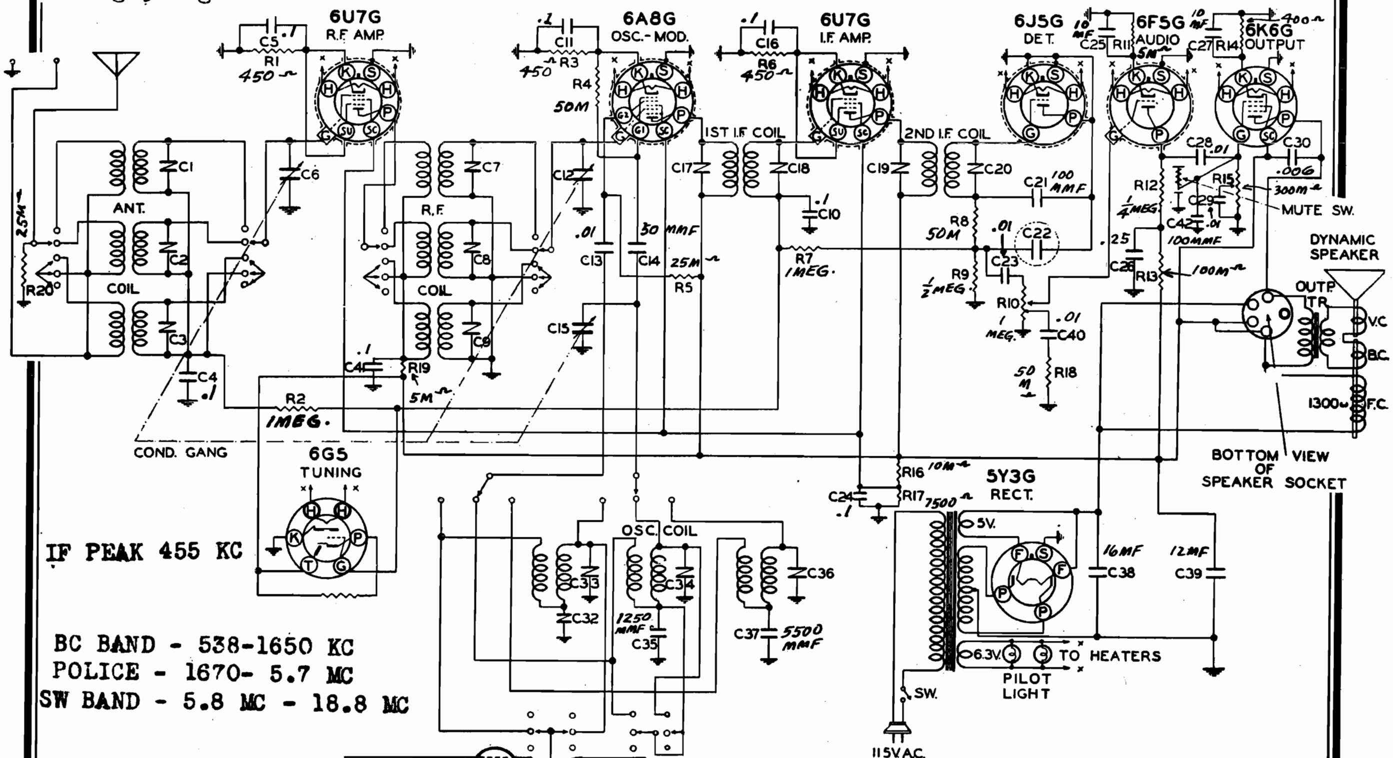
PUSH BUTTONS VIEWED FROM FRONT OF CABINET
FIG. 1

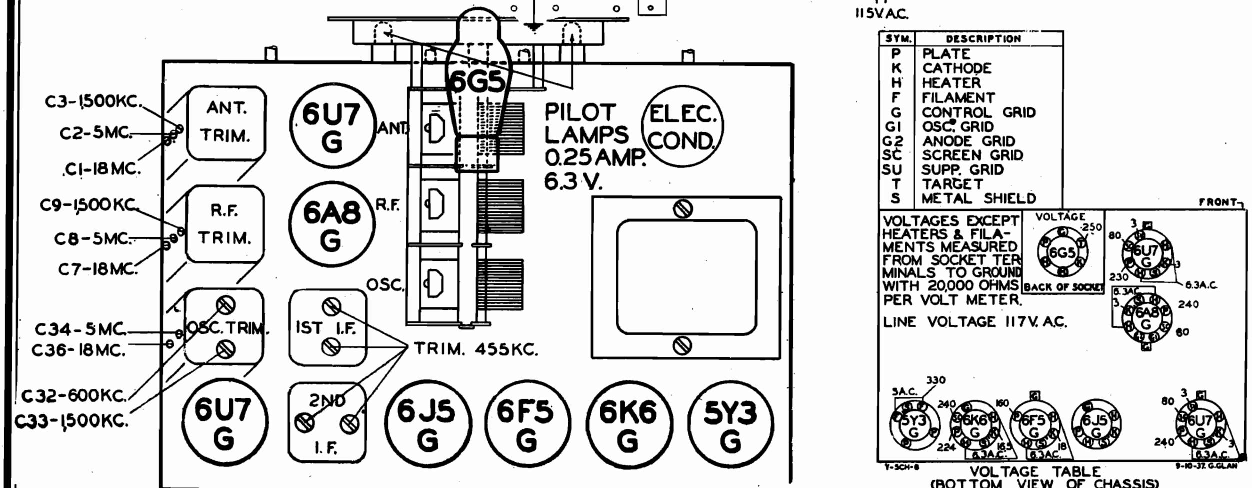


TRIMMERS VIEWED FROM BACK OF SET
FIG. 2

Chassis 1870
Schematic, Socket, Trimmers
Voltage, Alignment

MAJESTIC RADIO & TELEV. CORP.





ALIGNMENT - Turn wave change switch to BC pos. and rotate var. cond. until about 50 percent engaged. Apply a 455 KC sig. to 6A8G thru a .1 mf cond. Adjust trimmers marked "Trim 455 KC" for maximum signal.

SHORT WAVE BAND - Rotate wave band switch to full clockwise pos. Connect high side of gen. o.p. to ant. lead thru 400 ohm dummy ant. Set dial at 18 MC - Apply 18 MC signal. Adj. C36 trim. to min. cap., slowly turn screw so trim. cap. increases until signal is heard. Apply 18 MC sig. and adj. C7 and C1 for max. - Check align. thru medium of sensitivity at 11 meg. and 6 meg. resp. - When align. at 18 MC the C7 trim. may indicate 2 maxima. Maxima obtained with trimmer tighter is the desired one. Check by leaving gang cond. set and shifting to higher freq. : 19 meg. where image should appear. If properly aligned it should require about 10 times six. volt. for image to give same O.P. as real signal.

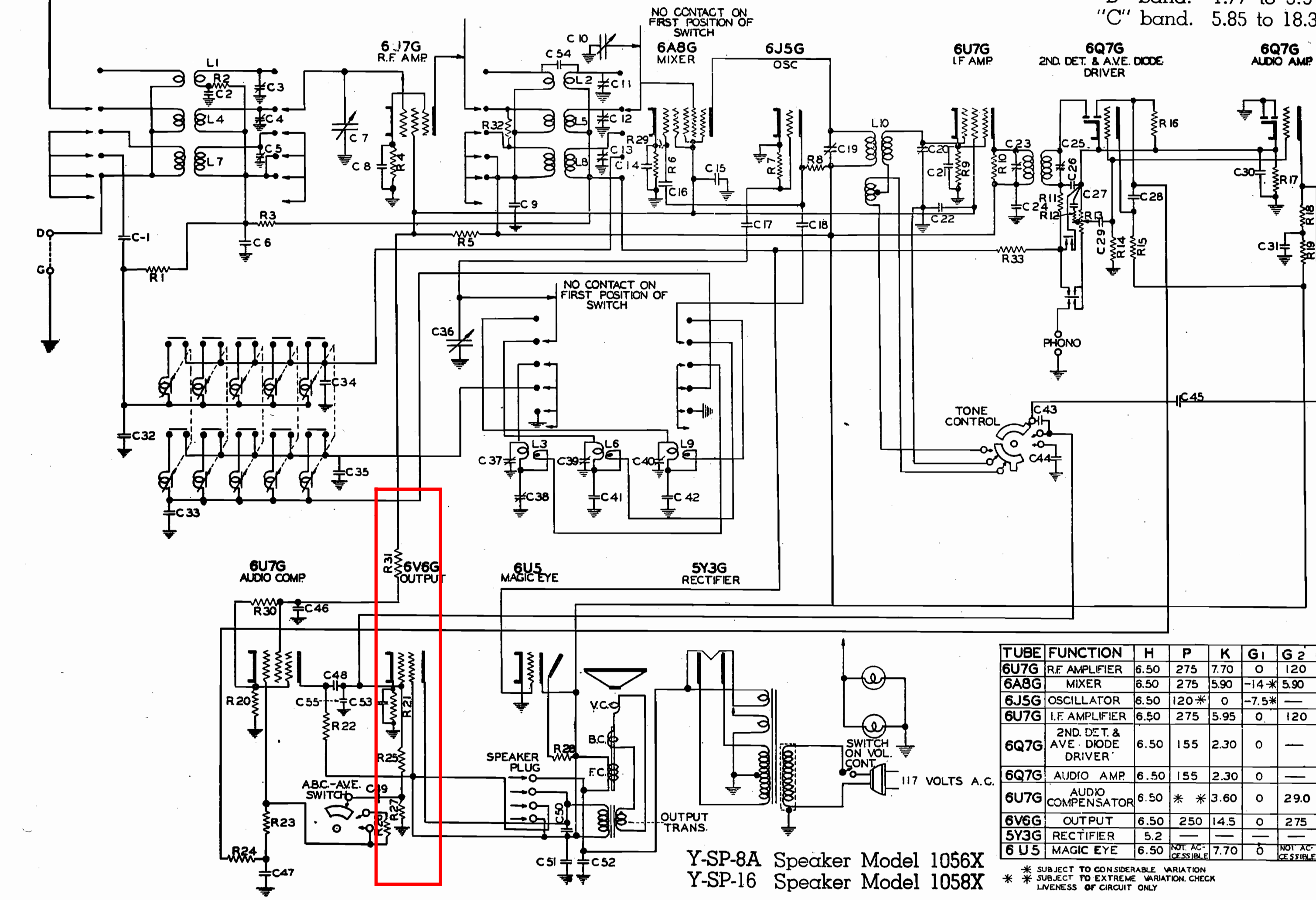
POLICE BAND - Shift waveband switch to middle pos. - Apply 5 MC sig. - Dial at 5 Mc. - Adj. C34 trim. as previous band until max. sig. is heard. Apply 5 meg. sig. and adj. Check alignment at 3.5 and 2 MC resp. Check for image same as previous band.

BROADCAST BAND - Use a 200 mmf cond. for dummy ant. on this band. Shift wave band sw. to full counter clockwise. Adj. trims. C3 and C9 to medium tight pos. - Dial at 600 KC. Apply 600 KC sig. and adj. padder C32 for max. - Dial at 1500 KC and 1500 KC sig. adj. C33 for same. Then adj. trims. C3 and C9 for max. - Shift gang to 600 KC and apply 600 KC sig. - Adjust C4 for max. sig. - Recheck 1500 KC trimming.

MODELS 1056X,1058X
Schematic,Voltage

MAJESTIC RADIO & TELEV. CORP.

"A" band. 530 to 1750 KC's.
"B" band. 1.77 to 5:9 MC's.
"C" band. 5.85 to 18.3 MCs.



VOLTAGES, EXCEPT HEATERS & FILAMENTS, MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH 20 000 OHMS PER VOLT METER. HEATER OR FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS.

TUBE	FUNCTION	H	P	K	G1	G2	G3	G4	G5	DP1	DP2
6U7G	RF AMPLIFIER	6.50	275	7.70	0	120	7.70	—	—	—	—
6A8G	MIXER	6.50	275	5.90	-14 *	5.90	120	0	120	—	—
6J5G	OSCILLATOR	6.50	120 *	0	-7.5 *	—	—	—	—	—	—
6U7G	I.F. AMPLIFIER	6.50	275	5.95	0	120	5.95	—	—	—	—
6Q7G	2ND. DET. & AVE. DIODE DRIVER	6.50	155	2.30	0	—	—	—	—	0	0
6Q7G	AUDIO AMP.	6.50	155	2.30	0	—	—	—	—	0	0
6U7G	AUDIO COMPENSATOR	6.50	**	** 3.60	0	29.0	3.60	—	—	—	—
6V6G	OUTPUT	6.50	250	14.5	0	275	—	—	—	—	—
5Y3G	RECTIFIER	5.2	—	—	—	—	—	—	—	—	—
6 U5	MAGIC EYE	6.50	NOT ACCESSIBLE	7.70	0	NOT ACCESSIBLE	—	—	—	—	—

* SUBJECT TO CONSIDERABLE VARIATION
** SUBJECT TO EXTREME VARIATION. CHECK LIVENESS OF CIRCUIT ONLY

Y-SP-8A Speaker Model 1056X
Y-SP-16 Speaker Model 1058X

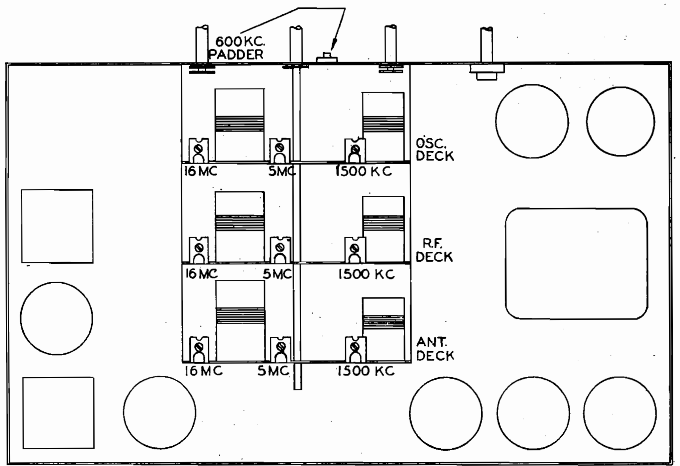
IF PEAK 455 KC

The tubes used are:

1 - 6 U 7 G	R. F. amplifier	1 - 6 U 7 G	AVE and ABC
1 - 6 A 8 G	Modulator	1 - 6 Q 7 G	Driver
1 - 6 J 5 G	Oscillator	1 - 5 Y 3 G	Rectifier
1 - 6 U 7 G	I. F. amplifier	1 - 6 V 6 G	Beam power output
1 - 6 Q 7 G	2nd det. and AVE amp.	1 - 6 U5	Tuning indicator

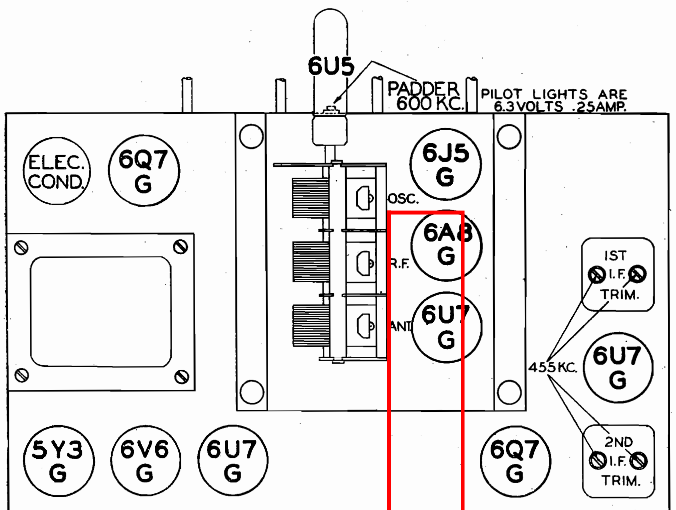
MODELS 1056X,1058X
Socket,Trimmers,
Parts List,Notes
Alignment

MAJESTIC RADIO & TELEV. CORP.



9-29-37

CHASSIS LAYOUT
(BOTTOM VIEW)



9-29-37

CHASSIS LAYOUT
(TOP VIEW)

Antenna

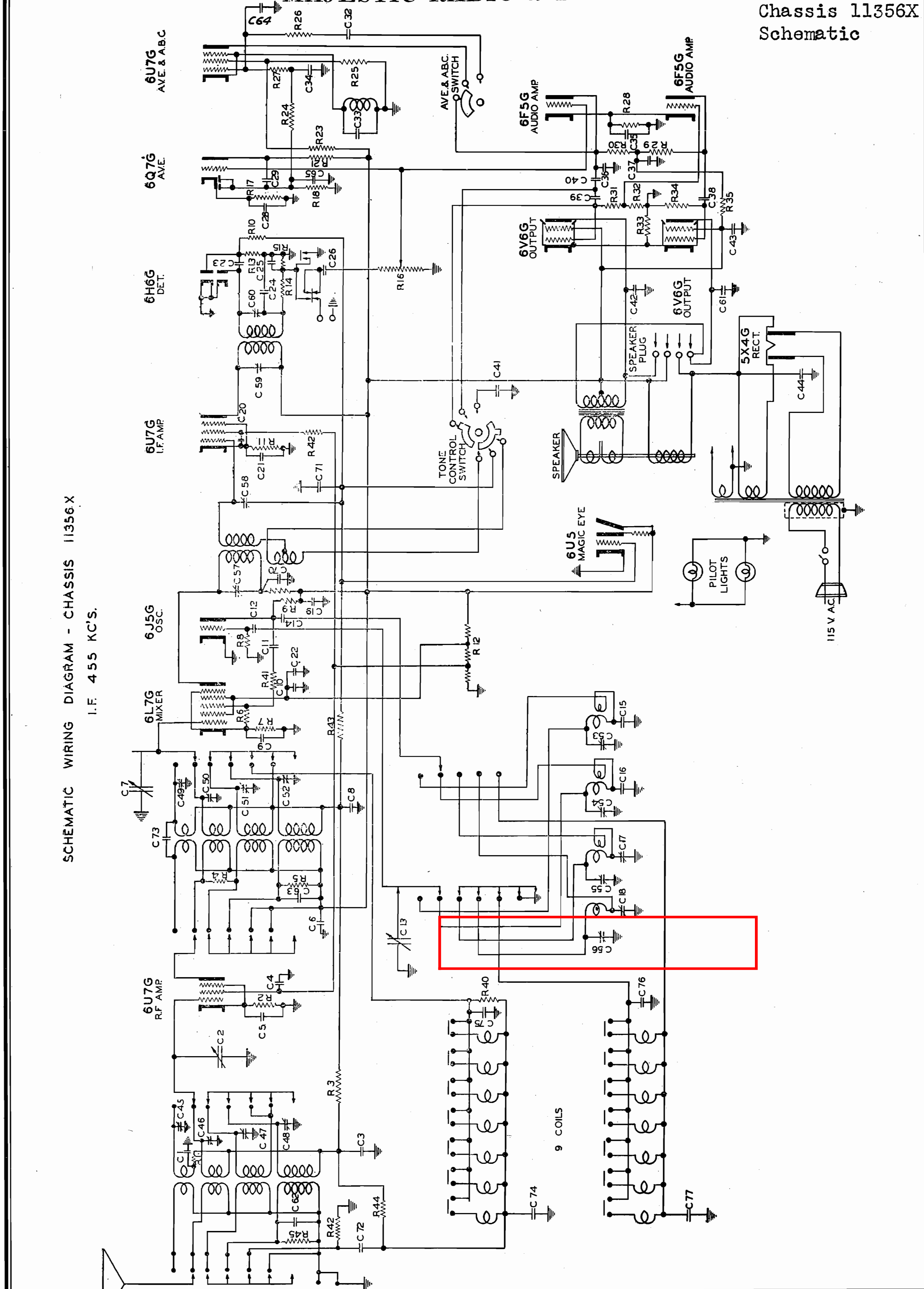
There are three terminals on back of chassis marked A D G. Terminal A is for use with ordinary outdoor antennas from 30 to 50 feet in length. Terminal G is for connection to a suitable ground such as a water pipe, although radiators or other type grounds are often used successfully. Terminal D is to used in combination with A when a doublet type antenna is used and under these conditions there should be no connection between terminals D and G.

Schematic Location	Part Number	Description
C7 C10 C36	Y-CV 7	Variable condenser
C32	CM-27	2000 MMF 3% silver condensers
C34	CM-24	484 MMF 1% silver condensers
C33	CM-26	710 MMF 1% silver condensers
C35	CM-25	274 MMF 1% silver condensers
C2 C9 C18	C-5	.01 MFD 400 Volt R. F. type
C1 C8 C14	C-6	.05 MFD 200 Volt R. F. type
C21	C-15761	.1 MFD 200 Volt
C22 C46	C-15757	.1 " 400 "
C29 C49	C-15754	.01 " 400 "
C44 C48 C50	C-15759	.006 " 600 "
C24 C31	C-15750	.25 " 400 "
C47	C-9	.15 " 200 "
C27	C-15772	.02 " 200 "
C6 C15 C45	C-15756	.05 " 400 "
C16	CM-15928	250 MMF Mica Condenser
C17	CM-15929	50 " " "
C42	CM-9	5500 " " "
C41	CM-6	1350 " " "
C43	CM-15939	1000 " " "
C26 C28 C55	CM-15918	100 " " "
C54	CM-10	10 " " "
C38	Y-CT-4	Padding Condenser
C3 C4 C5 C11 C12 C13 C 37 C39 C40	Y-CT-3	Trimmer Condenser
C51 C52 C53	Y-CE-10	16+16 MFD 400 Volt. 10 MFD - 25 Volt electrolytic cond.
C30	CE-25	10 MFD 25 Volt
C19 C20 C23 C25	Y-CT-2	Trimmer I. F.
R13	Y-VC-5	Volume Control
R25 R27	15512	250K 1/4W 20%
R4	15543	1000 1/4W 20%
R1 R2 R3 R19	15515	100K 1/4W 20%
R5	R-26	10K 3W 10%
R6	15571	500 ohm 1/4W 10%
R7 R11 R29	15511	50K 1/4W 20%
R8	15501	25K 1W 20%
R9 R72	15519	700 ohm 1/4W 10%
R10 R18	15549	300K 1/4W 20%
R12	15557	20K 1/4W 20%
R14 R16 R23 R26 R33	15517	1M 1/4W 20%
R31	15513	20K 1/2W 20%
R15 R22	15528	400K 1/4W 20%
R17	R-40	4K 1/4W 20%
R20	R-76	400 ohm 1/4W 10%
R21	15584	250 ohm 1W 10%
R24	15500	2M 1/4W 20%
R30	15576	5K 1/4W 20%
R32	15530	2500 1/4W 20%
R28		1M connected internal in magic eye socket
	Y-B9	Tone control
R13	Y-B-11	ABC-AVE switch
	Y-VC-5	Volume control
	Y-B-43	Band switch

FOR PHONOGRAPH AND
TUNER DATA,SEE INDEX

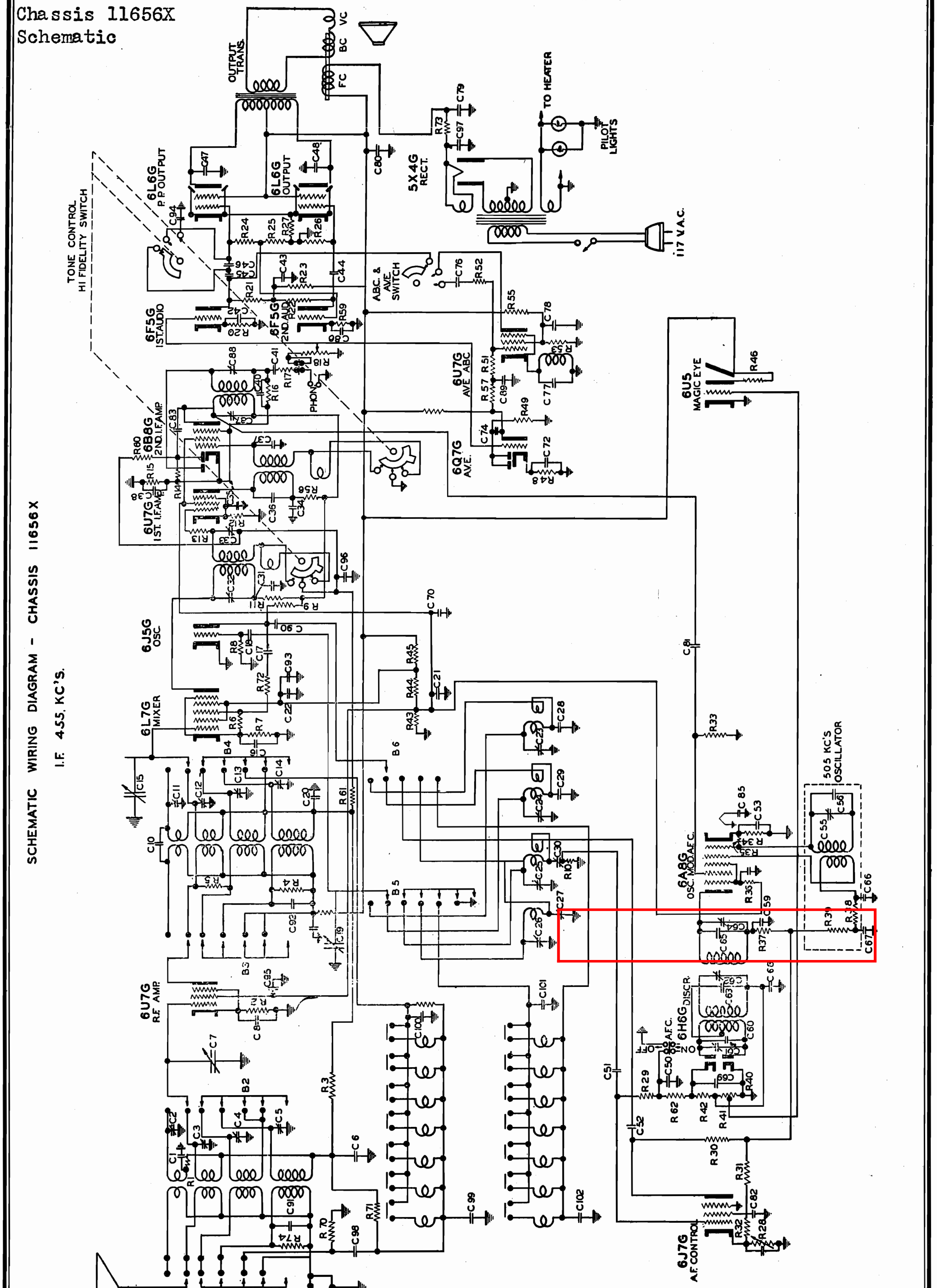
MAJESTIC RADIO & TELEV. CORP.

MODEL 1356X
Chassis 11356X
Schematic



MODEL 1656X
Chassis 11656X
Schematic

MAJESTIC RADIO & TELEV. CORP.



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MODELS 1056X,1058X
Phono.,Tuner Data

MAJESTIC RADIO & TELEV. CORP.

MODEL 1356X
MODEL 1656X
Socket,Trimmers
Phono.,Tuner Data
Alignment

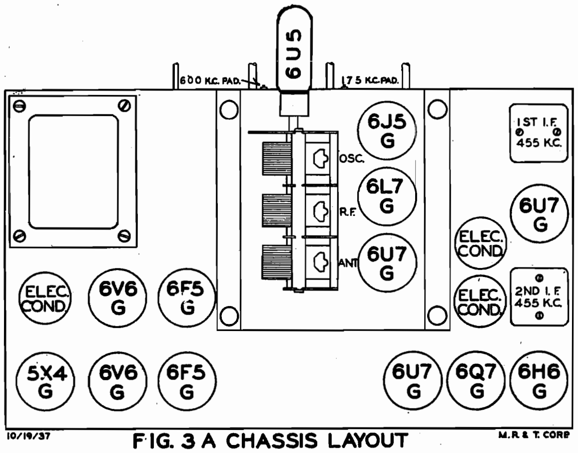


FIG. 3 A CHASSIS LAYOUT
TOP VIEW
MODEL 1356X

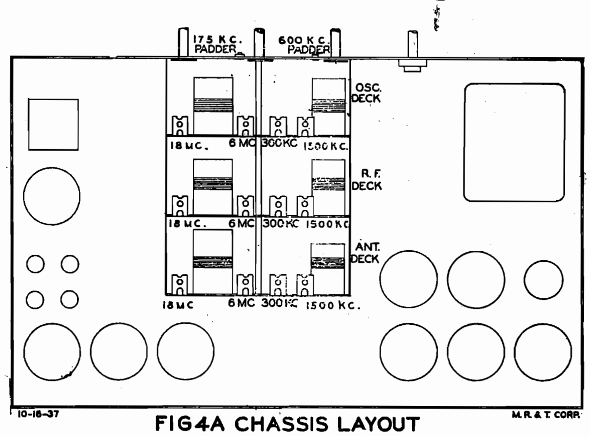


FIG 4A CHASSIS LAYOUT
BOTTOM VIEW MODEL 1356X

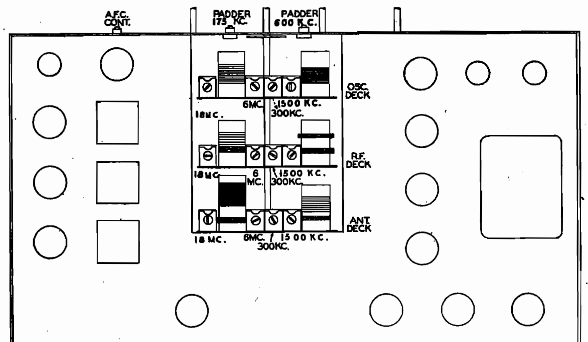


FIG.4B CHASSIS LAYOUT (BOTTOM VIEW)
MODEL 1656X

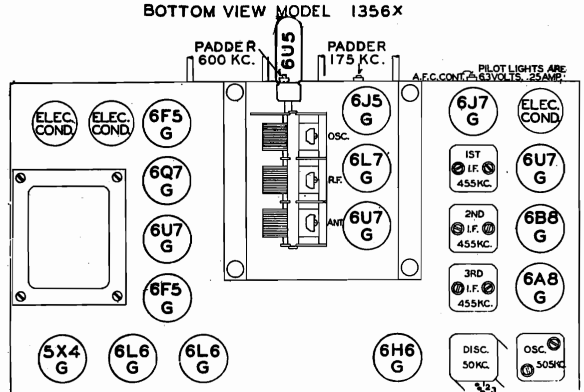


FIG.3B CHASSIS LAYOUT (TOP VIEW)
MODEL 1656X

MODELS 1056X,1058X,1356X,1656X

PHONOGRAPH—For phonograph, you can use the MAJESTIC Wireless record player, Model 3 PW, or any standard record player. When using a standard record player, plug in the pick-up tips in the jacks marked "PHONO" at the rear of the receiver. If you get undue hum, reverse these pick-up tips. Push the push-button marked "PHONO" and adjust the Volume, Tone, Volume Expansion and Bass Compensation by means of the controls on the receiver.

AUTOMATIC FREQUENCY CONTROL—Model 1656X.

When tuning manually on the broadcast or "A" band, the station may be pulled and held into proper tuning by using the AFC. This is done by pushing the first button from the left. If the station is approximately tuned, the AFC will do the rest and insure proper tuning.

This should be used only on local or strong stations as the AFC will cause the set to tune itself to the strongest stations within its range.

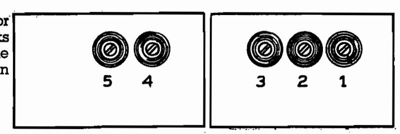
To release the AFC, push the AFC button slightly upward. This will cause it to come out in the same manner as the "PHONO" button.

SETTING UP OF PUSH BUTTONS

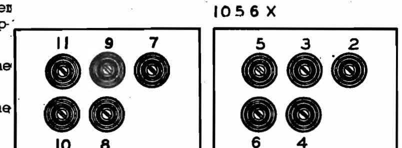
To adjust the push buttons, turn the band switch knob, the second one from the left, all the way to the left, to the position marked "E" on the cabinet. Going to the back of the receiver, adjust the coil marked No. in figure two (2), by turning the screw in the center of the coil by means of a screw driver, until the station you desire to hear is heard with maximum volume and best tone.

It is desirable to turn the tone control to high fidelity when listening on the push-buttons.

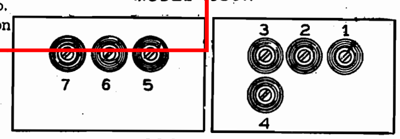
Only local or strong stations should be set up on the push-buttons.



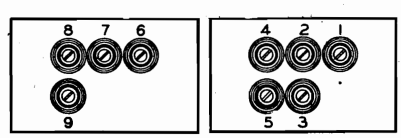
1056X



MODEL 1656X



1058X



1356X

Push button Number	Model 1356X	Model 1656X
1 is for stations lying between	1250 and 1750 KC's	AFC
2 " " " " "	950 and 1560 KC's	1250 and 1750 KC's
3 " " " " "	950 and 1560 KC's	950 and 1560 KC's
4 " " " " "	680 and 1110 KC's	950 and 1560 KC's
5 " " " " "	680 and 1110 KC's	680 and 1110 KC's
6 " " " " "	680 and 1110 KC's	680 and 1110 KC's
7 " " " " "	540 and 720 KC's	680 and 1110 KC's
8 " " " " "	540 and 720 KC's	680 and 1110 KC's
9 " " " " "	540 and 720 KC's	540 and 720 KC's
10 " " " " "	PHONO	540 and 720 KC's
11 " " " " "		540 and 720 KC's
12 " " " " "		PHONO

Push-Button Number	1056X	1058X
1	980 KC's to 1600 KC's	980 KC's to 1600 KC's
2	680 KC's to 1150 KC's	980 KC's to 1600 KC's
3	680 KC's to 1150 KC's	680 KC's to 1150 KC's
4	540 KC's to 880 KC's	680 KC's to 1150 KC's
5	540 KC's to 880 KC's	680 KC's to 1150 KC's
6	Phonograph	540 KC's to 880 KC's
7		540 KC's to 880 KC's
8		Phonograph

When the buttons are set up and the wave band switch is turned all the way to the left, counter clockwise, pushing any one of the buttons will cause the receiver to receive the station set up on that particular button.

WARNING

When operating this set on "RADIO," make certain that the phonograph push-button is out. If it is not, pushing slightly upwards on this push-button will cause it to be released and come out.

MODEL 1356X
MODEL 1656X
Parts Lists

MAJESTIC RADIO & TELEV. CORP.

Replacement Parts List For Chassis 1656X

Schematic location	Part Number	Description
C7, C15, C19	Y-CV-7	Condenser 3 gang variable
C68, C69	C-15772	" Tubular .02 mfd 200 V
C1, C9, C90, C98	C-5	" " .01 mfd 400 V
C6 C8, C16, C22, C95, C20	C-6	" " .05 mfd 200 V (H.F.)
C31, C34, C58, C59, C66, C67	C-15757	" " .1 mfd 400 V
C35, C38, C78, C84, C96	C-15761	" " .1 mfd 200 V
C89	C-15770	" " .2 mfd 200 V
C21	C-15775	" " .5 mfd 200 V
C76	C-15771	" " .004 mfd 600 V
C47, C48	C-15	" " .002 mfd 800 V
C85	C-14	" " .5 mfd 120 V
C94	C-15759	" " .006 mfd 600 V
C70	C-15750	" " .25 mfd 400 V
C77	C-9	" " .15 mfd 200 V
C46	C-15767	" " .001 mfd 600 V
C41, C44, C45, C50	C-15760	" " .02 mfd 400 V
C49, C53, C74, C82	C-15756	" " .05 mfd 400 V
C51	CM-11	" Mica 500 mmf 10%
C56	CM-16	" " 150 mmf 10%
C60, C63, C65	CM-15917	" " 650 mmf 5%
C18, C57, C81, C83, C91	CM-15919	" " 50 mmf 10%
C28	CM-9	" " 5500 mmf 5%
C29	CM-6	" " 1350 mmf 5%
C17, C75, C92	CM-7	" " 250 mmf 5%
C10	CM-10	" " 10 mmf 5%
C52, C40	CM-15906	" " 100 mmf 10%
C99	CM-27	" " 2000 mmf silver plated
C100	CM-24	" " 484 mmf silver plated
C101	CM-25	" " 274 mmf silver plated
C102	CM-26	" " 710 mmf silver plated
C42, C72, C86	CE-25	" Tubular Dry Elec. 10 mfd 25 V
C43	CE-27	" Tubular Dry Elec. 4 mfd 300 V
C97	CE-22	" Tubular Dry Elec. 28 mfd 400 V
C79	CE-15	" Wet Electrolytic
C80	CE-13	" Wet Electrolytic
C93	B-17042	" Wet Electrolytic
C54, C55	Y-CT-5	" Air trimmer
C2, C3, C4, C11, C12, C13, C23, C24, C25	Y-CT-3	" Trimmer 3-30 mmf
C5, C14, C26	Y-CT-7	" Trimmer 40-100 mmf
C30	Y-CT-4	" Trimmer
C27	Y-CT-6	" Trimmer
C61, C62, C64	Y-CP-3	" Padder
C32, C33, C36, C37, C87, C88	Y-CT-2	I. F. Trimmer
R13	R-39	Carbon Resistor 750K ¼ W 20%
R10	R-41	" " 75 ohm ¼ W 10%
R9	R-15501	" " 25K 1 W 20%
R8, R17, R23, R35	R-15511	" " 50K ¼ W 20%
R4, R5	R-15530	" " 2500 ohm ¼ W 10%
R2, R7	R-15610	" " 900 ohm ¼ W 10%
R1, R3, R6, R21, R71	R-15515	" " 100K ¼ W 20%
R30, R31, R32	R-15510	" " 20K ¼ W 20%
R14, R42, R49, R52, R57, R60, R61	R-15517	" " 1 meg. ¼ W 20%
R16, R24, R26, R29, R40, R41	R-15520	" " 500K ¼ W 20%
R11, R53, R56	R-2	" " 5000 ohm ¼ W 20%
R12	R-15519	Carbon Resistor 700 ohms ¼ W 10%
R15, R34	R-15551	" " 250 ohms ¼ W 10%
R36	R-15566	" " 2000 ohms ¼ W 10%
R33, R62	R-15500	" " 2 Meg. ¼ W 20%
R22, R51, R58	R-15512	" " 250K ¼ W 20%
R20, R38, R39, R54, R59	R-15556	" " 10000 ohms ¼ W 10%
R37, R48	R-15617	" " 3000 ohms ¼ W 20%
R25	R-16	" " 8000 ohms ¼ W 20%
R55	R-15524	" " 50K 1 W 10%
R72	R-15601	" " 100 ohms ¼ W 20%
R73	R-78	" " 150 ohms 4 W 20%
R74	R-15570	" " 2000 ohms ¼ W 20%
R28	Y-PA-12	Variable resistor 1000 ohms
R18	Y-VC-9	Volume control 1 meg
R27	Y-RC-5	Candohm resistor
R43, R44, R45	Y-RC-3	Candohm resistor
R46		1 MEG. Internal connection in magic eye socket
R70	R-15542	Carbon resistor 1000 ohms ¼ W. 20%
B1, B2, B3, B4, B5, B6, B7	B-45	Band Switch
B8, B9,	Y-B-8	Tone control and Hi. Fidelity switch
B10	Y-B-11	A.B.C. and A.V.E. switch
	Y-CK-5	A.B.C. filter choke
	Y-TP-8	Power Transformer
	Y-SP-10	Speaker 12"
	Y-CI-8	1st and 2nd I.F. coil assembly
	Y-CI-7	3rd I.F. coil assembly
	Y-CI-9	Discriminator coil assembly
	Y-CI-10	Oscillator coil assembly
	AM-88	Antenna bank assembly
	AM-89	R. F. bank assembly
	AM-90	Oscillator bank assembly
	SPA-18	Speaker voice coil and cone
	SPA-19	Speaker transformer
	ES-7	Escutcheon
	DC-3	Dial crystal
	2-P-16589	Pilot light Mazda No. 51

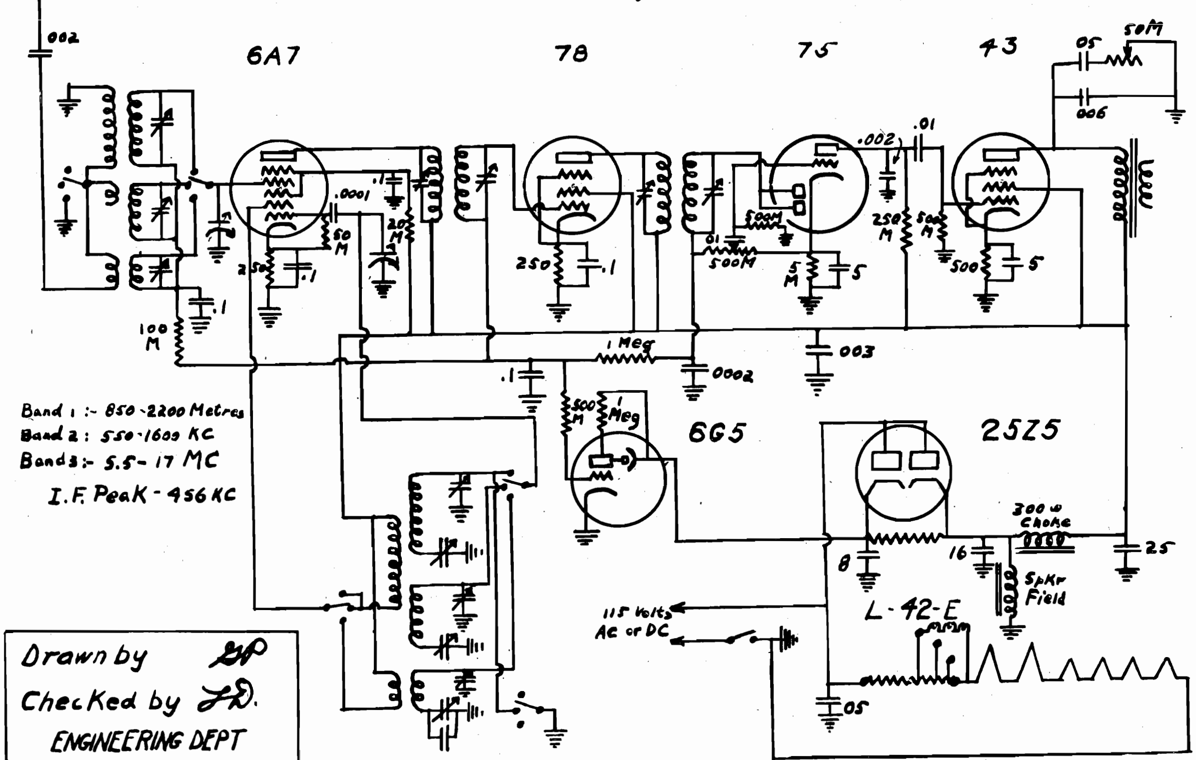
Replacement Parts List for Chassis 1356X

Schematic Location	Part Number	Description
C2, C7, C13	Y-CV-7	Cond. 3 gang variable
C3, C4, C5, C8, C9, C10	C-6	" tubular .05 mf. 200 V (H. F.)
C1, C6, C14	C-5	" " .01 mf 400 V (H. F.)
C19	C-15750	" " .25 mf 400 V
C32	C-15771	" " .004 mf 600 V
C26, C38, C40	C-15760	" " .02 mf 400 V
C39	C-15767	" " .001 mf 600 V
C20, C29, C70	C-15756	" " .05 mf 400 V
C21	C-15761	" " .1 mf 200 V
C33	C-9	" " .15 mf 200 V
C42, C61	C-11	" " .001 mf 800 V
C41	C-15759	" " .006 mf 600 V
C34	C-15770	" " .2 mf 200 V
C71	C-15752	" " .05 mf 200 V
C72	C-15754	" " .01 mf 400 V
C73	CM-10	" Mica 10 mmf 5%
C74	CM-27	" " 2000 mmf silver plated
C75	CM-24	" " 484 mmf silver plated
C76	CM-25	" " 274 mmf silver plated
C77	CM-26	" " 710 mmf silver plated
C16	CM-6	" " 1350 mmf 5%
C15	CM-9	" " 5500 mmf 5%
C12, C23, C36, C62, C65	CM-15919	" " 50 mmf 10%
C24, C25	CM-15918	" " 100 mmf 20%
C11, C63, C64	CM-15928	" " 250 mmf 20%
C45, C46, C47 C49, C50, C51 C53, C54, C55	Y-CT-3	" Antenna trim 3-30 mmf " R. F. trim 3-30 mmf " Oscillator trim 3-30 mmf
C48 C52 C56	Y-CT-7	" Antenna trim 40-100 mmf " R. F. trim 40-100 mmf " Oscillator trim 40-100 mmf
C57, C58 C59, C60	Y-CT-2	" 1st I. F. trimmer " 2nd I. F. trimmer
C43	Y-CE-13	" Wet Electrolytic 40 mf 300 V
C44	Y-CE-15	" Wet Electrolytic 30 mf 415 V
C35 C22 C28	Y-CE-23	Cond. Dry Electrolytic 20 mf 25 V 20 mf 200 V 10 mf 25 V
C37	CE-26	Cond. Tubular Dry Elec. 4 mf. 300 V
C17	Y-CT-4	Cond. Variable Padder 200-600 mmf
C18	Y CT-6	Cond. Variable Padder 100-300 mmf.
R8, R14, R35	R-15511	Resistor Carbon 50K ¼ W 20%
R9	R-15501	" " 25K 1 W 20%
R1, R3, R6, R30, R44	R-15515	" " 100K ¼ W 20%
R2, R7	R-15610	" " 900 ohms ¼ W 10%
R4, R5	R-15530	" " 2500 ohms ¼ W 10%
R11	R-15537	" " 400 ohms ¼ W 10%
R15	R-15520	" " 500K ¼ W 20%
R18, R24, R26, R10, R13, R40	R-15517	" " 1 meg ¼ W 20%
R27, R43, R21, R29	R-15512	" " 250K ¼ W 20%
R17	R-15611	" " 3000 ohms ¼ W 10%
R23	R-21	" " 75K 1 W 10%
R28	R-40	" " 4000 ohms ¼ W 10%
R31, R34	R-15554	" " 500K ¼ W 10%
R32	R-33	" " 8000 ohms ¼ 10%
R33	R-15607	Resistor Carbon. 250 ohms 2 W 10%
R25	R-2	" " 5000 ohms ¼ W 20%
R12	Y-RC-3	" Candohm 7000, 2250, 5800 ohms
R16	Y-VC-9	Volume control 1 meg.
R45	R-15570	2000 ohms ¼ W 20%
R41	R-15601	Resistor Carbon 100 ohms ¼ W 20%
R42	R-15542	" " 1000 ohms ¼ W 20%
	AM-88	Antenna bank assembly
	AM-89	R. F. bank assembly
	AM-90	Oscillator bank assembly
	Y-CI-6	1st I. F. coil assembly
	Y-CI-5	2nd I. F. coil assembly
	B45	Band switch
	Y-B-9	Tone and High Fidelity switch
	Y-B-11	A.B.C. - A.V.E. switch
	Y-SP-9	Dynamic speaker 12"
	SPA-16	Speaker voice coil and cone
	SPA-17	Speaker transformer
	Y-TP-7	Power transformer
	DC-3	Dial crystal
	ES-16	Escutcheon
	Y-CK-5	Filter choke (A.V.E. - A.B.C.)

MODEL Vanity 1937
MODEL Vanity 1938
Schematics

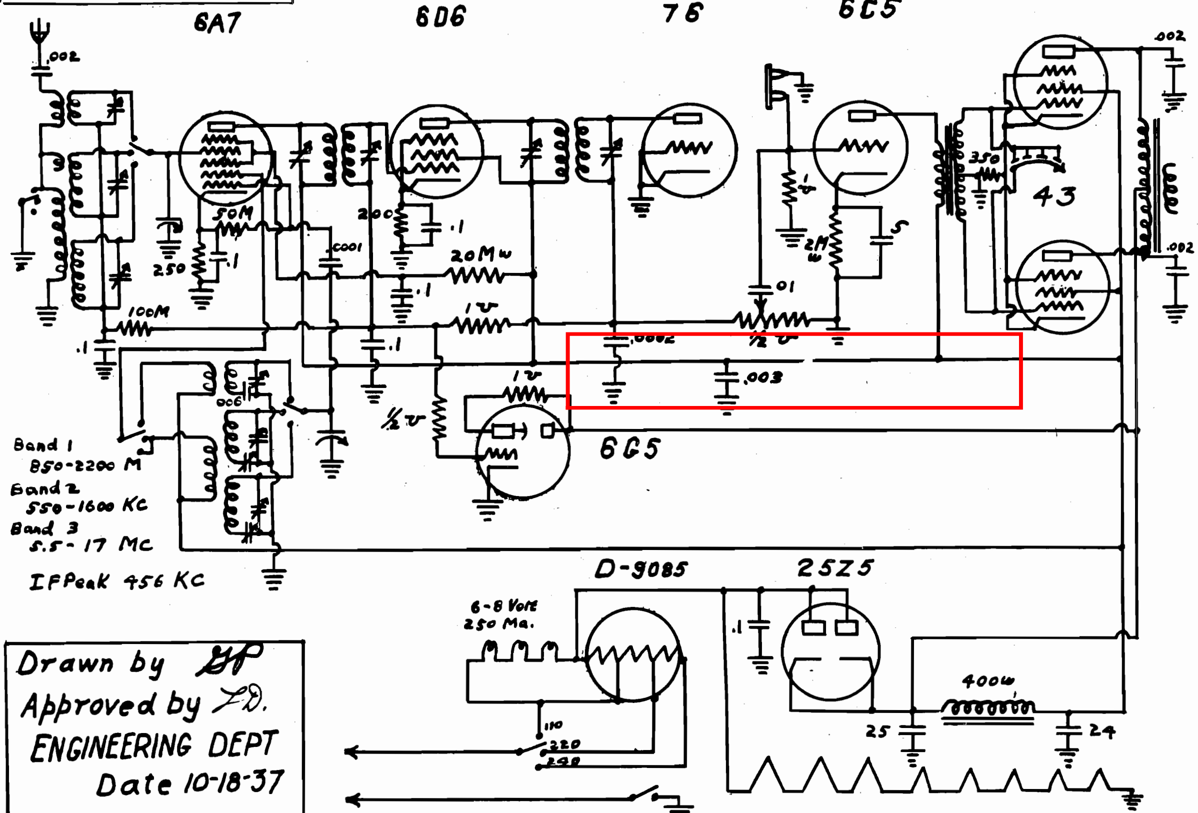
MARCONIPHONE INC.

Model-"Vanity" 1937



Drawn by GP
Checked by LD.
ENGINEERING DEPT
Date 5-28-37

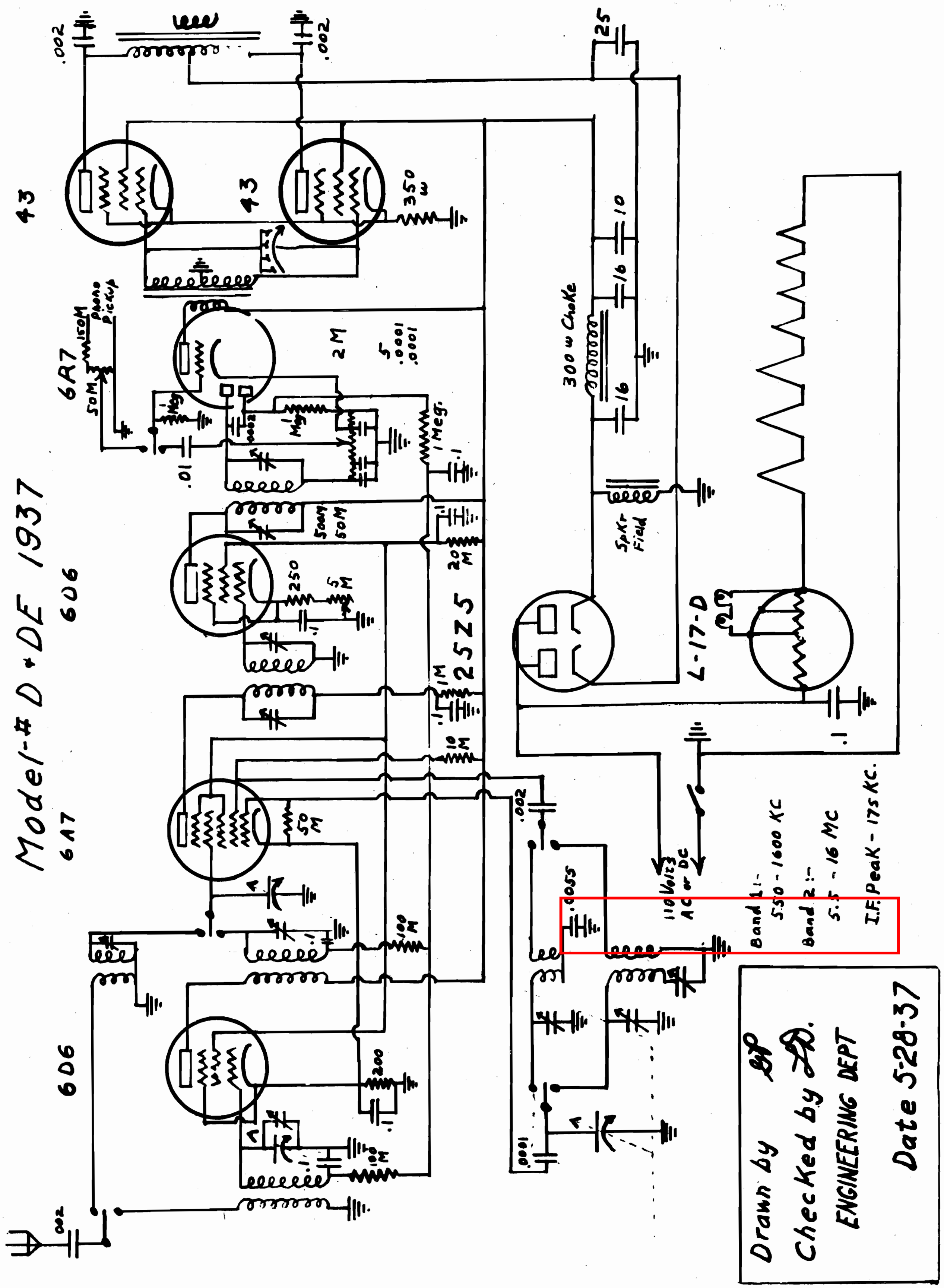
Model-"Vanity" 1938



Drawn by GP
Approved by LD.
ENGINEERING DEPT
Date 10-18-37

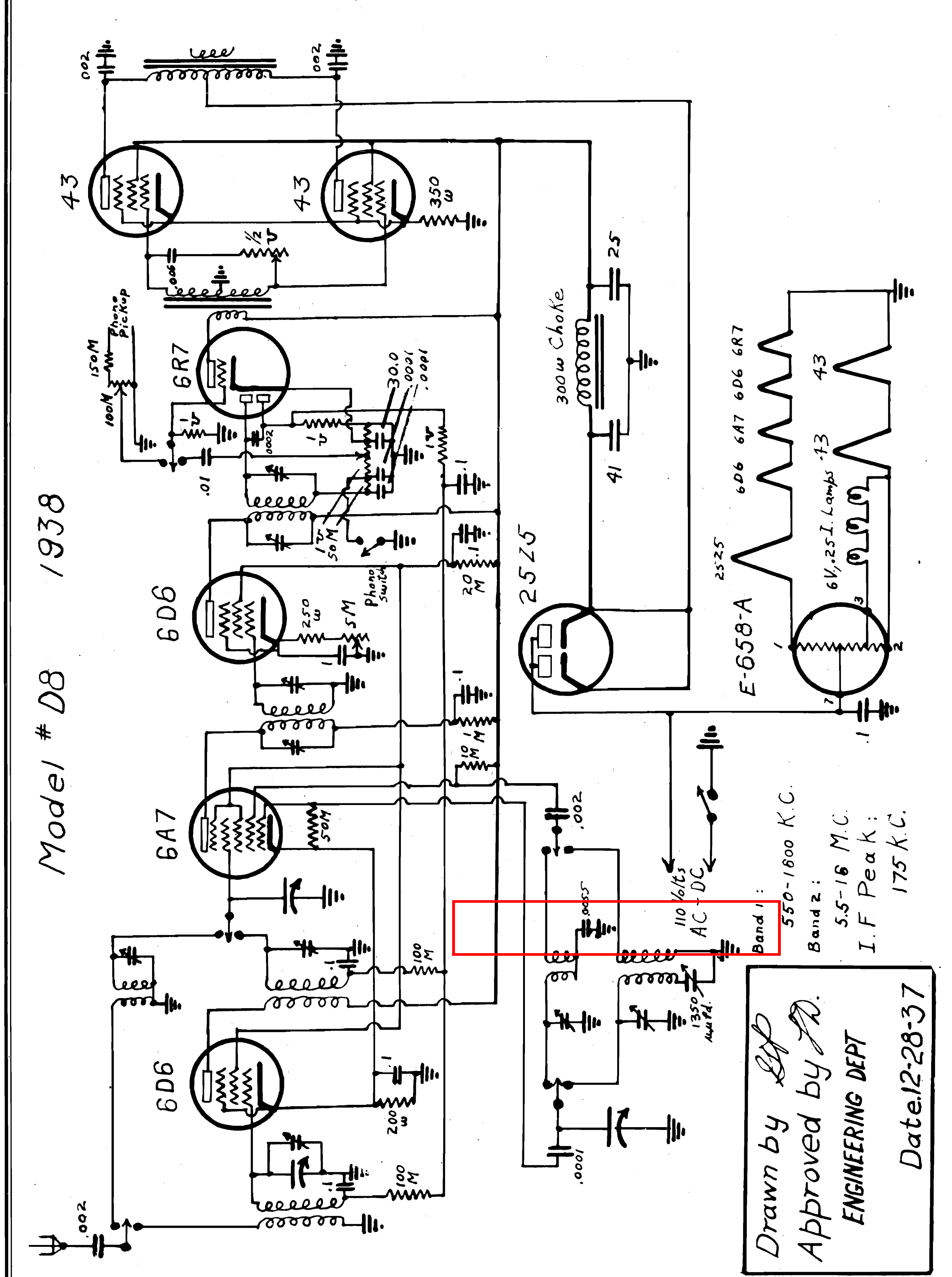
MODELS D,DE 1937
Schematic

MARCONIPHONE INC.



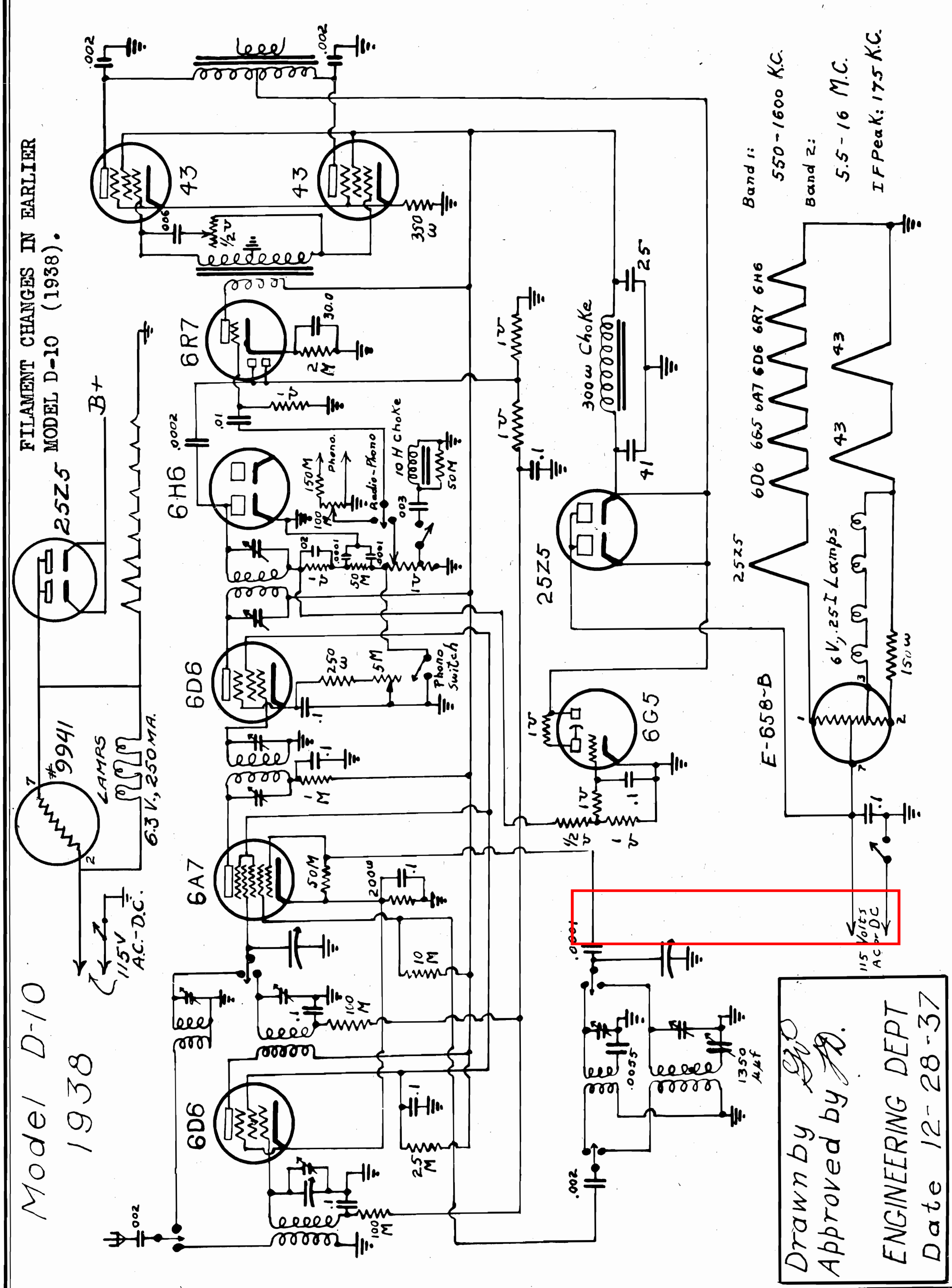
MODEL D8,1938
Schematic

MARCONIPHONE INC.



MODEL D10,1938
Schematic

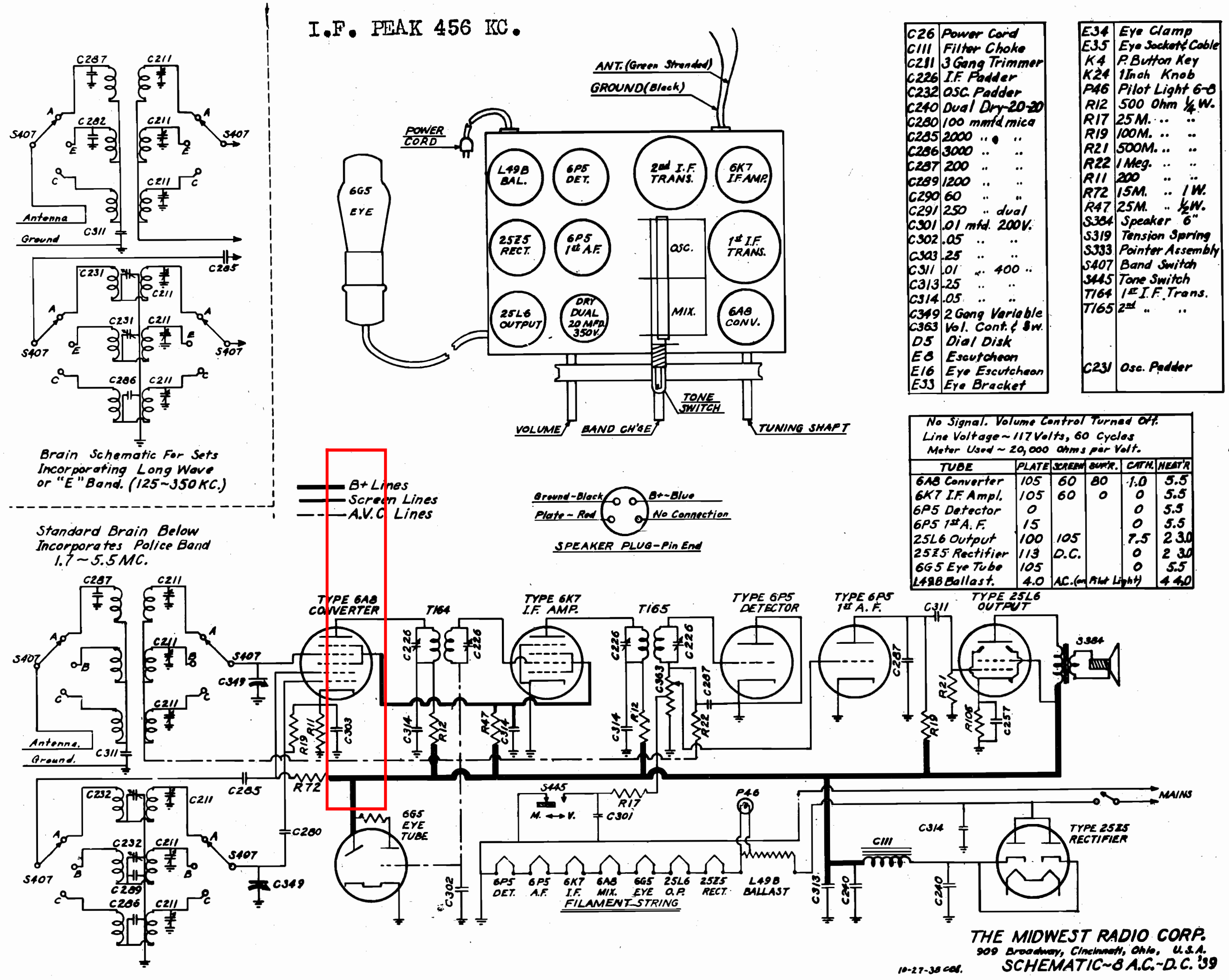
MARCONIPHONE INC.



MODEL 8 AC-DC '39
Schematic, Socket Voltage

MID-WEST RADIO CORP.

I.F. PEAK 456 KC.



C26	Power Cord
C111	Filter Choke
C211	3 Gang Trimmer
C226	I.F. Padder
C232	OSC. Padder
C240	Dual Dry-20-20
C280	100 mmfd mica
C285	2000 " "
C286	3000 " "
C287	200 " "
C289	1200 " "
C290	60 " "
C291	250 " dual
C301	.01 mfd. 200V.
C302	.05 " "
C303	.25 " "
C311	.01 " 400 "
C313	.25 " "
C314	.05 " "
C349	2 Gang Variable
C363	Vol. Cont. & Sw.
D5	Dial Disk
E8	Escutcheon
E16	Eye Escutcheon
E33	Eye Bracket

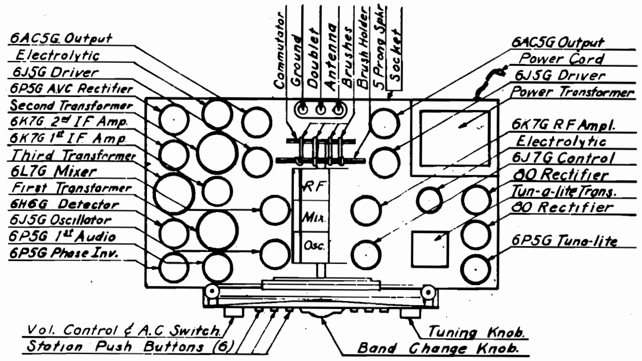
E34	Eye Clamp
E35	Eye Socket & Cable
K4	P. Button Key
K24	1 Inch Knob
P46	Pilot Light 6-8
R12	500 Ohm 1/4 W.
R17	25 M. " "
R19	100 M. " "
R21	500 M. " "
R22	1 Meg. " "
R11	200 " "
R72	15 M. " 1 W.
R47	25 M. " 1/2 W.
S384	Speaker 6"
S319	Tension Spring
S333	Pointer Assembly
S407	Band Switch
S445	Tone Switch
T164	1st I.F. Trans.
T165	2nd " "
C231	Osc. Padder

No Signal. Volume Control Turned Off.
Line Voltage ~ 117 Volts, 60 Cycles
Meter Used ~ 20,000 Ohms per Volt.

TUBE	PLATE	SCREEN	SUPR.	CATH.	HEAT'R.
6A8 Converter	105	60	80	1.0	5.5
6K7 I.F. Ampl.	105	60	0	0	5.5
6P5 Detector	0			0	5.5
6P5 1st A.F.	15			0	5.5
25L6 Output	100	105		7.5	23.0
25Z5 Rectifier	113	D.C.		0	23.0
6G5 Eye Tube	105			0	5.5
L49B Ballast	4.0	AC. (on Pilot Light)			44.0

MODEL 17-'39
Schematic, Socket
Voltage

MID-WEST RADIO CORP.



OPERATING VOLTAGES

No Signal. Volume Control Turned Off. Motor Switch In Off Position. Line Voltage 117 Volts, 60 Cycles. Meter Used ~ 20,000 Ohms per Volt.

TUBE	PLATE	SCREEN	SUP.	CATH	HEATER
6K7 R.F.	245	85	2.4	2.4	6.0
6L7 Mixer	245	85		2.4	6.0
6J5 Osc.	140			0	6.0
6J7 Control	200	85	4.4	4.4	6.0
6K7 1st I.F.	245	85	4.4	4.4	6.0
6K7 2nd I.F.	245	85	4.4	4.4	6.0
6P5 AVC. Rect.	0				6.0
6H6 2nd Det.	0				6.0
6P5 1st A.F.	150			9.2	6.0
6P5 Inverter	150			9.2	6.0
6J5 Drivers	245			10	6.0
6AC5 Outputs	335			0	6.0
80 Rectifiers	340 (AC)			350	4.8
6P5 Tunalite	90 (AC)			0	6.0

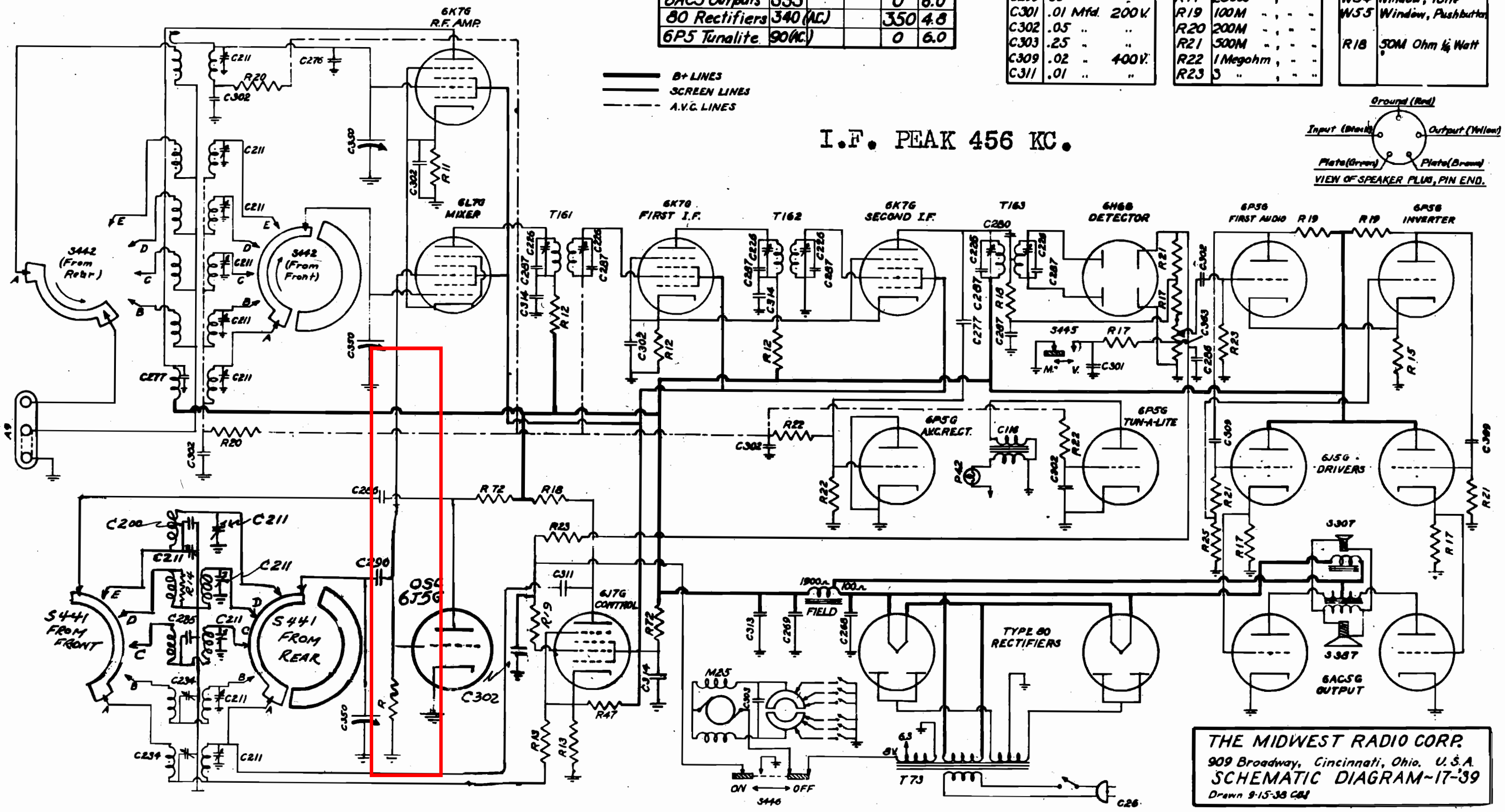
B+ LINES
SCREEN LINES
A.V.C. LINES

A9	Antenna Strip
B26	Brush Holder
B27	Brush Clip
B28	Brush Contact
C26	Cable & Plug, A.C.
C116	Tuna-lite Trans.
C145	Commutator Disk
C146	Commutator Segments
C211	3 Gang Trimmer
C226	I.F. Padder
C234	Osc. Padder
C268	24 M.F.D. 500 V.
C269	40 MFD 350 V.
C276	10 MMFD Mica
C277	25 " "
C280	100 " "
C285	2000 " "
C286	3000 " "
C287	200 " "
C290	60 " "
C301	.01 Mfd. 200 V.
C302	.05 " "
C303	.25 " "
C309	.02 " 400 V.
C311	.01 " "

C313	.25 Mfd. 400 V.
C314	.05 " "
C350	3 Gang Variable
C363	Control, Volume, WS
C401	Fish Line Cord
D3	Dial Background
D4	Dial, Glass
K24	Knob, 1 inch
K25	Knob, 2 inch
M25	Motor
P9	Panel, Molded
P42	Pilot Light 3.2 V.
P46	Pilot Light 6-8 V
P59	Pointer & Slide
R11	200 Ohm, 1/4 Watt
R12	500 " , " "
R13	1000 " , " "
R14	2000 " , " "
R15	5000 " , " "
R17	25000 " , " "
R19	100M " , " "
R20	200M " , " "
R21	500M " , " "
R22	1 Megohm , " "
R23	3 " , " "

R25	40M Ohm, 1/2 W.
R47	25M Ohm, 1/2 W.
R48	50M " " "
R72	15M " , 1 W.
S307	Speaker, 3 1/2"
S319	Spring, Belt Ten.
S387	Speaker, 12 in.
S441	Coil Switch, Osc.
S442	Coil Switch, R.F.
S443	Switch Clicker
S445	Tone Switch
S446	Motor Switch
T73	Power Transf'mer
T161	1st I.F. Trans.
T162	2nd I.F. Trans.
T163	3rd I.F. Trans.
W51	Window, Tuning
W52	Window, Volume
W53	Window, Motor
W54	Window, Tone
W55	Window, Pushbutton
R18	50M Ohm 1/4 Watt

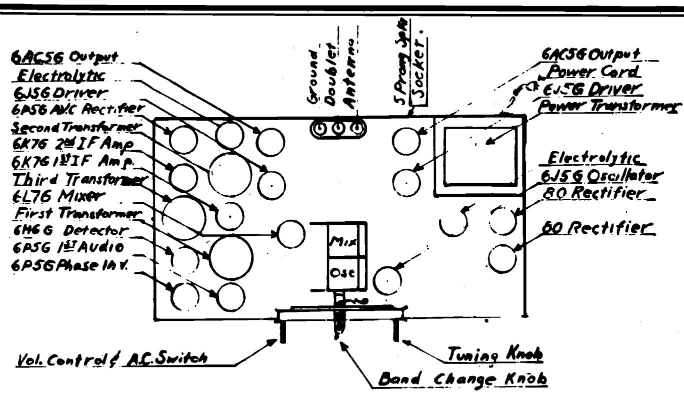
I.F. PEAK 456 KC.



THE MIDWEST RADIO CORP.
909 Broadway, Cincinnati, Ohio. U.S.A.
SCHEMATIC DIAGRAM ~ 17-'39
Drawn 9-15-38 CBK

MODEL 14-Z-9
Schematic, Voltage
Socket

MID-WEST RADIO CORP.

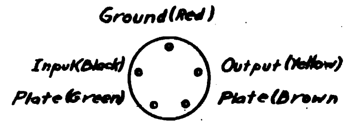


OPERATING VOLTAGES

No Signal, Volume Control Turned Off

Line Voltage 117 Volts 60 Cycles
Meter Used 20000 Ohms per Volt

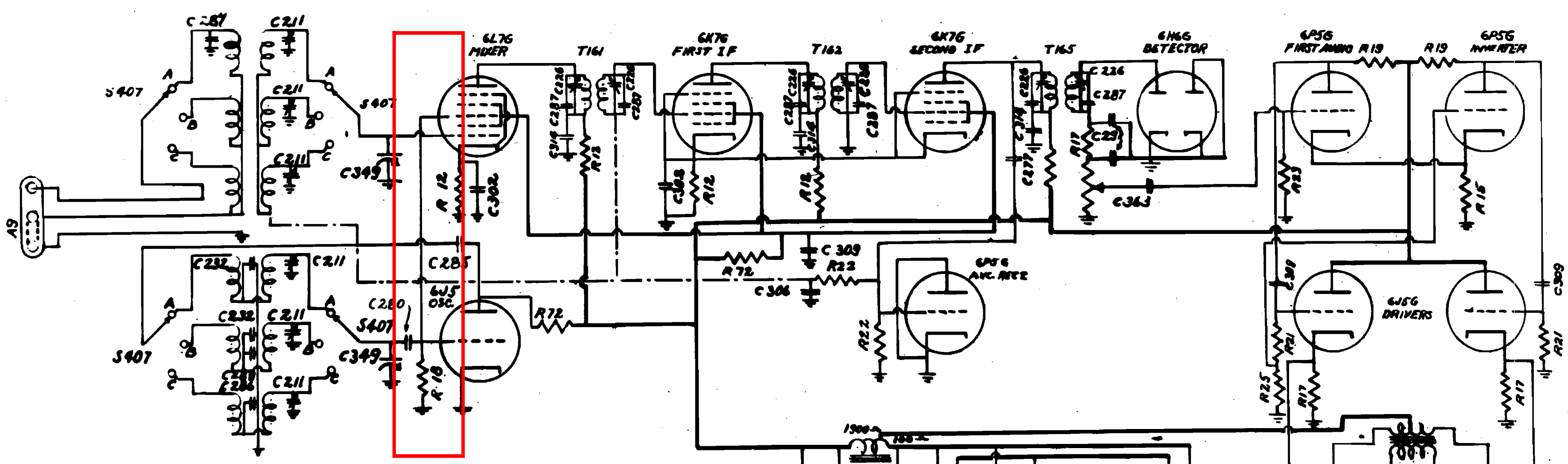
TUBE	PLATE	SCREEN	SUP	CATH	HEATER
6L7 Mixer	245	85		2.4	6.0
6J5 Osc.	140			0	6.0
6K7 1st IF	245	85	4.4	4.4	6.0
6K7 2nd IF	245	85	4.4	4.4	6.0
6P5 AVC Rect	0				6.C
6H6 2nd DET.	0				6.0
6P5 1st AF	150			9.2	6.0
6J5 Drivers	245			10	6.0
6P5 Inverter	150			9.2	6.0
6AC5 Drivers	335			0	6.0
80 Rectifiers	340 (AC)			350	4.8



View of Speaker Plug (Pin End)

A9	Antenna Strip
C26	Cable & Plug (AC)
C211	3 Gang Trimmer
C226	I F Padder
C232	Osc Padder
C268	24 MFD 500 V.
C269	40 MFD 350 V
C291	250 Mica Dual
C277	25 MMFD Mica
C286	3000 " "
C287	200 " "
C289	1200 " "
C302	.05 MFD 200 V.
C309	.02 MFD 400 V.
C313	.25 " "
C314	.05 " "
C349	2 Gang Variable
C363	Control, Volume W.S.
C401	Fish Line Cord
K24	Knob 1 inch
P96	Pilot Lite 6.8 V.
R11	200 Ohm ¼ Watt
R12	500 " " "
R15	5000 " " "
R17	25000 " " "

R18	5000 Ohm ¼ Watt
R19	100 M " " "
R21	500 M " " "
R22	1 Meg Ohm " "
R23	3 " " " "
R25	40 M Ohm ¼ W.
R72	15 M " 1 W
S319	Spring Belt Ten.
S301	Speaker 8"
S333	Pointer
S407	Coil Switch
T73	Power Trans.
T161	1st I F Trans.
T162	2nd " "
T165	3rd " "
C285	2000 MMFd
C280	100 "



I.F. PEAK 456 KC.

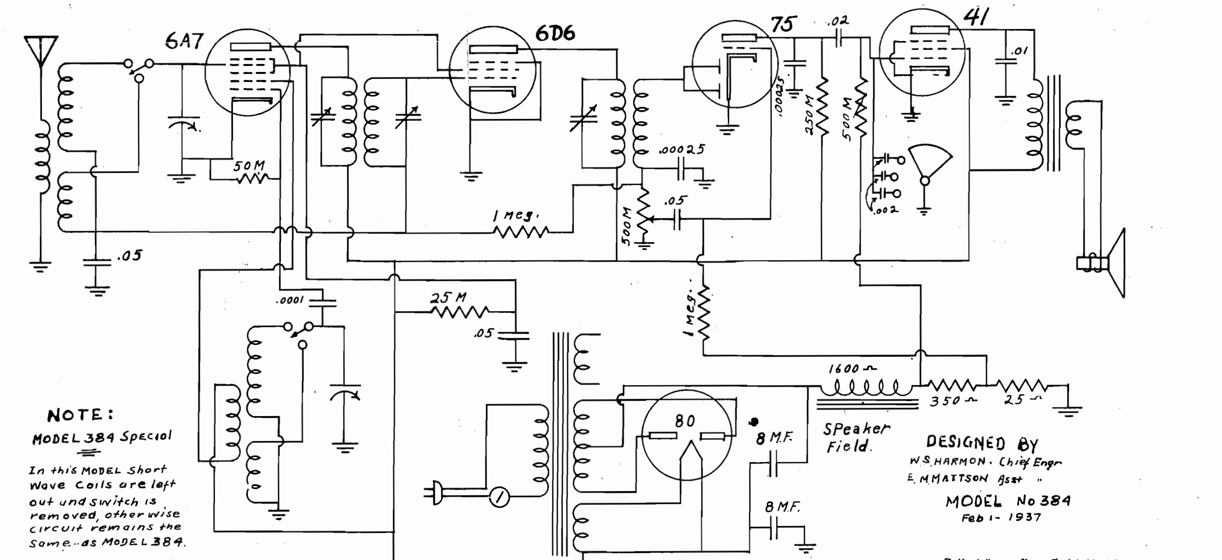
In Long Wave Sets The Coverag Of B Band Is From 125 to 350 KC.

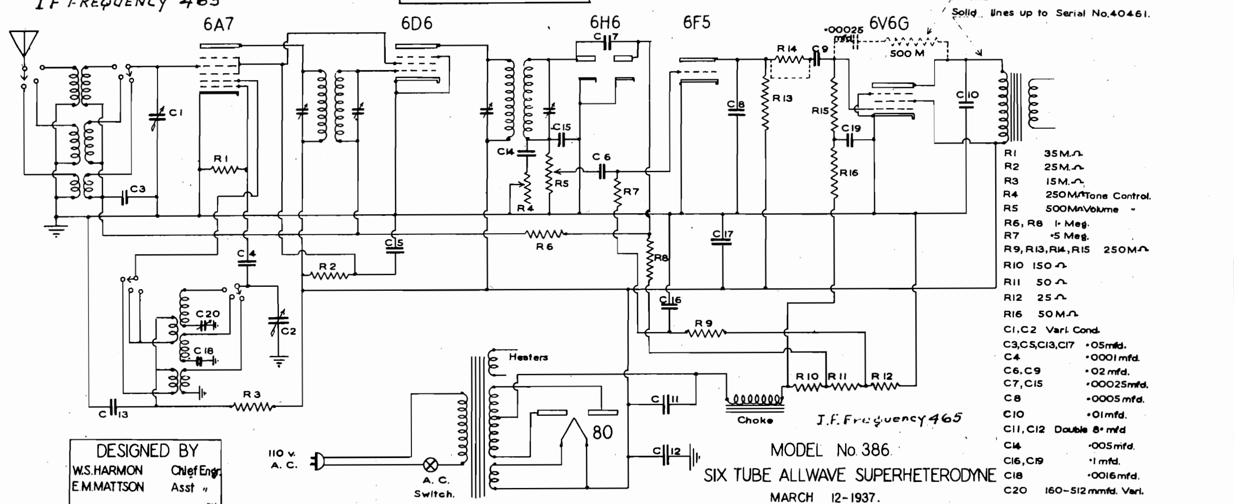
THE MIDWEST RADIO CORP.
909 Broadway Cincinnati, Ohio U.S.A.
SCHEMATIC DIAGRAM-14-Z-9

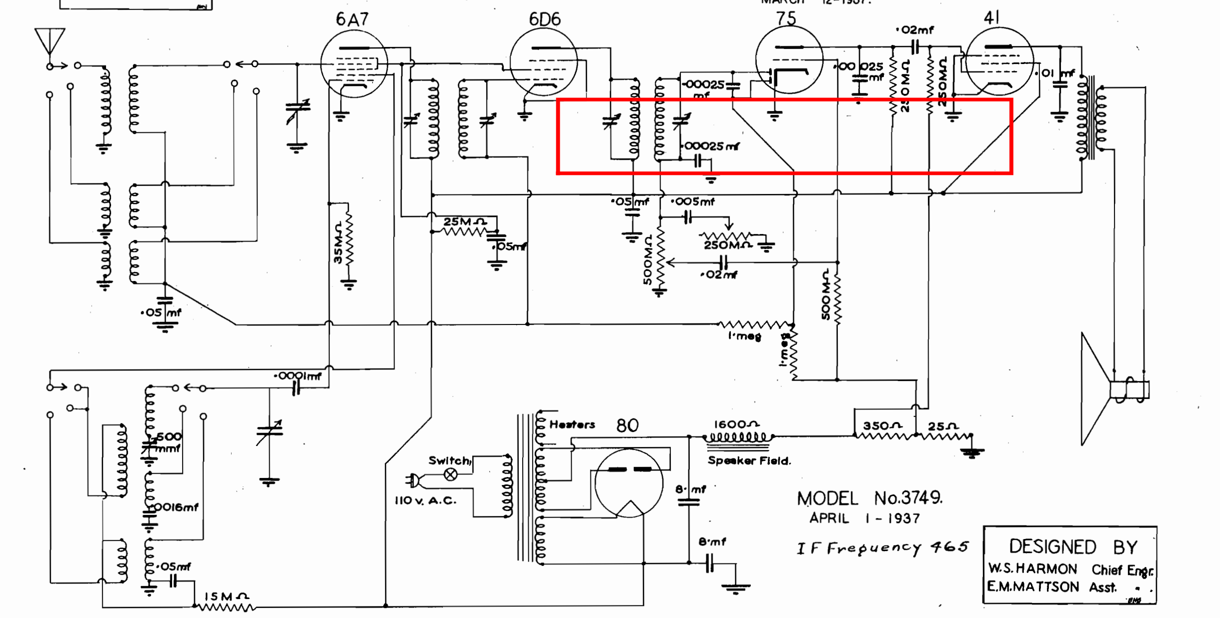
MODEL 3749
Schematics

MISSION-BELL RADIO MFG. CO., INC.

MODEL 384
384 Special
MODEL 386
Above, Below
Serial No. 40461

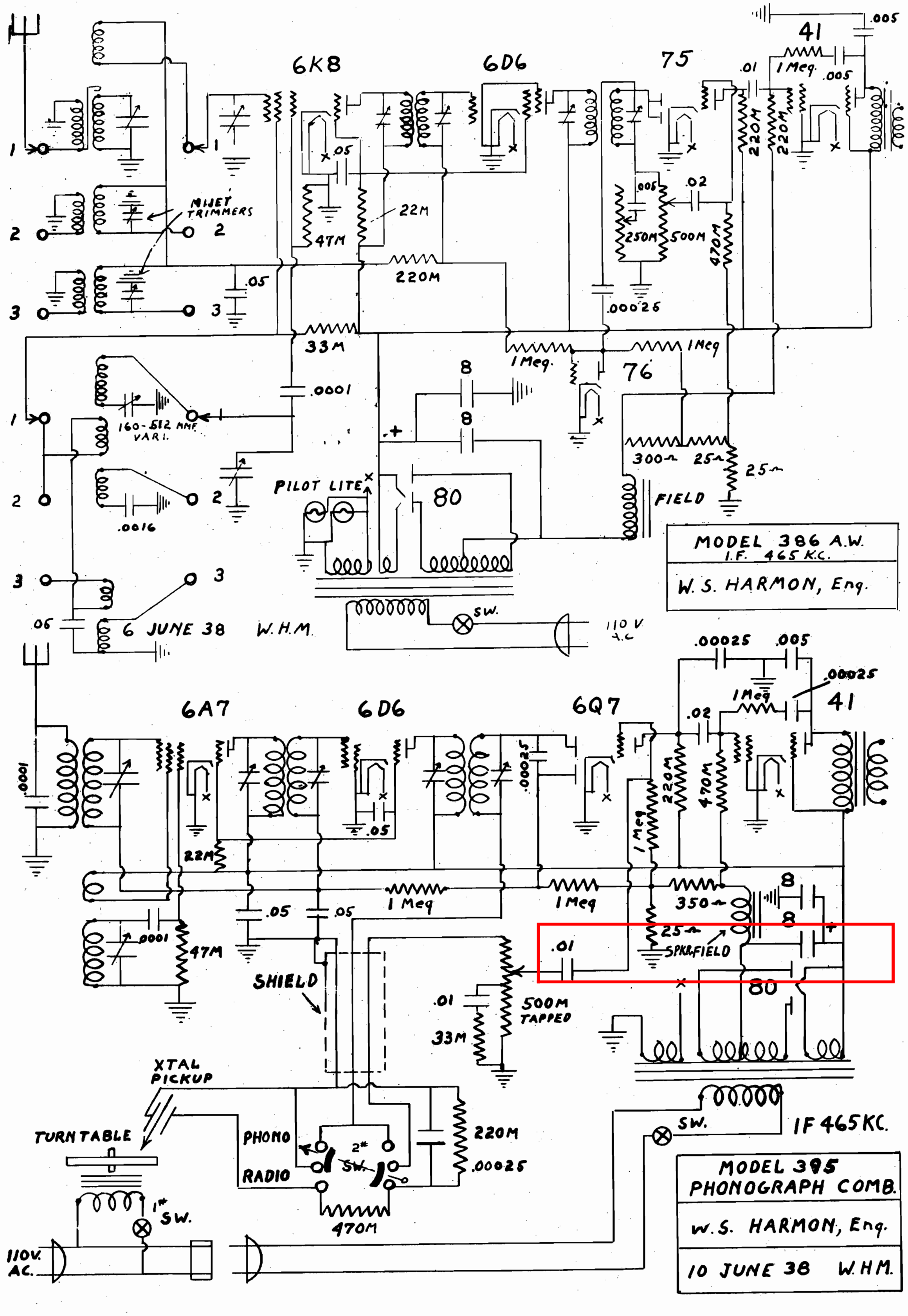






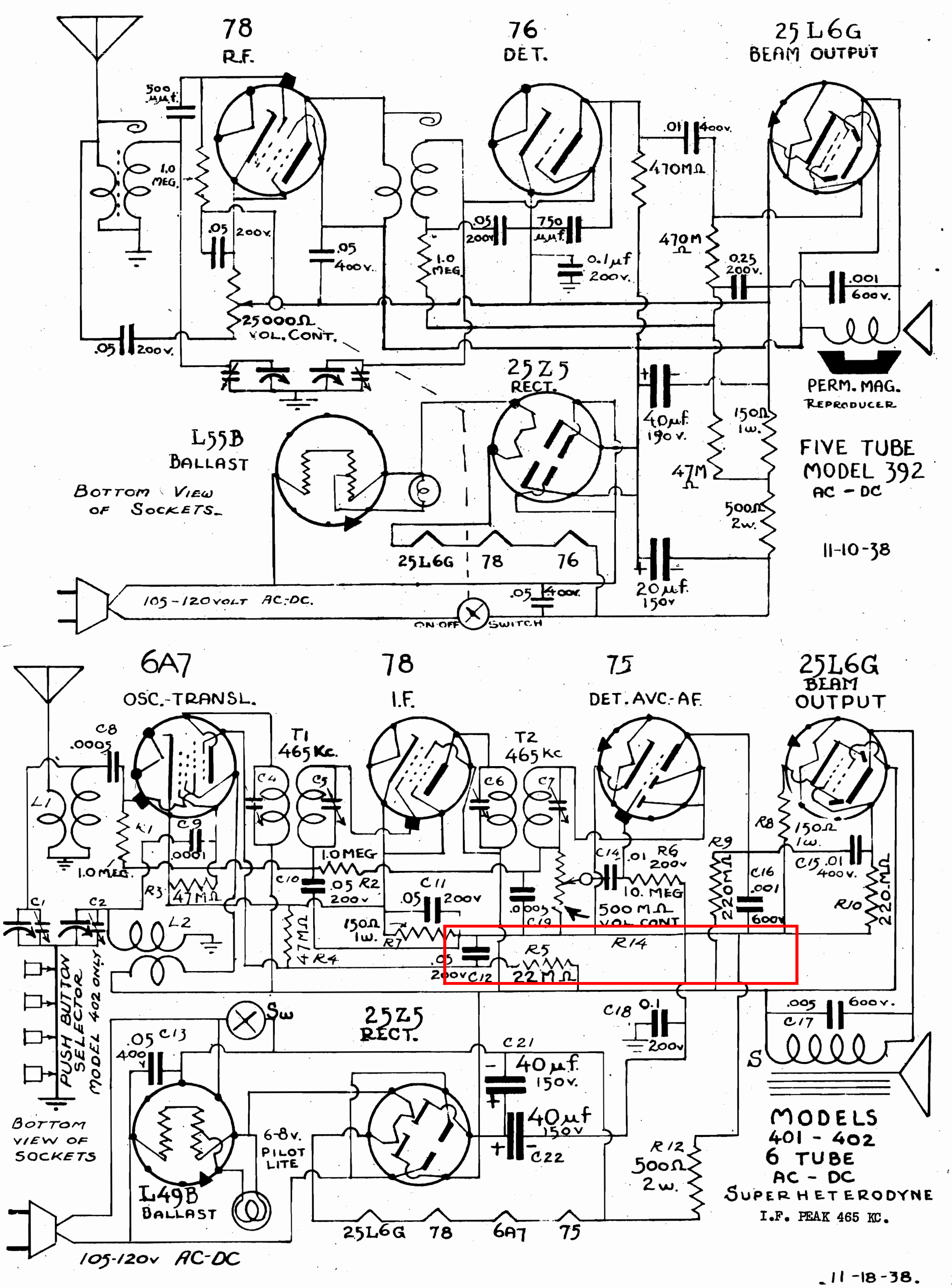
MODEL 386 AW
MODEL 395
Schematics

MISSION-BELL RADIO MFG. CO., INC.



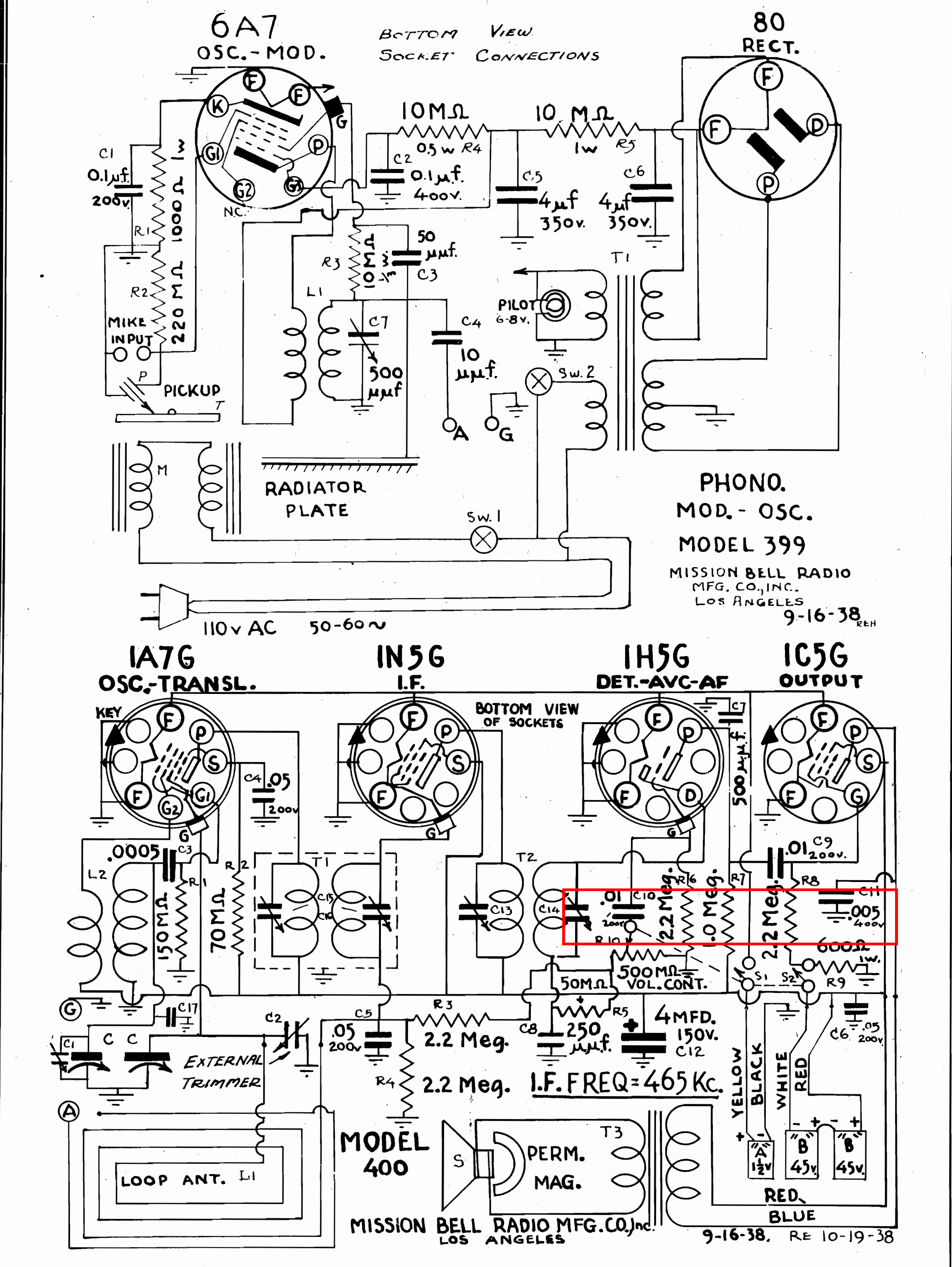
MISSION-BELL RADIO MFG. CO., INC.

MODEL 392
MODELS 401,402
Schematics



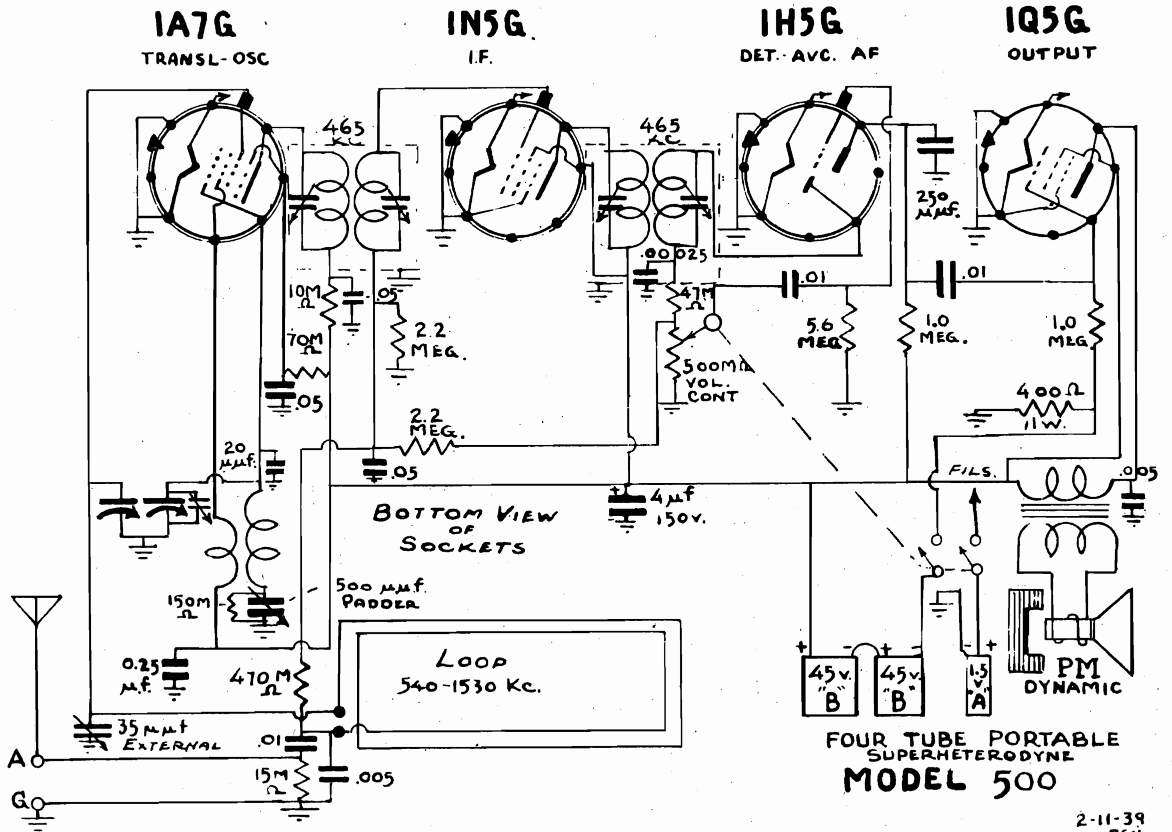
MODEL 399 Phono. Osc.
MODEL 400
Schematics

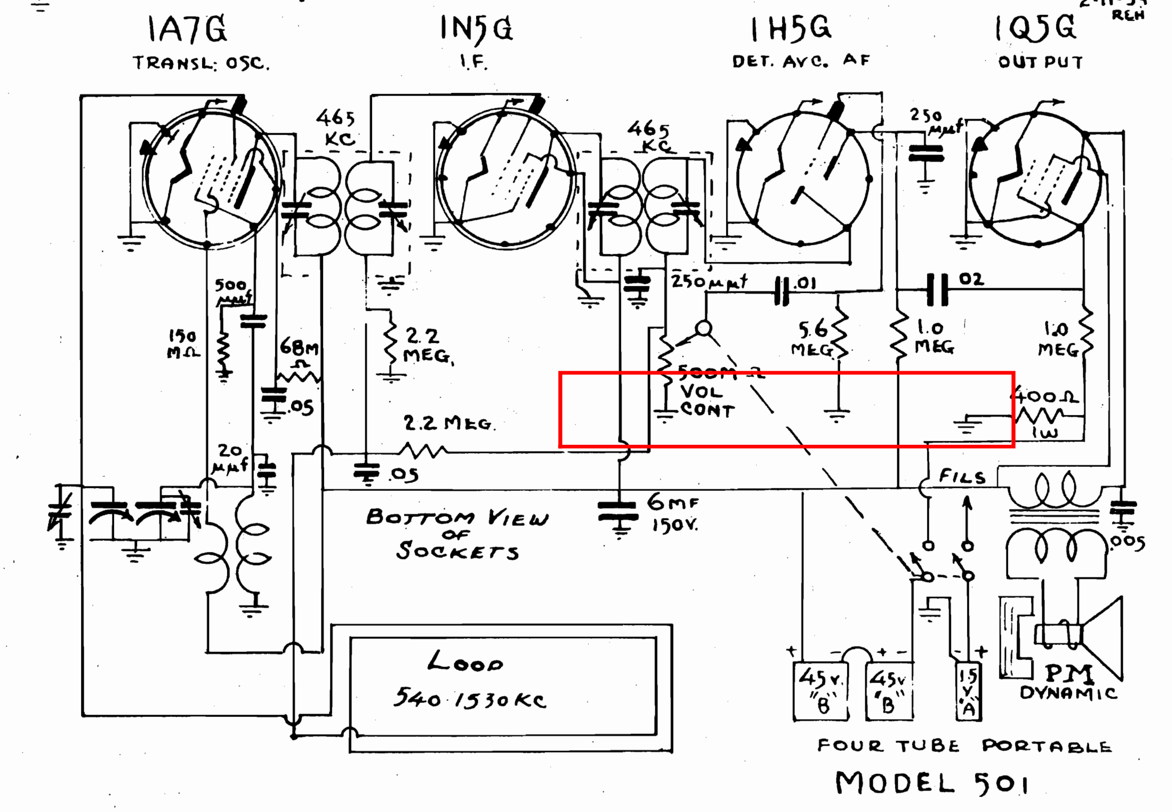
MISSION-BELL RADIO MFG. CO., INC.



MISSION-BELL RADIO MFG. CO., INC.

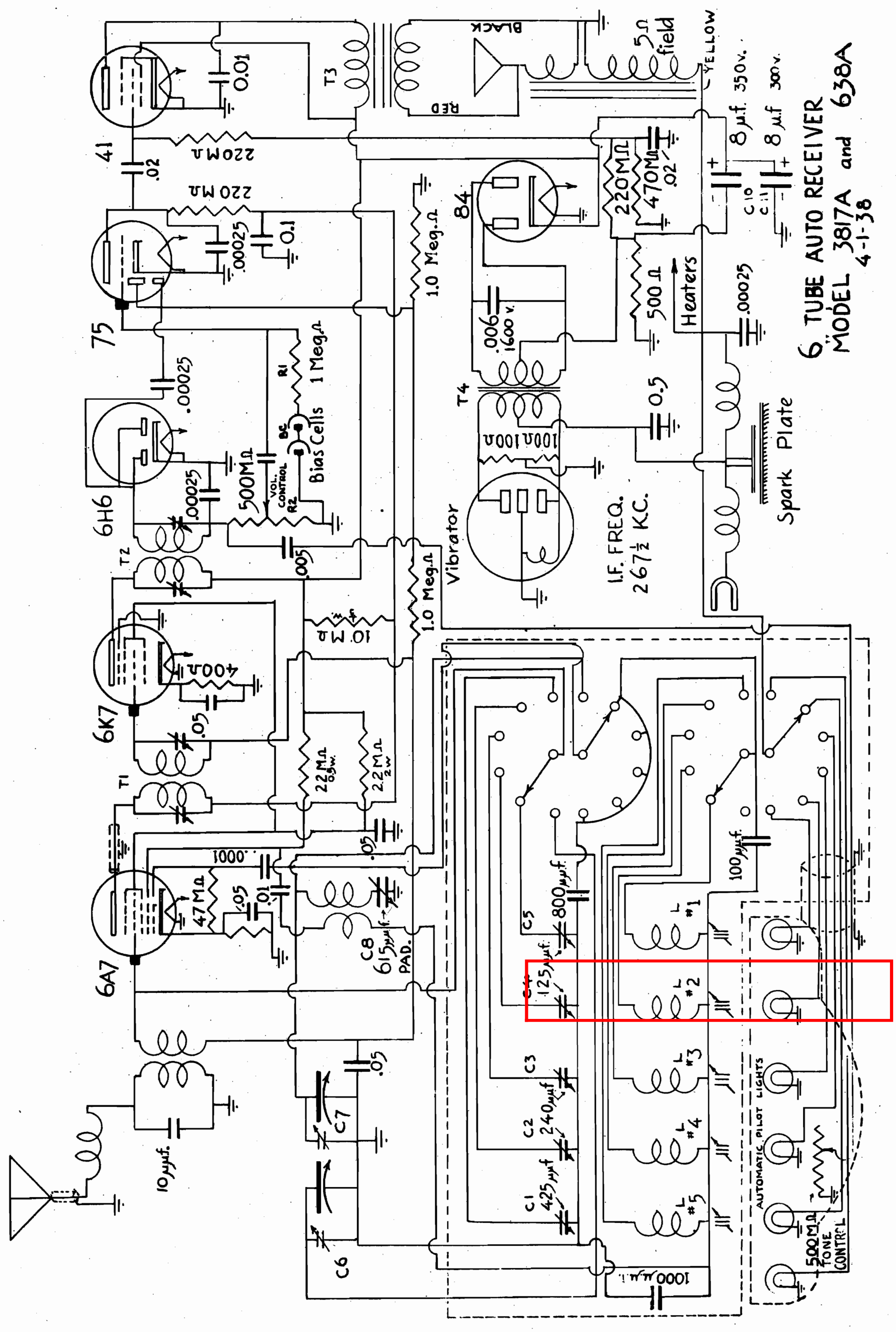
MODEL 500
MODEL 501
Schematics





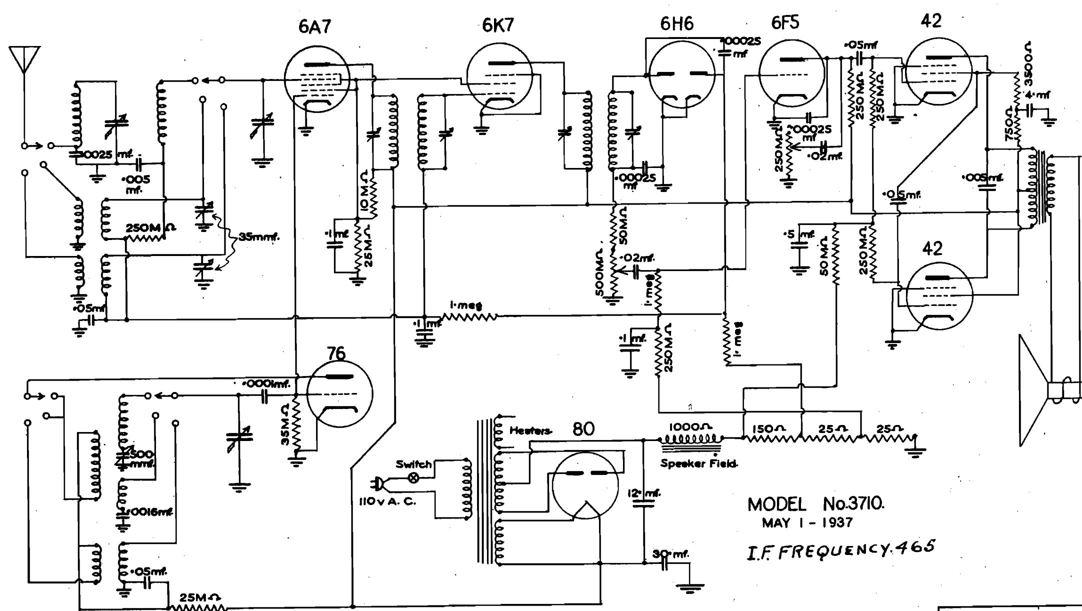
MODELS 638A, 3817A
Schematic

MISSION-BELL RADIO MFG. CO., INC.

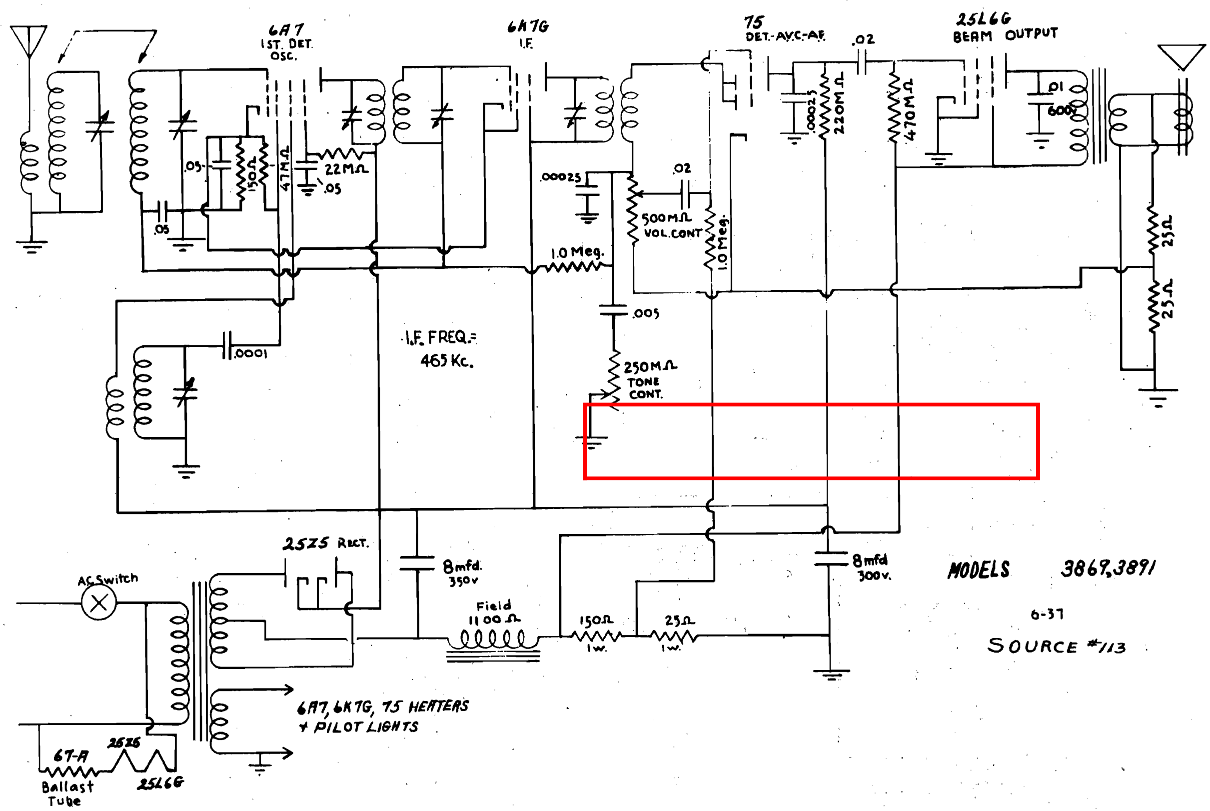


MISSION-BELL RADIO MFG. CO., INC.

MODEL 3710
MODELS 3869,3891
Schematics



DESIGNED BY
W.S. HARMON Chief Engr.
E.M. MATTSON Asst.



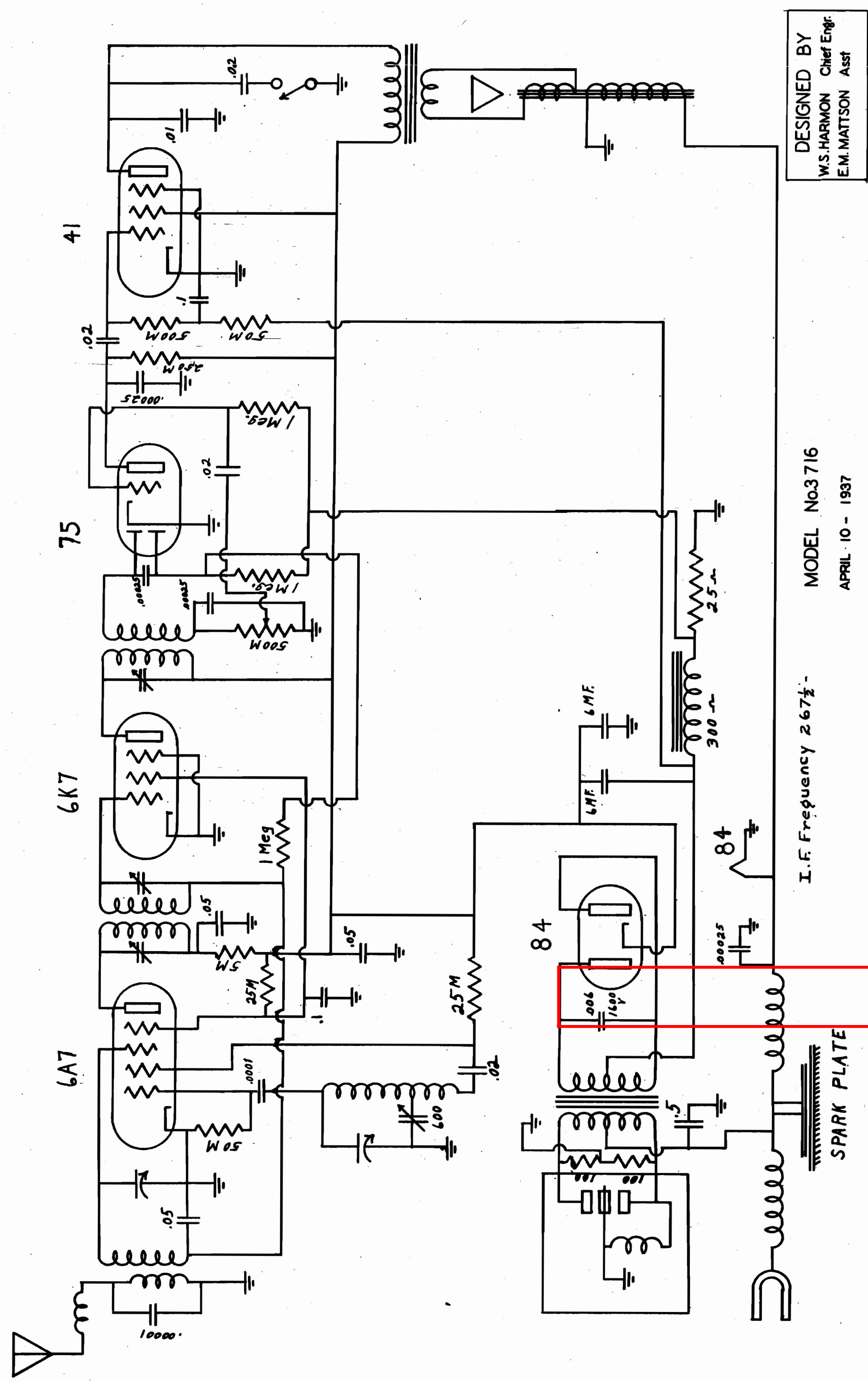
MODELS 3869,3891

6-37

SOURCE #113

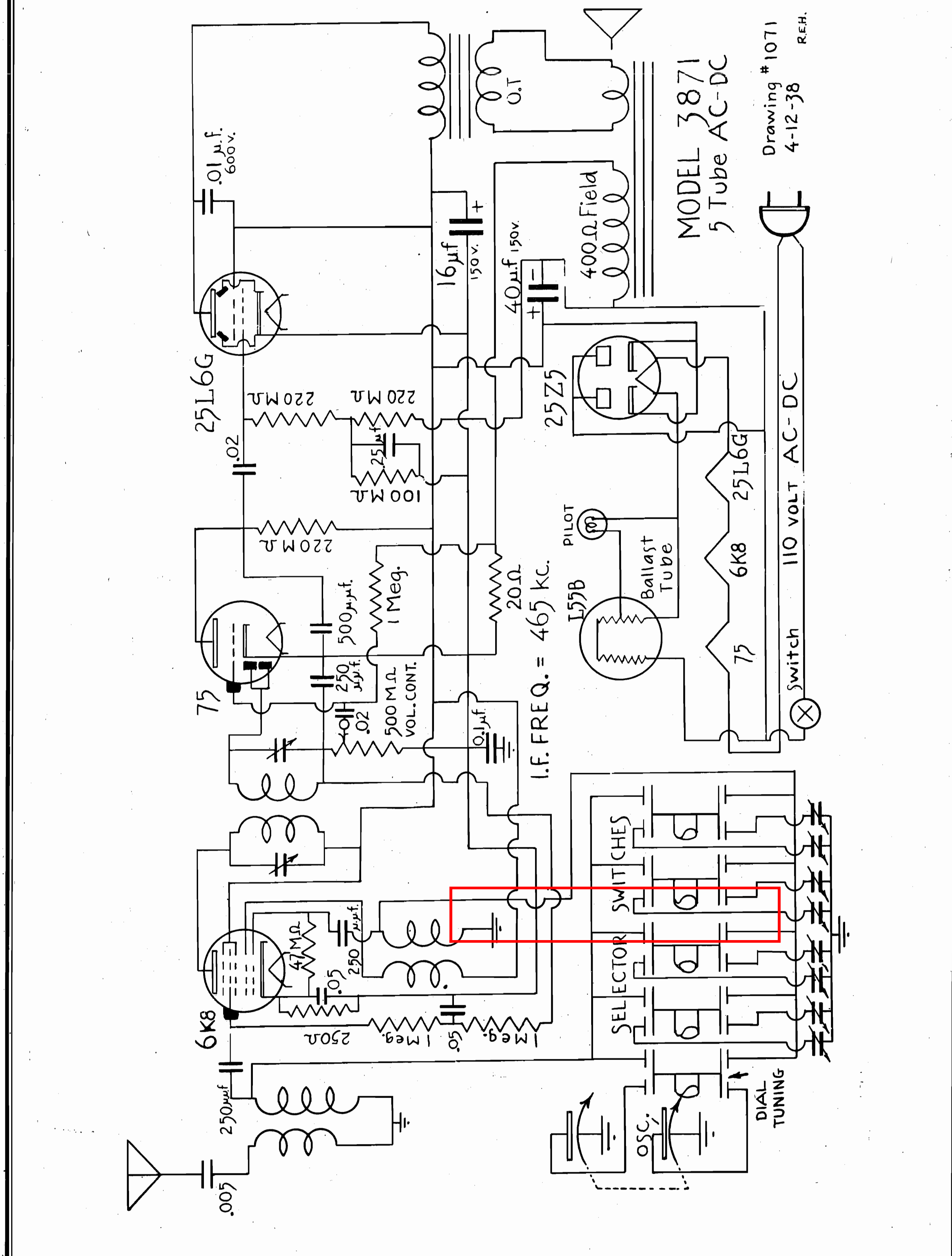
MODEL 3716
Schematic

MISSION-BELL RADIO MFG. CO., INC.



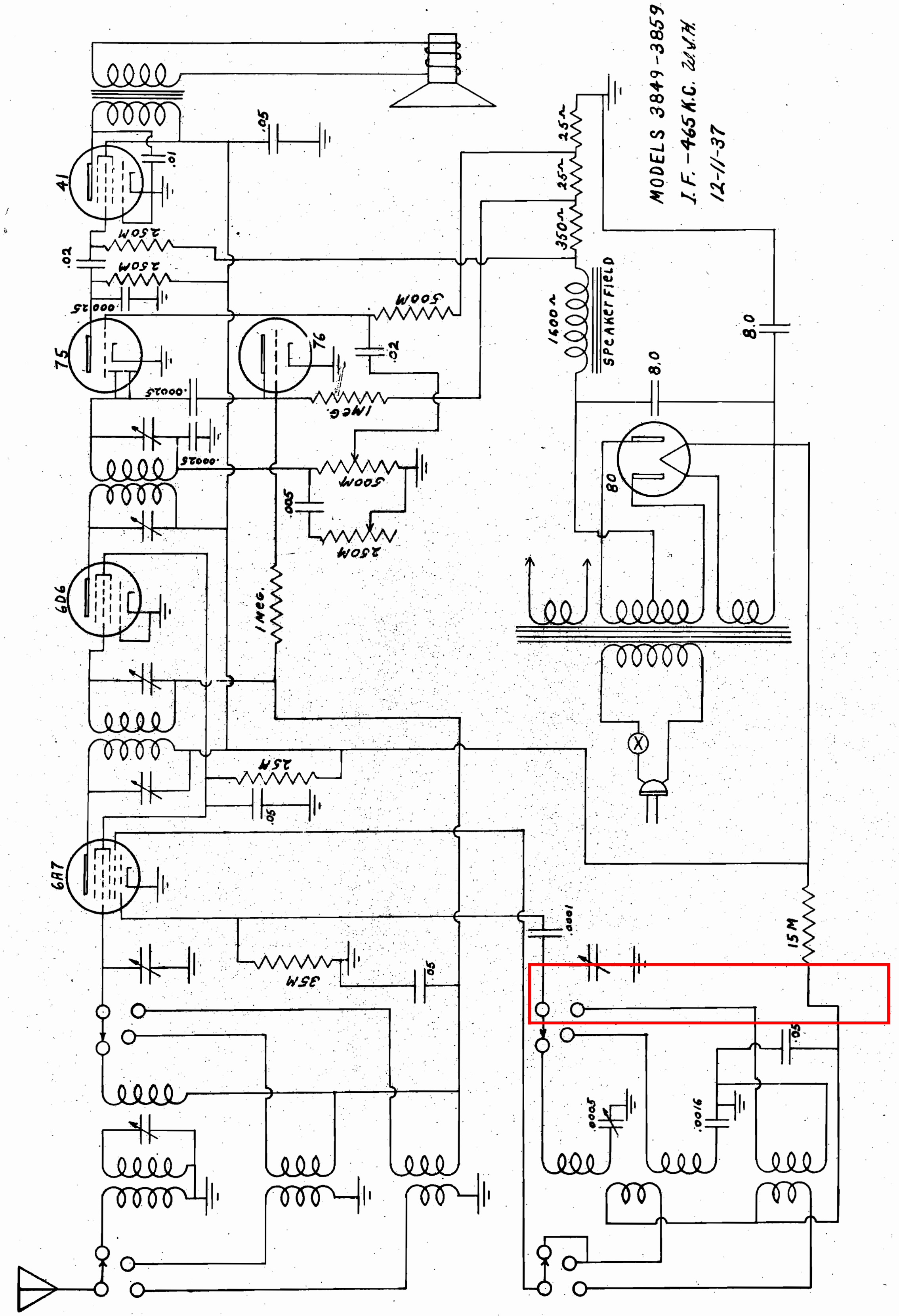
MISSION-BELL RADIO MFG. CO., INC.

MODEL 3871
Schematic



MODELS 3849,3859
Schematic

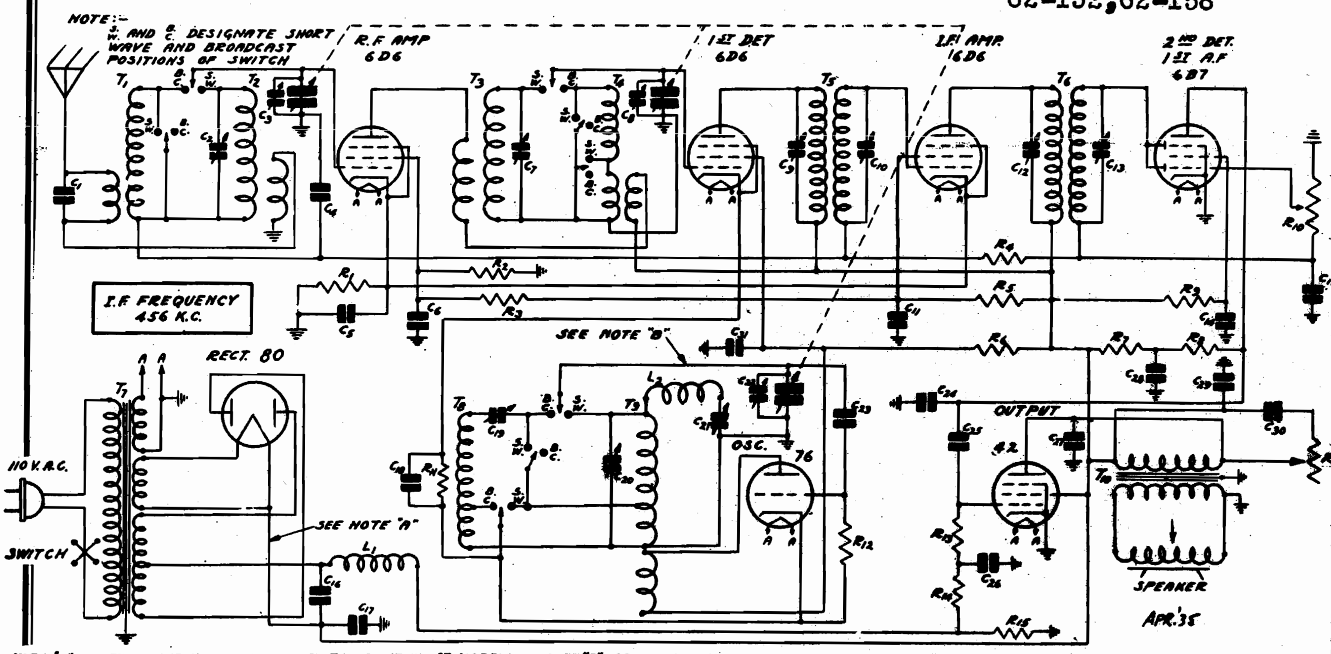
MISSION-BELL RADIO MFG. CO., INC.



Schematic, Socket Trimmers, Alignment

MONTGOMERY-WARD & CO.

MODELS 62-123, 62-131, 62-133, 62-142, 62-144, 62-152, 62-158



NOTE "A":-FILTER CHOKE USED IN SERIES AT THIS POINT IN 1ST MODELS. NOTE "B":-SERIES PADDER USED IN SERIES AT THIS POINT IN 1ST MODELS. L_2 & C_{21} WERE NOT USED.

Fig. 1—Schematic Circuit Diagram

Condenser Alignment

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 456 K. C. and accurately calibrated signals over the broadcast and short wave bands, 530-1740 K. C. and 5.8-18.3 M. C., is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for the adjustments. The complete procedure is as follows:

Intermediate Frequency Adjustment

Set the signal generator for 456 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. The volume control should be at the maximum position. Attenuate the signal so that A. V. C. action is not obtained.

Then adjust the four I. F. trimmer condensers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and are in the round I. F. cans—See Fig. 2. The openings to the trimmer condensers are covered over by a small cover plate which is held in position by a screw. Loosen these screws until the cover plates can be swung around.

Broadcast Band Adjustment

The broadcast short wave switch should be in the broadcast position. Set the signal generator for 1740 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Attenuate the signal so that A. V. C. action is not obtained. Adjust the oscillator broadcast trimmer until maximum output is obtained. This trimmer is on the tuning condenser and its location is shown in Fig. 2.

Then set the signal generator for 1500 K. C. Turn the rotor until maximum output is obtained. Loosen the pointer screw and set the pointer at the 1500 K. C. mark on broadcast band scale. Retighten pointer screw. Then adjust the antenna and 1st detector broadcast trimmers until maximum output is obtained.

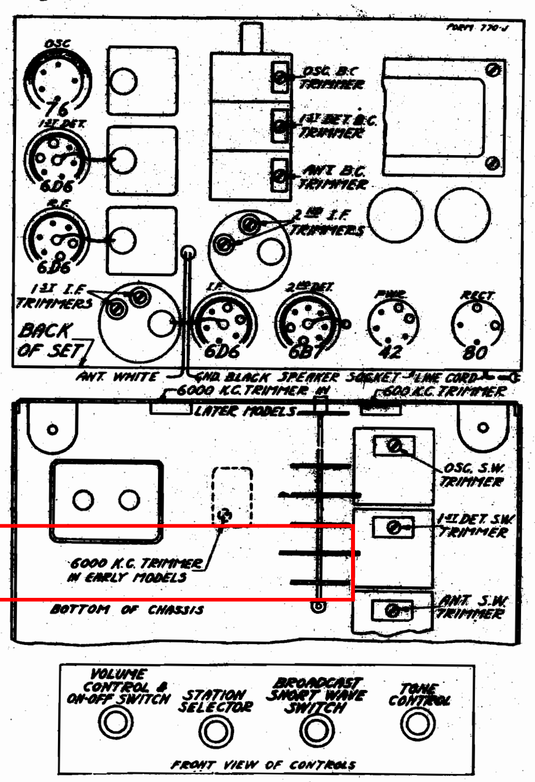


Fig. 2—Tube Arrangement and Location of Trimmers

Next set the signal generator for 600 K. C. and adjust the 600 K. C. trimmer. The adjusting screw is reached through a hole in the front panel of the chassis as shown in Fig. 2. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over

MODELS 62-123, 62-131
62-133, 62-142, 62-144
62-152, 62-158

MONTGOMERY WARD & CO.

Alignment, Part 2
Voltage, Drive Data
Changes, Parts

this setting at the same time adjusting the 600 K. C. trimmer screw until the highest output is obtained.

Short Wave Band Adjustment

CAUTION—After the broadcast band alignment as described above has been made, do not change the adjustment of any of the broadcast band trimmers.

Turn the broadcast short wave switch to the short wave position. Turn the rotor to the full open position. As explained above, the volume control should be at the maximum position and the signal should be attenuated to prevent A. V. C. action. Set the signal generator for 18,300 K. C. Then adjust the oscillator short wave trimmer for maximum output. This trimmer is reached from under the chassis and its position is shown in Fig. 2.

Next set the signal generator for 15,000 K. C. Turn the rotor until the dial pointer is at the 15,000 K. C. mark on the short wave portion of the dial scale. Then adjust the antenna and 1st detector short wave trimmers until maximum output is obtained.

In aligning the short wave band of the receiver, it will be noted that the signal will be heard with the signal generator set at two points 912 K. C. apart. That is, if the receiver is tuned to 15,000 K. C. a signal will be heard when the signal generator is set at 15,000 K. C. and again at approximately 15,912 K. C. This is due to image reception or the fact that a 456 K. C. beat is obtained when the signal is 456 K. C. lower than the receiver oscillator and also when the signal is 456 K. C. higher than the receiver oscillator. Care should be taken to see that the receiver is tracked with the signal generator adjusted to the lower of the two frequencies at which a signal is heard, in order that the oscillator in the receiver will be 456 K.C. higher in frequency than the signal.

Next set the signal generator for 6000 K. C. and adjust the 6000 K. C. trimmer. In the first models of this receiver, this condenser was located at the point shown in Fig. 2 in dashed lines. In the later models it is reached through a hole in the front panel of the chassis as shown in the same illustration. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 6000 K. C. trimmer screw until the highest output is obtained. In the early models this adjustment is broad while in the later models it is more critical.

Caution

The can of electrolytic condenser C16 is not at ground potential. Therefore in any work on the chassis, care should be taken not to touch this can and any other grounded point such as the other electrolytic condenser can.

Replacing Drive Cord

Remove chassis from cabinet.

Take off the pilot light assembly by lifting off the two sockets and spring clips.

Detach the large pointer by removing the screw at the center of the dial.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis.

Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and tone control collars which hold the indicator cords of these two controls in position.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 3.

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum as shown in Fig. 3. Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum.

Voltages at Sockets
LINE VOLTAGE — 115
ANTENNA SHORTED TO GROUND

Type of Tube	Function	Across Fila. or Heater	Plate to Cath.	Screen to Cath.	Control Grid to Cath.	Normal Plate M. A.
6D6	R. F.	6.3	246	100	3.6(1)	5.3
6D6	1st Det.	6.3	237	97	8.0(2)	3.4
76	Osc.	6.3	115		0	4.8
6D6	I. F.	6.3	246	130	3.6(1)	8.3
6B7	2nd Det.	6.3	50(3)	40(3)	0	2.7
42	Power	6.3	230	245	17.0(4)	33.0
80	Rectifier	5.0				37.0 per plate

(1) Cathode to ground
(2) Subject to variation
(3) Read with 1,000,000 ohm meter
(4) As read across R15

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

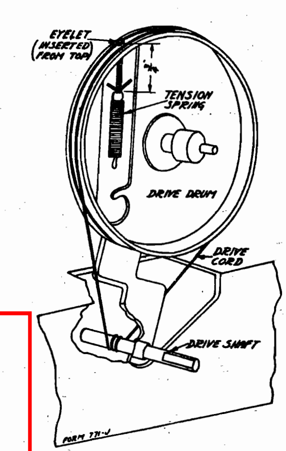


Fig. 3—Drive Cord Replacement

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one-half times around the drive shaft as shown in Fig. 3.

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth turns in a clockwise direction until it is up to the hole in this drum as illustrated.

Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring, when hanging free, should be approximately ¾" from the flange of the drum as shown in Fig. 3. Cut off the surplus length of cord after it is knotted.

Then secure the other end of the tension spring over the spur on the drive drum.

Replace the dial assembly and pointer.

Replace the pilot light assembly after which the chassis may be reinstalled in the cabinet.

Changes in Early Models

There are two points at which the early models of this receiver differ from the present models. These points are indicated in Fig. 1 and described below.

Power Unit

In the early models a separate filter choke was used in series at the point indicated in note A in Fig. 1. The values of the two filter condensers C16 and C17 were less than as used at present. The values of the old and new condensers are shown in the parts list. A different power transformer was also used with the early filter system and this is likewise shown in the parts list.

The two power transformers are not interchangeable and care must be taken in ordering for replacement purposes to order the correct one. The original chassis can be identified by the separate filter choke.

Short Wave Oscillator

Referring to Fig. 1 it will be noted that there is a tracking coil L2 and a trimmer condenser C21 connected in series between the short wave oscillator coil and ground. In the first models of this receiver these two units, which are required for tracking the short wave oscillator, are not used. Instead a series padding condenser was used at the point in the circuit indicated by note B in Fig. 1.

At the time this change was made a change was also made in the oscillator assembly and care must be taken in ordering for replacement purposes to order the correct one. Early models with the original oscillator assembly, have no spot of paint or a green spot of paint on the 80 socket rivet. Later models with the new oscillator assembly and new tracking system have a red spot of paint on the 80 socket rivet.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty-cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle chassis can be operated satisfactorily from a sixty-cycle power supply. However, the reverse is not true, the sixty-cycle receiver cannot be operated from a twenty-five cycle power supply.

A 110-220 Volt, 40-60 cycle Power Transformer is also available for this model.

REPAIR PARTS LIST FOR 7 TUBE BROADCAST AND SHORT WAVE RECEIVER

When ordering parts be sure and give the part number. Also give the series number which will be found in the License Notice label. If there is a spot of paint on the chassis, give this color.

Part No.	Item	List Price
P-1441	Double Mounting Strip	.10
P-1421	Single Mounting Strip	.10
P-2060	Knob Small	.20
P-2062	Knob Large	.20
P-10337	Small Tone & Volume Control Disc	.10
P-20912	Pointer, Large	.20
P-2012	Pilot Light Bulb 6-8 volt	.15
P-10272	Rubber Mounting Feet	.10
P-10820	Glass Crystal	.15
P-20875	Crystal Retainer Ring	.10
P-2090	6" Speaker Mantel Sets L1 - 1250 ohm	6.00
P-2091	8" Speaker Console Sets L1 - 1250 ohm	6.75
	8" Black Drive Cord (V. C. or T. C. Ind.)	.05
	29" Black Drive Cord (Cond. Drive)	.10
P-2136	Pilot Lamp Socket & Clip Assembly	.10
P-2101	Broadcast-Short Wave Switch	1.88

Part No.	Item	List Price
P-1885	No. 6D6 Socket	$ .15
P-2022	No. 76 Socket	.15
P-1944	No. 6B7 Socket	.15
P-1884	No. 42 Socket	.15
P-2025	No. 80 Socket	.15
P-1637	Speaker Socket	.10
P-40445	Tube Shield for 6D6 & 6B7 Tubes	.15
P-40444	Tube Shield for 76 Tube	.15
P-40443	Tube Shield Bases	.10
*P-50634	Power Transformer 115 Volts, 60 Cycles	3.00
*P-50635	Power Transformer 115 Volts, 25 Cycles	4.50
*P-50636	Power Transformer 115-230 Volts, 40-60 Cycles	3.25
†P-50646	Power Transformer 115 Volts, 60 Cycles	3.25
†P-50647	Power Transformer 115 Volts, 25 Cycles	4.50
†P-50648	Power Transformer 115-230 Volts, 40-60 Cycles	3.75
*P-50637	Filter Reactor	.85
P-50599 A	Output Transformer T 10	1.15
P-5176	Antenna R.F. Trans. less can T1 & T2	1.80
P-5177	Inter-Stage R. F. Trans. less can T3 & T4	1.75
*P-5178	Oscillator Coil Assembly Less can T8 & T9	1.70
†P-5183	Oscillator Coil Assembly Less can T9 & T9	1.70
P-40433	Cans for the above Assemblies	.15
†P-5190	High Frequency Oscillator Tracking Coil L2	.35
P-5179	1st I. F. Assembly Complete with Can T5	2.15
P-5180	2nd I. F. Assembly Complete with Can T6	1.75
P-30342-A	Grid Cap Only	.10
P-70702	AC Cord & Plug	.70
P-1504	8 Terminal Mounting Strip	.10

Part No.	Code	Resistance	Watts	Type	List Price
P-98016	R1	200 ohm	.2	Flex. Wire Wound	$ .15
P-B93303	R2	30,000 ohm	.5	Carbon	.20
P-B94602	R3	6,000 ohm	.5	Carbon	.15
P-A95205	R4	2.0 megohm	.2	Carbon	.15
P-98020	R5 / R6	16,000 ohm / 25,000 ohm	1.5 / 1.0	Armored wire wound	.65
P-A94203	R7	20,000 ohm	.2	Carbon	.15
P-B94603	R8	60,000 ohm	.5	Carbon	.15
P-B94254	R9	250,000 ohm	.5	Carbon	.15
P-96014	R10	500,000 ohm		Vol. Control & Switch	1.05
P-A94252	R11	2,500 ohm	.2	Carbon	.15
P-A94104	R12	100,000 ohm	.2	Carbon	.15
P-A95504	R13	500,000 ohm	.2	Carbon	.20
P-A94104	R14	100,000 ohm	.2	Carbon	.15
P-98015	R15	235 ohm	2.0	Flex. Wire Wound	.15
P-97011	R16	150,000 ohm		Tone Control	.75

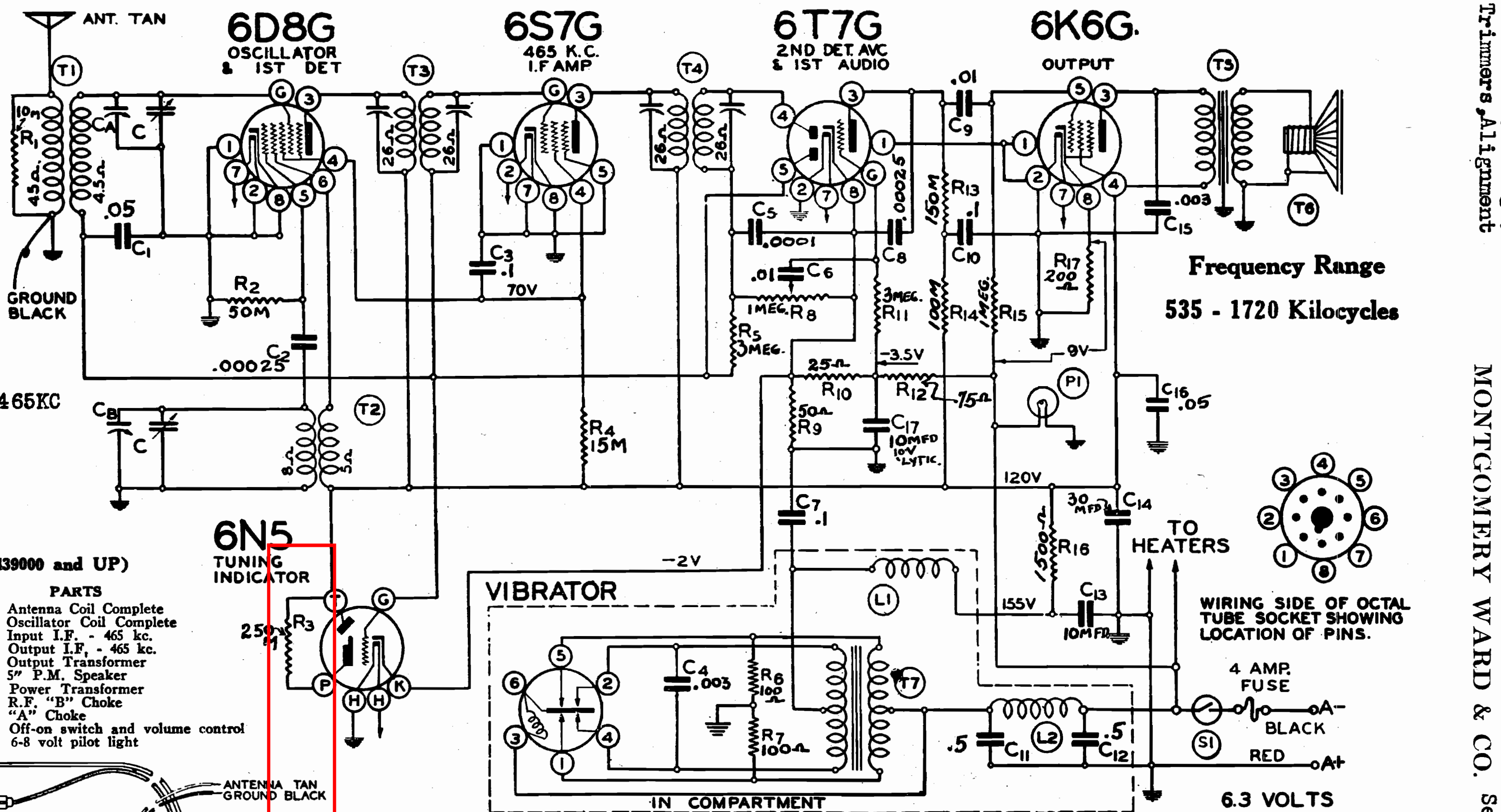
Part No.	Code	Capacity	Volts	Type	List Price
P-80919	C1	.00025 mfd.		Moulded	$ .20
P-2102	C2	3-40 mmfd.		Ant. S.W. Trimmer	.15
	C3	(See 3 Gang Cond.)		Gang Trimmer	
P-80862	C4	.05 mfd.	200V.	Tubular	.15
P-80888	C5	.25 mfd.	200V.	Tubular	.25
P-80890	C6	.05 mfd.	400V.	Tubular	.20
P-2102	C7	3-40 mmfd.		1st Det.S.W. Trim.	.15
	C8	(See 3 Gang Cond.)		Gang Trimmer	
P-1386-B	C9 / C10	90±30 mmfd. / 90±30 mmfd.		Dual Trimmer Part of I. F. Assem.	
P-81034	C11	.25 mfd.	300V.	Tubular	.30
P-1386-B	C12 / C13	90±30 mmfd. / 90±30 mmfd.		Dual Trimmer Part of I. F. Assem.	
P-81040	C14	.25 mfd.	400V.	Tubular	.35
P-80977	C15	.0001 mfd.		Moulded	.20
†P-81043	C16	18.0 mfd.	300V.	Electrolytic Wet	1.30
*P-80916	C16	8.0 mfd.	450V.	Electrolytic Wet	1.25
*P-81032	C17	8.0 mfd.	500V.	Electrolytic Wet	1.30
†P-81042	C17	14.0 mfd.	400V.	Electrolytic Wet	1.45
P-80862	C18	.05 mfd.	200V.	Tubular	.15
P-2112	C19	300-500 mmfd.		600 K.C. Trimmer	.45
P-2102	C20	3-40 mmfd.		Osc. S.W. Trimmer	.15
†P-1685	C21	70±30 mmfd.		6000 K.C. Trimmer	.35
	C22	(See 3 Gang Cond.)		Gang Trimmer	
P-81005	C23	.000035 mfd.		Moulded	.15
P-80914	C24	.002 mfd.	600V.	Tubular	.20
P-80981	C25	.01 mfd.	400V.	Tubular	.20
P-81044	C26	.03 mfd.	400V.	Tubular	.15
P-80914	C27	.002 mfd.	600V.	Tubular	.20
P-81033	C28	.25 mfd.	400V.	Tubular	.35
P-80887	C29	.1 mfd.	400V.	Tubular	.20
P-80890	C30	.05 mfd.	400V.	Tubular	.20
P-80887	C31	.1 mfd.	400V.	Tubular	.20
P-81027-B		3 Gang Condenser			3.35
*P-2113		600-1200 mmfd.		6000 K.C. Trimmer	.61

* Used in early Models. See Article on changes in this Manual
† Used in Later Models. See Article on changes in this Manual

Schematic, Voltage, Socket
Trimmers, Alignment

MONTGOMERY WARD & CO.

MODELS 62-280, 62-282, 62-284
Series B, Above Ser. 439000



(SERIAL #439000 and UP)

PARTS

T1	BE11085	Antenna Coil Complete
T2	BE11072	Oscillator Coil Complete
T3	BE10882C	Input I.F. - 465 kc.
T4	BE10883D	Output I.F. - 465 kc.
T5	BE10555	Output Transformer
T6	BE14104	5" P.M. Speaker
T7	BE104137B	Power Transformer
L1	BE10535	R.F. "B" Choke
L2	BE10519	"A" Choke
S1		Off-on switch and volume control
P1		6-8 volt pilot light

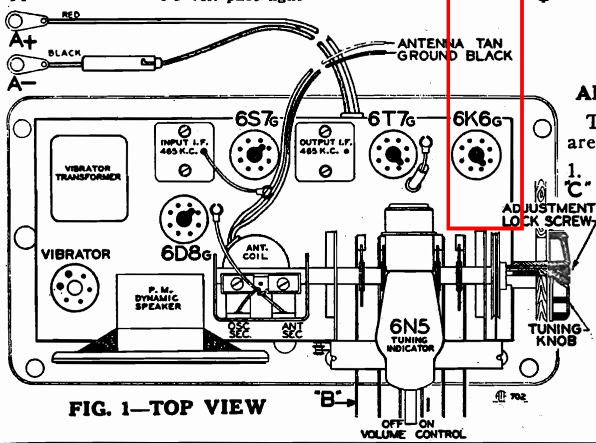


FIG. 1—TOP VIEW

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-83D) to resonance.
   (b) Move oscillator output clip from grid of 6S7G to grid of 6D8G and adjust input I.F. transformer (No. 108-82C) to resonance.
   (c) With oscillator still connected to 6D8G, readjust output I.F. transformer (108-83D) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.):

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

MODELS 62-280,62-282,62-284
MODELS 62-323,62-353
MODEL 62-324
MODEL 62-453
MODEL 62-459
MODELS 62-501,62-502
MODELS 62-504,62-505
TUNER DATA

MONTGOMERY WARD & CO

MODEL 62-552
MODEL 62-553
MODELS 62-558,62-1558,62-2558
MODEL 62-601
MODELS 93BR508A,93BR509A
MODEL 93BR564A
Tuner Data

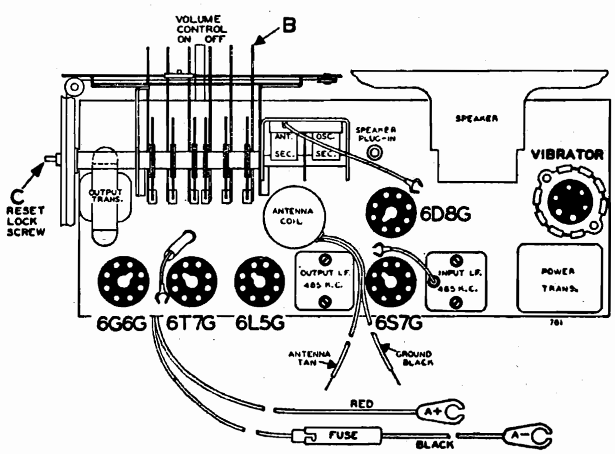


FIG. 1—TOP VIEW

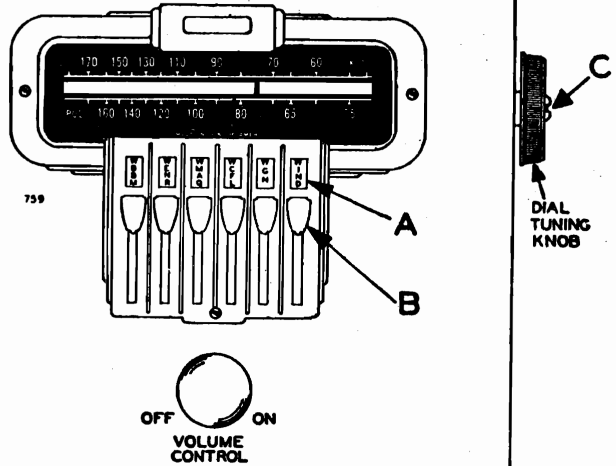


FIG. 2—FRONT VIEW

OPERATION:

The two control knobs in sequence from left to right are (see Fig. No. 2)

Knob 1, Volume Control and On-Off Switch.
Knob 2, Tuning Knob. (Side of Cabinet).

KNOB 1. VOLUME CONTROL AND "ON"-"OFF" SWITCH ARE COMBINED:

When turning on, a click will be heard and the dial will light. Wait approximately 45 seconds for the tubes to heat up. Turn knob all the way to the left to turn set off.

KNOB 2. MANUAL TUNING:

This radio may be used to tune in stations either by the conventional manual method or by using the Automatic levers. The tuning range of the radio is from 535 to 1735 kilocycles, the dial being calibrated in channel numbers. It covers all standard broadcast channels and one police band.

To convert channel numbers to kilocycles, add one zero. For example, 170 is 1700 kilocycles.

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are six levers on the dial by means of which six stations may be selected, (See "B," Fig. 2).

Press down any one of the six Automatic levers. Holding it down, tune in by means of tuning knob No. 2 any one of your favorite stations. Turn the tuning knob very slowly back and forth until signal is clearest. The stations will then be accurately tuned in.

Release this lever and press down any other Automatic lever. Hold this lever down and tune in by means of knob No. 2 another favorite station.

Follow this procedure until stations have been set on all the levers. Hold tuning knob securely with left hand to prevent it from turning and with a coin or screw driver, tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 2).

This screw will lock in place all stations you have selected on the Automatic levers. (Note: Locking Screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, hold the tuning knob securely and loosen locking screw ("C") one or two turns; select the new station as explained.

BE SURE TO RETIGHTEN THE LOCKING SCREW, otherwise ~~the stations will not stay adjusted to the levers~~.

Above each Automatic lever an opening in the escutcheon is provided for inserting station call letters, (See "A," Fig 2).

Punch the correct station call letter tabs from the set of sheets supplied and insert them into the rectangular openings in the escutcheon above each of the levers. One of the small, clear celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

The Automatic Tuner dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

TYPICAL TUNING DATA

The procedure for setting the Automatic Levers is the same for all the above mentioned models. However, the number of Automatic Levers may differ.

The locking screw "C" and automatic levers shown in both figs 1 and 2 are for the Model 62-552 receiver. However, this is a typical receiver.

MONTGOMERY-WARD & CO.

MODELS 62-292, 62-294
62-373, 62-374
Schematic

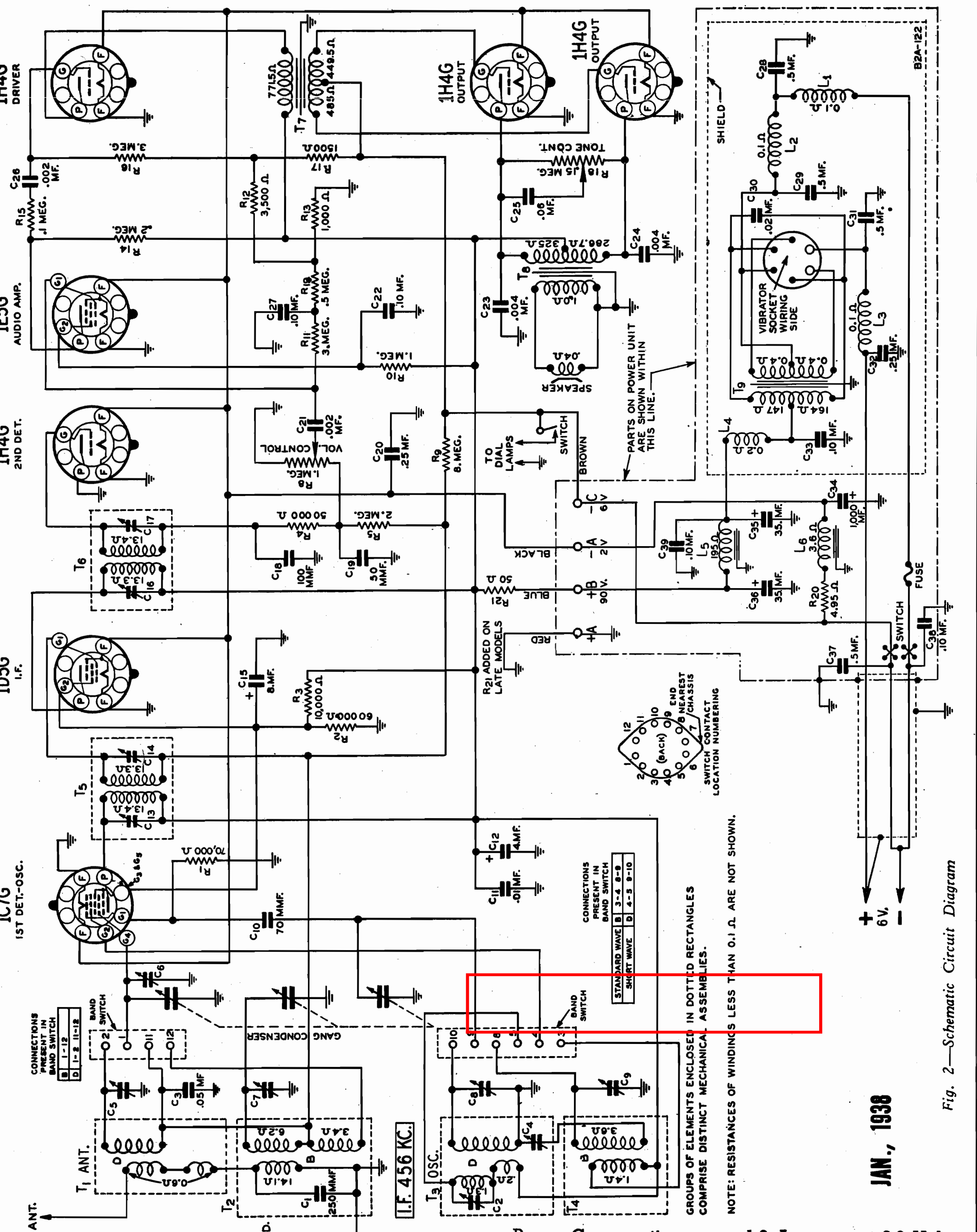


Fig. 2—Schematic Circuit Diagram

Sensitivity

- B Range .... 13.5 Microvolts Average
- D Range .... 21.0 Microvolts Average

Tuning Frequency Range

- B Range .... 528 to 1730 KC
- D Range .... 5750 to 18300 KC

Power Consumption - - 1.3 Amperes at 6.3 Volts

Power Output - - - - - 360 Milliwatts Undistorted; 725 Milliwatts Maximum

Selectivity - - 35 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - 6" P.M. Dynamic—Mantel Models; 8" P.M. Dynamic—Console Models

MODELS 62-292,62-294
62-373,62-374
Alignment,Voltage

MONTGOMERY-WARD & CO.

Coils,Socket,Trimmers
Drive Data, Notes

ALIGNMENT PROCEDURE

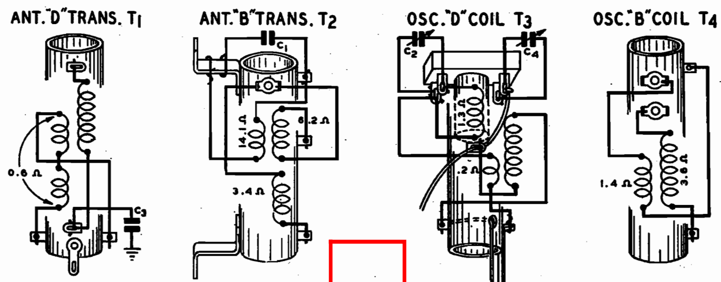
Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator With a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration	PROCEDURE INITIAL STEPS	PROCEDURE ADJUSTMENT
I.F.	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C13) & (C14) 2nd I.F. (C16) & (C17)	Turn Rotor to Full Open	Adjust to Maximum Output
RANGE B 1730 KC	Range B	200 mmf.	1730 KC	Antenna Lead	Oscillator Range B (C9)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	1st Ant. Range B (C7) 2nd Ant. Range B (C6)	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C4)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B
RANGE D 18300 KC	Range D	400 Ohm	18300 KC	Antenna Lead	Oscillator Range D (C8)	Turn Rotor to Full Open	Adjust to Maximum Output
15000 KC	Range D	400 Ohm	15000 KC	Antenna Lead	Ant. Range D (C5)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B
6000 KC	Range D	400 Ohm	6000 KC	Antenna Lead	6000 KC (C2)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B



NOTE: RESISTANCES OF WINDINGS LESS THAN .1Ω ARE NOT SHOWN

B2-56

Fig. 6—Coil Terminal Arrangement and D.C. Resistance of Windings

NOTE A—In sets using the finger tip tuning dial, remove the retaining ring which holds the dial scale in position. Readjust rotor to maximum output. Hold the station selector ring and turn the dial scale until the pointer is at the 1500 KC mark. Replace the retaining ring.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

After alignment of Range D has been completed, do not make any adjustments of the Range B trimmers. If this is done, it will be necessary to realign Range D.

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

VOLTAGES AT SOCKETS

Volume Control: Maximum
Readings taken with 1000 Ohm-per-volt meter.

Antenna Shorted to Ground
Band Switch in Standard Wave Position

TUBE	FUNCTION	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Control Grid Bias
		VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)						
1C7G	1st Det.—Osc.	0	103	66		103	2	
1D5G	I.F.	0	103	66			2	
1H4G	2nd Det.	0	0				2	
1E5G	Audio Amp.	0	40(1)	19(1)			2	1.0 Across R13
1H4G	Driver	0	100				2	4.5 Across R12 & 13
1H4G	Output	0	102		6		2	6 —C to Ground

(1) As read on 1000 volt scale.

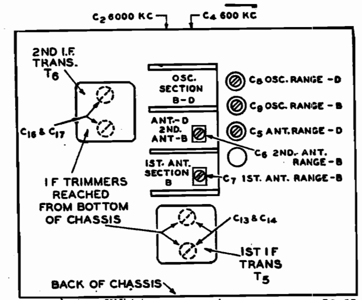


Fig. 3—Location of Trimmers

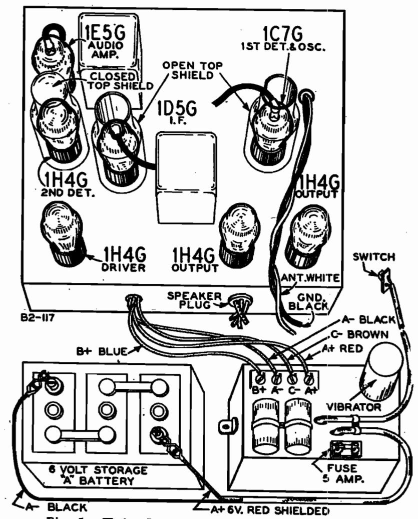


Fig. 5—Tube Arrangement and Battery Connections

A synchronous type vibrator is used in the power unit. This vibrator interrupts the current through the primary of the power transformer and also rectifies the current in the secondary circuit.

If, after a new 2 section dry electrolytic condenser has been installed, vibrator hash is encountered, reverse the connections of the 2 sections.

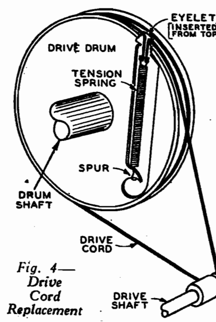


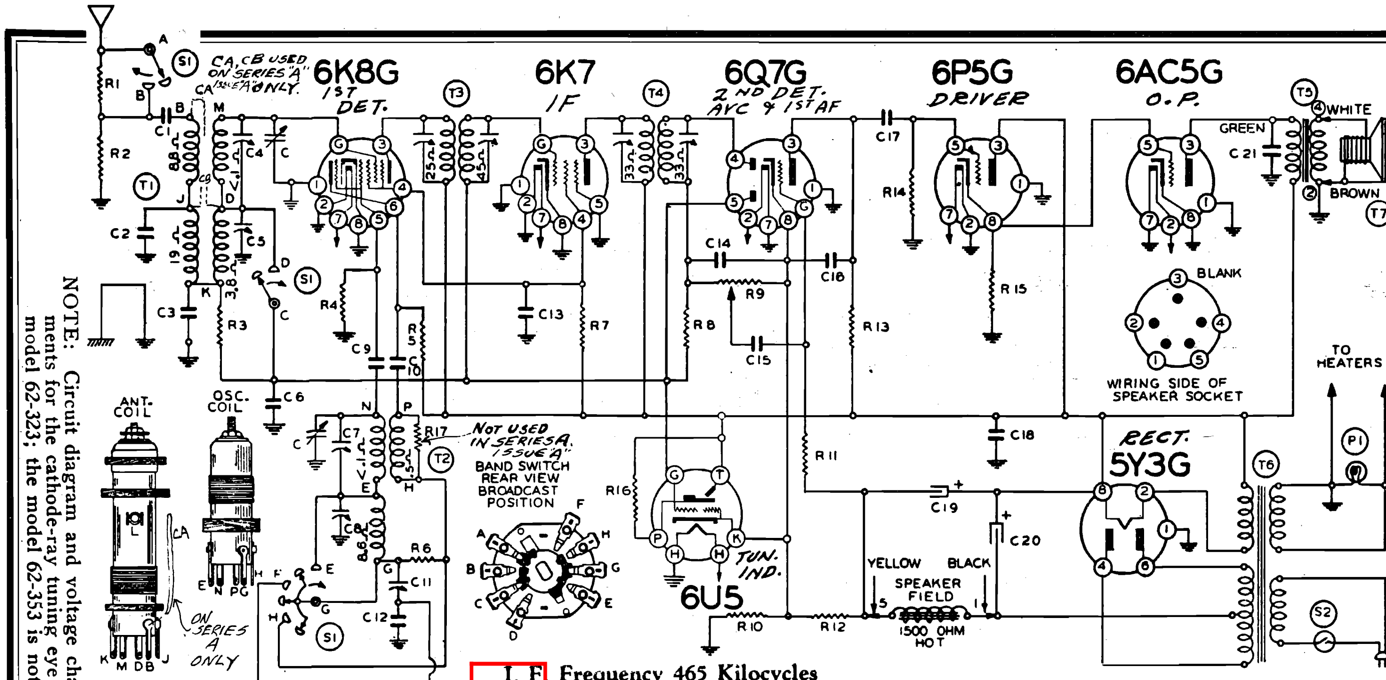
Fig. 4—Drive Cord Replacement

MODELS 62-323,62-353
Series A,Issue A
Ser.8J305400 up
Issue B,Ser.9B613100 up

Schematic,Voltage
Socket,Trimmers

MONTGOMERY WARD & CO.

Power Consumption .... 55 Watts (at 115 Volts 60 Cycles)
Power Output .... 1.5 Watts Undistorted, 3.2 Watts Maximum



I. F. Frequency 465 Kilocycles

FREQUENCY RANGE 540 to 1720 Kilocycles
5.45 to 18.3 Megacycles

THE FOLLOWING PARTS ARE COMMON TO BOTH ISSUES A AND B:

RESISTORS

R1	BE13041	800 ohm—½ w.
R2	BE13017	10M ohm—⅓ w.
R3	BE13020	100M ohm—⅓ w.
R4	BE13012	50M ohm—⅓ w.
R6	BE13031	1500 ohm—⅓ w.
R7	BE13042	20M ohm—½ w.
R8	BE1304	3 megohm—⅓ w.
R9	BE101126	1 megohm control (volume)
R11	BE1304	3 megohm—⅓ w.
R12	BE130203	40 ohm—⅓ w.
R13	BE1309	200M ohm—⅓ w.
R14	BE13019	1 megohm—⅓ w.
R15	BE130232	25M ohm—⅓ w.
R16	BE130110	1 Megohm (in Tuning Eye Socket)
R17	BE13023	2M ohm—⅓ w.
C	BE10274	2 gang variable condenser
C1	BE12987	.000105 Mica
C2	BE12949	.00009 Mica
C3	BE10077	.00304 x 600 v.
C4	BE12439	SW. Antenna Trimmer 2-25 mlfd.
C5	BE12453	BC. Antenna Trimmer 1-10 mmfd.
C6	BE10022	.05 x 400 v.
C7	BE12439	SW. Oscillator Trimmer 2-25 mmfd.
C8	BE12453	BC. Oscillator Trimmer 2-25 mmfd.
C9	BE12938	.00005 Mica
C10	BE10025	.002 x 600 v.
C11	BE12451B	350 mmfd. W.C. B.C. Series Pad
C12	BE129112	.0041 Compression Type (Short Wave Osc. Pad)
C13	BE10053	.25 x 400 v.
C14	BE12939	.00005 Mica
C15	BE10011	.01 x 400 v.
C16	BE1292	.0005 Mica
C17	BE10011	.01 x 400 v.
C18	BE10013	.05 x 400 v.
C19	BE11963B	8 mfd.—350 w. v. lytic
C20	BE11963B	12 mfd.—350 w. v. lytic
C21	BE10089	.008 x 800 v.

C5 and C8 in same unit. C18 and C19 in same unit.

PARTS

T1	BE11193C	SW. BC. Antenna Coil Complete
T2	BE11089	SW. BC. Oscillator Coil Complete
T3	BE108105G	Input I. F.—465 kc.
T4	BE108106D	Output I. F.—465 kc.
T5	BE10575	Output Transformer
T6	BE104124B	Power Transformer
T7	BE114125	6" Speaker Dynamic (1500 ohm field)
S1	BE12554	Band Switch
S2	BE101126	Off-on Switch on volume control
P1	BE10794	6.3 v. Pilot Light T-44

CERTAIN PARTS ARE DIFFERENT IN THE TWO ISSUES. THESE DIFFERENCES ARE SHOWN BELOW.

FOR ISSUE "A" ONLY

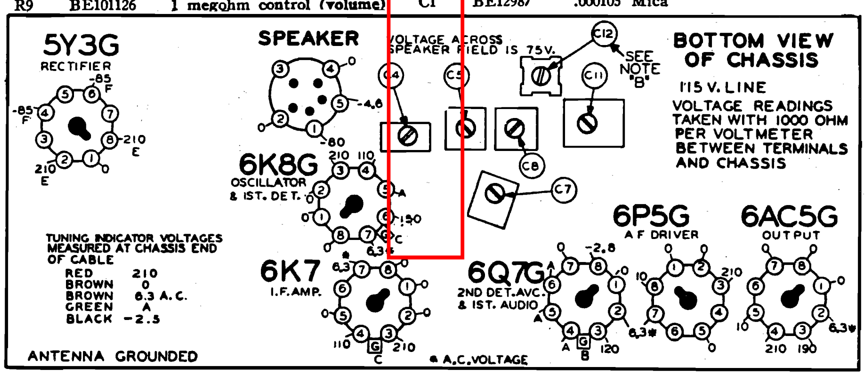
CA		Adjustable Capacitor
CB		Adjustable Capacitor
R5	BE13017	10M ohm—⅓ w.
R10	BE130233	60 ohm—⅓ w.

FOR ISSUE "B" ONLY

R5	BE13065	30M ohm—1 w.
R10	BE130203	40 ohm—⅓ w.

FOR SETTING UP PUSH BUTTONS, SEE INDEX.

REPAIR PARTS
Series A Issue A
(Serial No. 8J305400 and up)
Series A, Issue B
(Serial No. 9B613100 and up)



A - CANNOT BE MEASURED WITH VOLTMETER.
B - BIAS OF -1.8V READ ACROSS R-12
C - BIAS OF -2.8V READ ACROSS R-10
E - 5 V AC READ ACROSS TER. 2 & 8
F - 560 V AC READ ACROSS TER. 4 & 6

REAR OF CHASSIS

NOTE "B" Trimmer (C12) is the short wave osc. series pad. It is preadjusted at the factory and should not be tampered with.

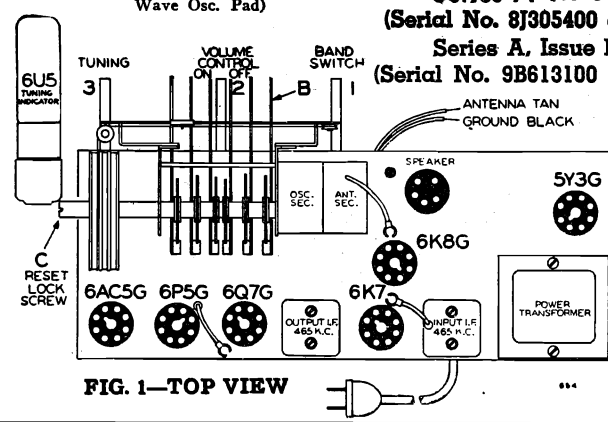


FIG. 1—TOP VIEW

NOTE: Circuit diagram and voltage chart indicate connections and voltage measurements for the cathode-ray tuning eye tube type 6U5. This data only applies to the model 62-323; the model 62-353 is not equipped with a cathode-ray tuning eye.

Feb. '39

MODELS 62-323,62-353
Series A,Issues A,B
Alignment,Notes

MONTGOMERY WARD & CO.

MODEL 62-380,Series A
Alignment,Socket
Trimmers

MODELS 62-323, and 62-353 Series A, Issues A & B
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short wave (Extreme right rotation)	Set dial at 17 MC	Trimmer (C7) (See Fig. 3)	Short wave Oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short wave (Extreme right rotation)	Dial set at 17 MC	Trimmer (C4) (See Fig. 3)	Short wave Antenna	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C8) (See Fig. 3)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 1400 Kc.	Trimmer (C5) (See Fig. 3)	Broadcast Antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 600 Kc.	Trimmer (C11) (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
IMAGE REJECTION ADJUST-MENTS	2100 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1170 Kc. on dial	Wire capacitor (CB) (See circuit diagram)	Image rejection	Adjust by twisting for minimum output. (See note "B")
	2630 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1700 Kc. on dial	Wire capacitor (CA) (See circuit diagram)	Image rejection	Adjust by moving for minimum output. (See note "C")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

- Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
- After each band is completed, repeat the procedure as a final check.

ISSUE "A" ONLY.

NOTE "B" 2100KC is the image frequency of 1170 KC. Adjust wire capacity (CB) by twisting the two wires until a minimum output is obtained.
NOTE "C" 2630KC is the image frequency of 1700KC. Adjust wire capacity (CA) by moving the wire either toward or away from the antenna coil winding until a minimum output is obtained on the output meter.

ALIGNMENT PROCEDURE MODEL 62-380 Series A

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6A8	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set dial at 17 MC.	Trimmer—Top of rear section of gang. (See Fig. 1)	Short wave Oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial set at 17 MC.	Trimmer (C19) (See Fig. 3)	Short wave Antenna	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C22) (See Fig. 3)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 1400 Kc.	(Trimmer (C21) (See Fig. 3)	Broadcast Antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 600 Kc.	Trimmer (C6) (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
After each range is completed, repeat the procedure as a final check.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.
All voltages as indicated on the voltage chart are measured with 115 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.
Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded

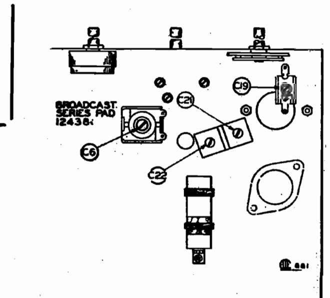


FIG. 3—BOTTOM VIEW SHOWING TRIMMERS

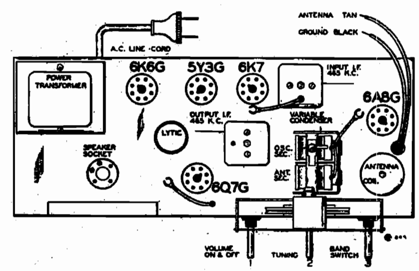
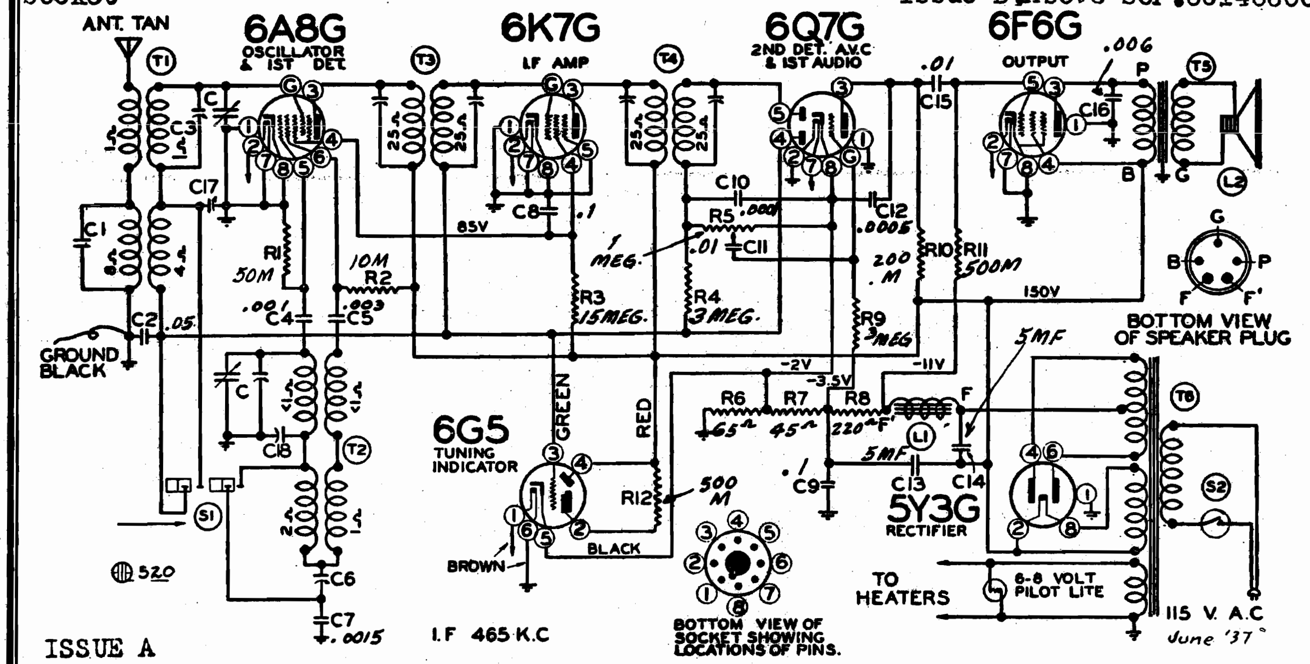


FIG. 1—TOP VIEW

Schematic, Voltage, Trimmers, Alignment Socket

MONTGOMERY WARD & CO.

MODELS 62-306, 62-406
Issue A, Above Ser. 7E659000
Issue B, Above Ser. 8C146800



ISSUE A

PARTS (SERIAL No. 7E659000 and UP)

ISSUE B **PARTS (SERIAL No. 8C146800 and UP)**

IF ALIGNMENT - 465 KC

Vol. Control full on, variable condenser in minimum capacity position:
Adjust to resonance 2 trimmers at 465 KC, thru a .1 mf. condenser.

SHORT WAVE ALIGNMENT - 2000 to 7000 KC

Dial at 6 MC, adjust to resonance the SW oscilator trimmer (at top of rear variable gang condenser) and SW Antenna trimmer No. 1 (Fig. 1) at 6 M.C., thru a .1 mf. condenser and 400 ohm resistor series.

BROADCAST ALIGNMENT- 535 to 1720 KC

Gang condenser in minimum capacity position; signal generator in series with a 200 mmf condenser and 20 ohm resistor series;-

(a) Adjust oscilator trimmer No. 3 Fig.3. to resonance at 1720 KC.
(b) Adjust Antenna trimmer No. 2 Fig. 3, to resonance at 1400 Kc.
(c) Adjust Padder No. 4 Fig. 3, to resonance at 600 KC.
(d) Repeat adjustments a & c until sensitivity is at maximum.
(e) Check for tracking & sensitivity at 1400, 1000 and 600 KC.

DO NOT BEND PLATES OF CONDENSER TO CORRECT TRACKING.

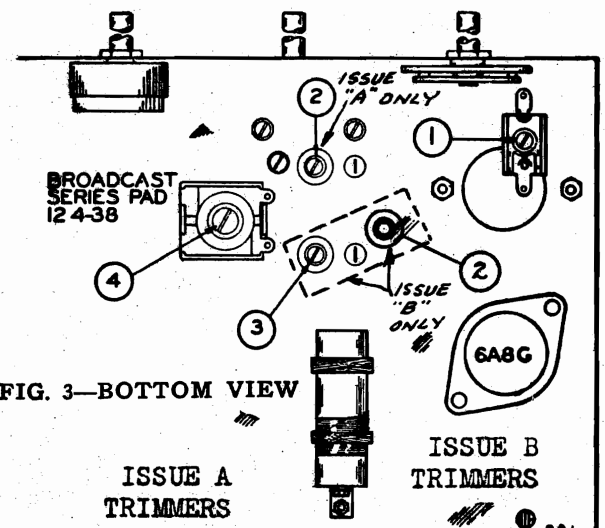


FIG. 3—BOTTOM VIEW

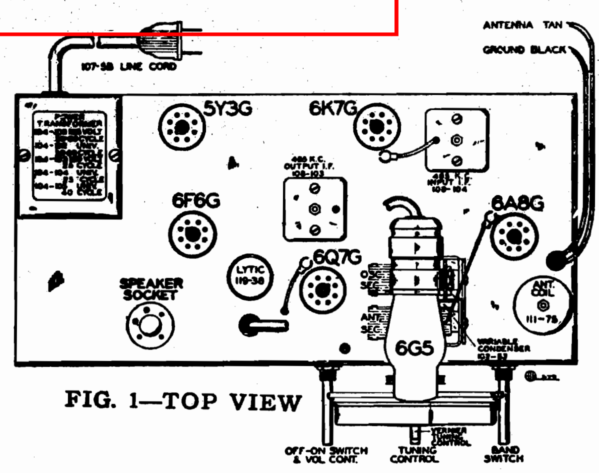
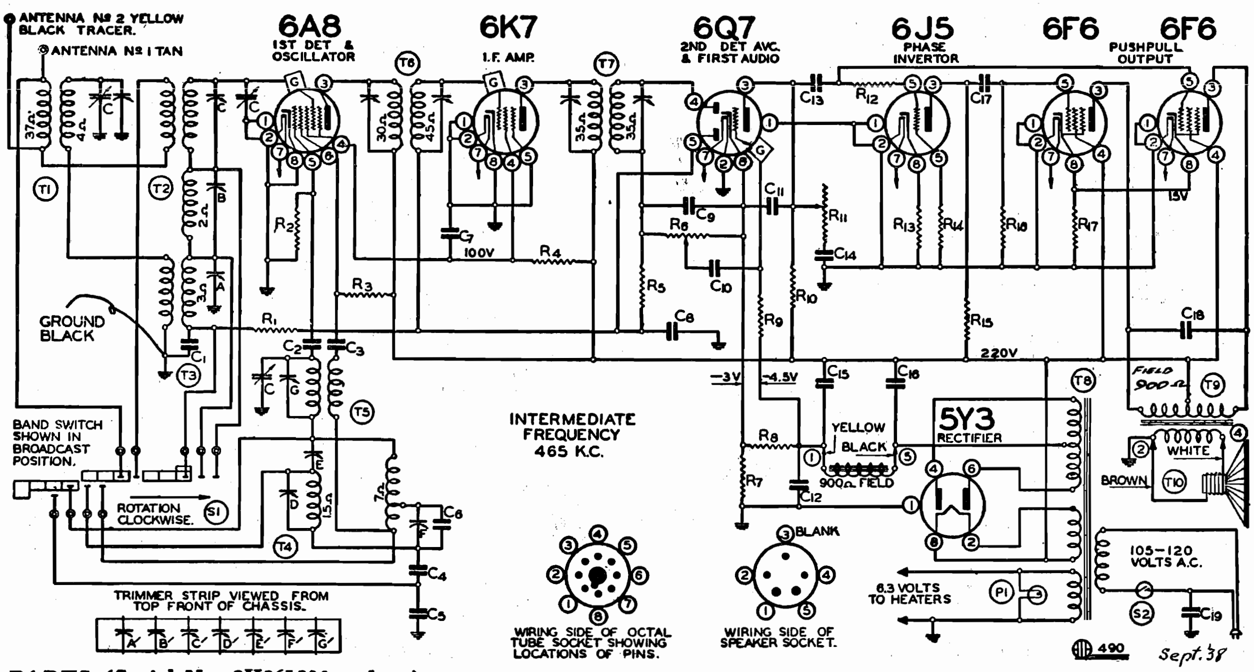


FIG. 1—TOP VIEW

MODEL 62-324
Schematic, Voltage

MONTGOMERY WARD & CO.

Socket, Trimmers
Alignment



PARTS (Serial No. 8H261200 and up)

RESISTORS

R1	130-103	100M ohm - 1/3 w. 10%
R2	130-12	50M ohm - 1/3 w. 20%
R3	130-123	15M ohm - 1/2 w. 10%
R4	130-196	30M ohm - 1 w. 10%
R5	130-4	3 megohm - 1/3 w. 20%
R6	101-104	1 megohm volume control
R7	130-198	40 ohm - 1/2 w. 10%
R8	130-197	20 ohm - 1/3 w. 10%
R9	130-4	3 megohm - 1/3 w. 20%
R10	130-103	100M ohm - 1/3 w. 10%
R11	101-105	300M ohm - tone control
R12	130-163	400M ohm - 1/3 w. 10%
R13	130-22	5M ohm - 1/3 w. 20%
R14	130-103	100M ohm - 1/3 w. 10%
R15	130-12	50M ohm - 1/3 w. 20%
R16	130-102	500M ohm - 1/3 w. 10%
R17	130-195	250 ohm - 1.2 w. 10%

CONDENSERS

C	102-62	3 gang variable
C1	100-23	.05 x 200 v. 25%
C2	129-67	.00004 Mica 10%
C3	100-25	.002 x 600 v. 25%
C4	129-83	.0027 Mica 2-1/2%
C5	129-84	.003 Mica 2-1/2%
C6	129-88	.0006 Mica 5%
C7	100-39	.1 x 400 v. 20%
C8	100-26	.02 x 400 v. 25%
C9	129-5	.0001 Mica 20%
C10	100-26	.02 x 400 v. 25%
C11	129-2	.0005 Mica 20%
C12	100-20	.1 x 200 v. 25%
C13	100-26	.02 x 400 v. 25%
C14	100-57	.006 x 600 v. + 10 - 20%
C15	103-14	16 mfd. lytic 275 w.v. Reg.
C16	103-6	8 mfd. lytic 350 w.v.
C17	100-26	.02 x 400 v. 25%
C18	100-37	.003 x 600 v. 10%
C19	100-61	.02 x 600 v. bakelite 20%

FOR TUNER DATA SEE INDEX

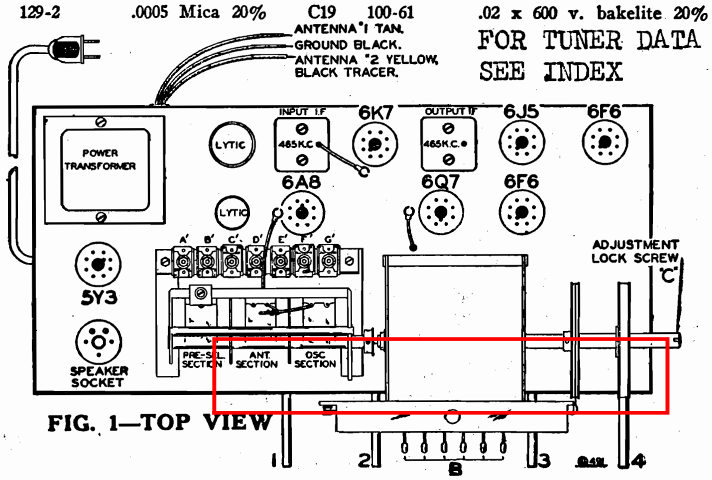


FIG. 1—TOP VIEW

I.F.-Vol.contr.full on; Var.at 1400KC. At 465KC-.1 mfd.dummy to grid cap of 6K7 tube,align output I.F.;signal to 6A8 grid cap,align input I.F.
B.C.BAND-Sw.in B.C.pos.;Var.at min.cap.;200mfd.and 20 ohm series resistor dummy to tan ant. lead. At 1750KC adjust trimmer E' to resonance. At 1400KC,trimmer A' and PRE-SEL section of var. to resonance. At 600KC trimmer F' to resonance. Repeat all adjustments of the band. Check sensitivity at 1000 KC.
S.W.BAND-.1 mfd.cond. in series with 400 ohm resistor as dummy;band sw. in S.W. pos. At 17MC,dial at 17MC,adjust G'and C' to resonance. At 6 MC check sensitivity For band coverage check set at 18,1 and 5.5 MC.
MIDDLE BAND- Band sw. at middle wave pos.Dummy as for S.W. adjustments. At 5000 KC, dial at 5000 KC, adjust D'and B' to resonance. At 1900KC check sensitivity; then recheck B.C.Band alignment.

Socket, Trimmers
Alignment

MONTGOMERY-WARD & CO.

MODEL 62-364
Schematic
Voltage

Set the signal generator for 175 KC and connect the output of the signal generator through a .05 mf. condenser to the stator of the interstage section (middle) of the tuning condenser. Connect the ground lead of the signal generator to the chassis. Set the volume control at maximum and the L-D switch in the distance position. Attenuate the signal from the signal generator to prevent the levelling off action of the AVC. Then adjust the 4 IF trimmers until maximum output is obtained–

Insert the antenna cable plug in the antenna socket on the chassis. Now refer to the antenna capacity changeover socket.

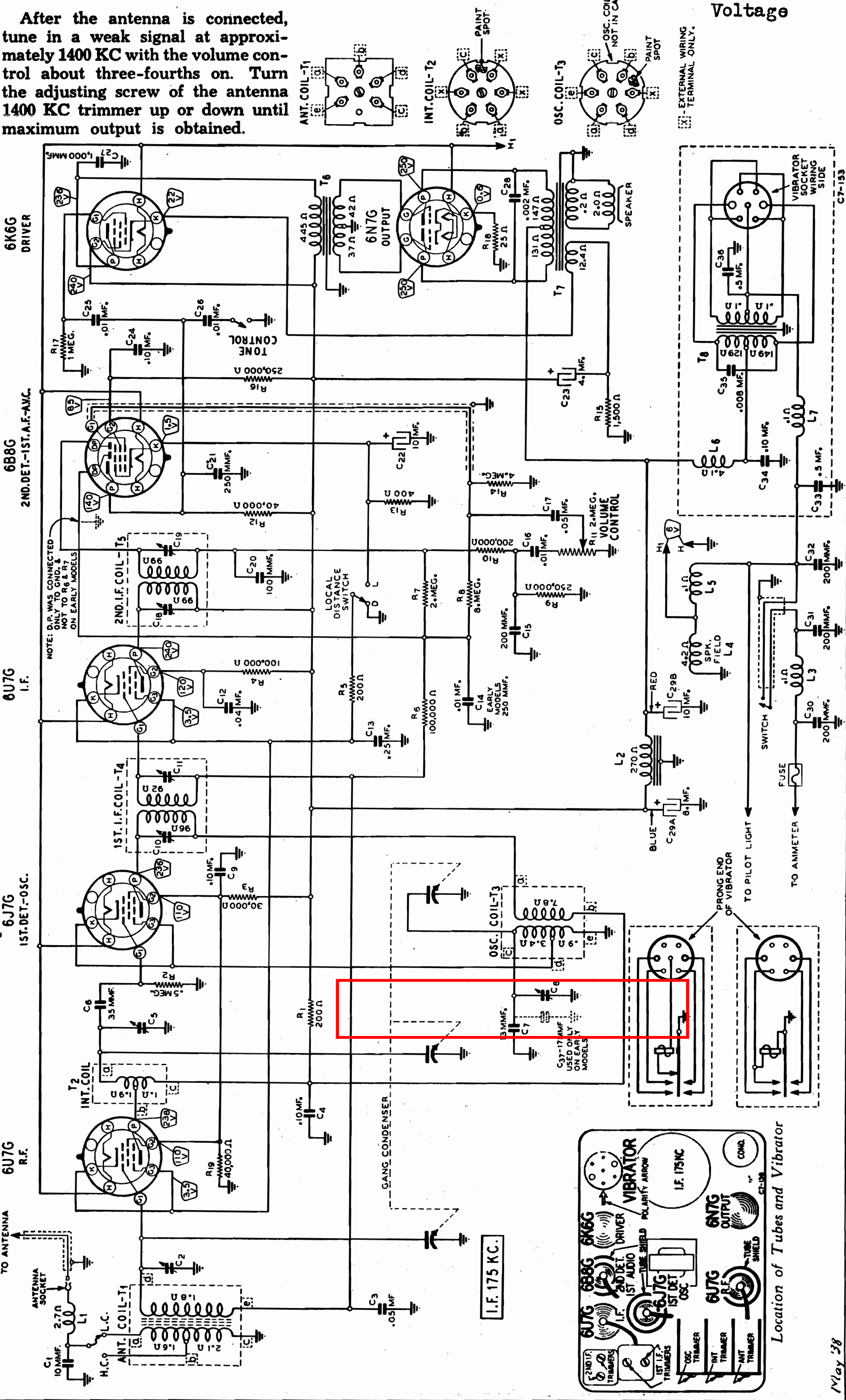
If the jumper is inserted between the HC holes of this socket and the entire 60-inch shielded cable (70 mmf.) is being used, connect the antenna wire at the other end through a 120 mmf. condenser to the antenna post of the signal generator.

If the jumper is inserted between the LC holes of this socket, the antenna cable has been cut as explained in the instructions. If cut in half (30-inch length), the capacity of the antenna cable is approximately 35 mmf. Connect the antenna wire, in this case, through a 25 mmf. condenser to the antenna post of the signal generator.

Set the signal generator for 1581 KC. Turn the rotor of the tuning condenser to the full open position. Adjust the trimmer of the oscillator section of the gang condenser until maximum output is obtained. See Fig. 4 for location of this trimmer.

Set the signal generator for 1400 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the interstage and antenna 1400 KC trimmers for maximum output. Do not change the setting of the oscillator trimmer.

After the antenna is connected, tune in a weak signal at approximately 1400 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 1400 KC trimmer up or down until maximum output is obtained.



MODEL 62-369
Schematic,Socket

MONTGOMERY-WARD & CO.

Trimmers,Alignment

Alignment and Calibration

Set the signal generator for 175 KC and connect the output of the signal generator through a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. Connect the ground lead of the signal generator to the chassis. The chassis should be in the case. Set the volume control at maximum and the L-D switch in the distance position. Attenuate the signal from the signal generator to prevent the leveling off action of the AVC. Then adjust the three I.F. trimmers until maximum output is obtained - See Fig. 2.

Set the signal generator for 1581 KC. Turn the rotor of the tuning condenser to the full open position. Insert the antenna plug with the mark on the high capacity (HC) side. Connect the shielded antenna lead from the chassis through a 120 mmf. condenser to the antenna post of the signal generator. Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained.

Set the signal generator for 1400 KC. Carefully turn the rotor of the tuning condenser until maximum output is obtained. Adjust the 1st detector and antenna 1400 KC trimmers for maximum output. Do not change the setting of the oscillator trimmer.

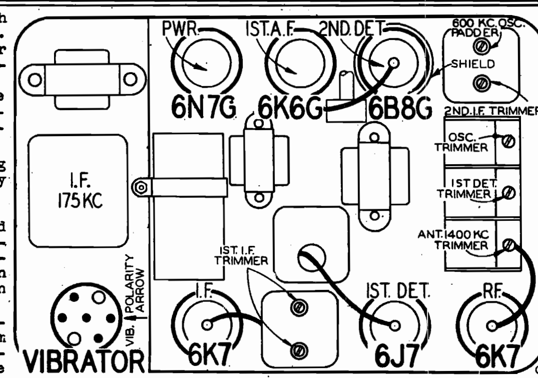
Set the signal generator for 600 KC. Connect the output through a .05 mf. condenser to the control grid of the 6K7 R. F. tube. Rock the tuning condenser rotor and adjust the 600 KC oscillator padder (See Fig. 2) until the peak of greatest intensity is obtained.

Leave the signal generator set for 600 KC and re-connect the output to the shielded antenna lead through a 120 mmf. condenser. Adjust the 600 KC antenna trimmer to maximum. (This trimmer is reached from outside of the case - See Fig. 1.)

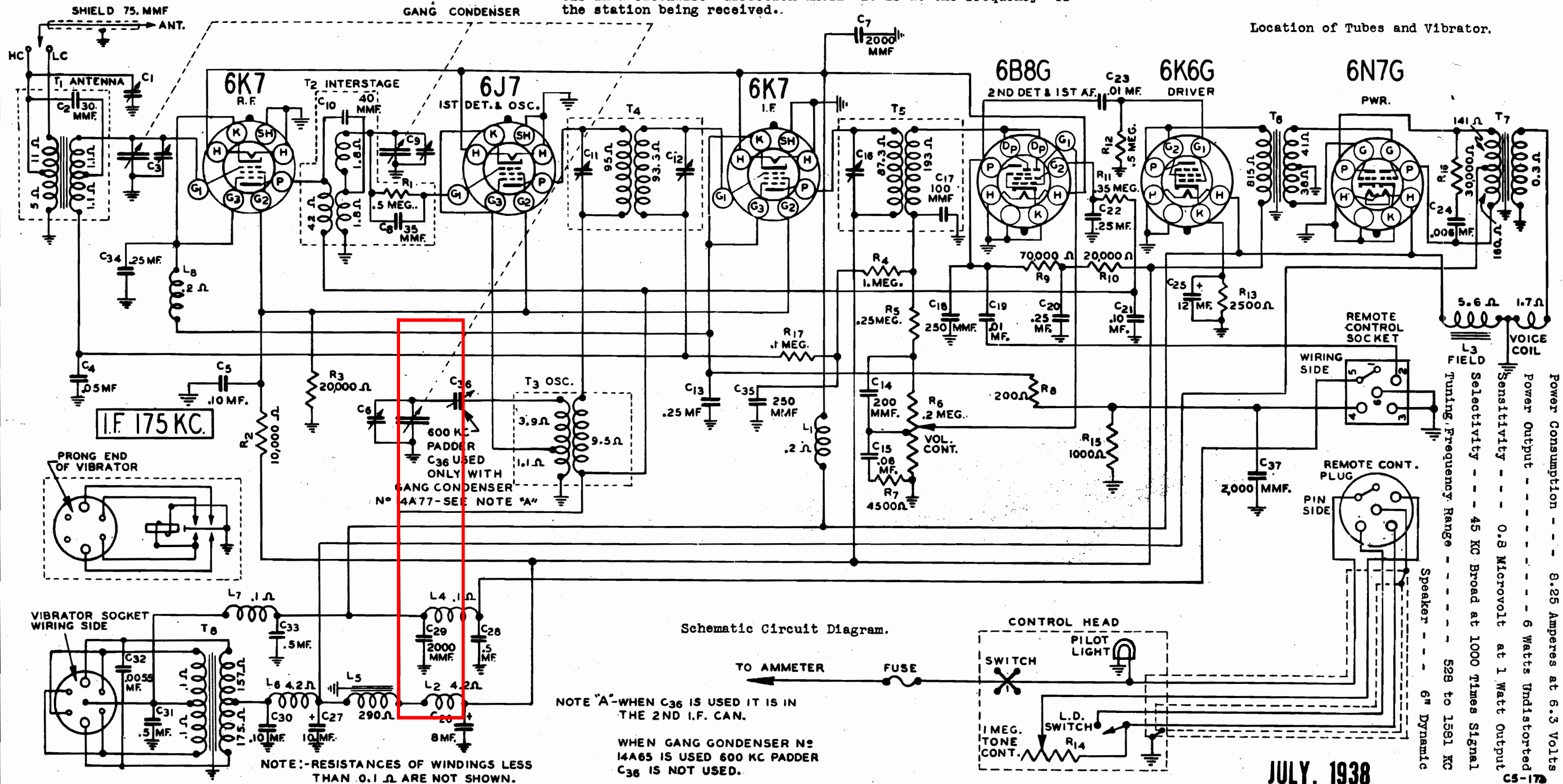
After the alignment procedure is completed, the antenna plug may be withdrawn and reinserted on the LC side if a low capacity (70 mmf.) car antenna is used.

Adjusting Antenna 600 KC Trimmer - After the radio is installed and the car antenna is connected, it will be necessary to readjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained.

Calibrating the Radio - To calibrate the radio, tune in a station of known frequency. Remove the dial lamp assembly from the back of the dial unit. The calibration screw is at the bottom of the dial lamp tube. Hold the tuning knob. Insert a fine blade screwdriver and turn this screw so that the POINTER travels in a clockwise direction until it is at the frequency of the station being received.



Location of Tubes and Vibrator.



Schematic Circuit Diagram.

NOTE "A"-WHEN C36 IS USED IT IS IN THE 2ND I.F. CAN.

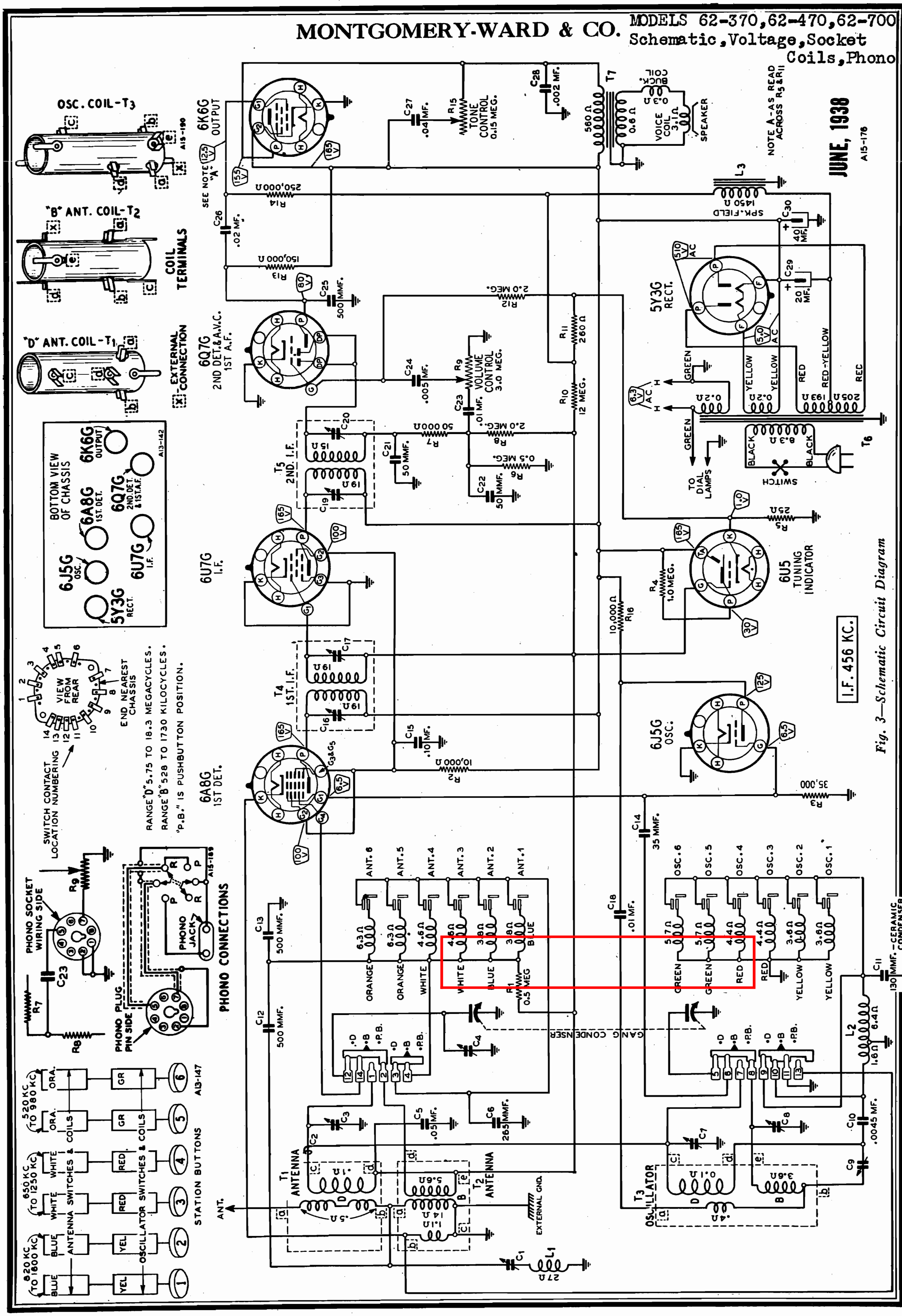
WHEN GANG GONDENSER Nº 14A65 IS USED 600 KC PADDER C36 IS NOT USED.

NOTE:-RESISTANCES OF WINDINGS LESS THAN 0.1 Ω ARE NOT SHOWN.

Power Consumption	- - -	8.25 Amperes at 6.3 Volts
Power Output	- - - - - - - - -	6 Watts Undistorted
Sensitivity	- - -	0.8 Microvolt at 1 Watt Output
Selectivity	- - -	45 KC Broad at 1000 Times Signal
Tuning Frequency Range	- - - - - -	528 to 1581 KC
Speaker	- - -	6" Dynamic

C5-17B

JULY, 1938



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MODELS 62-370,62-470,62-700
Alignment,Trimmers

MONTGOMERY WARD & CO.

Power Consumption - 50 Watts (At 117 volts 60 cycles)
Power Output - - - - - - 1.0 Watts Undistorted, 2.0 Watts Maximum
Selectivity - - 38 KC Broad at 1000 times Signal
Sensitivity
- B Range (Manual Tuning)..................15 Microvolts Average
- B Range (Automatic Tuning)............15 Microvolts Average
- D Range ....25 Microvolts Average

Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - - - 6" or 8" Dynamic
Tuning Frequency Range
- B Range (Manual Tuning).... 528 to 1730 KC (Kilocycles)
- D Range (Manual Tuning)....5750 to 18300 KC (Kilocycles)
- Buttons 1 and 2 (Automatic Tuning)............820 to 1600 KC
- Buttons 3 and 4 (Automatic Tuning)............650 to 1250 KC
- Buttons 5 and 6 (Automatic Tuning)............520 to 980 KC

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (Unless otherwise specified)
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C16) & (C17) 2nd I.F. (C19) & (C20)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C8)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Ant. Range B (C4)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C9) Rock Rotor—See Note B
WAVE TRAP					
456 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to 600 KC Adjust Sig. Gen.—See Note C	Wave Trap (C1) Adjust for MINIMUM Output
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C3) Rock Rotor—See Note B
PERMEABILITY TUNING UNIT			BUTTON DEPRESSED (Band Switch in Push Button Position)	TURN SETTING SCREW TO MAXIMUM OUTPUT —See Instruction Book	ADJUST COIL POSITION TO MAXIMUM OUTPUT —See Note D
1100 KC	Antenna Lead	200 mmf.	No. 1	Setting Screw No. 1	Antenna Coil No. 1
1100 KC	Antenna Lead	200 mmf.	No. 2	Setting Screw No. 2	Antenna Coil No. 2
850 KC	Antenna Lead	200 mmf.	No. 3	Setting Screw No. 3	Antenna Coil No. 3
850 KC	Antenna Lead	200 mmf.	No. 4	Setting Screw No. 4	Antenna Coil No. 4
700 KC	Antenna Lead	200 mmf.	No. 5	Setting Screw No. 5	Antenna Coil No. 5
700 KC	Antenna Lead	200 mmf.	No. 6	Setting Screw No. 6	Antenna Coil No. 6

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1500 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1500 KC mark, and tighten the clamps.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—Leave condenser rotor at the 600 KC setting and adjust the signal generator until maximum output is obtained at or near 456 KC.

NOTE D—At the top of the permeability tuning unit can be seen six "W" openings. Insert the end of a pair of long nose pliers or a screwdriver in the "W" opening of the proper button and adjust the position of the antenna (rear) coil by twisting the pliers or screwdriver until maximum output is obtained.

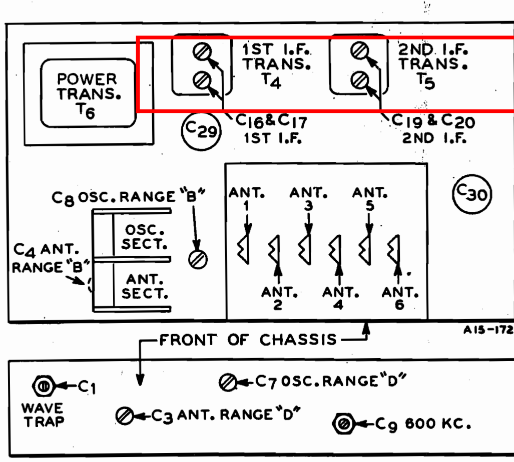


Fig. 2—Location of Trimmers

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

MODEL 93BR560A
MODEL 93BR657A
MODEL 93BR713A
Tuner Data

MONTGOMERY WARD & CO.

MODELS 62-370, 62-470
62-700
MODELS 62-704 to 62-712
MODELS 62-902, 62-905

MODELS 62-370, 62-470, 62-700; 62-902, 62-905; 62-704 to 62-712

Procedure for Setting the Station Buttons

Selecting the Stations to be Set

There are 6 buttons on the push button tuning dial by means of which 6 stations may be set for quick tuning. They are numbered 1 to 6 in Fig. 2.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the station with the highest kilocycle number first, the station with the next lower kilocycle number next, and so on.

Frequencies Covered by Each Button

The frequency range of each station button is shown in Fig. 2. Any station within the range of a button may be set. Although, in some cases, it may be possible to set a certain station on several buttons, it is better to set the stations so that the kilocycle numbers decrease from buttons 1 to 6.

Setting a Station Button

Select a station from the list you have prepared, preferably the station with the highest kilocycle number, and tune in this station with the tuning knob in the usual way. Determine what program is being broadcast.

At each side of the escutcheon plate is an escutcheon screw—See Fig. 2. Remove the escutcheon plate by unscrewing these two screws. Be careful to avoid scratching the plate.

When this is done, the setting screws above the six buttons will be exposed.

Turn the band switch knob to the PUSH BUTTON TUNING position —See Fig. 2. The station tuned in previously will probably disappear.

If the kilocycle number of the station tuned in is within the range of button No. 1, push this button in. The same station or a different station may be heard.

With a small screw driver, slowly turn the setting screw above button No. 1 in or out until the desired station (the one previously tuned in) is heard. Turning the screw in (clockwise) will tune in stations with higher kilocycle numbers while turning the screw out (counter-clockwise) will tune in stations with lower kilocycle numbers. Be sure not to tune in some other station broadcasting the same program. Using the tuning eye as a guide, *accurately* tune in this station. The station is now set on this button.

To determine whether the correct station has been set, turn the band switch knob back to the BROADCAST position. The same station should be heard (provided the tuning knob has not been turned). If it is not, turn the band switch knob to the PUSH BUTTON TUNING position again and retune with the setting screw.

Remove the station call letter tab from the sheets provided and push the tab all the way to the bottom of the rectangular space above the correct station button opening in the escutcheon plate. Then cover the call letter tab with one of the clear celluloid tabs.

Proceed in the same manner to set stations on any of the remaining buttons. Use blank tabs above buttons on which stations are not set.

After all of the stations have been set, carefully replace the escutcheon plate.

If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of any of the other buttons. The old call letter tab may be removed by sticking a pin through the notch in the celluloid tab and through the call letter tab.

MODELS 62-370 etc.

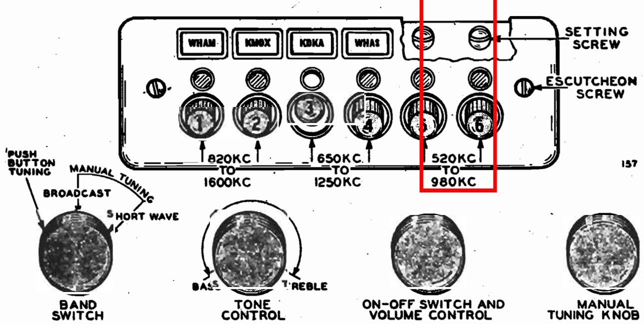


Fig. 2—Location of Controls and Push Buttons

MODELS 93BR560A, 93BR657A, 93BR713A

PROCEDURE FOR SETTING THE AUTOMATIC TUNER PUSHBUTTONS

NOW, PROCEED AS FOLLOWS:—

Unlock the tuner mechanism.
(NOTE:—The automatic tuner mechanism is locked **tight** when radio is shipped from the factory.)

1. Remove the snap-in button from the dial escutcheon plate on the front panel of the radio (**see "C," Reset Lock Screw, Fig. 2**). If the snap-in button will not come out easily using your fingers, pry it off with a screwdriver or a knife, being careful not to mar the finish on the escutcheon plate.

2. **Unlock the tuner mechanism** by inserting a screwdriver through the hole in the panel. **Press in** and **loosen the locking screw** by turning **it to the right** as far as it will turn **without forcing.**
You will note that as the locking screw is turned it will turn easily until the dial reaches its stop and then a slight amount of force will be required to **actually start unlocking** the tuner mechanism. Beyond this point, the locking screw will turn quite easily again until the tuner mechanism is **completely unlocked.** At this point do not force the locking screw any further. The tuner mechanism is now **unlocked.**

SETTING PUSHBUTTONS:

1. Press **in all the way** any one of the automatic tuner pushbuttons. **Holding it in firmly,** press on the Dial Tuning Control, No. 4, and tune in the station indicated on the station call letter tab on this pushbutton. You will note that in order to tune the station, the Dial Tuning Control will have to be pressed slightly. Move the Dial Tuning Control very slowly up and down (while **still holding the automatic tuner pushbutton in firmly**), noting the width of the shadow on the screen of the cathode-ray tuning eye. **Minimum** width on the tuning eye indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in.
2. Press in another tuner pushbutton. **Holding it in firmly,** press on the Dial Tuning Control and carefully tune in the station indicated on the call letter tab on this pushbutton.
3. Follow this procedure until you have selected all of your favorite stations. (NOTE:—If the dial mechanism works hard or has a tendency to slip when setting up a station **for one of the pushbuttons,** it is due to the tuner mechanism **not being unlocked all the way.** Loosen the reset locking screw. The Dial Tuning Control **should turn the dial drum freely with a pushbutton pushed in).**

LOCKING THE TUNER MECHANISM

1. **To lock the tuner mechanism** insert a screwdriver through the hole in the escutcheon panel and press in and turn the **reset locking screw to the left,** until it cannot be turned any further **without forcing it.**
2. This will lock the tuner mechanism and all the **stations** that have been set up on the pushbuttons will **be locked in place** for automatic tuning.
Press in any one of the pushbuttons and—YOUR FAVORITE STATION IS SELECTED.

MODELS 93BR560A etc.

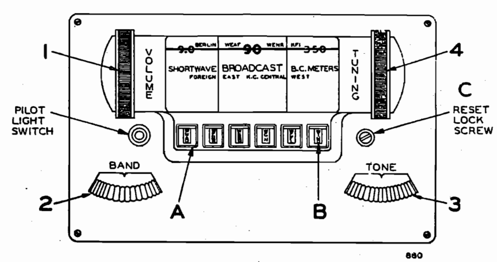


FIG. 2—FRONT VIEW

MODEL 62-380
Series A
Ser.9C618200 up
Schematic, Voltage
Socket

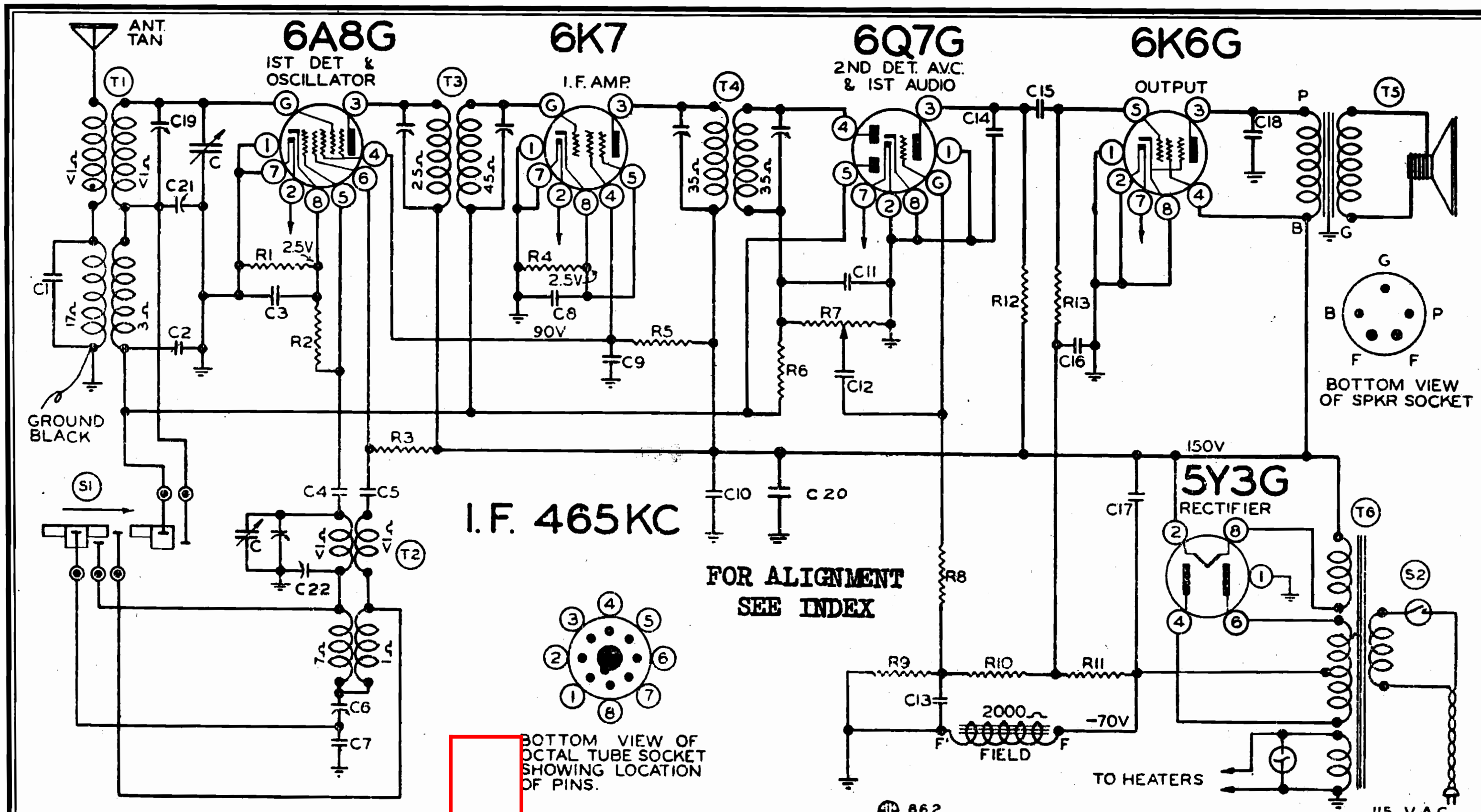
MONTGOMERY WARD & CO.

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.5 to 18.1 MC.
Extreme Left Rotation	Broadcast	535 to 1720 KC.

Power Consumption........55 Watts (At 115 volts 50-60 cycles)

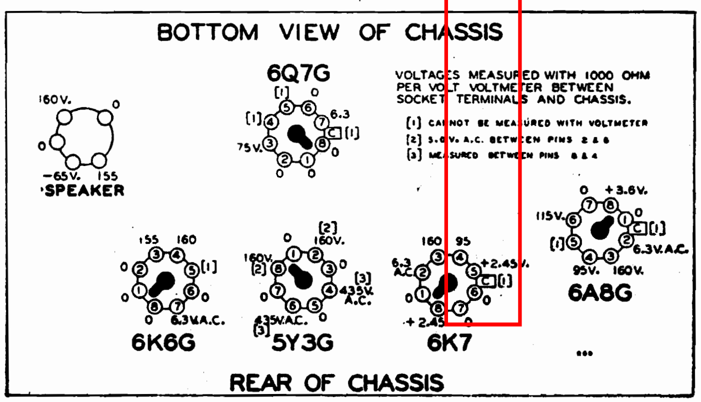
Power Output........750 Watts Undistorted, 1.6 Watts Maximum

Intermediate Frequency........465 KC.



FOR ALIGNMENT SEE INDEX

PARTS (SERIAL No. 9C618200 and UP)



RESISTORS

R1	BE13083	300 ohm—⅓ w.—10%
R2	BE13012	50M ohm—⅓ w.—20%
R3	BE13017	10M ohm—⅓ w.—20%
R4	BE13093	450 ohm—⅓ w.—10%
R5	BE130149	15M ohm—⅓ w.—20%
R6	BE1304	3 megohm—⅓ w.—20%
R7	BE10171	1 megohm Volume control
R8	BE1304	3 megohm—⅓ w.—20%
R9	BE130176	20M ohm—⅓ w.—10%
R10	BE13080	150M ohm—⅓ w.—10%
R11	BE13046	800M ohm—⅓ w.—10%
R12	BE1309	200M ohm—⅓ w.—20%
R13	BE1303	500M ohm—⅓ w.—20%

CONDENSERS

C	BE10243B	2 gang variable condenser
C1	BE1295	.0001 Mica
C2	BE10022	.05 x 200 v.—25%
C3	BE10020	.1 x 200 v.—25%
C4	BE12939	.00005—20%—Mica
C5	BE10025	.002 x 600 v.—20%
C6	BE12438	600 mmf. Series Pad Adj.
C7	BE12954	.003—2½% Mica
C8	BE10020	.1 x 200 v.—25%
C9	BE1001	.1 x 400 v.—50-10%
C10	BE11938	5.0 mfd.—250 w. v. 'Lytic
C11	BE1295	.0001—20% Mica
C12	BE10011	.01 x 400 v.—25%
C13	BE10020	.1 x 200 v.—25%
C14	BE1292	.0005—20% Mica
C15	BE10026	.02 x 400 v.—25%
C16	BE10020	.1 x 200 v.—25%
C17	BE11938	5.0 mfd.—250 w. v. 'Lytic
C18	BE10037	.003 x 600 v.—10%
C19	BE12439B	2-25 mmf. Adj. Cond.
C20	BE10013	.05 x 400 v.—25%
C21	BE12430C	Adj. Cond. 1-10 mmf.
C22	BE12430C	Adj. Cond. 2-20 mmf.
		C21—C22 in same unit
T1	BE11183	Ant. Coil
T2	BE11066B	Osc. Coil
T3	BE108105B	Input I. F.—465 kc.
T4	BE108106B	Output I. F.—465 kc.
T5	BE11461	6" Dynamic Speaker (2000 ohm field)
T6	BE10460B	Power Transformer
S1	BE12537	Wave Band Switch
S2		On-off switch on volume control

MONTGOMERY WARD & CO.

MODELS 62-386, 62-636, 62-646
Schematic, Voltage, Alignment
Resistances

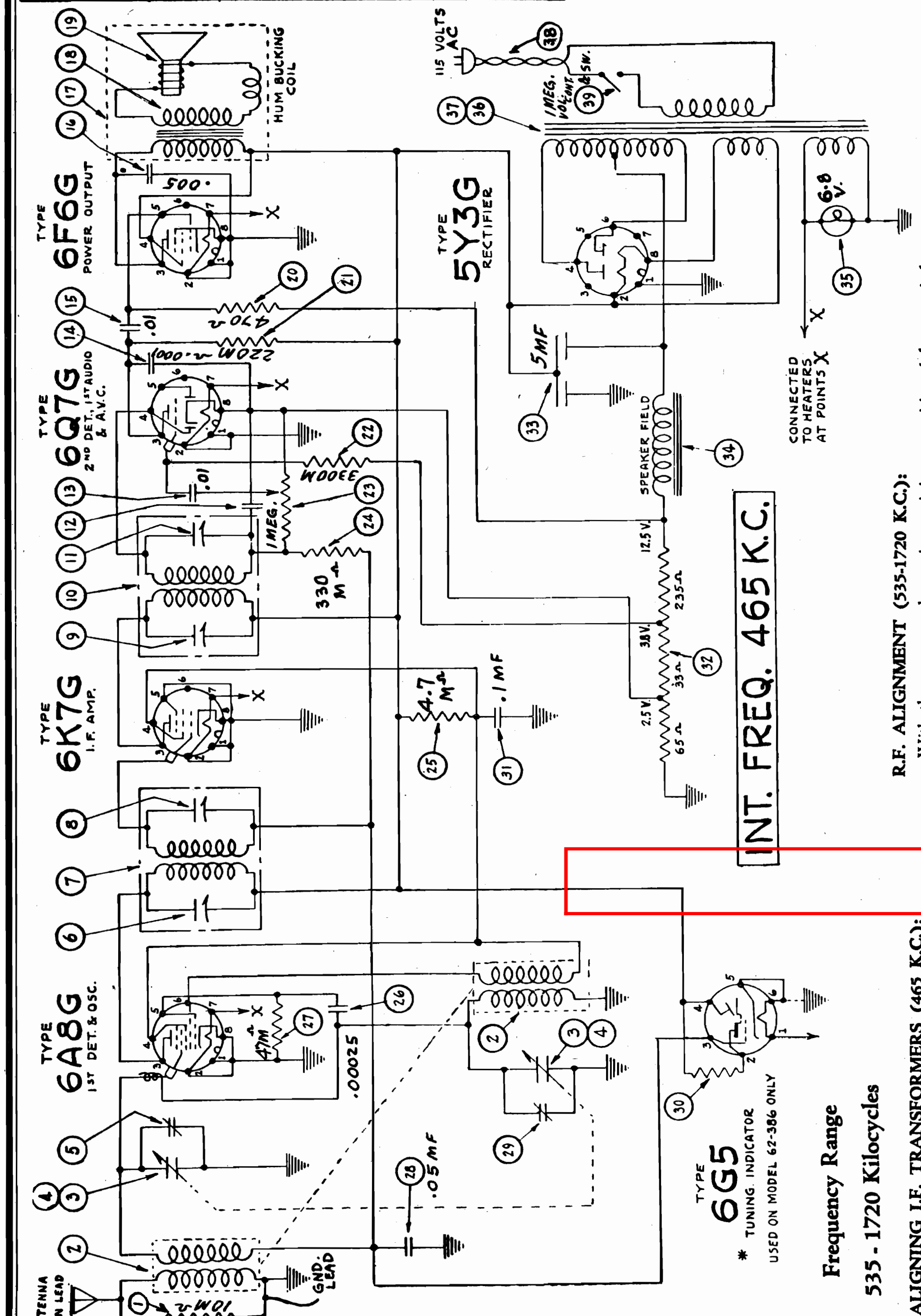
WINDING RESISTANCE

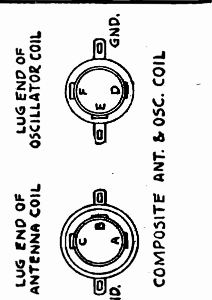
PART	FUNCTION	PRIMARY OHMS	PRIMARY IDENT.	SECONDARY OHMS	SECONDARY IDENT.
2	ANT. COIL	19	A To GND.	4.5	B To C
2	OSC. COIL	2.0	D To E	4.0	F To GND.
7	1ST I.F. COIL	18.5	GREEN TO RED & YEL.	18.5	RED TO BLUE
10	2ND I.F. COIL	18.5	GREEN TO RED & YEL.	18.5	RED TO BLUE
18	OUTPUT TR.	550	3 TO 4 6F6G SOCK.	.5	
19	VOICE COIL	3.5			
34	SPKR. FIELD	1700	YELLOW TO BLACK		
36	PWR. TRANS.	15	3 ON RECT. SOCK. TO SW.	558	4 TO 6 RECT. SOCK.
	5 V. SEC.			.2	2 TO 8 " "
	6.3 V. SEC.			.25	2 TO 7 6Q7G SOCK.
37	PWR. TRANS.				

SOCKET VOLTAGES

NOTE: ALL VOLTAGES READ WITH 1000 OHM PER VOLT VOLTMETER FOR 115 V. LINE

TUBE	STAGE	FIL.	PIN NO.	PLATE	PIN NO.	SCREEN	PIN NO.
6A8G	DET.-OSC.	6.3	2 To 7	PENT. 155 OSC. 100	1 To 3	100	1 To 4
6K7G	I.F. AMPLIFIER	6.3	2 To 7	155	1 To 3	100	1 To 4
6Q7G	2ND. DET. 1ST A.F.	6.3	2 To 7	75	1 To 3	100	1 To 4
6F6G	OUTPUT A.F.	6.3	2 To 7	148	1 To 3	155	1 To 4
5Y3G	RECTIFIER	5.0	2 To 8				
6G5	TUNING INDICATOR	6.3	1 To 6	155	6 To 4		





R.F. ALIGNMENT (535-1720 K.C.):

With the gang condenser in a minimum position (plates entirely out of mesh) the dial reading should be at the end marking of the scale.

1. Connect the test oscillator in series with a 200 mmf. condenser to the tan antenna lead from the chassis.
2. Set the oscillator and gang condenser to 1500 K.C. and adjust oscillator trimmer No. 29 (rear section of condenser gang).
3. Set the test oscillator and gang to 1400 K.C. and adjust antenna trimmer No. 5 (front section of condenser gang).
4. Check sensitivity at 1000 and 600 K.C.

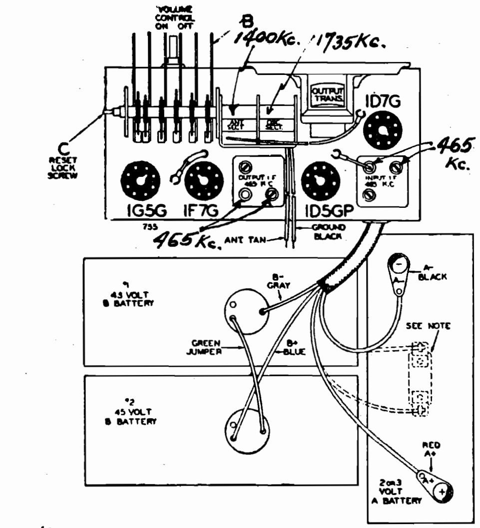
ALIGNING I.F. TRANSFORMERS (465 K.C.):

1. Connect an output meter across the voice coil of the speaker or across the primary of the output transformer.
2. Connect an external oscillator which has been adjusted to 465 K.C. in series with a .1 mfd. condenser, to the control grid of the 6A8-G tube.
3. Connect the oscillator ground to the black chassis ground lead.
4. Adjust I.F. trimmers Nos. 6, 8, 9 and 11 to resonance, at the same time reducing the output of the oscillator as required.

MODEL 62-453, Series A
Ser. 489500 up
Schematic, Voltage
Socket, Trimmers
Alignment

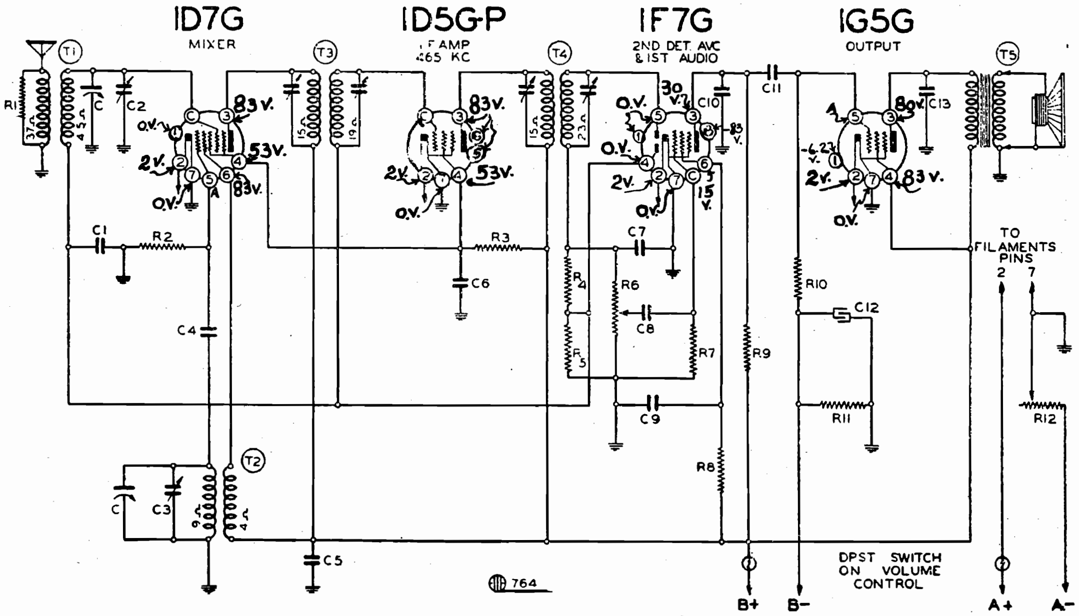
MONTGOMERY WARD & CO.

MODEL 62-459
MODEL 62-552
MODEL 62-553
MODEL 62-601
Alignment



Dec. '38

FIG. 1—TOP VIEW



D.C. VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
VOLUME CONTROL AT MIN., ANT. GROUNDED.
2 VOLT "A" AND 90 VOLT "B" BATTERIES
A-CANNOT BE READ WITH VOLTMETER

The following batteries are required:

2—45 Volt "B" Batteries.

1—3 Volt Dry "A" Battery or 2 Volt Storage Battery.

Check the Position of the Knob on the Back of the Radio Before Making any Battery Connections

PARTS (SERIAL No. 489,500 and UP)

RESISTORS

R1	BE13021	20M ohm—1/3 w.
R2	BE13012	50M ohm—1/3 w.
R3	BE13017	10M ohm—1/3 w.
R4	BE13038	2 megohm—1/3 w.
R5	BE13038	2 megohm—1/3 w.
R6	BE101155	1 megohm—volume control
R7	BE13019	1 megohm—1/3 w.
R8	BE13019	1 megohm—1/3 w.
R9	BE1309	200M ohm—1/3 w.
R10	BE13019	1 megohm—1/3 w.
R11	BE13093	450 ohm—1/3 w.
R12	BE101156	3.2 ohm rheostat

CONDENSERS

C	BE10287B	2 gang variable condenser
C1	BE1009	.05 x 200 v.
C2		Antenna Trimmer
C3		Oscillator Trimmer
C4	BE12912	.00025 mica
C5	BE10064	.25 x 200 v.
C6	BE10020	.1 x 200 v.
C7	BE1295	.0001 mica
C8	BE10011	.01 x 400 v.
C9	BE1009	.05 x 200 v.
C10	BE1292	.0005 mica
C11	BE10011	.01 x 400 v.
C12	BE11952	25 mfd. x 25 w. v. lytic
C13	BE10071	.004 x 600 v.

PARTS

T1	BE111114	Antenna Coil
T2	BE11095	Oscillator Coil
T3	BE108111E	Input I. F.—465 kc.
T4	BE108112D	Output I. F.—465 kc.
T5	BE114145	5" P. M. Speaker

FOR ADJUSTMENT OF AUTOMATIC TUNING LEVERS, SEE INDEX.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer
- Allow chassis and signal generator to "heat up" for several minutes.

THIS ALIGNMENT APPLIES ALSO TO
MODELS 62-459, 62-553, 62-601, and 62-552.

BAND	Signal Generator Frequency Setting	Signal Generator Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of last I.F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of first I.F. (Mixer Tube).	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1735 Kc.	200 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC. **After each band is completed, repeat the procedure as a final check.**

MONTGOMERY WARD & CO.

MODELS 62-471,62-472
Schematic

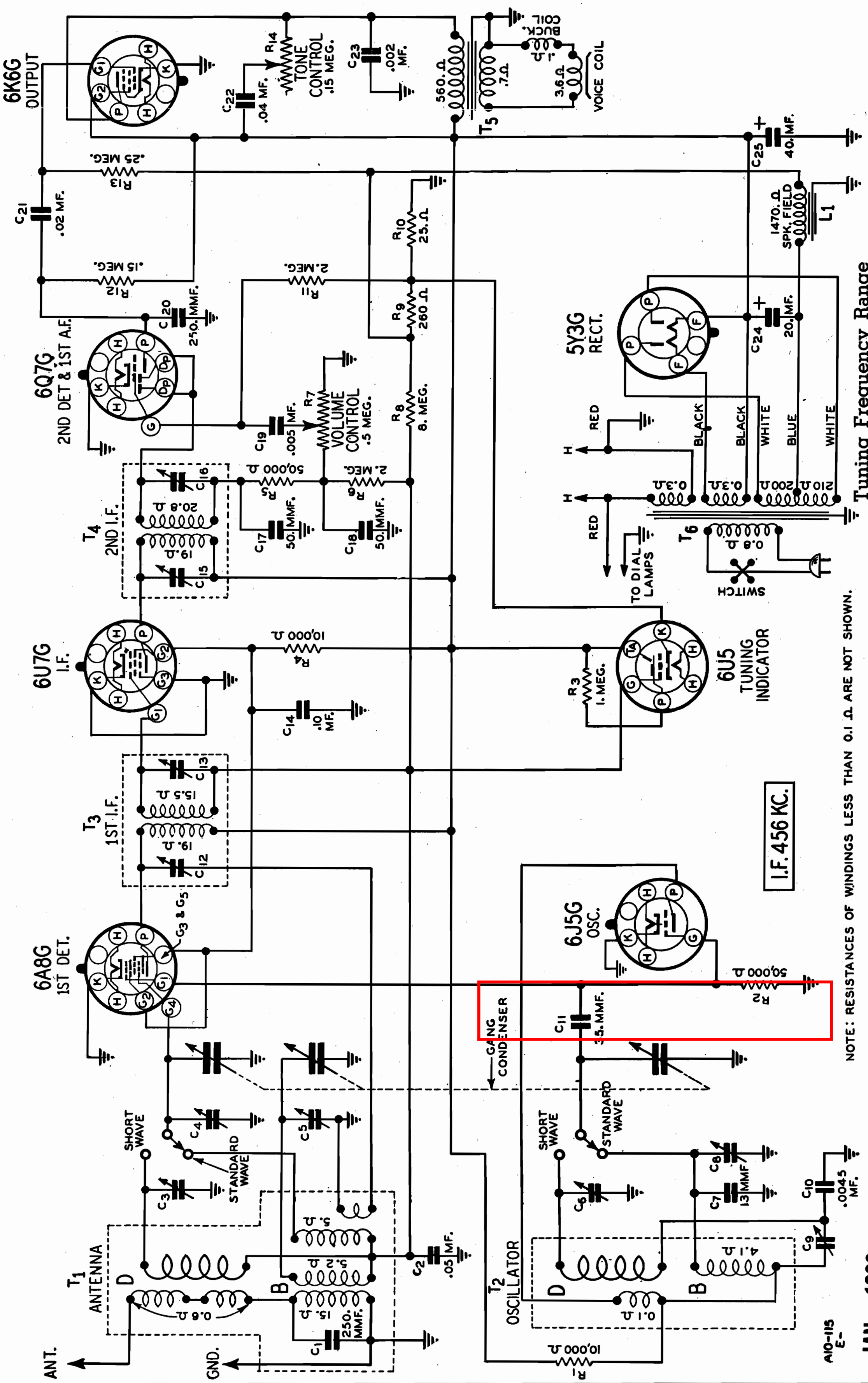


Fig. 1—Schematic Circuit Diagram

Tuning Frequency Range

B Range .... 528 to 1730 KC (Kilocycles)

D Range .... 5750 to 18300 KC (Kilocycles)

Sensitivity

B Range .... 15 Microvolts Average

D Range .... 20 Microvolts Average

Speaker - - - - 6″ or 8″ Dynamic

A10-115
E-

JAN., 1938

Power Consumption - 50 Watts (At 117 volts 60 cycles)

Power Output - - - - - 1.0 Watts Undistorted
2.0 Watts Maximum

Selectivity - - 38 KC Broad at 1000 times Signal

MODELS 62-471,62-472
Socket,Trimmers,Tuner
Alignment,Voltage
Drive Cord Data

MONTGOMERY-WARD & CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator With a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

The following equipment is required for aligning:
An all Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration	PROCEDURE INITIAL STEPS	PROCEDURE ADJUSTMENT
I.F.							
456 KC	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C12) & (C13) 2nd I.F. (C15) & (C16)	Turn Rotor to Full Open	Adjust to Maximum Output
RANGE B							
1730 KC	Range B	200 mmf.	1730 KC	Antenna Lead	Oscillator Range B (C8)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	1st Ant. Range B (C5) 2nd Ant. Range B (C4)	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C9)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor— See Note B
RANGE D							
18300 KC	Range D	400 Ohm	18300 KC	Antenna Lead	Oscillator Range D (C6)	Turn Rotor to Full Open	Adjust to Maximum Output
15000 KC	Range D	400 Ohm	15000 KC	Antenna Lead	Ant. Range D (C3)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor— See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

After alignment of Range D has been completed, do not make any adjustments of the Range B trimmers. If this is done, it will be necessary to realign Range D.

NOTE A—After the 1500 KC adjustment is made, the dial indicator should be at the 1500 KC mark on the dial scale. If it is not, the position of the indicator on the drive cord must be changed. This procedure, however, should not be followed unless it is absolutely necessary as there is danger of breaking the clamp which holds the indicator in place.

If the indicator must be moved, loosen the clamp at the back which holds it in place, move the indicator to the correct position, and bend the clamp back into place again.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

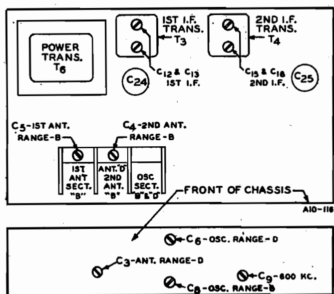


Fig. 2—Location of Trimmers

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control: Maximum.
Readings taken with a 1000 Ohm-per-volt meter.
Antenna Shorted to Ground.
Position of Band Switch: Standard Wave.

VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)

TUBE	FUNCTION	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6A8G	1st Det.	0	6.1(1)	165	90	6.5	90	6.1(1)	0
6J5G	Osc.	0	6.1(1)	125		6.5		6.1(1)	0
6U7G	I.F.	0	6.1(1)	165	90	0		6.1(1)	0
6Q7G	2nd Det. & 1st. Audio	0	6.1(1)	80				6.1(1)	0(2)
6K6G	Output	0	6.1(1)	155	165	12.5(3)		6.1(1)	0
5Y3G	Rectifier	0	4.7(4)		480(5)		480(5)		4.7(4)
6U5	Tuning Indicator	Plate to Ground 35		Target to Ground 165		Cathode to Ground 1		Across Heater 6.1 A.C.	

(1) A.C. voltage read across heater terminals 2 and 7.
(2) Bias (1.2 volts) as read across R10.
(3) Bias voltage as read across R9 and R10.
(4) A.C. voltage as read across filament terminals 2 and 8.
(5) A.C. voltage as read across terminals 4 and 6.

Replacing Drive Cords

Three drive cords, Nos. 1, 2, and 3, as shown in Fig. 5, are used. To replace any of these cords, proceed as follows:

Cord No. 1

Turn the gang condenser to full open position.

Turn the drive shaft so that the holes for the cord are vertical. The positions of the drive shaft and drive drum are shown in Fig. 5.

Tie a double knot in one end of the cord. From the bottom of hole (A) in the drive shaft, thread the other end of the cord through the hole.

Slide a ½ inch length of fabric tubing on the cord, placing it near the free end. Fasten the shorter of the two springs used to the free end of the cord, making the distance between the two knots 27⅞ inches.

Starting at the point where the cord leaves hole (A), wind it around the shaft ¾ of a turn as shown in Fig. 5. Bring the end up to the wide groove (B) in the drive drum and wind on 2¼ turns, progressing toward the edge of the groove. Pass the cord through the slot at (C), placing the fabric tube (F) in position to protect the cord from being cut, and hook the spring to the pin at (D).

Cord No. 2

The gang condenser and tuning shaft should be in the same position as explained for Cord No. 1.

Tie a double knot in one end of the cord. From the top of hole (E) in the drive shaft, thread the other end of the cord through the hole.

Slide a ½ inch length of fabric tubing on the cord, placing it near the free end. Tie a slip knot with a small loop in the free end of the cord so that the length of the cord is 12 inches between the knots.

Starting at the point where the cord leaves hole (E), wind it around the shaft 3¼ turns as shown in Fig. 5. Do not attempt to wind the cord on the drive drum, but put the loop in the slip knot over pin (G). Rotate the drive drum clockwise about ½ a turn. This will unwind the cord on the drive shaft at (E).

Pass the cord through the slot at (C), placing the fabric tube (F) in position to protect the cord from being cut. While holding the cord on the wide flange, rotate the drive drum counterclockwise. The cord will be pulled into position in the groove.

Cord No. 3

The gang condenser and drive drum should be in the same position as explained for Cord No. 1.

Tie one end of the cord on hook (H).

Slide a ½ inch length of fabric tubing over the cord. Place this tubing approximately 13½ inches from the end of the cord to be attached to the spring.

Tie the other end of the cord to the longer of the two springs used. The length of the cord between the knots should be 34⅜ inches.

Pass the cord through slot (J) in groove (P) of the drive drum. Bring the cord up to pulley (K), around the other pulleys as shown in Fig. 5, and down to groove (P). After passing the cord around the drive drum ½ turn in groove (P), fasten the spring to hook (Q).

Attaching Dial Pointer—Tune in a station of known frequency. Move the pointer to this frequency on the dial scale. After the pointer has been moved to the correct position, clamp it tightly over the fabric tubing on the cord—See Fig. 5.

Lever Tuning Assembly Adjustments

Pressure of Spacers on Heart Cams — The heart cams must rotate freely relative to the shaft spacers when the tightening lever is in the "loose" position and must not rotate relative to the shaft spacers when this lever is in the "tight" position.

Pressure of the spacers against the heart cams is determined by the position of nut (R) on the threaded shaft—See Fig. 5. If, after the tightening lever is turned to the "tight" position, the cams can turn relative to the shaft, this nut must be tightened.

Bend back the ears of washer (S)—See Fig. 5, and tighten nut (R) about ½ turn. Bend the ears of the washer down again on nut (R). Tighten the tightening lever and see if the cams are sufficiently tight.

In general, nut (R) should be at such a position on the threaded shaft that the stop on the tightening lever moves to about ⅛ inch from the end of the slot in the tightening washers when a reasonable amount of pressure is exerted on this lever.

Connection between Gang Condenser and Cam Shaft—One screw only should be used in the universal joint connection between the condenser shaft and the cam shaft. If 2 screws are used, considerably more pressure must be exerted on the station levers to rotate the cam shaft.

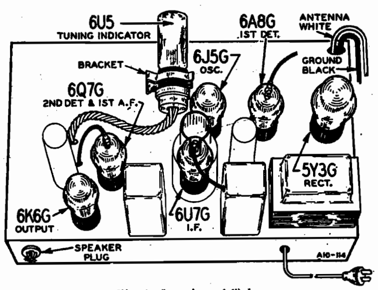


Fig. 4—Location of Tubes

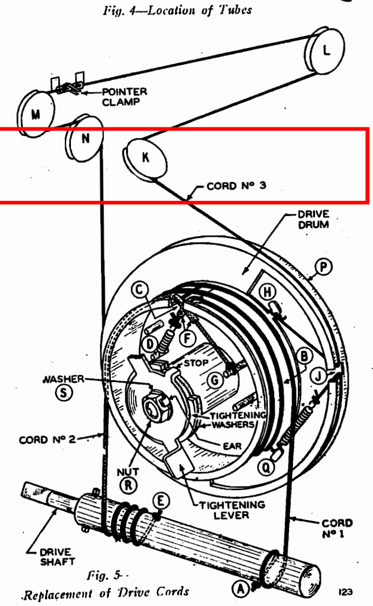
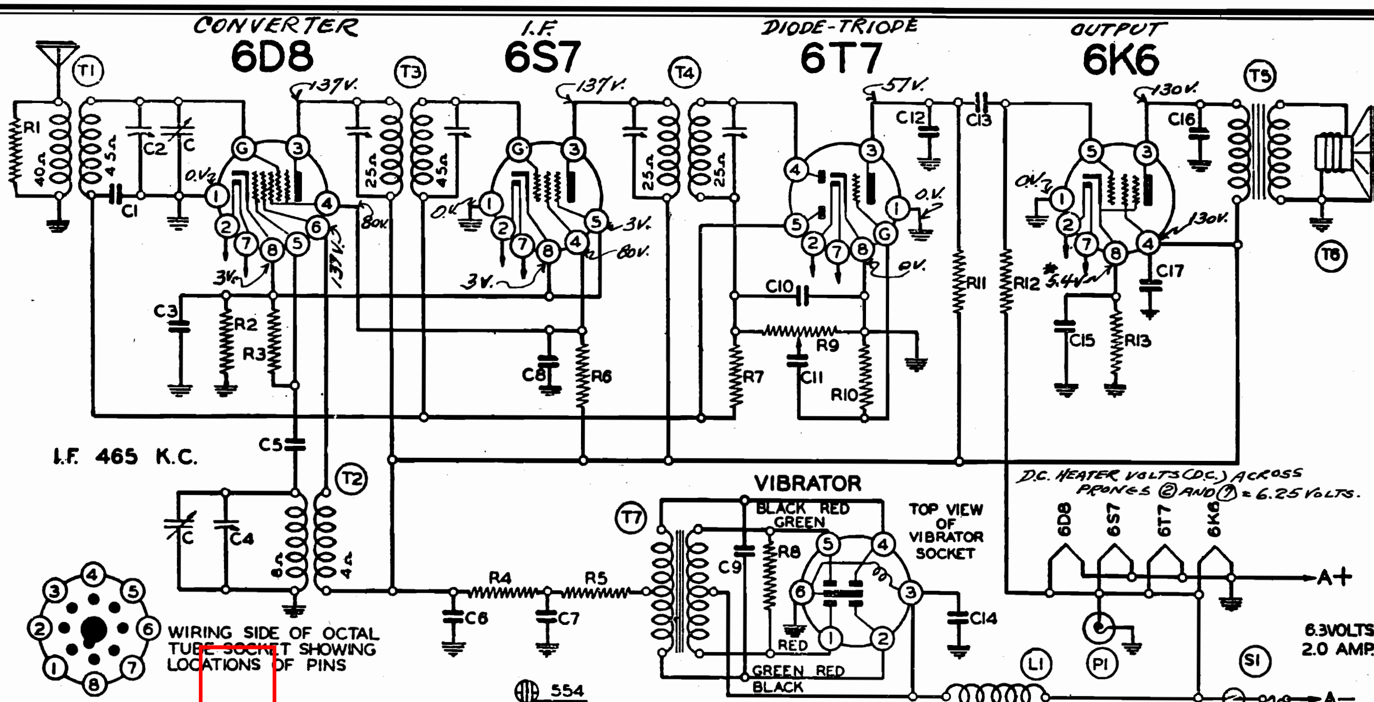


Fig. 5—Replacement of Drive Cords

Schematic, Voltage
Socket, Trimmers

MONTGOMERY WARD & CO.

MODEL 62-459
Series A



FREQUENCY RANGE
535 to 1720 KC.

*Bias (11.6 volts) as read across terminals 8 to 7.

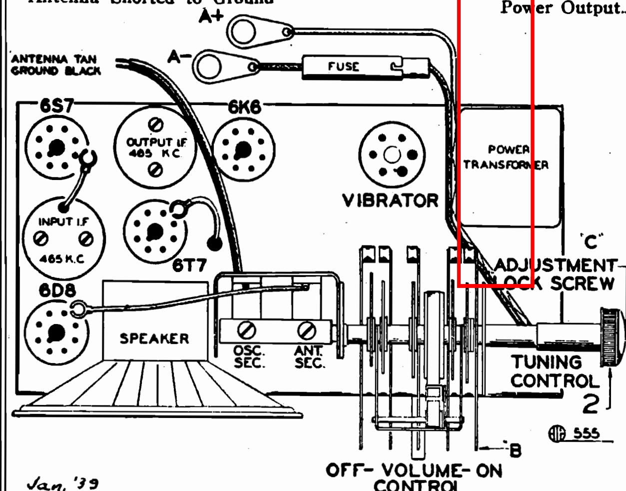
VOLTAGES AT SOCKETS

Supply Voltage 6.3 DC—Volume Control: Maximum
Readings taken with 1000 ohm-per-volt meter
Antenna Shorted to Ground

Power Consumption .... 2 Amperes at 6.3 Volts

Power Output .... .4 Watts Undistorted, 1 Watt Maximum

In case of difficulty, the fuse contained in the metal fuse receptacle should be checked. A 4 ampere Type 3AG fuse (Part No. BE13179) should be used.



RESISTORS

R1	BE13021	20M ohm—⅓ w.
R2	BE13081	250 ohm—⅓ w.
R3	BE13012	50M ohm—⅓ w.
R4	BE13084	200 ohm—⅓ w.
R5	BE13084	200 ohm—⅓ w.
R6	BE130149	15M ohm—⅓ w.
R7	BE130170	3 megohm—⅛ w.
R8	BE13084	200 ohm—⅓ w.
R9	BE101107	500M ohm Volume control
R10	BE130225	15 megohm—⅓ w.
R11	BE1309	200M ohm—⅓ w.
R12	BE1303	500M ohm—⅓ w.
R13	BE13024	400 ohm—⅓ w.

CONDENSERS

C	BE10267B	2 gang variable condenser
C1	BE1009	.05 x 200 v.
C2		Antenna trimmer on gang condenser
C3	BE10022	.05 x 200 v.
C4		Oscillator trimmer on gang condenser
C5	BE12912	.00025—mica
C6	BE11957	15 mfd.—150 w. v.
C7	BE11958	30 mfd.—150 w. v.
C8	BE10022	.05 x 200 v.
C9	BE10068	.003 x 1400
C10	BE12912	.00025—Mica
C11	BE10011	.01 x 400 v.
C12	BE1292	.0005—Mica
C13	BE10011	.01 x 400 v.
C14	BE10031	.5 x 120 w. v.
C15	BE11957	15 mfd.—25 w. v.
C16	BE10019	.006 x 600 v.
C17	BE10020	.1 x 200 v.

C6 and C 15 in same unit

PARTS

T1	BE11192	Antenna Coil Complete
T2	BE11073	Oscillator Coil Complete
T3	BE10896E	Input I. F.—465 kc. Complete
T4	BE10895D	Output I. F.—465 kc. Complete
T5	BE10570	Output Transformer
T6	BE114118	5" P. M. Speaker
T7	BE104137	Power Transformer
L1	BE10568	"A" Choke—
P1	BE10789	Pilot light—Type 40—6.3 v.—.15 amp.
S1		Off-on switch on volume control
	BE1268	Vibrator

TO REMOVE CHASSIS FROM THE CABINET:

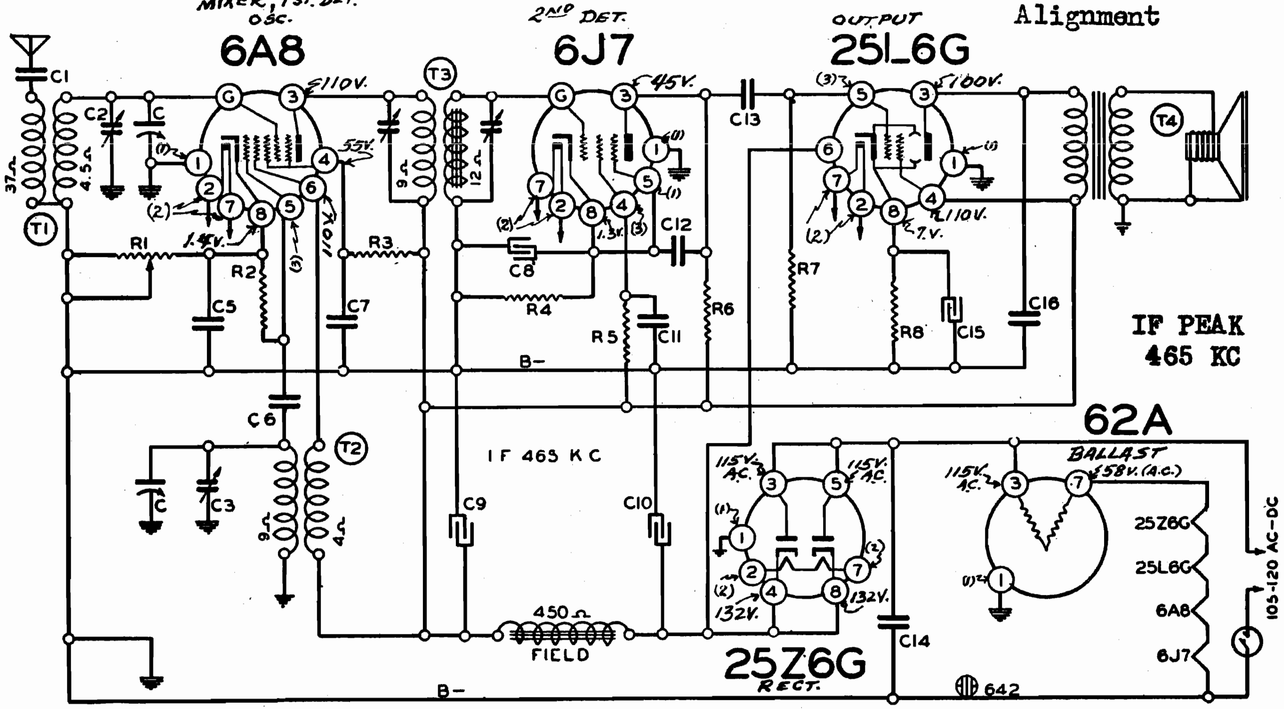
To remove chassis from the cabinet unscrew the locking screw in the center of the tuning knob and pull tuning knob and volume knob off their shafts. Remove the four mounting screws that hold the bottom plate and chassis to the cabinet Pull off the five buttons on the levers. Move the chassis toward back of cabinet so that control shafts and dial assembly clear holes in cabinet. then chassis can be slipped out.

FOR ALIGNMENT PROCEDURE AND SETTING AUTOMATIC TUNING LEVERS, SEE INDEX.

MODELS 62-501,62-502
Series A,Ser.286700 up

MONTGOMERY WARD & CO.

Schematic,Voltage
Socket,Trimmers
Alignment



Power Consumption .... 45 Watts
Power Output .... 800 Milliwatts Undistorted, 1300 Milliwatts Maximum
Intermediate Frequency .... 465 K.C.

Sept.'38

D.C. VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B−, WITH LINE VOLTAGE OF 115 VOLTS A.C. OR D.C.
NOTE: TERMINALS MARKED "0" ARE B- POINTS.

VOL. CONT. ON FULL
ANTENNA GROUNDED

(1) NO READING (CONNECTED TO CHASSIS)
(2) 6.3 V.A.C. READ BETWEEN TERMINALS 2 & 7 OF SAME SOCKET
(3) CANNOT BE READ WITH VOLTMETER

PARTS (Serial 286,700 and UP)

RESISTORS

R1	BE101138	20M ohm volume control
R2	BE13012	50M ohm—1/3 w.
R3	BE130194	35M ohm—1/3 w.
R4	BE130252	6M ohm—1/3 w.
R5	BE13038	2 megohm—1/3 w.
R6	BE13045	250M ohm—1/3 w.
R7	BE1303	500M ohm—1/3 w.
R8	BE130251	160 ohm—1/3 w.

CONDENSERS

C	BE10287	2 gang variable condense
C1	BE1292	.0005 mica
C2		Antenna Trimmer
C3		Oscillator Trimmer
C5	BE1009	.05 x 200 v.
C6	BE12912	.00025 mica
C7	BE1009	.05 x 200 v.
C8	BE11971	5 mfd. x 25 v. lytic
C9	BE11970	30 mfd. x 150 v. lytic
C10	BE11970	30 mfd. x 150 v. lytic
C11	BE10020	.1 x 200 v.
C12	BE1292	.0005 mica
C13	BE10026	.02 x 400 v.
C14	BE1001	.1 x 400 v.
C15	BE11970	40 mfd. x 25 w. v. lytic
C16	BE10095	.035 x 400 v.

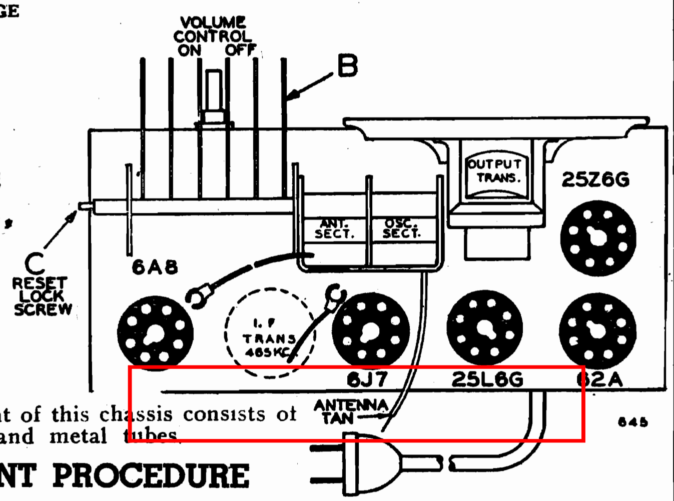
C9, C10 and C15 in one unit, part no. BE11970

PARTS

T1	BE111110	Antenna Coil
T2	BE11095	Oscillator Coil
T3	BE108123	I. F. Transformer—465 kc.
T4	BE114130	5 inch Dynamic Speaker

FREQUENCY RANGE
530 to 1720 K.C.

FOR SETTING THE AUTOMATIC TUNING LEVERS, SEE INDEX.



The tube complement of this chassis consists of octal base glass and metal tubes.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

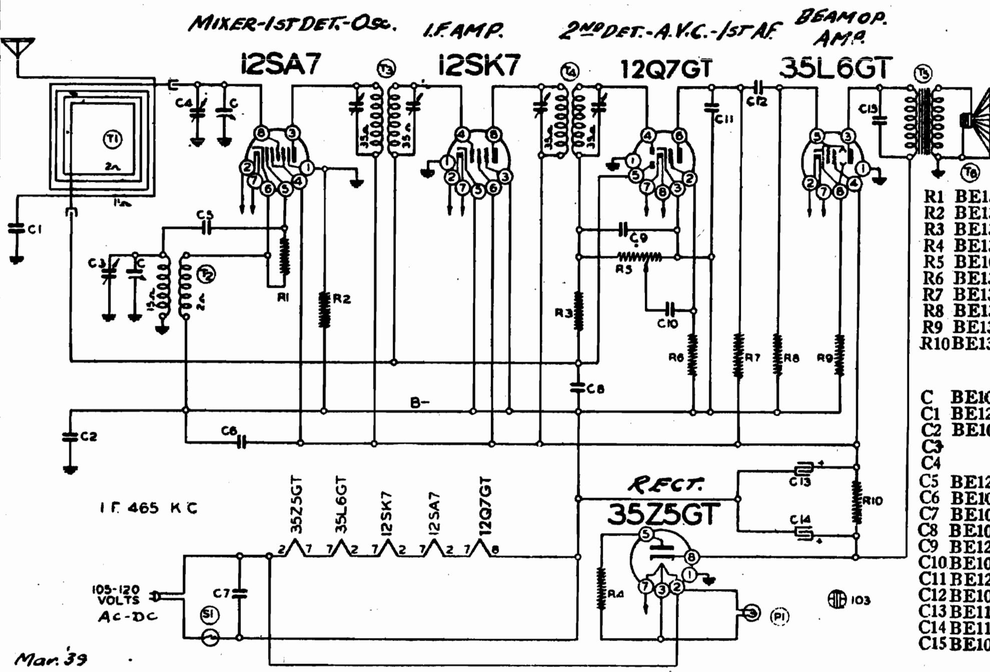
- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 100 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6A8	Rotor full open (Plates out of mesh)	Two trimmers	I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	100 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	100 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang	Broadcast Antenna	Adjust to maximum output

Schematic, Voltage
Socket, Trimmers
Alignment, Changes

MONTGOMERY WARD & CO.

MODELS 62-504, 62-505
Series A, Issues A, B
Ser. 623100 up



PARTS (Serial No. 623,100 and UP)
ISSUES A AND B

RESISTORS

R1	BE13021	20M ohm—½ w.
R2	BE130100	150M ohm—½ w.
R3	BE1304	3 megohm—½ w.
R4	BE130215	25 ohm—½ w.
R5	BE101164	1 megohm—volume control
R6	BE130225	15 megohm—½ w.
R7	BE13011	250M ohm—½ w.
R8	BE1303	500M ohm—½ w.
R9	BE130166	150 ohm—½ w.
R10	BE130199	1500 ohm—1 watt

CONDENSERS

C	BE102102	2 gang variable condenser
C1	BE1292	.0005 Mica
C2	BE10091	.15 x 400 v.
C3		Osc. Trimmer on Gang
C4		Ant. Trimmer on Gang
C5	BE12912	.00025 mica
C6	BE1009	.05 x 200 v.
C7	BE1001	.1 x 400 v.
C8	BE10022	.05 x 200 v.
C9	BE1295	.0001 mica
C10	BE10071	.004 x 600 v.
C11	BE12912	.00025 mica
C12	BE10011	.01 x 400 v.
C13	BE11982	30 mfd. lytic
C14	BE11982	30 mfd. lytic
C15	BE10095	.035 x 400 v.

C13 and C14 in same unit

PARTS

T1	BE120268	Loop Antenna
T2	BE110113	Oscillator Coil
T3	BE108140B	Input I. F.
T4	BE108141	Output I. F.
T5	BE10587	Output Transformer
T6	BE114157	4" P. M. Speaker
S1		Off-on switch on vol. control
P1	BE107249	6.3 volt Pilot Light

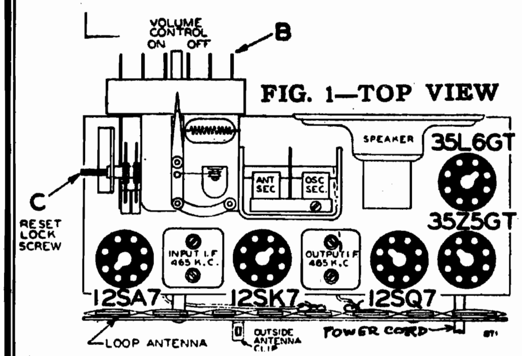
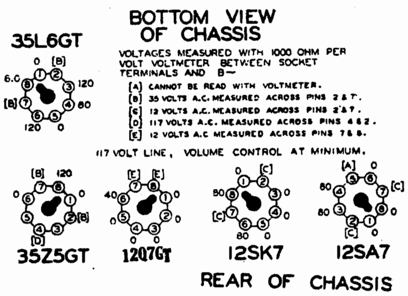


FIG. 1—TOP VIEW



FOR SETTING AUTOMATIC TUNING LEVERS, SEE INDEX

Frequency Range 540-1650 Kilocycles
I. F. Frequency 465 K. C.

NOTE:- In ISSUE A, a 12SQ7 is used as 2nd Det.-A.V.C.-1st. Audio; Resistor, R 10, part BE 130282, 2000 ohm 1 watt, and P1, part BE 10794, 6.8 v. Pilot Light are used. For all other parts see parts list.

ALIGNMENT PROCEDURE

Do not remove the back cover of the radio which contains the loop antenna from the chassis. It is important during alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

Slight adjustments to the oscillator and antenna circuits can be made without removing the chassis from the cabinet through two holes which are provided on the bottom of the cabinet.

The two adjustments on the variable gang condenser can be reached with a long insulated type screw driver through these two holes.

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Four Trimmers on Top (See Fig. 1)	Output and Input I.F.	Adjust to maximum output
BROADCAST BAND	1650 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer—Bottom of rear section of gang (See Bottom of Radio)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer—Bottom of front section of gang (See Bottom of Radio)	Broadcast Antenna	Adjust to maximum output

NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

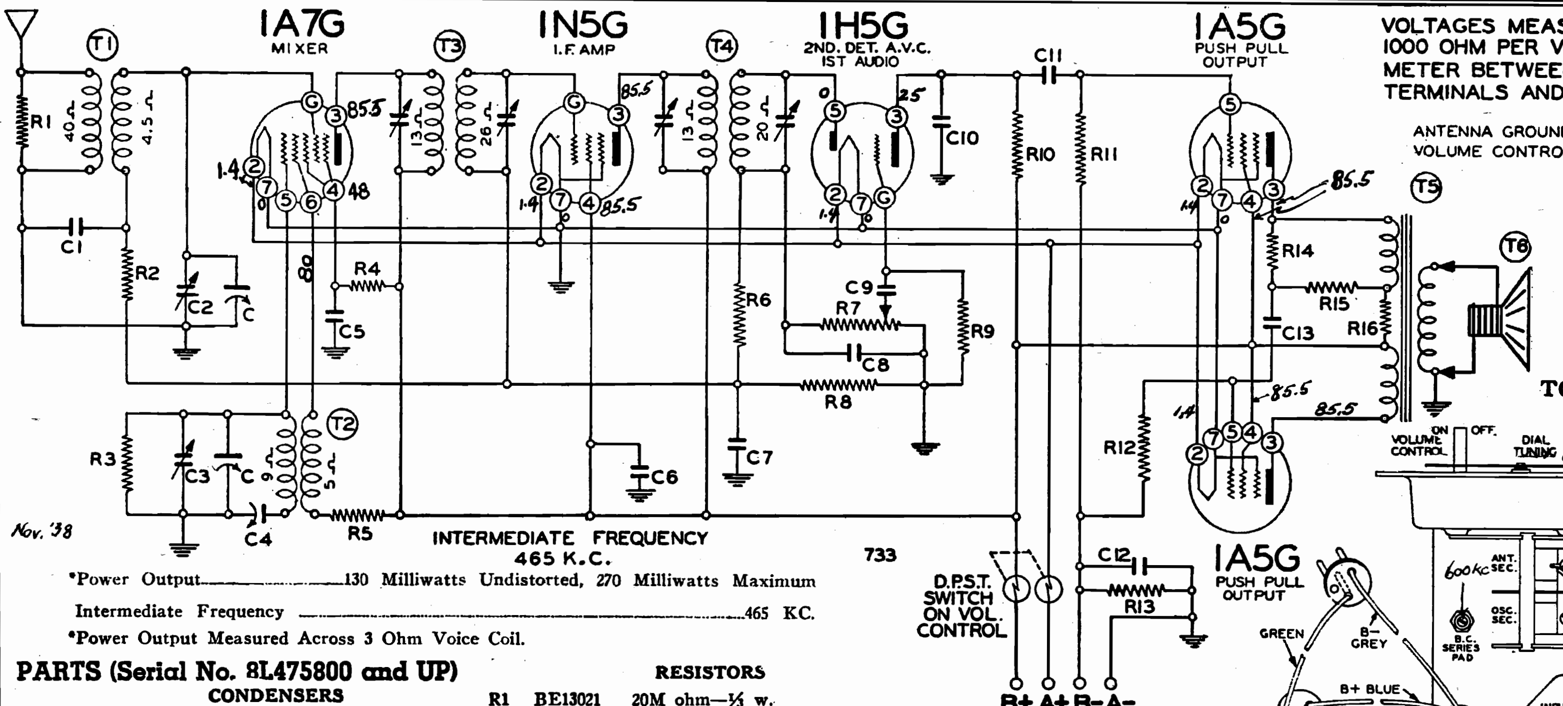
Power Consumption........40 Watts
Power Output........1.3 Watts Undistorted, 2.5 Watts Maximum
Intermediate Frequency........465 K.C.

MODELS 62-551,62-1551
62-2551
Series A,Ser.8L475800 up
Schematic,Voltage,Socket
Trimmers,Alignment

MONTGOMERY WARD & CO.

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

ANTENNA GROUNDED
VOLUME CONTROL AT MINIMUM.



INTERMEDIATE FREQUENCY
465 K.C.

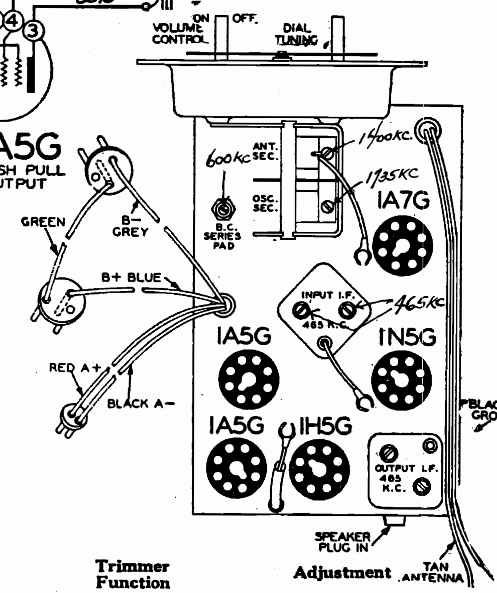


FIG. 1—
TOP VIEW

*Power Output .... 130 Milliwatts Undistorted, 270 Milliwatts Maximum

Intermediate Frequency .... 465 KC.

*Power Output Measured Across 3 Ohm Voice Coil.

FREQUENCY RANGE
535 to 1735KC.

PARTS (Serial No. 8L475800 and UP)

CONDENSERS

C	BE10289	2 gang Variable Condenser
C1	BE1009	.05 x 200 v.—25%
C2		Antenna Section Trimmer
C3		Oscillator Section Trimmer
C4	BE12464	Series Pad
C5	BE10070	.5 x 120 v.—20%
C6	BE10048	.25 x 200 v.
C7	BE1009	.05 x 200 v.
C8	BE1295	.0001 Mica
C9	BE10011	.01 x 400 v.
C10	BE12921	.0002 Mica
C11	BE10078	.01 x 200 v.
C12	BE11935	10 mfd. x 25 volts—lytic
C13	BE10078	.01 x 200 v.

RESISTORS

R1	BE13021	20M ohm—⅓ w.
R2	BE13020	100M ohm—⅓ w.
R3	BE1309	200M ohm—⅓ w.
R4	BE130208	40M ohm—⅓ w.
R5	BE13071	4M ohm—⅓ w.
R6	BE13038	2 megohm—⅓ w.
R7	BE101140	1 megohm—volume control
R8	BE13038	2 megohm—⅓ w.
R9	BE13019	1 megohm—⅓ w.
R10	BE13037	750M ohm—⅓ w.
R11	BE13019	1 megohm—⅓ w.
R12	BE13019	1 megohm—⅓ w.
R13	BE130222	350 ohm—⅓ w.
R14	BE13019	1 megohm—⅓ w.
R15	BE130232	25M ohm—⅓ w.
R16	BE130264	1000 ohm—⅓ w.

PARTS

T1	BE11192B	Antenna Coil Complete
T2	BE11096	Oscillator Coil Complete
T3	BE108111C	Input I. F. Complete
T4	BE108112	Output I. F. Complete
T5	BE10578	Output Transformer
T6	BE114137	6" P. M. Speaker

SIGNAL GENERATOR

BAND	Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1N5G I.F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROADCAST BAND	1735 Kc.	200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Set dial at 600 Kc.	B.C. Series Pad (See Fig. 1)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

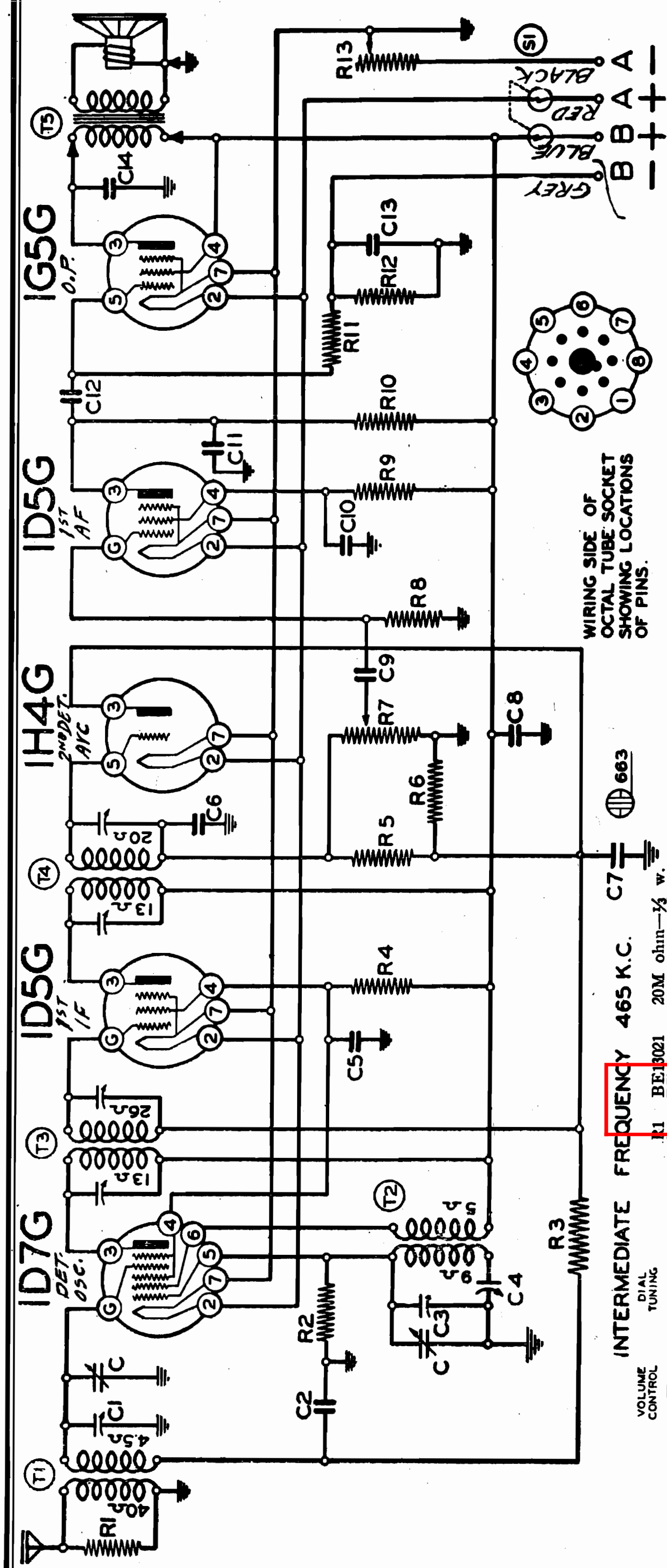
After each band is completed, repeat the procedure as a final check.

Schematic, Voltage
Socket, Trimmers

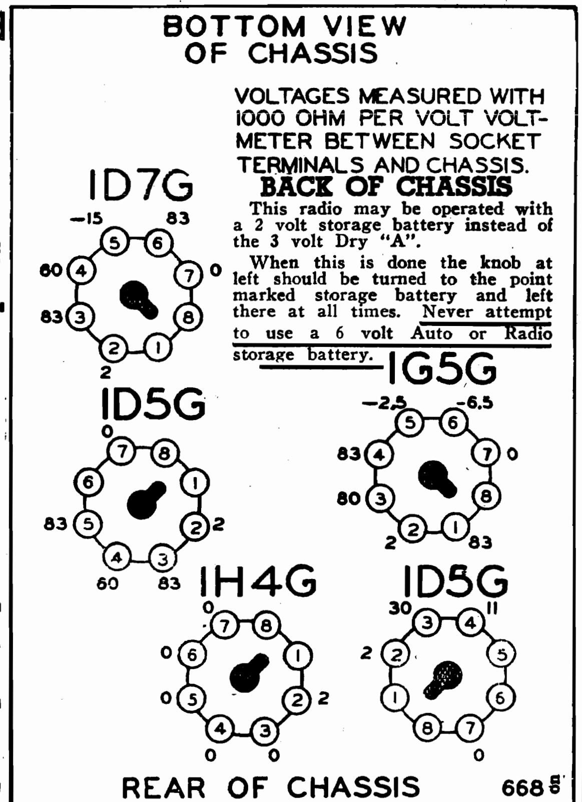
MONTGOMERY WARD & CO.

MODELS 62-550, 62-1550
62-2550, Series A
Ser. 8J312900 up

5 TUBE
Broadcast Band 2-Volt Battery Operated Superheterodyne Receiver



Frequency Range—535 - 1735 Kilocycles



This radio may be operated with a 2 volt storage battery instead of the 3 volt Dry "A".

When this is done the knob at left should be turned to the point marked storage battery and left there at all times. Never attempt to use a 6 volt Auto or Radio storage battery.

FIG. 3

663

INTERMEDIATE FREQUENCY 465 K.C.

PARTS (SERIAL No. 8J312900 and UP)

RESISTORS		
R1	BE13021	20M ohm—1/3 w.
R2	BE13012	50M ohm—1/3 w.
R3	BE13020	100M ohm—1/3 w.
R4	BE13017	10M ohm—1/3 w.
R5	BE13038	2 megohm—1/3 w.
R6	BE13038	2 megohm—1/3 w.
R7	BE101140	1 megohm Volume Control
R8	BE13019	1 megohm—1/3 w.
R9	BE13019	1 megohm—1/3 w.
R10	BE1309	200 M ohm—1/3 w.
R11	BE13019	1 megohm—1/3 w.
R12	BE13093	450 ohm—1/3 w.
R13	BE10179	Filament Rheostat (4.75 ohms)
CONDENSERS		
C	BE10289	Two Gang Variable Condenser
C1		Antenna Section Trimmer
C2	BE1009	.05 x 200 v.
C3		Oscillator Section Trimmer
C4	BE12464	Series Pad
C5	BE10022	.05 x 200 v.
C6	BE1295	.0001 Mica
C7	BE1009	.05 x 200 v.
C8	BE10048	.25 x 200 v.
C9	BE10011	.01 x 400 v.
C10	BE1009	.05 x 200 v.
C11	BE1292	.0005 Mica
C12	BE10011	.01 x 400 v.
C13	BE11935	25 mfd. 25 v. Lytic Condenser
C14	BE10071	.004 x 600 v.
PARTS		
T1	BE11192B	Antenna Coil Complete
T2	BE11096	Oscillator Coil Complete
T3	BE108111C	Input I.F. Complete
T4	BE108112	Output I.F. Complete
T5	BE11476	6 in. P. M. Speaker
S1		Double Pole Double Throw Switch on Volume Control.

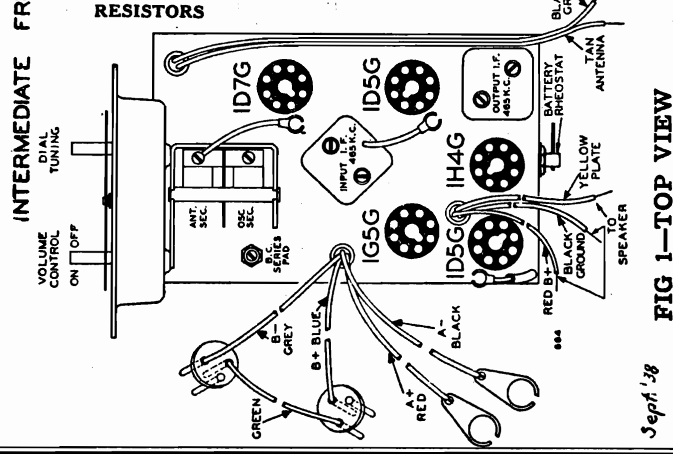


FIG 1—TOP VIEW

Sept '38

MODELS 62-550, 62-1550
62-2550
MODELS 93WG602, 93WG603
Alignment

MONTGOMERY WARD & CO.

MODELS 62-558, 62-1558
62-2558
MODEL 62-653
Alignment, Trimmers

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf.

MODELS 62-550, 62-1550, 62-2550
Series A

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1D5G I.F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1D7G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROADCAST BAND	1735 Kc.	200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Set dial at 600 Kc.	B.C. Series Pad (See Fig. 1)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

FREQUENCY RANGE
535 to 1735KC.

Power Output—150 Milliwatts Undistorted, 250 Milliwatts Maximum
Intermediate Frequency—465 KC.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

MODELS 62-558, 62-1558, 62-2558
Series A, Issue A

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1N5G 2nd I. F.	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1N5G 1st I. F.	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Interstage I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7G Mixer	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer C6—Top of front section of gang (See Fig. 1)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer C7 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROADCAST BAND	1750 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer C8 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer C3 (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer C9 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

ALIGNMENT PROCEDURE Model 62-653

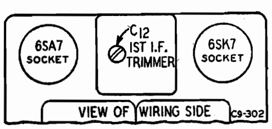


Fig. 6—Location of 1st I.F. Trimmer in Tuning Unit

Remove grille and speaker from speaker unit.

Remove the chassis from tuning unit case in accordance with the article under "General Installation Items" in this manual.

Set the signal generator for 456 KC and connect the output of the signal generator through a .05 mf. condenser to the control grid of the 6SA7 1st detector tube (prong No. 8). Connect the ground lead of the signal generator to the tuning unit chassis. Set the volume control at maximum and the Local-Distance switch to the distance position. Attenuate the signal from the signal generator to prevent the levelling off action of the AVC.

Then adjust the 4 I.F. trimmers until maximum output is obtained. Three of the trimmers are in the speaker unit—See Fig. 2. One trimmer is at the top of the tuning unit—See Fig. 6.

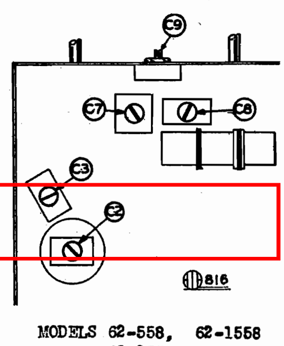
Insert the antenna cable plug in the antenna socket on the tuning unit. The total capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 25 mmf., use a 35 mmf. condenser for a dummy antenna. Connect the other end of the antenna cable through the dummy antenna capacity to the output of the signal generator.

Set the signal generator for 1560 KC. Turn the tuning knob until the iron cores are as far out of the tuning coils as they will go. Then adjust the oscillator trimmer C6 (Fig. 1) until maximum output is obtained.

Set the signal generator for 1000 KC. Turn the tuning knob until maximum output is obtained. Adjust interstage trimmer C7 and antenna trimmer C2 for maximum output—See Fig. 1.

Reassemble the radio and install it in the automobile. Insert the car antenna cable. Tune in a weak signal near 1000 KC and readjust the antenna trimmer C2 for maximum output.

Calibration—If it is necessary to calibrate the radio, remove the chassis from the tuning unit case—See article on that subject in this manual. Accurately tune in a signal of known frequency near 1000 KC. Loosen the set screw of the large gear that drives the dial drum. Turn the dial drum until the indicator line is at the frequency of the station tuned in. Tighten the set screw and reassemble.



MODELS 62-558, 62-1558
62-2558
Series A

ALIGNMENT PROCEDURE Models 93WG602 and 93WG603

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes. Connect Ground Post of Signal Generator to B—(12SK7—Prong No. 3) in Chassis.

SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1730 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C2)
1500 KC	None—See Note		Turn Rotor to max. output	Antenna (C3)

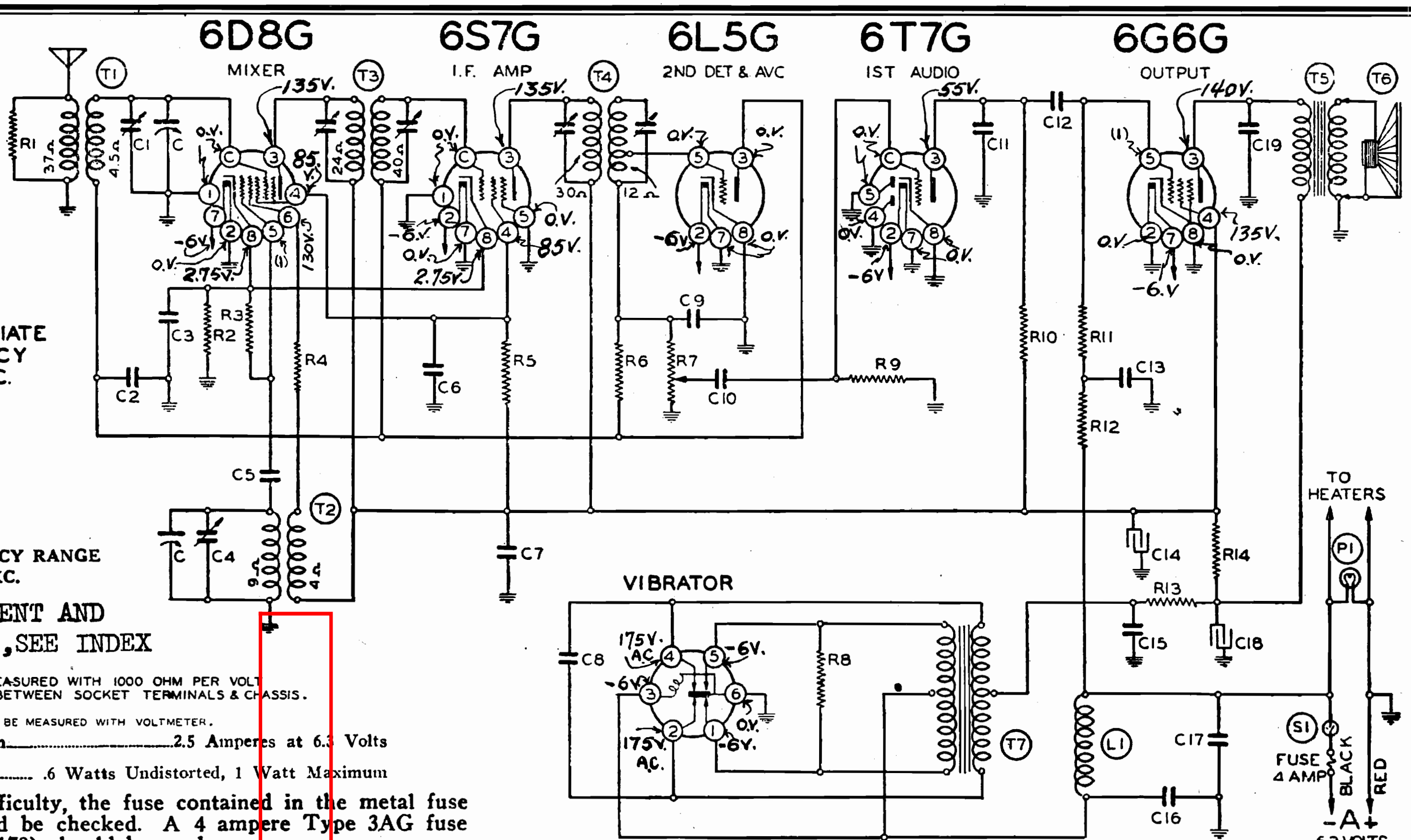
CALIBRATION—If it is necessary to calibrate the radio, remove the back cover. Turn the tuning control drum until the 2 set screws on the dial hub near the volume control can be reached with a screwdriver. Loosen the 2 set screws by turning them about 1/8th turn in a counter-clockwise direction. Tune in an 800 KC signal. Hold the tuning control motionless and at the same time turn the dial drum until the dial is in calibration. Then slowly turn the tuning control drum until the 2 set screws can be reached and re-tightened with a screwdriver. Check to see that the dial has remained in calibration.

Dummy Antenna—.1 mf.

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

MONTGOMERY WARD & CO.

MODEL 62-552, Series A
Schematic, Voltage
Socket, Trimmers
Alignment



INTERMEDIATE FREQUENCY 465 K.C.

FREQUENCY RANGE
535 to 1735 KC.

FOR ALIGNMENT AND
TUNER DATA, SEE INDEX

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

(1)- CANNOT BE MEASURED WITH VOLTMETER.

Power Consumption..........2.5 Amperes at 6.3 Volts

Power Output.......... .6 Watts Undistorted, 1 Watt Maximum

In case of difficulty, the fuse contained in the metal fuse receptacle should be checked. A 4 ampere Type 3AG fuse (Part No. BE13179) should be used.

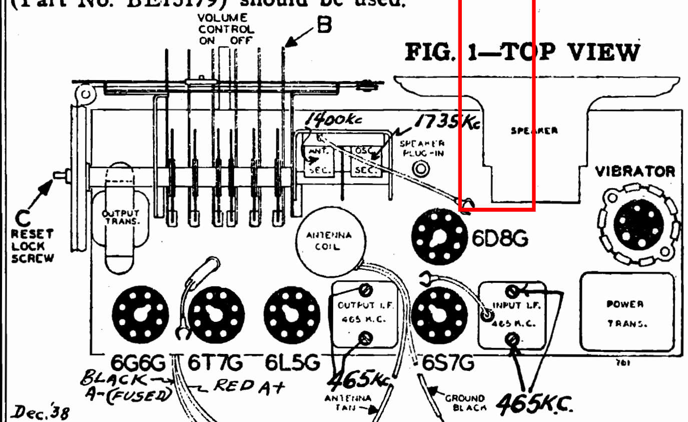


FIG. 1—TOP VIEW

R1	13017	10M ohm—⅓ w.
R2	13097	200 ohm—⅓ w.
R3	13012	50M ohm—⅓ w.
R4	13092	1000 ohm—⅓ w.
R5	130157	12M ohm—⅓ w.
R6	1304	3 megohm—⅓ w.
R7	101126	1 megohm—volume control.
R8	13097	200 ohm—⅓ w.
R9	130225	15 megohm—⅓ w.
R10	13011	250M ohm—⅓ w.
R11	130102	500M ohm—⅓ w.
R12	130103	100M ohm—⅓ w.
R13	130168	100 ohm—⅓ w.
R14	13092	1000 ohm—⅓ w.

CONDENSERS

C	10294	2 gang variable condenser
C1		Antenna Trimmer
C2	1009	.05 x 200 v.
C3	10048	.25 x 200 v.
C4		Oscillator Trimmer
C5	1295	.0001 mica
C6	10020	.1 x 200 v.
C7	10020	.1 x 200 v.
C8	10068	.003 x 1400 v.
C9	12960	.00015 mica
C10	10011	.01 x 400 v.
C11	1292	.0005 mica
C12	10011	.01 x 400 v.
C13	10020	.1 x 200 v.
C14	11959C	10 mfd. lytic—200 w. v.
C15	10020	.1 x 200 v.
C16	10040	.5 x 120 v.
C17	10040	.5 x 120 v.
C18	11959C	30 mfd. lytic—200 w. v.
C19	10019	.006 x 600 v.

C14 and C18 in same unit

PARTS

T1	11185C	Antenna Coil
T2	110103	Oscillator Coil
T3	108129B	Input I. F. Coil—465 kc.
T4	108130B	Output I. F. Coil—465 kc.
T5	10569B	Output Transformer
T6	114143	6" P. M. Speaker
T7	104137D	Power Transformer
L1	10568	"A" Choke
P1	10789	6.3 volt pilot light T40—150 ma.
S1		Off-on switch on volume control

MODEL 62-553
Schematic, Voltage
Socket, Trimmers

MONTGOMERY WARD & CO.

PARTS (Serial No. 8M502000 and up)

RESISTORS

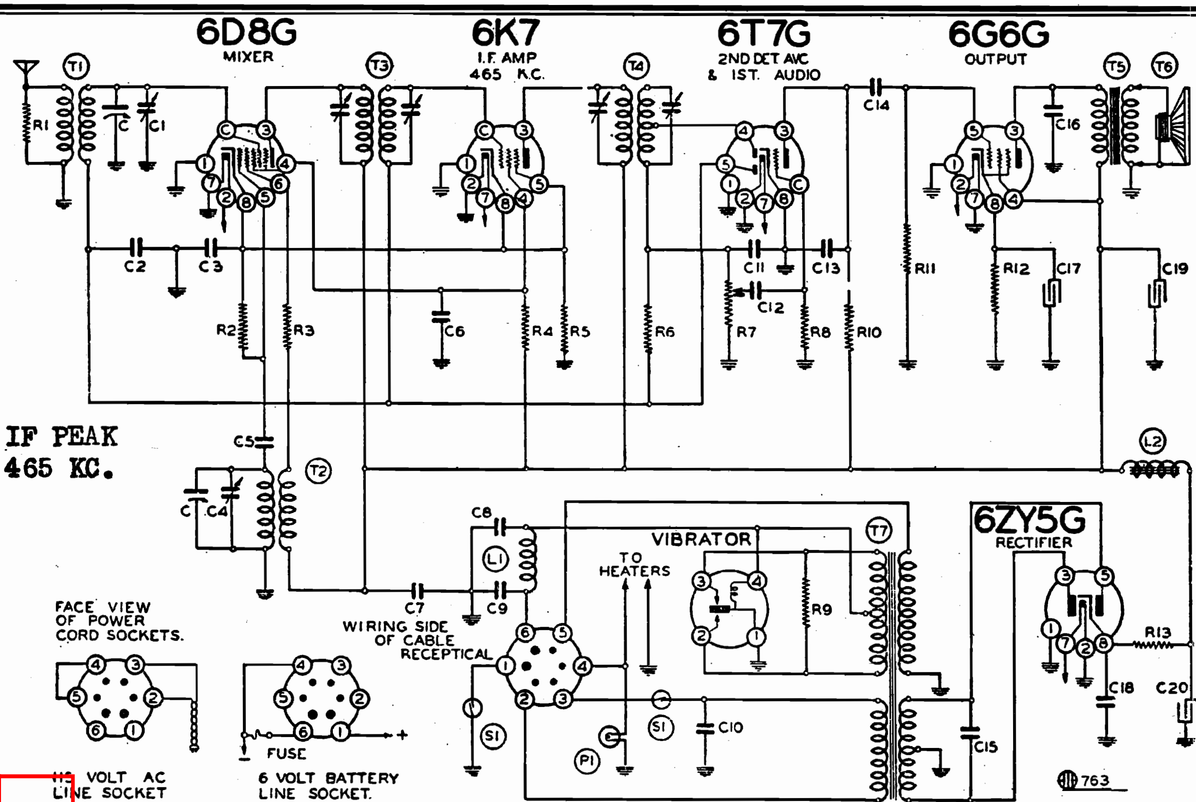
R1	BE13017	10M ohm—⅓ w.
R2	BE13012	50M ohm—⅓ w.
R3	BE13092	1000 ohm—⅓ w.
R4	BE130157	12M ohm—⅓ w.
R5	BE13097	200 ohm—⅓ w.
R6	BE1304	3 megohm—⅓ w.
R7	BE101150	1 megohm volume control
R8	BE130225	15 megohm—⅓ w.
R9	BE13097	200 ohm—⅓ w.
R10	BE130266	200M ohm—⅓ w.
R11	BE130102	500M ohm—⅓ w.
R12	BE13093	450 ohm—⅓ w.
R13	BE130168	100 ohm—⅓ w.

CONDENSERS

C	BE10294	2 gang variable condenser
C1		Antenna Trimmer
C2	BE1009	.05 x 200 v.
C3	BE10064	.25 x 200 v.
C4		Oscillator Trimmer
C5	BE1295	.0001 mica
C6	BE10020	.1 x 200 v.
C7	BE10020	.1 x 200 v.
C8	BE10040	.5 x 120 v
C9	BE10040	.5 x 120 v.
C10	BE10011	.01 x 400 v.
C11	BE12960	.00015 mica
C12	BE10011	.01 x 400 v.
C13	BE1292	.0005 mica
C14	BE1009	.05 x 200 v.
C15	BE10073	.008 x 1200 v.
C16	BE10019	.006 x 600 v.
C17	BE11979	20 mfd. x 25 w. volt
C18	BE10020	.1 x 200 v.
C19	BE11979	16 mfd. x 200 w. volt
C20	BE11979	16 mfd. x 200 w. volt

PARTS

T1	BE11185C	Antenna Coil
T2	BE110103	Oscillator Coil
T3	BE108129	Input I. F. Coil—465 kc.
T4	BE108130	Output I. F. Coil—465 kc.
T5	BE10569B	Output Transformer
T6	BE114143	6" P. M. Speaker
T7	BE104114B	Power Transformer
S1		Off-on switch on volume control
P1	BE10789	6.3 v. Pilot Light T40-150 ma.
L1	BE10568	"A" Choke
L2	BE10530G	"B" Choke



IF PEAK
465 KC.

Power Consumption.........40 Watts (at 115 Volts 50/60 Cycles) or 2.5 Amperes at 6.3 Volts
Power Output.........6 Watts Undistorted, 1 Watt Maximum

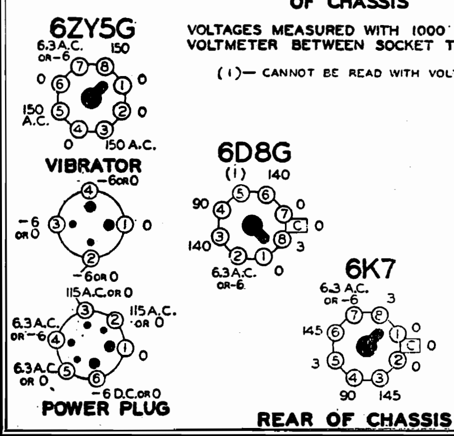
FREQUENCY RANGE
535 to 1735 KC.

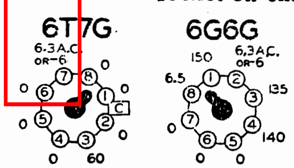
BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

(1)— CANNOT BE READ WITH VOLTMETER.

1. For 6 volt storage battery operation:
   Use cable No. BE107128C.
2. For 105-115 volts, 60 cycle operation:
   (a) Use special cable No. BE107129.
   (b) Plug receptacle of cable into power socket on chassis.





FOR ALIGNMENT
SEE INDEX

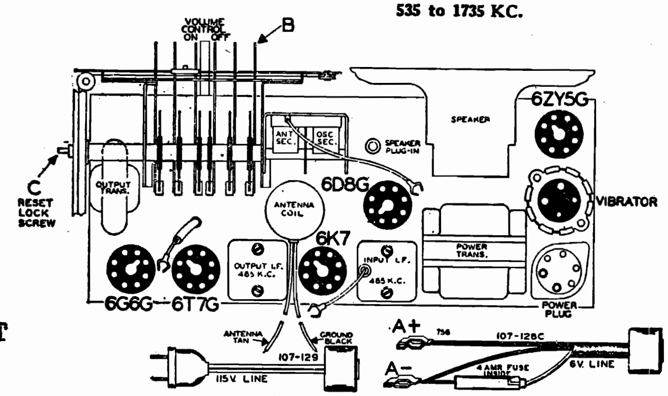


FIG. 1—TOP VIEW

Dec. '38

Socket,Trimmers
Alignment

MODEL 62-554
Schematic,Voltage

MONTGOMERY WARD & CO.
SPECIFICATIONS

Power Consumption - 6.25 Amperes at 6.3 Volts

Power Output - - - - - 1.5 Watts Undistorted

Sensitivity - - 1.5 Microvolts at .5 Watt Output

Selectivity - 42 KC Broad at 1000 Times Signal

Tuning Frequency Range - - - 540 to 1560 KC

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - 6" Electro-Dynamic

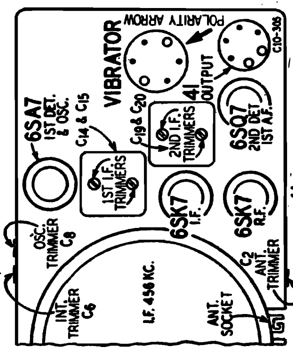


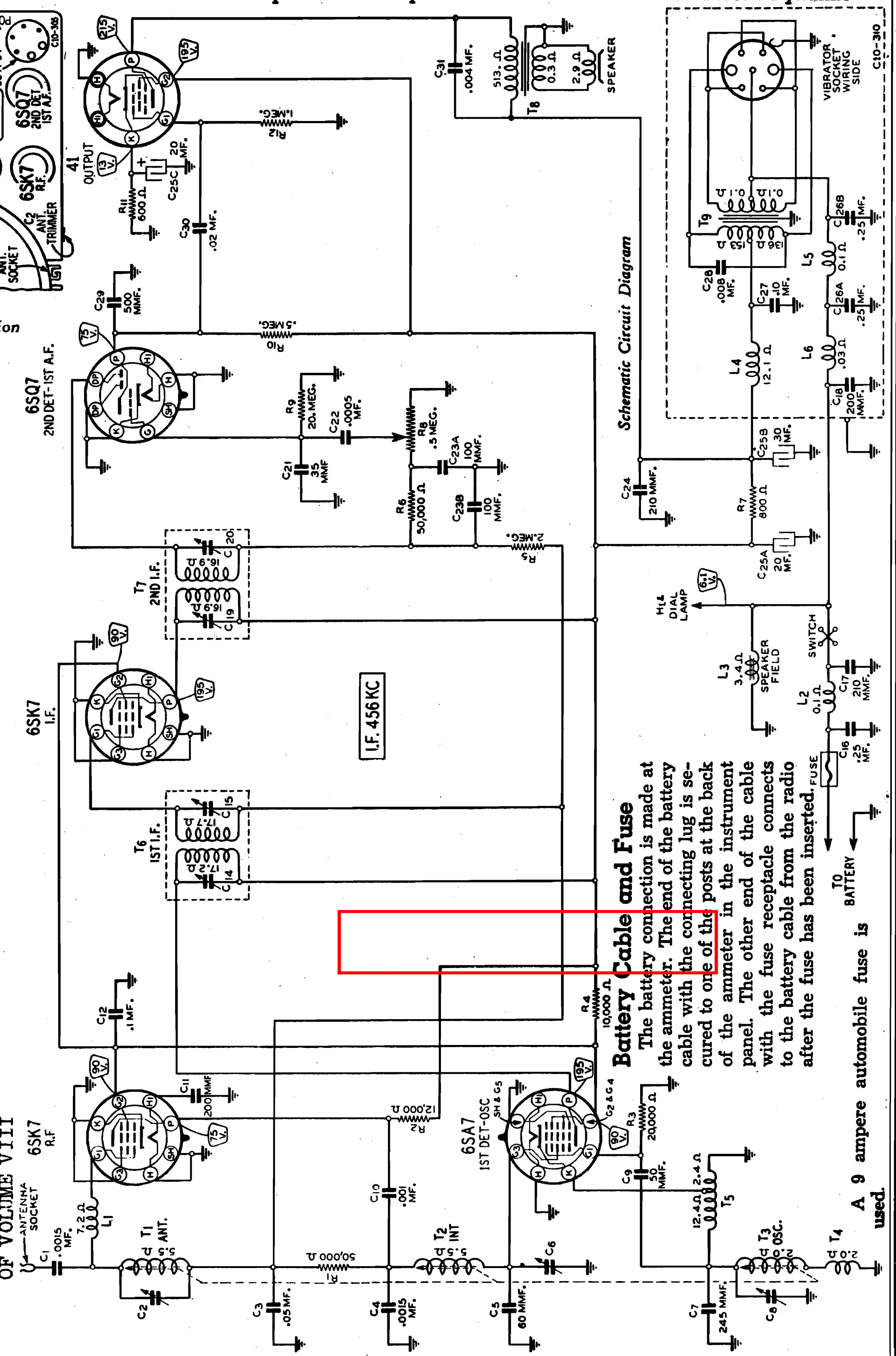
Fig. 2—Tube and Vibrator Location

IF ALIGNMENT
Adjust at 456 KC through 0.05 mfd. condenser.

BC ALIGNMENT
Adjust oscillator trimmer C8 at 1560 KC.
Adjust C6 and C2 trimmers at 1000 KC.

FOR CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION OF VOLUME VIII

FOR SETTING PUSH BUTTONS, SEE INDEX.



Battery Cable and Fuse

The battery connection is made at the ammeter. The end of the battery cable with the connecting lug is secured to one of the posts at the back of the instrument panel. The other end of the cable with the fuse receptacle connects to the battery cable from the radio after the fuse has been inserted.

A 9 ampere automobile fuse is used.

MODEL 62-554
MODEL 62-653
MODEL 93WG562
MODELS 93WG602, 93WG603

MONTGOMERY WARD & CO.

Tuner Data

Procedure for Setting the Station Buttons

TYPICAL TUNING DATA (FOR NUMBER OF BUTTONS AND LOCATION OF LOCKING SCREWS - SEE FIGURES).

There are 5 buttons on the automatic tuning dial by means of which 5 stations may be set.

Any button may be used for any station you can receive.

Depress the manual tuning button AND KEEP IT DEPRESSED DURING THE ENTIRE SETTING OPERATION AS DESCRIBED BELOW. See Fig. 1 for location of buttons. Turn the manual tuning knob so that the indicator moves toward the 1500 KC end of the dial until the stop is reached.

UNLOCK THE TUNING MECHANISM by inserting a SMALL HANDLE screwdriver, as shown in Fig. 1, in the locking screw opening at the bottom of the tuning unit. Loosen the locking screw by turning it counter-clockwise as far as it will go.

TO SET STATIONS ACCURATELY, DO NOT JAR THE RADIO OR BUTTONS WHILE THE MECHANISM IS UNLOCKED.

Insert a celluloid reinforcement tab half-way in the slot at the front of station button No. 1—See Fig. 3.

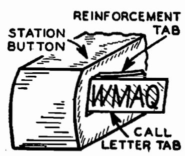


Fig. 3—Inserting Station Tab

Remove the correct station call letter tab for button No. 1 from the sheet supplied by bending the sheet back and forth at the score marks. Place the call letter tab in front of the celluloid reinforcement tab and insert it in slot. Push both tabs all the way in the button slot. Follow the same procedure for inserting the station call letter tabs in any other buttons.

After the stations are set and the mechanism is locked, tune in each of them by depressing the proper button. If any of them does not appear to be properly tuned in after the button has been depressed, reset the station for that button following the procedure outlined above. Changing the setting of one button will not affect the setting of the others.

KEEP THE MANUAL TUNING BUTTON DEPRESSED WITH ONE HAND and, with the other hand, depress the first (left hand) station button. Both will remain depressed.

Select the first station from the list you have made and tune in this station by means of the manual tuning knob.

TURN THE MANUAL TUNING KNOB CAREFULLY BACK AND FORTH UNTIL THE ABOVE MENTIONED STATION IS ACCURATELY TUNED IN TO THE LOUDEST POINT. This station is now set on button No. 1.

CAUTION—Do not touch this button again while the mechanism is unlocked as the setting may be altered.

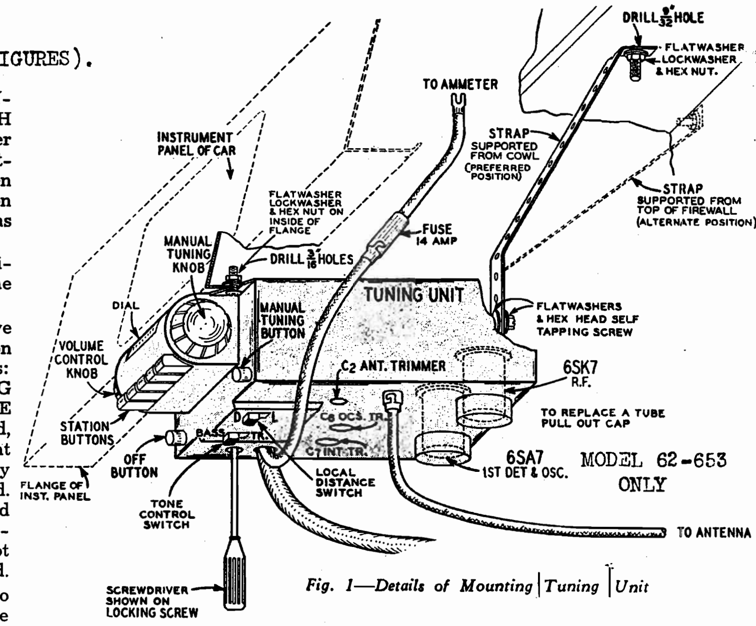
Next KEEP THE MANUAL TUNING BUTTON DEPRESSED WITH ONE HAND and, with the other hand, depress the second station button FIRMLY AND GENTLY. Then proceed to set the second station on your list in the same manner as described above.

Then continue to set any additional stations on your list on the remaining buttons.

After all desired stations have been set, release any station button which is depressed as follows: KEEP THE MANUAL TUNING BUTTON DEPRESSED WITH ONE HAND and, with the other hand, push in the OFF button a slight amount—only enough to release any station button which is depressed. Should the OFF button be pushed all the way in to the depressed position, no harm will be done except that the dial will not be illuminated.

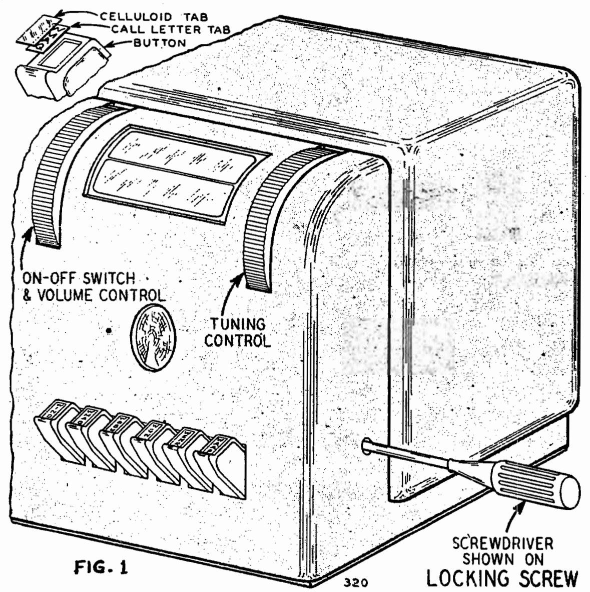
Turn the manual tuning knob so that the indicator moves toward the 1500 KC end of the dial, until the stop is reached.

NOW LOCK THE TUNING MECHANISM by inserting the SMALL HANDLE screwdriver, as shown in Fig. 1, in the locking screw opening. Turn the locking screw in a clockwise direction until it is tight. DO NOT tighten too much to avoid stripping the threads.



MODEL 62-653 ONLY

Fig. 1—Details of Mounting Tuning Unit



MODELS
93WG-562
93WG-602
93WG-603

FIG. 1

MODEL 62-554 ONLY

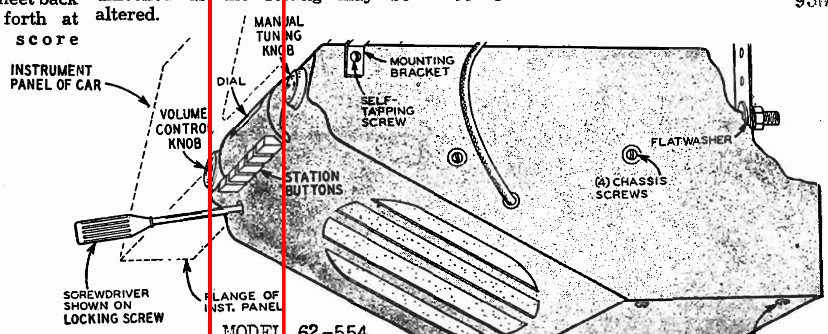


Fig. 1—

MODEL 62-554 ONLY

Schematic, Voltage Socket, Alignment Trimmers

MONTGOMERY WARD & CO.

MODELS 62-555, 62-557
62-2555, 62-2557

SPECIFICATIONS

Input Voltages and Currents

"A" Battery .... 1.5 Volts—.30 Amperes
"B" Battery .... 90 Volts—12 to 15 Ma.

Power Output - - - 140 Milliwatts Undistorted

Selectivity - - 41 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC.

Speaker - - - - - - - - - 6" P.M. Dynamic

Tuning Frequency Range - - - 540 to 1600 KC.

Sensitivity (For .05 Watt Output)

Table Model .... 10.5 Microvolts Average
Portable Model .... 20 Microvolts Per Meter Average

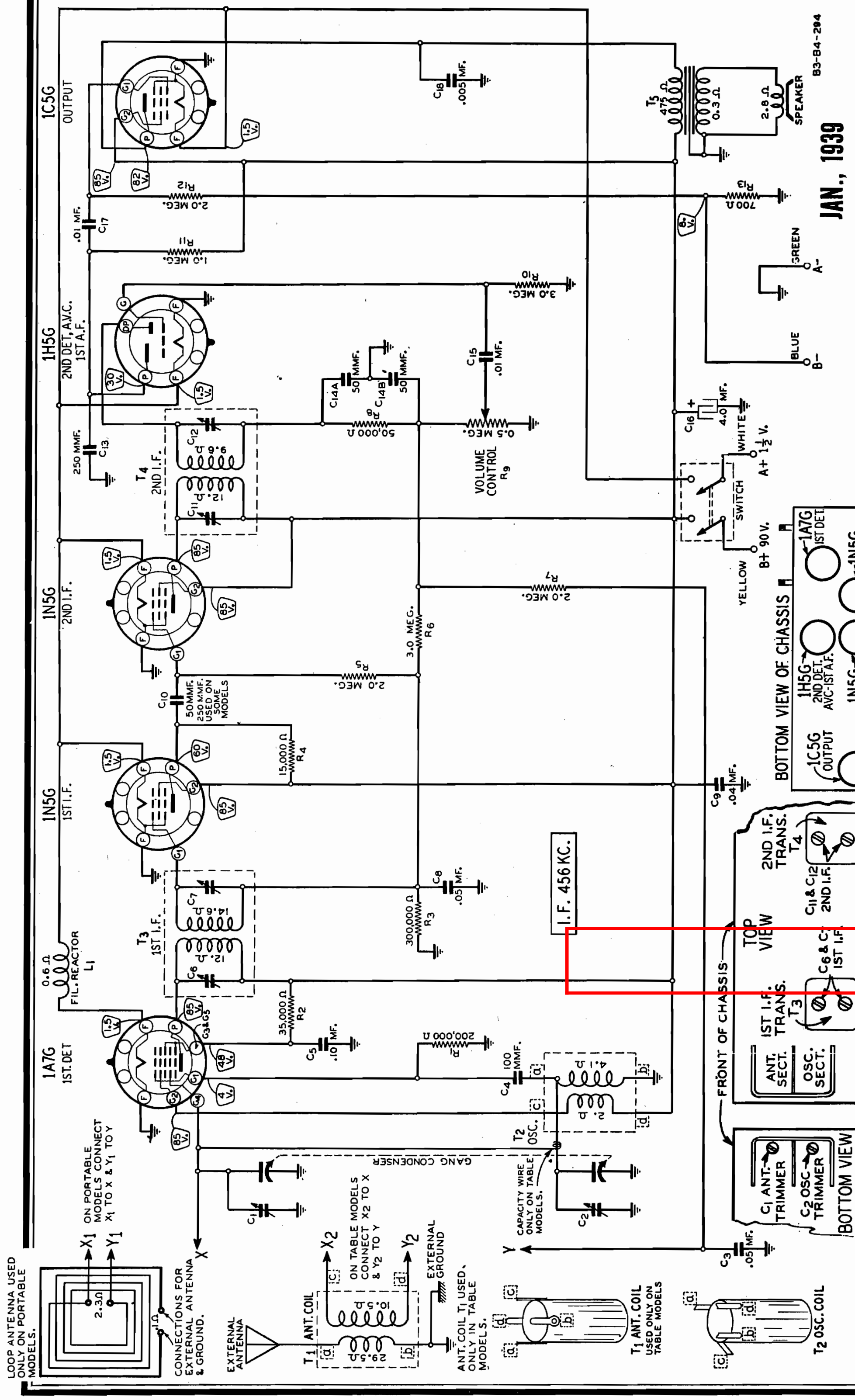


Fig. 3—Location of Trimmers

JAN., 1939

Dummy Antennas—.1 mf. and 200 mmf.

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Connections for the output meter may be made through the opening for the outside antenna and ground connecting posts. This opening is at the bottom of the cabinet near the back. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes

SIGNAL GENERATOR		DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Fig. 3)
FREQUENCY SETTING	CONNECTION AT RADIO			
456 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C11) & (C12)
1600 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C2)
TABLE MODEL ONLY				
1500 KC	Antenna Lead	200 mmf.	Turn rotor to max. output	Antenna (C1)
PORTABLE MODEL ONLY				
1500 KC	None—See Note		Turn rotor to max. output	Antenna (C1)

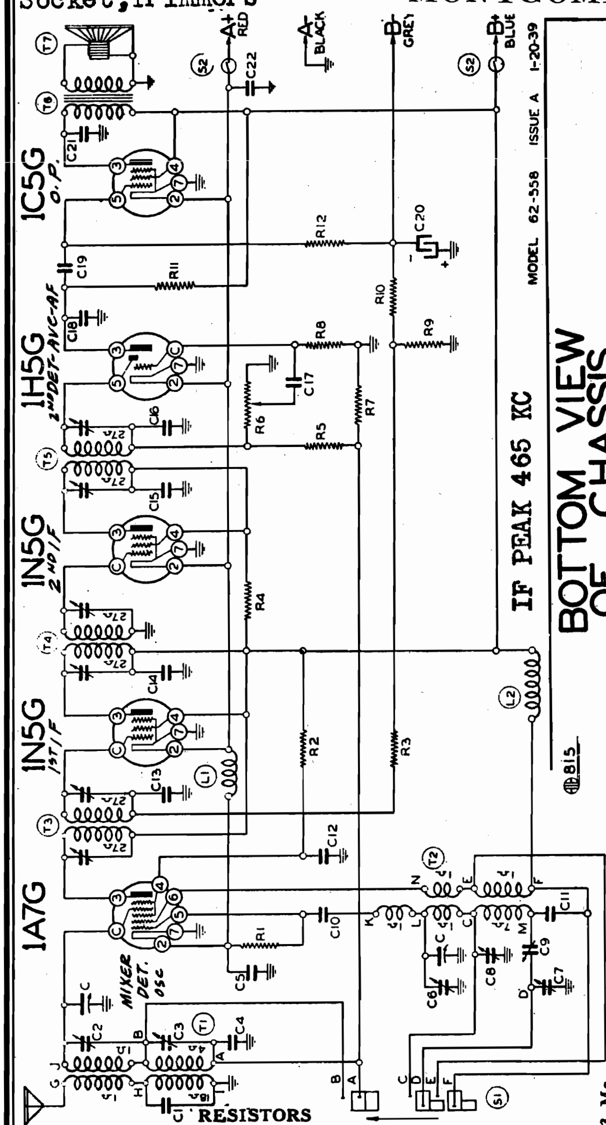
Schematic, Voltage Socket, Trimmers

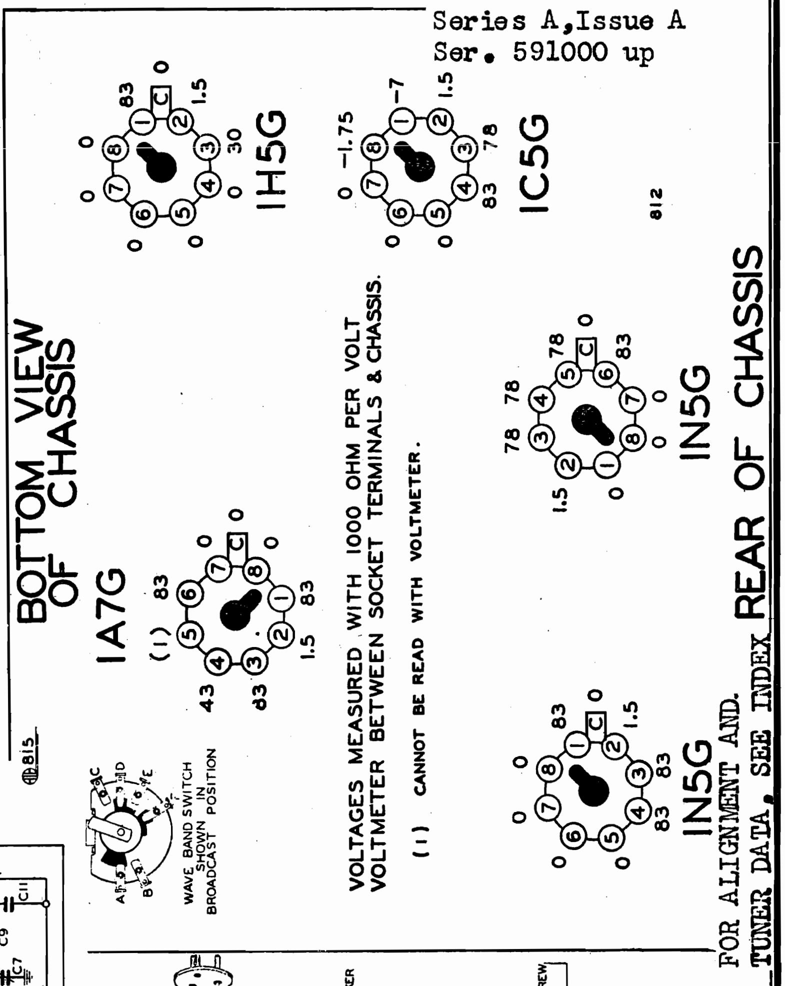
MONTGOMERY WARD & CO.

MODELS 62-558, 62-1558 62-2558

Series A, Issue A

Ser. 591000 up





FOR ALIGNMENT AND TUNER DATA, SEE INDEX

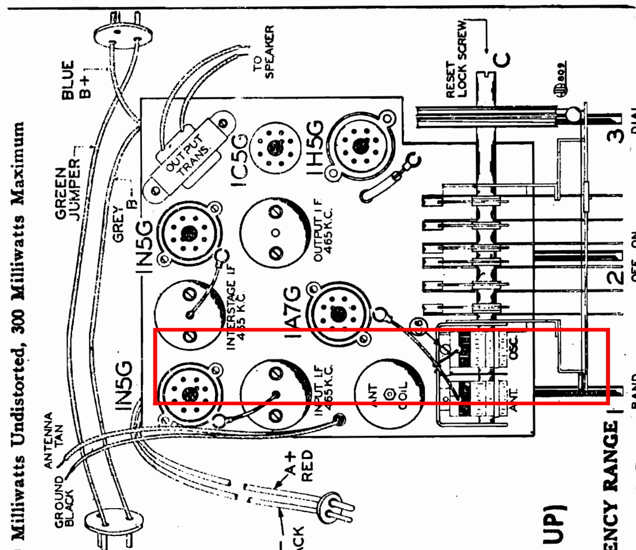
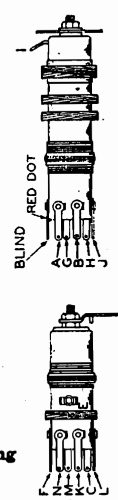


FIG 1—TOP VIEW



"A" 300 Ma., "B" 13 Ma.

Power Consumption 150 Milliwatts Undistorted, 300 Milliwatts Maximum

Power Output

RESISTORS

R1	BE130266	200M ohm—⅓ w.
R2	BE13094	50M ohm—⅓ w.
R3	BE13019	1 megohm—⅓ w.
R4	BE130193	3M ohm—⅓ w.
R5	BE13038	2 megohm—⅓ w.
R6	BE101160	250M ohm—volume control
R7	BE130271	4 megohm—⅓ w.
R8	BE13019	1 megohm—⅓ w.
R9	BE130270	180 ohm—⅓ w.
R10	BE13093	450 ohm—⅓ w.
R11	BE1303	500M ohm—⅓ w.
R12	BE13019	1 megohm—⅓ w.

CONDENSERS

C	BE10299	2-gang variable condenser			
C1	BE12940	.0001 mica			
C2	BE12455	S.W. Antenna Adj. Trimmer			
C3	BE12439	B.C. Antenna Adj. Trimmer			
C4	BE10022	.05 x 200 v.			
C5	BE10064	.25 x 200 v.			
C6		S.W. Osc. Adj. Trimmer on gang			
C7	BE12994	S.W. Adj. Series pad .003 w.c.			
C8	BE12439	B.C. Osc. Adj. Trimmer			
C9	BE12438	B.C. Adj. Series Pad 580 mmf. W.C.			
C10	BE129135	.00005 mica	C16	BE12912	.00025 mica
C11	BE1009	.05 x 200 v.	C17	BE10019	.006 x 600 v.
C12	BE10020	.1 x 200 v.	C18	BE12921	.0002 mica
C13	BE10059	.05 x 200 v.	C19	BE10011	.01 x 400 v.
C14	BE10050	.25 x 200 v.	C20	BE11952	20 mfd. lytic w. v. 25
C15	BE10020	.1 x 200 v.	C21	BE10071	.004 x 600 v.
			C22	BE1006	.25 x 200 v.

PARTS

T1	BE111117	Antenna Coil Complete
T2	BE110106	Oscillator Coil Complete
T3	BE108133	Input I. F. 465 kc. complete
T4	BE108135	Interstage I. F.—465 kc. complete
T5	BE108134	Output I. F. — 465 kc. complete
T6	BE114115	6" P. M. Speaker
L1	BE10568	"A" Choke
L2	BE1233	R. F. "B" Choke
S1	BE12573	Wave Band Switch
S2		D.P. S.T. Switch on Volume Control
T7	BE10569	Output Transformer

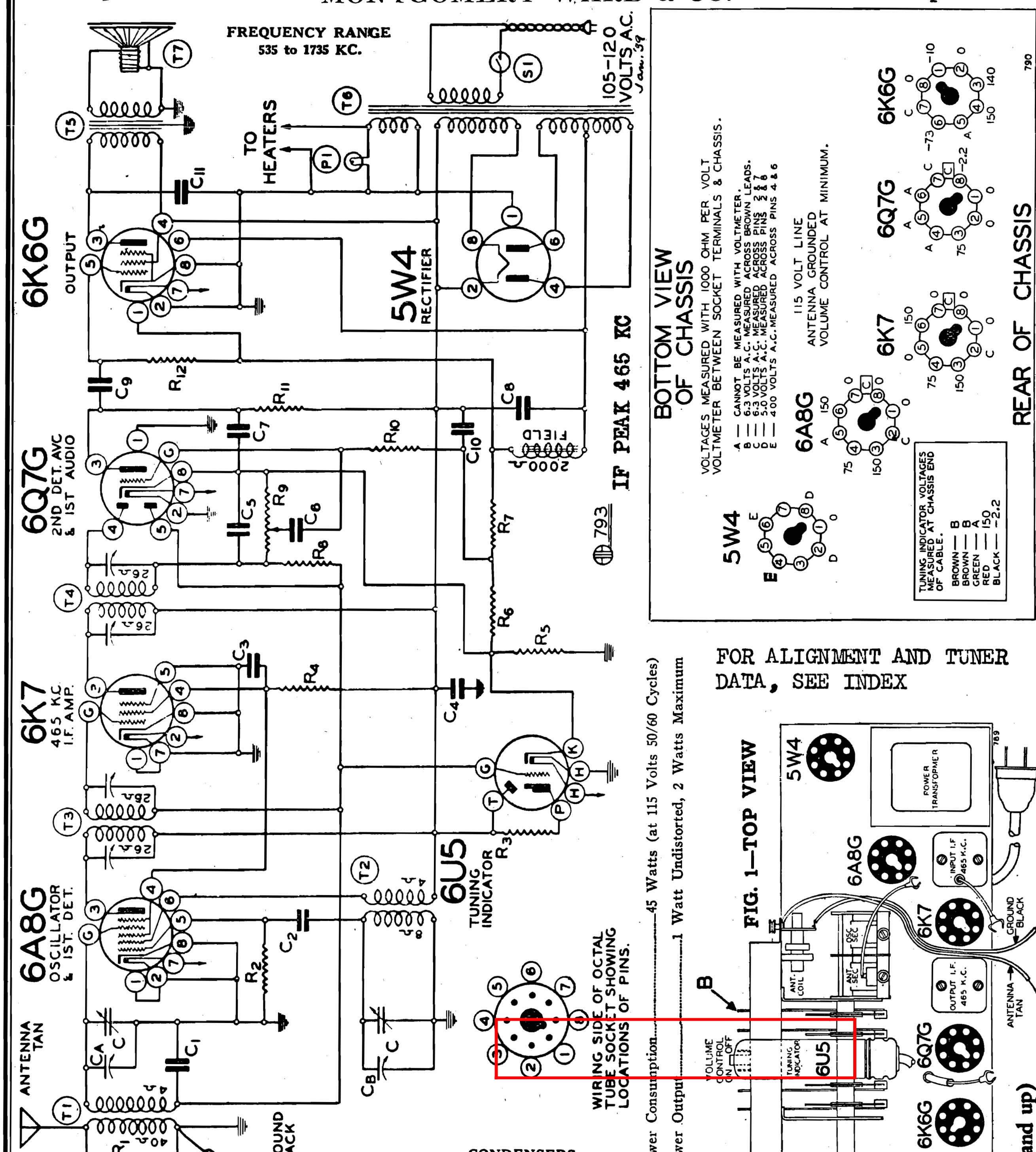
REPAIR PARTS (SERIAL No. 591000 and UP)

BAND SWITCH	FREQUENCY RANGE
Extreme Right Rotation	5.7 to 18.1 MC.
Extreme Left Rotation	530 to 1750 KC.

Schematic, Voltage
Socket, Trimmers

MONTGOMERY WARD & CO.

MODEL 62-601, Series A
Ser. 545900 up



RESISTORS

R1	BE13017	10M ohm—⅓ w.
R2	BE13012	50M ohm—⅓ w.
R3	BE130186	250M ohm—1/10 w.
R4	BE13021	20M ohm—⅓ w.
R5	BE10635	65 ohm Resistor Strip
R6	BE10635	45 ohm Resistor Strip
R7	BE10635	220 ohm Resistor Strip
R8	BE130170	3 megohm—⅓ w.
R9	BE101158	1 megohm—Volume control
R10	BE130170	3 megohm—⅓ w.
R11	BE1309	200M ohm—⅓ w
R12	BE130118	600M ohm—⅓ w

R5, R6 and R7 in same unit

CONDENSERS

C	BE10296	2 gang variable condenser
CA		Antenna Trimmer on Gang
CB		Oscillator Trimmer on Gang
C1	BE1009	.05 x 200 v.
C2	BE12912	.00025 Mica
C3	BE1001	.1 x 400 v.
C4	BE10013	.05 x 400 v.
C5	BE1295	.0001 Mica
C6	BE10011	.01 x 400 v.
C7	BE1292	.0005 Mica
C8	BE11947BC	5.0 mfd. 250 w. v. lytic
C9	BE10011	.01 x 400 v.
C10	BE11947BC	5.0 mfd. 250 w. v. lytic
C11	BE10019	.006 x 600 v.

C8 and C10 in same unit

PARTS

T1	BE111102	Antenna Coil Complete
T2	BE11072	Oscillator Coil Complete
T3	BE10882D	Input I. F.—465 kc.
T4	BE10883D	Output I. F.—465 kc.
T5	BE10555	Output Transformer
T6	BE104100B	Power Transformer
T7	BE114152	6" Dynamic Speaker (2000 ohm field)
S1		Off-on Switch on Volume Control
P1	BE10794	6-8 volt pilot light type 44

PARTS (Serial No. 545,900 and up)

MODELS 62-651,62-652
MODELS 62-654,62-655,62-1654,
62-2654,62-2655 ,62-1655,
MODELS 62-656,62-1656,62-2656
MODELS 62-750,62-751

MONTGOMERY WARD & CO.

Tuner Data

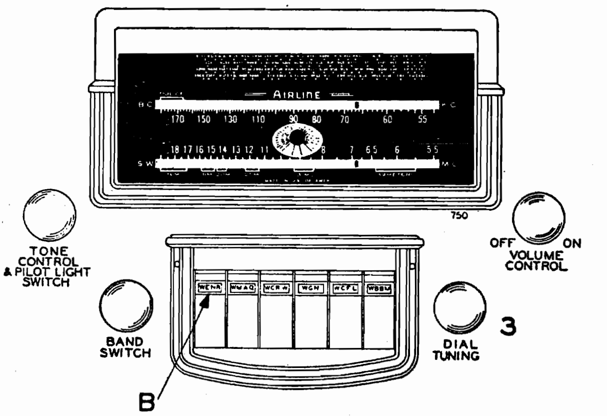


FIG. 2—FRONT VIEW

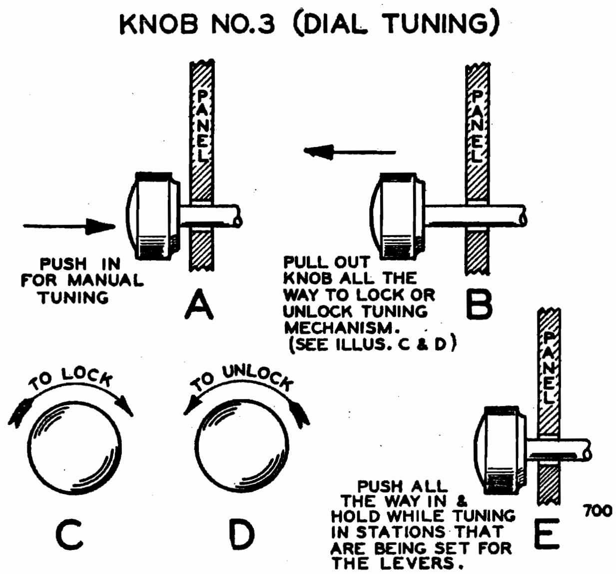


FIG. 3

PROCEDURE FOR SETTING THE AUTOMATIC TUNER LEVERS:

IMPORTANT—Read carefully before setting the automatic levers.

There are six levers by means of which six stations may be selected. Make a list of local stations or stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever button an opening is provided for inserting the call letter tabs.

Insert the call letter tabs in the rectangular openings of each of the automatic tuner buttons. One of the small celluloid tabs supplied should be inserted into place over each of the station call letter tabs.

NOW, PROCEED AS FOLLOWS:—

1. Pull the dial tuning knob **all the way out** (See Illus. "B," Fig. 3), and rotate the tuning knob to the **left** (counterclockwise) until it cannot be turned any further (See Illus. "D," Fig. 3). This will unlock the automatic tuner mechanism. **(NOTE:—Automatic tuner mechanism is locked TIGHT when radio is shipped from the factory.)**

2. Press **down all the way** any one of the automatic tuner levers. Holding it down **firmly,** press in on the dial tuning knob No. 3 and tune in the station indicated on the station call letter tab on this lever. You will note that in order to tune the station, the dial tuning knob will have to be **pressed in** (See Illus. "E," Fig. 3). Turn the dial tuning knob very slowly back and forth **(while still holding the automatic tuner lever in downward position),** noting the width of the shadow on the screen of the cathode-ray tuning indicator. Minimum width on the tuning indicator indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in.

3. Press down another automatic tuner lever. Holding it down **firmly,** press in on the dial tuning knob and carefully tune in the station indicated on the call letter tab on this lever.

4. Follow this procedure until you have selected all of your favorite stations.

5. Pull the dial tuning knob **all the way out** (See Illus. "B," Fig. 3) and rotate the tuning knob to the **right** (clockwise) until it cannot be turned any further (See Illus. "C," Fig. 3). This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place. After you have locked the tuner mechanism, push the dial tuning knob in.

6. If you should desire to change any station you selected to another, pull the dial tuning knob all the way **out** and rotate the knob to the left (counterclockwise) and unlock the tuner mechanism. Select the new station as explained. (NOTE:—If the dial mechanism works hard when setting up a new station for one of the automatic tuner levers, it is due to the tuner mechanism not being unlocked all the way. Pull the dial tuning knob out all the way and rotate the knob to the left (counterclockwise) until it will turn no further. The dial mechanism should work freely with the tuner lever pressed down).

7. After you have selected the new station, pull the dial tuning knob all the way **out** and rotate the knob to the **right** (clockwise) to lock the tuner mechanism. Be sure the knob is turned until it will turn no further, then **press** the dial tuning knob **in.**

8. The automatic tuner levers are now set up for quick tuning. Press down the lever key and—YOUR FAVORITE STATION IS SELECTED!

The **important** steps to remember when setting up stations on the tuner levers for automatic tuning are:

1. **To unlock** the tuner mechanism pull the dial tuning knob **all the way out.** You may find it necessary to rotate the knob slightly when pulling it out to make certain that the gears mesh properly. Rotate the dial tuning knob to the left (counterclockwise) as far as it will turn without forcing.

2. **To set a lever,** press down **all the way** and **hold** in this position while tuning in by means of the dial tuning knob the station you want this lever to be tuned to. (NOTE:—you will notice that it will be necessary to keep pressing in on the dial tuning knob while tuning in the station as a spring tends to push the knob out.) Set all the levers in the same manner before locking the mechanism.

3. **To lock** the tuner mechanism pull the dial tuning knob **all the way out.** Rotate the dial tuning knob to the right as far as it will turn making certain that it is tight, but it is not necessary to use force.

4. After locking or unlocking the tuner mechanism always return the dial tuning knob to its normal position **(pushed in).**

TYPICAL TUNING DATA

The procedure for setting the Automatic Levers is the same for all the above mentioned models. However, the number of Automatic Levers may differ.

Schematic, Socket, Trimmers

MONTGOMERY WARD & CO.

MODELS 62-651, 62-652
Series A, Ser. 8M498700 up

PARTS (SERIAL No. 8M498700 and UP)

CONDENSERS

C	BE10292C	2 gang variable condenser
C1	BE10012	.003 x 600 w.
C2	BE12469	B. C. Antenna Trimmer
C3	BE129132	.000125 mica
C4	BE129131	.002775 mica
C5	BE12469	S. W. Antenna Trimmer
C6	BE12466	.00045 Series Pad B. C.
C7	BE12466	.0015 Series Pad S. W.
C8	BE10020	.1 x 200 v.
C9	BE12470	S. W. Oscillator Trimmer
C10	BE12470	B. C. Oscillator Trimmer
C11	BE12938	.00005 mica
C12	BE10025	.002 x 600 v.
C13	BE10020	.1 x 200 v.
C14	BE10020	.1 x 200 v.
C15	BE1295	.0001 mica
C16	BE10020	.1 x 200 v.
C17	BE11959C	10 mfd. lytic
C18	BE10068	.003 x 1400 v.
C19	BE1009	.05 x 200 v.
C20	BE10012	.003 x 600 v.
C21	BE10020	.1 x 200 v.
C22	BE1292	.0005 mica
C23	BE10076	.02 x 400 v.
C24	BE10019	.006 x 600 v.
C25	BE1009	.05 x 200 v.
C26	BE10031	.5 x 120 v.
C27	BE10040	.5 x 120 v.
C28	BE10089	.008 x 800 v.
C29	BE11959C	.30 mfd. lytic

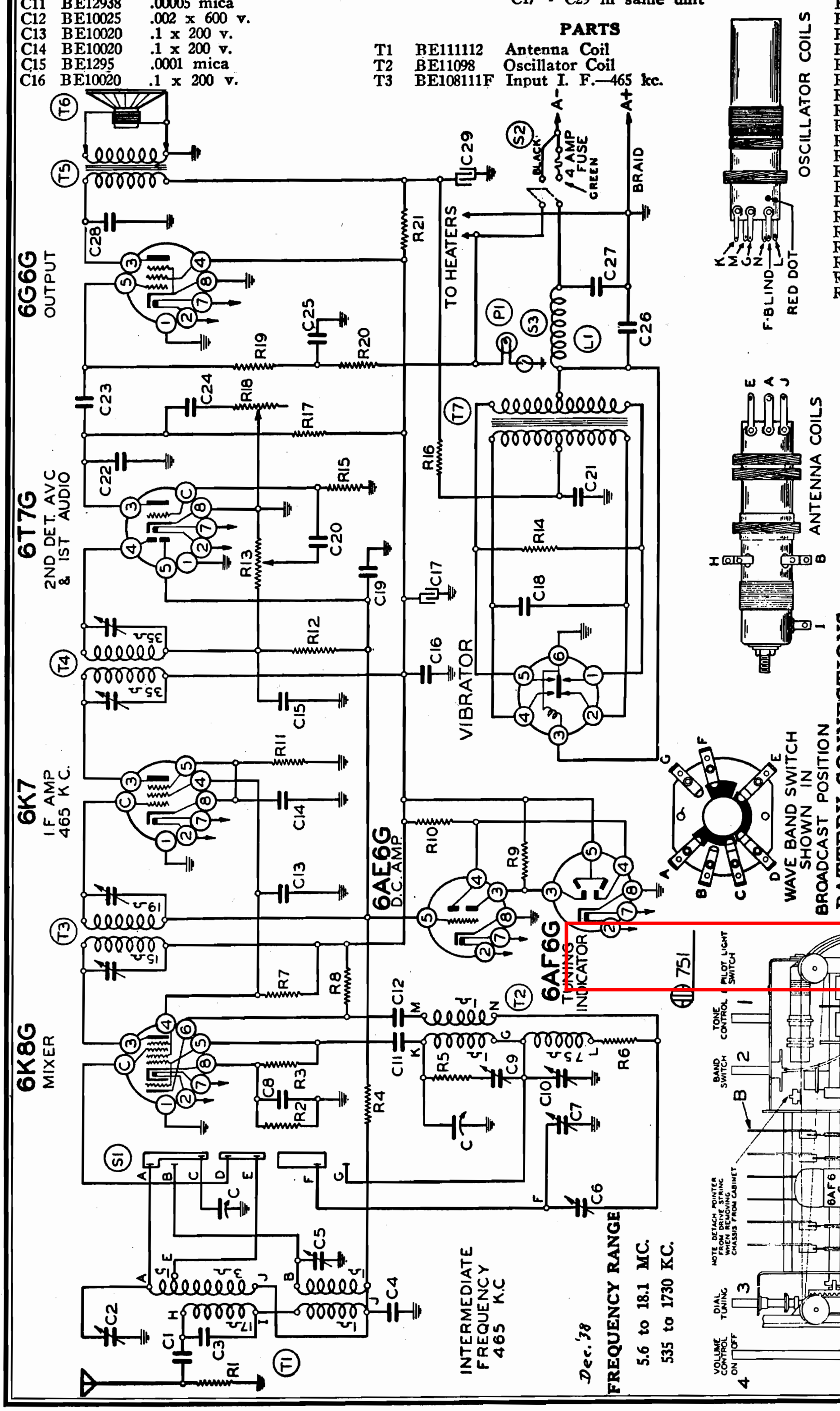
C17 - C29 in same unit

PARTS

T1	BE111112	Antenna Coil
T2	BE11098	Oscillator Coil
T3	BE108111F	Input I. F.—465 kc.
T4	BE108106-O	Output I. F.—465 kc.
T5	BE10569C	Output Transformer
T6	BE114143	6 in. P. M. Speaker (62-651)
T6	BE114139	8 in. P. M. Speaker (62-652)
T7	BE104137E	Power Transformer
L1	BE10568	"A" Choke
S1	BE12568	Band Switch
S2		Off-on Switch on Volume Control
S3		Push button pilot light switch on tone control
P1	BE10789	6.3 volt pilot light—T40—150 ma.

RESISTORS

R1	BE13017	10M ohm—⅓ w.
R2	BE13097	200 ohm—⅓ w.
R3	BE13012	50M ohm—⅓ w.
R4	BE13011	250M ohm—⅓ w.
R5	BE130240	30 ohm—⅓ w.
R6	BE130197	20 ohm—⅓ w.
R7	BE13082	10M ohm—⅓ w.
R8	BE13048	15M ohm—⅓ w.
R9	BE13019	1 megohm—⅓ w.
R10	BE13019	1 megohm—⅓ w.
R11	BE13070	500 ohm—⅓ w.
R12	BE1304	3 megohm—⅓ w.
R13	BE101153	1 megohm volume control
R14	BE13097	200 ohm—⅓ w.
R15	BE130225	15 megohm—⅓ w.
R16	BE130168	100 ohm—⅓ w.
R17	BE1309	200M ohm—⅓ w.
R18	BE101154	250M ohm—tone control
R19	BE130163	400M ohm—⅓ w.
R20	BE130103	100M ohm—⅓ w.
R21	BE13079	400 ohm—⅓ w.



BATTERY CONNECTIONS:

Referring to Fig. 1, connect the battery cable to the storage battery in the following manner:

(a) The storage battery should be located as far from the receiver as the battery cable will permit.

(b) Connect the lead (containing the fuse receptacle) marked A negative (—) to the negative (—) post of the storage battery.

(c) Connect the lead marked A positive (+) to the positive (+) post of the storage battery.

FUSE:

In case of difficulty, the fuse contained in the metal fuse receptacle should be checked. A 4 ampere Type 3AG fuse (Part No. BE13179) should be used.

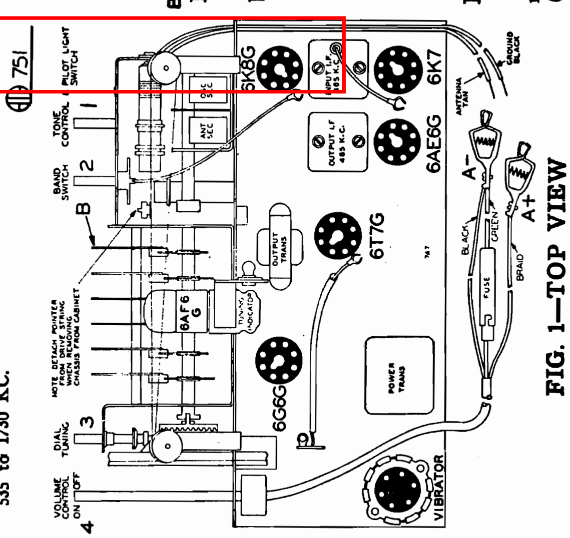


FIG. 1—TOP VIEW

MODELS 62-651,62-652
MODELS 62-654,62-655
62-1654,62-2654,62-2655
Voltage,Alignment,Trimmers

MONTGOMERY WARD & CO.

MODELS 62-750,62-751
Alignment,Trimmers

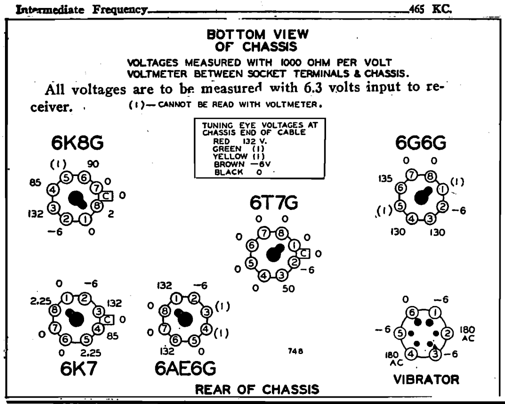
BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C10) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer (C2) (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C6) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer (C9) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 Mc.	Trimmer (C5) (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer (C7) (See Fig. 4)	Short Wave Oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

Power Consumption .... 2.8 Amperes at 6.3 Volts
Power Output .... 6 Watts Undistorted, 1.1 Watts Maximum
Intermediate Frequency .... 465 KC.



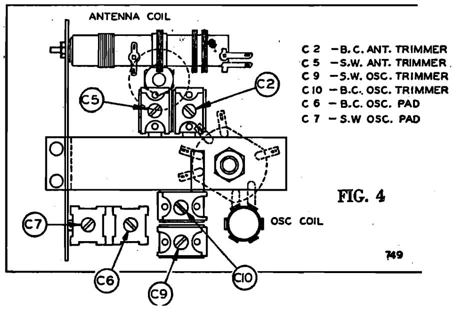


FIG. 4

To remove the chassis from the cabinet, remove the four bolts which are used to fasten the chassis to the cabinet bottom; pull the knobs off their shafts and detach the pointer from the drive string (see Fig. 1, top view).

NOTE:—On the side of the string dial drum a calibrated scale is provided for aligning this chassis to the frequencies listed in the alignment procedure. Attach a pointer so that it will indicate proper dial setting in respect to the position of the variable condenser.

ALIGNMENT
SOCKET
VOLTAGE
TRIMMERS
MODELS
62-651
62-652
Series A

ALIGNMENT
TRIMMERS
MODELS
62-750
62-751

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1D5G-P 2nd I. F.	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1D5G-P 1st I. F.	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Interstage I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1C7G Mixer	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer C8 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer C2 (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer C11 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer C7 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 Mc.	Trimmer C5 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 Mc.	Trimmer C6 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

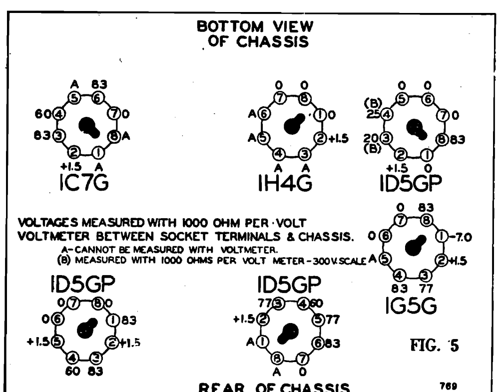


FIG. 5

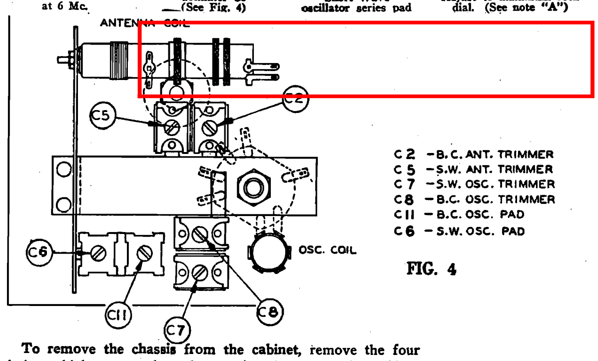


FIG. 4

To remove the chassis from the cabinet, remove the four bolts which are used to fasten the chassis to the cabinet bottom; pull the knobs off their shafts and detach the pointer from the drive string (see Fig. 1, top view).

NOTE:—On the side of the string dial drum a calibrated scale is provided for aligning this chassis to the frequencies listed in the alignment procedure. Attach a pointer so that it will indicate proper dial setting in respect to the position of the variable condenser.

MODELS 62-654, -655,
-1654, -1655,
-2654, -2655
Series A

FOR TUNER DATA
SEE INDEX

MODEL 62-653
Schematic, Voltage
Socket, Trimmers

MONTGOMERY WARD & CO.
SPECIFICATIONS

Power Consumption	6.8 Amperes at 6.3 Volts
Power Output	3 Watts Undistorted
Sensitivity	1.5 Microvolts at .5 Watt Output (L-D Switch in Distance Position)
Selectivity	39 KC Broad at 1000 Times Signal
Tuning Frequency Range	540 to 1560 KC
Intermediate Frequency	456 KC
Speaker	6" Electro-Dynamic

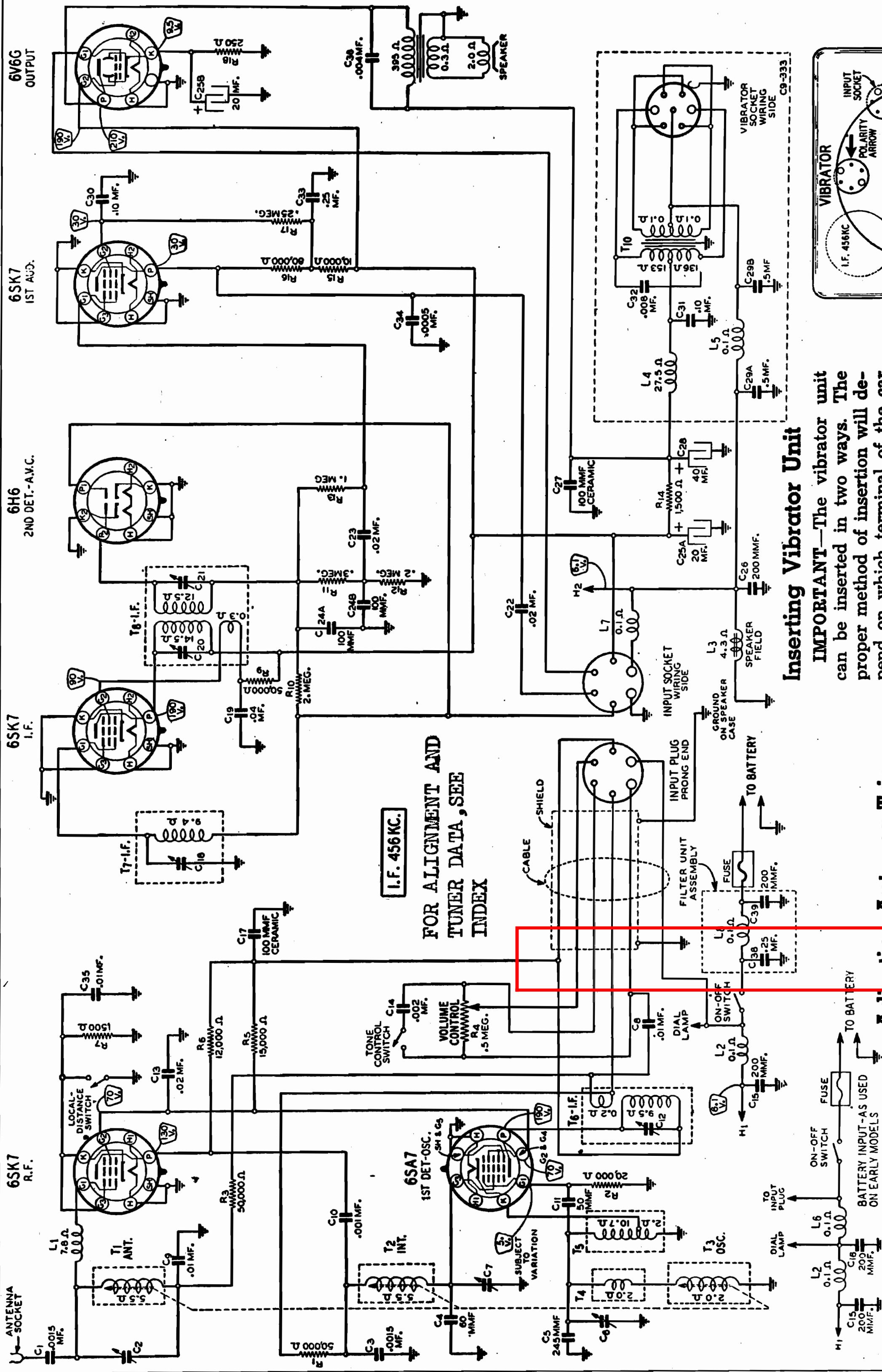


Fig. 5—Schematic Circuit Diagram

6 TUBES
5 STATION BUTTONS

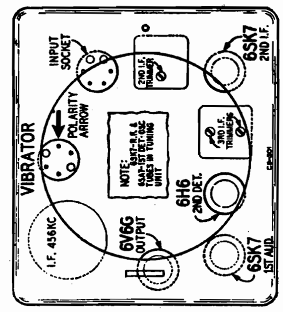


Fig. 2—Tube and Vibrator Location

Inserting Vibrator Unit

IMPORTANT—The vibrator unit can be inserted in two ways. The proper method of insertion will depend on which terminal of the car battery is grounded. If the POSITIVE (+) terminal of the car battery is grounded, line up the + mark on the top of the vibrator with the arrow on the chassis base. If the NEGATIVE (—) terminal of the car battery is grounded, line up the — mark on the top of the vibrator with the arrow on the chassis base.

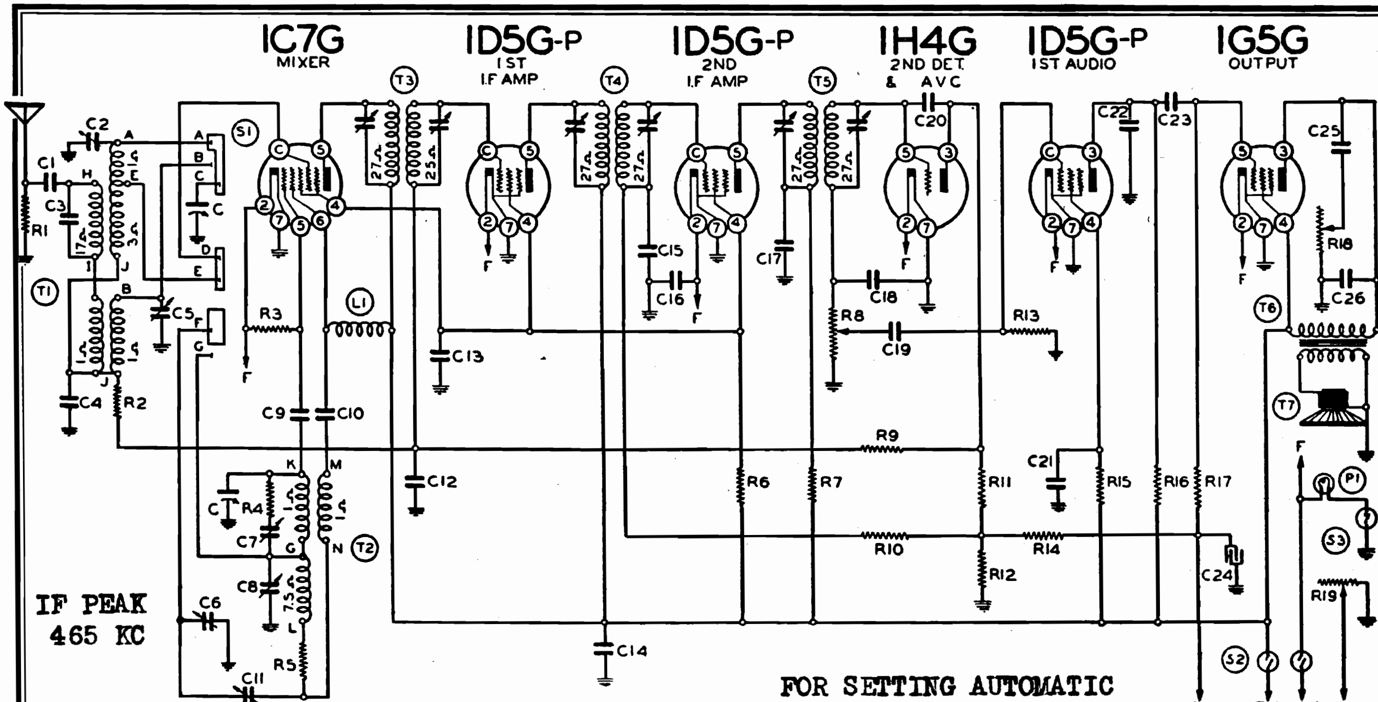
Adjusting Antenna Trimmer

After the antenna is connected, tune in a weak signal at approximately 1000 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna trimmer (C2) up or down until maximum output is obtained. See Fig. 1 for location of this trimmer.

MODELS 62-654,62-655
62-1654,62-1655
62-2654,62-2655
Series A
Ser.509200 up

MONTGOMERY WARD & CO.

Schematic, Socket
Trimmers



IF PEAK
465 KC

PARTS
(SERIAL No. 509200 and UP)

RESISTORS

R1	BE13017	10M ohm—⅓ w.
R2	BE1309	200M ohm—⅓ w.
R3	BE13012	50M ohm—⅓ w.
R4	BE130197	20 ohm—⅓ w.
R5	BE130197	20 ohm—⅓ w.
R6	BE130265	8M ohm—⅓ w.
R7	BE13043	2500 ohm—⅓ w.
R8	BE101152	250M ohm—volume control
R9	BE13019	1 megohm—⅓ w.
R10	BE13019	1 megohm—⅓ w.
R11	BE13019	1 megohm—⅓ w.
R12	BE13083	300 ohm— ⅓ w.
R13	BE130225	15 megohm—⅓ w.
R14	BE130168	100 ohm—⅓ w.
R15	BE13019	1 megohm—⅓ w.
R16	BE1303	500M ohm—⅓ w.
R17	BE13019	1 megohm—⅓ w.
R18	BE101151	1 megohm tone control
R19	BE101112	3.2 ohm—rheostat

CONDENSERS

C	BE10292C	2 Gang Variable
C1	BE10078	.01 x 200 v.
C2	BE12469	B.C. Antenna Trimmer
C3	BE129132	.000125 mica
C4	BE129131	.002775 mica
C5	BE12469	S.W. Antenna Trimmer
C6	BE12466	S.W. Oscillator Series Pac
C7	BE12470	S.W. Oscillator Trimmer
C8	BE12470	B.C. Oscillator Trimmer
C9	BE12939	.00005 mica
C10	BE10025	.002 x 600 v.
C11	BE12466	B.C. Oscillator Series Pad
C12	BE10026	.02 x 400 v.
C13	BE10048	.25 x 200 v.
C14	BE10048	.25 x 200 v.
C15	BE10022	.05 x 200 v.
C16	BE10048	.25 x 200 v.
C17	BE10020	.1 x 200 v.
C18	BE12912	.00025 mica
C19	BE1007	.005 x 600 v.
C20	BE12939	.00005 mica
C21	BE10020	.1 x 200 v.
C22	BE1295	.0001 mica
C23	BE10086	.02 x 400 v.
C24	BE11952	25 mfd.-25 w. v. lytic
C25	BE10011	.01 x 400 v.
C26	BE10071	.004 x 600 v.

PARTS

T1	BE111112	Antenna Coil
T2	BE11098B	Oscillator Coil
T3	BE108128	Input I. F.—465 Kc.
T4	BE108127	Interstage I. F.—465 Kc.
T5	BE10879E	Output I. F.—465 Kc.
T6	BE10569	Output Transformer
T7	BE114115	6" P. M. Speaker (62-654)
T7	BE114146	8" P. M. Speaker (62-655)
L1	BE1233	R. F. Choke
S1	BE12568	Wave Band Switch
S2		Off-on switch on volume control
S3		Push-in switch on tone control

779 Dec. '38

FOR SETTING AUTOMATIC TUNING LEVERS AND ALIGNMENT, SEE INDEX.

FREQUENCY RANGE

5.6 to 18.1 MC.
535 to 1730 KC.

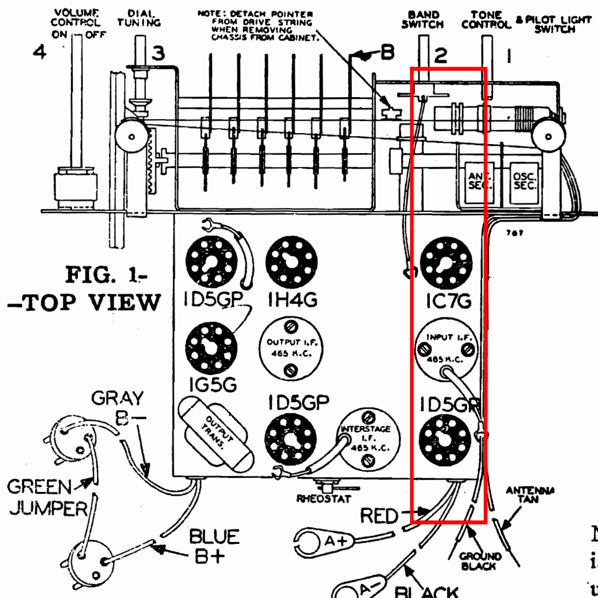
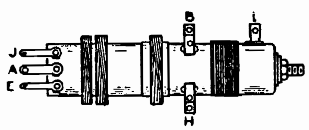
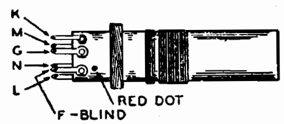


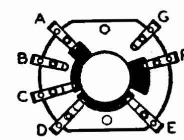
FIG. 1-
-TOP VIEW



ANTENNA COILS



OSCILLATOR COILS



WAVE BAND SWITCH
SHOWN IN
BROADCAST POSITION

Power Consumption

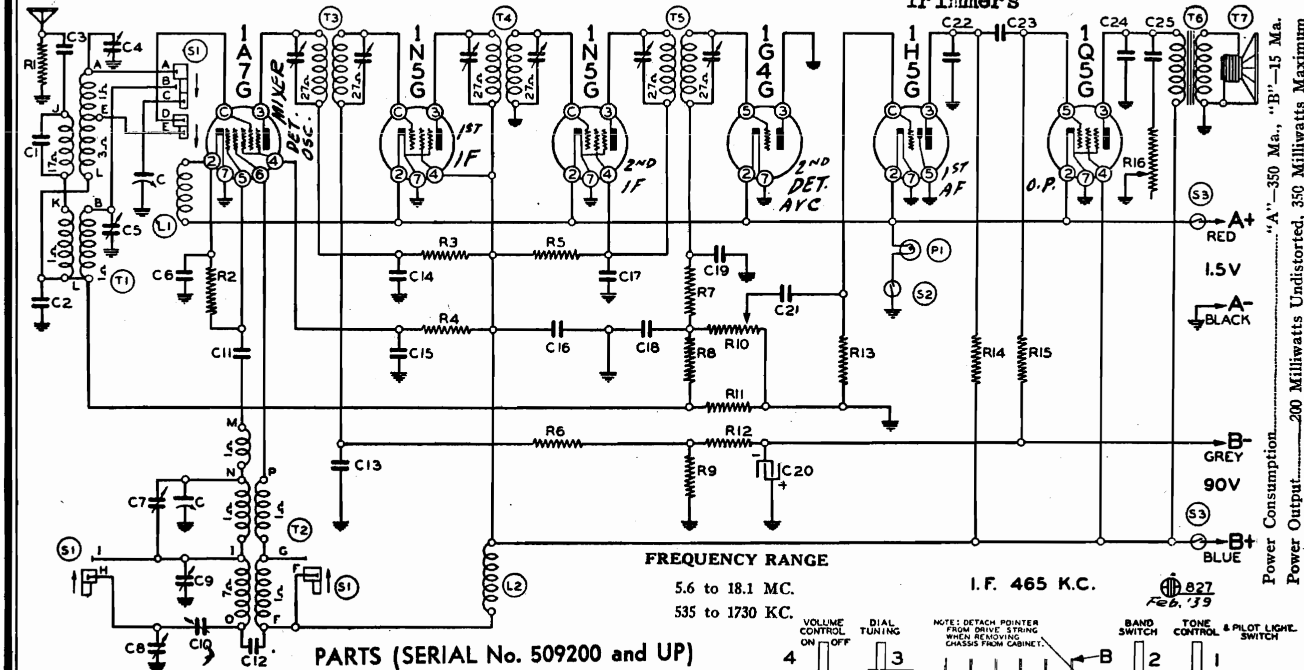
250 Milliwatts Maximum
170 Milliwatts Undistorted,

Power Output
"A"—480 Ma., "B"—19 Ma.

NOTE:—The letter "P" indicates that the 1D5G Tube used is a Pentode. It is important that only this type 1D5G-P be used in this radio.

MONTGOMERY WARD & CO.

MODELS 62-656, 62-1656, 62-2656
Series A, Ser. 509200 up
Schematic, Voltage, Socket
Trimmers



FREQUENCY RANGE

5.6 to 18.1 MC.

535 to 1730 KC.

PARTS (SERIAL No. 509200 and UP)

RESISTORS

R1	BE13017	10M ohm—1/3 w.
R2	BE130266	200M ohm—1/3 w.
R3	BE13043	2500 ohm—1/3 w.
R4	BE13094	50M ohm—1/3 w.
R5	BE13043	2500 ohm—1/3 w.
R6	BE13019	1 megohm—1/3 w.
R7	BE13094	50M ohm—1/3 w.
R8	BE13038	2 megohm—1/3 w.
R9	BE130166	150 ohm—1/3 w.
R10	BE101152	250M ohm—volume control
R11	BE1304	3 megohm—1/3 w.
R12	BE13097	200 ohm—1/3 w.
R13	BE13019	1 megohm—1/3 w.
R14	BE1303	500M ohm—1/3 w.
R15	BE13019	1 megohm—1/3 w.
R16	BE101151	1 megohm tone control

CONDENSERS

C	BE10292C	2 Gang Variable Condenser
C1	BE129132	.000125 mica
C2	BE129131	.002775
C3	BE10078	.01 x 200 v.
C4	BE12469	B.C. Antenna Trimmer
C5	BE12469	S.W. Antenna Trimmer
C6	BE10048	.25 x 200 v.
C7	BE12470	S.W. Oscillator Trimmer
C8	BE12479	.00136 W.C. S.W. Series Pad
C9	BE12470	B. C. Oscillator Trimmer
C10	BE12479	.00049 W.C. B.C. Series Pad
C11	BE12939	.00005 mica
C12	BE1009	.05 x 200 v.
C13	BE10022	.05 x 200 v.
C14	BE10048	.25 x 200 v.
C15	BE10020	.1 x 200 v.
C16	BE10048	.25 x 200 v.
C17	BE10020	.1 x 200 v.
C18	BE12912	.00025 mica
C19	BE1295	.0001 mica
C20	BE11952	25 mfd.—25 w.v. lytic
C21	BE1007	.005 x 600 v.
C22	BE1295	.0001 mica
C23	BE10026	.02 x 400 v.
C24	BE10071	.004 x 600 v.
C25	BE10011	.01 x 400 v.

PARTS

T1	BE111112	Antenna Coils
T2	BE110108	Oscillator Coils
T3	BE108128	Input I.F. Coil—465 kc.
T4	BE108127	Interstage I.F. Coil—465 kc.
T5	BE108134B	Output I.F. Coil—465 kc.
T6	BE10569	Output Transformer
T7	BE114115	6" Speaker—P.M.
T7	BE114146	8" Speaker—P.M.
S1	BE12575	Wave Band Switch
S2		Pilot Light Switch on tone control
S3		Off-On Switch on Volume Control
P1	BE107243	1½ v. pilot light
L1	BE10568	"A" Choke
L2	BE1233	R.F. "B" Choke

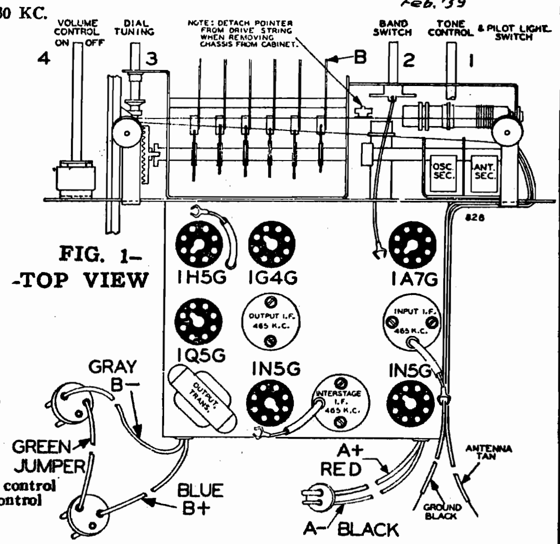
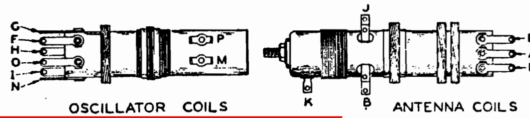
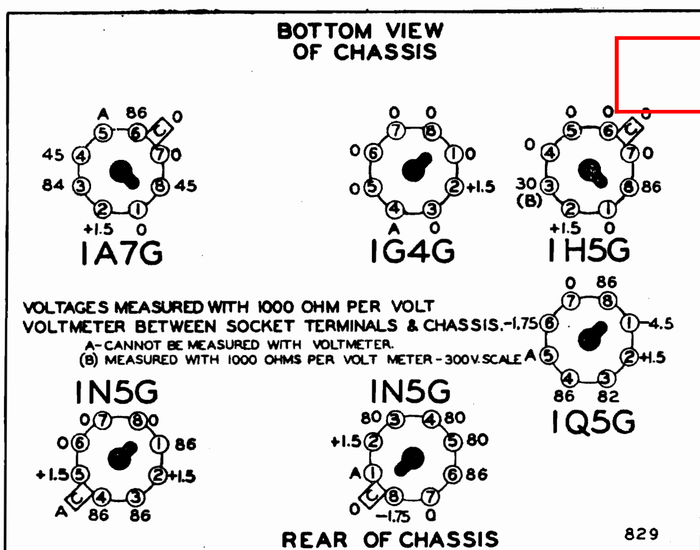
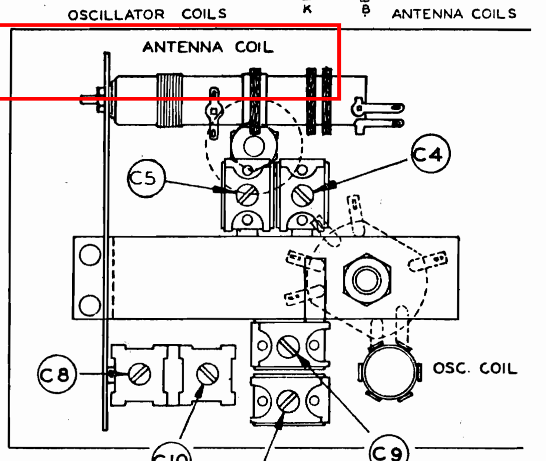


FIG. 1—TOP VIEW

FOR SETTING AUTOMATIC TUNING LEVERS SEE INDEX







C4 – B.C. ANT. TRIMMER
C5 – S.W. ANT. TRIMMER
C7 – S.W. OSC. TRIMMER
C9 – B.C. OSC. TRIMMER
C10 – B.C. OSC. PAD
C8 – S.W. OSC. PAD

MODELS 62-656, 62-1656, 62-2656
MODELS 93BR454A, 93BR1455A MONTGOMERY WARD & CO.
MODEL 93BR713A

Alignment

MODELS 62-656, 62-1656, 62-2656
Series A

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., and 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1N5G 2nd I. F.	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1N5G 1st I. F.	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Interstage I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7G Mixer	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set dial at 17 Mc.	Trimmer C7 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set dial at 17 Mc.	Trimmer C5 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set dial at 6 Mc.	Trimmer C8 (See Fig. 4)	Short Wave oscillator series 'pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer C9 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 1400 Kc.	Trimmer C4 (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 600 Kc.	Trimmer C10 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")

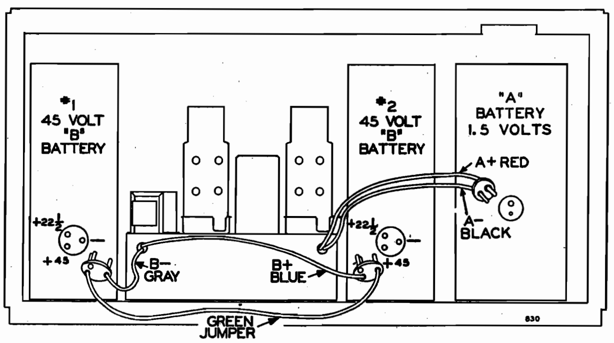
BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.6 to 18.1 MC.
Extreme Left Rotation	Broadcast	535 to 1730 KC.

Power Consumption—"A"—350 Ma., "B"—15 Ma.
Power Output—200 Milliwatts Undistorted, 350 Milliwatts Maximum
Intermediate Frequency—465 K.C.

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.



Connecting A Battery

First—Place the A Battery in the cabinet as shown.
NEXT—Insert the special two-prong connector plug into the socket on the A batteries as shown in illustration.

Connecting B Batteries

First—Place both B Batteries in the cabinet exactly as shown.
NEXT—Insert the special three-prong connector plugs into the sockets on the B batttries as shown in illustration.
NOTE: The above procedure and illustration pertains to the new style B batteries which have sockets; however, the old style B batteries which have terminals can be used by connecting them as follows.

FIRST—Remove the special plugs by cutting the wires ofl at the plugs.

NEXT—Connect gray colored B minus (—) wire to minus (—) terminal of battery on left side of receiver (marked Battery No. 1 in illustration).

NEXT—Connect one end of green connecting wire to plus (+45) terminal of battery No. 1 and other end to the minus (—) terminal of Battery No. 2.

NOW—Connect blue B plus (+) wire to the plus (+45) terminal of Battery No. 2.

MODELS 93BR-454A & 93BR-1455A

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1A7G Tube	Rotor full open (Plates out of mesh)	Four trimmers on top (See Fig. 1)	Output and input I. F.	(See Note "A") Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	200 mmf.	Grid of 1A7G Tube	Rotor full open (Plates out of mesh)	Trimmer (C3) front section of gang (See Fig. 4)	Oscillator	(See Note "A") Adjust to maximum output
	1400 Kc.		See Note "C"	Set dial at 1400 Kc.	Trimmer (C2) rear section of gang (See Fig. 4)	Antenna	(See Note "B") Adjust to maximum output

NOTE "A" — A 1 megohm resistor must be connected between the two loop antenna leads from the chassis when aligning the I. F. transformers and setting the oscillator trimmer, (C3). The loop antenna must be disconnected from the chassis.
NOTE "B" — Remove the 1 megohm resistor from the loop antenna leads; mount the chassis and the loop antenna in the cabinet, connect the loop antenna to the chassis. Adjust trimmer (C2). (See note "C")
NOTE "C" — Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.

FREQUENCY RANGE
545 to 1650 KC.

Power Output—200 Milliwatts Undistorted, 300 Milliwatts Maximum
Intermediate Frequency—465 KC.

CHASSIS No. 93BR713A

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer (C13) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer (C7) (See Fig. 3)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C10) (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
	465 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C1) (See Fig. 4)	I. F. Wave Trap	Adjust for minimum output
IMAGE ADJUSTMENT	2430 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1500 Kc. on dial	Trimmer (C6) (See Figs. 1 and 4)	Image rejection	Adjust for minimum output (See note "B")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer (C12) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave	Dial Set at 17 Mc.	Trimmer (C8) (See Fig. 3)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 6 Mc.	Trimmer (C11) (See Fig. 3)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B" 1500 KC. is the image frequency of 2430 KC. Adjust Trimmer (C6) until a minimum output is obtained. Trimmer (C6) is mounted on the bottom of the chassis.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

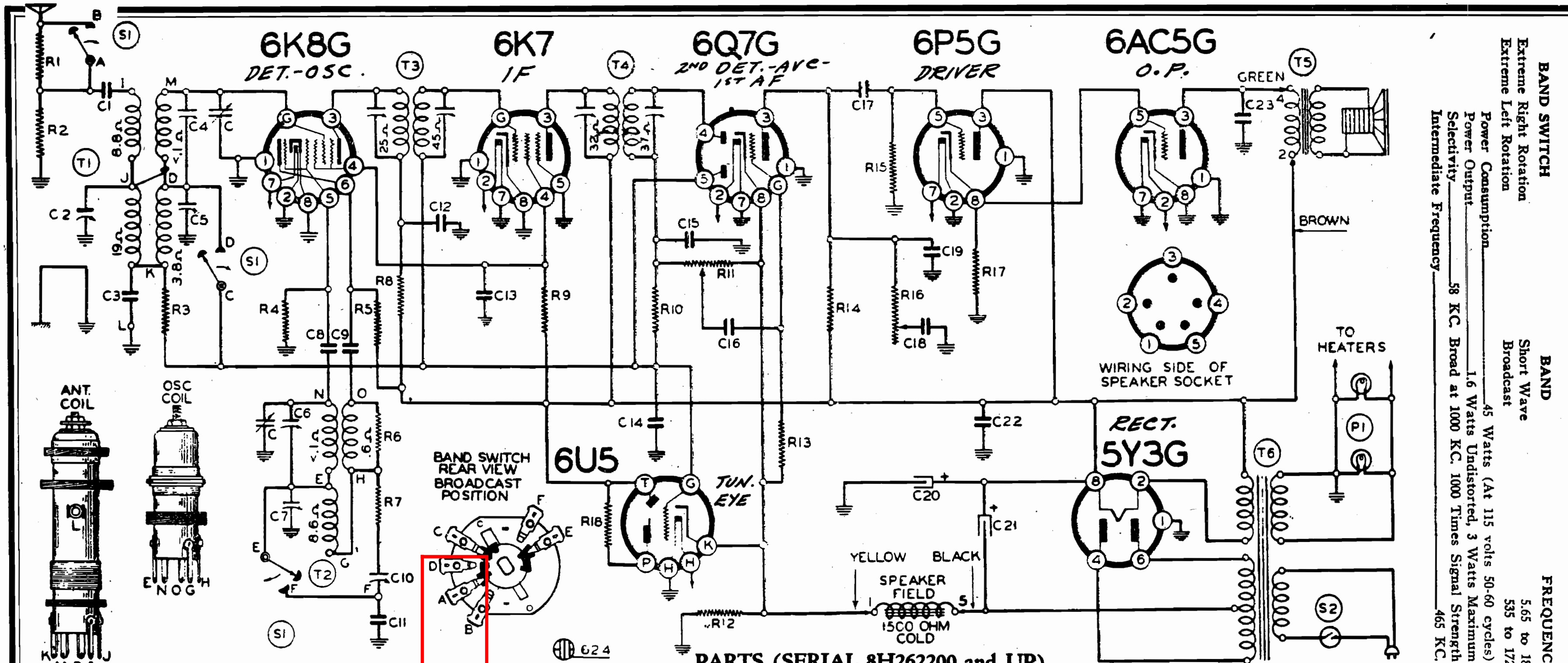
Schematic, Voltage
Socket, Trimmers

MONTGOMERY. WARD & CO.

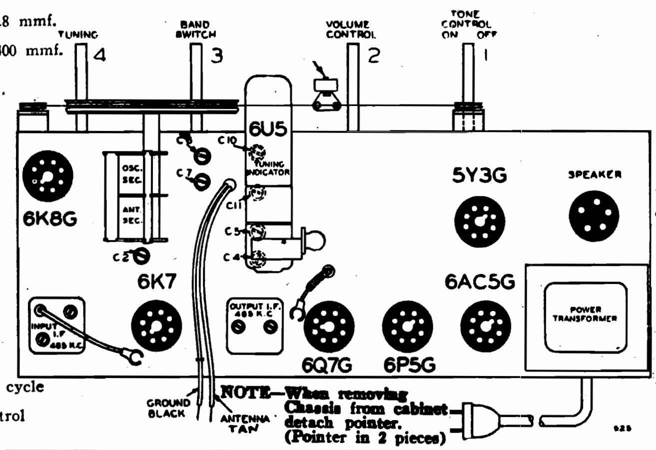
MODELS 62-702, 62-703
Series A, Issue B
Ser. 8H262200 up

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.65 to 18.3 MC.
Extreme Left Rotation	Broadcast	535 to 1720 KC.

Power Consumption .... 45 Watts (At 115 volts 50-60 cycles)
Power Output .... 1.6 Watts Undistorted, 3 Watts Maximum
Selectivity .... 58 KC. Broad at 1000 KC. 1000 Times Signal Strength
Intermediate Frequency .... 465 KC.



Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts.



NOTE—When removing Chassis from cabinet detach pointer. (Pointer in 2 pieces)

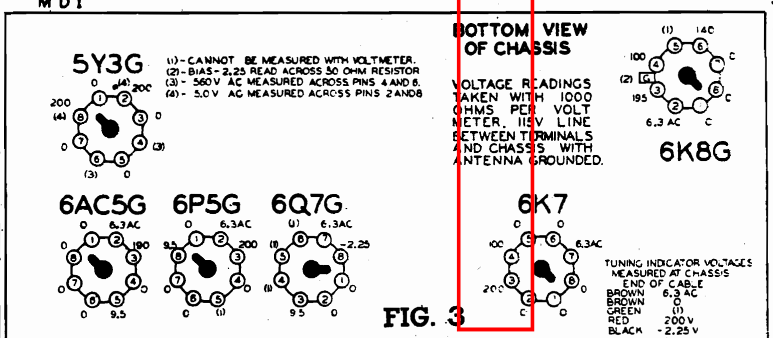


FIG. 3

PARTS (SERIAL 8H262200 and UP)

C3	BE129128	.0027 Mica
C4	BE12462	Dual Adjustable Trimmer
C5	BE12462	Dual Adjustable Trimmer
C6	BE12463	Dual Adjustable Trimmer
C7	BE12463	Dual Adjustable Trimmer
C8	BE12939	.000050 Mica
C9	BE10025	.002 x 600 v.
C10	BE12460 W. C.	Dual Compression Mica 418 mmf.
C11	BE12460 W. C.	Dual Compression Mica 3400 mmf.
C12	BE10026	.02 x 400 v.
C13	BE1001	.1 x 400 v.
C14	BE10096	.02 x 200 v.
C15	BE1295	.0001 mica
C16	BE10019	.006 x 600 v.
C17	BE10041	.01 x 400 v.
C18	BE10019	.006 x 600 v.
C19	BE1292	.0005 Mica
C20	BE11969	16 mfd. lytic
C21	BE11969	16 mfd. lytic
C22	BE10013	.05 x 400 v.
C23	BE10019	.006 x 600 v.

PARTS

T1	BE11193E	BC.—SW. Antenna Coil
T2	BE11089B	BC.—SW. Oscillator Coil
T3	BE108122	Input I.F.—465 kc.
T4	BE108106J	Output I.F.—465 kc.
T5	BE11415	6" Dynamic Speaker (1500 Ohm Field)
T6	BE104124F	Power Transformer—50/60 cycle
S1	BE12566	Band Switch
S2		Off-on switch on tone control
P1	BE10794	6-8 v. Pilot Lights (2)

RESISTORS

R1	BE130250	800 ohm—¼ w.
R2	BE133249	10M ohm—¼ w.
R3	BE13020	100M ohm—⅓ w.
R4	BE13012	50M ohm—⅓ w.
R5	BE13082	10M ohm—⅓ w.
R6	BE130235	1500 ohm—⅓ w.
R7	BE130240	30 ohm—⅓ w.
R8	BE13023	2M ohm—⅓ w.
R9	BE130176	20M ohm—⅓ w.
R10	BE1304	3 megohm—⅓ w.
R11	BE101137	Volume Control—1 Megohm
R12	BE130174	50 ohm—⅓ w.

REAR OF CHASSIS

R13	BE130225	15 megohm—⅓ w.
R14	BE1309	20M ohm—⅓ w.
R15	BE13019	1 megohm—⅓ w.
R16	BE101136	Tone Control—250M Ohm
R17	BE13096	25M ohm—½ watt
R18	BE130148	1 megohm—in tuning indicator socket—1/10 w.

CONDENSERS

C	BE10285	2 gang variable
C1	BE129127	.0001 Ceramic
C2	BE12461	Adjustable Trimmer

MODELS 62-702,62-703
Series A,Issue B
Alignment

MONTGOMERY WARD & CO.

MODEL 62-901
Alignment,Trimmers
Dial Data,Phono.

MODELS 62-702, 62-703 Series A Issue B

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 MC	Trimmer (C 6) Top of Chassis (See Fig. 1)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 MC	Trimmer (C 4) (See Fig. 1)	Short Wave antenna	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C 7) (See Fig. 1)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1400 Kc.	Trimmer (C 5) (See Fig. 1)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C 10) (See Fig. 1)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
IMAGE REJECTION ADJUST-MENTS	2330 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1400 kc. on dial	Trimmer (C2) (See Fig. 1)	Image rejection	Adjust for minimum output. (See note "B")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B" 1400KC is the image frequency of 2330KC. Adjust Trimmer (C2) until a minimum output is obtained.

NOTE "C" Trimmer (C11) is preadjusted at factory and should not be tampered with.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

MONTGOMERY WARD MODEL 62-901

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

IMPORTANT—Follow procedure in the order shown.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (Unless otherwise specified)
I. F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C16) & (C17) 1st I.F. (C14) & (C15)
WAVE TRAP	456 KC	Antenna Lead	200 mmf.	B Range	600 KC	Wave Trap (C5) Adjust for MINIMUM Output
RANGE B	1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C11)
	1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Ant. Range B (C3)
	600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C9) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C8)
	15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1500 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1500 KC mark, and tighten the clamps.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

Drive Cord Replacement

Tie a knot with a small loop at one end of the new drive cord. Slide a 1¾ inch length of fabric tubing on the cord. Tie the free end of the drive cord to the tension spring. The distance between knots should be 48½ inches.

Arrange to keep the gang condenser in the completely closed position.

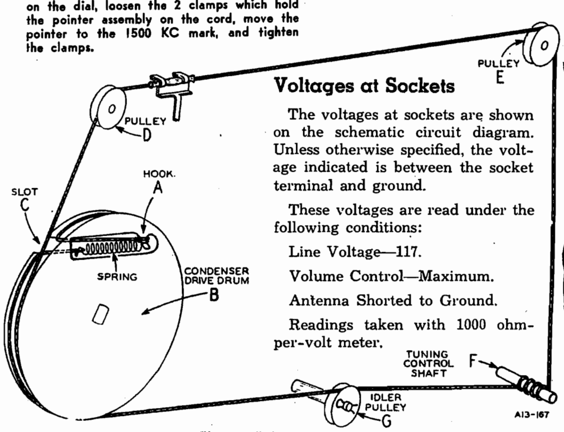
Place the looped end of the drive cord over hook A on condenser drive drum B (See Fig. 4). Pass the cord through slot C in the drum rim and wind one turn in a clockwise direction (from front of chassis) on condenser drive drum. Pass drive cord over pulleys D and E as shown. See that the fabric tubing is now between pulleys D and E. Continue cord down to shaft F and wind 2¼ turns clockwise, progressing towards the chassis. Bring cord over pulley G to bottom of condenser drive drum B as shown. Wind drive cord clockwise (from front of chassis) around condenser drive drum B to slot C. See that the drive cord does not cross in groove of condenser drive drum. Pass the remaining drive cord and tension spring through slot C and secure the free end of the spring on hook A.

DIAL POINTER ATTACHMEN—Tune in a station of known frequency. Move the pointer to this frequency on the dial scale. Clamp pointer tightly over the fabric tubing on the cord—See Fig. 4.

Phonograph Connections

Phonograph connections are made as shown in the schematic circuit diagram—Fig. 3. On the back panel of the chassis base is a round knockout 1-9/64 inches in diameter. An octal base socket is mounted in this knockout opening and wired as shown in the schematic.

A phono cable assembly may then be purchased (See parts list). On one end of this cable is an octal plug and on the other end is a phonograph-radio switch and double tip jack.



Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.

Volume Control—Maximum.

Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter.

Fig. 4—Drive Cord Replacement

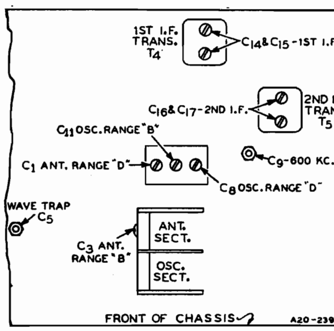


Fig. 2—Location of Trimmers

MONTGOMERY WARD & CO. MODELS 62-704 to 62-712 inc.
Schematic, Voltage

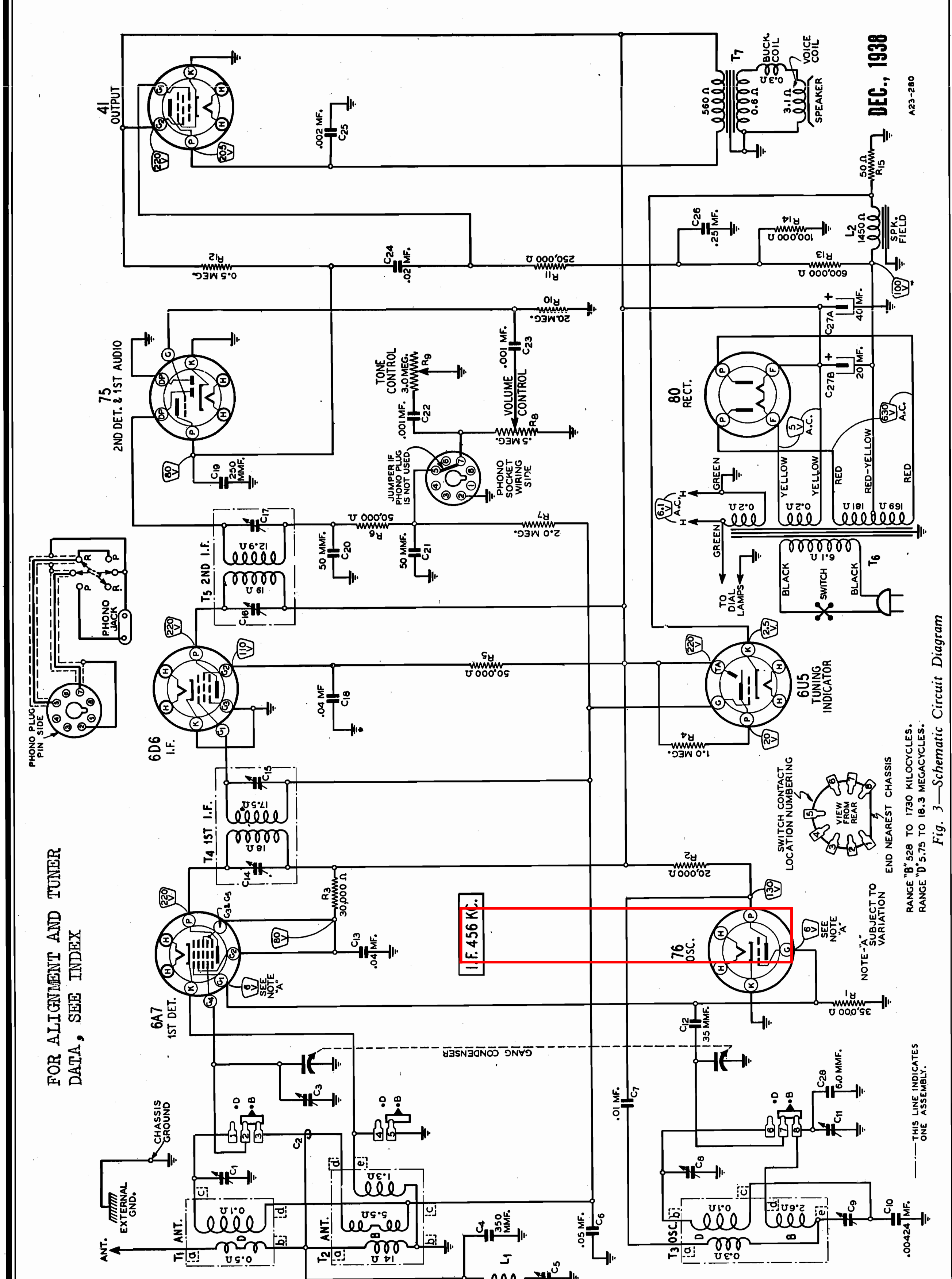
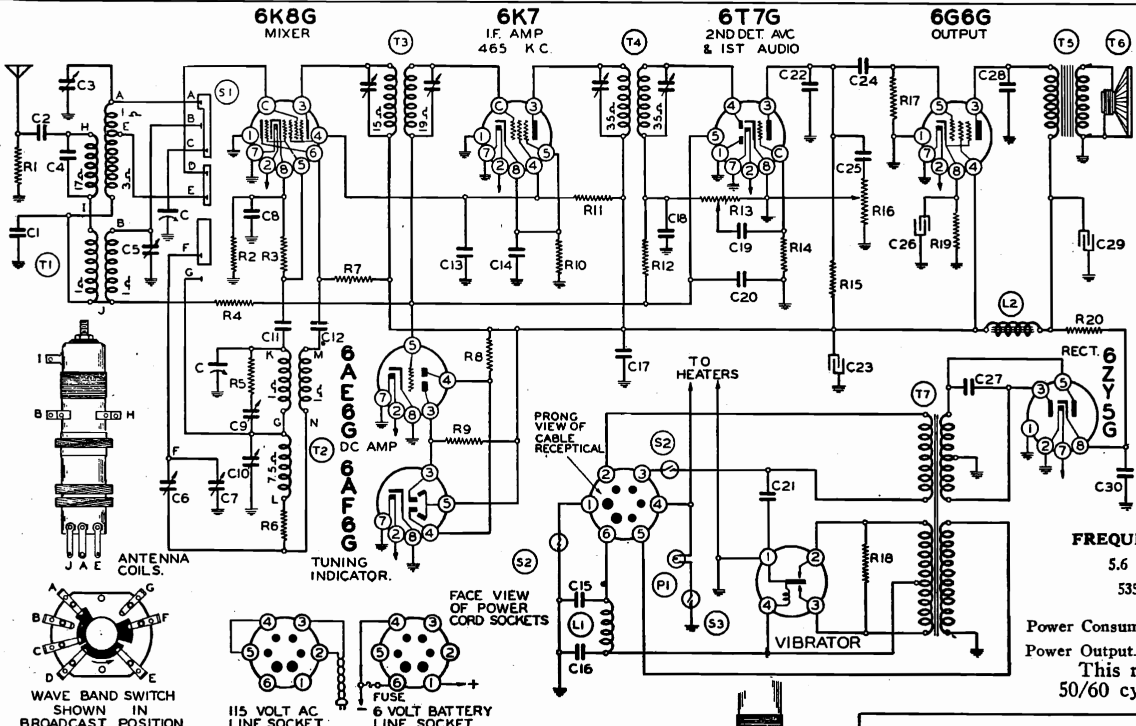


Fig. 3—Schematic Circuit Diagram

MODELS 62-750, 62-751
Series A, Ser. 8M499800 up
Schematic, Voltage
Socket, Trimmers

MONTGOMERY WARD & CO.



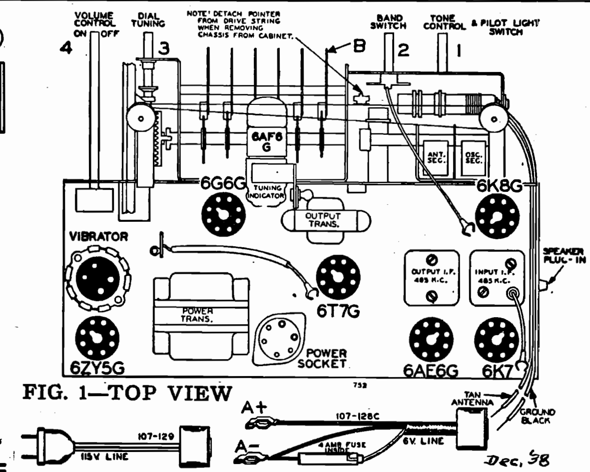


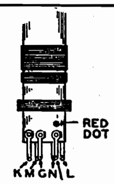
FIG. 1—TOP VIEW

FOR TRIMMERS, ALIGNMENT PROCEDURE, AND SETTING AUTOMATIC TUNING LEVERS, SEE INDEX.

FREQUENCY RANGE
5.6 to 18.1 MC.
535 to 1730 KC.

Power Consumption.......40 Watts (At 115 volts 50-60 cycles), or 3.3 amperes at 6.3 volts
Power Output.. .6 Watts Undistorted, 1 Watt Maximum

This radio is designed to operate from either 105-125 volts 50/60 cycle A.C. supply or a 6 volt storage battery.



OSCILLATOR COILS

PARTS (SERIAL No. 8M499800 and UP)

R1	BE13017	10M ohm—⅓ w.
R2	BE13097	200 ohms—⅓ w.
R3	BE13094	50M ohm—⅓ w.
R4	BE13011	250M ohm—⅓ w.
R5	BE130240	30 ohms—⅓ w.
R6	BE130197	20 ohms—⅓ w.
R7	BE13048	15M ohm—⅓ w.
R8	BE13068	1 megohm—⅓ w.
R9	BE13068	1 megohm—⅓ w
R10	BE13079	400 ohms—⅓ w
R11	BE13082	10M ohms—⅓ w
R12	BE1304	3 megohm—⅓ w.
R13	BE101153	1 megohm volume control
R14	BE130225	15 megohm—⅓ w
R15	BE13011	250M ohm—⅓ w.
R16	BE101154	250M ohm tone control
R17	BE1303	500M ohm—⅓ w.
R18	BE13097	200 ohms—⅓ w.
R19	BE13093	450 ohms—⅓ w.
R20	BE130168	100 ohms—⅓ w.

CONDENSERS

C	BE10292C	2 gang variable condenser
C1	BE129131	.002775 mica
C2	BE10012	.003 x 600 v.
C3	BE12469	BC Antenna Trimmer
C4	BE129132	.000125 mica
C5	BE12469	S. W. Antenna Trimmer
C6	BE12466	B. C. Series Pad
C7	BE12466	S. W. Series Pad
C8	BE10020	.1 x 200 v.
C9	BE12470	S. W. Oscillator Trimmer
C10	BE12470	B. C. Oscillator Trimmer
C11	BE12938	.00005 mica
C12	BE10025	.002 x 600 v.
C13	BE10020	.1 x 200 v.
C14	BE10020	.1 x 200 v.
C15	BE10040	.5 x 120 v.
C16	BE10040	.5 x 120 v.
C17	BE10020	.1 x 200 v.
C18	BE12960	.00015 mica
C19	BE10019	.006 x 600 v.
C20	BE1009	.05 x 200 v.
C21	BE10011	.01 x 400 v.
C22	BE1292	.0005 mica
C23	BE11979B	16 mfd. lytic—200 w. v.
C24	BE10026	.02 x 400 v.
C25	BE10019	.006 x 600 v.
C26	BE11979B	20 mfd.—25 w. v. lytic
C27	BE10073	.008 x 1200 v.
C28	BE10019	.006 x 600 v.
C29	BE11979B	16 mfd. lytic—200 w. v.
C30	BE10020	.1 x 200 v.

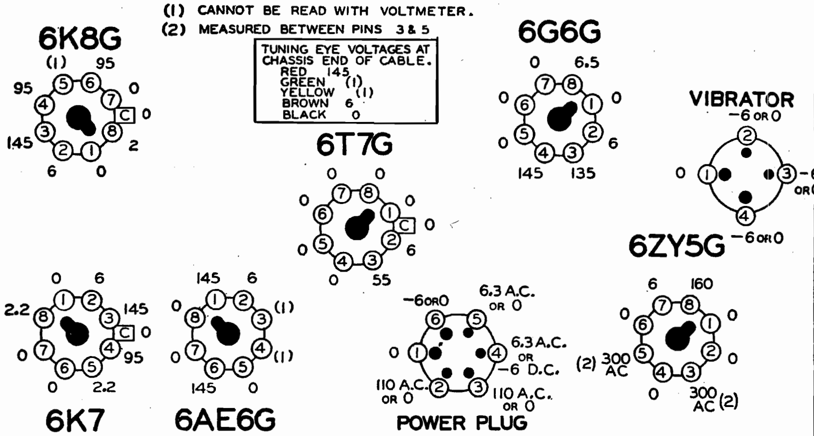
C23, C26 and C29 in same unit

T1	BE111112	Antenna Coil
T2	BE11098	Oscillator Coil
T3	BE108111F	Input I. F.—465 kc.
T4	BE108106	"O" Output I. F.—465 kc.
T5	BE10569C	Output Transformer
T6	BE114143	6 in. P. M. speaker—62-750
T6	BE114139	8 in. P. M. speaker—62-751
T7	BE104114C	Power Transfomer
L1	BE10568	"A" Choke
L2	BE10530H	"B" Choke
S1	BE12568	Wave Band Switch
S2		L.P.S.T. Switch on volume control
S3		Push in switch on tone control
P1	BE10789	6.3 volt pilot light T40—150 ma.

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

(1) CANNOT BE READ WITH VOLTMETER.
(2) MEASURED BETWEEN PINS 3 & 5



REAR OF CHASSIS

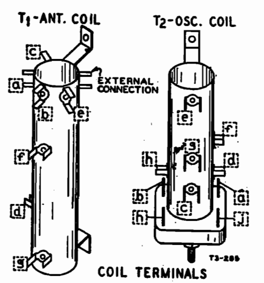
753

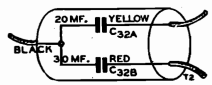
MONTGOMERY WARD & CO.

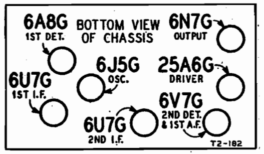
MODELS 62-752, 62-753
Schematic, Voltage
Socket, Trimmers, Notes

Power Consumption	1.45 Amperes at 32 Volts DC
Power Output	.17 Watts Undistorted, .40 Watts Maximum
Selectivity	30 KC Broad at 1000 times Signal
Sensitivity (For .05 watt output)	
B Range	6.0 Microvolts Average
D Range	6.0 Microvolts Average
Intermediate Frequency	456 KC
Speaker	6" or 8" Electro-Dynamic
Tuning Frequency Range	
B Range	528 to 1730 KC (Kilocycles)
D Range	5750 to 18300 KC (Kilocycles)

32 Volt Power Supply







This radio is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant.

Polarity of Power Supply

There is a red mark on the plug at the end of the power supply cord of the radio. The prong of the plug at which the red mark is placed must be plugged into the positive side of the line.

Caution

If used on any other type of power supply than 32 volt DC, severe damage may be done to the receiver.

Do not turn the radio on unless all of the tubes and the dial lamps are in the proper sockets. Use only No. 51 dial lamps.

Line Voltage Range

The radio will operate satisfactorily within a line voltage range of 25 to 42 volts. If the line voltage is higher than 42, it will be necessary to use a series resistor to cut it down. If the voltage varies, a variable resistor may be required.

Starting Current

When first turned on for a few seconds the drain is slightly higher than normal until the tubes heat up. Some automatic plants are adjusted to start under a load of 200 to 300 watts. If a number of devices such as lights or motors are being used and the radio set is turned on the total drain may be sufficient to start the plant.

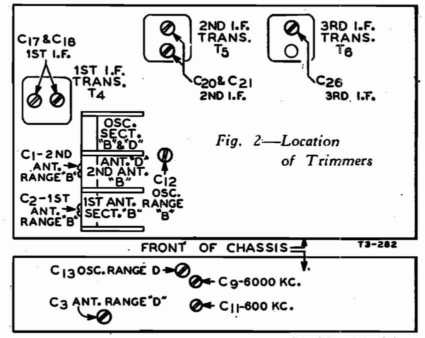
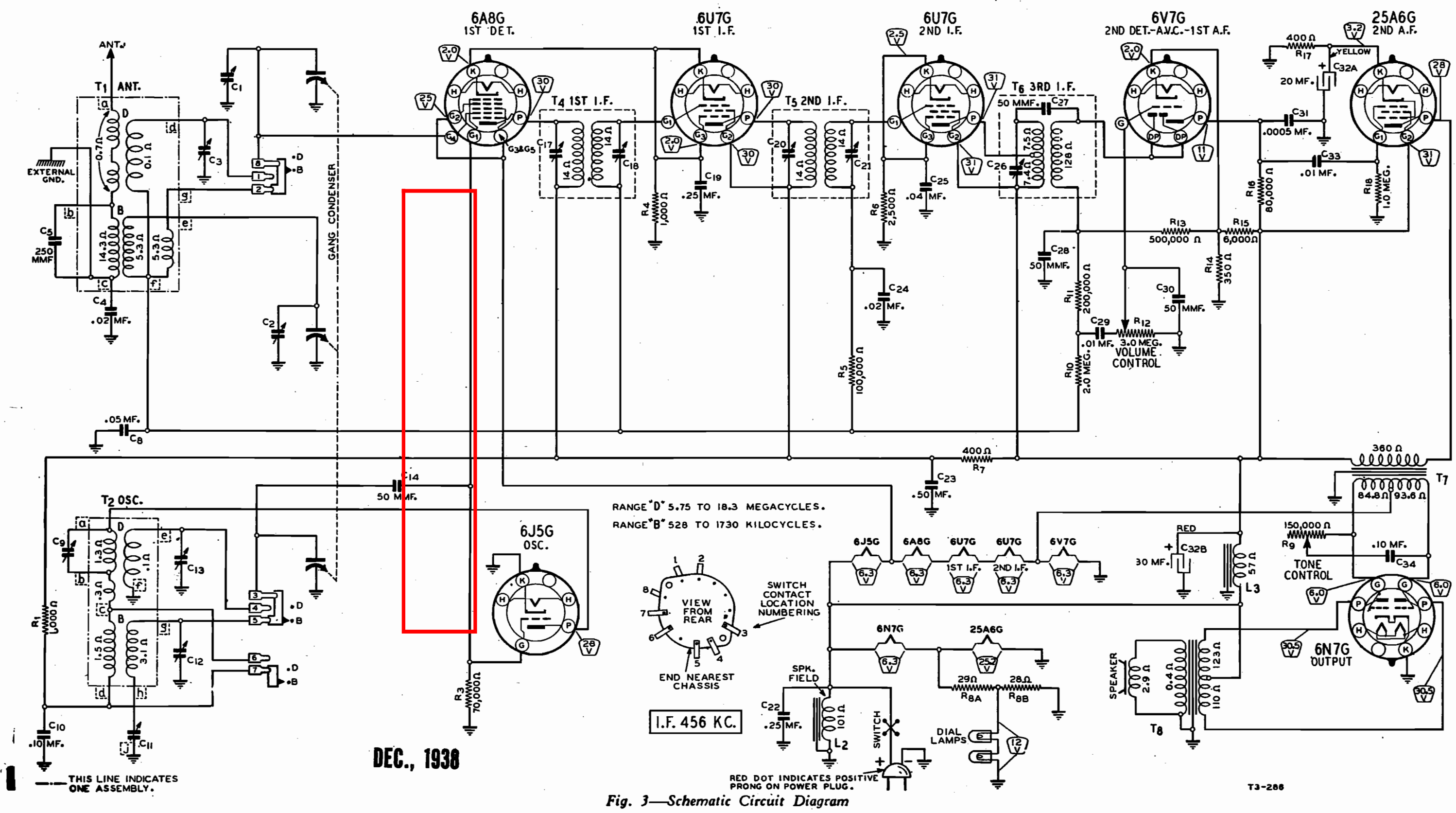


Fig. 2—Location of Trimmers



DEC., 1938

Fig. 3—Schematic Circuit Diagram

MODELS 62-704 to 62-712 inc.
Socket, Trimmers, Alignment
MODELS 62-752, 62-753
Alignment, Drive Data

MONTGOMERY WARD & CO.

MODELS 62-752 and 62-753

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 2nd I.F. (C20) & (C21) 3rd I.F. (C26)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	1st Ant. Range B (C2) 2nd Ant. Range B (C1)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C11) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C3) Rock Rotor—See Note B
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C9) Rock Rotor—See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTE A—If the pointer is not at 1500 KC on the dial, hold the drive cord and move the pointer to this mark.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

Dial Pointer Attachment—Tune in a station of known frequency. Move the pointer to the approximate frequency on the dial scale. Pass the cord through the slotted head—See Fig. 4. Hold the drive cord and slide the pointer to the exact frequency on the dial scale.

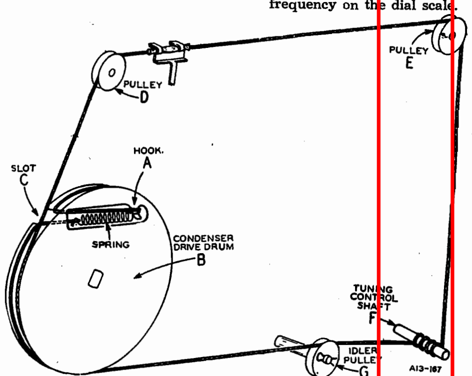


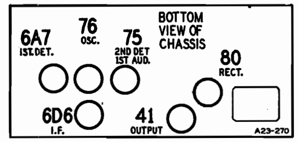
Fig. 4—Drive Cord Replacement

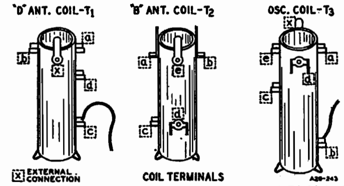
Drive Cord Replacement

Tie a knot with a small loop at one end of the new drive cord. Tie the free end of the drive cord to the tension spring. The distance between knots should be 49¾ inches.

Arrange to keep the gang condenser in the completely closed position.

Place the looped end of the drive cord over hook A on condenser drive drum B (See Fig. 4). Pass the cord through slot C in the drum rim and wind one turn in a clockwise direction (from front of chassis) on condenser drive drum. Pass drive cord over pulleys D and E as shown. Continue cord down to shaft F and wind 4 turns clockwise, progressing towards the chassis. Bring cord over pulley G to bottom of condenser drive drum B as shown. Wind drive cord clockwise (from front of chassis) around condenser drive drum B to slot C. See that the drive cord does not cross in groove of condenser drive drum. Pass the remaining drive cord and tension spring through slot C and secure the free end of the spring on hook A.





MODELS 62-704 to 62-712

Tuning Frequency Range
- B Range.......... 528 to 1730 KC (Kilocycles)
- D Range.......... 5750 to 18300 KC (Kilocycles)

Sensitivity (For 0.5 watt output)
- B Range.......... 30 Microvolts Average
- D Range.......... 50 Microvolts Average

Power Consumption - - 60 Watts (At 117 volts 60 cycles)

Power Output - - - - - - 1.5 Watts Undistorted, 3.0 Watts Maximum

Selectivity - - 45 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - 6", 8" or 10" Dynamic

FOR DRIVE CORD REPLACEMENT AND RACK AND PANEL ASSEMBLY SEE MODEL62--905

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

IMPORTANT—Follow procedure in the order shown.

The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER OR DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM (Unless otherwise specified)
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C16) & (C17) 1st I.F. (C14) & (C15)
WAVE TRAP					
456 KC	Antenna Lead	200 mmf.	B Range	600 KC	Wave Trap (C5) Adjust for MINIMUM Output
RANGE B				Turn Rotor to Full Closed Position. Pointer should be at low frequency end mark on scale—See Note A.	
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor until dial pointer is at 1500 KC	Oscillator Range B (C11)
1500 KC	Antenna Lead	200 mmf.	B Range	Leave Rotor at above setting	Ant. Range B (C3)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C9) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C8)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—The low frequency end mark is a small dot at the left side of the short wave scale under the "5." of the number 5.8 and to the right of the "C" of the letters MC. If the pointer is not at this mark on the dial, move the pointer to this mark.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

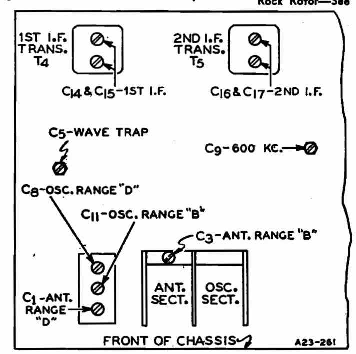


Fig. 2—Location of Trimmers

MODEL 62-901, Issues A, B
Schematic, Voltage
Socket, Changes

MONTGOMERY WARD & CO.

SPECIFICATIONS

Power Consumption - - 60 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - 3.0 Watts Undistorted, 4.0 Watts Maximum

Selectivity - - 40 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - - - - - 10" Dynamic

Tuning Frequency Range

B Range.................................. 528 to 1730 KC (Kilocycles)

D Range..................................5750 to 18300 KC (Kilocycles)

Sensitivity (For 0.5 watt output)

B Range..25 Microvolts Average

D Range..40 Microvolts Average

"B" Issue Models

The issue letter is the last letter of the chassis number on the chassis number label.

In "B" issue models, the screen grid circuits of the 1st Detector and I.F. tubes are supplied through separate resistors as shown in the schematic.

If distortion is encountered at high signal levels in the "A" issue models, change the screen grid circuits of the 1st Detector and I.F. tubes according to the schematic.

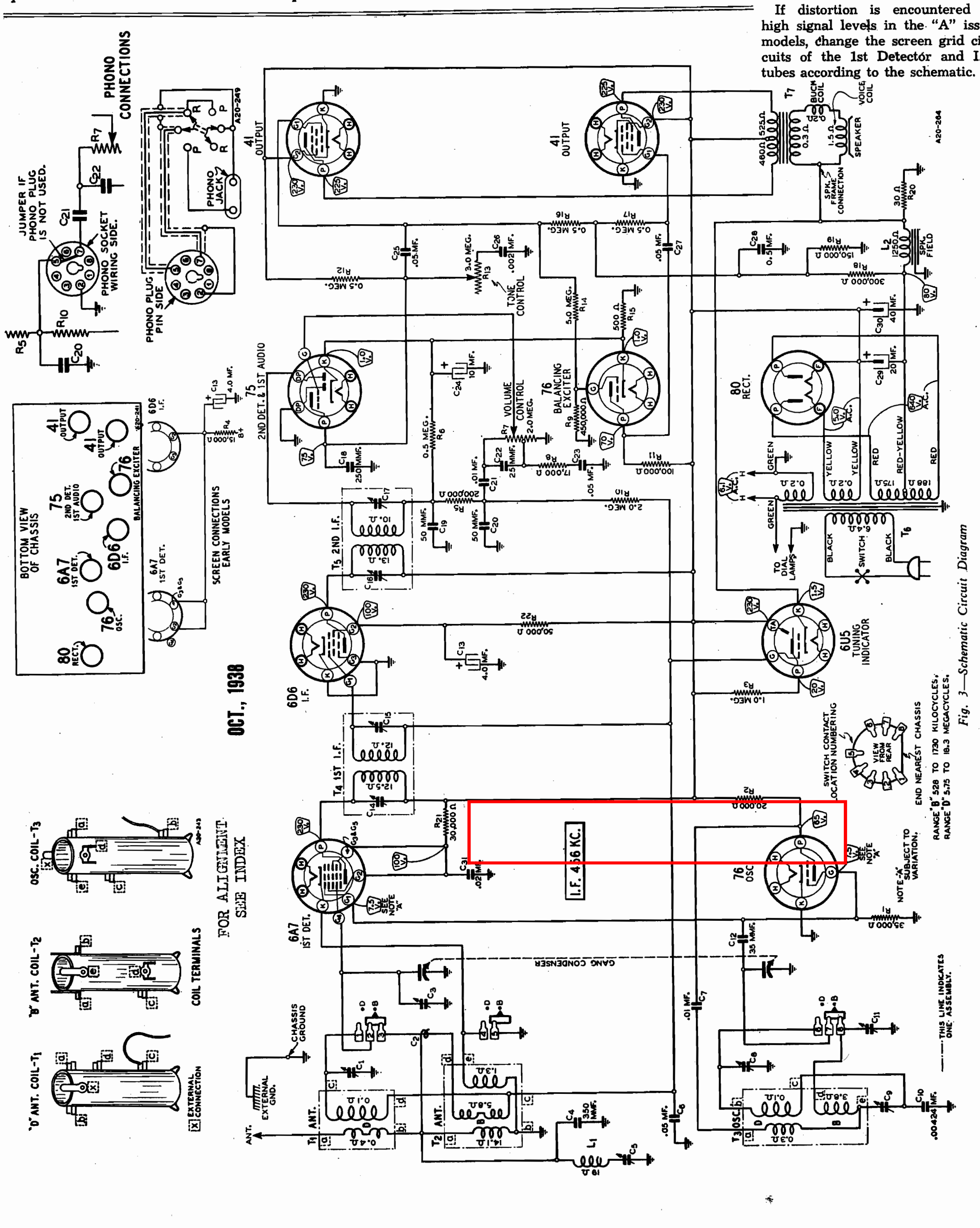


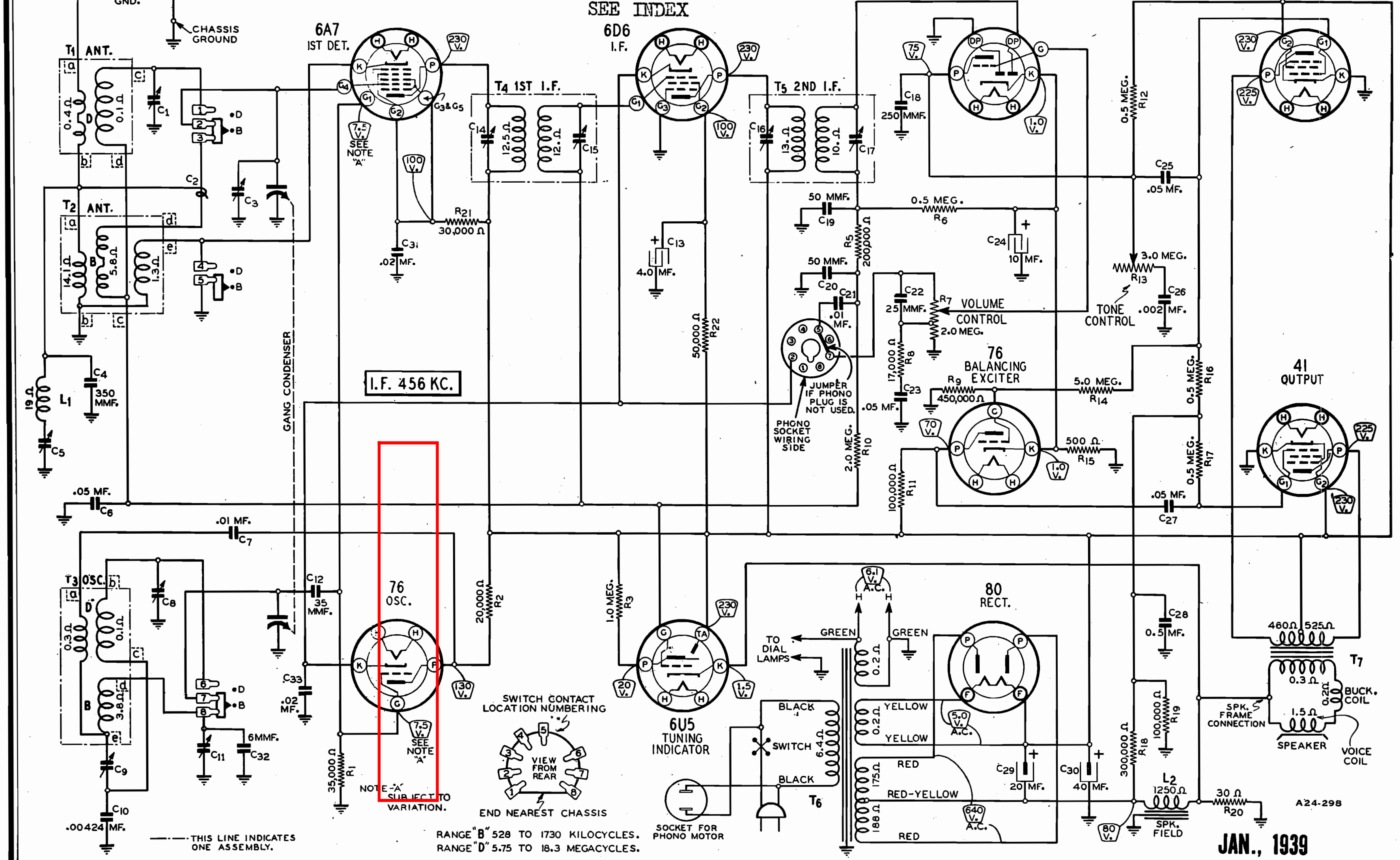
Fig. 3—Schematic Circuit Diagram

MODEL 62-902
Schematic, Voltage
Notes, Phono.

MONTGOMERY WARD & CO.

The chassis used in this model is almost identical to the chassis used in Model 62-905. The differences are in the re-mounting of the electrolytic condensers in order to keep them upright when the chassis is mounted in the cabinet, the addition of a phono motor socket to the back panel of the chassis, and the phono attachment parts. The alignment procedure and other service data given for Model 62-905 also applies to this model.

FOR TUNER DATA
SEE INDEX



MODELS 62-704 to 62-712 inc.
Drive Data

MONTGOMERY WARD & CO.

MODEL 62-902
MODEL 62-905
Alignment, Trimmers
Drive Data

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

IMPORTANT—Follow procedure in the order shown.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER OR DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM (Unless otherwise specified)
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C16) & (C17) 1st I.F. (C14) & (C15)
WAVE TRAP 456 KC	Antenna Lead	200 mmf.	B Range	600 KC	Wave Trap (C5) Adjust for MINIMUM Output
RANGE B				Turn Rotor to Full Closed Position. Pointer should be at low frequency end mark on scale—See Note A.	
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor until dial pointer is at 1500 KC	Oscillator Range B (C11)
1500 KC	Antenna Lead	200 mmf.	B Range	Leave Rotor at above setting	Ant. Range B (C3)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C9) Rock Rotor—See Note B
RANGE D 18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C8)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B

NOTE A—The low frequency end mark is a small dot at the left side of the short wave scale under the "5." of the number 5.8 and to the right of the "C" of the letters MC. If the pointer is not at this mark on the dial, move the pointer to this mark.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.

General Service Data

Drive Cord Replacement

Tie a knot with a small loop at one end of the new drive cord. Tie the other end to the tension spring, leaving a distance of 64⅛ inches between the knots.

Turn the gang condenser to the full open position. Secure the free end of the spring over hook A—See Fig. 4. Turn the gang condenser to the completely closed position.

Pass the cord through slot B and, guiding the cord in the groove of the drive drum, turn the gang condenser to the full open position. Hook the cord in slot B and turn the gang condenser to the completely closed position. Unhook the cord from slot B and pass over pulleys C, D, and E as shown. Pass the cord in front of idler pulley F. Wind 2½ turns counter-clockwise (from front of chassis) around the drive shaft spool, progressing away from the chassis. Pass cord up and over the drive drum. Guiding the cord in the groove of the drive drum, turn the gang condenser to the full open position. If necessary, stretch the tension spring and pull the drive cord taut. Pass drive cord through slot B and secure the loop to the tension spring at point G.

EARLY MODELS—In the early models using a larger drive shaft spool (See Fig. 4), there should be a distance of 65½ inches between the knots.

DIAL POINTER ATTACHMENT—Tune in a station of known frequency. Move the pointer to the approximate frequency on the dial scale. Pass the cord through the slotted head—See Fig. 4. Hold the drive cord and slide the pointer to the exact frequency on the dial scale

Rack and Pinion Assembly

If it is ever necessary to re-assemble the automatic tuning unit, proceed as follows: The pinion gear shaft should be held in such a position that the flat portion is vertical or turned slightly counter-clockwise from the vertical as shown in Fig. 5.

The lower rack should be meshed with the pinion gear so that the 8th tooth from the front on each side of the rack is in line with the axis of the pinion gear shaft—See Fig. 5. The upper rack should then be lined up with the lower rack and meshed with the pinion gear. The 8th tooth from the front on each side of the upper rack will then line up with the axis of the pinion gear shaft.

The rear and side brackets can then be mounted on the rack and pinion assembly.

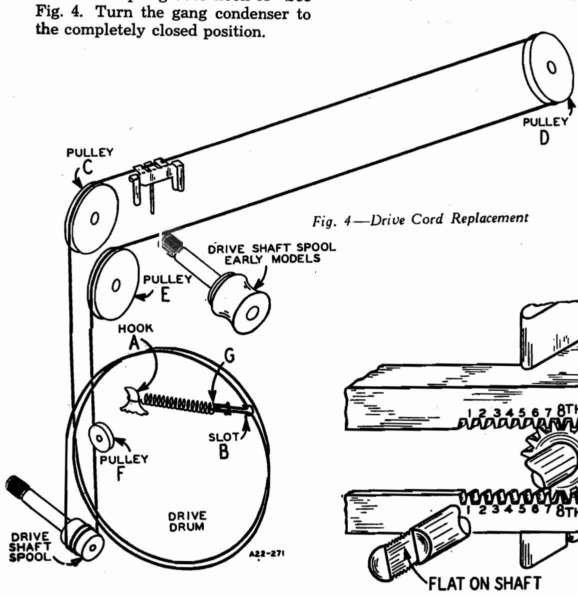


Fig. 4—Drive Cord Replacement

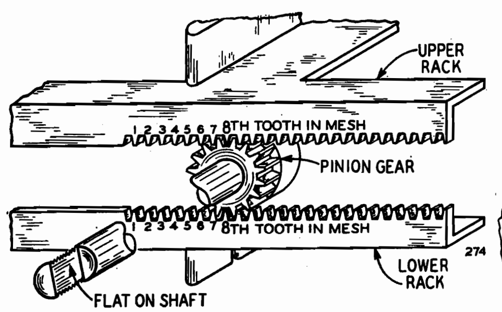


Fig. 5—Rack and Pinion Assembly

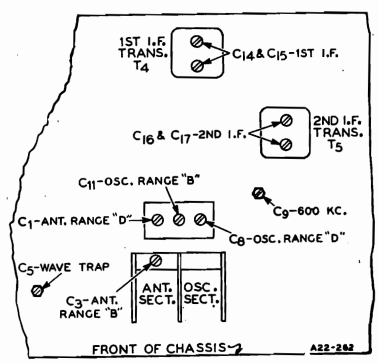


Fig. 2—Location of Trimmers

MODEL 62-905
Schematic, Socket
Coils, Voltage

MONTGOMERY-WARD & CO.

SPECIFICATIONS

Power Consumption	65 Watts (At 117 volts 60 cycles)
Power Output	3.0 Watts Undistorted 4.0 Watts Maximum
Selectivity	40 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	10" Dynamic

Tuning Frequency Range

B Range.................................. 528 to 1730 KC (Kilocycles)
D Range..................................5750 to 18300 KC (Kilocycles)

Sensitivity (For 0.5 watt output)

B Range..25 Microvolts Average
D Range..40 Microvolts Average

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground. These voltages are read under the following conditions: Line Voltage—117.

Volume Control—Maximum. Antenna Shorted to Ground. Readings taken with 1000 ohm-per-volt meter.

Twenty-Five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used.

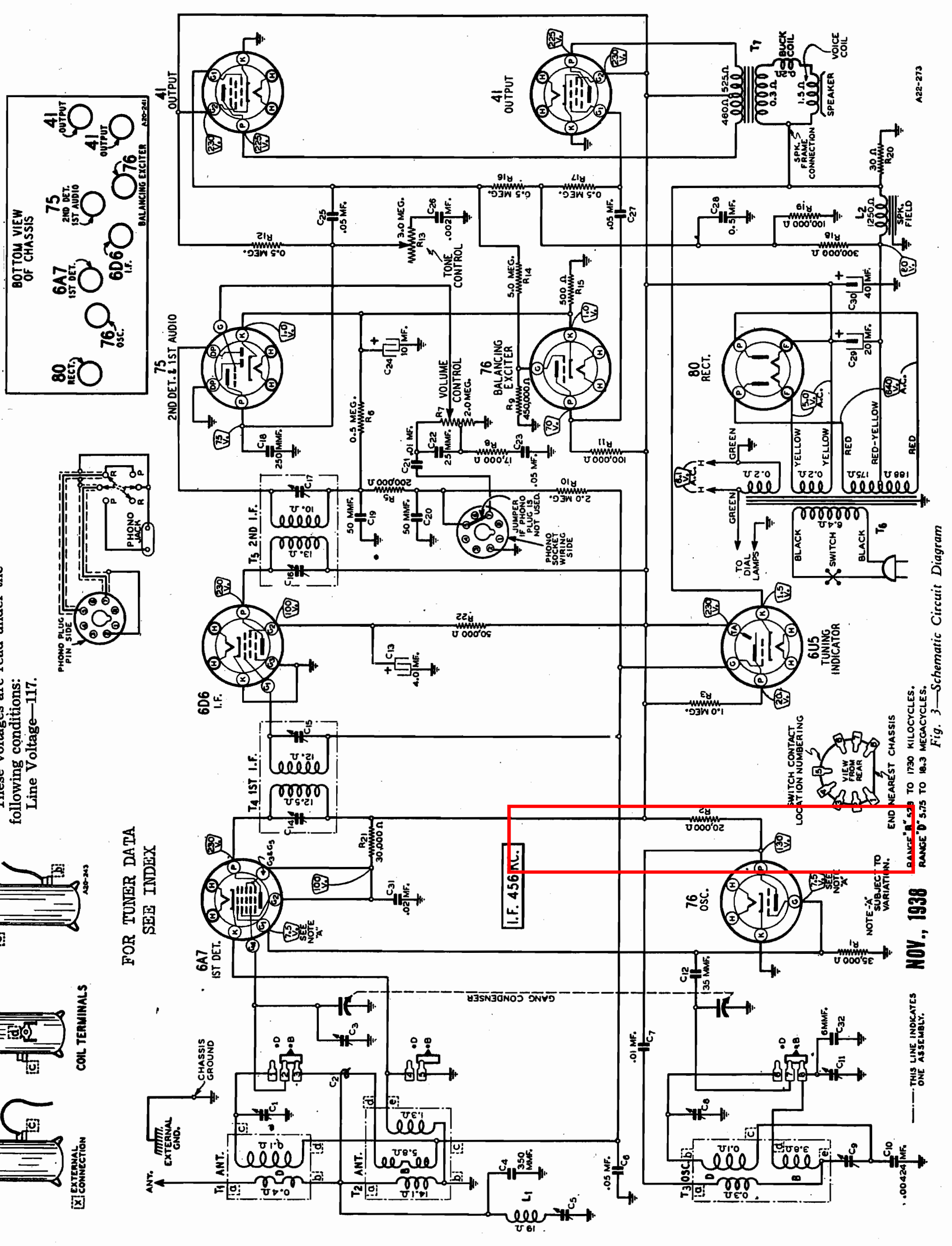
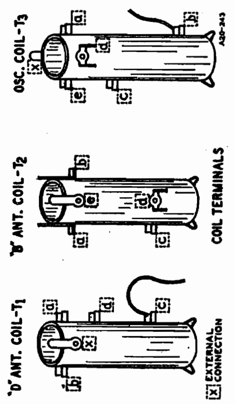
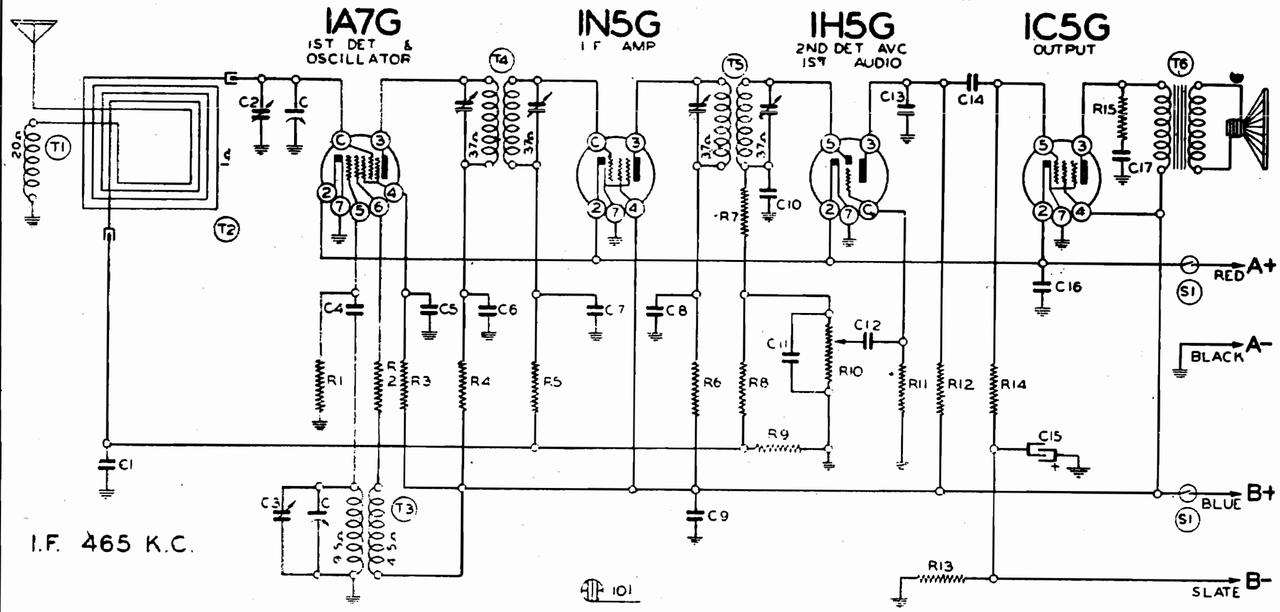


Fig. 3—Schematic Circuit Diagram



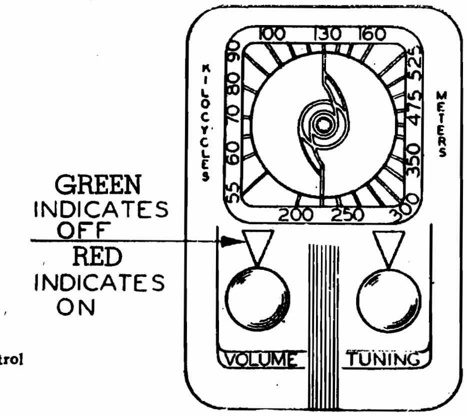
MONTGOMERY WARD & CO.

MODELS 93BR454A, 93BR1455A
Series A
Schematic, Voltage, Socket
Trimmers

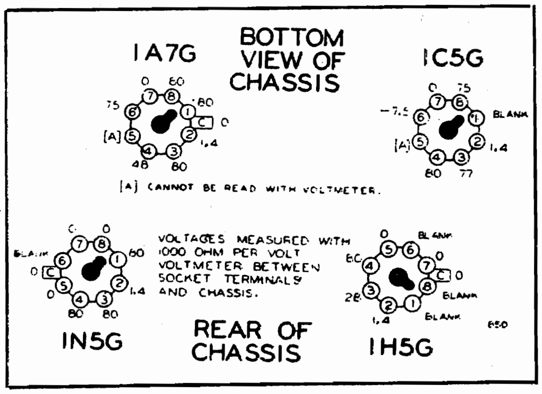


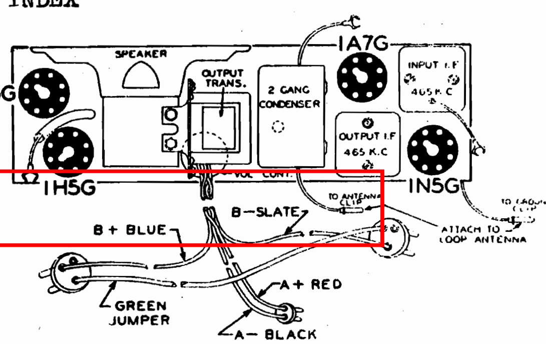
Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	BE1309	200M ohm—1/3 w.
R2	BE13071	4M ohm—1/3 w.
R3	BE130208	40M ohm—1/3 w.
R4	BE13026	1000 ohm—1/3 w.
R5	BE13020	100M ohm—1/3 w.
R6	BE13026	1000 ohm—1/3 w.
R7	BE13040	19M ohm—1/3 w.
R8	BE13038	2 megohm—1/3 w.
R9	BE13038	2 megohm—1/3 w.
R10	BE101163	1 megohm volume control
R11	BE13038	2 megohm—1/3 w.
R12	BE1303	500M ohm—1/3 w.
R13	BE130283	750 ohm—1/3 w.
R14	BE13019	1 megohm—1/3 w.
R15	BE130218	5M ohm—1/3 w.
		CONDENSERS
C	BE102103	2 gang variable condenser
C1	BE10022	.05 x 200 v.
C2		Loop ant. trimmer on gang
C3		Oscillator trimmer on gang

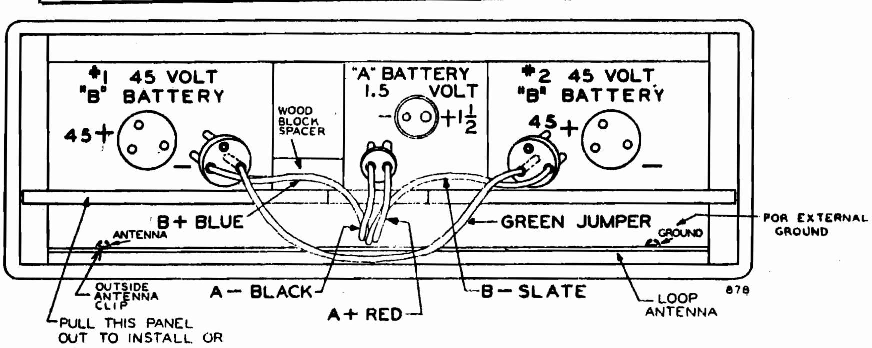
Schematic Ref. No.	Part No.	Description
C4	BE12912	.00025 mica
C5	BE10022	.05 x 200 v.
C6	BE10078	.01 x 200 v.
C7	BE10078	.01 x 200 v.
C8	BE10078	.01 x 200 v
C9	BE10064	.25 x 200 v.
C10	BE1295	.0001 mica
C11	BE1295	.0001 mica
C12	BE10078	.01 x 200 v.
C13	BE12912	.00025 mica
C14	BE10078	.01 x 200 v.
C15	BE11935	25 mfd. 25 w v. lytic
C16	BE10056	.5 x 200 v.
C17	BE10012	.003 x 600 v.
		PARTS
T1	BE1236	Antenna load coil (on loop)
T2	BE120257	Loop antenna coil (complete)
T3	BE110110	Oscillator coil
T4	BE108142	Input I. F. coil
T5	BE108143	Output I. F. coil
T6	BE114158	5" P. M. Speaker
S1		Off-on switch D.P.S.T. on vol. control



FOR ALIGNMENT
SEE INDEX







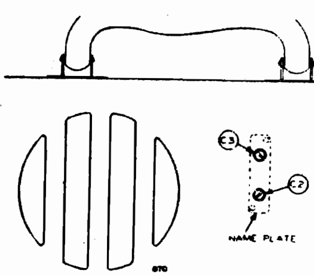
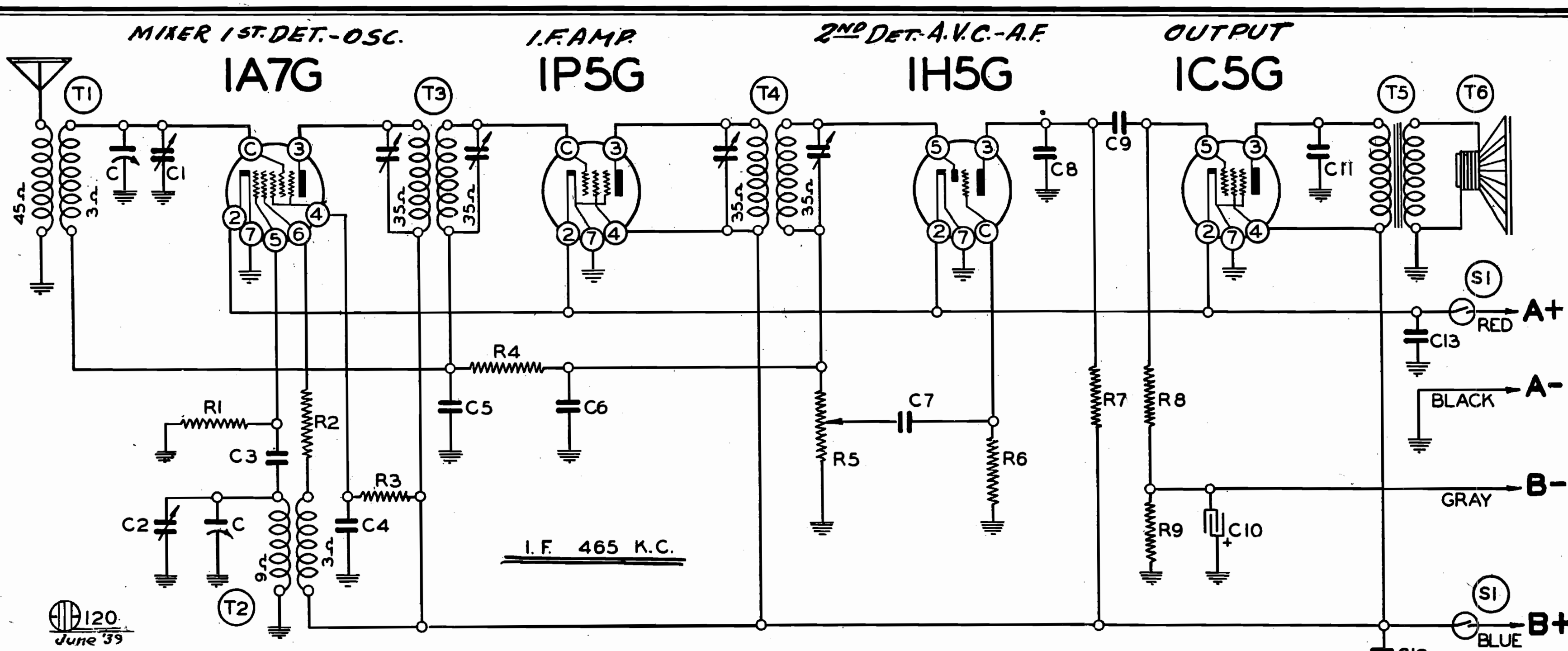


FIGURE 4

MODELS 93BR460A,93BR1460A
Schematic,Voltage,Socket
Trimmers

MONTGOMERY WARD & CO.



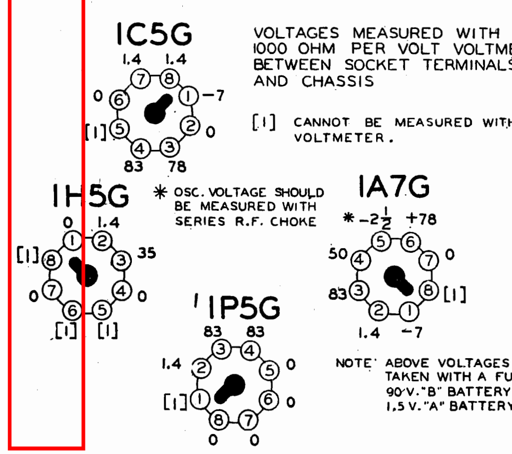
RESISTORS

R1	BE130266	200M ohm—⅓ w.
R2	BE13018	4M ohm—⅓ w.
R3	BE1307	40M ohm—⅓ w.
R4	BE1304	3 megohm—⅓ w.
R5	BE101175	1 megohm volume control
R6	BE130257	5 megohm—⅓ w.
R7	BE1303	500M ohm—⅓ w.
R8	BE13019	1 megohm—⅓ w.
R9	BE130200	700 ohm—⅓ w.

CONDENSERS

C	BE102110	2 gang variable condenser
C1		Antenna Trimmer on gang
C2		Oscillator trimmer on gang
C3	BE12912	.00025 mica
C4	BE1009	.05 x 200 v.
C5	BE1009	.05 x 200 v.
C6	BE1295	.0001 mica
C7	BE10012	.003 x 600 v.
C8	BE1295	.0001 mica
C9	BE10011	.01 x 400 v.
C10	BE11975	10 mfd. x 25 w. v.
C11	BE10012	.003 x 600 v.
C12	BE10064	.25 x 200 v.
C13	BE10020	.1 x 200 v.
T1	BE111132	Antenna Coil
T2	BE110122	Oscillator Coil
T3	BE108151B	Input I. F. - 465 kc.
T4	BE108153	Output I. F. - 465 kc.
T5	BE10591	Output Transformer
T6	BE114166	5" P. M. Speaker
S1		Off-on switch on Volume control

BOTTOM VIEW OF CHASSIS



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS

[1] CANNOT BE MEASURED WITH VOLTMETER.

* OSC. VOLTAGE SHOULD BE MEASURED WITH SERIES R.F. CHOKE

NOTE: ABOVE VOLTAGES ARE TAKEN WITH A FULL 90 V. "B" BATTERY AND 1.5 V. "A" BATTERY

REAR OF CHASSIS

924

FOR ALIGNMENT SEE INDEX

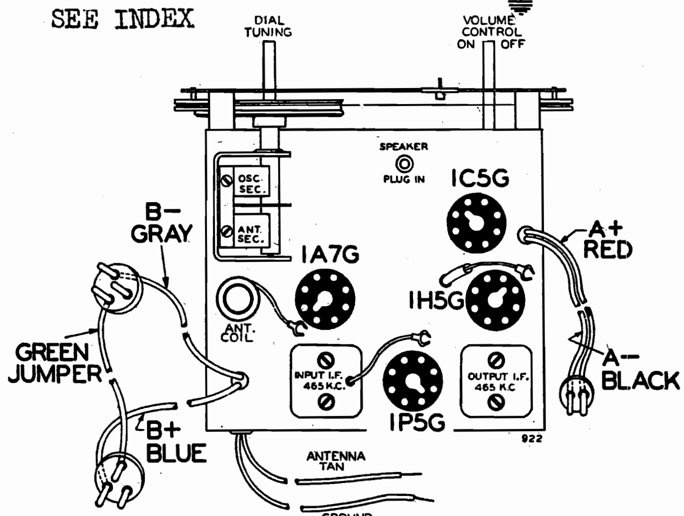
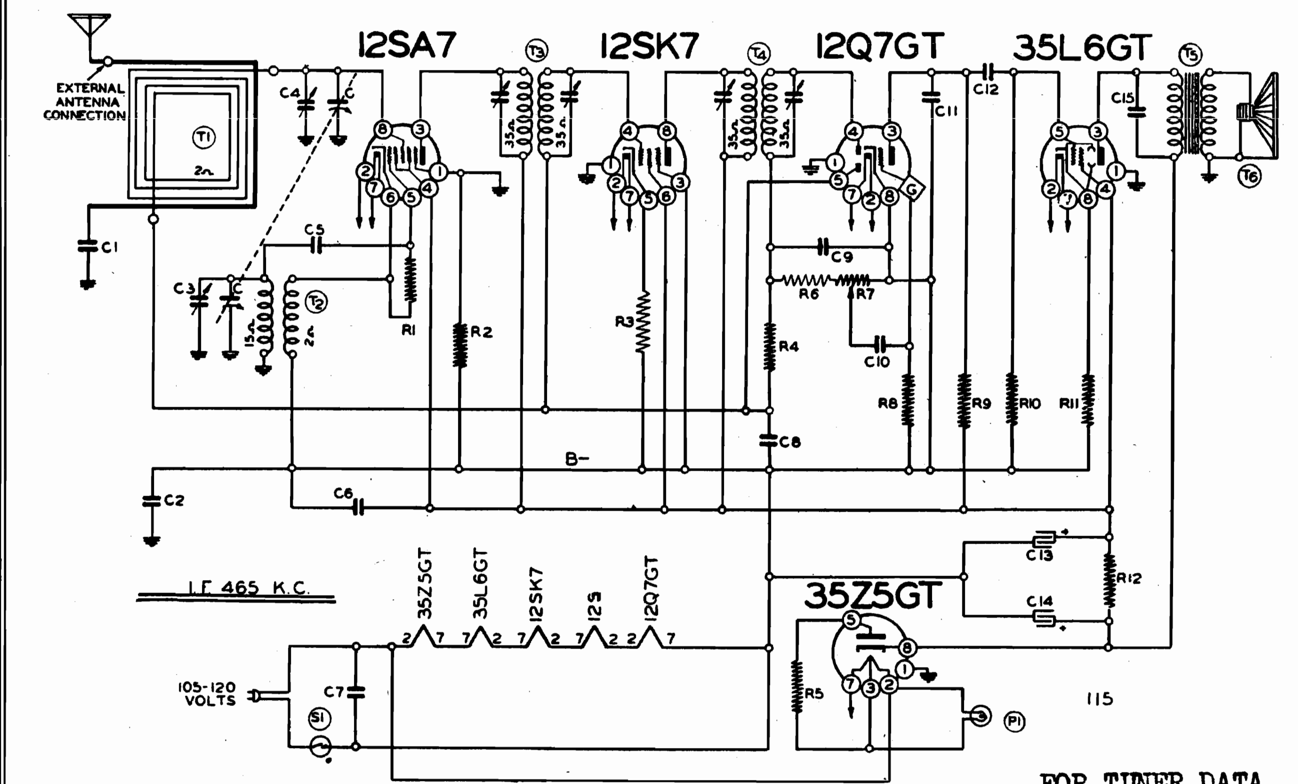


FIG. 1 — TOP VIEW

MONTGOMERY WARD & CO. MODELS 93BR508A, 93BR509A
Schematic, Voltage, Socket
Trimmers



FOR TUNER DATA
SEE INDEX.

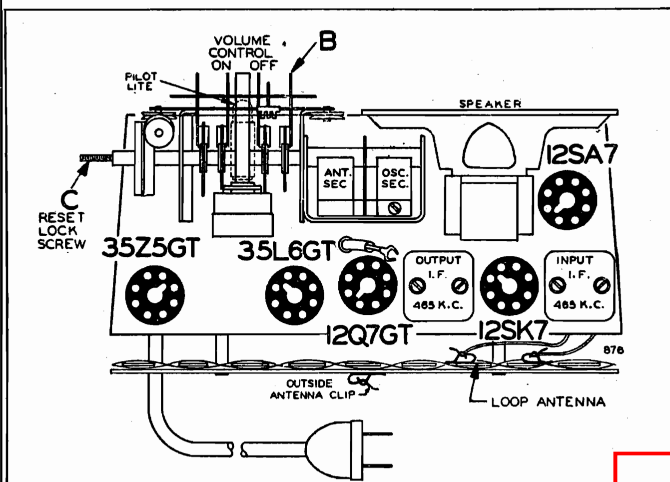
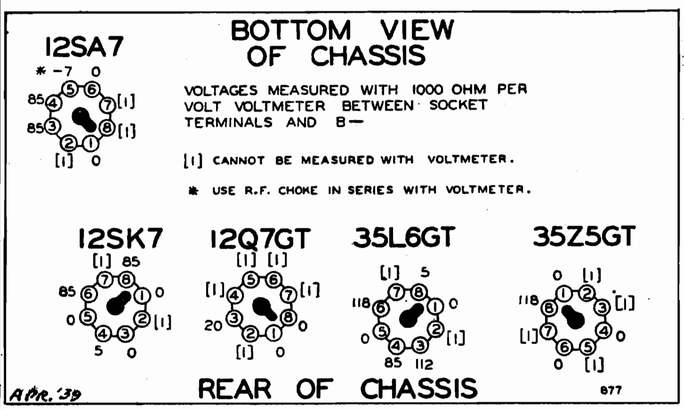


FIG. 1—TOP VIEW

Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	BE130176	20M ohm—⅓ w.—10%
R2	BE1309	200M ohm—⅓ w.
R3	BE130203	40 ohm—⅓ w.—10%
R4	BE1304	3 megohm—⅓ w.
R5	BE130215	25 ohm—½ w.
R6	BE1301	25M ohm—⅓ w.
R7	BE101170	1 megohm—volume control
R8	BE130257	5 megohm—⅓ w.
R9	BE1303	500M ohm—⅓ w.
R10	BE1303	500M ohm—⅓ w.
R11	BE130166	150 ohm—⅓ w.
R12	BE130199	1500 ohm—1 watt
		CONDENSERS
C	BE102107	2 gang variable condenser
C1	BE10011	.01 x 400 v.
C2	BE10091	.15 x 400 v.
C3		Osc. Trimmer on Gang
C4		Antenna Trimmer on Gang
C5	BE12921	.0002 mica



Schematic Ref. No.	Part No.	Description
C6	BE1009	.05 x 200 v.
C7	BE1001	.1 x 400 v.
C8	BE1009	.05 x 200 v.
C9	BE1295	.0001 mica
C10	BE10025	.002 x 600 v.
C11	BE12912	.00025 mica
C12	BE100106	.004 x 600 v.
C13	BE11987	30 mfd. lytic
C14	BE11987	30 mfd. lytic,
C15	BE10026	.02 x 400 v.
		C13 and C14 in same unit
		PARTS
T1	BE111128	Loop Antenna
T2	BE110116	Oscillator Coil
T3	BE108140E	Input I. F.
T4	BE108141B	Output I. F.
T5	BE10589	Output Transformer
T6	BE114160	5" P. M. Speaker
S1		Off-on switch on vol. control
P1	BE107249	6-8 v. pilot light T-47

The tube complement of this chassis consists of the following octal base glass and metal tube.
The type and function of each tube is as follows.
1—Type 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12Q7GT Second Detector, A.V.C. and First Audio.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

MODELS 93BR508A, 93BR509A
MODEL 93BR564A
Alignment

MONTGOMERY WARD & CO.

CHASSIS No. 93-BR-508A and 93-BR-509A

Power Consumption - - - - - - - - - 40 Watts
Power Output - - - - 800 Milliwatts Undistorted
Sensitivity (for .05 Watts Output) - 250 Microvolts Per Meter at 1000 KC. (For Loop Antenna)

Selectivity - 70 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - - - 540 to 1650 KC
Intermediate Frequency - - - - - - - - - - 465 KC
Speaker - - - - - - - - - - - 5 in. P. M. Dynamic

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions on Page 4.

- Volume control—Maximum all adjustments.
- Connect B of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metalliq screwdriver
- Dummy antennas—.1 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SK7 I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	(See Note "A") Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	(See Note "A") Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer—Bottom of rear section of gang (See Bottom of Radio)	Oscillator	(See Note "A") Adjust to maximum output
	1400 Kc.		(See Note "B" and "C")	Set dial at 1400 Kc.	Trimmer—Bottom of front section of gang (See Bottom of Radio)	Antenna	(See Note "B") Adjust to maximum output

NOTE "A" — A 200M ohm resistor must be connected between the two loop antenna leads from the chassis when aligning the I. F. transformers and setting the oscillator trimmer. The loop antenna must be disconnected from the chassis.

NOTE "B" — Remove the 200M ohm resistor from the loop antenna leads; mount the chassis and the loop antenna in the cabinet, connect the loop antenna to the chassis. Adjust the antenna trimmer through hole in bottom of cabinet.

NOTE "C" — Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.

MODEL 93BR508A
" 93BR509A

ALIGNMENT PROCEDURE — Model No. 93BR-564A

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7 I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6D8G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna Lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output

Attentuate the signal from the signal generator to prevent the leveling-off action of the AVC.

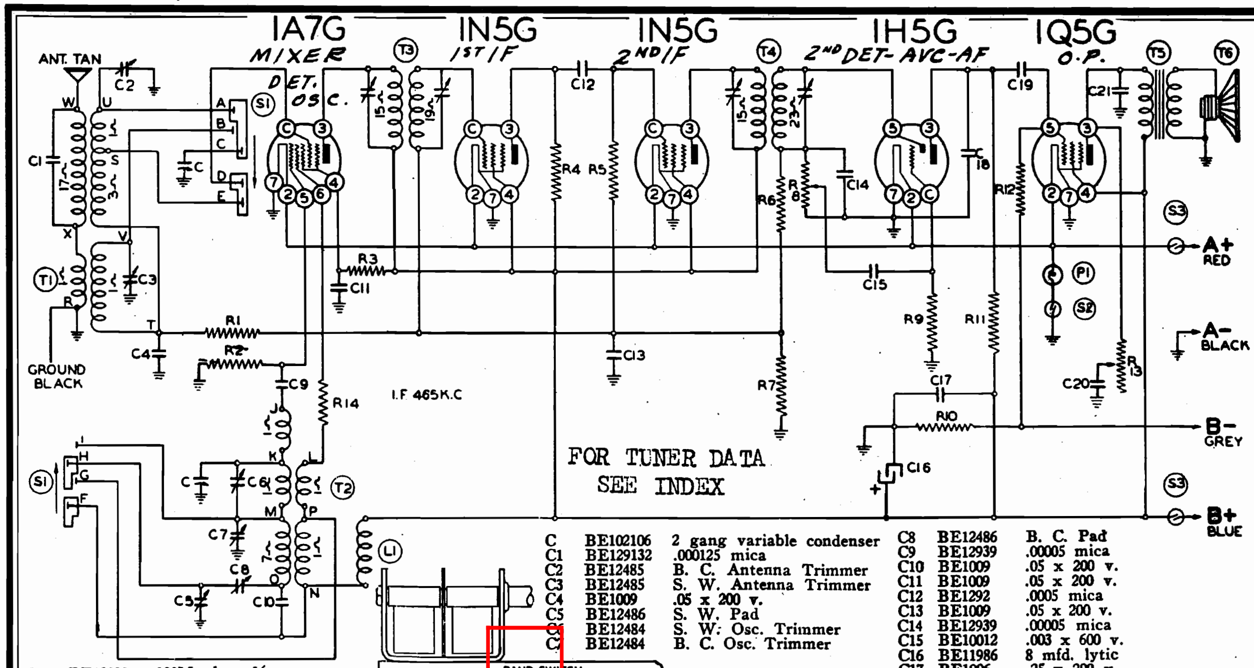
After each band is completed, repeat the procedure as a final check.

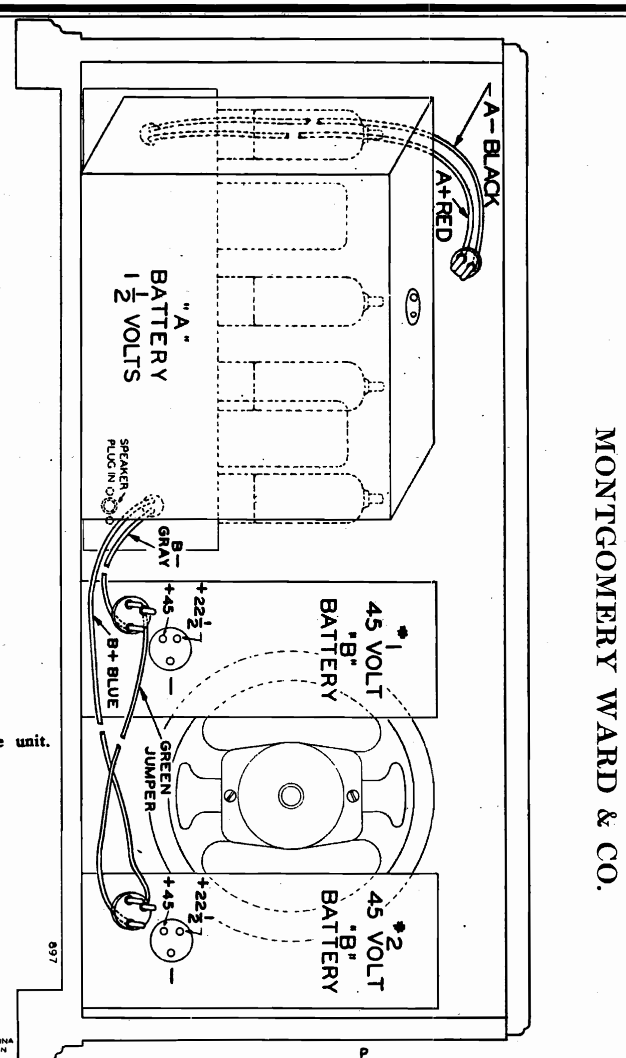
Power Consumption - - - - - 40 Watts (at 117 Volts 50/60 Cycles) 2.5 Amp. at 6.3 Volts
Power Output - - - - - - - - - - .6 Watts Undistorted
Sensitivity (for .05 Watts Output) - - - - - 25 Microvolts Average

Selectivity - 45 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - - - - 535 to 1735 KC
Intermediate Frequency - - - - - - - - - - 465 KC
Speaker - - - - - - - - - - - 6 in. P. M. Dynamic

MONTGOMERY WARD & CO.

MODEL 93BR560A
Schematic, Voltage
Socket, Trimmers





C	BE102106	2 gang variable condenser
C1	BE129132	.000125 mica
C2	BE12485	B. C. Antenna Trimmer
C3	BE12485	S. W. Antenna Trimmer
C4	BE1009	.05 x 200 v.
C5	BE12486	S. W. Pad
C6	BE12484	S. W. Osc. Trimmer
C7	BE12484	B. C. Osc. Trimmer

C8	BE12486	B. C. Pad
C9	BE12939	.00005 mica
C10	BE1009	.05 x 200 v.
C11	BE1009	.05 x 200 v.
C12	BE1292	.0005 mica
C13	BE1009	.05 x 200 v.
C14	BE12939	.00005 mica
C15	BE10012	.003 x 600 v.
C16	BE11986	8 mfd. lytic
C17	BE1006	.25 x 200 v.
C18	BE12921	.0002 mica
C19	BE10011	.01 x 400 v.
C20	BE10026	.02 x 400 v.
C21	BE10071	.004 x 600 v.

C2 and C3 in one unit. C6 and C7 in same unit. C5 and C8 in one unit.

R1	BE13020	100M ohm—⅓ w.
R2	BE1309	200M ohm—⅓ w.
R3	BE13012	50M ohm—⅓ w.
R4	BE13022	5M ohm—⅓ w.
R5	BE13020	100M ohm—⅓ w.
R6	BE1304	3 megohm—⅓ w.
R7	BE1304	3 megohm—⅓ w.
R8	BE101166	1 megohm—volume control
R9	BE130225	15 megohm—⅓ w.
R10	BE130101	600 ohm—⅓ w.
R11	BE1303	500M ohm—⅓ w.
R12	BE13019	1 megohm—⅓ w.
R13	BE101169	Tone Control—1 Megohm
R14	BE13056	100 ohm—⅓ w.

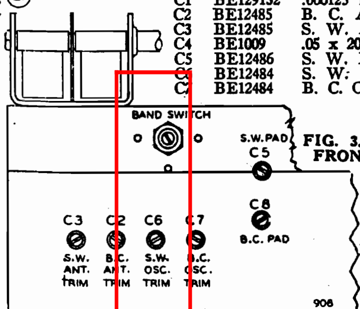
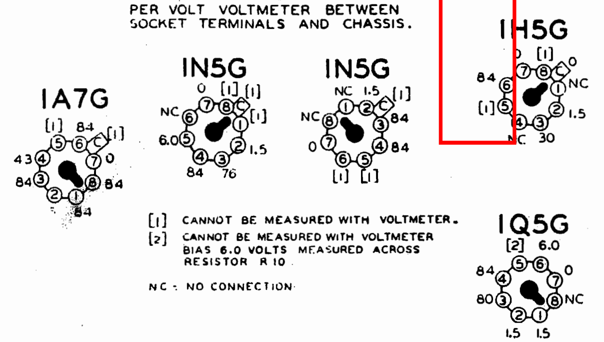


FIG. 3. TRIMMERS ON FRONT OF CHASSIS

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.



[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] CANNOT BE MEASURED WITH VOLTMETER BIAS 6.0 VOLTS MEASURED ACROSS RESISTOR R 10

NC : NO CONNECTION

REAR OF CHASSIS

AM '39 904

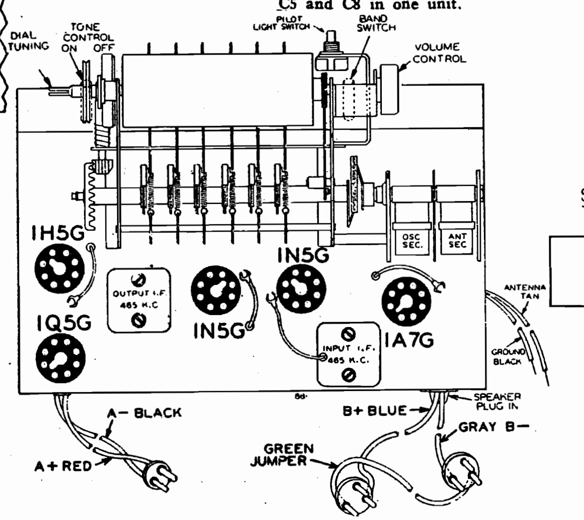
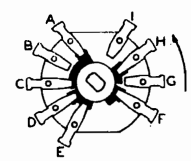
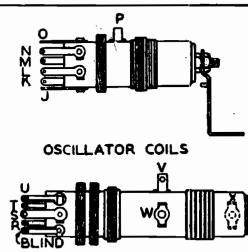


FIG. 1 — TOP VIEW



WAVE BAND SWITCH SHOWN IN BROADCAST POSITION



OSCILLATOR COILS

ANTENNA COILS

MODELS 93BR460A, 93BR1460A
Alignment, Battery Data

MONTGOMERY WARD & CO.

MODEL 93BR560A
Alignment

Chassis No. 93BR560A

Power Consumption - - - "A" Battery 300 MA; "B" Battery 11 MA.
Power Output - - - - - - - - - - 190 Milliwatts, Undistorted
Sensitivity (for .05 Watts) - Broadcast Band—10 Microvolts Average; Short Wave Band—20 Microvolts Average
Selectivity - - - 35 Kc. Broad at 1000 Times Signal at 1000 Kc.
Tuning Range - Broadcast 535—1720 Kc.; Shortwave 5.6—18.3 Mc.
Intermediate Frequency - - - - - - - - - - 465 Kc.
Speaker - - - - - - - - - - - 6 in. P. M. Dynamic

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1N5G 2nd I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7G, Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output (See Note "A")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C6 (See Fig. 3)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C3 (See Fig. 3)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 6 Mc.	Trimmer C5 (See Fig. 3)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "B")
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C7 (See Fig. 3)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer C2 (See Fig. 3)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer C8 (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "B")

NOTE "A" Do not re-adjust the trimmers on the output I. F. Transformer.

NOTE "B" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

Model No. 93BR-460A and 93BR-1460A

Power Consumption - - - "A" Battery 260 MA; "B" Battery 11.5 MA.
Power Output - - - - - - - - - - 150 Milliwatts, Undistorted
Sensitivity (for .05 Watts) - - - - - - - - 45 Microvolts Average
Selectivity - - - 45 Kc. Broad at 1000 Times Signal at 1000 Kc.
Tuning Range - - - - - - - - - - - - - 535 to 1730 Kc.
Intermediate Frequency - - - - - - - - - - - - 465 Kc.
Speaker - - - - - - - - - - - - - - 5 in. P. M. Dynamic

ALIGNMENT PROCEDURE

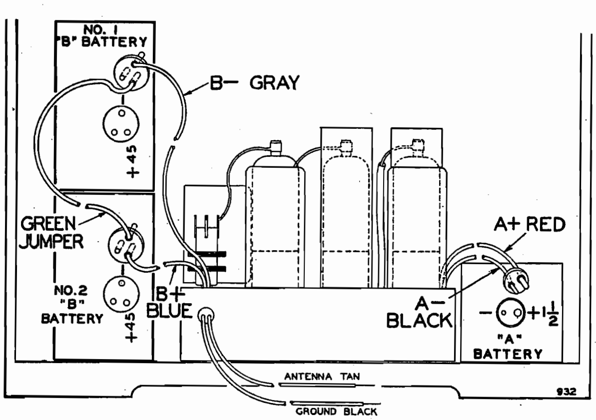
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1P5G I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 1A7G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of front section of gang (See Fig. 1)	Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmer—Top of rear section of gang (See Fig. 1)	Antenna	Adjust to maximum output

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
After each band is completed, repeat the procedure as a final check.



STEP 1—CONNECTING "A" BATTERY:

First—Place the "A" Battery in the cabinet as shown, (alongside right hand side of the radio chassis).

NEXT—Insert the special two-prong connector plug into the socket on the "A" battery as shown in illustration.

STEP 2—CONNECTING "B" BATTERIES:

First—Place both "B" Batteries in the cabinet exactly as shown (alongside left hand side of the radio chassis).

NEXT—Insert the special three-prong connector plugs into the sockets on the "B" batteries as shown in illustration.

NOTE: The above procedure and illustration pertains to the new style "B" batteries which have sockets; however, the old style "B" batteries which have terminals can be used by connecting them as follows:

FIRST—Remove the special plugs by cutting the wires off at the plugs.

NEXT—Connect gray colored B minus (—) wire to minus (—) terminal of "B" battery (marked Battery No. 1 in illustration).

NEXT—Connect one end of green connecting wire to plus (+45) terminal of battery No. 1 and other end to the minus (—) terminal of Battery No. 2.

NOW—Connect blue B plus (+) wire to the plus (+45) terminal of Battery No. 2.

MONTGOMERY WARD & CO.

MODEL 93WG562
Schematic, Socket
Alignment, Trimmers

SPECIFICATIONS

Power Consumption - 2.2 Amperes at 6.3 Volts

Power Output - - - - - - - .5 Watt Undistorted
1.0 Watt Maximum

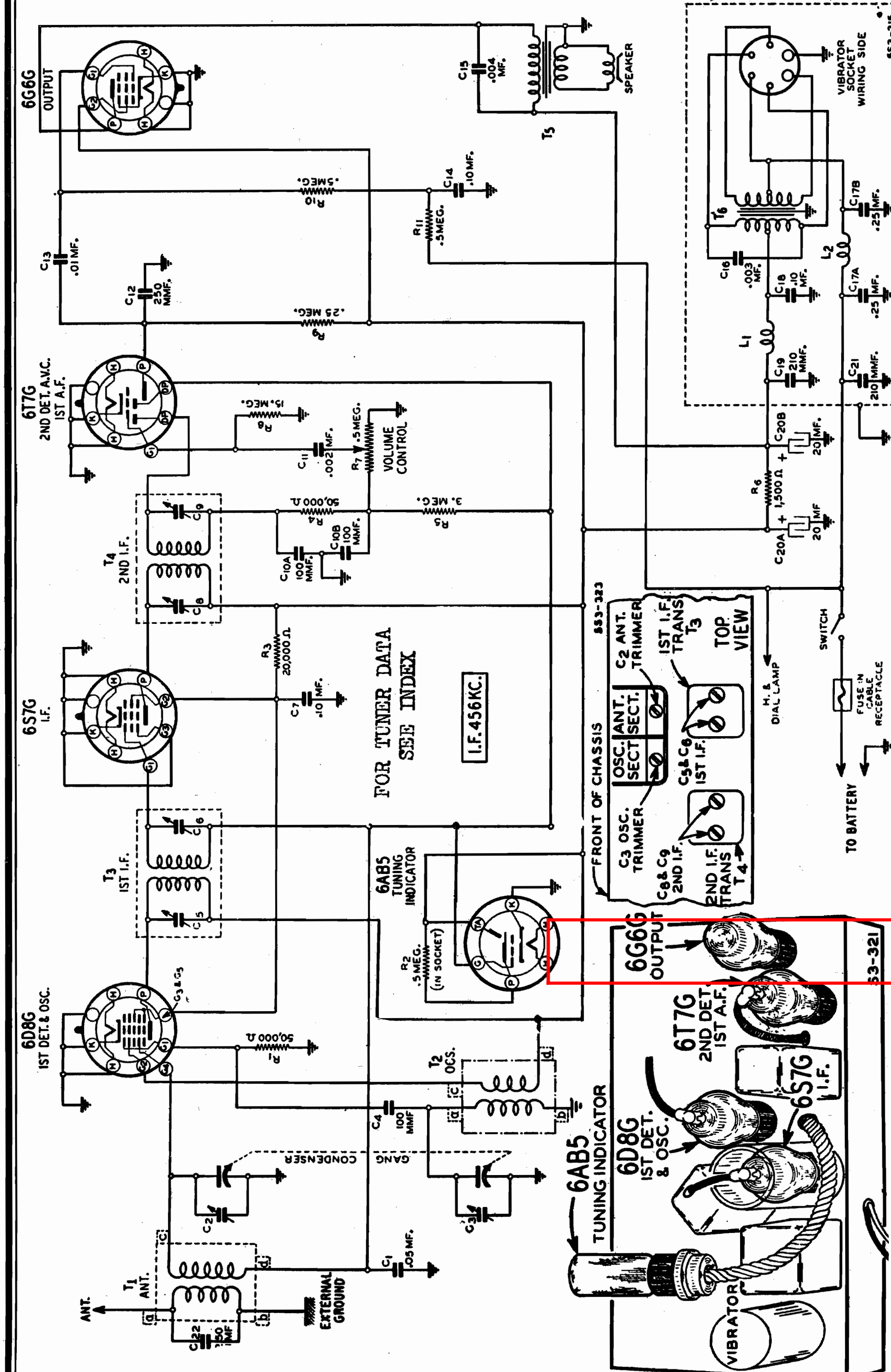
Selectivity - 41 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - - 5" P. M. Dynamic

Tuning Frequency Range - - 528 to 1730 KC.

Sensitivity (For .05 Watt Output) 15 Microvolts Average



CALIBRATION—If it is necessary to calibrate the radio, accurately tune in a signal of known frequency near 800 KC and note distance and direction dial is off calibration. Remove chassis from cabinet. Loosen the 2 set screws in the hub at the side of the dial drum nearest the center of the chassis. Turn the dial drum the necessary amount in required direction. Place the chassis back in the cabinet and see if it is in calibration. If it is, remove the chassis, tighten the set screws and reassemble.

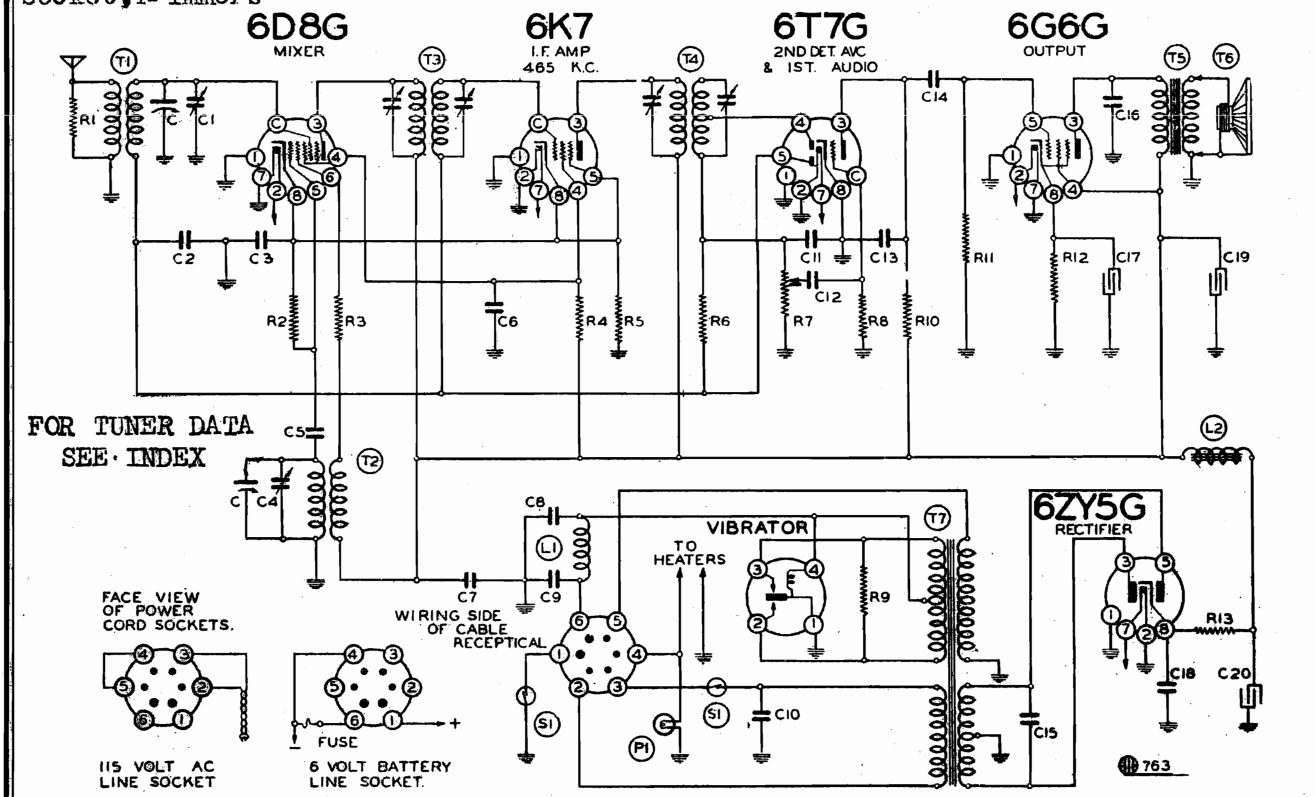
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det.	.1 mf.	Turn rotor to full open	1st I.F. (C5) & (C6) 2nd I.F. (C8) & (C9)
1730 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C3)
1500 KC	Antenna Lead	200 mmf.	Turn rotor to max. output	Antenna (C2)

MODEL 93BR564A
Schematic, Voltage
Socket, Trimmers

MONTGOMERY WARD & CO.



FOR TUNER DATA
SEE · INDEX

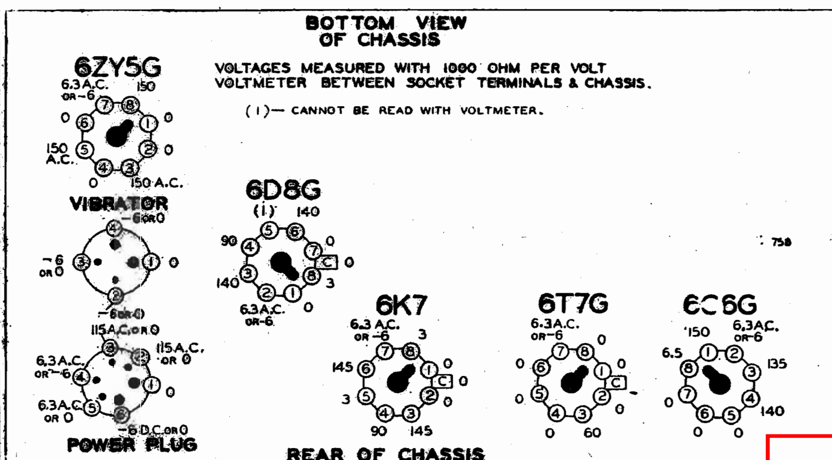


FIG. 3

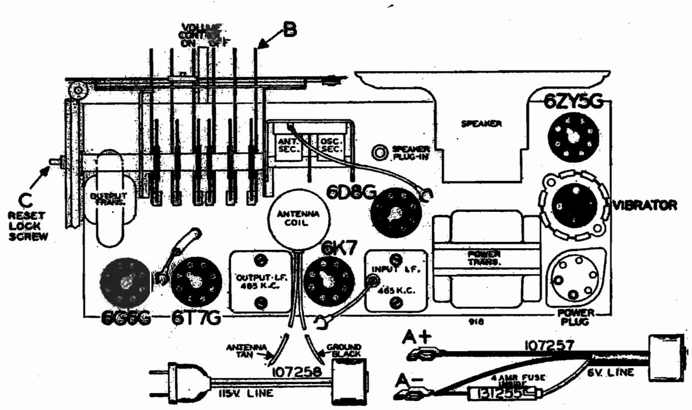


FIG. 1—TOP VIEW

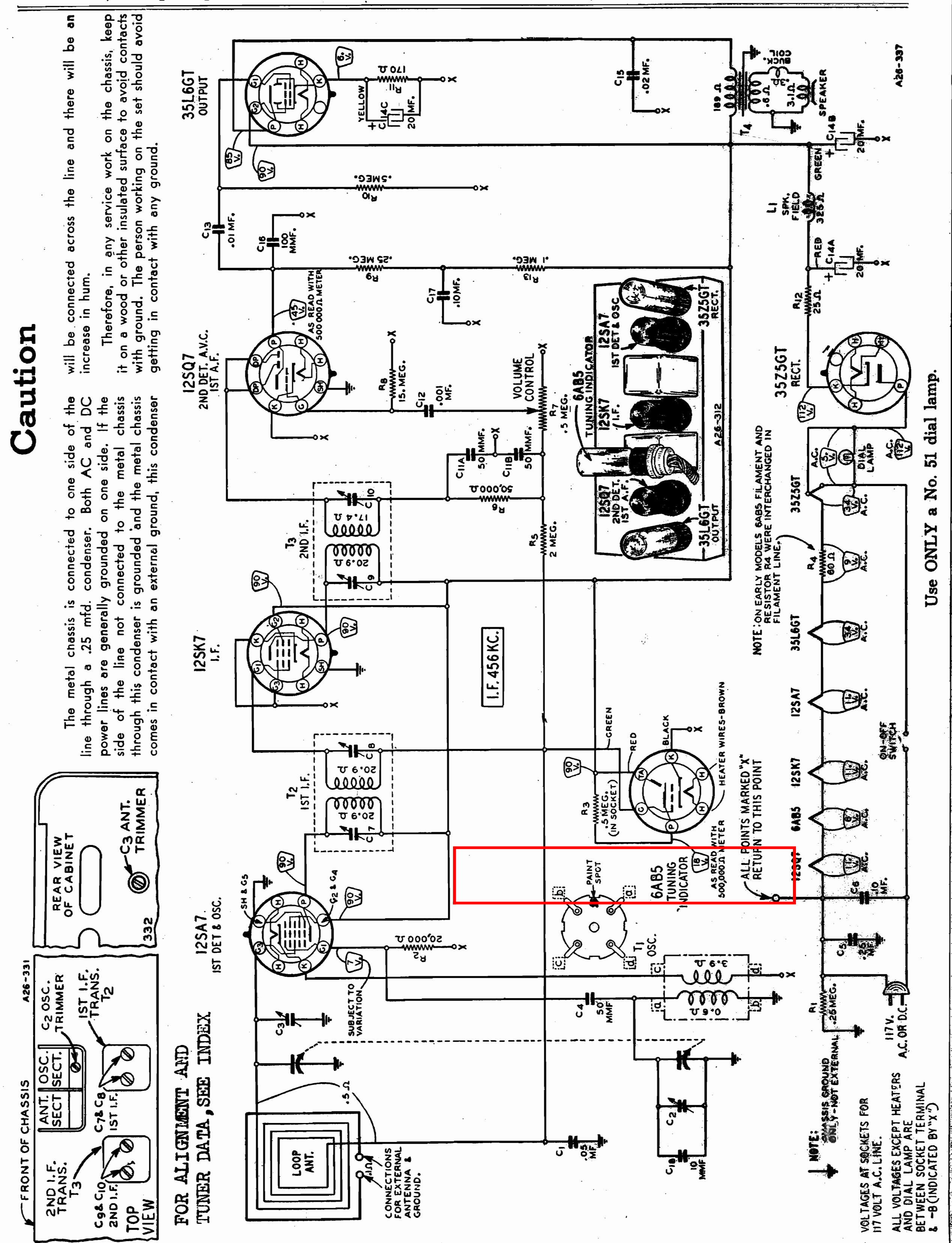
Schematic Reference No.	Part No.	Description
		RESISTORS
R1	BE13017	10M ohm—1/3 w.
R2	BE13012	50M ohm—1/3 w.
R3	BE13092	1000 ohm—1/3 w.
R4	BE130157	12M ohm—1/3 w.
R5	BE13097	200 ohm—1/3 w.
R6	BE1304	3 megohm—1/3 w.
R7	BE101150	1 megohm volume control
R8	BE130225	15 megohm—1/3 w.
R9	BE13097	200 ohm—1/3 w.
R10	BE130266	200M ohm—1/3 w.
R11	BE130102	500M ohm—1/3 w.
R12	BE13093	450 ohm—1/3 w.
R13	BE130168	100 ohm—1/3 w.
		CONDENSERS
C	BE102113	2 gang variable condenser.
C1		Antenna Trimmer
C2	BE1009	.05 x 200 v.
C3	BE10064	.25 x 200 v.
C4		Oscillator Trimmer
C5	BE1295	.0001 mica
C6	BE10020	.1 x 200 v.
C7	BE10020	.1 x 200 v.
C8	BE10040	.5 x 120 v.
C9	BE10040	.5 x 120 v.
C10	BE10011	.01 x 400 v.
C11	BE12960	.00015 mica
C12	BE10011	.01 x 400 v.
C13	BE1292	.0005 mica
C14	BE1009	.05 x 200 v.
C15	BE10073	.008 x 1200 v.
C16	BE10019	.006 x 600 v.
C17	BE11979	20 mfd. x 25 w. volt
C18	BE10020	.1 x 200 v.
C19	BE11979	16 mfd. x 200 w. volt
C20	BE11979	16 mfd. x 200 w. volt
		PARTS
T1	BE11185C	Antenna Coil
T2	BE110103	Oscillator Coil
T3	BE108129	Input I. F. Coil—465 kc.
T4	BE108130	Output I. F. Coil—465 kc.
T5	BE10569B	Output Transformer
T6	BE114143B	6" P. M. Speaker
T7	BE104114B	Power Transformer
S1		Off-on switch on volume control
P1	BE107249	6.3 v. Pilot Light Type 47
L1	BE10568	"A" Choke
L2	BE10530G	"B" Choke

MODELS 93WG602,93WG603
Schematic,Voltage
Socket,Trimmers

MONTGOMERY WARD & CO.

SPECIFICATIONS

Power Consumption - 28 Watts (At 117 volts AC Supply)	Speaker - - - - - - - - - 5" Electro Dynamic
Power Output - - - - - - - .8 Watt Undistorted	Tuning Frequency Range - - - 528 to 1730 KC
Selectivity - - 50 KC Broad at 1000 times Signal	Sensitivity - - - 40 Microvolts per Meter Average (For .05 Watt Output)
Intermediate Frequency - - - - - - - - 456 KC	



MODEL 93BR713A
Schematic, Voltage
Socket, Trimmers

MONTGOMERY WARD & CO.

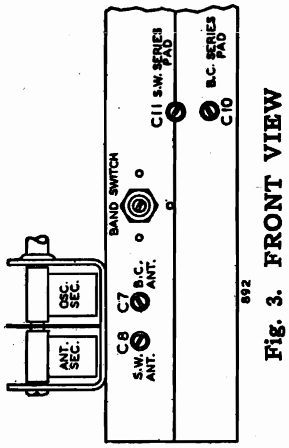


Fig. 3. FRONT VIEW

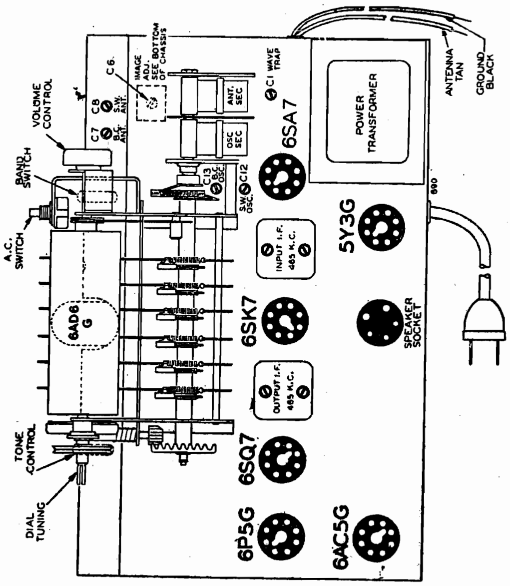
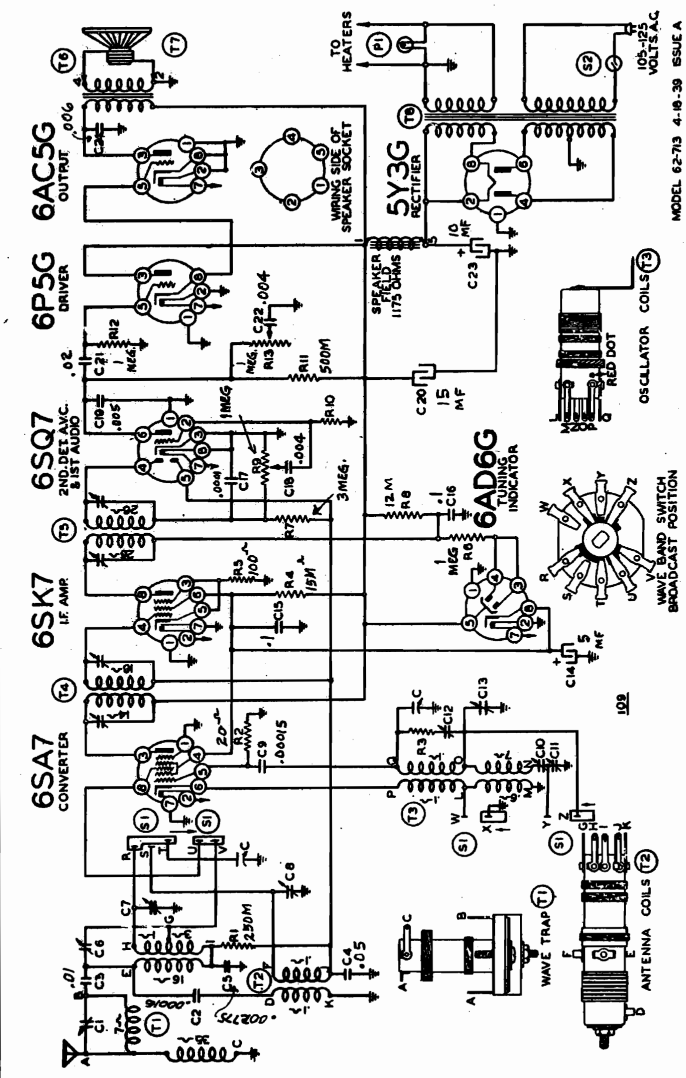


FIG. 1—TOP VIEW

Power Consumption . . . . 65 Watts
Power Output . . . . . 2.5 Watts Undistorted
Sensitivity (for .5 Watts Output) . . 60 Microvolts Average
Selectivity - 45 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range . . . . . . 535 to 1730 KC / 5.5 to 18.3 MC
Intermediate Frequency . . . . 465 KC
Speaker . . . . 6 in. Electro Dynamic



MODEL 62-713 4-18-39 ISSUE A

IF PEAK 465 KC

FOR ALIGNMENT AND TUNER DATA, SEE INDEX.

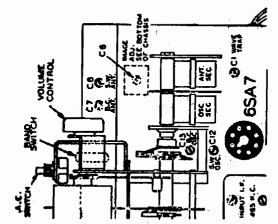
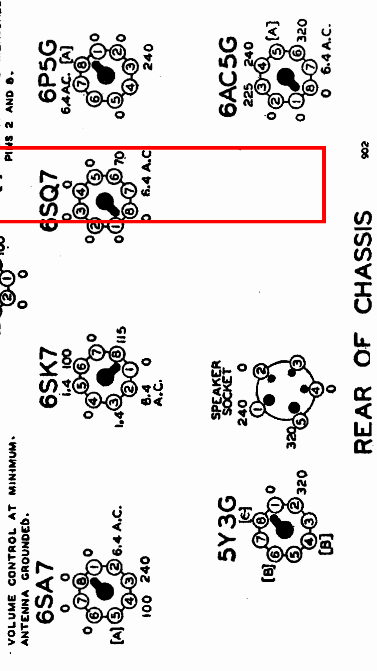


Fig. 4. TOP VIEW

BOTTOM VIEW OF CHASSIS

[A] CANNOT BE READ WITH VOLTMETER.
[B] 6.3 VOLTS A.C. MEASURED ACROSS PINS 4 AND 8.
[C] 5.2 VOLTS A.C. MEASURED ACROSS PINS 2 AND 8.

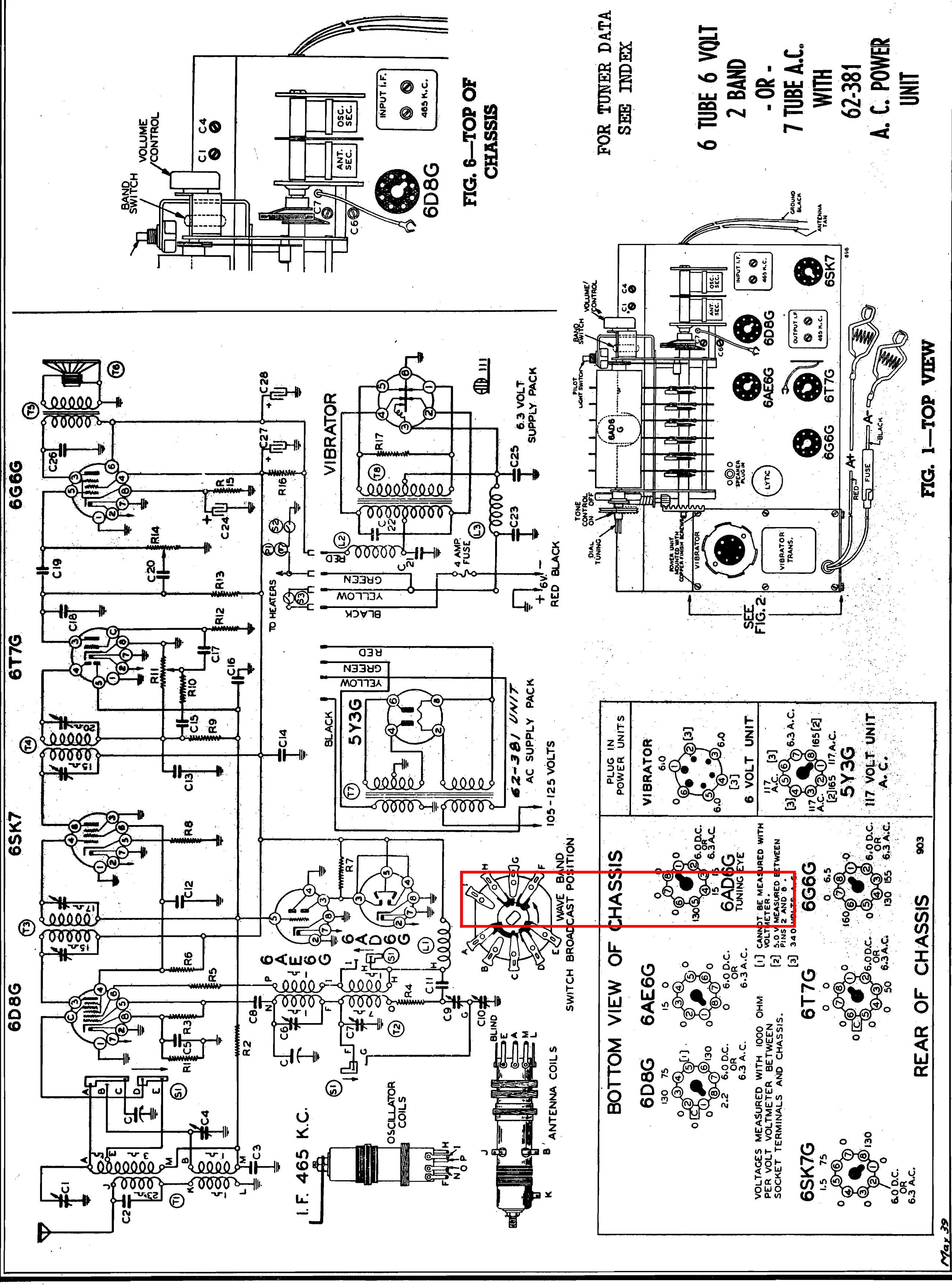


VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS. 117 VOLT LINE.
VOLUME CONTROL AT MINIMUM. ANTENNA GROUNDED.

REAR OF CHASSIS

MONTGOMERY WARD & CO.

MODEL 93BR657A
Schematic, Voltage
Socket, Trimmers
MODEL 62-381 S.P.U.
Schematic



MODEL 93BR657A
Alignment
MODEL 62-381 S.P.U.
Chassis

MONTGOMERY WARD & CO.

Chassis No. 98BR657A

Power Consumption	2.5 Amp. at 6.3 Volts	Selectivity	35 KC Broad at 1000 Times Signal at 1600 KC
Power Output	.6 Watts Undistorted	Tuning Frequency Range	535 to 1730 KC 5.6 to 18.3 MC
Sensitivity (for .05 Watts Output)	Broadcast 10 Microvolts Average Shortwave 20 Microvolts Average	Intermediate Frequency	465 KC
		Speaker	6 in. P. M. Dynamic

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

- The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6D8G	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer (C6) (See Fig. 6)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer (C4) (See Fig. 5)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 6 Mc.	Trimmer (C10) (See Fig. 5)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer (C7) (See Fig. 6)	Broadcast oscillator	Adjust to maximum output
	1500 Kc	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer (C1) (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C9) (See Fig. 5)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")

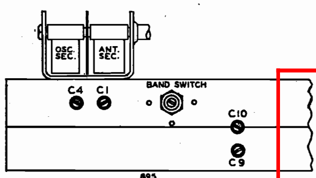


FIG. 5—FRONT OF CHASSIS

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attentuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

TUBES:

The following complement of this chassis consists of the following octal base glass and metal tubes:

The type and function of each tube is as follows:

1—Type 6D8G First Detector-oscillator.
1—Type 6SK7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).
1—Type 6T7G Duplex Diode Triode Second Detector, A.V.C. and First Audio.
1—Type 6G6G Output Amplifier.
1—Type 6AE6G D. C. Amplifier.
1—Type 6AD6G Cathode-Ray Tuning Eye.
NOTE:—If the 62-381 A. C. power unit is installed in place of the 6 volt power unit, the tube complement of the radio will consist of one more tube:
1—Type 5Y3G Rectifier.

No.	Part No.	Description
		RESISTORS
R1	BE13083	300 ohm—½ w.
R2	BE13020	100M ohm—½ w.
R3	BE13012	50M ohm—½ w.
R4	BE130286	20 ohm—½ w.
R5	BE130168	100 ohm—½ w.
R6	BE13048	15M ohm—½ w.
R7	BE13019	1 megohm—½ w.
R8	BE13097	200 ohm—½ w.
R9	BE1304	3 megohm—½ w.
R10	BE13012	50M ohm—½ w.
R11	BE101166	1 Megohm volume control
R12	BE130225	15 megohm—½ w.
R13	BE1305	300M ohm—½ w.
R14	BE101171	500M ohm tone control
R15	BE13070	500 ohm—½ w.
R16	BE130199	1500 ohm—1 watt
R17	BE130285	200 ohm—½ w.
		CONDENSERS
C	BE102106B	2 gang variable condenser
C1	BE12475	BC Antenna Trimmer
C2	BE129132	.000125 mica
C3	BE1009	.05 x 200
C4	BE12475	S. W. Antenna Trimmer
C5	BE10020	.1 x 200 v.
C6	BE12476	S. W. Oscillator Trimmer
C7	BE12476	B. C. Oscillator Trmmer
C8	BE12938	.00005 Mica
C9	BE12488	B. C. Series Pad
C10	BE12488	S. W. Series Pad
C11	BE10020	.1 x 200 v.
C12	BE10020	.1 x 200 v.
C13	BE1295	.0001 Mica
C14	BE10020	.1 x 200 v.
C15	BE1295	.0001 mica
C16	BE10026	.02 x 400 v.
C17	BE10019	.006 x 600 v.
C18	BE1292	.0005 mica
C19	BE10026	.02 x 400 v.
C20	BE10019	.006 x 600 v.
C21	BE10020	.1 x 200 v.
C22	BE10068	.003 x 1400 v.
C23	BE10040	.5 x 120 v.
C24	BE11985	20 mfd.—25 w. v. lytic
C25	BE10040	.5 x 120 v.
C26	BE10019	.006 x 600 v.
C27	BE11985	30 mfd.—200 w. v. lytic
C28	BE11985	30 mfd.—200 w. v. lytic
		C24, 27, 28 in same unit
		PARTS
T1	BE111121	Antenna Coil
T2	BE110117	Oscillator Coil
T3	BE108111-I	Input I. F.
T4	BE108112E	Output I. F.
T5	BE10569C	Output Transformer
T6	BE114162J	6 in. P. M. Speaker
T7	BE104165	AC Power Transformer
T8	BE104164	Vibrator Transformer
	BE12616	Vibrator
L1	BE1233	R. F. Choke
L2	BE1233	R. F. Choke
L3	BE10568	"A" Choke
S1	BE12576	Wave Band Switch
S2	BE12577	Pilot Light Switch
S3		Off-on switch on tone control
P1	BE10789	Pilot light 6.3 v.—150 ma.—T-40

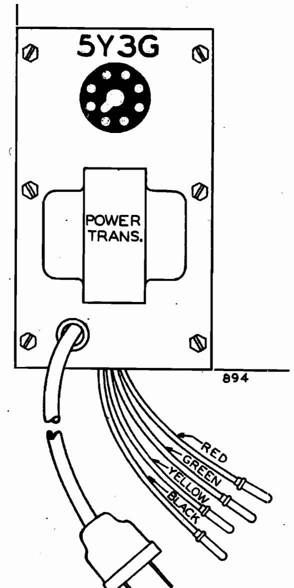


FIG. 2—MODEL 62-381 A. C. POWER UNIT

Model 62-381 Power Unit

(For 105-125 Volt 50/60 Cycle A. C. Operation)

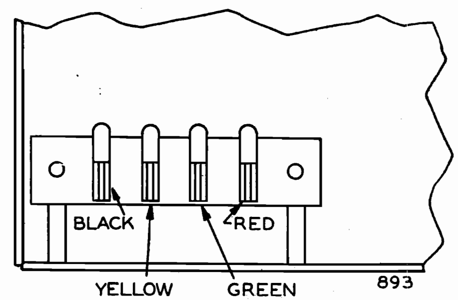


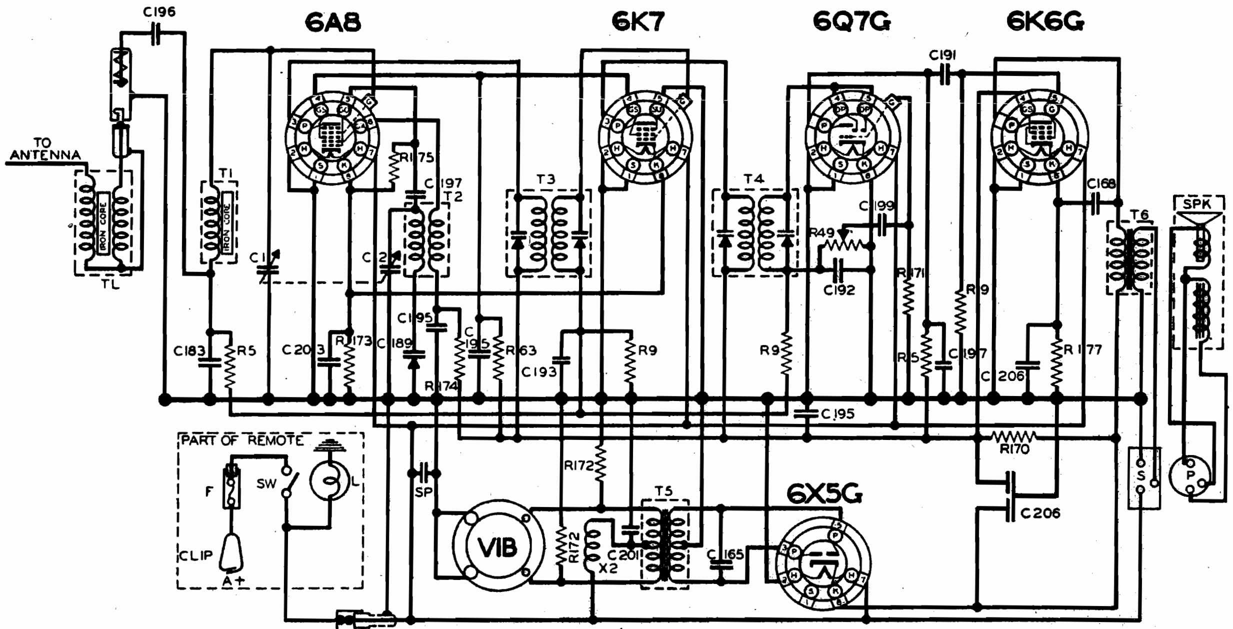
FIG. 3—CONNECTOR STRIP ON CHASSIS FOR POWER UNIT

Schematics
Voltage

NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 7A, Chassis RE44
MODEL 44C, Chassis RE46

ARVIN CAR RADIO CHASSIS RE44



RESISTORS			
P	OHMS	W	PART NO
5	500K	1/4	17-2070
9	1M	1/4	17-2080
49	500K	VC	17-14536
63	25K	1/4	17-14091
170	800	1	17-14287
171	15M	1/4	17-14288
172	100	1/4	17-14289
173	200	1/4	17-14290
174	20K	1/4	17-14291
175	40K	1/4	17-14292
177	650	1/4	17-14296

CONDENSERS			
C	CAPACITY	VOLT	PART NO
1	TWO-GANG		29-16254
2	VARIABLE		
165	.005	1200	17-14230
183	.003	600	17-14294
189	.0005	PAD	17-14266
191	.01	400	17-14272
192	.00025	600	17-14273
193	.05	200	17-14274
195	.05	400	17-14276
196	.1	200	17-14277
197	.0001	600	17-14278
199	.02	200	17-14283
201	.5	150	17-14285
203	.2	200	17-16242
206	10-10MFD	300	17-14297
206	20MFD.	15	
168	.002	400	17-14234

CHOKES & TRANSFORMERS		
T-X	TYPE	PART NO
1	ANTENNA COIL	00-16219
2	OSCILLATOR COIL	00-16220
3	FIRST I F COIL	00-16263
4	SECOND I F COIL	00-16264
5	POWER TRANS.	00-16265
6	OUTPUT TRANS	00-16266
X	CHOKES	
2	SUPPRESSION CHOKE	29-13459

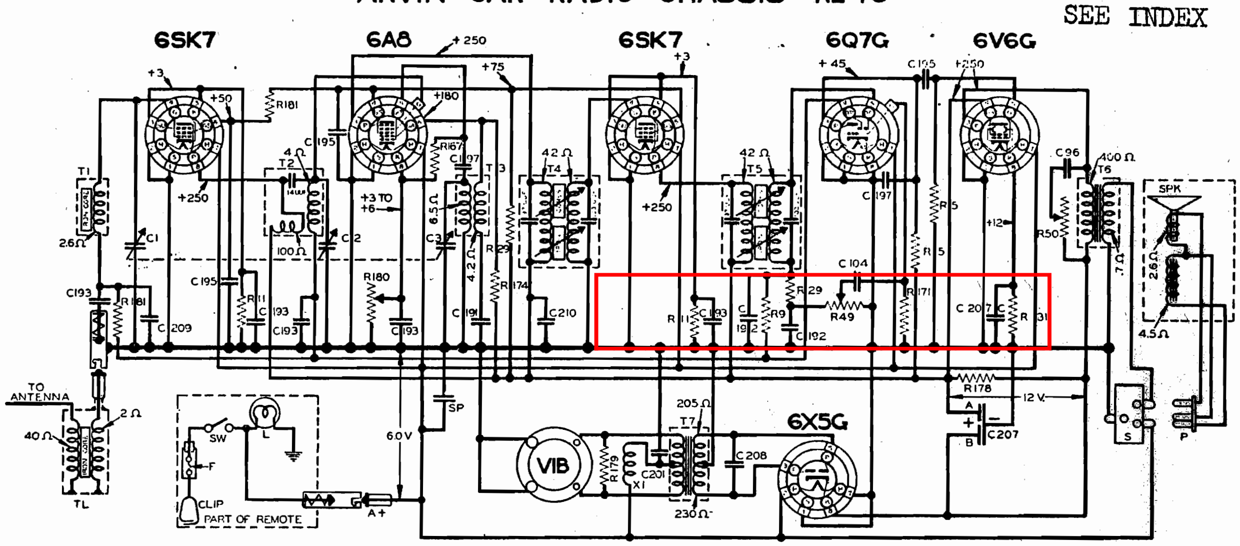
MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO
F	FUSE - 20 AMP	17-2228
L	DIAL LIGHT BULB - MAZDA NO. 51	17-13904
P	SPEAKER PLUG	17-4780
S	SPEAKER SOCKET	17-15631
SPK	SPEAKER ASSEMBLY	17-13370
SW	POWER SWITCH	——
TL	TRANSMISSION LINE	00-16233
SP	SPARK PLATE	——
VIB	VIBRATOR	17-14747

I.F PEAK 455 K.C
FREQUENCY RANGE 1575 TO 540 K.C
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

MODEL 7A

ARVIN CAR RADIO CHASSIS RE46

FOR ANTENNA DATA
SEE INDEX



R5--500K
R9--1M
R11-2K
R29-50K
R31-260
R49-500K
R50-100K
R167-60K

R171--15M
R174--20K
R178-1200
R179--100
R180-2000
R181-100K
All 1/4 W.
but R31-1/2.

C96--.05-600v.
C104-.01-200v.
C191-.01-400v.
C192-.00025-200v.
C193-.05-200v.
C195-.05-400v.
C197-.0001-600v.
C201-.5-150v.

C207A) 10mfd.-400v.
C207B)
C207C 20mfd.-25v.
C208--.005-1600v.
C209-.001725-600v.
C210--.1-400v.
F-fuse-20 amp.
L-Mazda No.51

INTERMEDIATE FREQUENCY 170 K.C.
FREQUENCY RANGE 1570 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA.

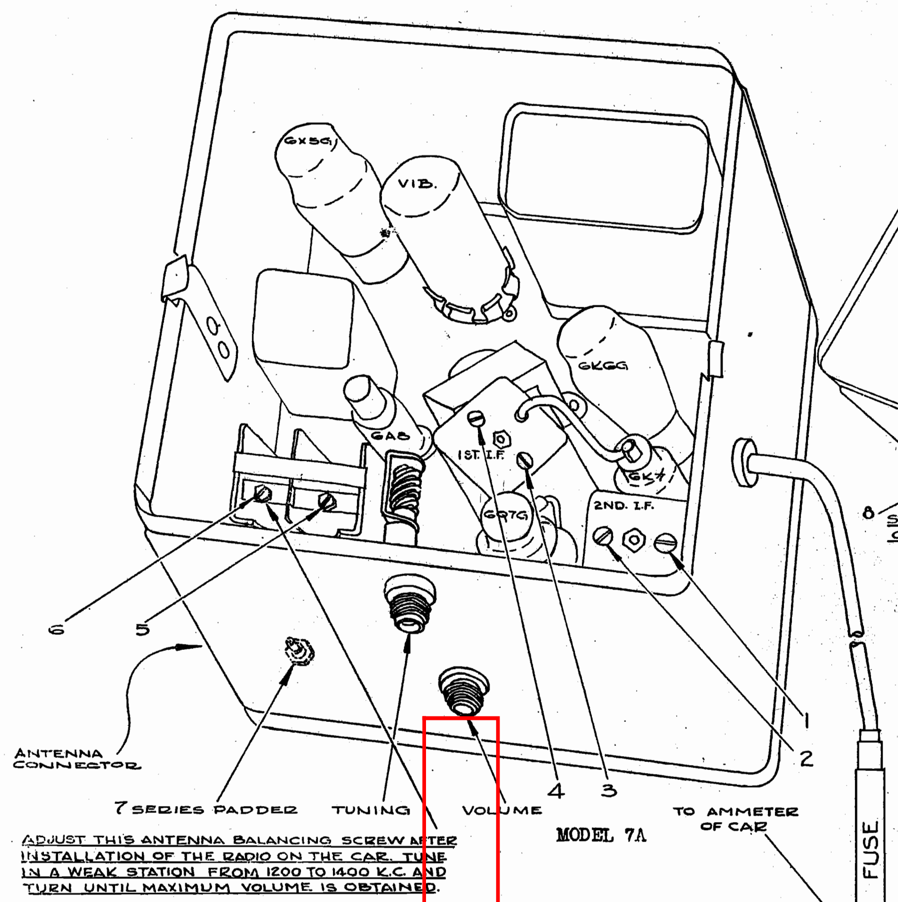
MODEL 44C

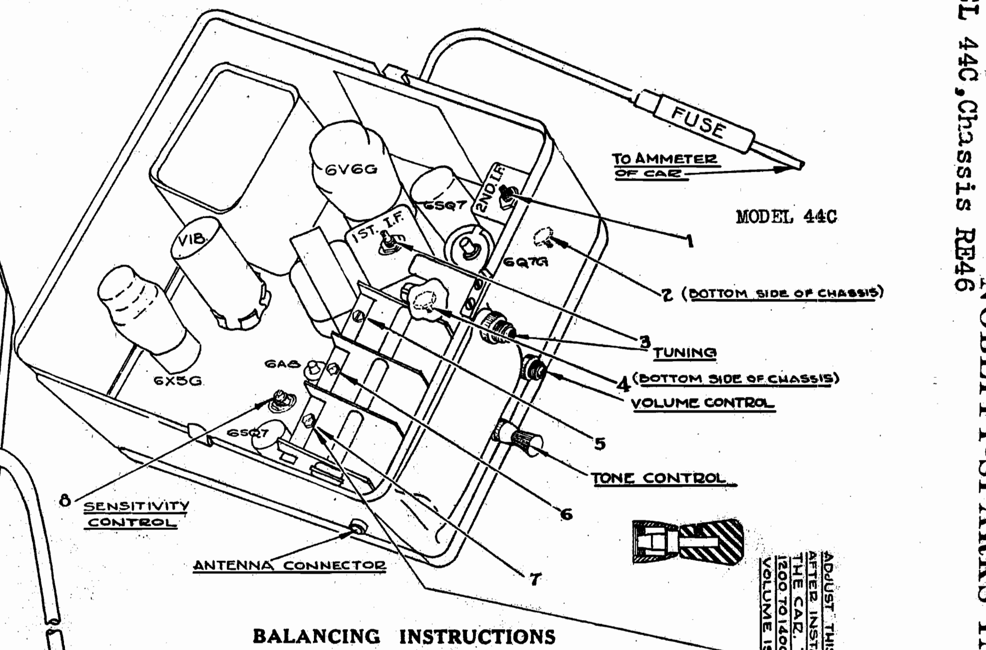
NOTE - ALL VOLTAGES GIVEN FOR "A" INPUT OF 6 VOLTS. ALLOW ± 10% ON ALL VOLTAGES & RESISTANCES OF WINDING.

MODEL 7A, Chassis RE44
MODEL 44C, Chassis RE46

NOBLITT-SPARKS INDUSTRIES, INC.

Alignment, Socket
Sensitivity
Trimmers





ADJUST THIS ANTENNA BALANCING SCREW AFTER INSTALLATION OF THE RADIO ON THE CAR. TUNE IN A WEAK STATION FROM 1200 TO 1400 K.C. AND TURN UNTIL MAXIMUM VOLUME IS OBTAINED.

BALANCING INSTRUCTIONS
ARVIN MODEL 7A CAR RADIO

All sensitivities given for ½ watt output equals 1.4 V. across Voice Coil

Operation No.	Connect Bal. Oscillator To	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6A8 Grid	455	1, 2, 3 and 4	550 KC	50 uv
2	Ant. Coupler Through 20 uuf	1400	5	1400	
3	"	1400	6	1400	10 uv
4	"	600	7	600	10 uv

BALANCING INSTRUCTIONS
ARVIN MODEL 44C CAR RADIO

All sensitivities are given for 1 watt output = 1.73 V across speaker voice coil.

SPECIAL NOTE: The intermediate frequency transformers in this receiver are coupled so as to secure flat top characteristics and provide semi-high fidelity reception of radio stations. These transformers may be balanced with a standard signal generator and output meter as follows:

Feed a signal of 170 kc into the grid of the 6A8 tube through .002 mfd. capacity, connect a 30,000 ohm resistor across the primary of the second I. F. transformer (P to B+) and adjust screw No. 1 for maximum output. Disconnect the resistor and place it across the secondary of the same transformer and adjust screw No. 2.

Then connect the resistor across the primary of the 1st I. F. transformer and adjust screw No. 3 and then after placing the resistor across the secondary, adjust screw No. 4.

Operation No.	Connect Bal. Oscillator To	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1 (See note above)	6A8 Grid	170 kc	1, 2, 3 & 4	Condenser Closed	700 uv
2	Ant. Coupler Through 20 uuf	1570 kc	5	Condenser Open	—
3	Through 20 uuf	1400 kc	6 & 7	1400 kc	5 uv
*4	Through 20 uuf	600 kc	8	600 kc	3.5 uv

*Operation No. 4 adjusts bias on 6A8 to obtain 5 uv sensitivity; for metropolitan areas this sensitivity may be set as low as 10 uv. and in mountainous areas as high as 1 uv. to secure the most satisfactory reception.

MODELS 828AT,838AT
Alignment,Tuner Data
Sensitivity

NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 7A
MODEL 8A
MODEL 44C
Antenna Data

ARVIN 828AT-838AT AUTOMATIC DIAL TUNING INDICATOR

This receiver should first be removed from its carton and the cabinet carefully cleaned with a soft rag to remove packing lint.

The hook bolts or clips which secure the chassis to the cabinet to hold it rigidly during shipment should next be removed. One will be found on each side of the chassis. Do not confuse these with the brackets which suspend the chassis through rubber grommets. These latter brackets should not be molested unless it is necessary to service the receiver.

The receiver may be prepared for operation by connecting an antenna lead at "A" on the rear terminal strip and connecting a ground lead at "G", leaving the jumper from "D" to "G" in place; or by removing the jumper and connecting the transmission line lead from an Arvin all-wave antenna kit. (Black lead to "D" and red lead to "A".) Plug the line cord into a suitable receptacle.

Make a list of ten stations in your locality which you desire to set up on the station selector, arranging this list so that the stations appear in the order of their frequencies. Cut the call letters of these stations from the sheets supplied with this receiver, leaving a white tab on each end of the piece cut out.

The receiver is placed in operation by turning the right-hand knob in a clockwise direction. This knob also functions as a tone control. The second knob to the left should be turned to the maximum counter-clockwise or manual tuning position.

Tune in the first station on your list, using the tuning indicator to determine whether station is properly tuned in. Change the Manual-Automatic Tuning switch to the automatic tuning position. Unless one of the buttons about to be adjusted happens to be set at this point the receiver will now appear to be inoperative. (In event a button does happen to be set at the proper point—no adjustment is necessary. If the pilot light is not in proper rotation, the sockets may be exchanged from the rear.) Looking at the rear of the dial and on the side toward which the pointer is now pointing, locate the button in the circular slot whose lead goes to the lowest pilot light on that side of the dial. Loosen this button by means of a turn in the counter-clockwise direction and slide the button in its track slowly until a point is reached where the receiver operates. The correct location for this button is directly behind the brass strip carried by the arm behind the plate on which the buttons are mounted. If this correct location cannot be attained by sliding the button in the particular track it now occupies, the button should be slid along this track to the point where it may be taken out and inserted in a track where this adjustment is possible.

The Manual-Automatic Tuning switch should now be returned to the Manual position; the second station on the list tuned in; the Manual-Automatic Tuning switch again thrown to the Automatic Tuning position; the button at the rear of the dial selected whose lead goes to the second pilot light; this button should be loosened, slid along the track and again tightened at the point where the receiver operates.

This same procedure should be continued for each station successively right around the dial, which then completes the set-up.

The switch may now be turned to the Automatic Tuning position. Tune in each station again, placing the proper call letters in each clip, inserting them from the rear of the receiver and at the edge of the dial frame. Push the call letter strips in so that they properly center in each window when viewed from the front.

This Arvin receiver has special advanced features which must be properly understood in order that full benefit may be derived from this fine instrument.

When the receiver is being operated with the Manual-Automatic Tuning switch in the manual position, the receiver tunes sharply and any station within the range of the receiver may be selected at will. Tonal quality to suit the taste of the listener may be obtained by adjustment of the tone control.

On the other hand, when the Manual-Automatic Tuning switch is in the automatic tuning position, the receiver functions in an entirely different manner. Throwing this switch automatically broadens the selectivity characteristics of the receiver.

It should be noted that this broad selectivity will only function satisfactorily on the louder stations, that is, those which are normally selected for use on the Arvin-Station-Selector. (This broadened selectivity is not practical in the manual tuning position because of inter-station interference which would inevitably result.)

Should the listener so desire, this increased fidelity can be compensated for by readjusting the setting of the tone control.

When this receiver is being operated on the police-amateur or foreign-short wave band, tuning should always be done manually and no attempt made to utilize the station selector feature which has been set up for the broadcast band.

ARVIN MODELS 7A, 8A, AND 44C,
ANTENNAS A22,A23 and A24

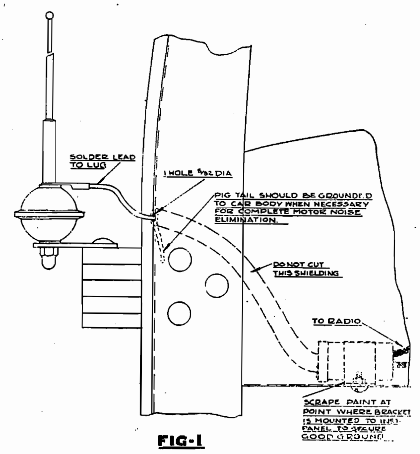


FIG-1
INSTALLATION FOR DOOR HINGE ANTENNA

Antenna:

Arvin antennae A22, A23 and A24 are recommended for use with the Arvin Model 7A Radio. These antennae are supplied with special connector shield cups to provide for good motor noise elimination.

The use of UNDER CAR or built in ROOF TYPE ANTENNA is not recommended nor will satisfactory reception be obtained if this type antennae is used.

The Phantom Filter should be mounted as shown in Figure 1 if a door hinge type antenna is used. Fig 2 illustrates the proper connections for the side cowl type Arvin Antenna and the Arvin Phantom Filter.

Installation:

A clear space, preferably above the steering column, approximately 8½" square and free of obstructions is required for mounting the model 7A radio chassis.

Remove the cap screw in the rear of the radio chassis and insert the stud, (supplied in the hardware envelope) in its place. Drill a ½" hole in the center of the space selected for the chassis.

Scrape the paint from the motor side of the dash around the ½" hole to secure a good ground for the mounting stud.

BALANCING INSTRUCTIONS
MODELS 828AT and 838AT

Sensitivity:

A. Broadcast Band—50 Microvolts Minimum
B. Police Band—75 Microvolts Minimum
C. Short Wave Band—100 Microvolts Minimum

Note: Standard output is considered 500 milliwatts which is equal to 1.12 R.M.S. AC volts across the voice coil of the speaker. Sensitivity is determined by the amount of input in microvolts required to produce 1.12 volts at the voice coil. Measurement may be made with any AC voltmeter or output meter.

The intermediate frequency transformers embodied in the circuit of Arvin Models 828AT-838AT are of the semi-permatune type, the only adjustment being variable iron cores in the fields of the transformers. It is advisable before attempting to rebalance the intermediate stages of this receiver, therefore, to check the overall intermediate frequency stage sensitivity. This may be accomplished by connecting the 455 K. C. output of a standard signal generator to the grid cap of the 6A8G tube after removing the grid clip. Connection should be made through a standard 200 uuf. dummy antenna. Check sensitivity and perform all balancing procedure with the automatic tuning in the "off" position. The intermediate frequency sensitivity should be at least 75 microvolts for 50 milliwatts output. If the I. F. sensitivity is within the limits prescribed the following instructions for balancing may then be followed.

If the I. F. sensitivity is low then adjust screws 1, 2, 3 and 4 for maximum output.

1. Connect the signal generator to the A and G terminals on the rear of the radio. Rotate the condenser until it is fully in mesh (maximum clockwise position.) The dial pointer should point to the center of the station window which is alongside 550 kilocycles (55 on the American broadcast band.)
2. Rotate dial pointer to 1,400 K. C. Set band switch to Broadcast Position. Adjust padder No. 5 to resonance. Adjust padder No. 6 for maximum output.
3. Rotate dial pointer to 600 K. C. With 600 K. C. input from the signal generator adjust padder No. 7 for resonance.
4. Set band switch to mid-band position. Rotate dial pointer to 5.0 megacycles. With 5,000 K. C. input from signal generator adjust padder No. 8 for resonance. Adjust padder No. 9 for maximum output.
5. Set band switch to short-wave band position. Rotate dial pointer to 15.0 megacycles. With 15 megacycles input from signal generator turn padder No. 10 to the extreme clockwise position. Then rotate padder screw counter-clockwise selecting the second resonance point reached. Then adjust padder No. 11 for maximum output.

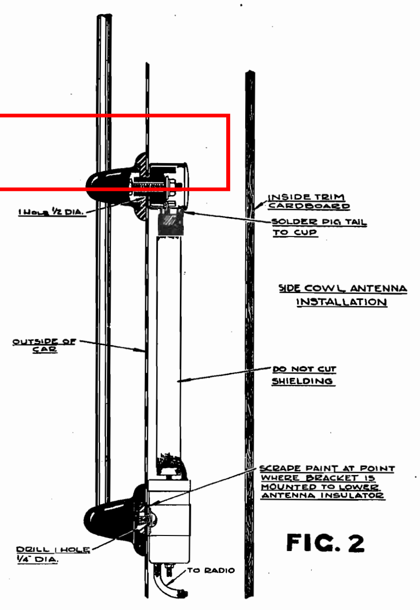


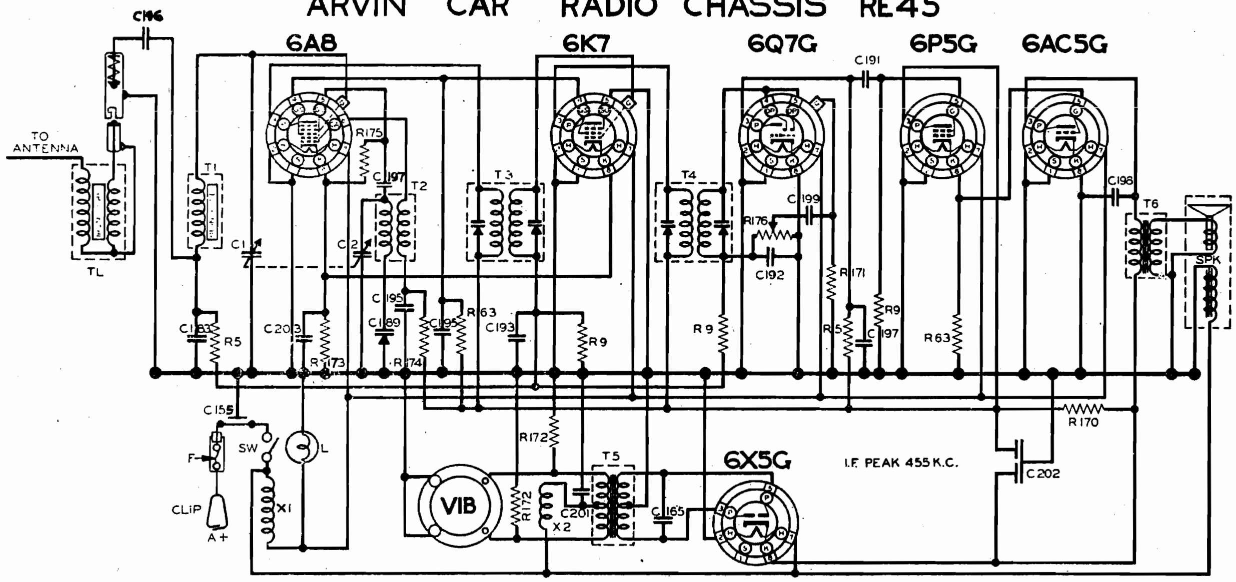
FIG. 2

MODEL 8A
Chassis RE 45
Schematic

NOBLITT-SPARKS INDUSTRIES, INC.

Alignment
Socket
Trimmers

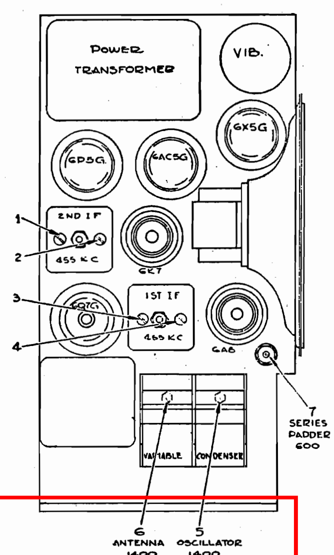
ARVIN CAR RADIO CHASSIS RE45



BALANCING INSTRUCTIONS:

All sensitivities given for ½ watt output = 1.4 V. across Voice Coil

Operation No.	Connect Bal. Oscillator to	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6A8 Grid	455	1, 2, 3 & 4	550 KC	50 uv
2	Ant. Coupler Through 20 uuf	1400	5	1400	
3	"	1400	6	1400	10 uv
4	"	600	7	600	10 uv



FREQUENCY RANGE 1575 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

FOR ANTENNA DATA
SEE INDEX

RESISTORS:

Ref. No.	Part No.	Description
R5	17-2070	500,000 ohm, ¼ W.
R9	17-2080	1,000,000 ohm, ¼ W.
R63	17-14091	25,000 ohm, ¼ W.
R170	17-14287	800 ohm, 1 W.
R171	17-14288	15,000,000 ohm, ¼ W.
R172	17-14289	100 ohm, ¼ W.
R173	17-14290	200 ohm, ¼ W.
R174	17-14291	20,000 ohm, ¼ W.
R175	17-14292	40,000 ohm, ¼ W.
R176	17-16225	500,000 ohm, vol. control

CONDENSERS:

Ref. No.	Part No.	Description
C182	29-16217	Tuning Condenser
C155	17-14217	.0002 mfd. 600 V.
C165	17-14230	.005 mfd. 1200 V.
C183	17-14294	.003 mfd. 600 V.
C189	17-14266	.0005 mfd. padder
C191	17-14272	.01 mfd., 400 V.
C192	17-14273	.00025 mfd., 600 V.
C193	17-14274	.05 mfd., 200 V.
C195	17-14276	.05 mfd., 400 V.
C196	17-14277	.1 mfd., 200 V.
C197	17-14278	.0001 mfd., 600 V.
C198	17-14279	.005 mfd., 400 V.
C199	17-14283	.02 mfd., 200 V.
C201	17-14285	.5 mfd. -150 V.
C202	17-15286	10-10 mfd., 300 V.
C203	17-16242	2 mfd., 200 V.

COILS and TRANSFORMERS:

Ref. No.	Part No.	Description
T—1	00-16219	Antenna Coil
T—2	00-16220	Oscillator Coil
T—3	00-16221	1st. I. F. Trans.
T—4	00-16222	2nd I. F. Trans.
T—5	00-16223	Power Transformer
T—6	00-16224	Output Transformer
X—1	20-13458	Suppression Choke
X—2	29-13459	Suppression Choke
TL	00-16233	Phantom Filter

MISCELLANEOUS:

Part No.	Description
17-16213	Speaker Assembly (5¼")
37-13423	Rear Mounting Bracket
61-16230	Dial Glass
26-16212	Dial Pointer
29-13583	24" Dial Cord
17-14747	Vibrator.
29-16024	Tuning & Volume Knob
29-16232	Push Button Knobs
10-5145	Mounting Screw $\frac{5}{16}$x1½"
10-5141	Mounting Screw No. 10 x ¾"
29-3219	Instruction Sheet
29-3150	Call Letter Sheets
23-16249	Ford Mounting Spacer

MODEL 578B
Alignment, Voltage
Data

NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 9A
Voltage

MODEL 9A SOCKET VOLTAGES

Tube	Heater	Cathode	Suppressor Grid	Screen Grid	Plate	Oscillator Grid	Anode Grid	Diode Plates	Control Grid
78	6.3	0	0	75	175	......	......	......	3.4
6A7	6.3	0	......	75	175	4-7	135	......	3.4
78	6.3	3.2	0	75	175	......	......	......	0
75	6.3	0	......	......	90	......	......	2.0	1.6
41	6.3	0	......	175	172	......	......	......	17.0
84	6.3	195	......	......	215 A. C.	......	......	......	......

Socket voltages given in table are for an input of 5.8 volts at the tubes in the receiver. 5.8 volts is the average obtained in various cars after allowing for drop in car wiring.

FOR OTHER SERVICING DATA ON THESE MODELS SEE INDEX

MODEL 578B ARVIN RADIO

TUBES:
1C7G—1st Detector-Oscillator
1D5G—I. F. Amplifier
1H6G—2nd Detector
1G5G—Audio Output Amplifier

FREQUENCY RANGE: 540 to 1,725 Kilocycles

POWER OUTPUT: 300 Milliwatts

SPEAKER:
6″ Permanent Magnet Dynamic
3 ohm voice coil—400 cycles

VOLTAGE AND POWER CONSUMPTION:
"A" Battery—360 milliamperes at 2.1 volts
"B" Battery—12-15 milliamperes at 90 volts

SENSITIVITY:
1000 KC.—100 Microvolts for 50 milliwatts output
456 KC.—200 Microvolts for 50 milliwatts output

COIL RESISTANCES

Antenna Coil Primary	14.5 Ω	1st I. F. Secondary	14 Ω
Antenna Coil Secondary	4.4 Ω	2nd I. F. Primary	14 Ω
Oscillator Coil Primary	4.5 Ω	2nd I. F. Secondary	14 Ω
Oscillator Coil Secondary	4.7 Ω	Output Transformer Primary	800 Ω
1st I. F. Primary	14 Ω	Output Transformer Secondary	.3 Ω

POINT TO POINT RESISTANCES

1C7G

Filament	0 Ω
Filament	∞
Screen to B+	15,000 Ω
Oscillator Grid	50,000 Ω
Anode Grid to B+	0 Ω
Control Grid	2,500,000 Ω
Plate to B	15 Ω

1D5G

Filament	0 Ω
Filament	∞
Screen to B+	15,000 Ω
Plate to B+	15 Ω
Control Grid	2,500,000 Ω

1H6G

Filament	0 Ω
Filament	∞
Plate to B+	250,000 Ω
Diode Plates	500,000 Ω
‡Grid	500,000 Ω

1G5G

Filament	0 Ω
Filament	∞
Screen to B+	800 Ω
Grid	1,000,400 Ω

‡ Volume control in full-on position.

SOCKET VOLTAGES MODEL 578B

Tube	Filament	Plate	Screen Grid	Oscillator *Grid	Anode Grid	Diode *Plates	Control *Grid
1C7G	2.1	84	45	3-6V	84	......	0
1D5G	2.1	84	45	......	......	......	0
1H6G	2.1	35	......	......	......	0	0
1G5G	2.1	84	84	......	......	......	—6

* Measured with a vacuum tube voltmeter. 600 to 1500 K. C.

No signal applied to receiver: with 100,000 microvolts to input diode voltage approximately 12 volts.

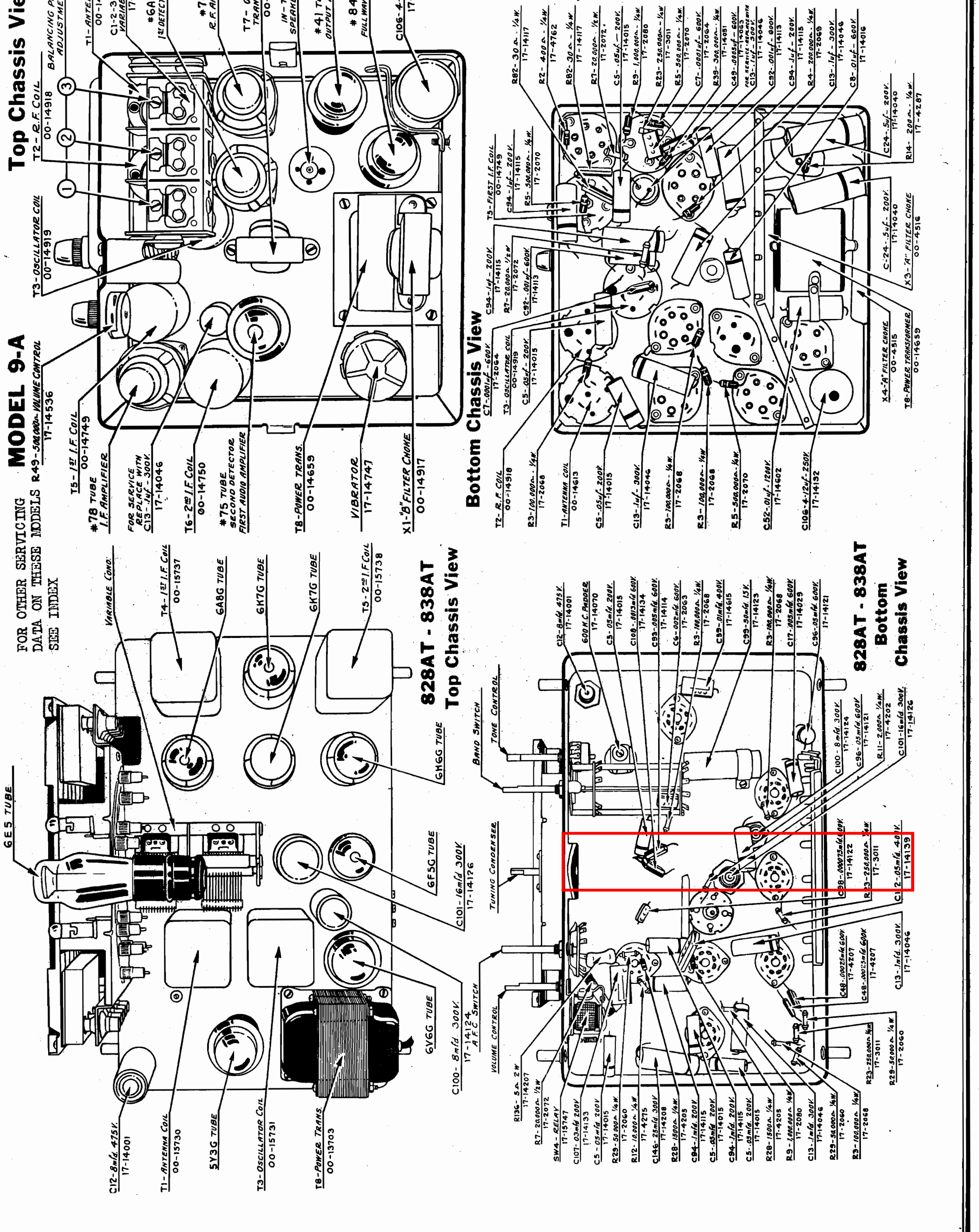
BALANCING INSTRUCTIONS

CONNECT an output meter or A. C. Voltmeter across the speaker coil leads.

1. Connect the signal generator to the grid cap of the 1C7G tube and with an input of 456 K. C. adjust padders 1, 2, 3 and 4 for maximum output.
2. Connect the signal generator through a standard 200 micromicrofarad dummy antenna to the antenna (green) lead wire on the rear of the chasis. Ground the generator to the (black) ground wire.
3. Rotate the tuning condenser to the wide open position. Check the dial pointer to see that it is parallel to the horizontal line across the dial face.
4. Rotate the dial pointer to 1,400 K. C. and with an input of that frequency adjust padder No. 5 to resonance. Adjust padder No. 6 for maximum output.
5. Rotate the dial pointer to 600 K. C. and with an input of that frequency adjust the series padder No. 7 to resonance.
6. Return to 1,400 K. C. and recheck the settings of padders No. 5 and No. 6.

MODEL 9A
MODELS 828AT,838AT **NOBLITT-SPARKS INDUSTRIES, INC.**
Socket,Trimmers
Chassis

FREQUENCY RANGE: 1575-540 Kilocycles VOICE COIL: 3 Ohms
POWER OUTPUT: 2.7 Watts POWER SUPPLY: 6 V. Storage Battery
SPEAKER: 5" Dynamic AMPERE DRAIN: 5.4 Amperes

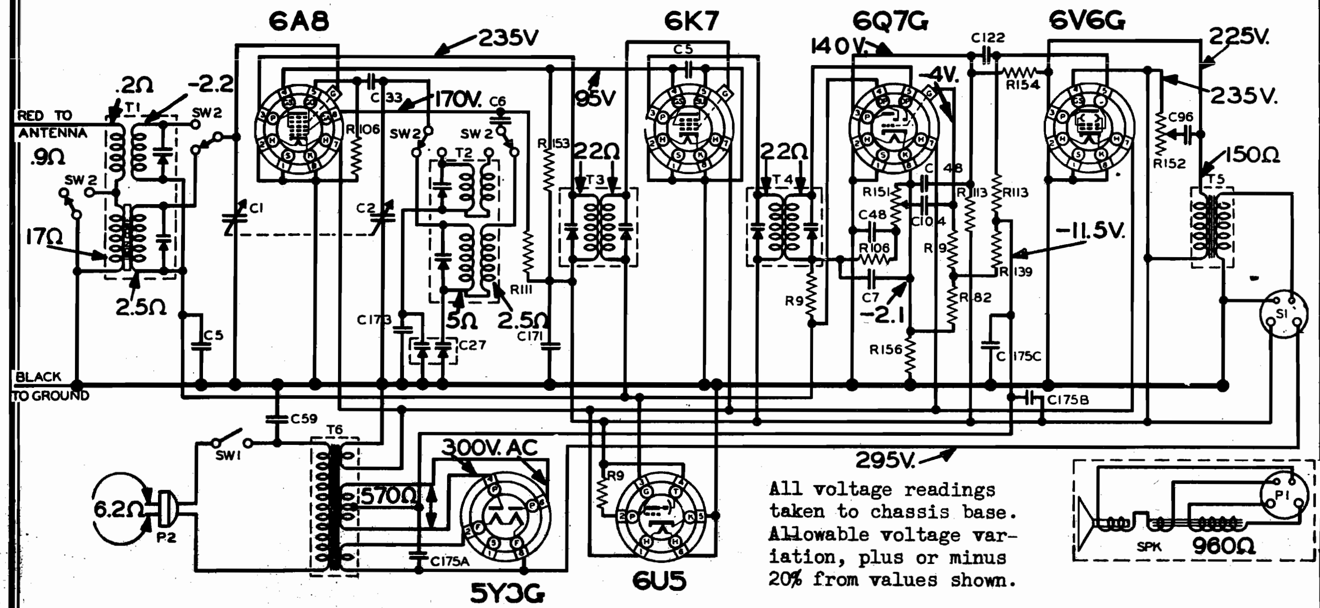


Alignment, Trimmers
Sensitivity

NOBLITT-SPARKS INDUSTRIES, INC.

MODELS 89, 91
Chassis RE27
Schematic, Voltage

ARVIN RADIO CHASSIS RE27 — RADIO MODELS 89 and 91



All voltage readings taken to chassis base. Allowable voltage variation, plus or minus 20% from values shown.

RESISTORS

Ref. No.	Part No.	Description	Price
R9	17-2080	1,000,000 ohm, 1/4 Watt	.20
R82	17-14117	30 ohm, 1/4 watt	.20
R106	17-14171	50,000 ohm, 1/4 watt	.20
R111	17-14176	20,000 ohm, 1/4 watt	.20
R113	17-14178	250,000 ohm, 1/4 watt	.20
R139	17-14219	100 ohm, 1 watt	.30
R153	17-14243	30,000 ohm, 1/2 watt	.20
R154	17-14244	1,500,000 ohm, 1/4 watt	.20
R156	17-14246	35 ohm, 1/4 watt	.20

CONDENSERS

Ref. No.	Part No.	Description	Price
C6	17-2063	.002 mfd. 600V	.25
C7	17-2064	.0001 mfd. 600V	.25
C122	17-2189	.01 mfd. 400 V	.35
C104	17-4206	.01 mfd. 200 V	.30
C48	17-4207	.00025 mfd. 600 V	.25
C27	17-13077	Series Padder	.60
C5	17-14015	.05 mfd. 200 V	.30
C33	17-14047	.00005 mfd. 600 V	.25
C96	17-14121	.05 mfd 600 V	.40
C171	17-14238	.1 mfd. 400 V	.40
C173	17-14247	.003 mfd. 600V	.25
C175 A,B,& C	17-14249	10-10 mfd. 450V	
		20 mfd. 25V	3.00
C59	17-14615	.01 mfd. 400V	.35
C1,2 & 3	17-16005	Tuning Condenser	4.00

COILS AND TRANSFORMERS

Ref. No.	Part No.	Description	Price
T6	00-15995	Power Transformer	4.50
T5	00-15996	Output Transformer	1.75
T1 & 2	00-15997	Antenna & Oscillator	-
		Coil Assembly	3.00
T3	00-15998	1st I.F. Transformer	1.50
T4	00-15999	2nd I.F. Transformer	1.50

SPEAKER, DIAL PARTS, CABINET & MISCELLANEOUS

Part No.	Description	Price
29-3188	Instruction sheet	.02
28-5186	Dial Drive Pulley (rubber)	.10
17-13249	Speaker socket	.15
29-13583	Dial Drive Cord	.10
34-13660	Dial Drive Cord Spring	.05
17-13875	Tuning Eye Cable	.60
17-13904	Dial Light (M-51)	.15
17-15791E	110 V. Line Cord	.40
29-15981A	Dial Pointer	.15
61-16000	Dial Glass	1.00
17-16007	Band Switch	.75
17-16008	Volume Control	.75
17-16009	Tone Control	1.00
29-16013	Knob (Pushbutton)	.10
41-16030	Electric Eye Escutcheon	.25
41-16031	Escutcheon Plate (Dial)	1.50
41-16032	Escutcheon Plate (Pushbutton)	.35
17-16047	Speaker 8"	6.50
27-16115	Cabinet Model 89	15.00
27-16122	Cabinet Model 91	30.00
29-16123	Knob (Tuning and volume)	.15

BALANCING INSTRUCTIONS

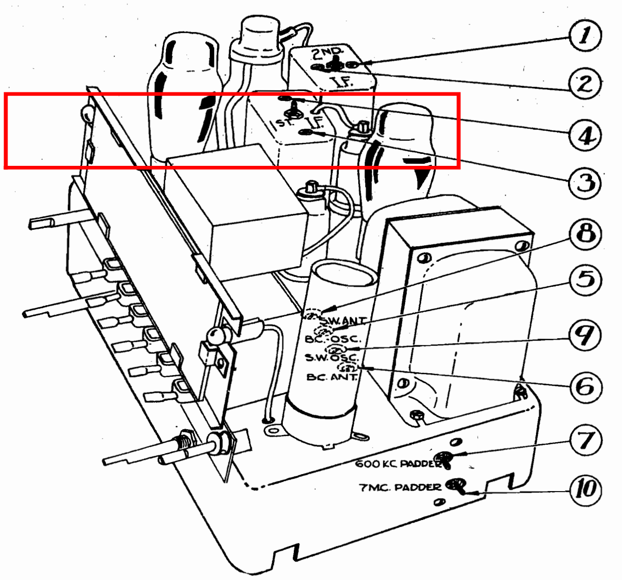
ARVIN MODELS 89, 91 - - RE27 CHASSIS

All sensitivities given for 200 milliwatts output = .78 V across voice coil

Operation No.	Connect Sig. Generator To	Input Frequency	Adjust Padder No.	Dial Setting	Band Switch Position	Sensitivity
1	6A8 Grid	455 KC	1,2,3,& 4	600 KC	Broadcast	70 uv
*2	Antenna Wire	1400 KC	5	1400 KC	Broadcast	-------
3	Antenna Wire	1400 KC	6	1400 KC	Broadcast	25 uv
**4	Antenna Wire	600 KC	7	600 KC	Broadcast	40 uv
5	Antenna Wire	15 MC	8	15 MC	Short Wave	-------
6	Antenna Wire	15 MC	9	15 MC	Short Wave	120 uv
7	Antenna Wire	7 MC	10	7 MC	Short Wave	150 uv

* Dial pointer should be parallel with horizontal line across center of dial with tuning condenser in closed position (maximum capicity) before proceeding with adjustments.

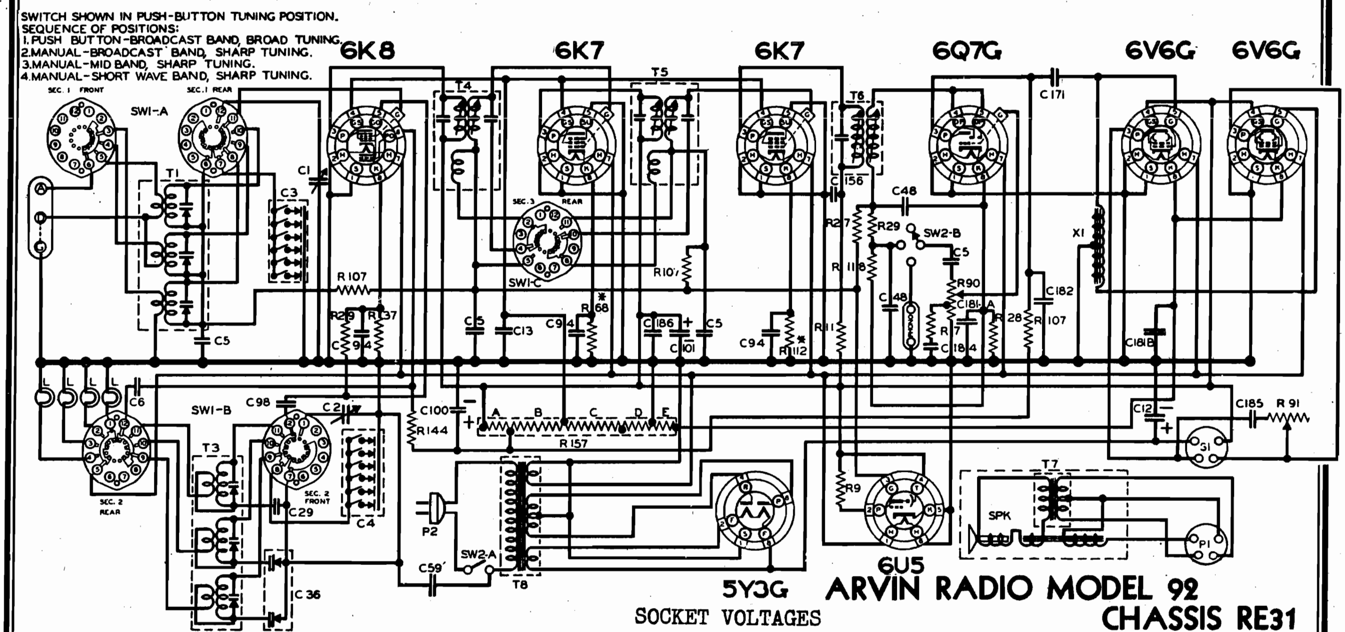
** After balancing 600 KC padder, return and recheck the adjustments of padders 5& 6



MODEL 92
Chassis RE31
Schematic, Alignment

NOBLITT-SPARKS INDUSTRIES, INC.

Trimmers
Sensitivity



SOCKET VOLTAGES

6K8: P-255; Gs-65; Po-70; K-2. 6K7: P-255; Gs-65; K-2. 6V6G: P-245; Gs-255; K-11.5
5Y3G: P-380AC; P-380AC; K-300. 6K7; P-255; Gs-65; K-5. 6Q7: P-115; K-2.
6V6G: P-245; Gs-255; K-11.5. 6U5: *P-255; T-255; K-0.

* Through 1 megohm resistor. Voltage Divider: A=1650; B=6310; C=4230; D=145; E=170.
Speaker Field = 600 ohms.

RESISTORS

Ref. No.	Part No.	Description	Price
R29	17-2060	50,000 ohm, 1/4 watt	.20
R7	17-2072	20,000 ohm, 1/4 watt	.20
R9	17-2080	1,000,000 ohm, 1/4 watt	.20
R11	17-4202	2,000 ohm, 1/4 watt	.20
R28	17-4205	1,500 ohm, 1/4 watt	.20
R68	17-4290	8,000 ohm, 1/4 watt	.20
R27	17-4788	2,000 ohm, 1/4 watt	.20
R37	17-14033	300 ohm, 1/4 watt	.20
R107	17-14172	100,000 ohm, 1/4 watt	.20
R112	17-14177	500 ohm, 1/4 watt	.20
R118	17-14183	300,000 ohm, 1/4 watt	.20
R144	17-14231	40,000 ohm, 1/4 watt	.20
R157	17-14251A	12,500 ohm tapped res.	1.50

CONDENSERS

Ref. No.	Part No.	Description	Price
C6	17-2063	.002 mfd. 600V	.25
C48	17-4207	.00025 mfd. 600V	.25
C5	17-14015	.05 mfd. 200V	.30
C12	17-14001	8 mfd. 475 V	.75
C29	17-14022	.005 mfd. 600 V	.35
C13	17-14046	.1 mfd. 300 V.	.35
C36	17-14054	Series Padder Condenser	.75
C156	17-4397	.05 mfd. 400 V.	.35
C94	17-14115	.1 mfd. 200 V.	.40
C98	17-14122	.000075 mfd. 600 V.	.30
C100	17-14124	8 mfd. 300 V.	.75
C101	17-14126	16 mfd. 300 V.	.90
C171	17-14238	.1 mfd. 400 V.	.40
C181 A&B	17-13260	4 mfd. 15V. 50 mfd. 25V.	1.25
C182	17-14261	.0002 mfd. 600 V.	.25
C184	17-14263	.03 mfd. 200 V.	.30
C185	17-14265	.03 mfd. 600 V.	.40
C59	17-14615	.01 mfd. 400 V.	.35
C1&2	17-15965	Tuning Condenser	4.50
C3&4	17-15967	Six section Push button condenser assembly	5.50

COILS & TRANSFORMERS

X1	00-15966	Input Choke (Audio)	2.20
T8	00-15972	Power Transformer	5.00
T7	17-16050	Output Transformer	2.00
T1	00-16078	Antenna Transformer	2.60
T3	00-16079	Oscillator Coil	2.75
T4	00-16080	1st I. F. Transformer	1.75
T5	00-16081	2nd I. F. Transformer	1.75
T6	00-16082	3rd I. F. Transformer	1.50

SPEAKER, DIAL PARTS, CABINET & MISCELLANEOUS

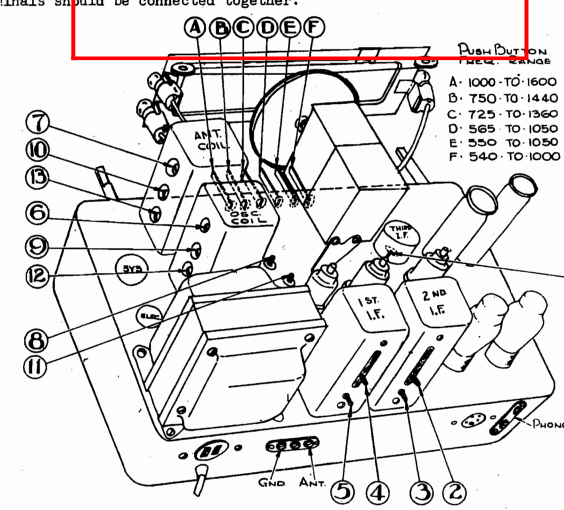
61-16017	Dial Glass (Broadcast)	.75	29-3167	Call letter sheets	.40
61-16018	Dial Glass (Mid Band)	.50	29-3189	Carton	1.50
61-16019	Dial Glass (Short Wave)	.50	29-3190	Instruction Sheet	.02
41-16030	Escutcheon (Tuning Eye)	.35	17-13249	Speaker Socket	.15
41-16051	Escutcheon (Dial)	1.75	29-13583	Dial Drive Cord, 38"	.25
41-16052	Escutcheon (Push Button)	.65	17-13761	110 V Outlet Socket	.65
29-16057	Knob (Push Button)	.10	17-13795	Volume Control	.75
29-16085	Dial Pointer	.20	17-13796	Tone Control	.75
17-16125	Speaker (12")	7.50	17-15731	Line Cord & Plug	.40
27-16126	Cabinet	50.00	17-15952	Band Switch	2.50
29-16127	Knob (Tuning, Volume, etc)	.15	17-16014	AC, Phono-Radio Switch	.90

BALANCING INSTRUCTIONS

(All sensitivities given for 1 watt output = 1.73 V. across voice coil)

Operation No.	Connect Sig. Generator To	Input Frequency	Adjust Padder No.	Dial Setting	Band Switch Position	Sensitivity (Minimum)
1	6K8 Grid	455 kc	1,2,3,4,& 5	600 kc	Broadcast	75 uv
*2	Antenna Term.	1400 kc	6	1400 kc	Broadcast	------
3	Antenna Term.	1400 kc	7	1400 kc	Broadcast	50 uv
**4	Antenna Term.	600 kc	8	600 kc	Broadcast	50 uv
5	Antenna Term.	5.0 mc	9	5.0 mc	Mid-Band	------
6	Antenna Term.	5.0 mc	10	5.0 mc	Mid-Band	75 uv
7	Antenna Term.	2 mc	11	2 mc	Mid-Band	75 uv
8	Antenna Term.	15 mc	12	15 mc	Short Wave	------
9	Antenna Term.	15 mc	13	15 mc	Short Wave	120 uv

* Dial pointer should line up with end of broadcast band dial calibration with tuning condenser fully closed.
** After balancing 600 kc padder, return and recheck the adjustments of padders 6 & 7.
* NOTE: Signal generator should ~~be connected to A & G terminals on rear of radio~~ chassis. D & G terminals should be connected together.

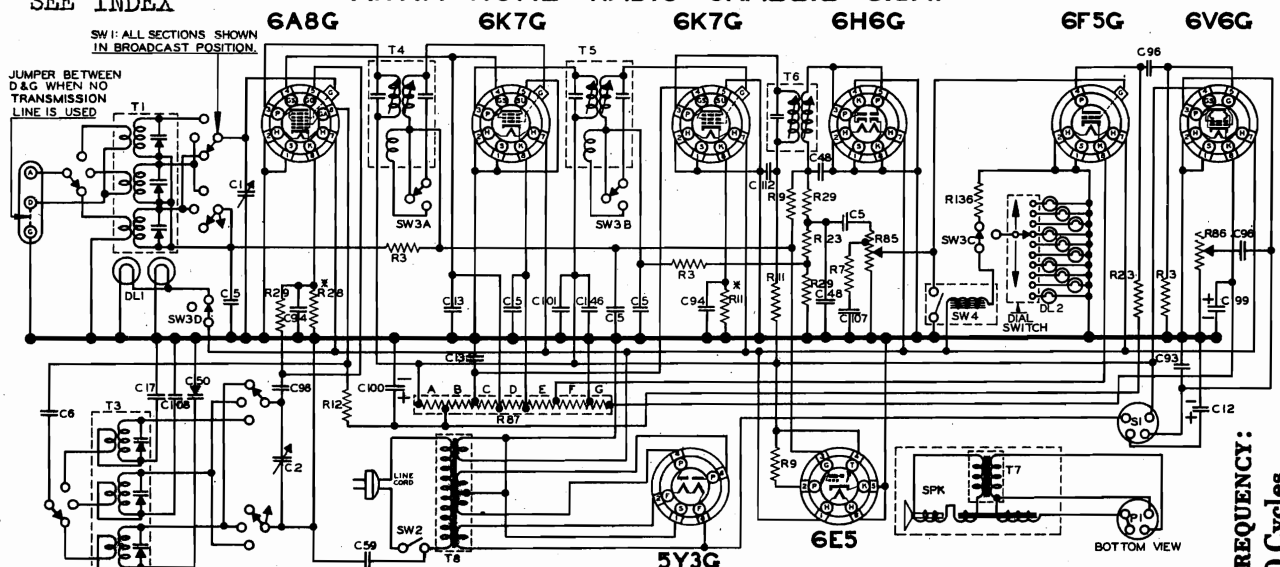


MODELS 828AT, 838AT
Chassis 818AT
Schematic, Voltage
Resistances

NOBLITT-SPARKS INDUSTRIES, INC.

FOR OTHER DATA
SEE INDEX

SCHEMATIC CIRCUIT DIAGRAM
ARVIN HOME RADIO CHASSIS 818AT



NOTE: R MAY BE VARIED FROM 400 TO 2000 OHMS TO CONTROL SENSITIVITY.

SW3 SHOWN IN MANUAL TUNING POSITION

NOTE
R87
A-1666 OHMS
B-4285 "
C-1860 "
D-3890 "
E- 225 "
F- 55 "
G- 240 "

RESISTORS

R	OHM	W	PART NO.	
3	100K	1/4	17-2066	
7	20K	1/2	17-2072	
9	1M	1/4	17-2080	
11	2K	1/4	17-4202	
12	10K	1/4	17-4275	
23	250K	1/4	17-3011	
28	1500	1/4	17-4205	
29	50K	1/4	17-2060	
85	500K	V.C.	17-13712	
86	100K	T.C.	17-13713	
87	TAPPED		17-14127	SEE NOTE
136	5	2	17-14207	

CONDENSERS

C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		17-14971
2	VARIABLE		
5	.05	200	17-14015
6	.002	600	17-2063
12	8 ELECT.	475	17-14001
13	.1	300	17-14046
17	.005 +15% -3%	600	17-14029
48	.00025	600	17-4207
50	.0006 MAX PAD		17-14070
59	.01	400	17-14015
93	.005	600	17-14114
94	.1	200	17-14115
96	.05	600	17-14121
98	.000075	600	17-14122
99	50 ELECT.	15	17-14123
100	8 ELECT.	300	17-14124
101	16 REG.	300	17-14126
107	.03	200	17-14133
108	.0013 ±2%	600	17-14134
112	.05	400	17-14139
146	.25	300	17-14206

TRANSFORMERS

T	TYPE	PART NO.
1	ANTENNA COIL	00-15730
2		
3	OSCILLATOR COIL	00-15731
4	FIRST I.F. TRANS.	00-15737
5	SECOND I.F. TRANS.	00-15738
6	THIRD I.F. TRANS.	00-15739
7	OUTPUT TRANS. 838AT	17-15735
7	OUTPUT TRANS. 828AT	17-13721
8	POWER TRANS.	00-13703

MISCELLANEOUS

SYMBOL	DESCRIPTION	PART NO.
SPK	12" SPEAKER FOR MODEL 838AT	17-15734
SPK	10" SPEAKER FOR MODEL 828AT	17-13720
S1	SPEAKER SOCKET	17-13249
P1	SPEAKER PLUG	SEE SPK
DL1	DIAL LIGHT	17-13804
DL2	DIAL LIGHT	17-15748
SW1	BAND SWITCH	17-13728
SW2	LINE SWITCH - SEE R86	17-13713
SW3	MANUAL-AUTOMATIC TUNING SWITCH	17-15745
SW4	RELAY	17-15747

I.F. PEAK 455 K.C.
3 BANDS
- BALANCE 15 M.C. PAD .60 M.C.
- BALANCE 4.7 M.C. CHECK 2.0 M.C.
- BALANCE 15.0 M.C. CHECK 6.0 M.C.

VOLTAGE AND FREQUENCY: 110 Volts, 60 Cycles

WATTS POWER CONSUMPTION: 75 Watts

POWER OUTPUT: 5 Watts

MODEL 838AT-828AT SOCKET VOLTAGES (Input Voltage 110 V. RMS)

Tube	Heaters	Plate	Screen	Cathode	Osc. Grid	Anode Grid	Suppressor Grid
6A8G	6.3	252	85	3.4	—5 to —20 V.	155	......
6K7G	6.3	252	85	5.8	......	......	0
6K7G	6.3	252	114	3.1	......	......	0
6H6G	6.3	......	......	0	......	......	......
6F5G	6.3	105	......	1.0	......	......	......
6V6G	6.3	240	252	10.8	......	......	......
5Y3G	5.0	365AC	......	325	......	......	......
6E5	6.3	150	......	0	......	......	‡

‡ AVC voltage developed approximately 30 volts with 100,000 microvolts input to antenna. Reading taken with a vacuum tube voltmeter.

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise stated. * Volume control in pull on position. All shell terminals grounded to chassis.

6A8G
- Heater .... 0 Ω
- Heater .... .05 Ω
- Cathode .... 1,500 Ω
- Oscillator Grid .... 51,500 Ω
- Anode Grid to B+ .... 11,666 Ω
- Screen to B+ .... 7,811 Ω
- Plate to B+ .... 12.0 Ω
- Control Grid .... 1,450,000 Ω

6K7G
- Heater .... 0 Ω
- Heater .... .05 Ω
- Cathode .... 280 Ω
- Suppressor .... 0 Ω
- Screen to B+ .... 7,811 Ω
- Plate to B+ .... 12.0 Ω
- Control Grid .... 1,350,000 Ω

6K7G
- Heater .... 0 Ω
- Heater .... .05 Ω
- Cathode .... 200,000 Ω
- Suppressor .... 0 Ω
- Screen to B+ .... 5,951 Ω
- Plate to B+ .... 2,000 Ω
- Control Grid .... 150,000 Ω

6H6G
- Heater .... 0 Ω
- Heater .... .05 Ω
- Cathode .... 0 Ω
- Plate .... 350,000 Ω
- Plate .... 350,000 Ω
- Cathode .... 0 Ω

6F5G
- Heater .... 0 Ω
- Heater .... .05 Ω
- Cathode .... 55 Ω
- *Control Grid .... 500,000 Ω
- Plate to B+ .... 250,000 Ω

6V6G
- Heater .... 0 Ω
- Heater .... .05 Ω
- Cathode .... 240 Ω
- Control Grid .... 100,000 Ω
- Screen Grid to B+ .... 0 Ω
- Plate to B+ .... 760 Ω
- Screen .... 12,200 Ω

6E5
- Heater .... 0 Ω
- Heater .... .05 Ω
- Cathode .... 0 Ω
- Control Grid .... 1,450,000 Ω
- Plate to B+ .... 1,000,000 Ω
- Target to B+ .... 0 Ω

5Y3G
- Filament to B+ .... 1,000 Ω
- Filament .... 12,000 Ω
- Plate .... 155 Ω
- Plate .... 145 Ω
- Plate to Plate .... 300 Ω

T7—Output Transformer (838AT)
- Primary .... 760 Ω
- Secondary .... .1 Ω

T8—Power Transformer
- 110 V. Primary .... 6.5 Ω
- 6 V. Secondary .... .05 Ω
- 5 V. Secondary .... .05 Ω
- Hi-Volt Secondary .. 155-0-145 Ω

*R87 tapped as follows: A—1,666; B—4,285; C—1,860; D—3,890; E—225; F—55; G—240.

COIL, TRANSFORMER AND SPEAKER RESISTANCES

T1—Antenna Coil
- Broadcast Primary .... 18.5 Ω
- Broadcast Secondary .... 3.5 Ω
- Mid-Band Primary .... .1 Ω
- Mid-Band Secondary .... .07 Ω
- Short-Wave Primary .... .05 Ω
- Short-Wave Secondary .... .02 Ω

T3—Oscillator Coil
- Broadcast Primary .... .15 Ω
- Broadcast Secondary .... .27 Ω
- Mid-Band Primary .... .08 Ω
- Mid-Band Secondary .... .06 Ω
- Short-Wave Primary .... .08 Ω
- Short-Wave Secondary .... .01 Ω

T4—1st I. F. Transformer
- Primary .... 12.0 Ω
- Secondary .... 12.0 Ω

T5—2nd I. F. Transformer
- Primary .... 12.0 Ω
- Secondary .... 12.0 Ω

T6—3rd I. F. Transformer
- Primary .... 64.0 Ω
- Secondary .... 64.0 Ω

T7—Output Transformer (828AT)
- Primary .... 760 Ω
- Secondary .... .1 Ω

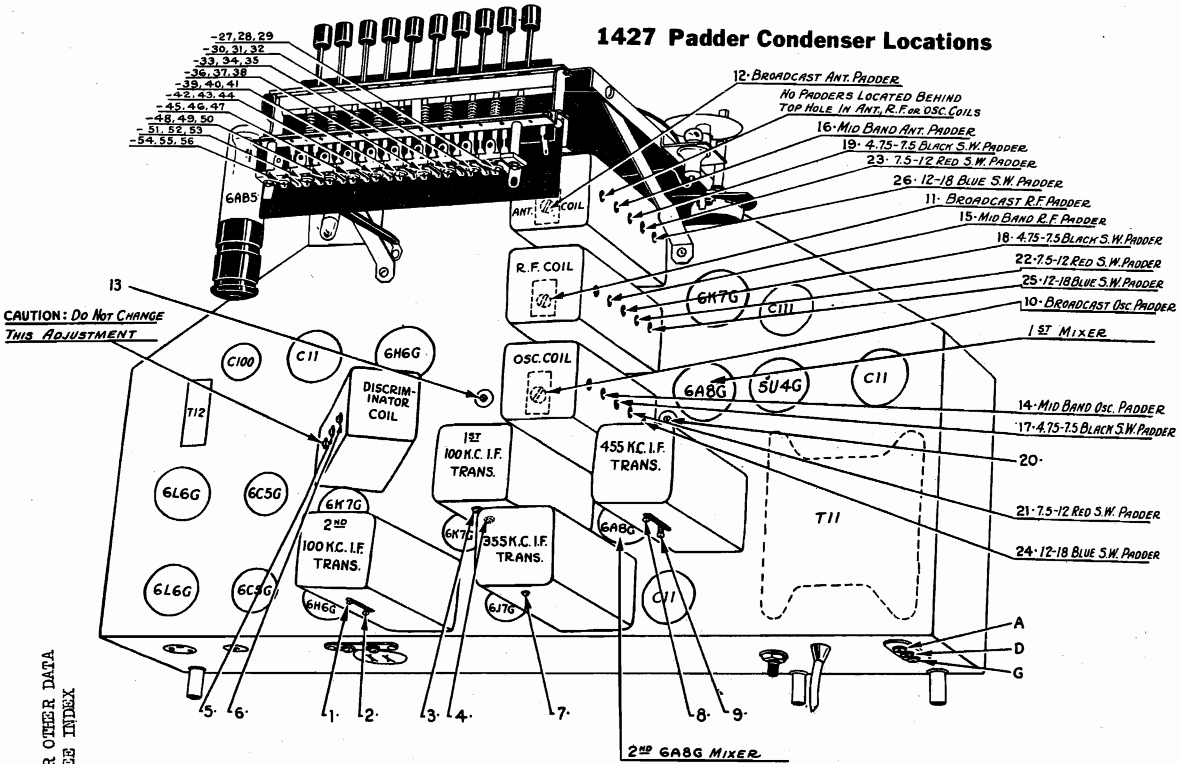
SPK—Speaker (828AT or 838AT)
- Field .... 1,000 Ω

MODEL 578B
Socket, Trimmers
Chassis

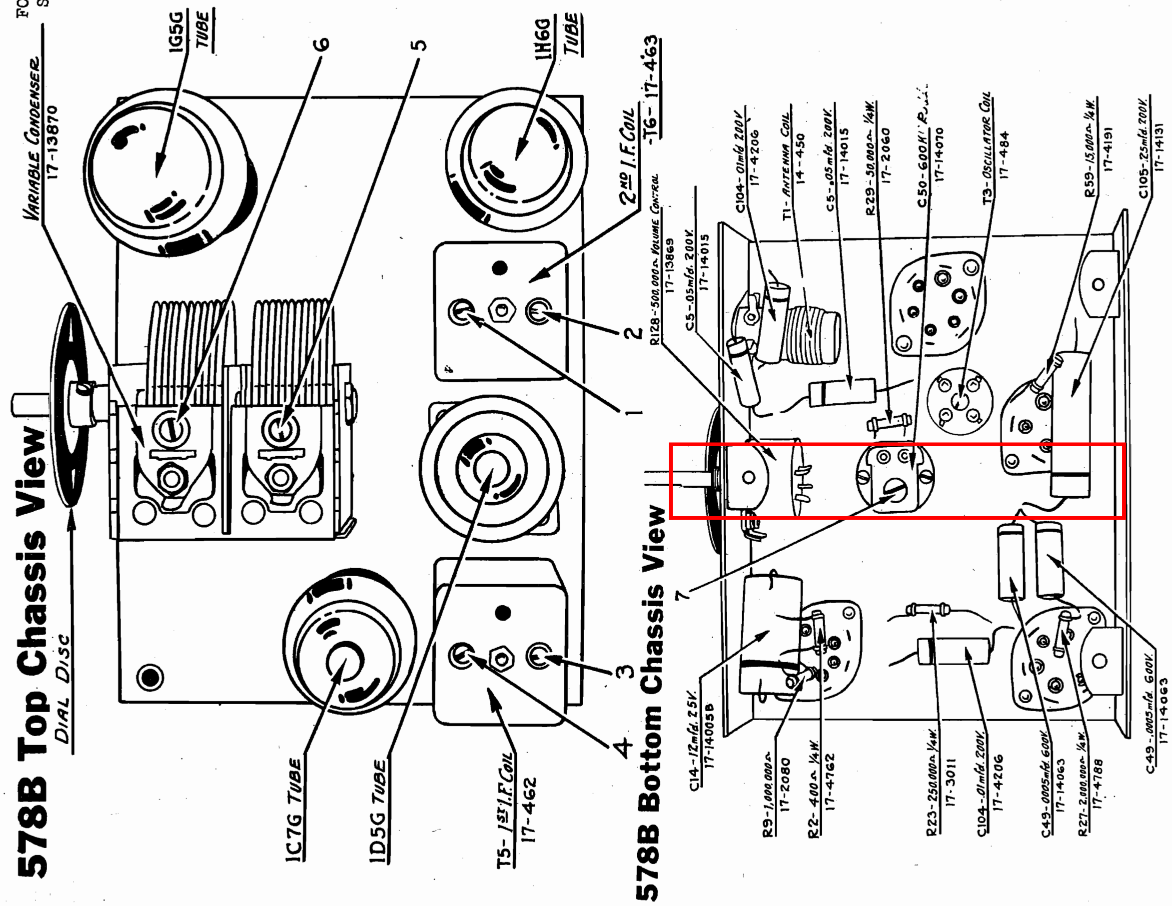
NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 1427, 1427D
Trimmers, Socket

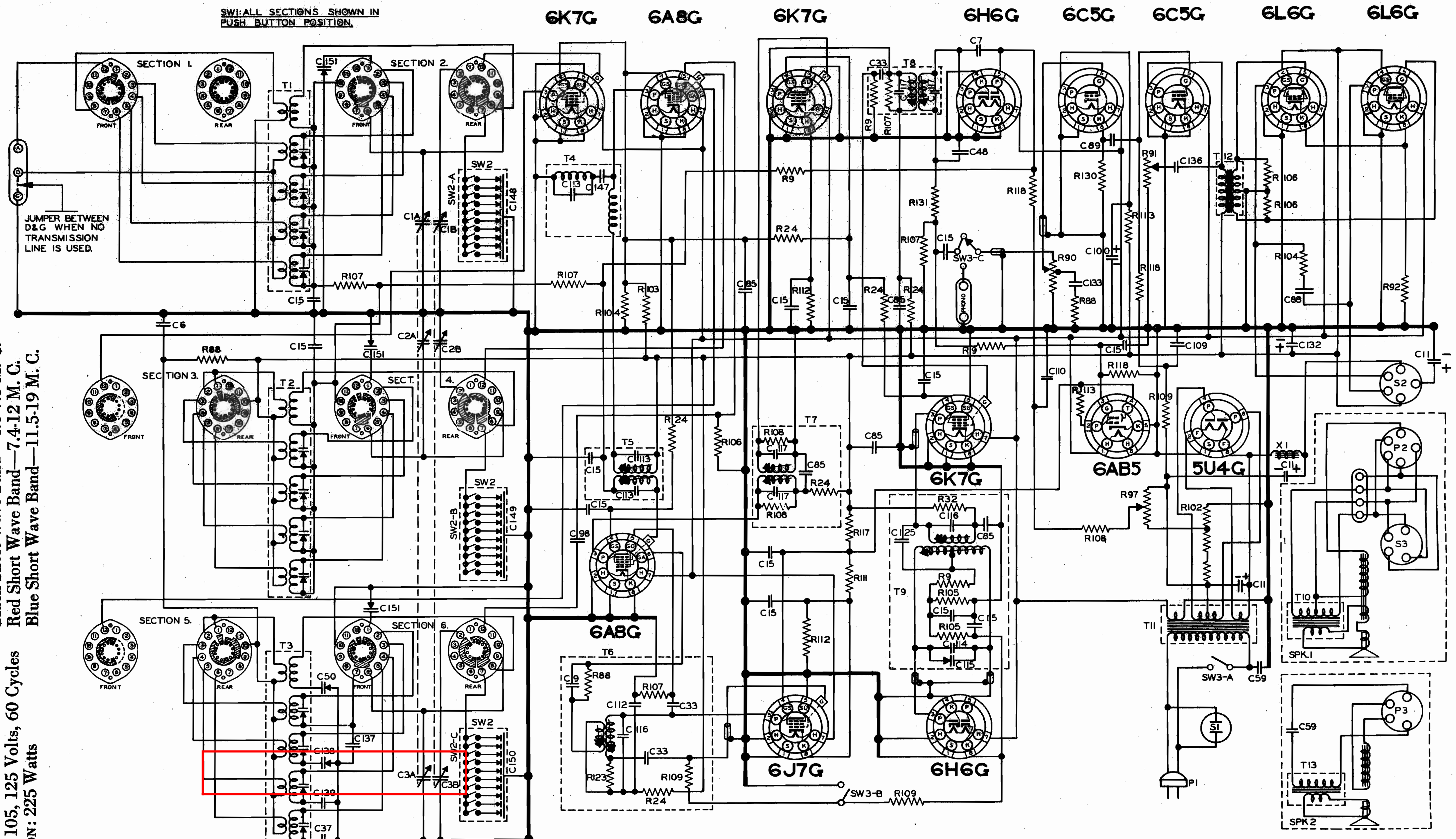
1427 Padder Condenser Locations



FOR OTHER DATA SEE INDEX



NOBLITT-SPARKS INDUSTRIES, INC.



Black Short Wave Band—4.6-7.5 M. C.
Red Short Wave Band—7.4-12 M. C.
Blue Short Wave Band—11.5-19 M. C.

Power Output: 30 Watts
Voltage and Frequency: 105, 125 Volts, 60 Cycles
Watts Power Consumption: 225 Watts

FREQUENCY RANGE:
Broadcast Band—540-1,600 K. C.
Mid Band—1,600-5,000 K. C.

SCHEMATIC CIRCUIT DIAGRAM
ARVIN HOME RADIO CHASSIS 1427 & 1427D

RESISTORS

R	OHM	W	PART NO.	R	OHM	W	PART NO.
9	1M	¼	17-2080	117	20K	1	17-14182
11	2K	¼	17-4202	118	300K	¼	17-14183
13	75K	¼	17-2067	123	100	¼	17-14188
24	1K	¼	17-2065	130	10K	⅓	17-14197
32	3K	¼	17-2090	131	30K	⅓	17-14198
88	18K	¼	17-14135				
90	500K	V.C.	17-13795				
91	100K	T.C.	17-13796				
92	150	2	17-14141				
97	900	VAR.	17-14157				
102	40-2W	TAP.	17-14163				
103	8K	10	17-14164				
104	10K	2	17-14165				
105	50K	¼	17-14169				
106	50K	¼	17-14171				
107	100K	¼	17-14172				
108	200K	¼	17-14173				
109	500K	¼	17-14174				
111	20K	½	17-14176				
112	500	¼	17-14177				
113	250K	¼	17-14178				

CONDENSERS

C	CAPACITY		VOLT	PART NO.	C	CAPACITY	VOLT	PART NO.
1A	LARGE	SECTION ONE	VARIABLE CONDENSER	17-15723	109	.25	200	17-14136
1B	SMALL				110	.1	200	17-14137
2A	LARGE	SECTION TWO			112	.05	400	17-14139
2B	SMALL				113	.0002	600	17-14143
3A	LARGE	SECTION THREE			114	.0003	600	17-14148
3B	SMALL				115	.00007	600	17-14149
6	.002		800	17-2063	116	.0005	600	17-14151
7	.0001		600	17-2064	117	.0004	600	17-14142
9	.001		600	17-4292	125	.00001	600	17-14166
11	16.		475	17-14002	132	30. REG.	300	17-14192
15	.05		200	17-14036	133	.03	200	17-14193
33	.00005		600	17-14047	136	.04	600	17-14196
37	.004		600	17-14053	137	.00115	600	17-14199
48	.00025		600	17-4207	138	PADDER	600	17-14200
50	PADDER		600	17-14070	139	.00155	600	17-14201
59	.01		400	17-14615	147	.0005	600	17-14215
85	.1		400	17-14101	148	STRIP OF 10 PADDERS		17-14209
88	.02		600	17-14105	149	STRIP OF 10 PADDERS		17-14210
89	.05		600	17-14106	150	STRIP OF 10 PADDERS		17-14211
98	.000075		800	17-14122	151	1.5-35 M.M.F.	PADDER	17-14216
100	8.0		300	17-14124				

TRANSFORMERS

T	TYPE	PART NO.
1	ALLWAVE ANT. COIL	00-13858
2	ALLWAVE R. F. COIL	00-13859
3	ALLWAVE OSC. COIL	00-13860
4	455 K.C. BAND PASS	00-13853
5	455 K.C. I.F. COIL	00-13779
6	355 K.C. OSC. COIL	00-13782
7	100 K.C. I.F. INPUT	00-13780
8	100 K.C. I.F. OUTPUT	00-13781
9	100 K.C. DISCRIMINATOR	00-13783
10	OUTPUT TRANS.	17-13788
11	POWER TRANS.	00-13786
12	INPUT TRANS	00-13852
13	OUTPUT TRANS.	17-14973

CHOKES

X	TYPE	PART NO.
1	"B" CHOKE	00-13861

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.
SW1	BAND SWITCH ASSEMBLY	17-13572
SW2ABC	PUSH BUTTON SWITCH (LESS PADDERS)	17-13561
SW2	PUSH BUTTON SWITCH ASSY. (WITH PADDERS)	29-13576
SW3	AC-AFC & PHONO "ON-OFF" SWITCH	17-13813
S1	AC RECEPTACLE	17-13761
S2	SPEAKER SOCKET	17-4153
S3	SPEAKER SOCKET (PART OF SPK.1)	SEE BELOW
P1	PLUG & LINE CORD ASSEMBLY	17-15791
P2	SPEAKER PLUG (PART OF SPK.1)	SEE BELOW
P3	SPEAKER PLUG (PART OF SPK2)	SEE BELOW
SPK 1	DYNAMIC SPEAKER 12"	17-13787
SPK 2	DYNAMIC SPEAKER 6"	17-13785

"A" BAND-.535 TO 1.600 M.C. - BALANCE AT 1.400 M.C.
CHECK AT 1.000 M.C. - PAD AT .600 M.C.
"B" BAND-1.575 TO 4.750 M.C. - BALANCE AT 4.2 M.C.
CHECK AT 3.0 M.C. - CHECK AT 1.8 M.C.
"C" BAND-4.725 TO 7.40 M.C. - BALANCE AT 7.0 M.C.
CHECK AT 6.0 M.C. - PAD AT 5.0 M.C.
"D" BAND-7.35 TO 11.6 M.C. - BALANCE AT 11.0 M.C.
CHECK AT 9.5 M.C. - CHECK AT 8.0 M.C.
"E" BAND-11.5 TO 18.2 M.C. - BALANCE AT 17.0 M.C.
CHECK AT 15.0 M.C. - CHECK AT 12.0 M.C.

FIRST I.F. PEAK 455 K.C.
SECOND I.F. PEAK 100 K.C.
SECOND OSCILLATOR 355 K.C.

MODEL 1427

SOCKET VOLTAGES

All readings taken to ground unless otherwise specified. Allow speaker to remain connected.

Tube	Heater	Plate	Screen	Cathode	Suppressor	‡ Grid	Anode Grid	Osc. Grid	Target
6K7G	6.3	250	95	0	0	3.6	......	......	......
6A8G	6.3	250	95	0	......	3.6	150	—17	......
6A8G	6.3	250	90	0	......	3.4	165	—4	......
6K7G	6.3	250	90	4.2	0	6.1	......	......	......
6K7G	6.3	250	90	0	0	.7	......	......	......
6J7G	6.3	250	90	4.5	0	5.5	......	......	......
6H6G	6.3	......	......	‡ .5	......	......	......	......	......
6H6G	6.3	......	......	0	......	......	......	......	......
6C5G	6.3	75	......	3.5	......	0	......	......	......
6C5G	6.3	250	......	0	......	3.4	......	......	......
6L6G	6.3	245	250	16	......	0	......	......	......
6L6G	6.3	245	250	16	......	0	......	......	......
5U4G	5.0	330	......	325	......	......	......	......	......
6AB5	6.3	*250	......	0	......	6.8	......	......	250

‡ Measured with a vacuum tube voltmeter.
* Through 1,000,000 Ω Resistor.

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Allow speaker to remain connected.

6K7G—R. F.

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Suppressor Grid	0 Ω
Screen Grid to B+	8.000 Ω
Control Grid	1,700,000 Ω
Plate to B+	3.6 Ω

6A8G—First Mixer

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Oscillator Grid	50,000 Ω
Oscillator Anode to B+	18.000 Ω
Screen to B+	8,000 Ω
Plate to B+	106 Ω
Control Grid	1,600,000 Ω

6A8G—Second Mixer

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Oscillator Grid	100,000 Ω
Oscillator Anode to B+	19,000 Ω
Screen to B+	9,000 Ω
Control Grid	1,500,000 Ω

6J7G—Controlled Oscillator

Heater	0 Ω
Heater	.05 Ω
Cathode	500 Ω
Suppressor Grid	0 Ω
Screen Grid to B+	20,000 Ω
Plate to B+	1.100 Ω
Control Grid	1,100,000 Ω

6C5—First Audio

Heater	0 Ω
Heater	.05 Ω
Cathode	10.000 Ω
*Control Grid	500,000 Ω
Plate to B+	250,000 Ω

* Volume control pull on position.

6K7G—I. F. Amplifier

Heater	.0 Ω
Heater	.05 Ω
Cathode	500 Ω
Suppressor Grid	0 Ω
Screen Grid to B+	9,000 Ω
Plate to B+	1,000 Ω
Control Grid	31.5 Ω

6AB5—Electric Eye

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Target to B+	0 Ω
Grid	1,100.000 Ω
Plate to B+	300.000 Ω

6K7G—A. F. C. Amplifier

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Suppressor Grid	0 Ω
Screen Grid to B+	10,000 Ω
Plate to B+	3,000 Ω
Control Grid	1,000,000 Ω

6HG6—Detector A. V. C.

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Diode Plate	130,000 Ω
Diode Plate	500,000 Ω
Cathode	0 Ω

5U4G

Filament to B+	1,700 Ω
Filament to Ground	19,700 Ω
Plate	90 Ω
Plate	95 Ω
Plate to Plate	185 Ω

6H6G—A. F. C. Bias Rectifier

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Plate	1,050,000 Ω
Cathode	1,000.000 Ω
Plate	1,050,000 Ω
Plate to Plate	36.5 Ω

6C5—Second Audio

Heater	0 Ω
Heater	.05 Ω
Cathode	0 Ω
Control Grid	800,000 Ω
Plate to B+	2,000 Ω

6L6G—Power Output Transformer

Heater	0 Ω
Heater	.05 Ω
Cathode	150 Ω
Screen Grid to B+	0 Ω
Plate to B+	190 Ω
Control to Grid	2,200 Ω

6L6G—Power Output

Heater	0 Ω
Heater	.05 Ω
Cathode	150 Ω
Screen Grid to B+	0 Ω
Plate to B+	220 Ω
Control Grid	2,000 Ω

COIL, TRANSFORMER AND SPEAKER RESISTANCES

T1—Antenna Coil

B. C. Primary	19.0 Ω
B. C. Secondary	3.6 Ω
Mid-Band Pri.	.6 Ω
Mid-Band Sec.	.17 Ω
Black S. W. Band Pri.	.5 Ω
Black S. W. Band Sec.	.2 Ω
Red S. W. Band Pri.	.3 Ω
Red S. W. Band Sec.	.02 Ω
Blue S. W. Band Pri.	.35 Ω
Blue S. W. Band Sec.	.015 Ω

T2—R. F. Coil

B. C. Primary	2.7 Ω
B. C. Secondary	3.6 Ω
Mid-Band Pri.	.4 Ω
Mid-Band Sec.	.2 Ω
Black S. W. Band Pri.	.4 Ω
Black S. W. Band Sec.	.2 Ω
Red S. W. Band Pri.	.3 Ω
Red S. W. Band Sec.	.2 Ω
Blue S. W. Band Pri.	.2 Ω
Blue S. W. Band Sec.	.2 Ω

T3—Oscillator Coil

B. C. Primary	1.9 Ω
B. C. Secondary	.4 Ω
Mid-Band Pri.	.17 Ω
Mid-Band Sec.	.23 Ω
Black S. W. Band Pri.	.05 Ω
Black S. W. Band Sec.	.05 Ω
Red S. W. Band Pri.	.035 Ω
Red S. W. Band Sec.	.03 Ω
Blue S. W. Band Pri.	.02 Ω
Blue S. W. Band Sec.	.015 Ω

T4—455 K. C. Band Pass Filter

Shunt Coil	14.5 Ω
Plate Coil	100 Ω

T5—455 K. C. I. F. Trans.

Primary	6.4 Ω
Secondary	6.4 Ω

T6—355 K. C. Osc. Coil

Primary	20,000 Ω
Secondary	1,100 Ω

T7—100 K. C. First I. F. Trans.

Primary	1.000 Ω
Secondary	31.5 Ω

T8—100 K. C. Second I. F. Trans.

Primary	31.5 Ω
Secondary	31.5 Ω

T9—100 K. C. Discriminator Coil

Primary	3,000 Ω
Secondary (Tapped)	36.5 Ω

T10—Output Trans. 12" Spk.

Primary	550 Ω
Secondary	.4 Ω

T11—Power Transformer

110 Volt Primary	2.0 Ω
Hi-Volt Secondary	90-0-95 Ω
5 Volt Secondary	.04 Ω
6 Volt Secondary	.05 Ω

T12—Audio Input Transformer

Primary	2,000 Ω
Secondary	2,000-0-2,200 Ω

T13—Output Trans. 6" Spk.

Primary	1,200 Ω
Secondary	.6 Ω

X-1—B Filter Choke

X-1 B Filter Choke	1,000 Ω

Spk—1 12" Speaker

Speaker Voice Coil	8 Ω-400 cycles
Speaker Field	235 Ω

Spk—2 6" Speaker

Speaker Voice	4 Ω-400 cycles
Speaker Field	550 Ω

Coils Listed Below Contain Other Circuit Parts Not Shown on Chassis Plan Views.

T4—455 K. C. Band Pass Filter
(Contains the Following Parts)

1-C113	.0002 mfd. 600 V.	17-14143
1-C147	.0005 mfd. 600 V.	17-14215

T5—455 K. C. I. F. Trans. 00-13779
(Contains the Following Parts)

2-C113	.0002 mfd. 600 V.	17-14143
2-C15	.05 mfd. 200 V.	17-14036

T6—355 K. C. Osc. Coil 00-13782
(Contains the Following Parts)

1-R24	1,000 Ω ¼ w.	17-2065
1-R123	100 Ω ¼ w.	17-14188
1-R109	500,000 Ω ¼ w.	17-14174
2-C33	.00005 mfd. 600 V.	17-14047
1-C116	.0005 mfd. 600 V.	17-14151
1-C112	.05 mfd. 400 V.	17-14139
1-R107	100.000 Ω ¼ w.	17-14172
1-C9	.001 mfd. 600 V.	17-4292
1-R88	18,000 Ω ¼ w.	17-14135

T7—100 K. C. Input Trans. 00-13780
(Contains the Following Parts)

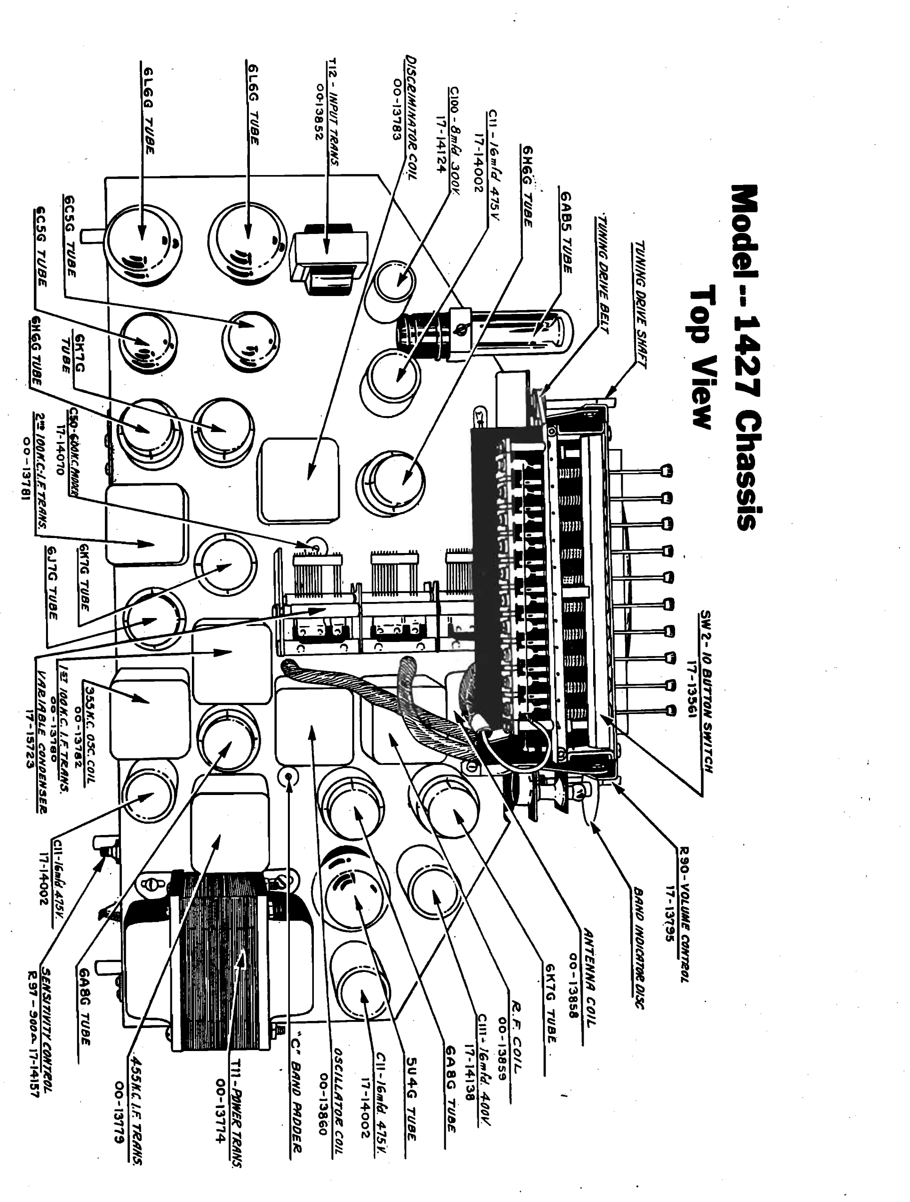
2-R108	2,000.000 Ω ¼ w.	17-14173
2-C117	.0004 mfd. 600 V.	17-14142
1-C85	.1 mfd. 400 V.	17-14101
1-R24	1,000 Ω ¼ w.	17-2065

T8—100 K. C. I. F. Output Trans. 00-13781
(Contains the Following Parts)

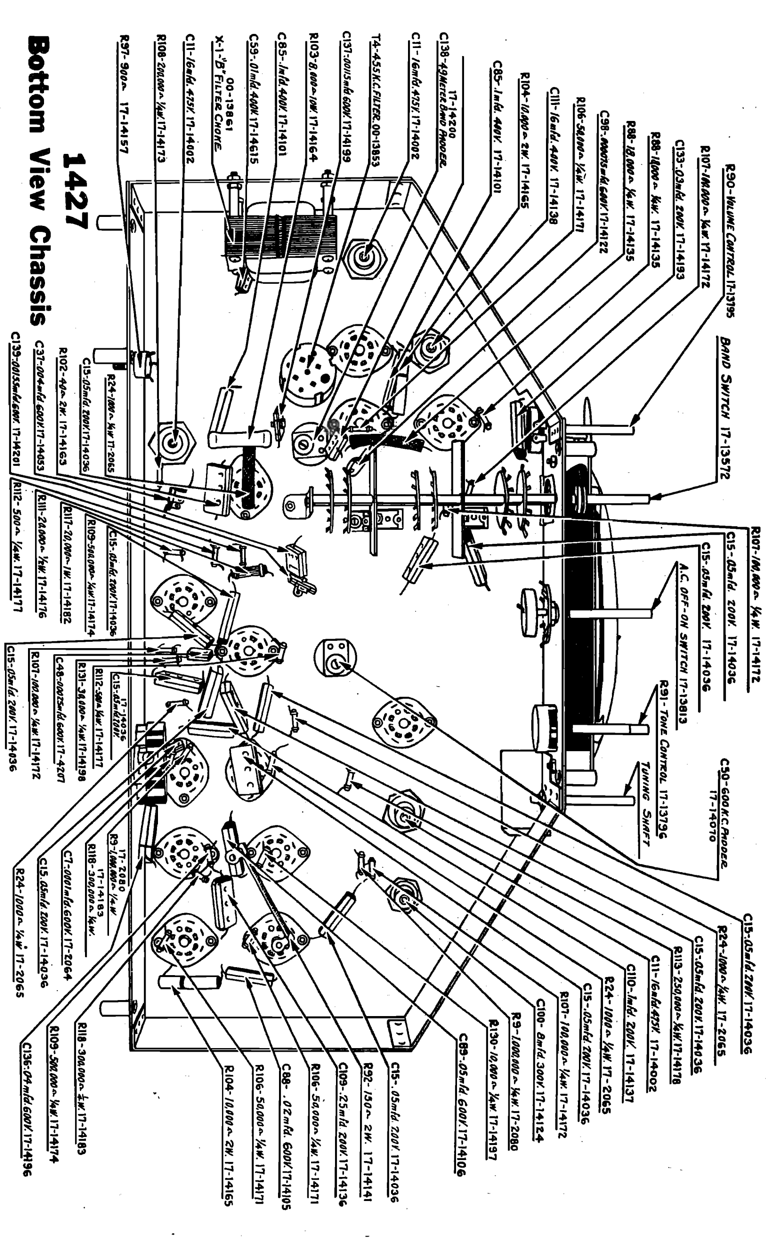
2-C117	.0004 mfd. 600 V.	17-14142
1-R9	1.000 000 Ω ¼ w.	17-2080
1-R107	100,000 Ω ¼ w.	17-14172

T9—100 K. C. Discriminator Coil 00-13783
(Contains the Following Parts)

1-C115	.00007 mfd. 600 V.	17-14149
1-C114	.0003 mfd. 600 V.	17-14148
2-R105	50.000 Ω ¼ w.	17-14169
2-C15	.05 mfd. 200 V.	17-14036
1-R9	1.000,000 Ω ¼ w.	17-2080
1-C85	.1 mfd. 400 V.	17-14101
1-C125	.00001 mfd. 600 V.	17-14166
1-C116	.0005 mfd. 600 V.	17-14151
1-R32	3 000 Ω ¼ w.	17-2090



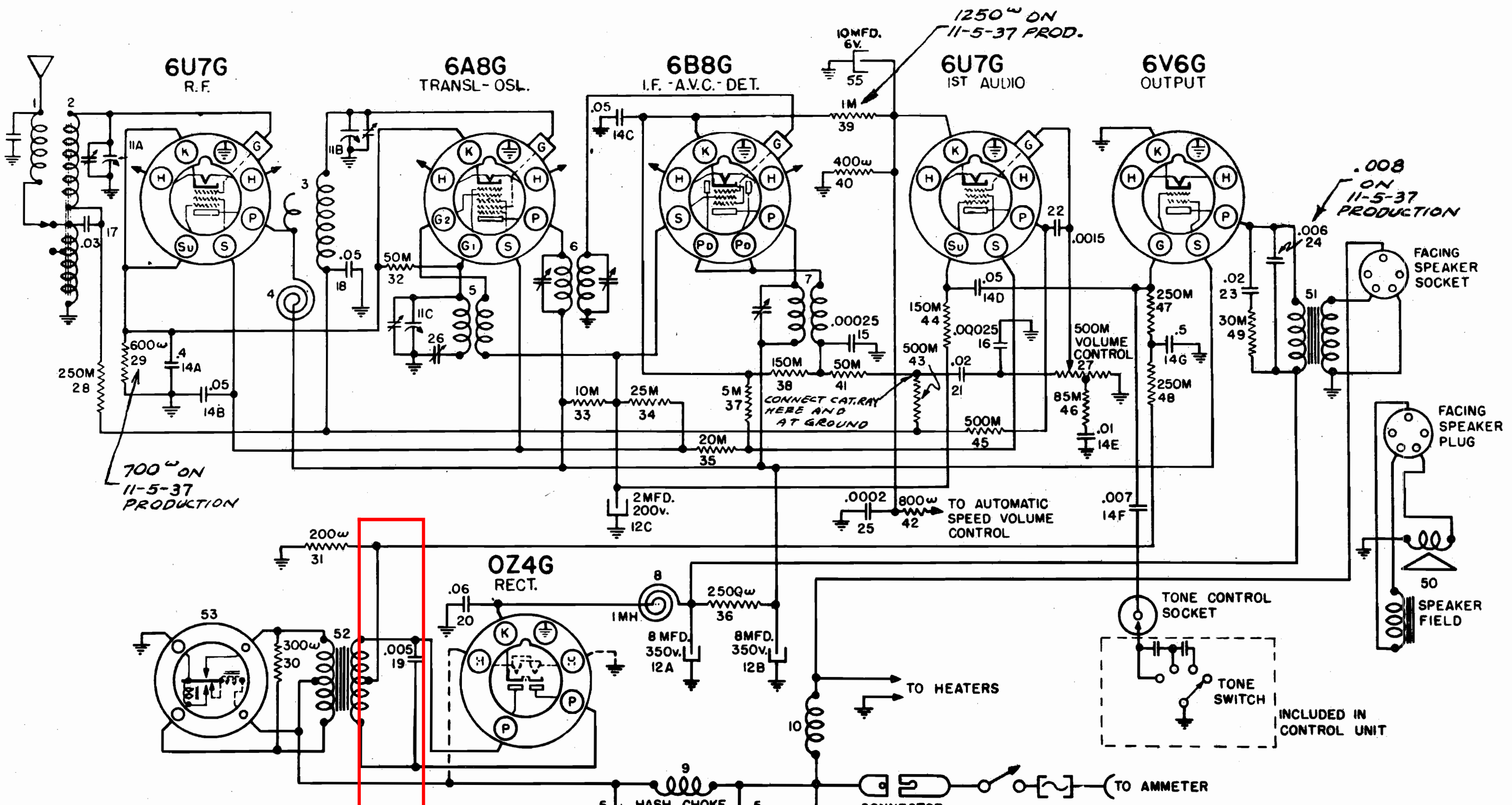
Model -- 1427 Chassis Top View



1427 Bottom View Chassis

MODEL 982083
Early, Late
Schematic

OLDSMOBILE DIV.—GEN. MOTORS



FOR ALIGNMENT AND CONVERSION
CONTROL UNIT, SEE INDEX

IF PEAK 262 KC

FIG. 1 MODEL 982083 - CIRCUIT DIAGRAM

The Oldsmobile Model 982083 is a six tube single unit receiver with variable tone control. This receiver was designed specifically for 1938 Model Oldsmobiles and is equipped with an instrument panel tuning control having a variable tone control in addition to the tuning and volume controls.

MODEL 982083
Early, Late
Socket, Trimmers
Chassis
Condenser Schematic

OLDSMOBILE DIV.—GEN. MOTORS

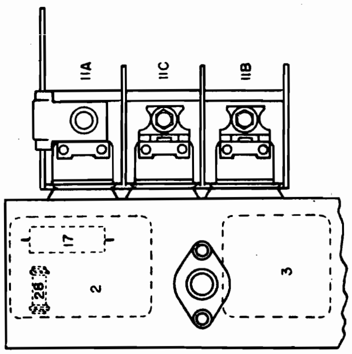


FIG. 3 GANG CONDENSER

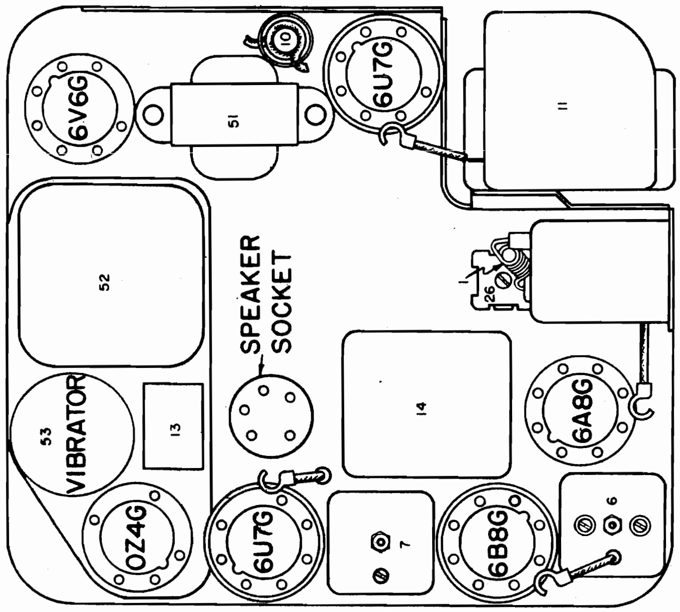


FIG. 2 PARTS LAYOUT - TOP VIEW

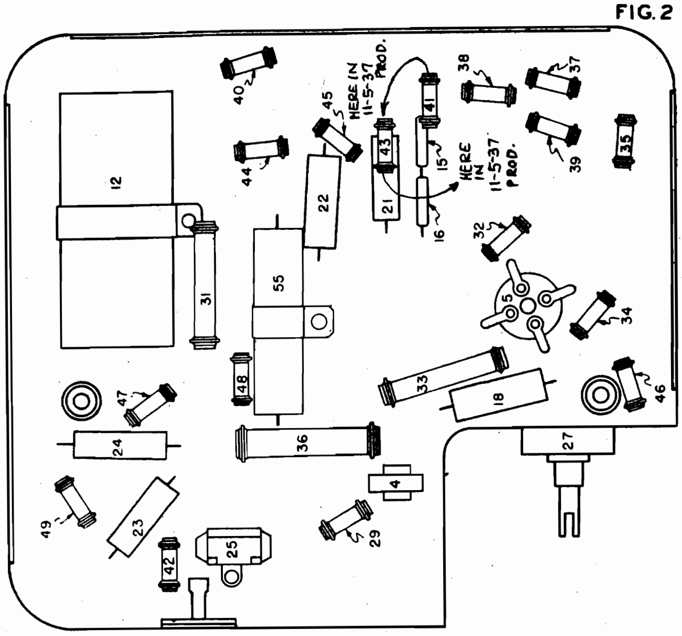


FIG. 4 PARTS LAYOUT-BOTTOM VIEW

SCHEMATIC - BY PASS CONDENSER

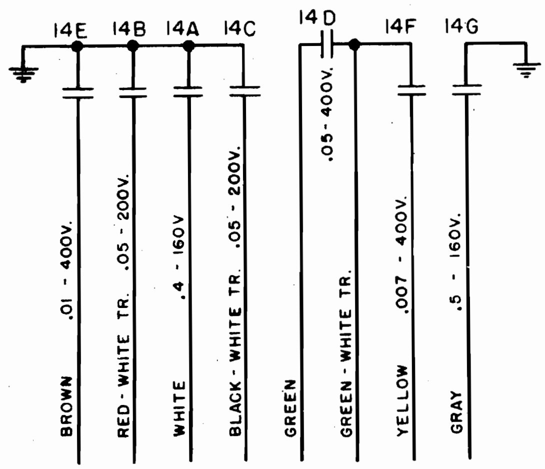


FIG. 6

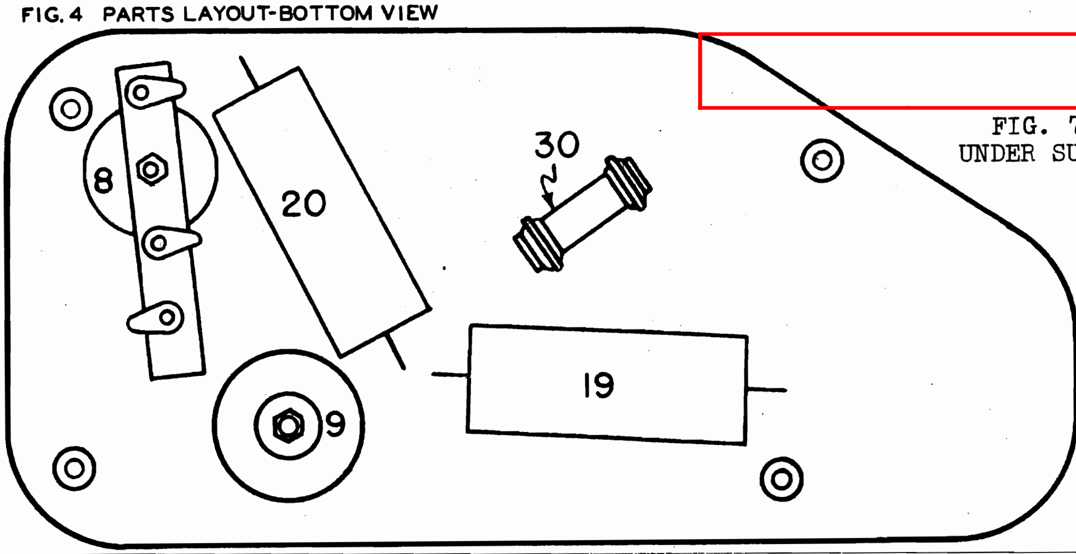
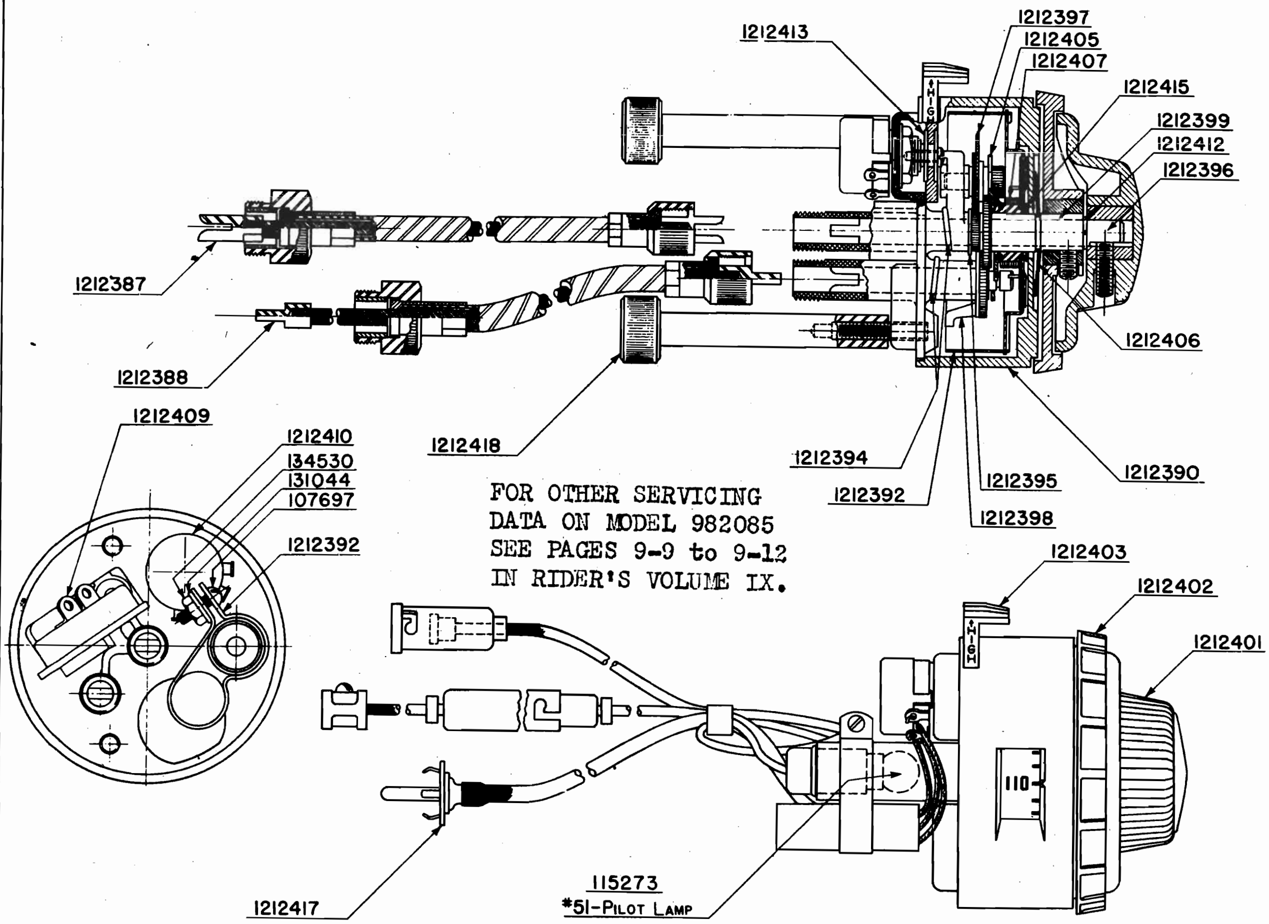


FIG. 7 PARTS UNDER SUB. PANEL

Remote Cont.Head
Details,Parts

OLDSMOBILE DIV.—GEN. MOTORS

MODEL 982083
MODEL 982085



FOR OTHER SERVICING
DATA ON MODEL 982085
SEE PAGES 9-9 to 9-12
IN RIDER'S VOLUME IX.

FIG. 8 REMOTE CONTROL HEAD

409976	Control Unit Complete .	Standard ....
1212484	Base	Control Assembly ....
1212387	Cable Assembly Flexible	Station Selector ....
1212388	Cable Assembly Flexible	Volume Control ....
1212392	Clamp	Lead ....
1212393	Clip	Shaft Retaining ....
1212394	Clutch Dial Assembly ..	....
1212397	Gear and Shaft Assembly	Idler Driving and Dial Drive ....
1212396	Gear and Shaft	Dial Drive (Driving Pinion) ....
1212398	Gear and Shaft	Off-On Volume (Driving) ....
1212399	Gear and Shaft	Off-On Volume (Driven) ....
1212401	Knob	Station Selector
1212402	Knob	Off-On and Volume Control ....
1212403	Knob	Tone Control ....
115275	Lamp No. 51 Miniature Bayonet Base	Pilot Light ....
134530	Nut 6/32	Lead Clamp Mtg. ....
1212405	Plate	Gear Retaining ....
1212482	Screw 4/36 x 3/16	Binder Head ....
107697	Screw 6/32 x 3/8 R.H. .	Lead Clamp Mtg. ....
1212406	Spring	Case Retaining ....
1212407	Spring	Dial Tension ....
1212418	Stud	Control Unit Mtg. ....
1212409	Switch	Off-On ....
1212410	Switch	Tone Control 4 Positions ....
1212413	Washer	Knob Retaining ....
1212414	Washer	Off-On and Volume Shaft Retaining ...
131044	Washer Lock	Lead Clamp Mtg. ....
1212395	Washer Plain	Pinion Gear and Shaft Mtg.
1212415	Washer Plain	Dial Drive Bushing Mtg. ..
1212417	Cable and Plug Assy ..	Tone Control
1212390	Case Control Unit	Escutcheon ..
1212480	Condenser Dual	Tone Control
121841	Washer	No. 8 Lock ..

MODEL 982083
MODEL 982084
"Hash" Elimination
Changes, Notes

OLDSMOBILE DIV.—GEN. MOTORS

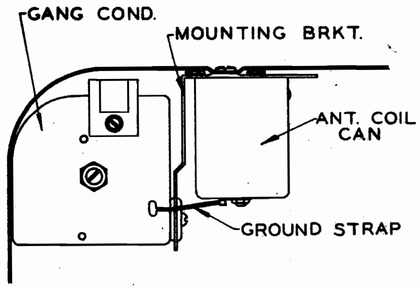


FIG. 1
BEFORE

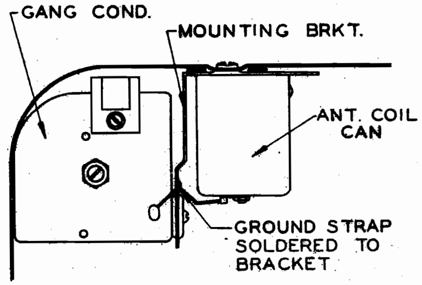


FIG. 2
AFTER

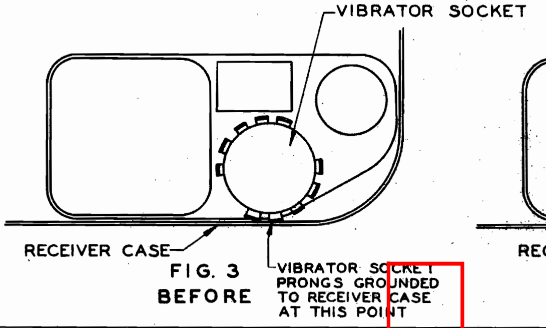


FIG. 3
BEFORE

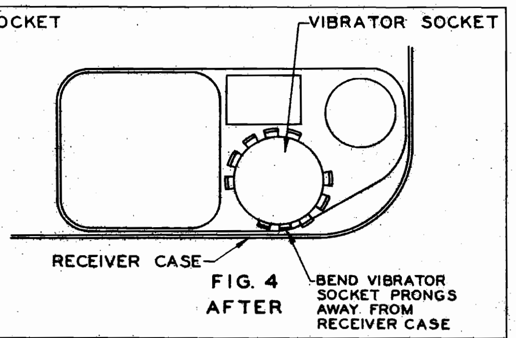


FIG. 4
AFTER

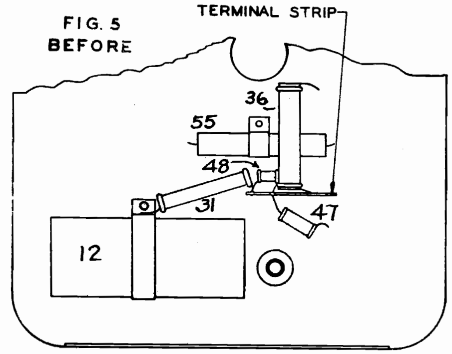


FIG. 5
BEFORE

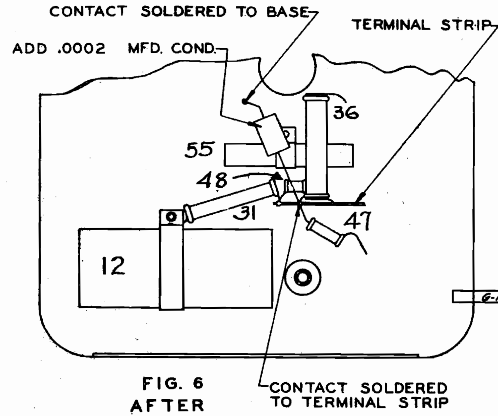


FIG. 6
AFTER

SUBJECT--VIBRATOR "HASH" NOISE

Caution: Only radios that have a vibrator hash noise should have this correction made. If there is no hash noise and these changes are made to prevent hash development, it will only tend toward driving hash noise into the radio.

CORRECTION

The following procedure to correct vibrator hash is:

Deluxe Model - 982084 ONLY

1. The Bond that grounds the Gang Condenser to the Antenna Coil can should be held against the Gang Condenser bracket and soldered. This is shown in Figure 1 before change, and Figure 2 after change.

2. Vibrator prongs may be contacting the receiver case as shown in Figure 3. Bend vibrator prongs away from receiver case as shown in Figure 4.

3. Tighten power supply mounting nuts.

Standard Model - 982083 ONLY

1. Ground the Gang Condenser can as shown in Figure 2.

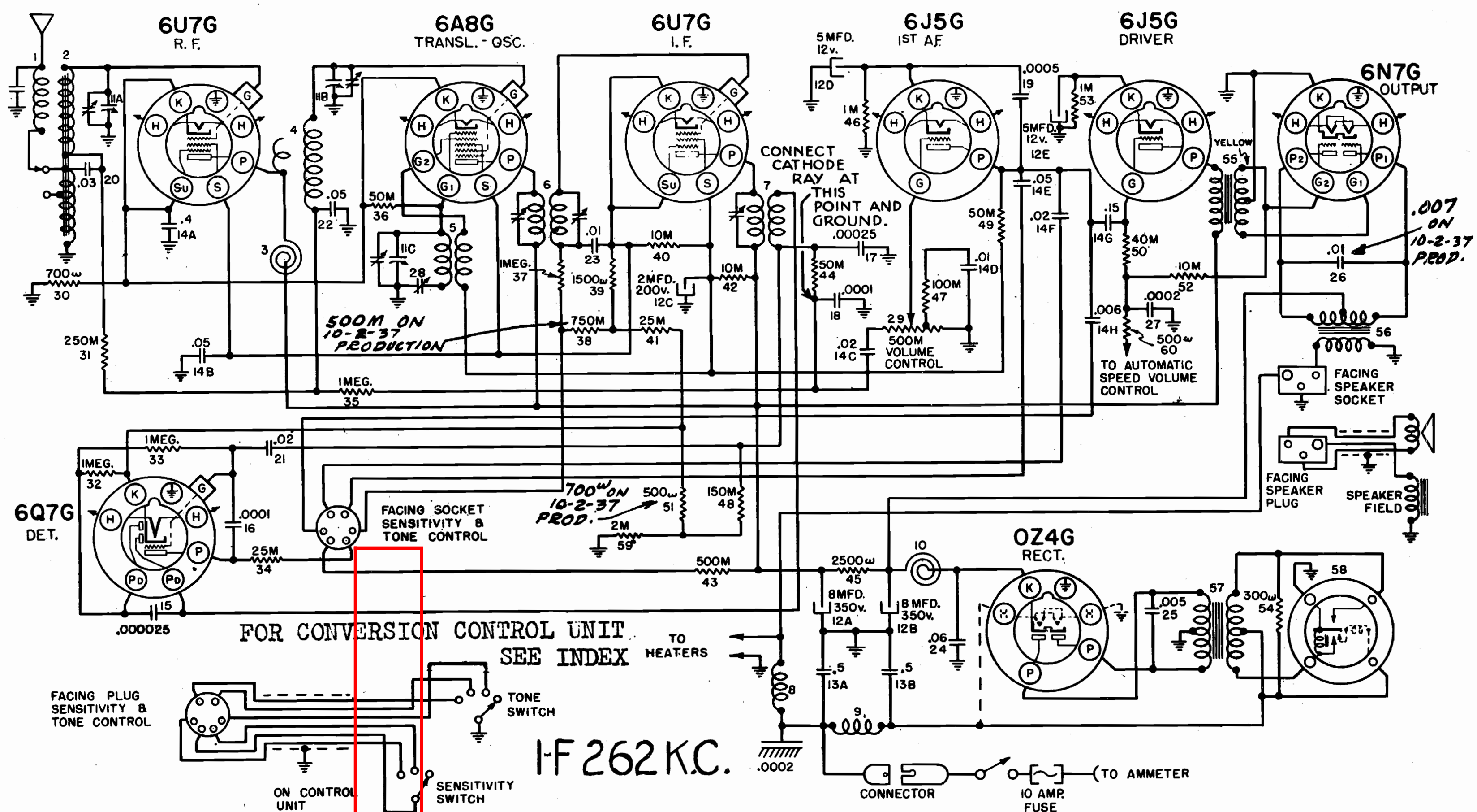
2. Bend vibrator prongs away from receiver case as shown in Figure 4.

3. Tighten power supply mounting nuts.

4. Remove the receiver from the car and add a .0002 MFD condenser from the small terminal strip to ground. Solder one end of condenser to the same terminal that the two small resistors are soldered to and solder the other end of the condenser to the chassis ground, as shown in Figure 6.

MODEL 982084
Early, Late
Schematic, Notes

OLDSMOBILE DIV.—GEN. MOTORS



The Oldsmobile Model 982084 is an eight tube Dash Speaker DeLuxe Receiver, with tone and sensitivity controls. This receiver was designed specifically for 1938 Oldsmobiles and is equipped with an instrument panel tuning control having a sensitivity switch and variable tone control in addition to the tuning and volume controls.

The antenna circuit is directly coupled to the antenna in contrast with the capacity coupled circuit used in some previous Oldsmobile Models. A small adjustable condenser is provided for adjusting the antenna circuit to the antenna. This adjustment is made near the high frequency end of the band (1400 K.C.) instead of at the low frequency end as with the capacity coupled sets. There are two taps provided on the Antenna Coil. One for use with the Running Boards Antenna and the other for use with overhead (Roof) type Antennas.

MODEL 982084
Early, Late

OLDSMOBILE DIV.—GEN. MOTORS

Socket, Trimmers
Chassis

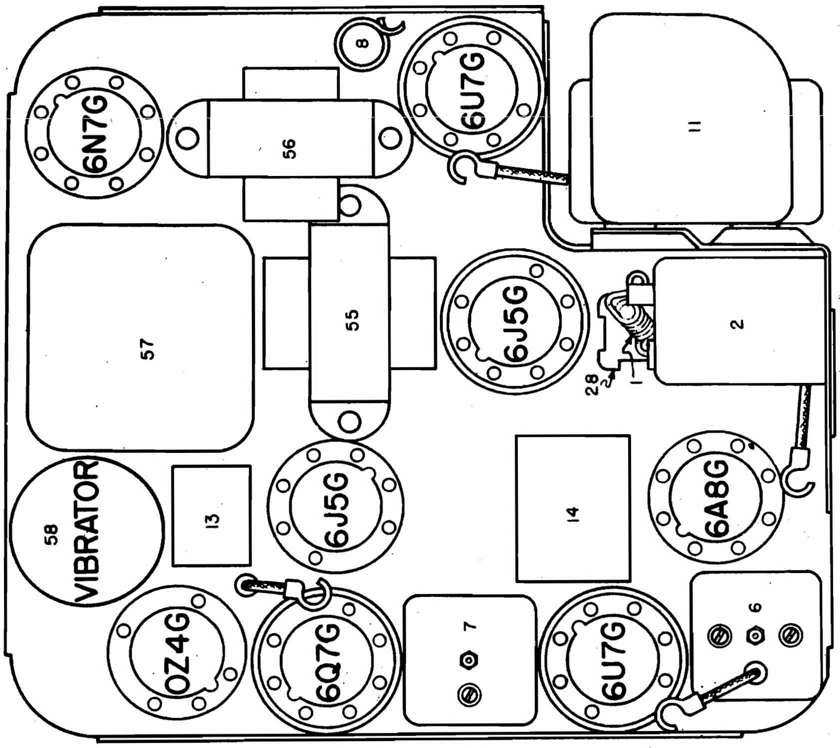


FIG. 2 PARTS LAYOUT-TOP VIEW

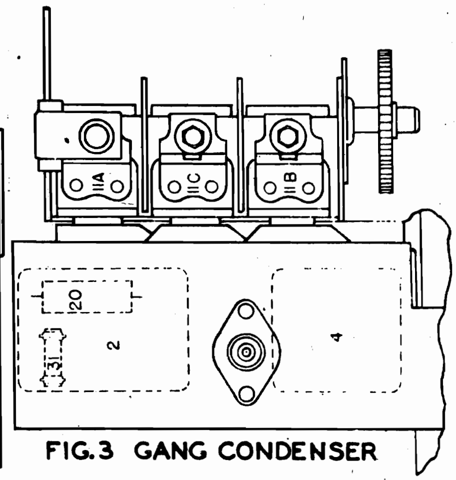


FIG. 3 GANG CONDENSER

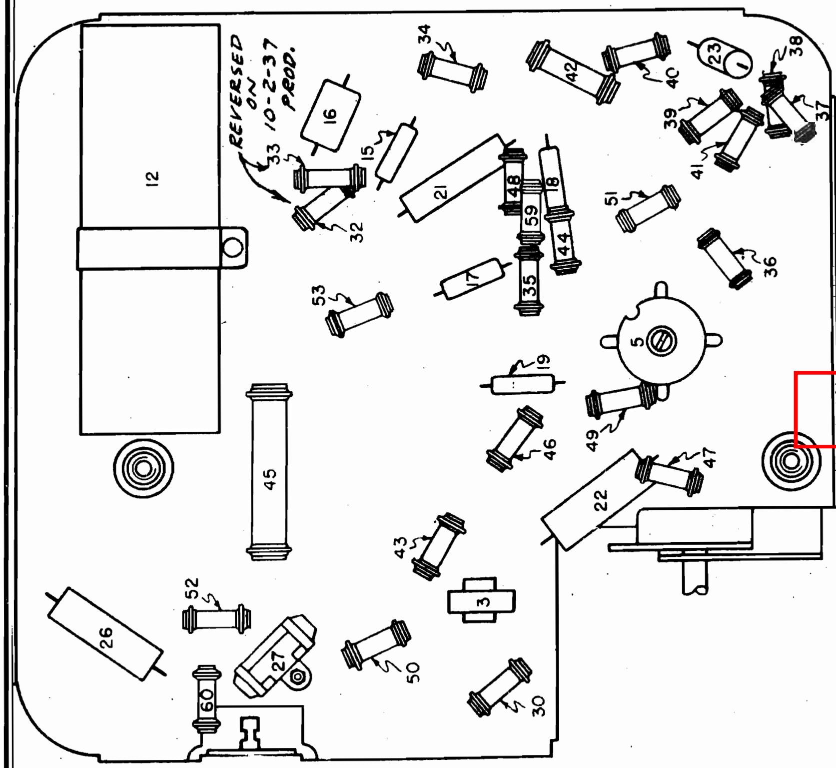


FIG. 4 PARTS LAYOUT-BOTTOM VIEW

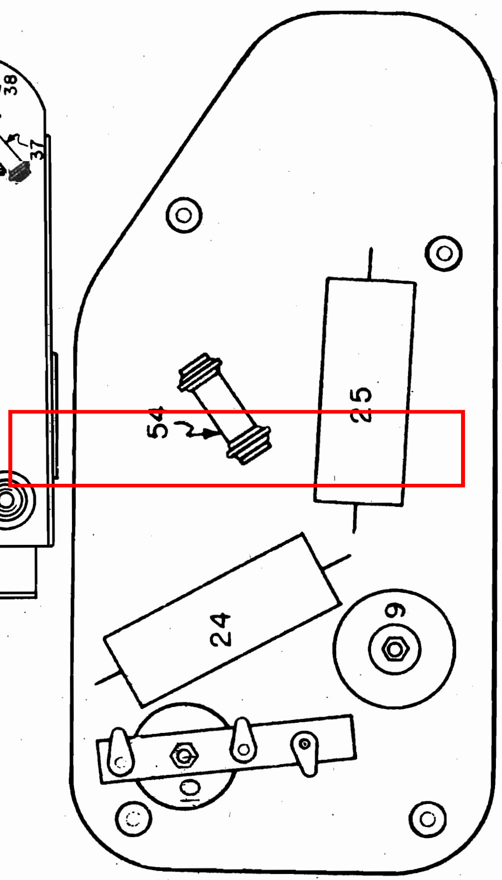


FIG. 2-3-4 PARTS LAYOUT

FIG. 7 PARTS UNDER SUB. PANEL

OLDSMOBILE DIV.—GEN. MOTORS

MODEL 982084
Early, Late
Alignment, Voltage

1. Aligning I-F Stages at 262 Kilocycles:

IMPORTANT: The sensitivity switch on the tuning control should be in the "Distance" position when aligning the receiver, or the cable from the control unit to the receiver disconnected.

a. Connect the signal lead of the test oscillator to the grid cap of the 6A8G Tube through a .1 mfd. condenser, leaving the tube's grid clip in place.

b. Connect the ground lead of the test oscillator to the chassis frame.

c. Connect the output meter across the plate prongs of the output tube. Care should be taken when connecting the output meter to insert a series condenser to protect the meter from D.C. Voltages.

d. Set the test oscillator to exactly 262 K.C.

e. Adjust the trimmers on the I-F coils (Illustration 6 and 7, Figure 2) for maximum output. These adjustments should be repeated several times and during alignment, the test oscillator output should be kept to as low a value as is consistant with obtaining a readable indication on the output meter.

2. Aligning at 1520 Kilocycles:

a. Leave the test oscillator leads connected the same as for aligning the I-F circuits.

b. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.

c. Set the test oscillator to 1520 Kilocycles.

d. Adjust the parallel trimmer for the oscillator section of the condenser gang (Illustration 11C, Figure 3) for maximum output. (It is very important that this frequency be set accurately as a slight mis-setting will cause the receiver to be out of track over the entire high frequency end of the dial.)

3. Aligning at 540 Kilocycles:

a. Leave test oscillator leads connected the same as before.

b. Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.

c. Set the test oscillator to 540 K.C.

d. Adjust the oscillator padding condenser (Illustration 28, Figure 2) located on the mounting plate of the receiver to maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

4. Aligning at 1400 Kilocycles:

a. Remove the signal lead of the test oscillator from the grid of the Translator tube and connect to the antenna terminal of the receiver THROUGH A .00055 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .00055 mfd. mica condenser be used in aligning the antenna stage of these receivers in order that this circuit can be made to track properly. Some test oscillators have this condenser included and if the capacity is correct, it will not be necessary to use an external series condenser.)

b. Set the test oscillator to 1400 K.C.

c. Turn the condenser rotor plates until the frequency is tuned in with maximum output.

d. Adjust the R-F parallel trimmer on the condenser gang (Illustration 11B) and the antenna compensating condenser which is the parallel trimmer on the Condenser Gang (Illustration 11A, Figure 3).

5. Aligning at 600 Kilocycles:

The oscillator padding condenser was previously adjusted at 540 K.C., however, it is necessary in most cases to repeak the oscillator tracking condenser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

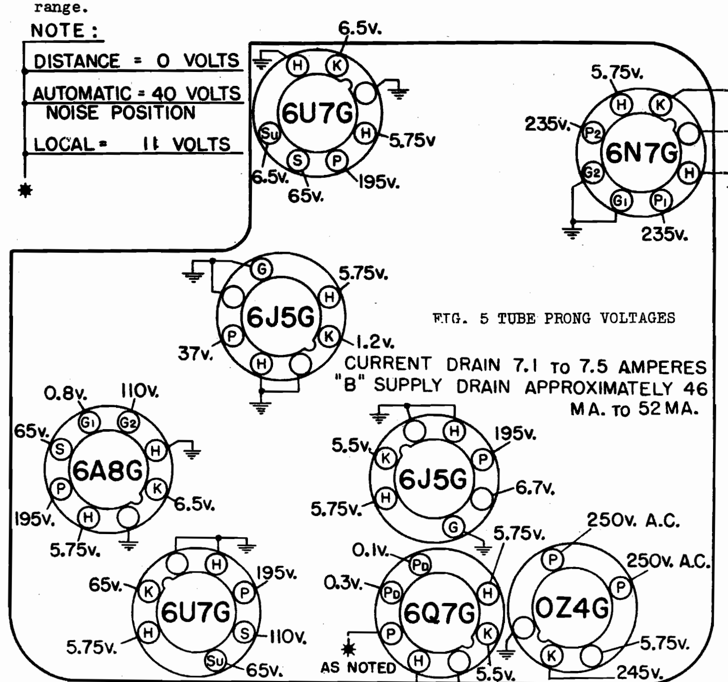
a. Set the test oscillator on 600 K.C.

b. Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output.

c. Maintain a low output signal from the test oscillator and readjust the oscillator gang tuning shaft back and forth through the signal.

d. This operation should be continued until no further increase in output can be obtained.

NOTE: If the entire alignment procedure has been accomplished correctly, the receiver should be very nearly uniformly sensitive over the entire frequency range.



BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6 VOLTS

MODEL 982084
Early, Late

OLDSMOBILE DIV.—GEN. MOTORS

Remote Cont. Head
Assembly, Details
Condenser Schematic

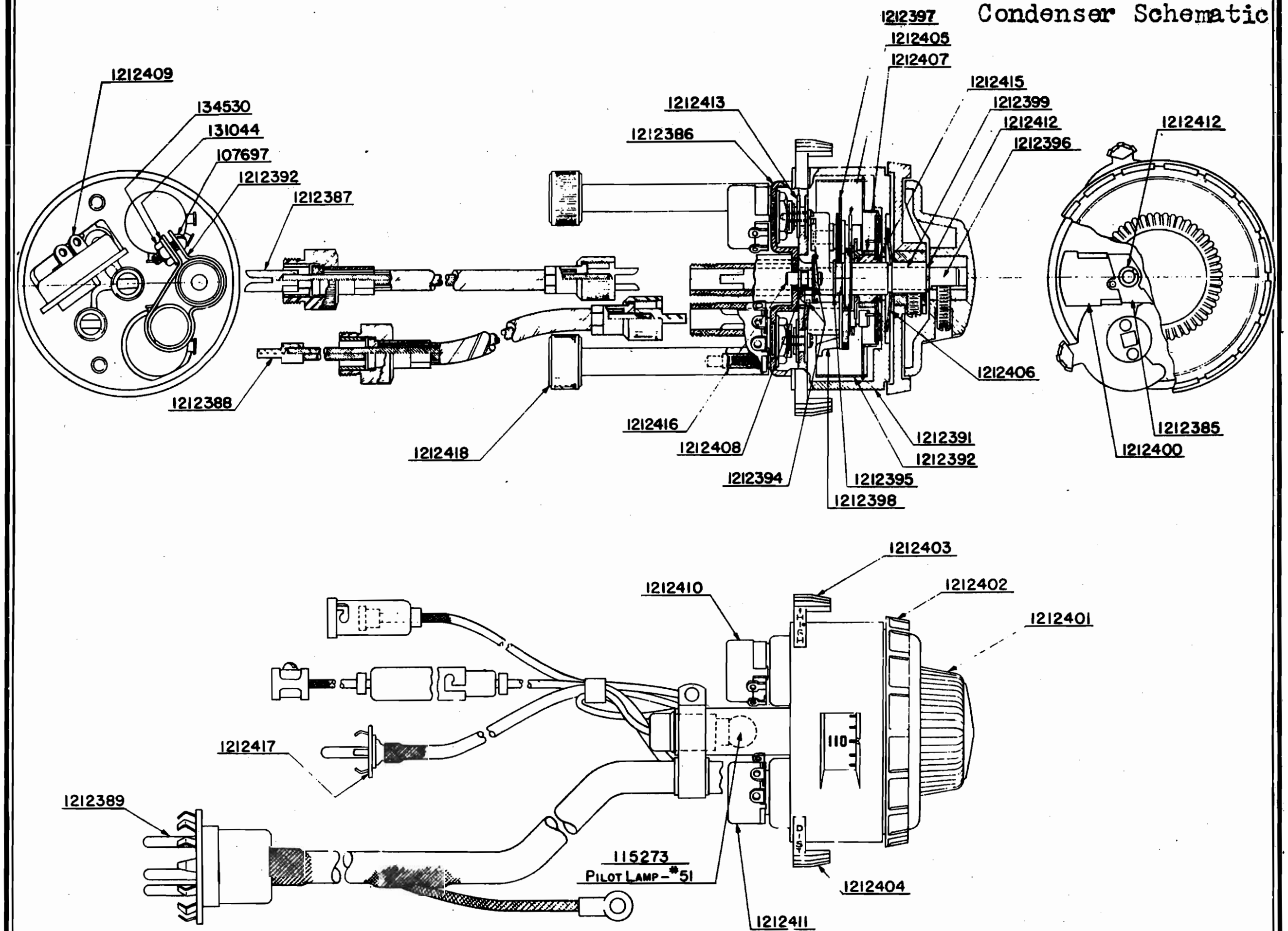


FIG. 8 REMOTE CONTROL HEAD

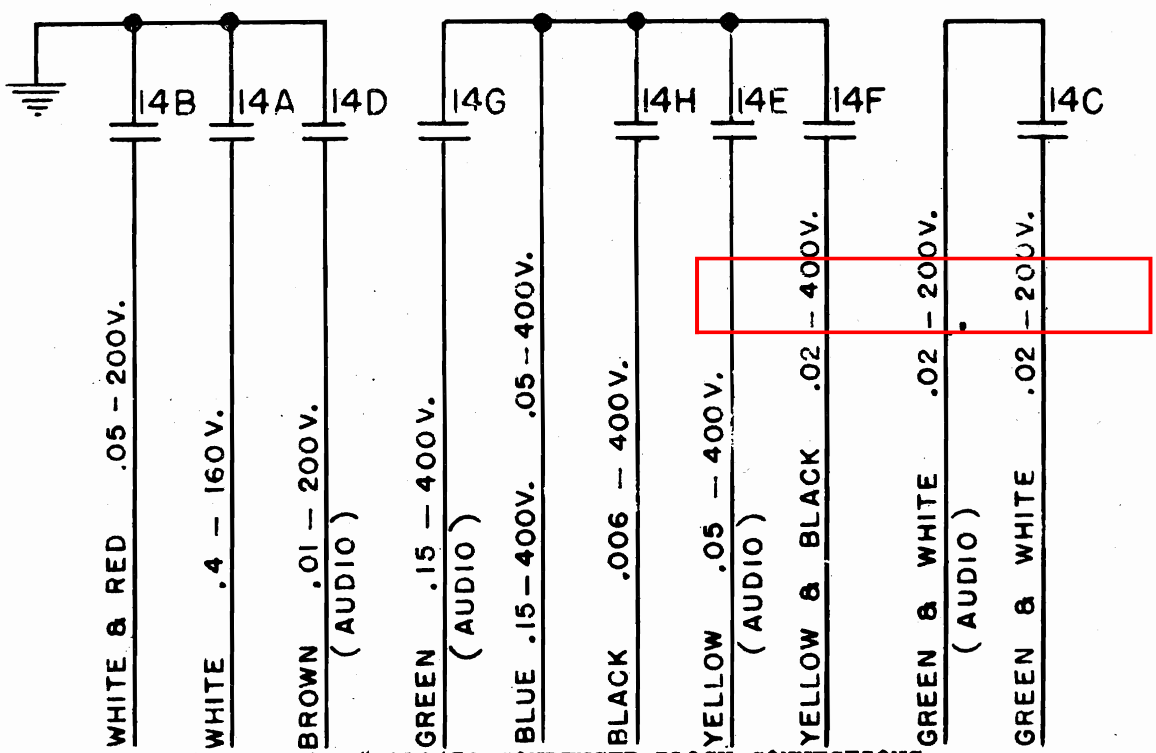
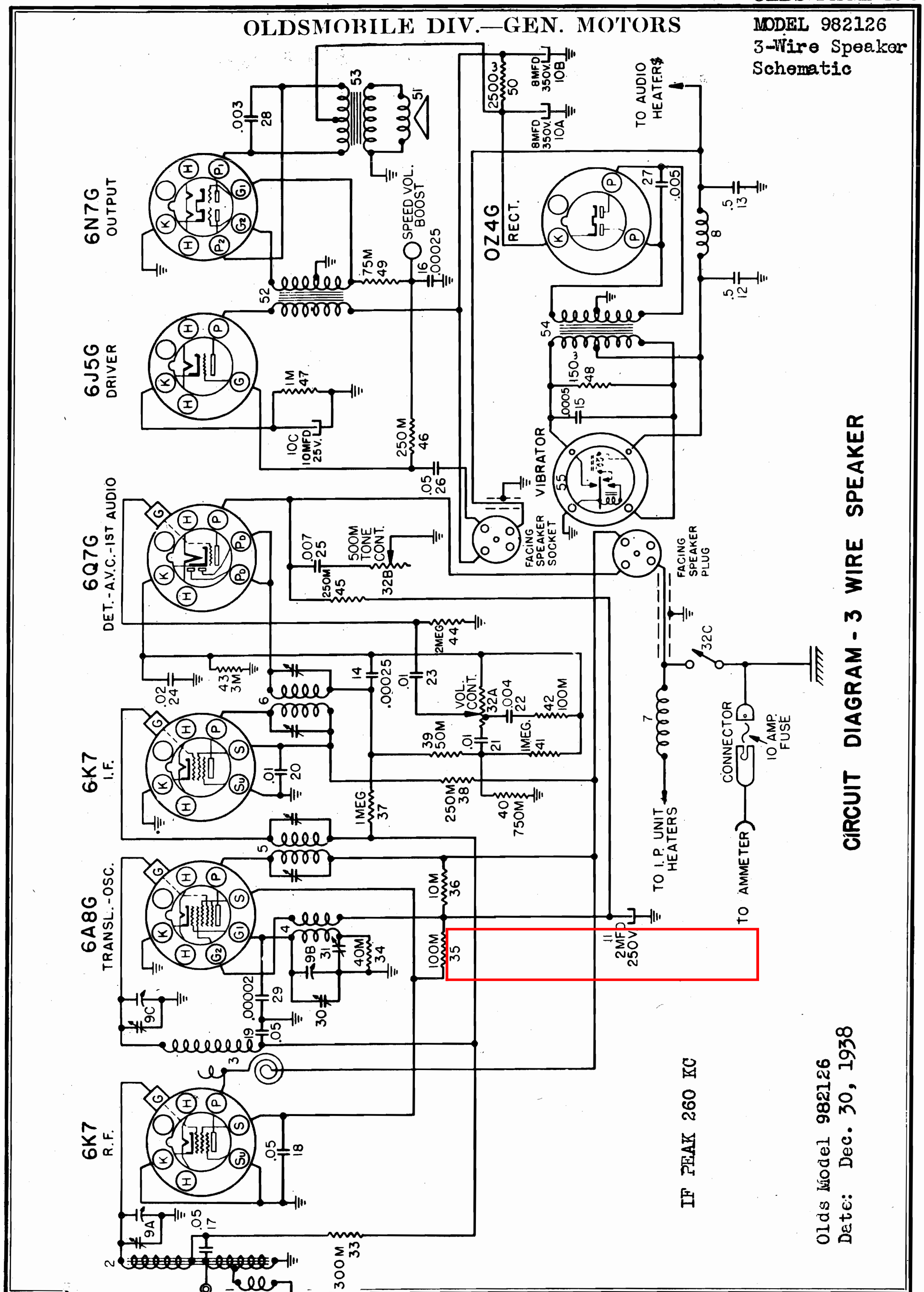


FIG. 7--#1212439 CONDENSER BLOCK CONNECTIONS

OLDSMOBILE DIV.—GEN. MOTORS

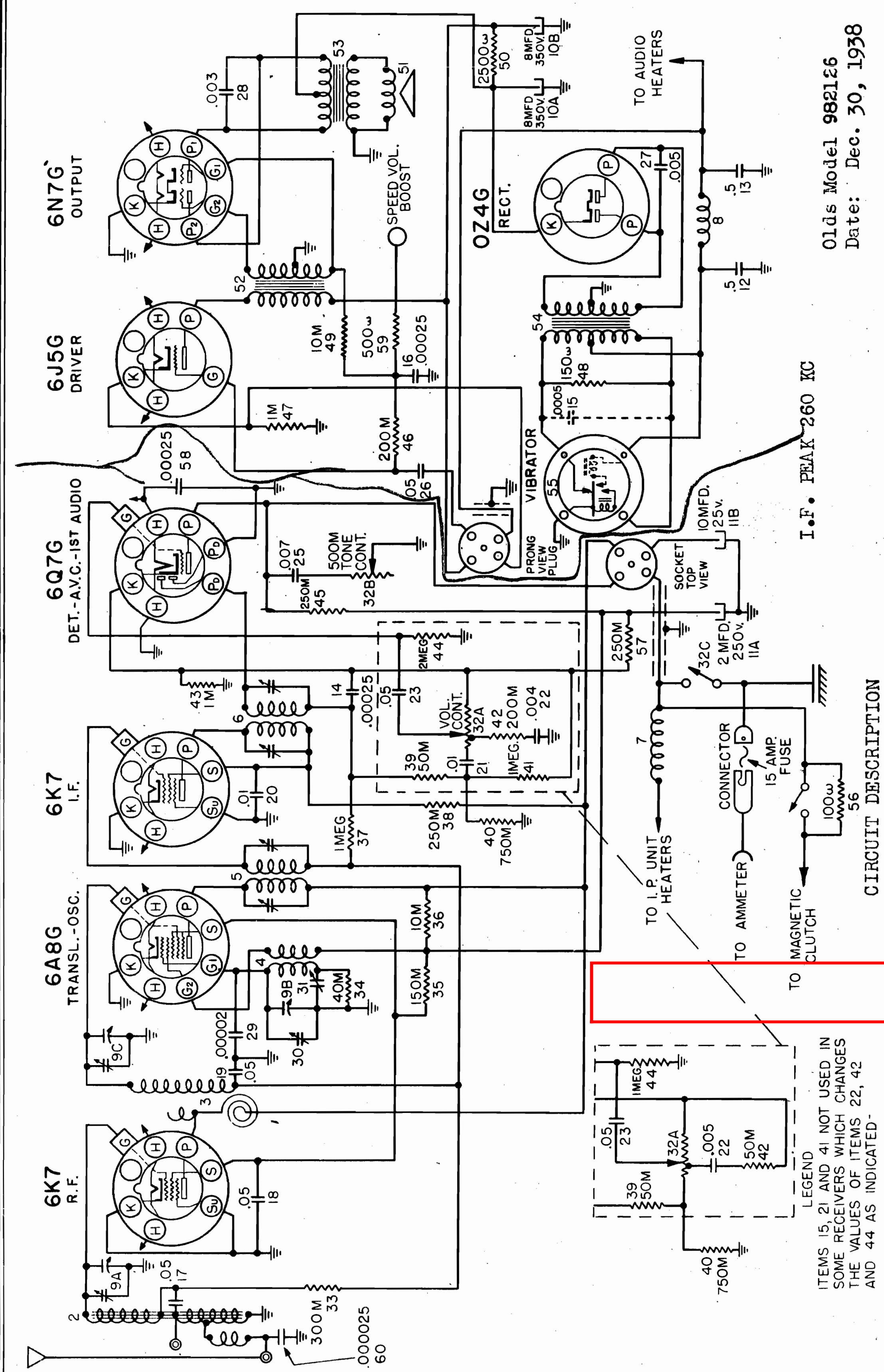
MODEL 982126
3-Wire Speaker
Schematic



CIRCUIT DIAGRAM - 3 WIRE SPEAKER

MODEL 982126
4-Wire Speaker
Schematic

OLDSMOBILE DIV.—GEN. MOTORS



I.F. PEAK 260 KC

Olds Model 982126
Date: Dec. 30, 1938

CIRCUIT DESCRIPTION

The circuit used in this receiver is the conventional superheterodyne type and does not employ regeneration.

An Automatic Speed Volume Control, which increases volume with car speed, is incorporated in the receiver.

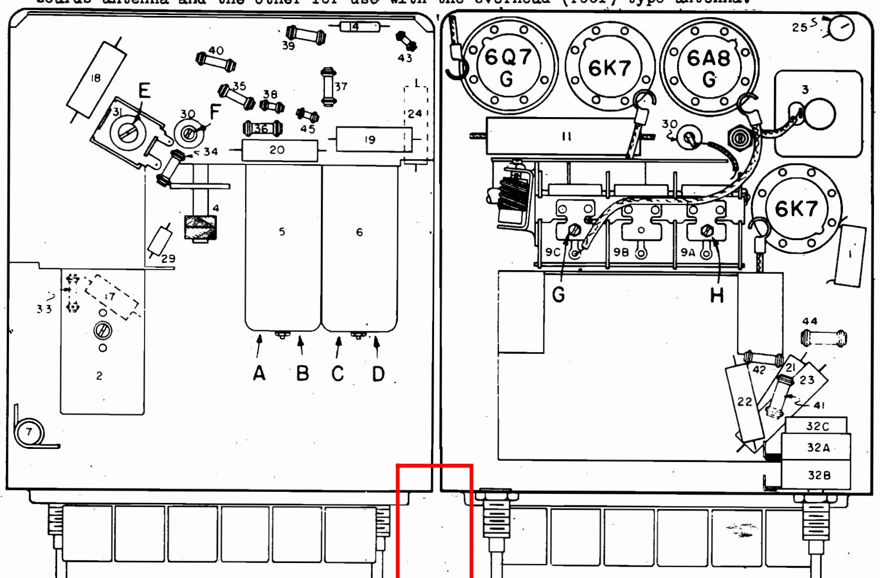
CIRCUIT DIAGRAM OLDS MODEL 982126
4 PRONG CABLE SPEAKER

MODEL 982126
Socket, Trimmers
Chassis, Alignment

OLDSMOBILE DIV.—GEN. MOTORS

ANTENNA CIRCUIT

The antenna circuit is directly coupled to the antenna. A small adjustable condenser is provided for adjusting the antenna circuit to the antenna. This adjustment is made near the high frequency end of the band (1400 K.C.) There are two antenna receptacles provided on the receiver. One for use with the running boards antenna and the other for use with the overhead (roof) type antenna.



1. Aligning I-F stages at 260 Kilocycles

(a) Connect the signal lead of the test oscillator to the grid cap of the 6A8G Tube through a .1 mfd. condenser, leaving the tube's grid clip in place.

(b) Connect the ground lead of the test oscillator to the chassis frame.

(c) Connect the output meter across the plate prongs of the output tube. Care should be taken when connecting the output meter to insert a series condenser to protect the meter from D. C. voltages.

(d) Set the test oscillator to exactly 260 Kilocycles.

(e) Adjust the trimmers "A", "B", "C" and "D" on the I-F Transformers for maximum output. (See parts layout). These adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistent with obtaining a readable indication on the output meter.

2. Aligning at 1560 Kilocycles

(a) Leave the test oscillator leads connected as for aligning the I-F Circuits.

(b) Turn the Rotor plates of the gang condenser (Illustration #9) all the way out and against the high frequency stop.

(c) Set the test oscillator to 1560 kilocycles.

(d) Adjust the condenser "F" for maximum output. (It is very important that this frequency be set accurately as a slight missetting will cause the receiver to be out of track over the high frequency end of the dial.)

3. Aligning at 540 Kilocycles

(a) Leave the test oscillator leads connected the same as before.

(b) Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.

(c) Set the test oscillator to 540 kilocycles.

(d) Adjust the oscillator padding condenser "E" for maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

4. Aligning at 1400 Kilocycles

(a) Remove the signal lead of the test oscillator from the grid of the 6A8G tube and connect to the Running Board Antenna receptacle of the receiver THROUGH a .00045 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .00045 mfd. mica condenser be used when aligning the antenna stage of these receivers and that the lead from the test oscillator is in the correct terminal in order that this circuit can be made to track properly.)

(b) Set the test oscillator to 1400 K.C.

(c) Turn the condenser rotor plates until this frequency is tuned in with Maximum output.

(d) Adjust the R-F Parallel trimmer "G" on the condenser gang and the antenna compensating condenser "H" which is the parallel trimmer on the Condenser Gang.

5. Aligning at 600 Kilocycles

The oscillator padding condenser was previously adjusted at 540 K.C., however, it is necessary in most cases to repeak the oscillator tracking condenser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

(a) Set the test oscillator at 600 K. C.

(b) Turn the Condenser rotor plates until the signal from the test oscillator is tuned in with maximum output.

(c) Maintain a low output signal from the test oscillator and readjust the oscillator tracking condenser "E" while rocking the variable condenser gang tuning shaft back and forth through the signal.

(d) This operation should be continued until no further increase in output can be obtained.

NOTE: If the entire alignment procedure has been accomplished accurately, the receiver should be very nearly uniformly sensitive over the entire frequency range.

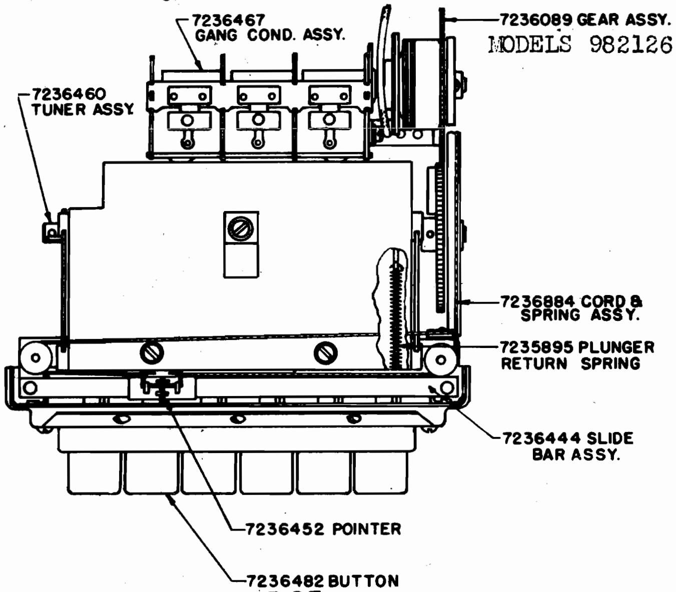
Model 982126
Date: Dec. 30, 1938.

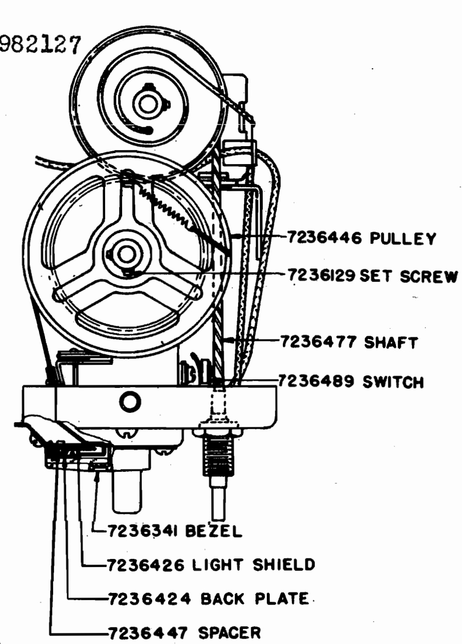
MODEL 982126
Voltage, Chassis
Control Assembly

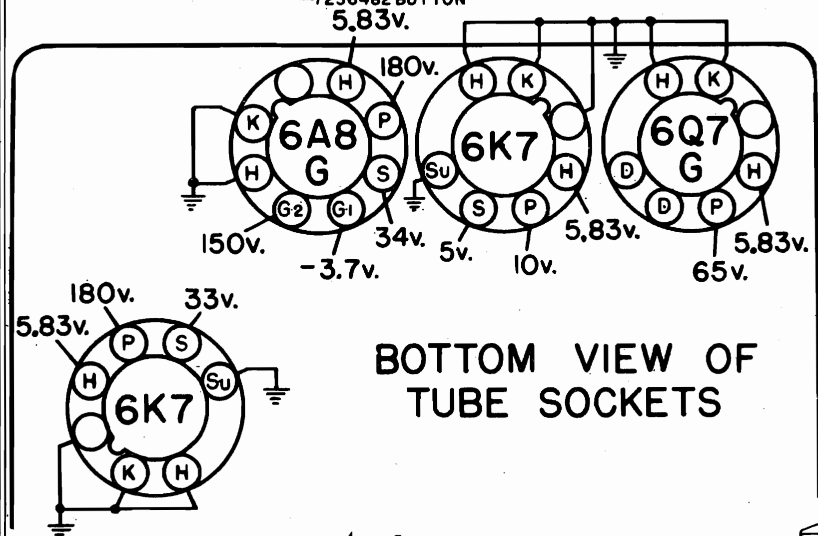
OLDSMOBILE DIV.—GEN. MOTORS

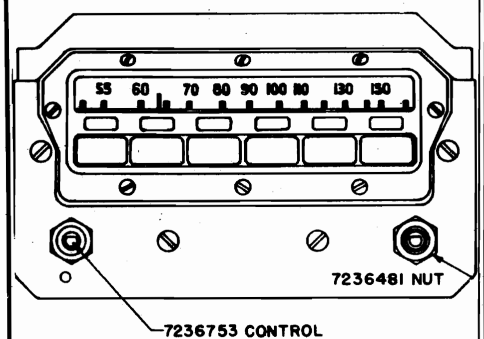
MODEL 982127
Control Assembly

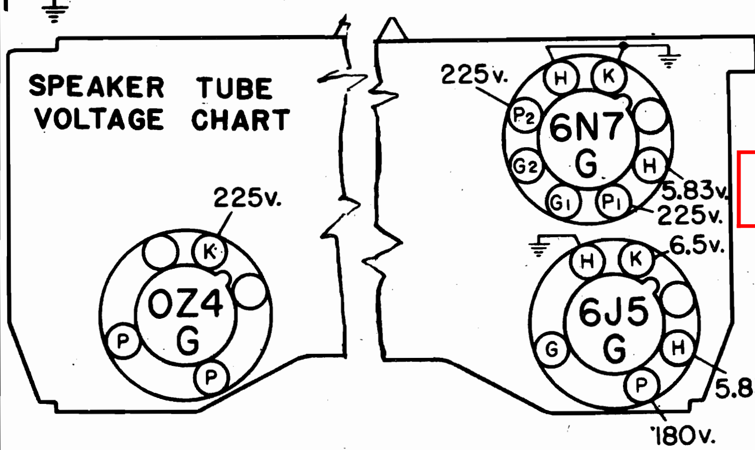
MODELS 982126 AND 982127









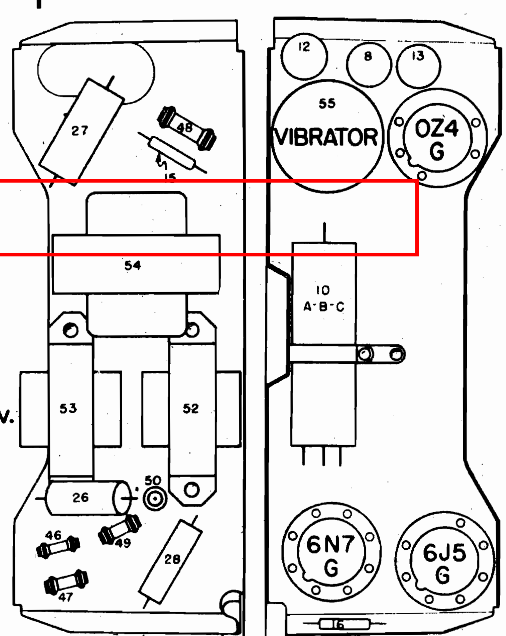


READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT;

"A" BATTERY 6 VOLTS.

CURRENT DRAIN 6.7 TO 7.6 AMPERES.

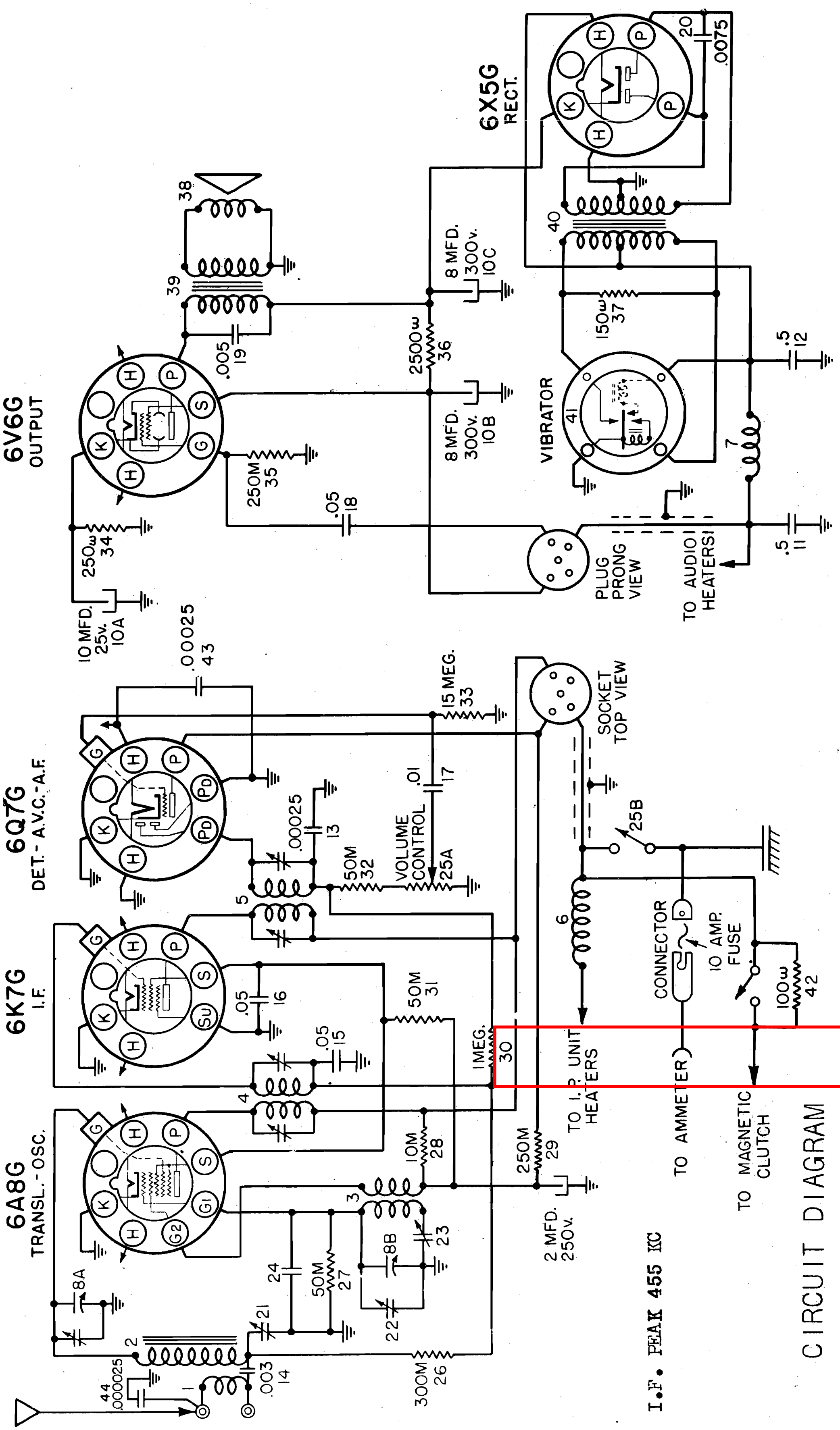
"B" SUPPLY DRAIN APPROXIMATELY



BOTTOM SPEAKER LAYOUT TOP PARTS

MODEL 982127
Schematic

OLDSMOBILE DIV.—GEN. MOTORS



CIRCUIT DIAGRAM
OLDS MODEL 982127

The antenna circuit is capacity coupled to the antenna. A small adjustable condenser is provided for adjusting the antenna circuit to the antenna. This adjustment is made near the low frequency end of the band (600 K.C.) There are two antenna receptacles provided on the receiver. One for use with the Running Boards Antenna and the other for use with Side Cowl Mounted type Antenna.

Olds Model 982127
Date: April 20, 1939

MODEL 982127
Socket,Trimmers
Alignment

OLDSMOBILE DIV.—GEN. MOTORS

1. Aligning I-F Stages at 455 Kilocycles

(a) Connect the signal lead of the test oscillator to the grid cap of the 6A8G Tube through a .1 mfd. condenser, leaving the tube's grid clip in place.

(b) Connect the ground lead of the test oscillator to the chassis frame.

(c) Connect the output meter from the plate prong of the output tube to ground. Care should be taken when connecting the output meter to insert a series condenser to protect the meter from D. C. Voltages.

(d) Set the test oscillator to exactly 455 K.C.

(e) Turn volume control to maximum.

(f) Adjust the trimmers "A", "B", "G" and "H" on the I-F Transformers for maximum output. (See parts layout) These adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistent with obtaining a readable indication on the output meter.

2. Aligning at 1520 Kilocycles

(a) Leave the test oscillator leads connected the same as for aligning the I-F Circuits.

(b) Turn the Rotor plates of the gang condenser (Illus. #8) all the way out and against the high frequency stop.

(c) Set the test oscillator to 1520 kilocycles.

(d) Adjust the condenser "F" for maximum output. (It is very important that this frequency be set accurately as a slight missetting will cause the receiver to be out of track over the entire high frequency end of the dial.)

3. Aligning at 540 Kilocycles

(a) Leave test oscillator leads connected the same as before.

(b) Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.

(c) Set the test oscillator to 540 K.C.

(d) Adjust the oscillator padding condensor "E" for maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

4. Aligning the Antenna Stage

(a) Remove the signal lead of the test oscillator from the grid of the 6A8G tube and connect to the Running Board Antenna receptacle of the receiver THROUGH a .0004 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .0004 mfd. mica condenser be used when aligning the antenna stage of these receivers and that the lead from the test oscillator is in the correct receptacle in order that this circuit can be made to track properly.

(b) Set the test oscillator to 600 K.C.

(c) Adjust antenna trimmer condenser "D" for maximum output.

(d) Set the test oscillator to 1400 K.C.

(e) Turn the condenser rotor plates until this frequency is tuned in with maximum output.

(f) Adjust the Parallel trimmer "C" on the condenser gang for maximum output.

5. Aligning at 600 Kilocycles

The oscillator padding condensor was previously adjusted at 540 K.C., however, it is necessary in most cases to repeak the oscillator padding condensor at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

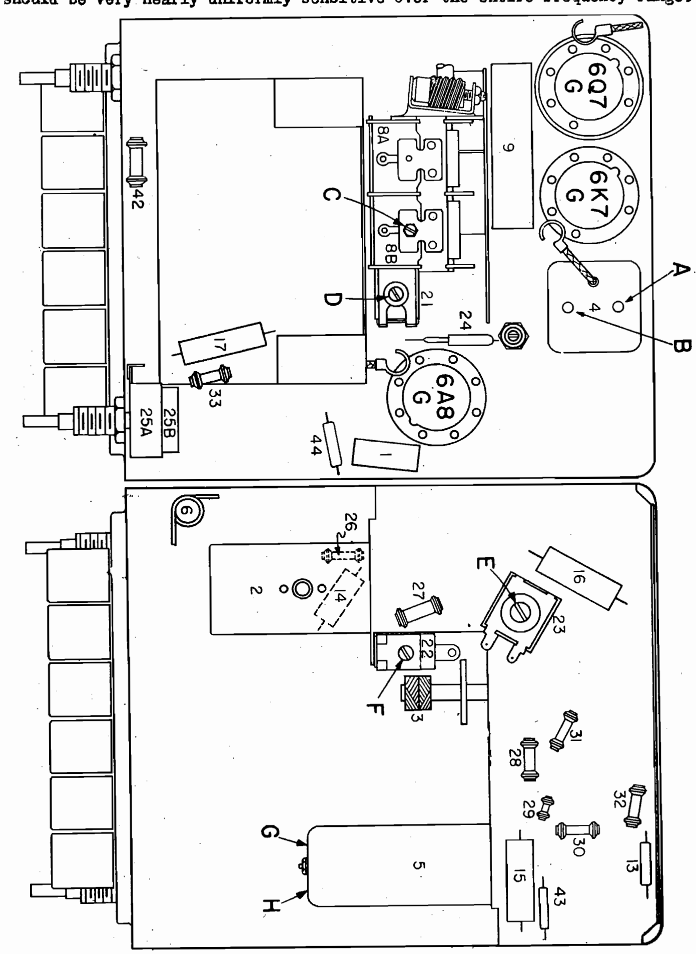
(a) Set the test oscillator at 600 K.C.

(b) Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output.

(c) Maintain a low output signal from the test oscillator and readjust the oscillator padding condenser "E" while rocking the variable condenser gang tuning shaft back and forth through the signal.

(d) This operation should be continued until no further increase in output can be obtained.

NOTE: If the entire alignment procedure has been accomplished correctly, the receiver should be very nearly uniformly sensitive over the entire frequency range.

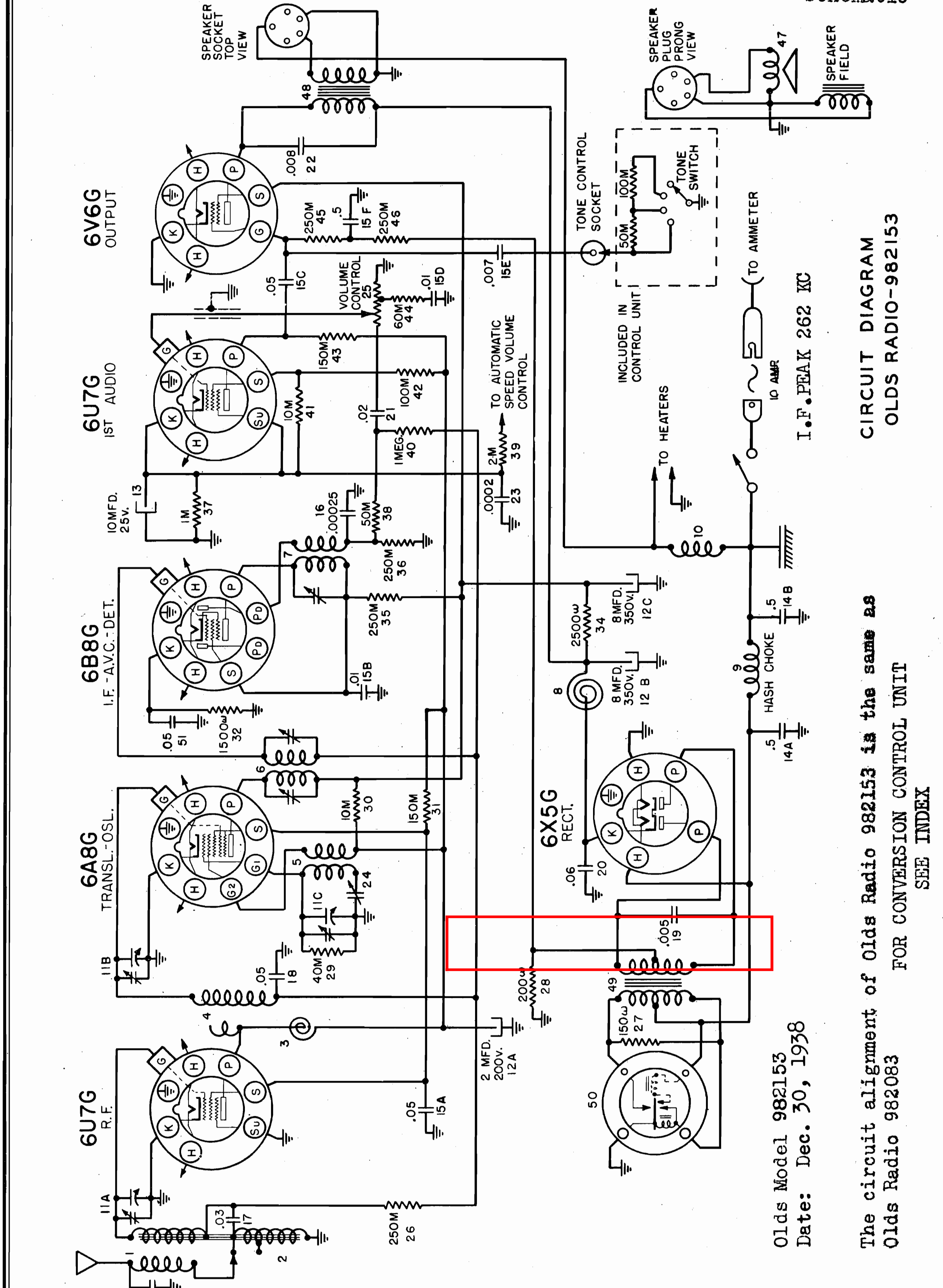


LOCATION OF PARTS - OLDS MODEL 982127

Note: For tuning head mechanism parts, refer to Olds Model Radio 982126.

OLDSMOBILE DIV.—GEN. MOTORS

MODEL 982153
Schematic



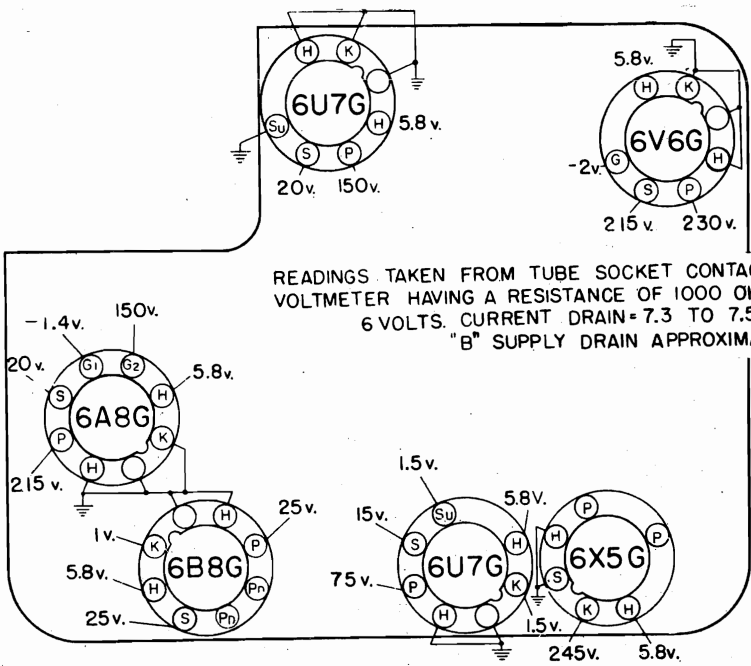
Olds Model 982153
Date: Dec. 30, 1938

The circuit alignment of Olds Radio 982153 is the same as Olds Radio 982083

FOR CONVERSION CONTROL UNIT
SEE INDEX

MODEL 982153
Voltage,Chassis
Socket,Trimmers

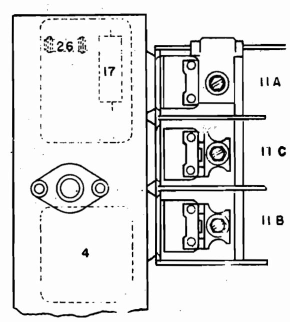
OLDSMOBILE DIV.—GEN. MOTORS

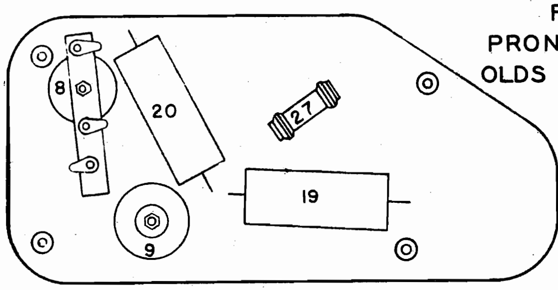


READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6 VOLTS. CURRENT DRAIN = 7.3 TO 7.5 AMPS.
"B" SUPPLY DRAIN APPROXIMATELY 52 TO 55 M A

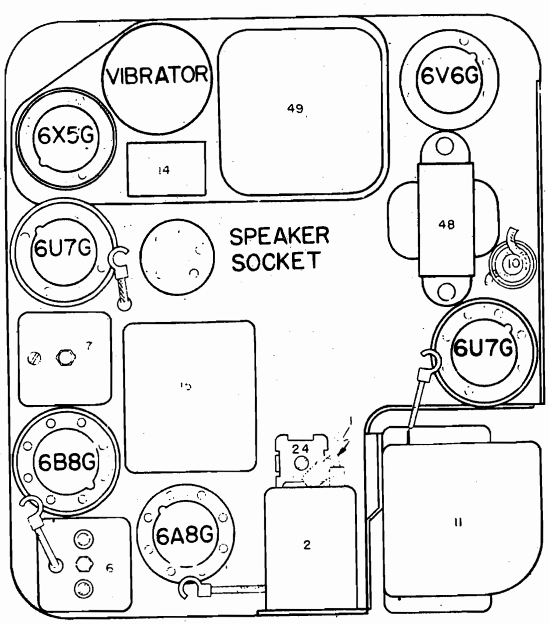
BOTTOM VIEW OF TUBE SOCKETS

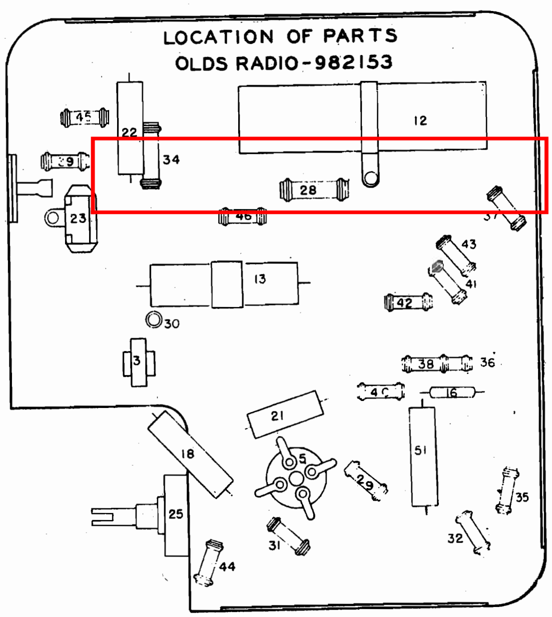
FIG. 3
PRONG VOLTAGES
OLDS RADIO-982153





POWER SUPPLY UNIT LOCATION OF PARTS
RADIO 982153





OLDSMOBILE DIV.—GEN. MOTORS

1. Aligning I-F Stages at 262 Kilocycles:

   a. Connect the signal lead of the test oscillator to the grid cap of the 6A8G tube through a .1 mfd. condenser, leaving the tube's grid clip in place.

   b. Connect the ground lead of the test oscillator to the chassis frame.

   c. Connect the output meter from the plate prong of the 6V6G to ground. Care should be taken when connecting the output meter to insert a series condenser to protect the meter from D.C. voltages.

   d. Set the test oscillator to exactly 262 K.C.

   e. Adjust the trimmers on the I-F coils (Illustration 6 and 7, Figure 2) for maximum output. These adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistant with obtaining a readable indication on the output meter.

2. Aligning at 1520 Kilocycles:

   a. Leave the test oscillator leads connected the same as for aligning the I-F circuits.

   b. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.

   c. Set the test oscillator to 1520 kilocycles.

   d. Adjust the parallel trimmer for the oscillator section of the condenser gang (Illustration 11C, Figure 3) for maximum output. (It is very important that this frequency be set accurately as a slight mis-setting will cause the receiver to be out of track over the entire high frequency end of the dial.

3. Aligning at 540 Kilocycles:

   a. Leave test oscillator leads connected the same as before.

   b. Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.

   c. Set the test oscillator to 540 K.C.

   d. Adjust the oscillator padding condenser (Illustration 26, Figure 2) located on the mounting plate of the receiver to maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

4. Aligning at 1400 Kilocycles:

   a. Remove the signal lead of the test oscillator from the grid of the Translator tube and connect to the antenna terminal of the receiver THROUGH A .00055 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .00055 mfd. mica condenser be used in aligning the antenna stage of these receivers in order that this circuit can be made to track properly. Some test oscillators have this condenser included and if the capacity is correct, it will not be necessary to use an external series condenser.)

   b. Set the test oscillator to 1400 K.C.

   c. Turn the condenser rotor plates until the frequency is tuned in with maximum output.

   d. Adjust the R-F parallel trimmer on the condenser gang (Illustration 11-B) and the antenna compensating condenser which is the parallel trimmer on the Condenser Gang (Illustration 11-A, Figure 3).

5. Aligning at 600 Kilocycles:

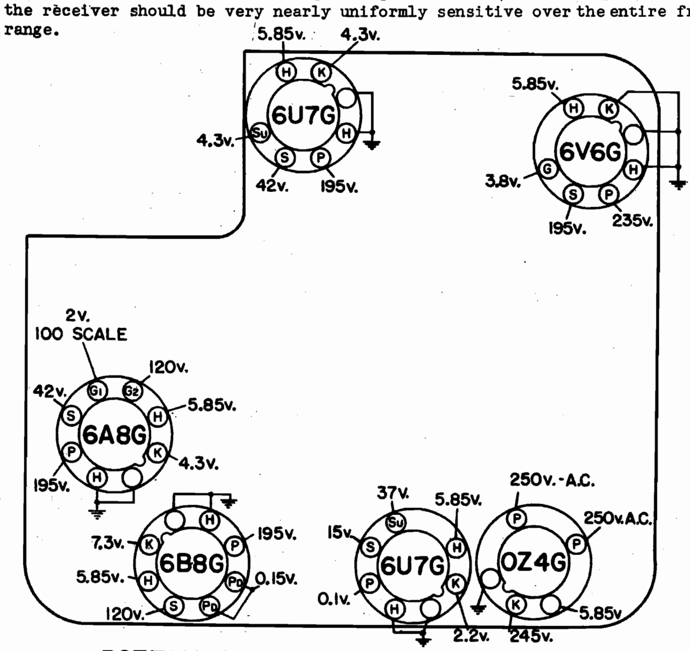
   The oscillator padding condenser was previously adjusted at 540 K.C., however, it is necessary in most cases to repeak the oscillator tracking condenser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

   a. Set the test oscillator on 600 K.C.

   b. Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output.

   c. Maintain a low output signal from the test oscillator and readjust the oscillator tracking condenser (Illustration 26, Figure 2) while rocking the variable condenser gang tuning shaft back and forth through the signal.

   d. This operation should be continued until no further increase in output is obtained. Note if the entire alignment procedure has been accomplished correctly, the receiver should be very nearly uniformly sensitive over the entire frequency range.



BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6 VOLTS. CURRENT DRAIN = 6.6 TO 6.8 AMPS. "B" SUPPLY DRAIN APPROXIMATELY 50 TO 54 M.A.

FIG. 5 TUBE PRONG VOLTAGES - MODEL 982083

MODEL 982083
MODEL 982084
MODEL 982085
MODEL 982153

OLDSMOBILE DIV.—GEN. MOTORS

Conversion Cont. Units
Assembly, Parts List

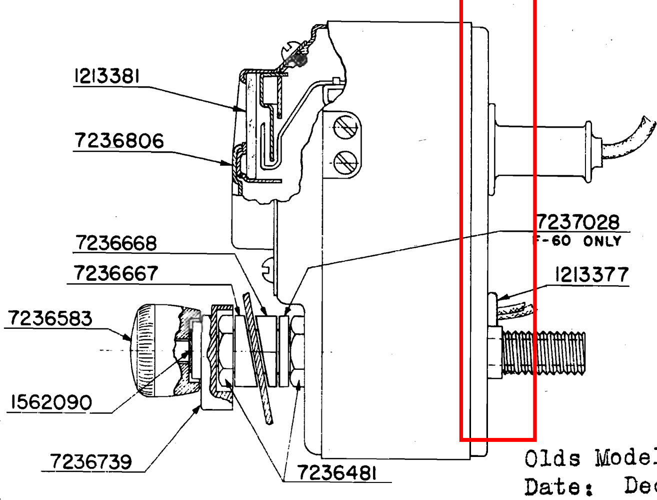
CONVERSION CONTROL UNIT 412304.

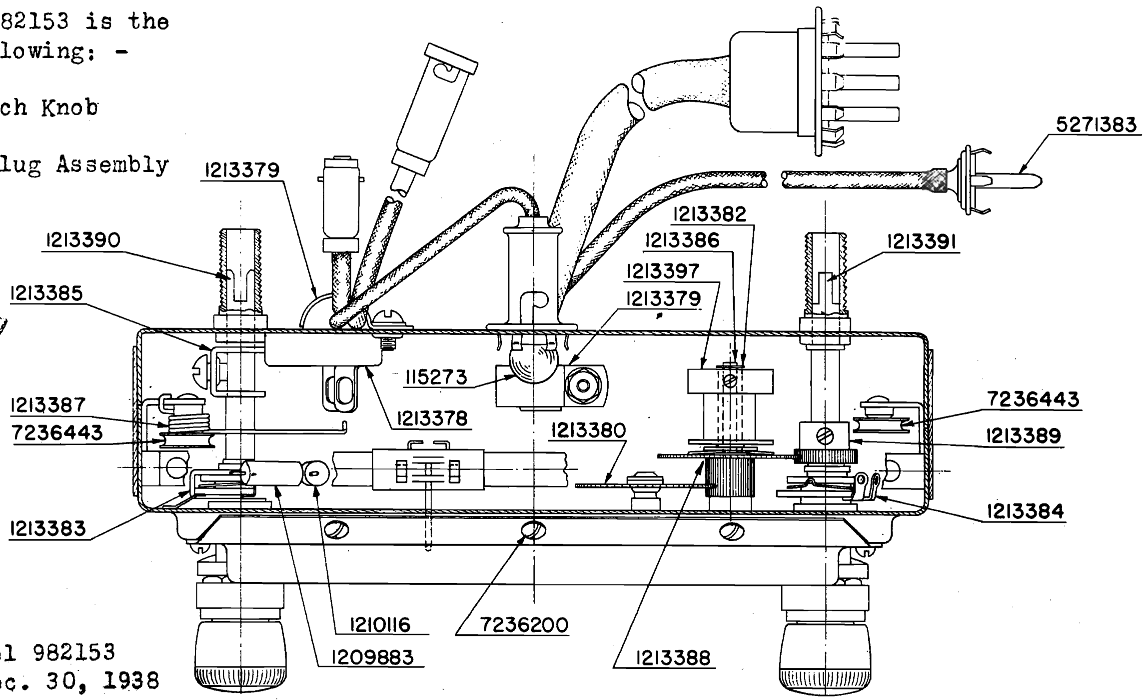
1213385	Arm Assembly	Off-On Switch Actuating	1213397	Pulley Assembly	Dial Drive
7236806	Bezel Assembly		7236443	Pulley	Wood
5271383	Cable & Plug Assembly	Tone Control	1210116	Resistor	Insulated 50,000 ohms, 1/2 Watt
	Cable & Plug Assembly	Tone Control	1209883	Resistor	Insulated 100,000 ohms, 1/2 Watt
1213379	Clamp	Cable Retaining	7236200	Screw 4-36 x 3/16	Bezel Mounting
1213382	Clip	Pulley Retaining	1213391	Shaft	Station Selector
1213381	Dial Glass	Station Indicator	1213390	Shaft	Volume Control
1213388	Gear Assembly	Idler & Pinion	1213387	Spring	Dial Pointer - String Tension
1213389	Gear Assembly	Driving Pinion	1213386	Stud	Idler Gear
1213380	Gear & Bushing Assy.	Driven	1213378	Switch	Off-On
1213377	Grommet	Cable Insulating	1213383	Switch	Tone Control
115273	Lamp #51	Pilot Light	1213384	Switch	Local Distance
7236583	Knob	Station Selector & Volume			
7236739	Knob	Tone Control & Local Distant Switch			
7236481	Nut 7/16-28 Hex	Control Mounting			

CONVERSION CONTROL UNIT 412304
INCLUDED IN PACKAGE 982123
USED IN CONNECTION WITH RECEIVER
982083-4-5

Note that Remote Control, 412073, for Radio 982153 is the same as 412304 except it will be less the following: -

7236739	Local Distance Switch Knob
1213384	Switch
5271569	6 Prong Cable and Plug Assembly

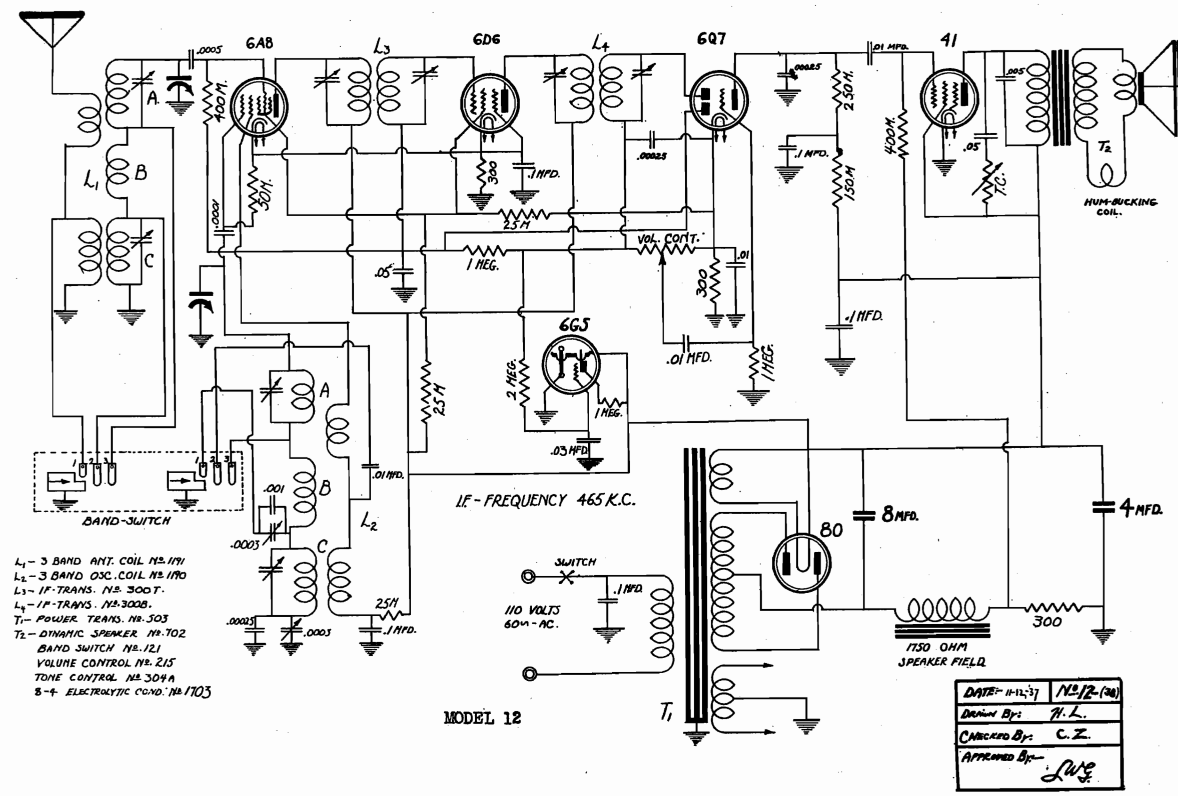




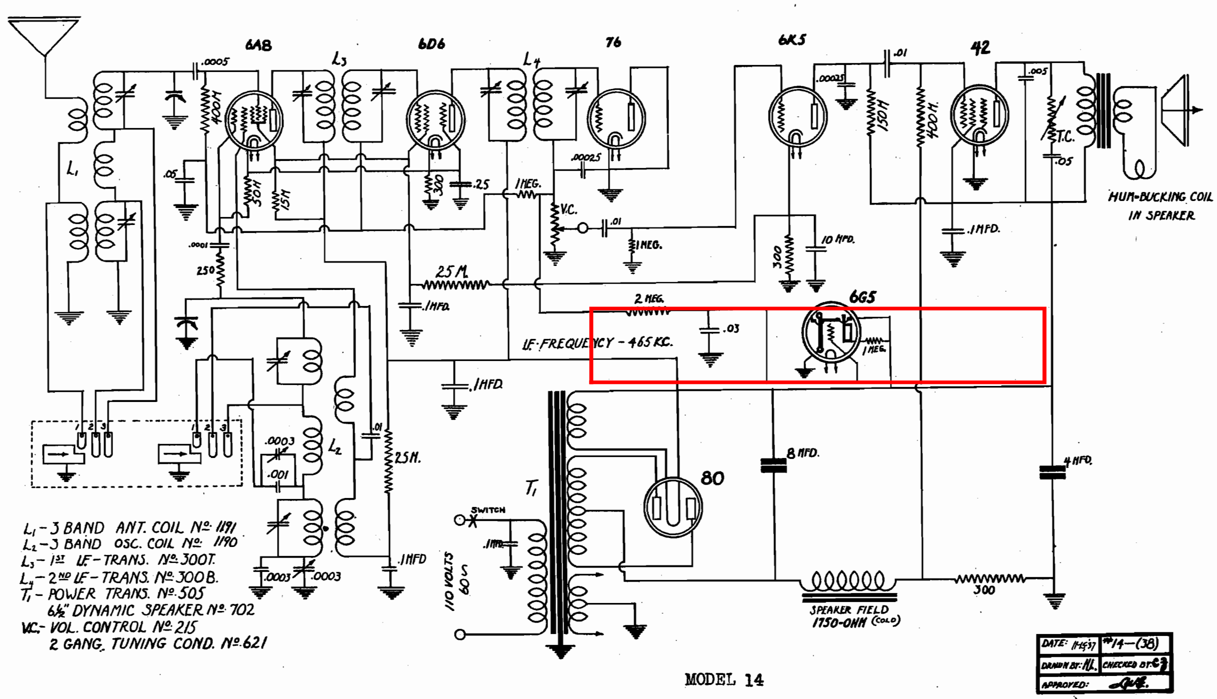
Olds Model 982153
Date: Dec. 30, 1938

MODEL 12
MODEL 14
Schematics

PACIFIC RADIO CORP.



MODEL 12

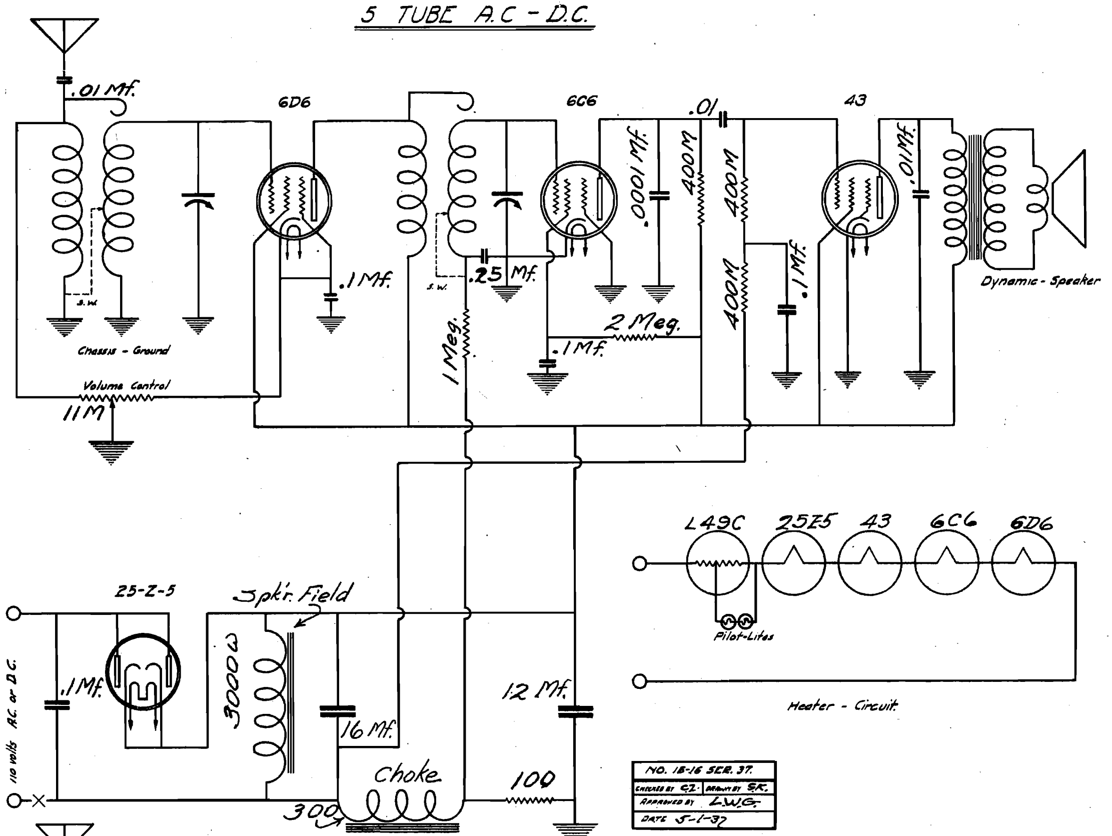


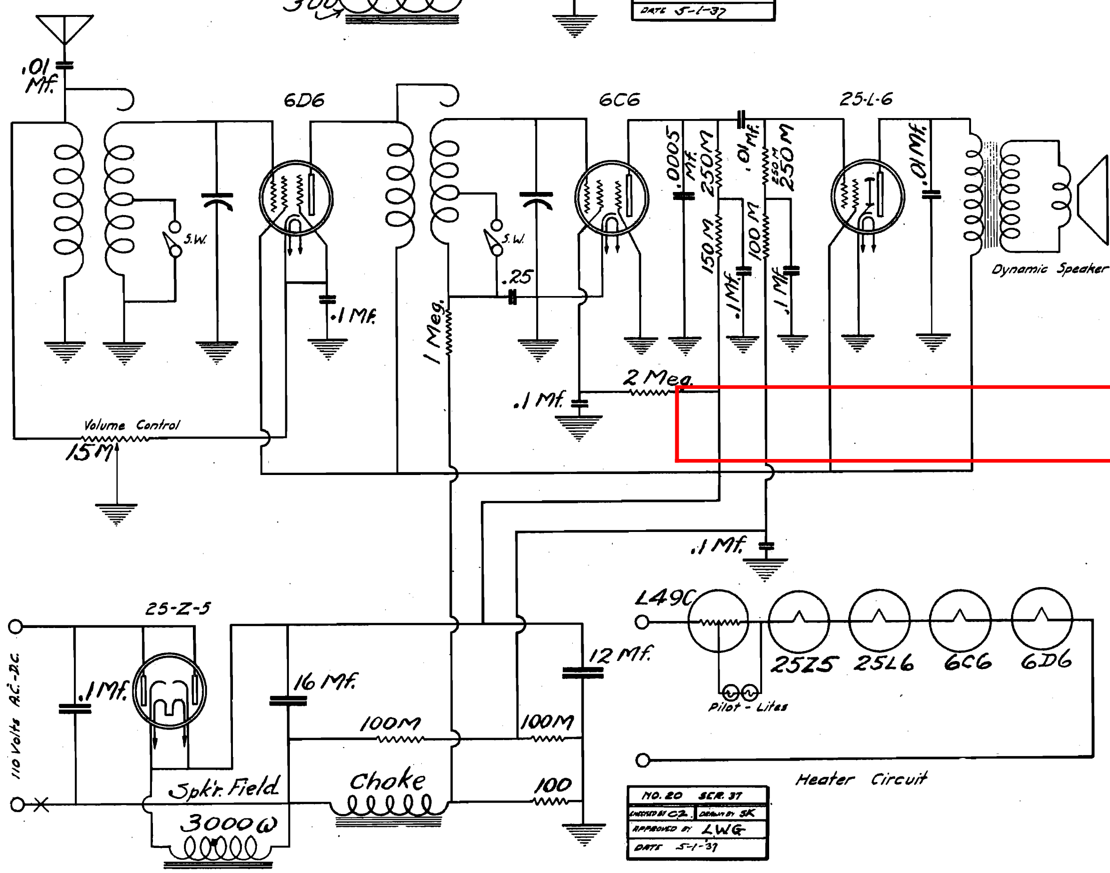
MODEL 14

MODELS 15,16 Ser.37
MODEL 20,Ser.37
Schematics

PACIFIC RADIO CORP.

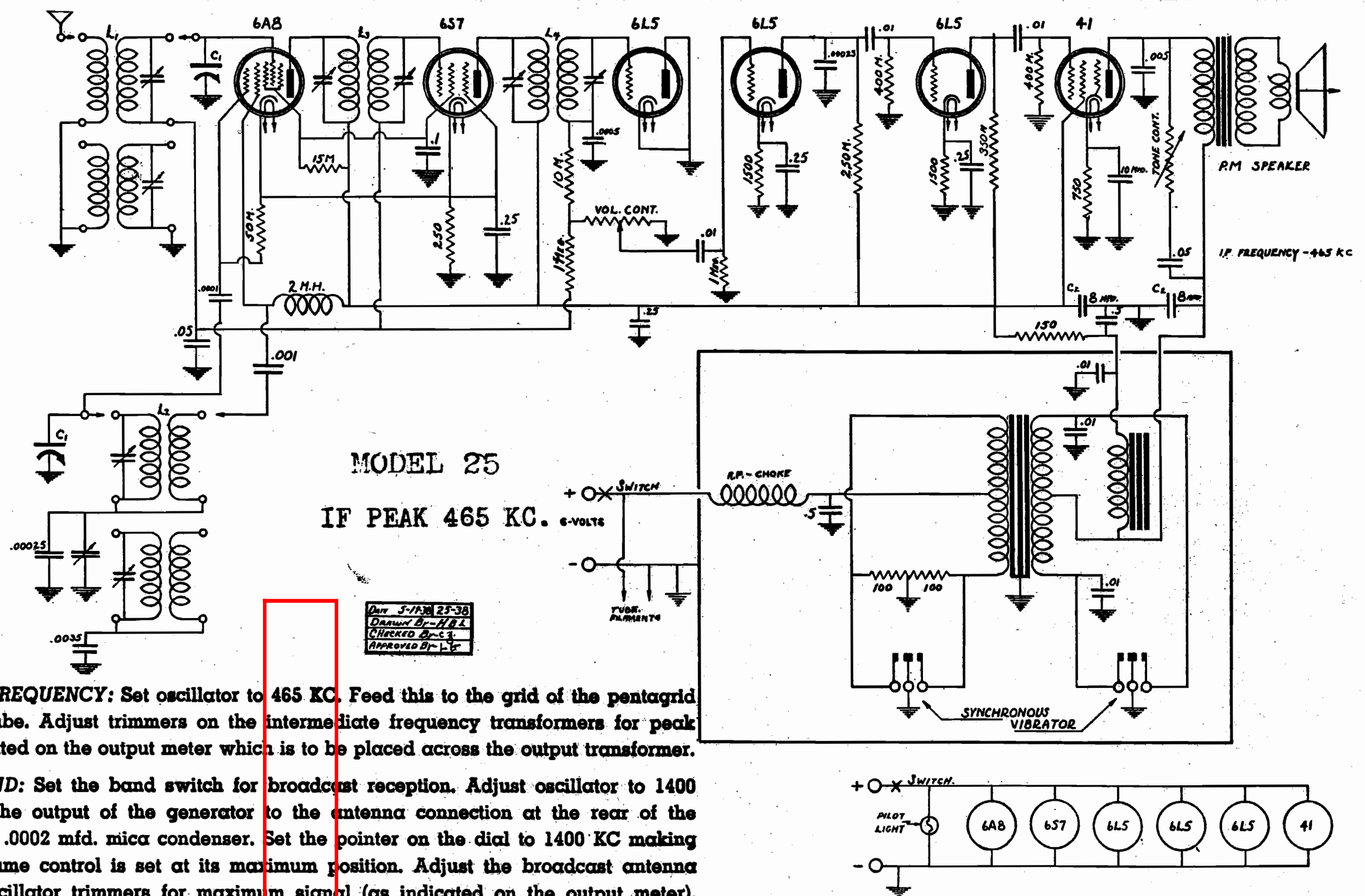
5 TUBE A.C - D.C.





MODEL 25
Schematic
Alignment

PACIFIC RADIO CORP.



INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the *broadcast padding* condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0035 mica condenser for short circuit.

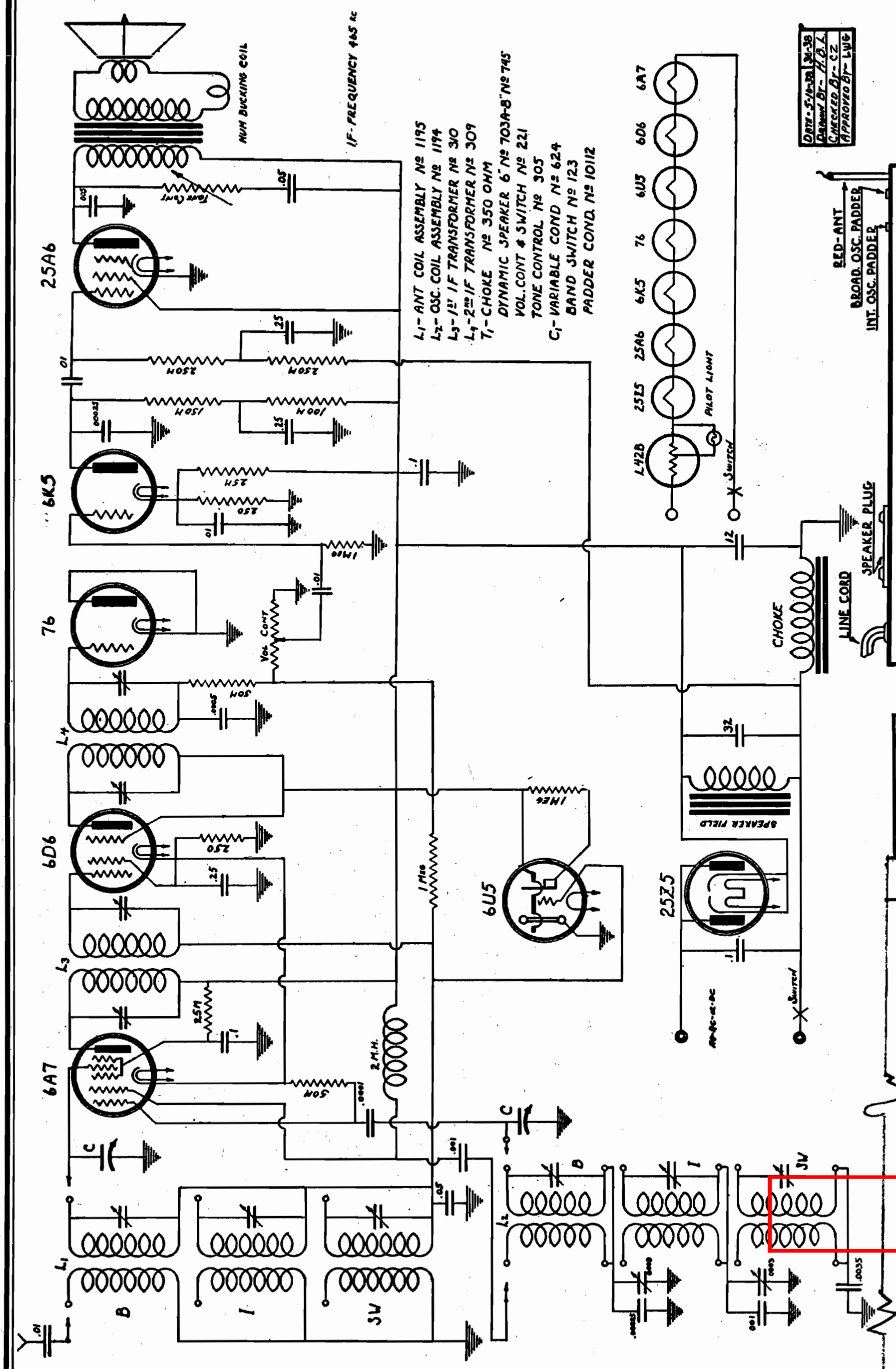
L_1 - ANT. COIL № 430
L_2 - OSC COIL № 431
L_3 - 1st IF TRANSFORMER № 1017
L_4 - 2nd IF TRANSFORMER № 1018
BAND SWITCH № 124
TONE CONT. № 305
VOL. CONT. & SWITCH № 221

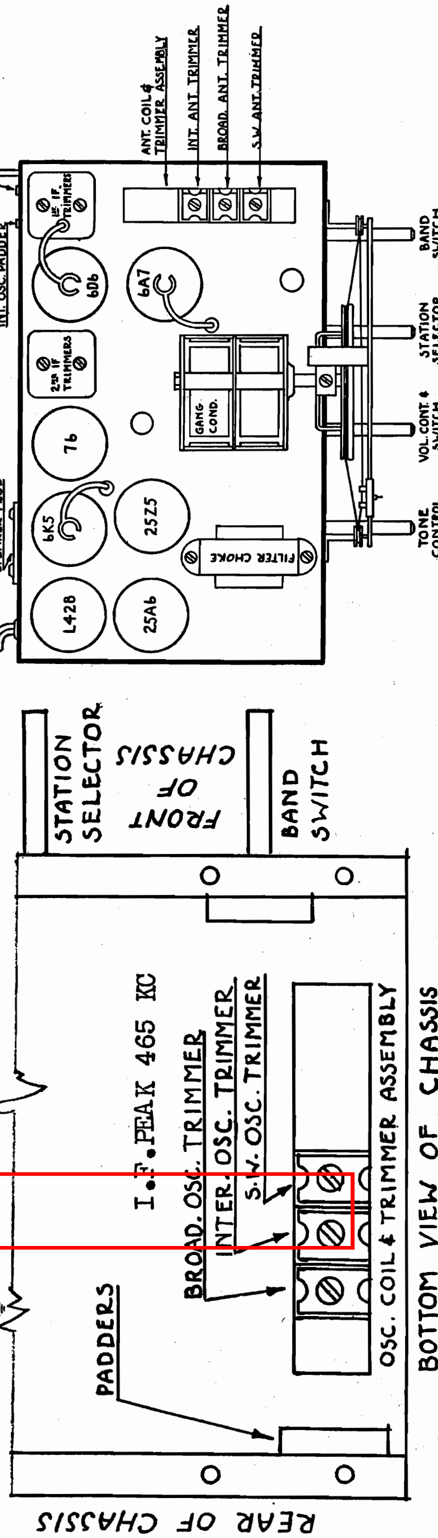
C_1 - TUNING COND. № 624
C_2 - FILTER COND. № 1720
SPEAKER 6" № 722 - 8" № 723
OUTPUT TRANSFORMER № 524
POWER TRANSFORMER № 526
VIBRATOR № 480

This receiver is designed to operate over two tuning ranges.
from 540 K.C. to 1730 and
from 5800 K.C. to 18000 K.C.

MODEL 36
Schematic, Socket
Trimmers

PACIFIC RADIO CORP.





MODEL 36 **110-115 volts A.C. or D.C.**

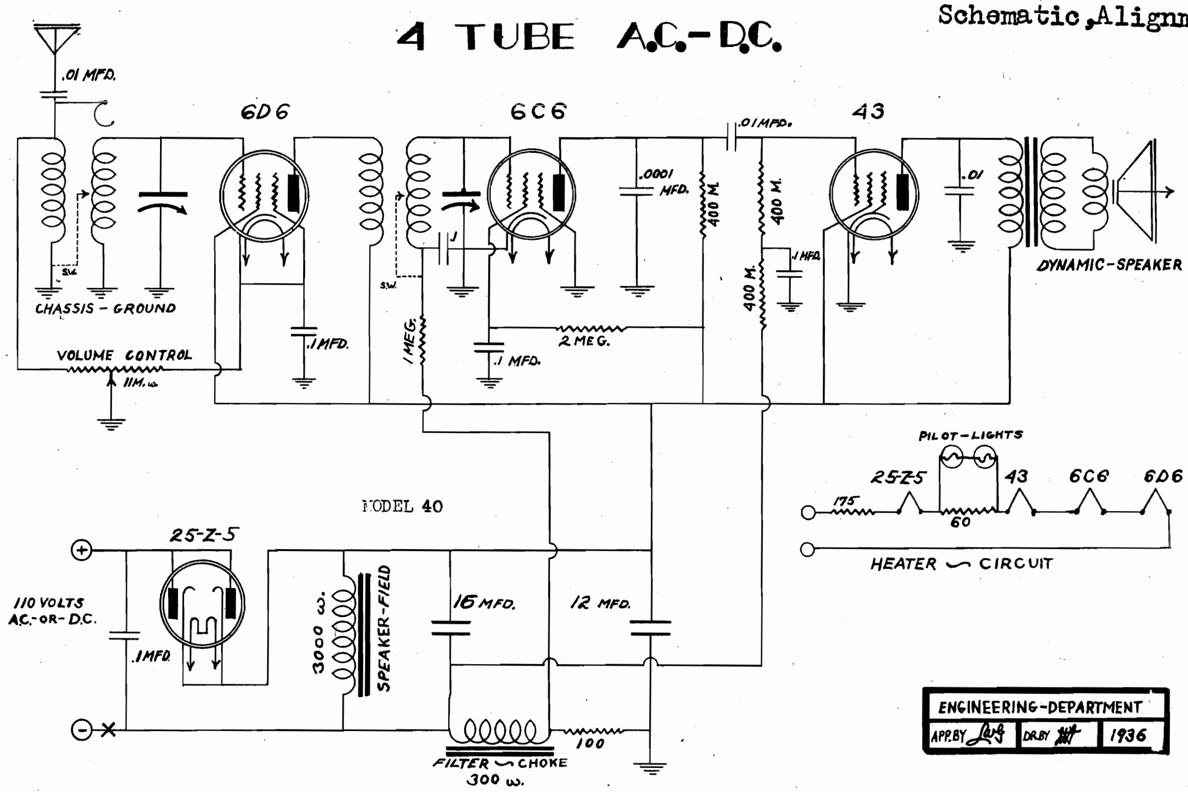
FOR ALIGNMENT, SEE THAT OF MODEL 35 ON PACIFIC PAGE 9-6, RIDER'S VOL. IX

SWITCH POSITION	BAND	RANGE IN KILOCYCLES
Left	Broadcast	540— 1710 KC
Center	Intermediate	1710— 5800 KC
Right	Short Wave (foreign)	5800—17500 KC

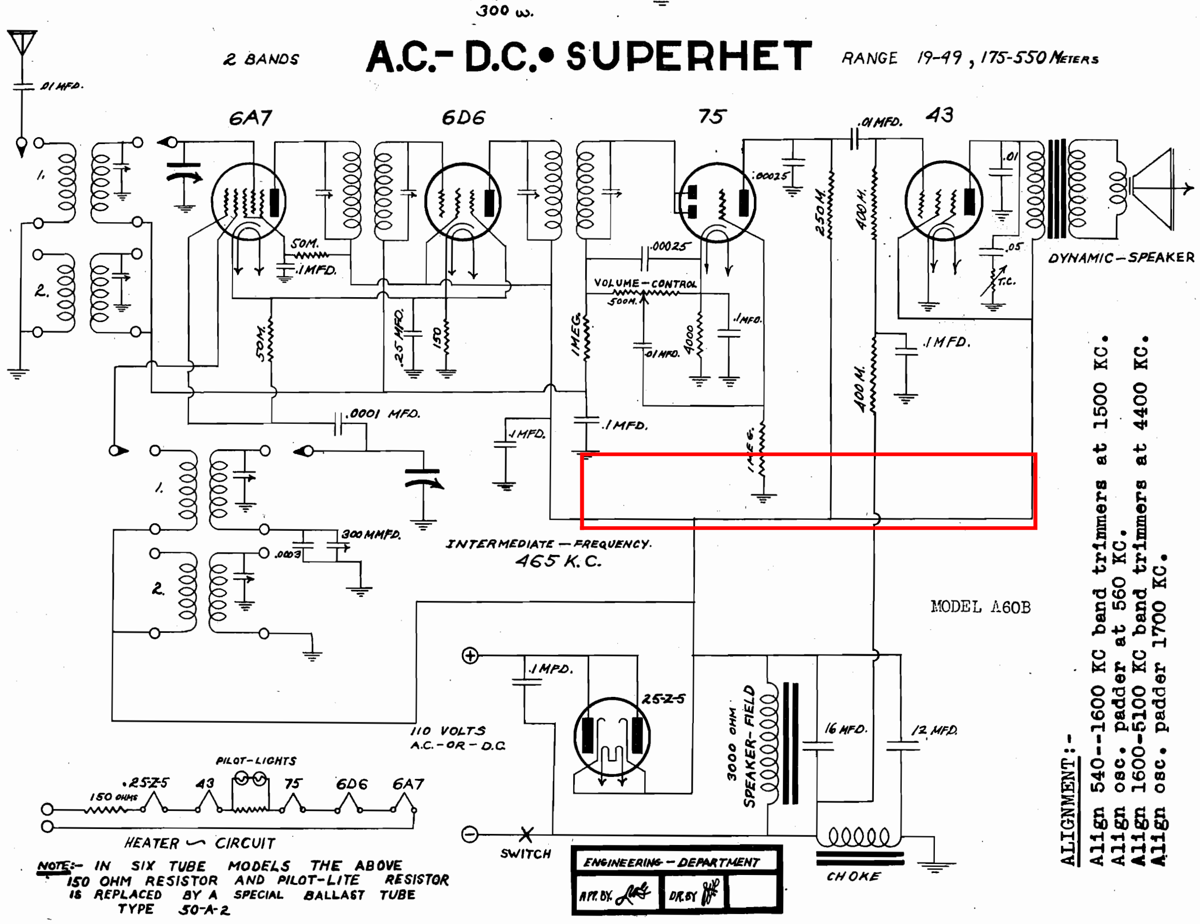
MODEL 40 Schematic
MODEL A60B Schematic, Alignment

PACIFIC RADIO CORP.

4 TUBE A.C.-D.C.



2 BANDS A.C.-D.C.• SUPERHET RANGE 19-49, 175-550 METERS

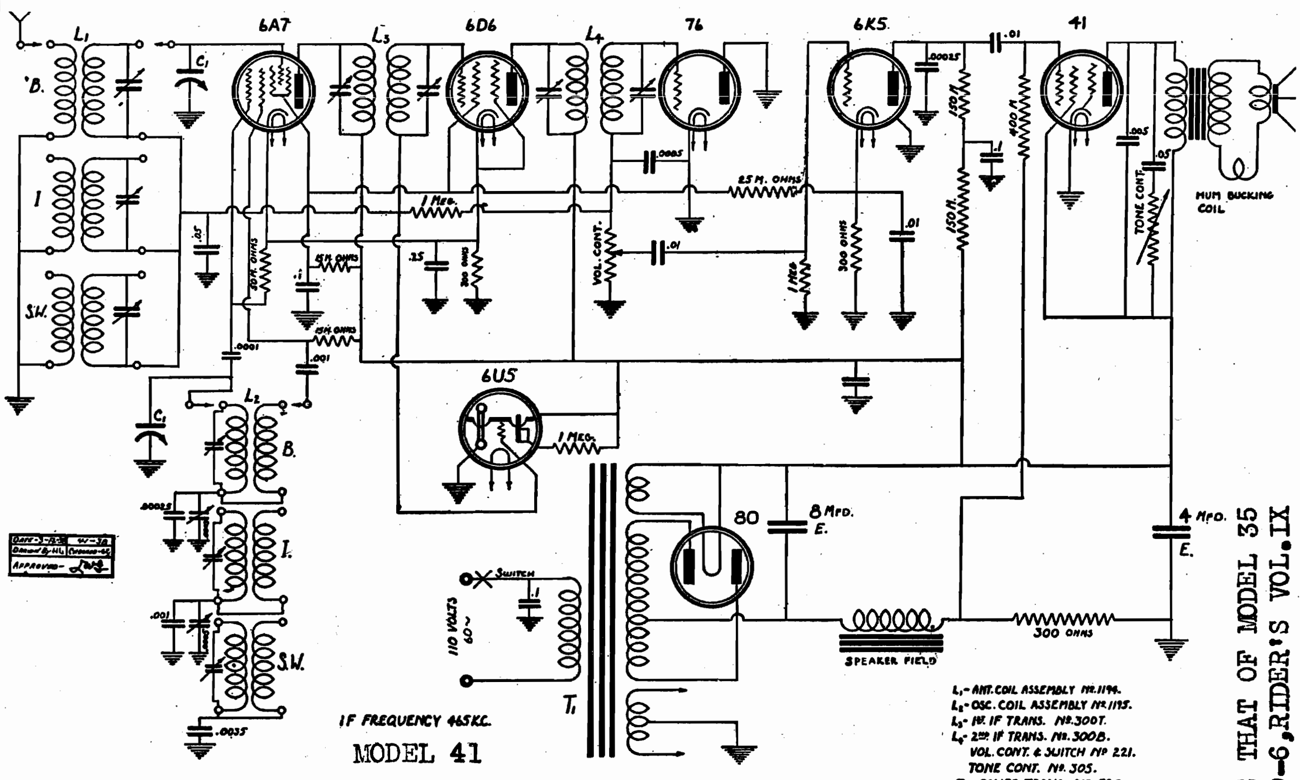


NOTE:- IN SIX TUBE MODELS THE ABOVE 150 OHM RESISTOR AND PILOT-LITE RESISTOR IS REPLACED BY A SPECIAL BALLAST TUBE TYPE 50-A-2

ALIGNMENT:-
Align 540--1600 KC band trimmers at 1500 KC.
Align osc. padder at 560 KC.
Align 1600-5100 KC band trimmers at 4400 KC.
Align osc. padder 1700 KC.

MODEL 41
Schematic, Socket
Trimmers

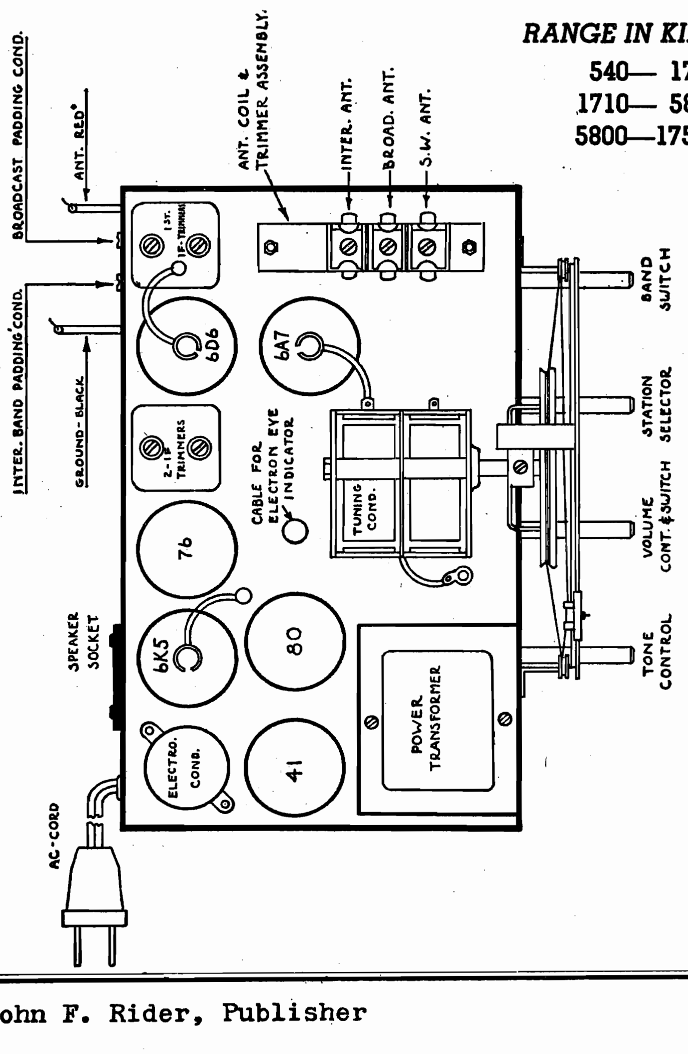
PACIFIC RADIO CORP.

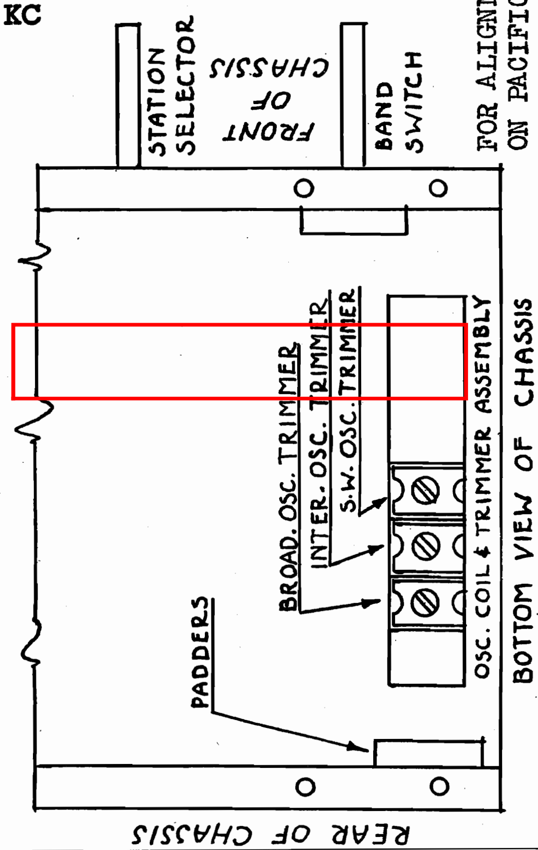


MODEL 41

RANGE IN KILOCYCLES

540— 1710 KC
1710— 5800 KC
5800—17500 KC

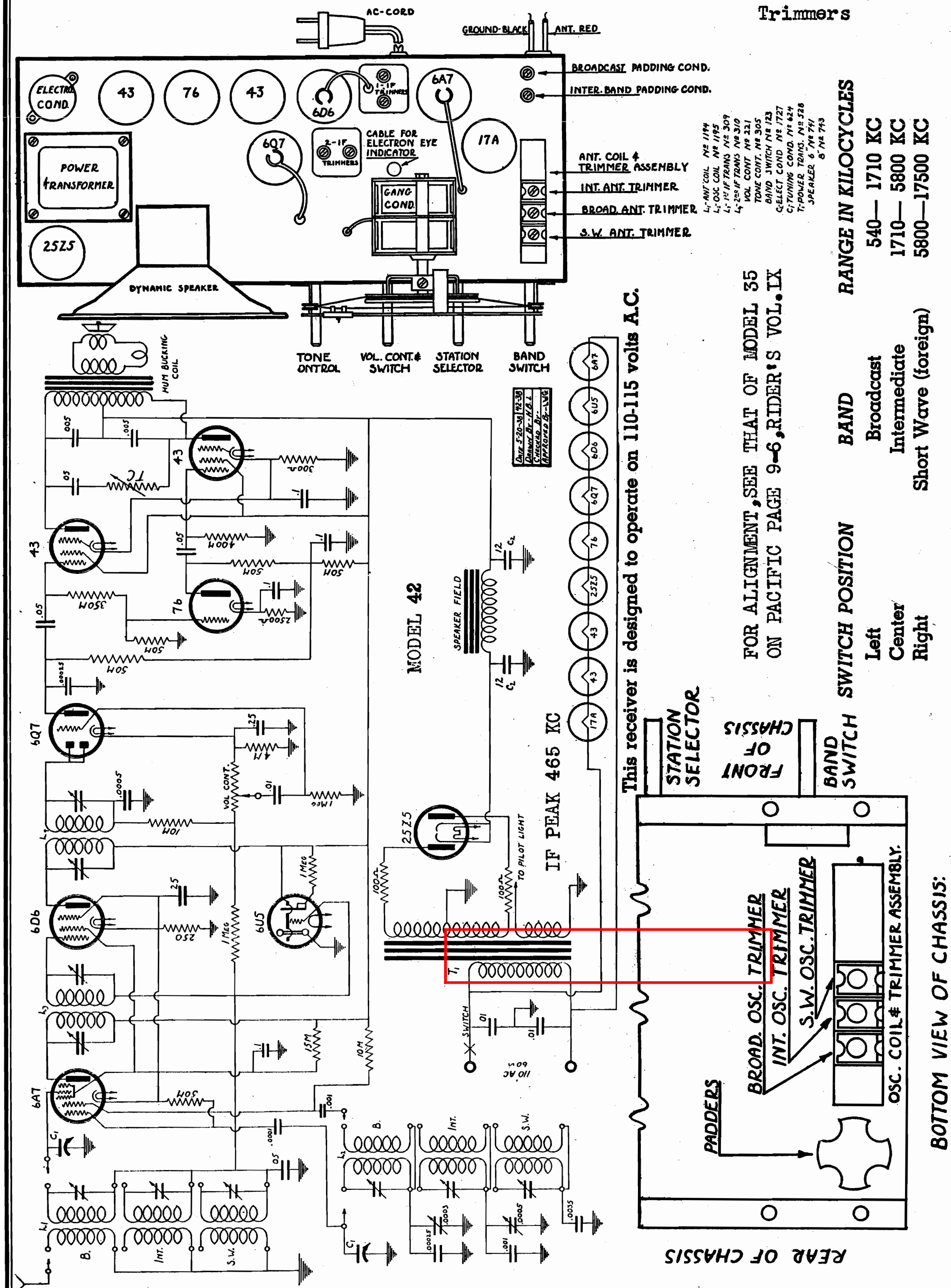




FOR ALIGNMENT, SEE THAT OF MODEL 35 ON PACIFIC PAGE 9-6, RIDER'S VOL. IX

MODEL 42
Schematic, Socket
Trimmers

PACIFIC RADIO CORP.



This receiver is designed to operate on 110-115 volts A.C.

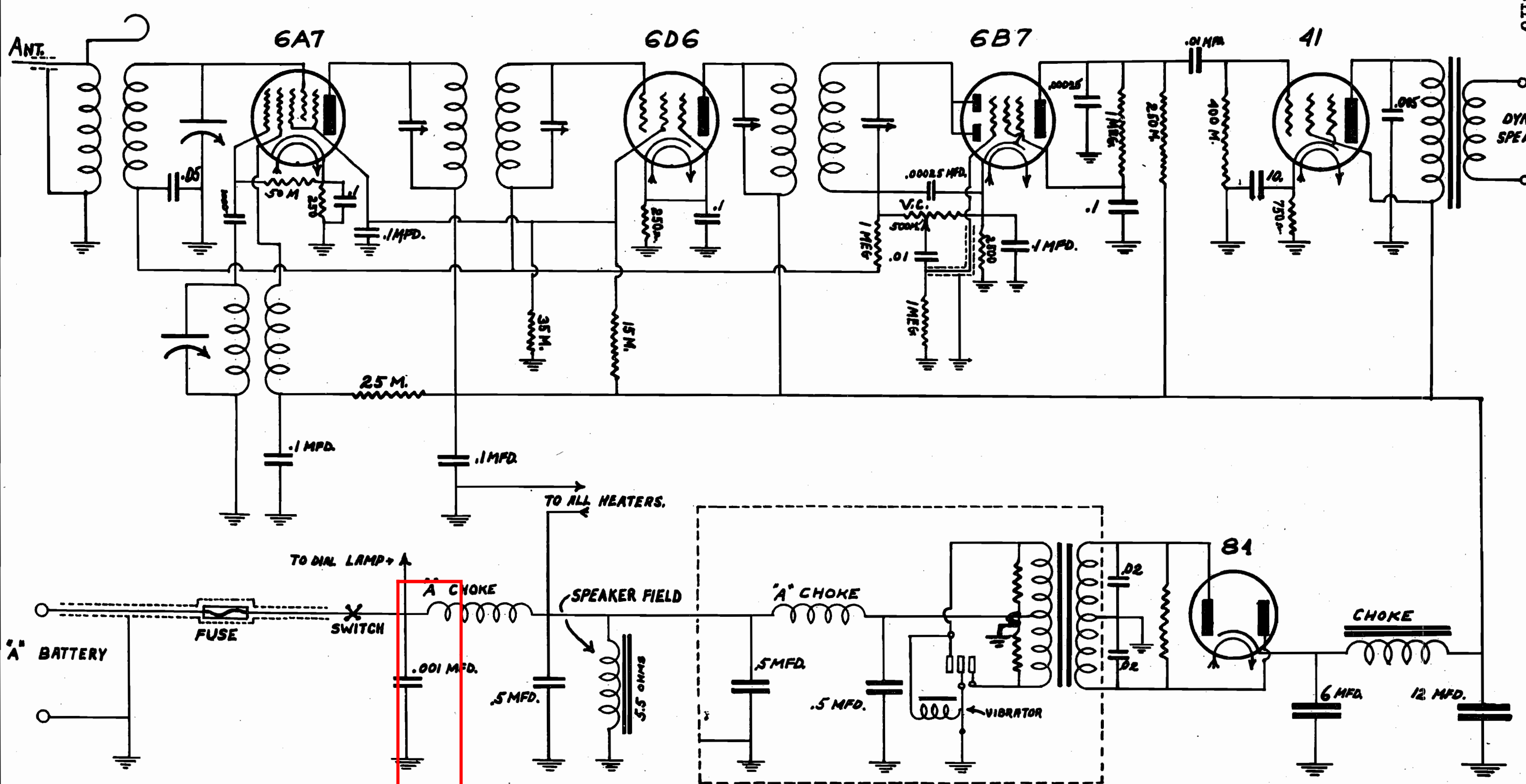
FOR ALIGNMENT, SEE THAT OF MODEL 35 ON PACIFIC PAGE 9-6, RIDER'S VOL. IX

BAND	SWITCH POSITION	RANGE IN KILOCYCLES
Broadcast	Left	540— 1710 KC
Intermediate	Center	1710— 5800 KC
Short Wave (foreign)	Right	5800—17500 KC

MODEL 101,Early 1935
Schematic
Alignment

PACIFIC RADIO CORP.

5 TUBE AUTO RADIO



CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOLUME VIII

ENGINEERING DEPARTMENT		
CIRCUIT —— 5 TUBE AUTO SUPERHET		
APP. BY	DR. BY	APRIL 1, 1935

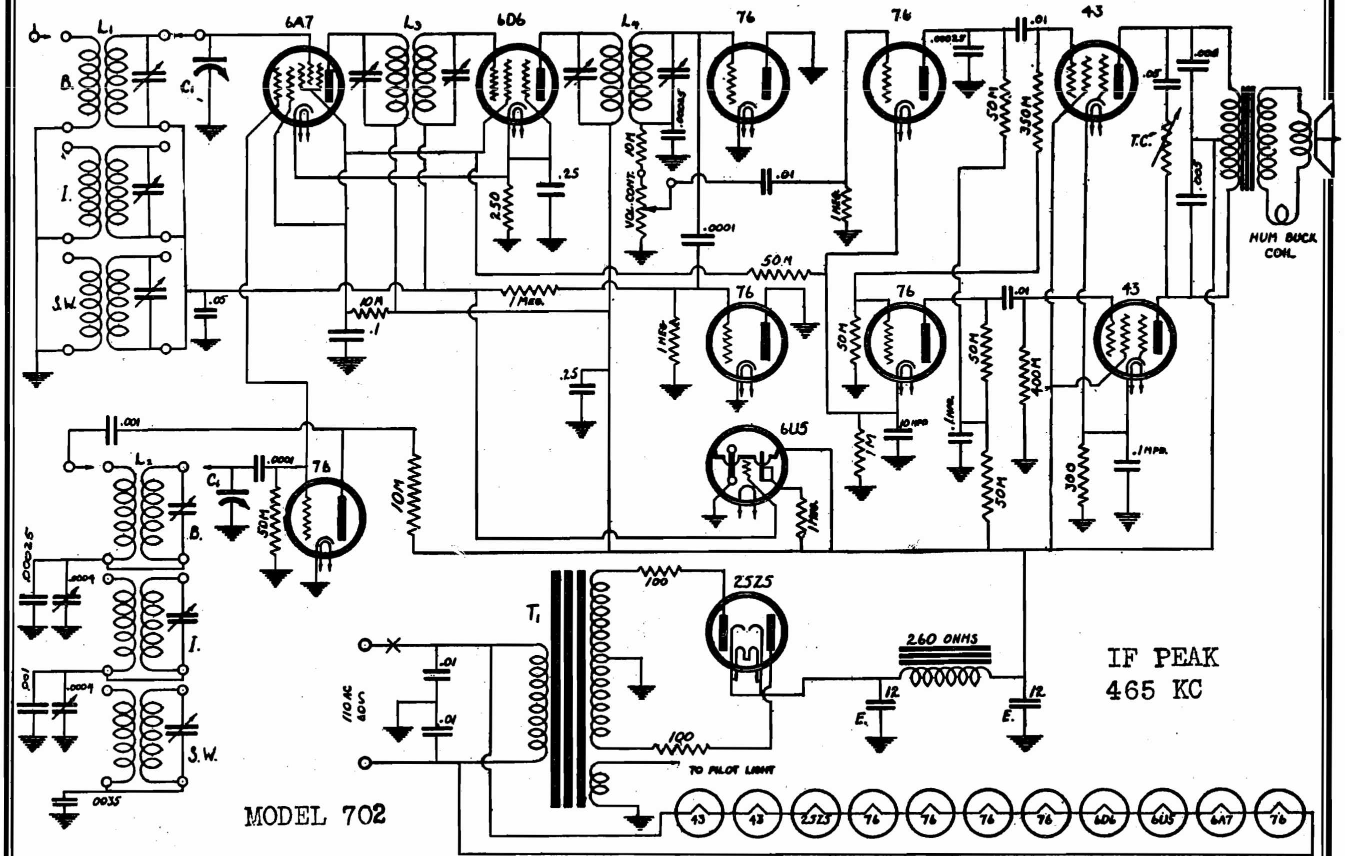
ALIGNMENT

INT. FREQ. PEAK----456 KC

ALIGN TRIMMER CONDENSERS AT 1400 KC

PACIFIC RADIO CORP.

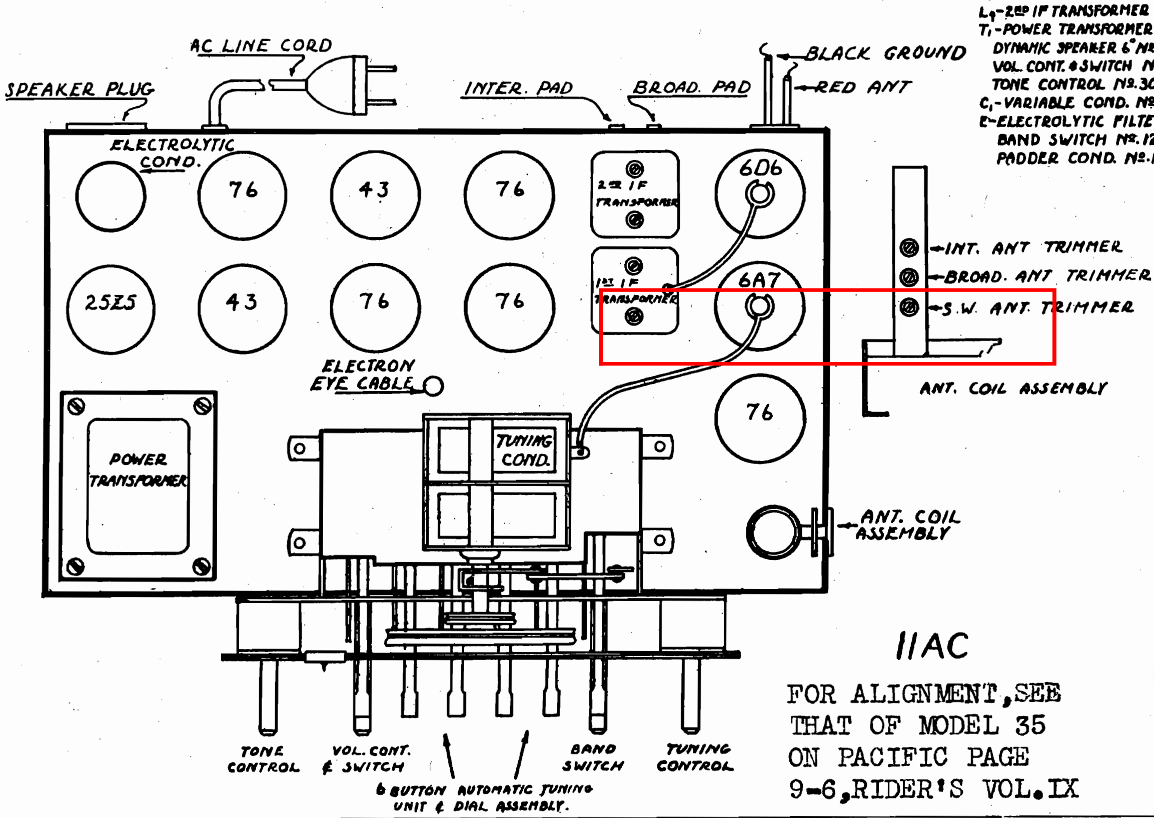
MODEL 702
Schematic, Socket
Trimmers



IF PEAK
465 KC

This receiver is designed to operate on 110-115 volts A.C. 60 cycles.

- L1 - ANT. COIL ASSEMBLY Nº. 1194.
- L2 - OSC. COIL ASSEMBLY Nº. 1195.
- L3 - 1st IF TRANSFORMER Nº. 309.
- L4 - 2nd IF TRANSFORMER Nº. 310.
- T1 - POWER TRANSFORMER Nº. 528.
- DYNAMIC SPEAKER 6" Nº. 741 8" Nº. 742.
- VOL. CONT. & SWITCH Nº. 221.
- TONE CONTROL Nº. 305.
- C1 - VARIABLE COND. Nº. 624.
- E - ELECTROLYTIC FILTER COND. Nº. 1789.
- BAND SWITCH Nº. 123.
- PADDER COND. Nº. 10112.



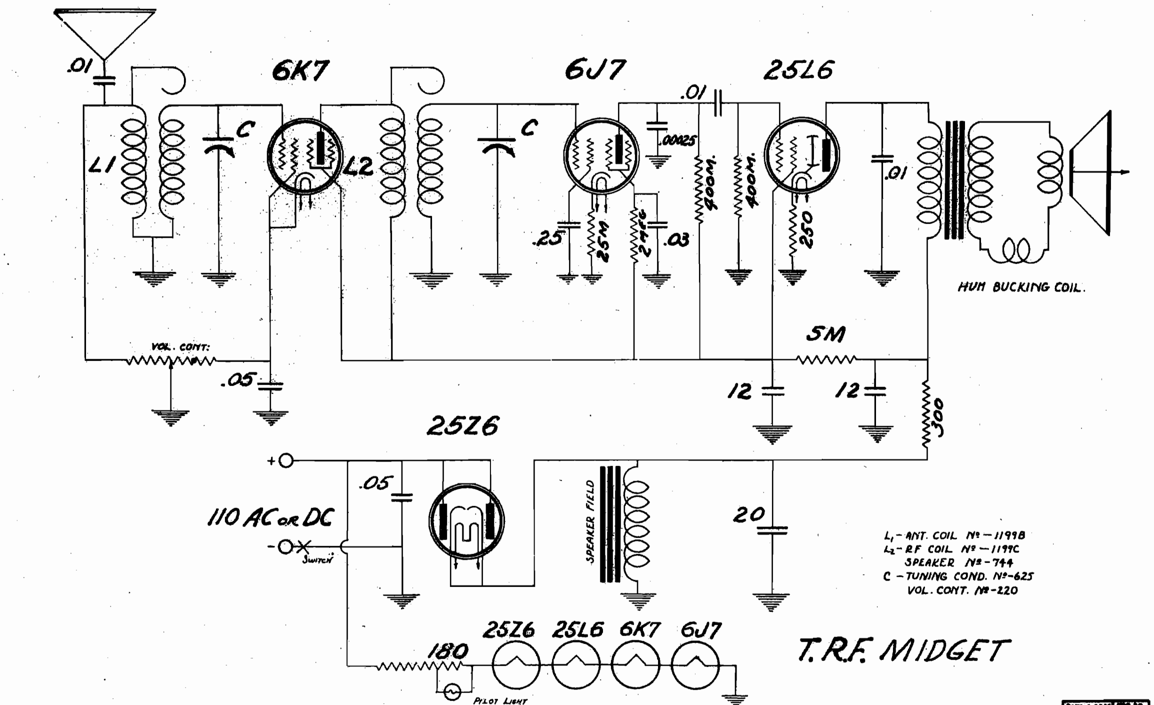
BAND	RANGE IN KILOCYCLES
Broadcast	540— 1710 KC
Intermediate	1710— 5800 KC
Short Wave (foreign)	5800—17500 KC

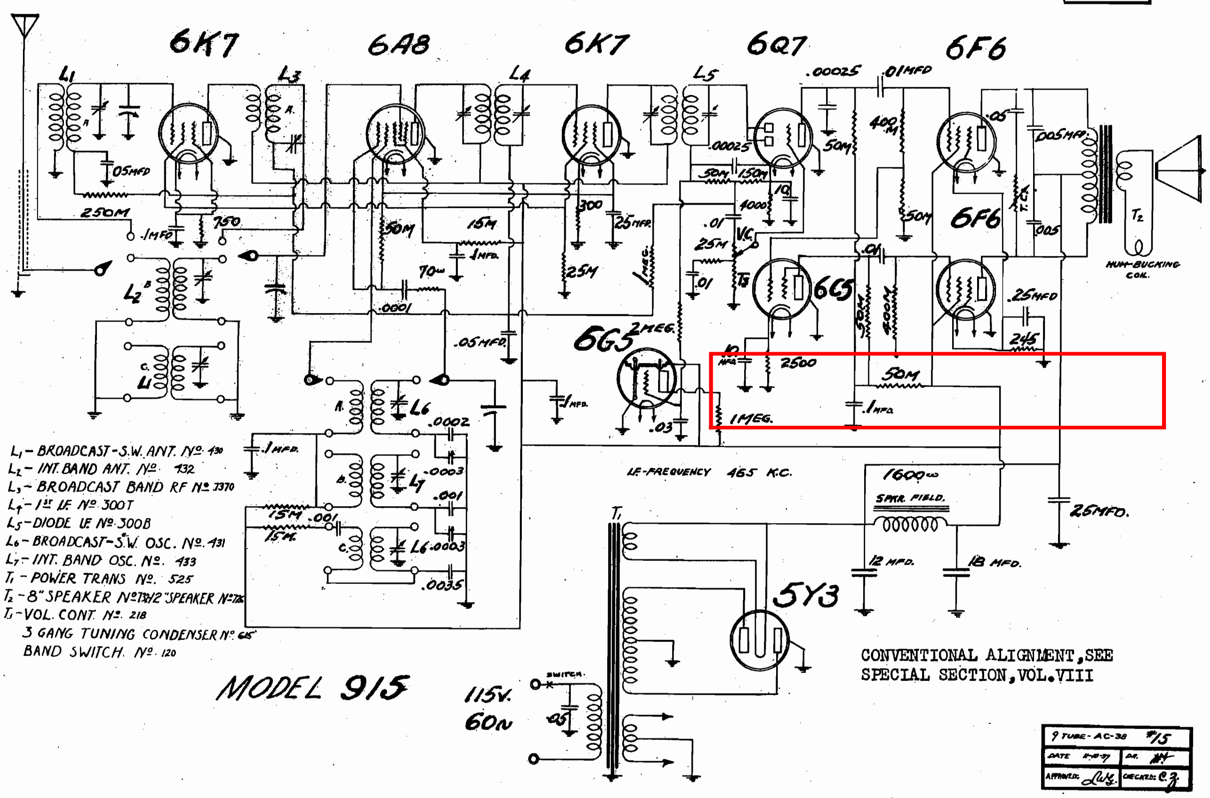
11AC

FOR ALIGNMENT, SEE THAT OF MODEL 35 ON PACIFIC PAGE 9-6, RIDER'S VOL. IX

MODEL TRF Midget
Schematic
MODEL 915
Schematic, Alignment

PACIFIC RADIO CORP.



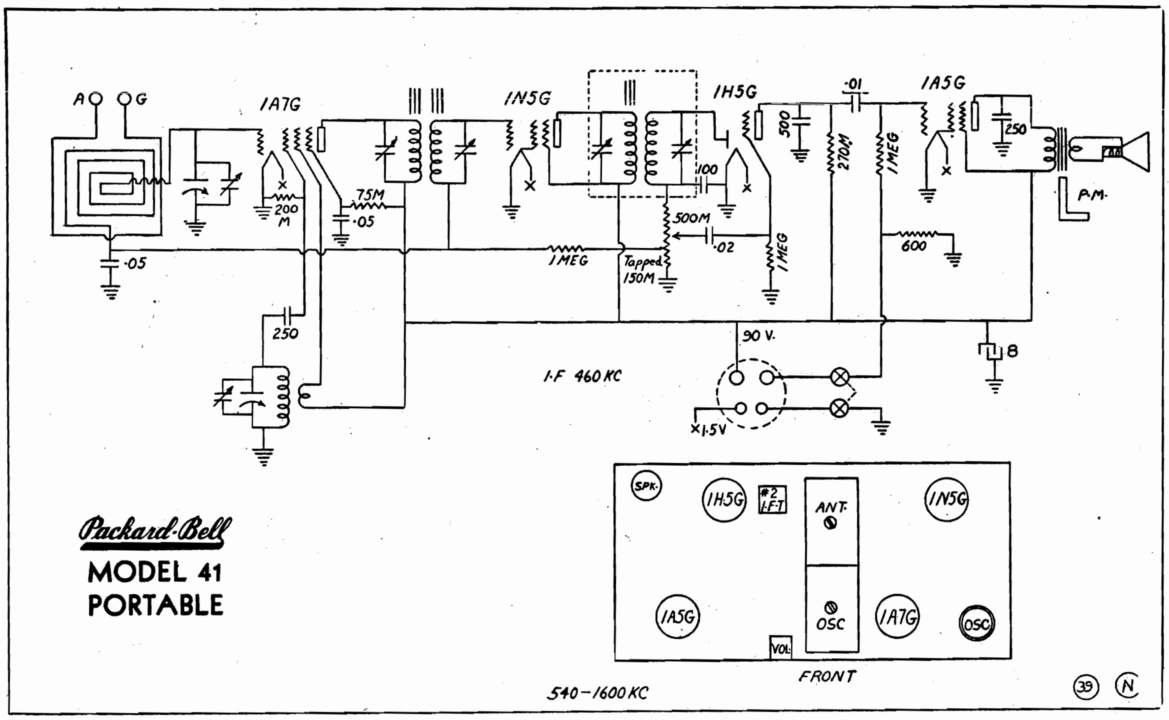


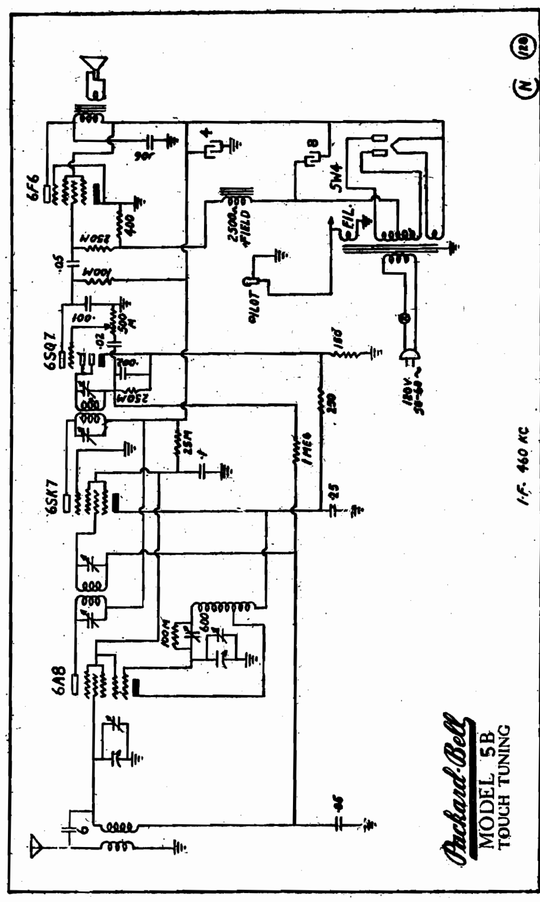
CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION, VOL. VIII

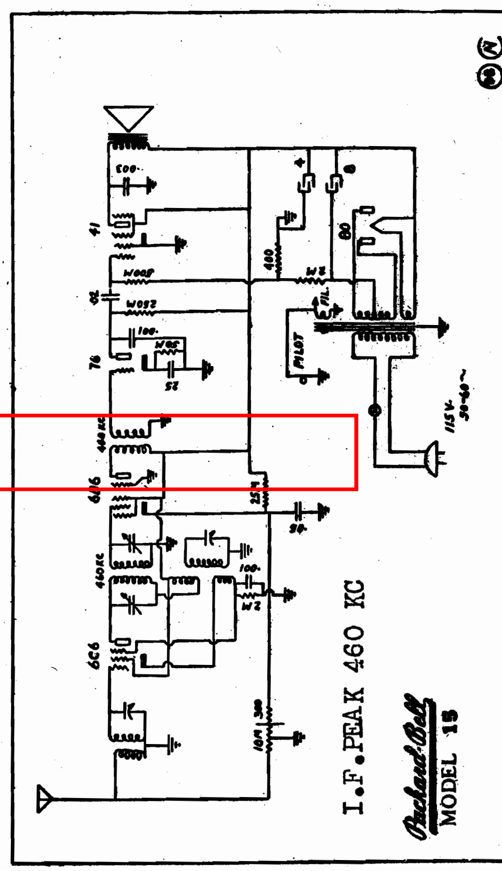
MODEL 41
Schematic, Socket
Trimmers

PACKARD BELL CO.

MODEL 5B
MODEL 15
Schematics





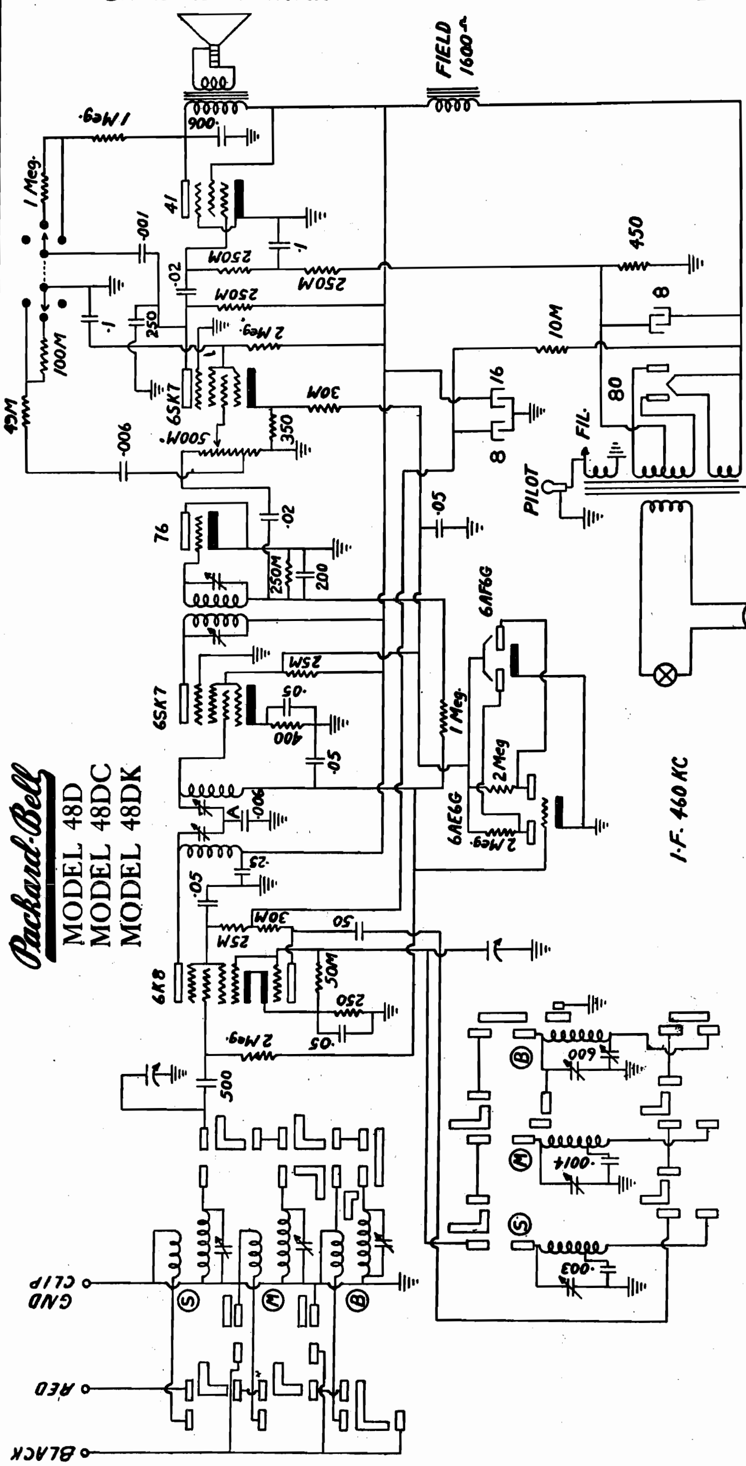


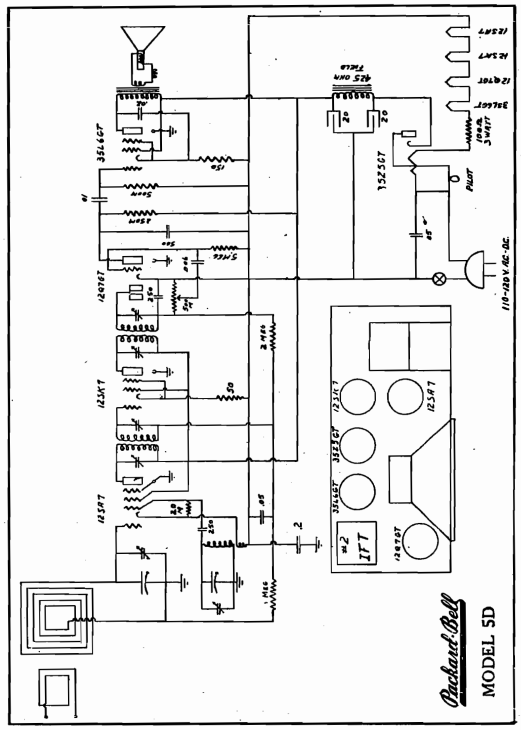
MODEL 5D
MODEL 40 Portable
Schematics, Socket
MODELS 48D, 48DC, 48DK
Schematic

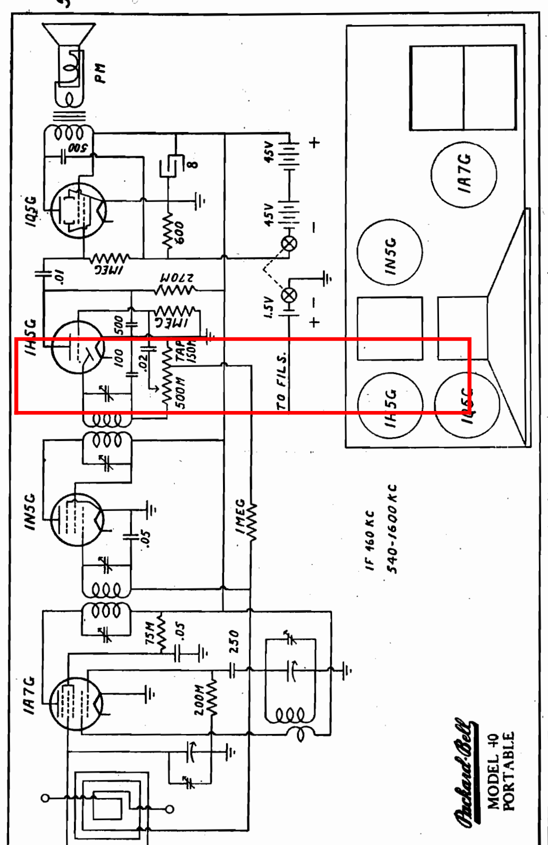
PACKARD BELL CO.

NOTE---
1. GROUND POINT "A"
2. ALIGN I.F. USUAL METHOD
3. REMOVE GROUND AT "A"
4. BAND SWITCH SHOWN IN BROADCAST POSITION

B. 550–1750 KC
M. 1.75–6.25 MC
S. 6.25–22 MC

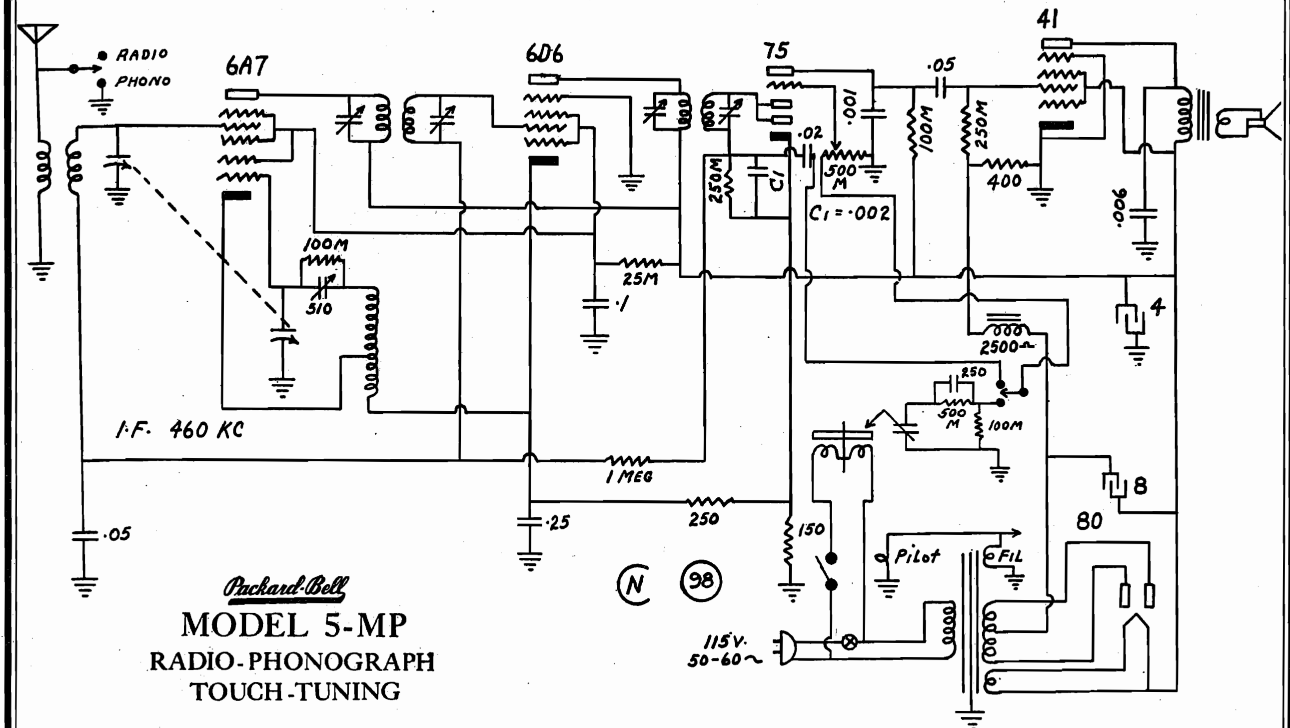




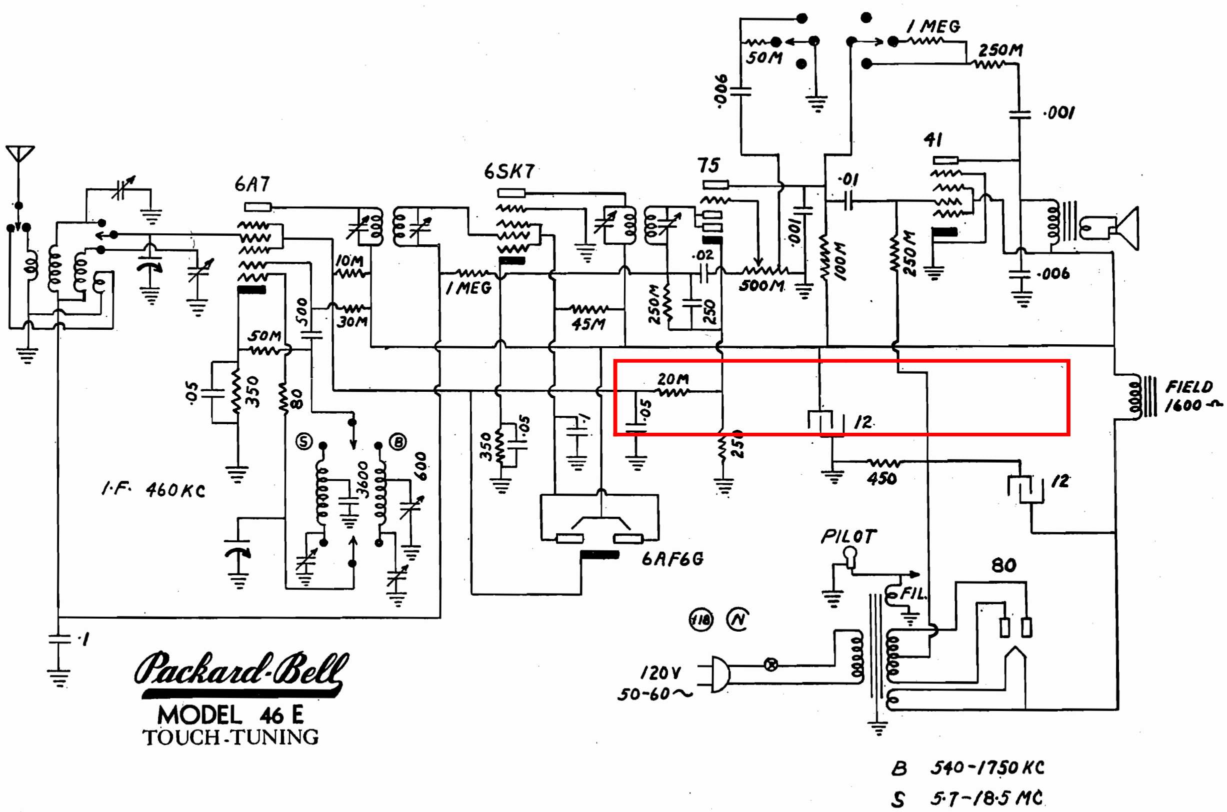


MODEL 5MP
MODEL 46E
Schematics

PACKARD BELL CO.



Packard-Bell
MODEL 5-MP
RADIO-PHONOGRAPH
TOUCH-TUNING

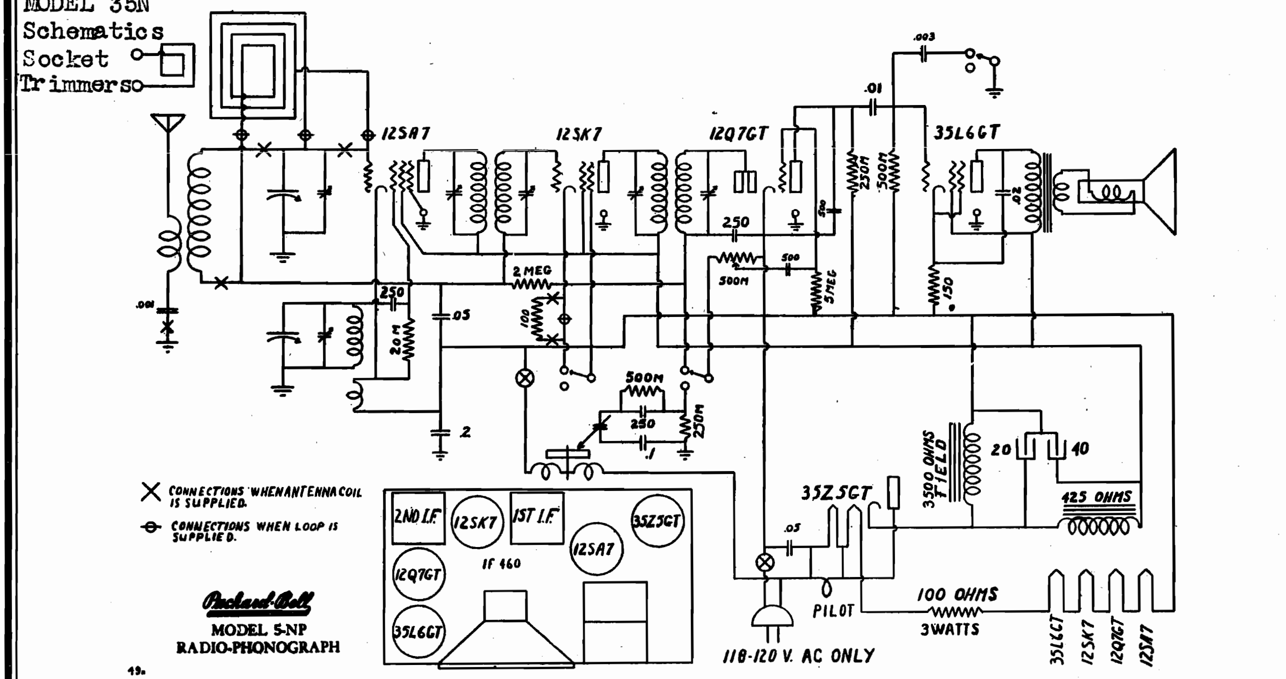


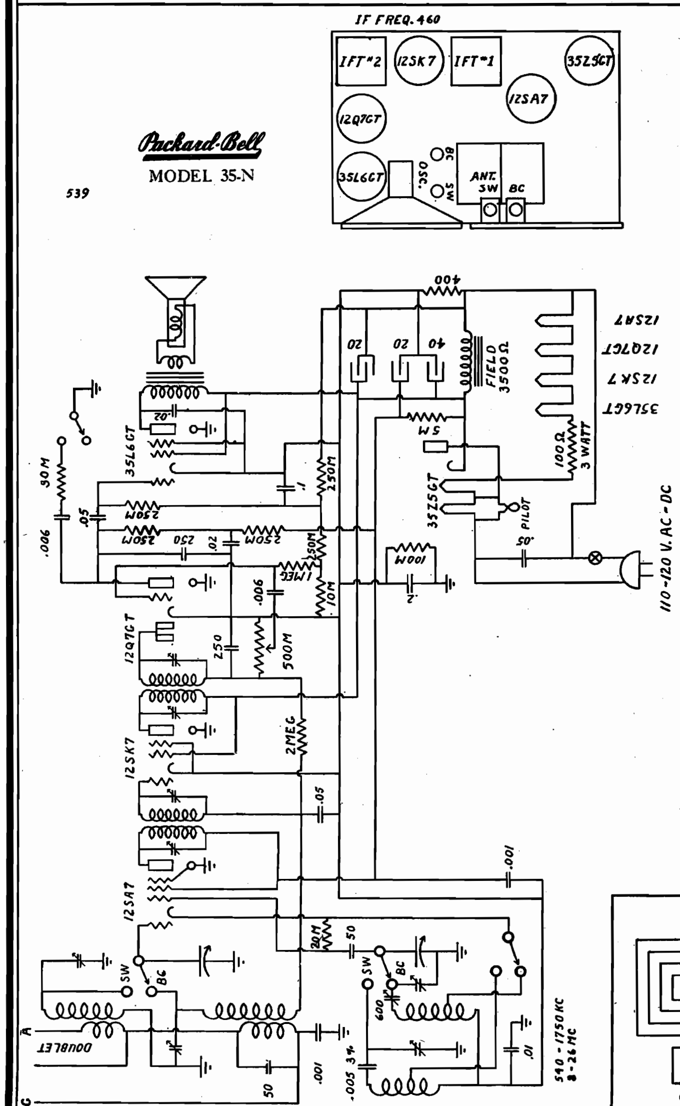
Packard-Bell
MODEL 46 E
TOUCH-TUNING

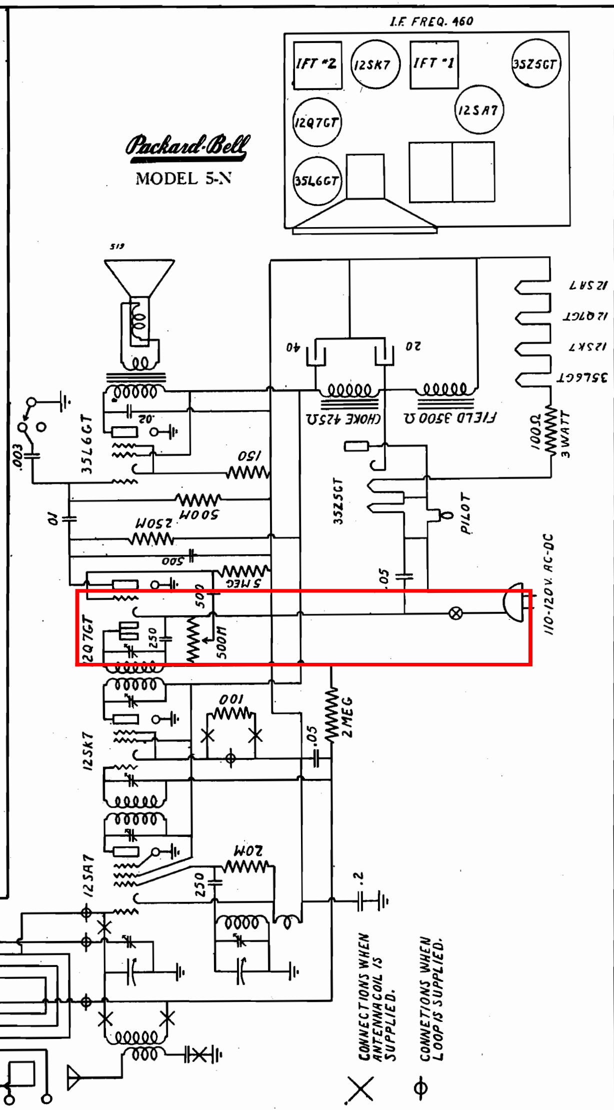
B 540-1750 KC
S 5.7-18.5 MC

MODEL 5N
MODEL 5NP
MODEL 35N
Schematics
Socket
Trimmers

PACKARD BELL CO.







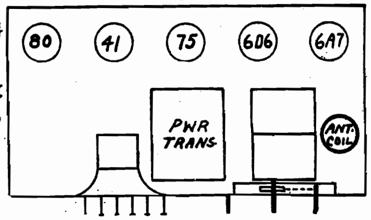
MODEL 75 Auto
Schematic, Socket
Trimmers, Alignment

PACKARD BELL CO.

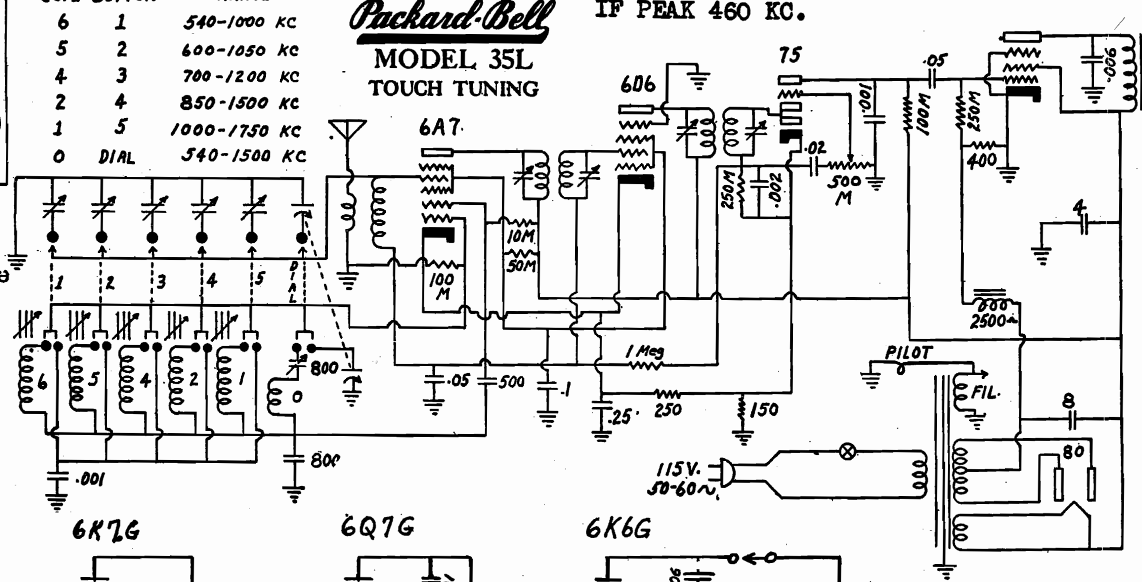
MODEL 35L
Schematic, Socket
Tuner Data

Packard-Bell MODEL 35L TOUCH TUNING

IF PEAK 460 KC.



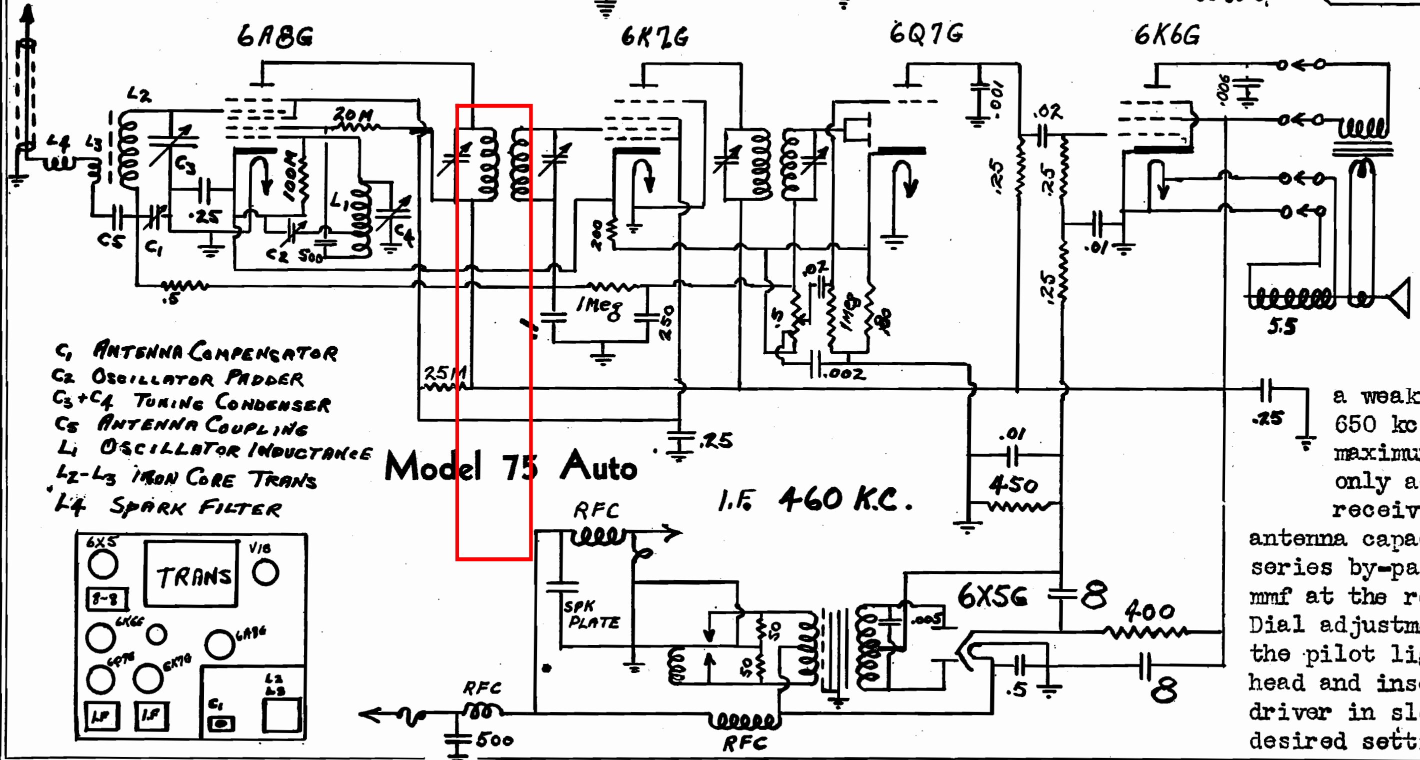
COIL	BUTTON	RANGE
6	1	540-1000 KC
5	2	600-1050 KC
4	3	700-1200 KC
2	4	850-1500 KC
1	5	1000-1750 KC
0	DIAL	540-1500 KC



TOUCH TUNING PROCEDURE. Station with lowest frequency is assigned to Button No.1. Push this to "IN" position, select station by turning Osc. screw No.1 for maximum volume and adjust further with Ant.Trimmer screw No.1. Set other four buttons in the same way with their respective adjustments. Do not use button marked "Dial" to change from manual tuning; just push button for station desired.

Model 75 Auto

I.F. 460 K.C.

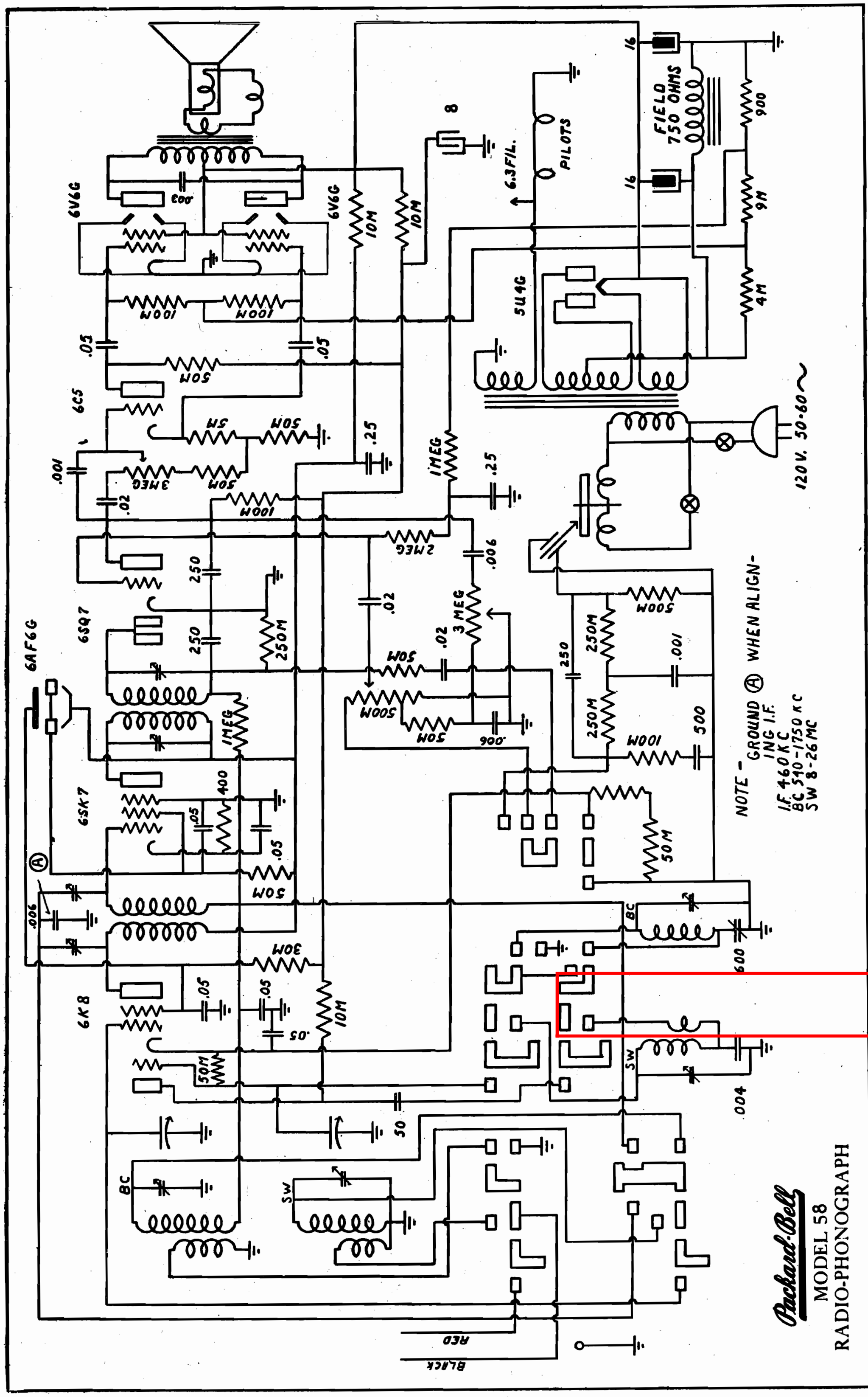


C_1 ANTENNA COMPENSATOR
C_2 OSCILLATOR PADDER
C_3+C_4 TUNING CONDENSER
C_5 ANTENNA COUPLING
L_1 OSCILLATOR INDUCTANCE
L_2-L_3 IRON CORE TRANS
L_4 SPARK FILTER

Ant.Trimmer is in front corner of box. To trim remove button in box. Turn station knob until stop is reached; Adjust pointer to the right hand stop line on dial face. Tune in a weak signal between 550 and 650 kc and adjust trimmer for maximum volume. This is the only adjustment to match the receiver to the antenna. If antenna capacity is too high, use a series by-pass condenser, 250-500 mmf at the receiver and shield it. Dial adjustment is made by removing the pilot light in rear of control head and inserting a small screwdriver in slot, turning pointer to desired setting.

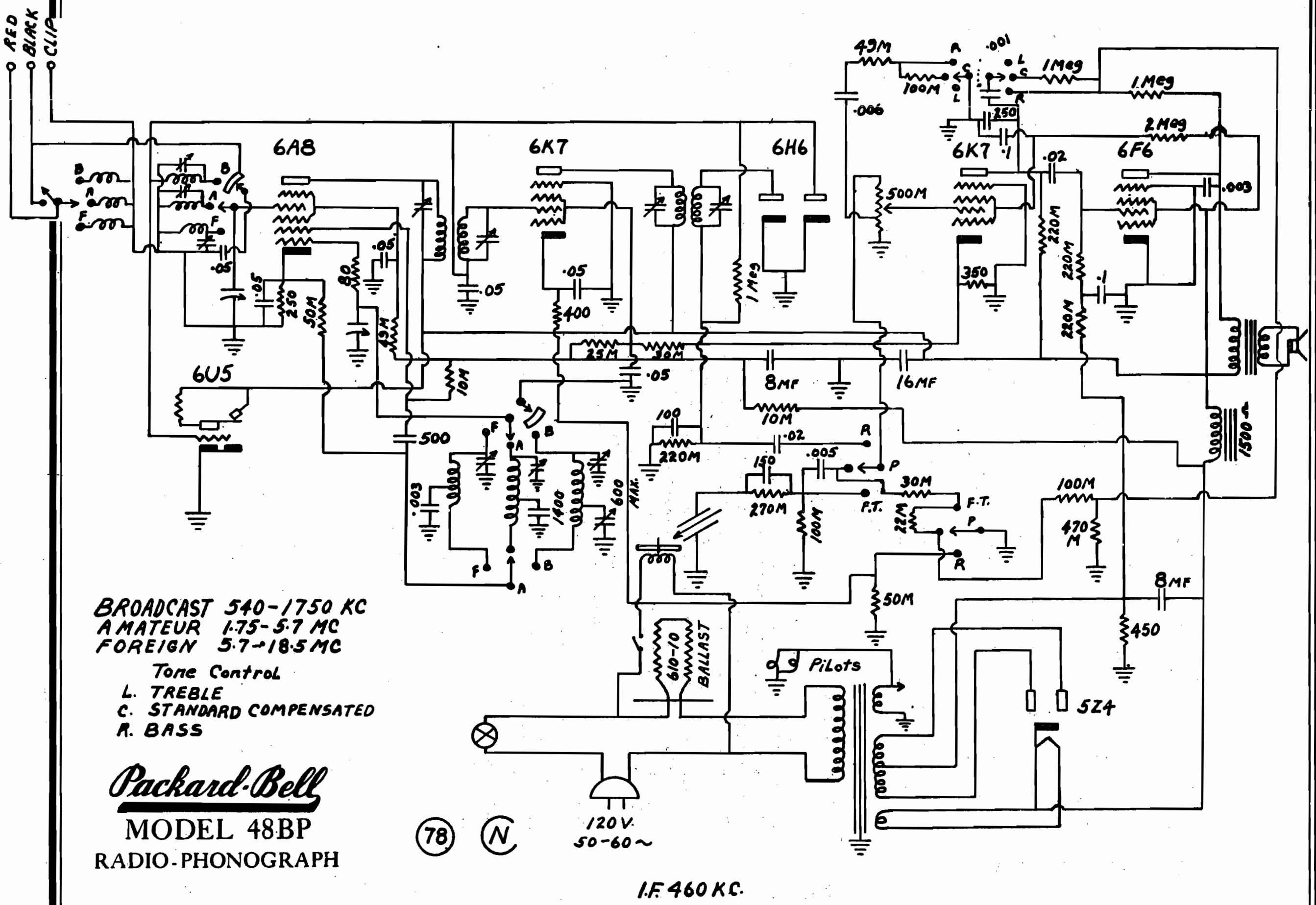
MODEL 58
Schematic

PACKARD BELL CO.

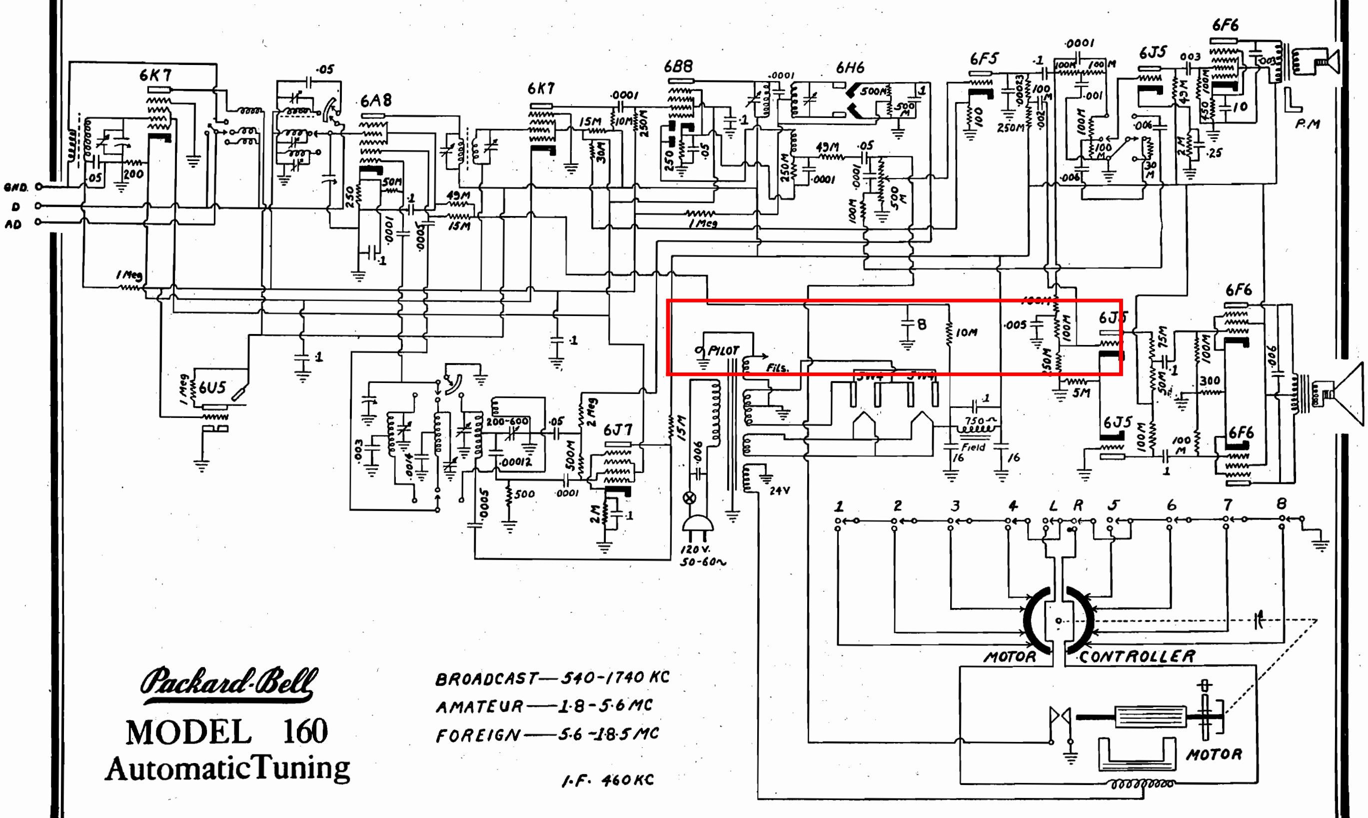


MODEL 48BP
MODEL 160
Schematics

PACKARD BELL CO.



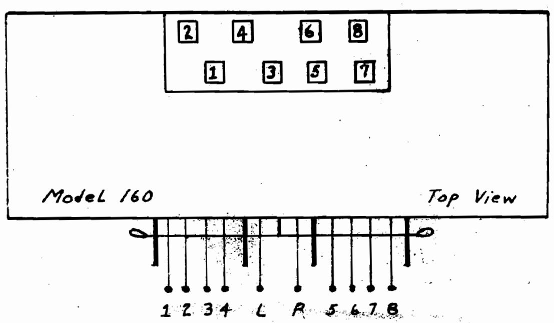
Packard-Bell
MODEL 48BP
RADIO-PHONOGRAPH

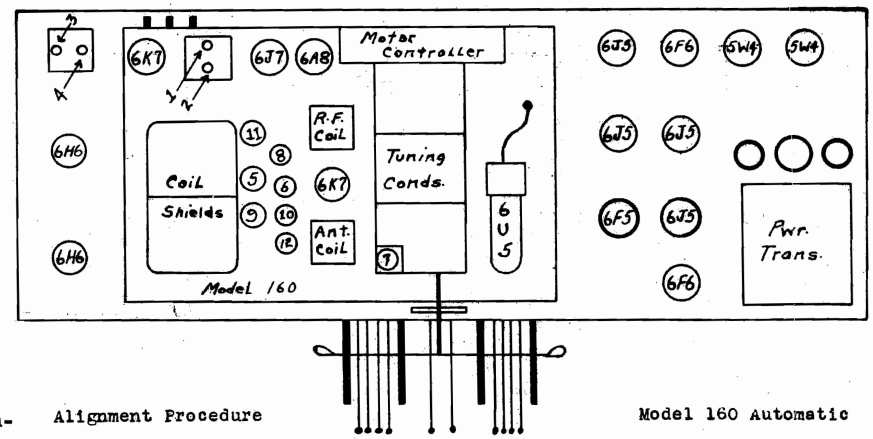


Packard-Bell
MODEL 160
AutomaticTuning

MODEL 160
Socket, Trimmers
Tuner Data, Alignment

PACKARD BELL CO.





Model 160 Automatic

The automatic frequency control in the Model 160 Packard-Bell Radio is so adjusted that it does not interfere with the normal selectivity of the receiver. Any station that can be received without automatic frequency control can also be received with it. The only instances where A.F.C. will give preference to a more powerful station is where the stronger station will be heard in the background of the weaker one. From this it is obvious that an A.F.C. switch is unnecessary. This eliminates a control which would have been confusing to most people.

INSTRUCTION FOR SETTING MARKERS ON CONTROLLER. To begin with, in setting the motor controller (located at center-rear of chassis) one must first determine what stations are desired on the eight station keyboard. To do this examine the stationized dial and determine the location of stations related to each side of dial center. This done, it is then necessary to allot a sufficient number of sliders (station markers) corresponding to push-button switches on station keyboard of receiver panel below large dial.

Let us take for example a choice which would give us 5 stations between center and left hand side of dial, and 3 between center and right hand side of dial. We then consider push-button switches to correlate in numerical order with stations chosen as follows: KECA, KGFJ, KRKD, KNX, KFWB, KHJ, KMPC, and KFI, giving KECA No. 1 position, others following consecutively, completing with KFI as No. 8. Considering push-buttons on panel from left to right as reading from 1 to 8, a correct sequence will result for control sliders at rear of chassis. Control sliders are set up to correspond with buttons in correct numerical order, (that is, on rear slider rail you will find 4 buttons, and on front slider rail 4 buttons). Buttons or sliders on front are odd numbers, i.e., 1-3-5-7, and on rear rail are the even numbers, i.e., 2-4-6-8. Looking from rear the right hand slider corresponds to left front panel push button looking from the front.

OPERATION: Starting with KECA, push button No. 1 until it locks. We then reach back and push slider No. 1 back and forth until dial pointer comes to rest at KECA as marked on dial. Follow this procedure for all other stations.

The buttons marked R and L are used to tune in stations not set up on the keyboard. For example: If one is listening to KHJ and decides to change to KFOX then all that is necessary is to press the button L down until pointer turns to KFOX, then release the button and the pointer will stop. Or if one is listening to KHJ and wants to change to KEHE just press the button R down and hold until the pointer gets to KEHE, then release. In other words button R controls the motor to the right and button L to the left.

Alignment Procedure

Model 160 Automatic

Turn the dial (manually) to 1740 kc position (plates of tuning condenser completely unmeshed) and set the volume control at maximum. Turn the band switch to Broadcast position. Short the cathode of 6H6 tube (now connected to 2 meg.resistor) to chassis so that the automatic frequency control action will be nullified during alignment. Connect the output lead of the signal generator to the control grid of the 6A8 tube through a .006 condenser and set dial of generator to 460 kc. Adjust I.F. trimmers 1-2-3 and 4 until maximum output is obtained, meanwhile maintaining as low a value of signal as will allow obtaining of accurate adjustment.

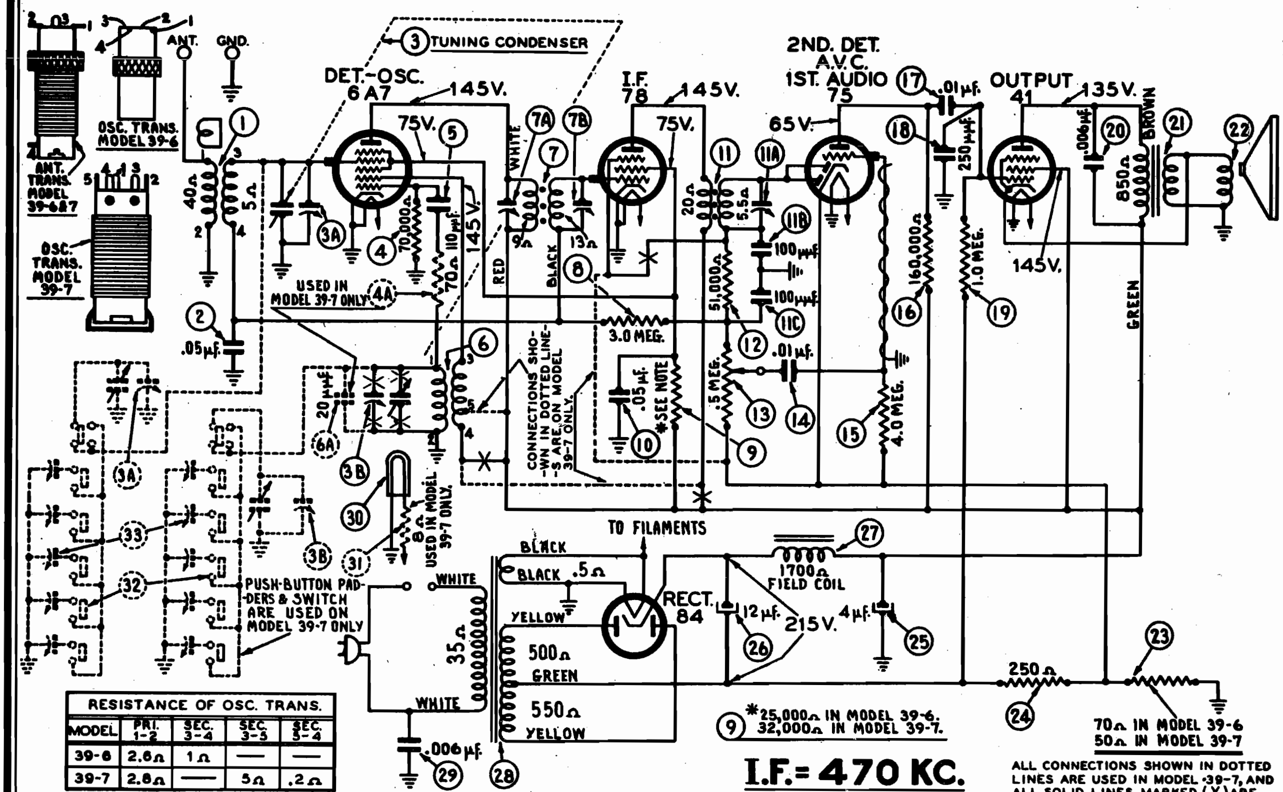
Now tune signal generator to 1740 kc and connect output lead through .006 condenser to antenna post of receiver. Turn dial pointer of receiver to horizontal position and adjust oscillator trimmer 5, antenna trimmer 7 and first detector trimmer 6 for maximum output. Next tune the generator to 600 kc. Turn dial pointer of radio to point of maximum signal and adjust trimmer 8 for increase in signal. At the same time rock the tuning condenser back and forth through resonance while adjusting the padder until maximum output is obtained. This should occur when the receiver dial is set at approximately 600 kc. Now tune back across the dial and if not exactly on kc at the high frequency end readjust trimmers 5-6 and 7 for correction. Do not attempt to play this receiver with only one speaker as there are two audio channels and the tone quality will be very poor unless both speakers are used.

Band Number 2. (1.8 to 5.6 Mc) Turn knob of waveband switch to Amateur position. Tune signal generator to 5.5 mc and set radio dial to 5.5 position. Adjust oscillator trimmer 9 and antenna trimmer 10 for maximum output. There is no R.F. stage on the Amateur and Foreign bands.

Band Number 3. (5.6 to 18.5Mc) Turn knob of waveband switch to Foreign position. Tune signal generator to 18 mc and connect output lead to antenna post through a 200 MMfd condenser and a 400 ohm resistor. Set volume control at maximum. Turn radio dial to 18 mc and adjust oscillator trimmer 11 and first detector trimmer 12 for maximum output. After completing alignment of all bands then disconnect 6H6 cathode jumper so that the AFC will be active again. The discriminator circuit is adjusted at the factory and should not be touched under any circumstances.

MODELS 39-6,39-7,Code 121
Schematic,Voltage
Socket,Trimmers

PHILCO RADIO & TELEV. CORP.



RESISTANCE OF OSC. TRANS.

MODEL	PRI. 1-2	SEC. 3-4	SEC. 3-5	SEC. 5-4
39-6	2.6Ω	1Ω	—	—
39-7	2.8Ω	—	5Ω	.2Ω

SCHEMATIC DIAGRAM MODELS 39-6 & 39-7

Models 39-6, 39-7, Code 121

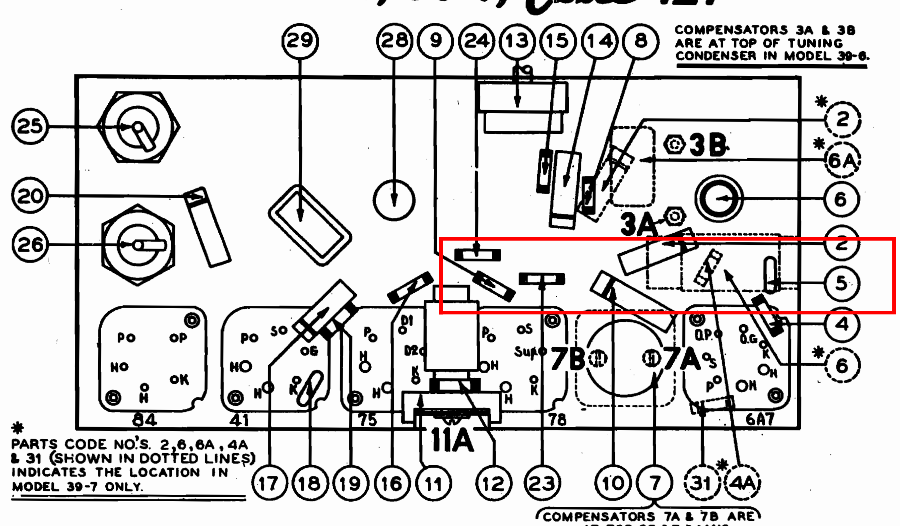


Fig. 2. Part Locations, Underside of Chassis

FREQUENCY RANGE: 530 to 1720 K.C.

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES USED: 6A7, First Detector Oscillator; 78, I.F. Amplifier; 75, Second Detector, A.V.C., First Audio; 41, Audio Output and 84, Rectifier.

POWER SUPPLY: 115 V., 50 to 60 cycle A.C.
Power Transformers are available for operation on 115 V., 25 to 40 cycles A.C.

POWER CONSUMPTION: 30 watts.

AUDIO OUTPUT: One (1) watt.

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K.C. is the correct instrument for this purpose.

(2) Output Meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and screen terminals of the type 41 tube and adjusted for the 0 to 30 V.A.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Schem. No.	Description	Part No.
6A*	Silver Mica Cond. (20 mfd.) (39-7)	30-1123
7	1st I.F. Trans. Assy. (39-6)	32-3120
	1st I.F. Trans. Assy. (39-7)	32-3121
8	Resistor (3.0 meg., ½ watt)	33-350339
9	Resistor (25,000 ohms, ½ watt) (39-6)	33-325339
	Resistor (32,000 ohms, ½ watt) (39-7)	33-332339
10	Tubular Cond. (.05 mfd.)	30-4444
11	2nd I.F. Trans. Assy.	32-2674
12	Resistor (51,000 ohms, ½ watt)	33-351339
13	Volume Control (.5 meg.)	33-5254
14	Tubular Cond. (.01 mfd.)	30-4479
15	Resistor (4.0 meg., ½ watt)	33-540339
16	Resistor (160,000 ohms, ½ watt)	33-416339
17	Tubular Cond. (.01 mfd.)	30-4169
17	Tubular Cond. (.01 mfd.) (39-7)	30-4572
18	Mica Cond. (250 mmfd.)	30-1032
19	Resistor (1.0 meg., ½ watt)	33-510339
20	Tubular Cond. (.006 mfd.)	30-4125
21	Output Trans. (Speaker 36-1461)	
22	Cone and Voice Coil Assy. (Speaker 36-1461)	36-4095
23	Resistor (70 ohms, ½ watt), Model 39-6	33-070339
	Resistor (50 ohms, ½ watt), Model 39-7	33-050339
24	Resistor (250 ohms, ½ watt)	33-125339
25	Electrolytic Cond. (4 mfd., 300 V.)	30-2327
26	Electrolytic Cond. (12 mfd., 300 V.)	30-2328
27	Field Coil (Replace Speaker 36-1461)	
28	Power Trans. (115 V., 50 to 60 cycles)	32-7979

Schem. No.	Description	Part No.
1	Ant. Trans. (39-6)	32-2583
1	Ant. Trans. (39-7)	32-3039
2	Tubular Cond. (.05 mfd.)	30-4519
3	Tuning Cond. (39-6)	31-2335
3	Tuning Cond. (39-7)	31-2338
4	Resistor (70,000 ohms, ½ watt)	33-370339
4A*	Resistor (70 ohms, ½ watt) (39-7)	33-070339
5	Mica Cond. (110 mfd.)	30-1031
6	Oscillator Trans. (39-6)	32-3021
	Oscillator Trans. (39-7)	32-2122
29	Condenser (.006, moulded)	30-4423
30	Pilot Lamp	34-2064
31*	Pilot Lamp Resistor (8 ohms, ½ watt)	33-980331
32*	Push-Button Switch	42-1477
33*	Padder Strip Assy.	31-6290

Indicates parts used on Model 39-7 only.

TYPE OF CIRCUIT: Models 39-6, code 121; and 39-7, code 121, employ a five-tube A.C. operated superheterodyne circuit, covering standard broadcast frequencies; Automatic Volume Control, and Pentode Audio Output. In general the two models are similar but differ in their tuning mechanisms and cabinets.

Model 39-6 is manually tuned and is assembled in cabinet type C.

Model 39-7, code 121, in addition to being manually tuned, is equipped with six Electric Automatic Push-Buttons. Five push-buttons are used for selecting any one of five stations in the standard broadcast range, and one push-button for changing to manual tuning. The procedure for adjusting the push-buttons for reception of stations will be found in the instructions supplied with each set.

Operation in Order	SIGNAL GENERATOR			RECEIVER			Special Instructions
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	6A7	.1 mf.	470 K.C.	580 K.C.	Vol. Cont. Max.	11A, 7B, 7A	Adjust for max. output
2	Ant. Lead	100 mf.	1550 K.C.	1550 K.C.	Vol. Cont. Max.	3B, 3A	Adjust for max. output Note A, B

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—DIAL CALIBRATION: With the tuning condenser in "maximum capacity" position (plates fully meshed), set the dial pointer between the two horizontal lines at the low frequency end of the scale (550 K.C.).

Schematic, Chassis
Parts List

PHILCO RADIO & TELEV. CORP.

MODEL 39-17
Codes 121, 122

REPLACEMENT PARTS
Model 39-17; Codes 121 & 122

Schem. No.	Description	Part No.
1	Antenna Transformer	32-3039
2	Condenser (.05 mf. tubular)	30-4519
3	Tuning Condenser Assembly	31-2265
4	Resistor (51,000 ohms, ½ watt)	33-351339
5	Condenser (110 mmf. mica)	30-1031
6	Condenser (25 mmf., silver plated mica)	30-1112
7	Oscillator Transformer	32-3040
8	Resistor (3.0 megohm)	33-530339
9	Condenser (.03 mf. tubular)	30-4449
10	Resistor (40,000 ohms, ½ watt)	33-340339
11	1st I. F. Transformer Assembly	32-3075
12	2nd I. F. Transformer Assembly	32-2944
13	Resistor (51,000 ohms, ½ watt)	33-351339
14	Volume Control and On-Off Switch	33-5276
15	Condenser (.01 mf. tubular)	30-4479
16	Condenser (mica), 250 mmf.	30-1032
17	Condenser (.01 mf. tubular)	30-4572
18	Resistor (16,000 ohms, ½ watt)	33-316339
19	Resistor (1.0 megohm, ½ watt)	33-510339
20	Resistor (4.0 megohm, ½ watt)	33-540339
21	Condenser (.01 mf. tubular)	30-4572
22	Output Transformer	32-7980
23	Cone and Voice Coil Assembly for Speaker (Part No. 36-1426-1)	36-4083
	(Part No. 36-1426-3)	36-4085
	Cone and Voice Coil Assembly for Speaker (Part No. 36-1440)	36-4086
24	Resistor (250 ohms, wire wound)	33-125431
25	Resistor (70 ohms, ½ watt)	33-070339
26	†Field Coil for Speaker (Pt. No. 36-1426)	
	†Field Coil for Speaker (Pt. No. 36-1440)	
27	Condenser (12 mf. electrolytic)	30-2319
28	Condenser (4 mf. electrolytic)	30-2236
29	Condenser (.03 mf. tubular)	30-4449
30	Power Transformer (115 volts, 50-60 cycles)	32-7974
31	Condenser (.01 mf.—.01 mf., bakelite)	3903DG
32	Pilot Lamp	34-2064
33	Pilot Lamp	34-2064

MISCELLANEOUS PARTS

Description	Part No.
Automatic Tuning Unit (complete)	31-2282
Bezel Assembly (dial)	40-6364
Bezel Gasket (dial)	27-9174
Bezel (push buttons)	28-5929
Bezel Gasket (push buttons)	27-9218
Bezel Clamp (dial)	28-5153
Cable and Plug (power)	L-2778
Dial and Frame Assembly	31-2283
Dial Tuning Drum Assembly	31-2281
Dial Tuning Cord Assembly	31-2275
Dial Tuning Spring (cord)	28-8919
Clip (Mtg. R. F. Coils)	28-5002
Clip (Mtg. R. F. Coils)	28-5003
Escutcheon Plate (extension shafts, F cabinet)	56-1051
Escutcheon Pin	W-950
Knob (Tuning)	27-4750
Knob (Volume)	27-4753
Pilot Lamp Socket Assembly	38-9612
Pointer (dial)	28-5934
Push-Buttons	27-4749
Shaft Extension (Volume)	38-9640
Shaft Extension (Tuning)	28-6928
Sleeve-long Tuning Shaft Extension (F Cabinet)	28-6935
Sleeve-short Tuning Shaft (T and F Cabinet)	28-6887
Spring-retaining Volume Shaft	28-8915
Socket (6 prong)	27-6036
Socket (7 prong)	27-6107
Socket (5 prong)	27-6035
Speaker (F Cabinet)	36-1440
*Speaker (T Cabinet) optional	36-1426-1 / 36-1426-3
Tab Kit	40-6391

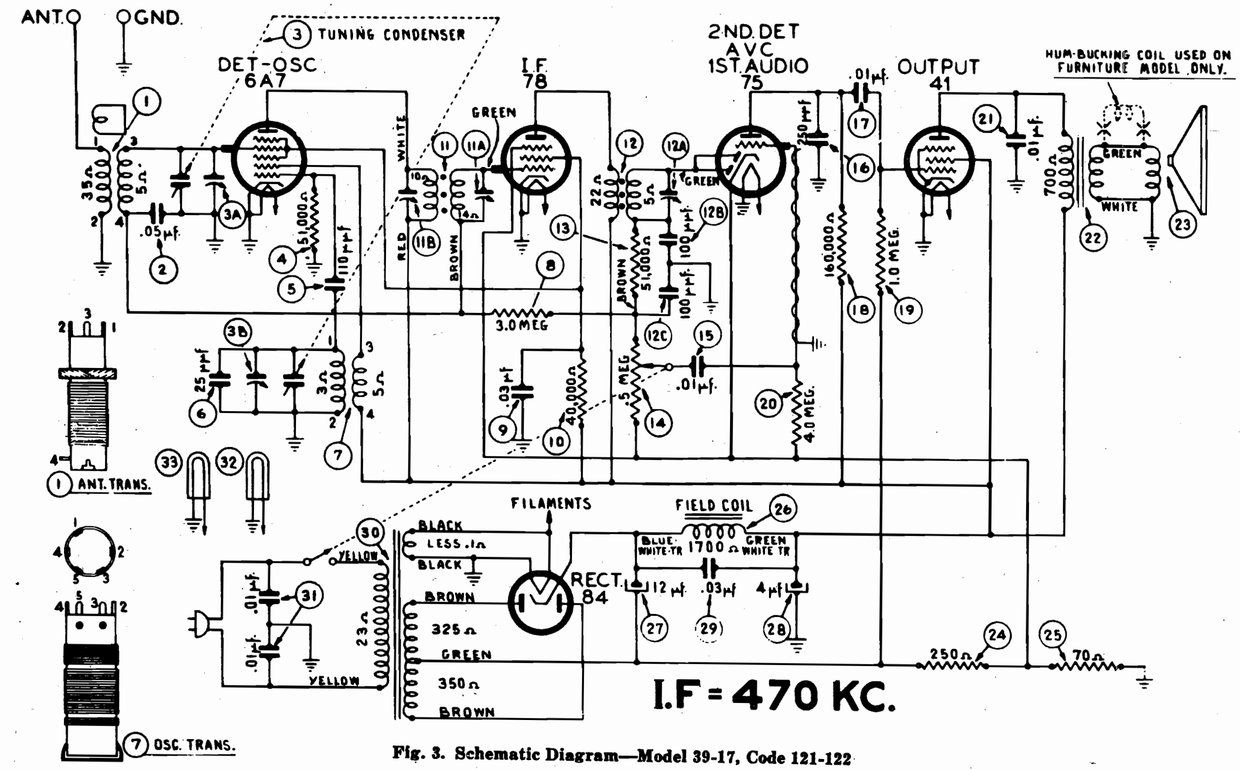


Fig. 3. Schematic Diagram—Model 39-17, Code 121-122

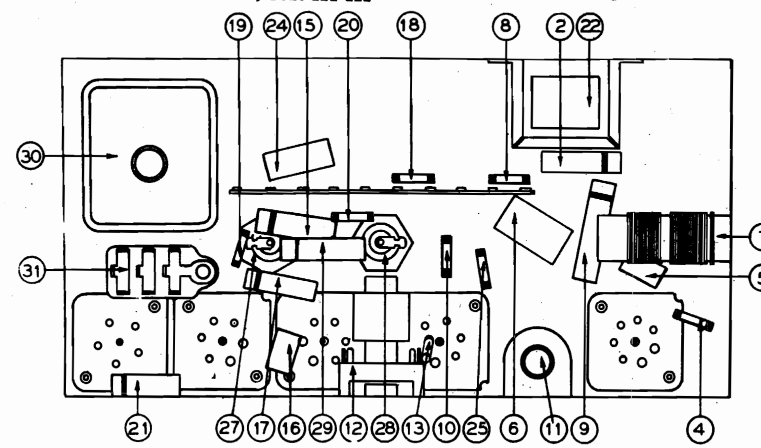


Fig. 4. Part Locations, Underside of Chassis

† Replace Speaker.
* When ordering Speaker or Cone assembly specify which of the small numbers (-1 or -3) following the part number is required.

June 1938

MODEL 39-17
Codes 121,122
Socket,Trimmers,
Alignment,Voltage

PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

TYPE OF CIRCUIT: A. C. operated; superheterodyne circuit, covering standard broadcast band (540 K. C. to 1720 K. C.); Automatic Volume Control; and pentode output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

The receiver is designed to operate from a "Philco Utility Aerial," part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. Frequency—50-60 cycles. Power consumption—40 watts.

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGE: 540 to 1720 K. C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five tubes: 1-6A7, 1st detector and oscillator; 1-78, I. F.; 1-75, 2nd detector, Automatic Volume Control, and 1st audio; 1-41, Output; and 1-84, Rectifier.

TUNING MECHANISM: Pulley and cable drive for Manual tuning. Push-Button for Automatic Tuning. The procedure for adjusting and operating the Automatic Tuning Push-Buttons will be found in the instructions supplied with each set.

CABINETS: Code 121 chassis in type "T" cabinet.
Code 122 chassis in type "F" cabinet.

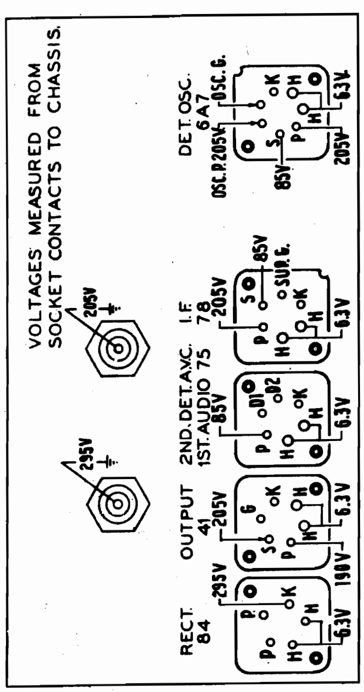


Fig. 1. Socket Voltage—Underside of Chassis View

The voltages indicated by arrows were measured with a Philco 027 Circuit Tester, which contains a sensitive voltmeter. Volume Control at minimum—Tuning Condenser set for no signal—line voltage 115 A. C.

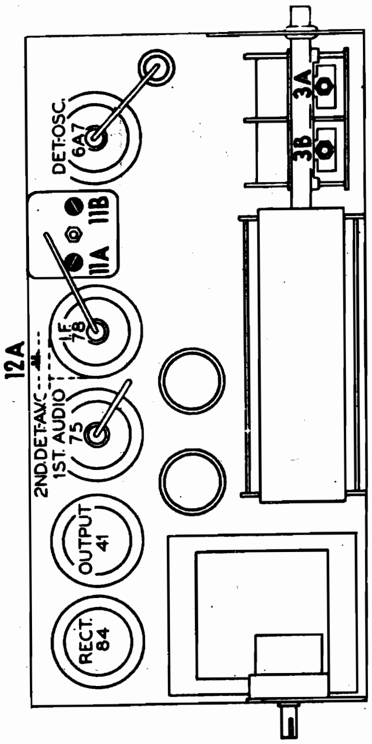


Fig. 2. Locations of Compensators

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator: Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose. (2) Output meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended. (3) Philco Fiber Handle Screw Driver, part No. 27-7059, and Fiber Wrench, part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 41 tube Set the meter to use the 0-30 volt scale.

Operations In Order	Signal Generator			Receiver			Special Instructions
	Output Connections To Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators In Order	
1	6A7 Grid	1 mf.	470 K. C.	580 K. C.	Vol. Cont. (Max.)	(12A) (11A) (11B)	
2	Ant. Ter.	100 mmf.	1550 K. C.	1550 K. C.	Vol. Cont. (Max.)	(3B) (3A)	See Note B

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the push button unit disconnected from the gang, the pointer is to be set on the extreme left edge of the index line (low frequency end of the scale) with the gang closed. The gang is then opened until the pointer is at the right edge of the index line and, with the push button shaft at its closed stop, the push button coupling is tightened on the gang shaft.

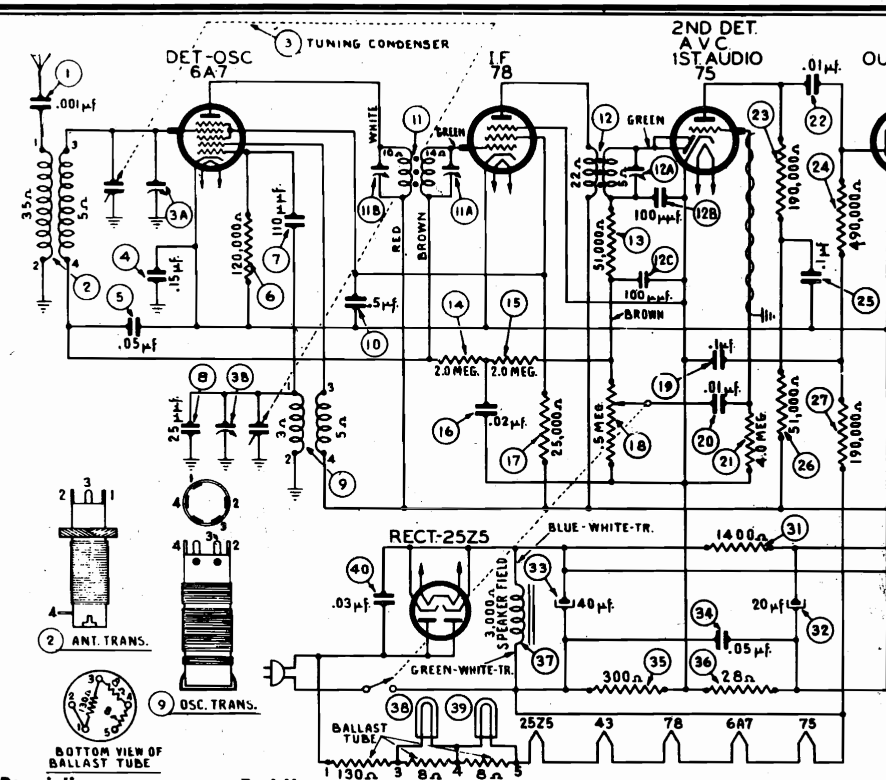
MODEL 39-18
Codes 121,122
Schematic, Chassis
Parts List

PHILCO RADIO & TELEV. CORP.

REPLACEMENT PARTS
Model 39-18, Codes 121 & 122

Schem. No.	Description	Part No.
1	Condenser (.001 mfd. tubular)	30-4453
2	Antenna Transformer	32-3039
3	Tuning Condenser Assembly	31-2265
4	Condenser (.15 mfd. tubular)	30-4505
5	Condenser (.05 mfd. tubular)	30-4519
6	Resistor (120,000 ohms, ½ watt)	33-412339
7	Condenser (110 mmf., mica)	30-1031
8	Condenser (25 mmf., silver plated mica)	30-1112
9	Oscillator Transformer	32-3040
10	Condenser (.5 mf., tubular)	30-4551
11	1st I. F. Transformer Assembly	32-3075
12	2nd I. F. Transformer Assembly	32-2944
13	Resistor (51,000 ohms, ½ watt)	33-351339
14	Resistor (2.0 megohms, ½ watt)	33-520339
15	Resistor (2.0 megohms, ½ watt)	33-520339
16	Condenser (.02 mf., tubular)	30-4516
17	Resistor (25,000 ohms, ½ watt)	33-325339
18	Volume Control and On-Off Switch	33-5276
19	Condenser (.1 mf., tubular)	30-4499
20	Condenser (.01 mf., tubular)	30-4572
21	Resistor (4.0 megohms, ½ watt)	33-540339
22	Condenser (.01 mf., tubular)	30-4572
23	Resistor (190,000 ohms, ½ watt)	33-419339
24	Resistor (490,000 ohms, ½ watt)	33-449339
25	Condenser (.1 mf., tubular)	30-4499
26	Resistor (51,000 ohms, ½ watt)	33-351339
27	Resistor (190,000 ohms, ½ watt)	33-419339
28	Condenser (.02 mf., tubular)	30-4215
29	Output Transformer	32-7986
30	Cone and Voice Coil Assembly (Speaker Part No. 36-1444-1)	36-4083
	(Speaker Part No. 36-1444-3)	36-4085
	Cone and Voice Coil Assembly (Speaker Part No. 36-1445)	36-4086
31	Resistor (1400 ohms, ½ watt)	33-214339
32	Condenser (20 mf., electrolytic)	30-2245
33	Condenser (40 mf., electrolytic)	30-2332
34	Condenser (.05 mf., tubular)	30-4444
35	Resistor (300 ohms, wire wound)	33-130431
36	Resistor (28 ohms, ½ watt)	33-028339
37	†Field Coil for Speaker (Pt. No. 36-1444)	
	†Field Coil for Speaker (Pt. No. 36-1445)	
38	Pilot Lamp	34-2068
39	Pilot Lamp	34-2068
40	Condenser (.03 mf., tubular)	30-4449

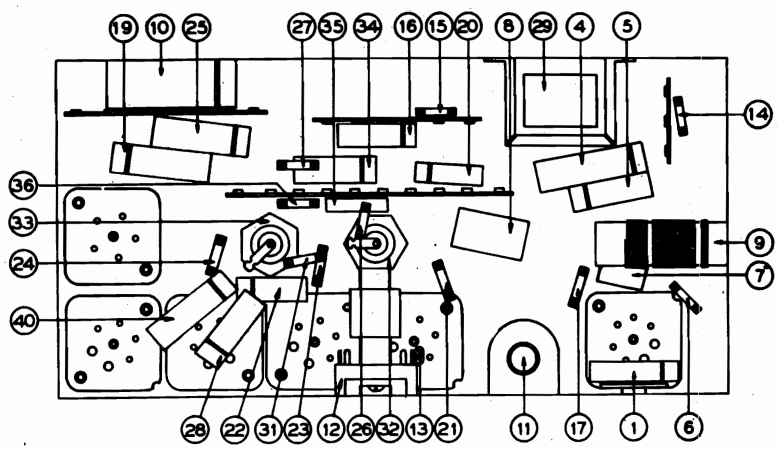
* When ordering Speaker or Cone assembly specify which of the small numbers (-1 or -3) following the part number is required.
† Replace Speaker.



I.F. 470 KC.

Fig. 3. Schematic Diagram, Model 39-18, Code 121-122

Description	Part No.
Dial Tuning Spring (cord)	28-8919
Clip (Mtg. R. F. Coils)	28-5002
Clip (Mtg. R. F. Coils)	28-5003
Escutcheon Plate (extension shafts, F Cabinet)	56-1051
Escutcheon Pin	W-950
Felt (Dial Lamps)	27-9222
Knob (Tuning)	27-4750
Knob (Volume)	27-4753
Mtg. Rubber (Tuning Condenser)	27-4596
Pilot Lamp Socket Assembly	38-9649
Pointer	28-5934
Push-Button	27-4749
Screw (Tuning Knob)	28-6882
Shaft Extension (Volume, F Cabinet)	38-9640
Shaft Extension (Tuning, F Cabinet)	28-6928
Sleeve-long Tuning Shaft Extension (F Cabinet)	28-6935
Sleeve-short Tuning Shaft (T and F Cabinet)	28-6887
Spring-retaining Volume Ext. Shaft	28-8915
*Speaker (T Cabinet, code 121)	36-1444-3
optional	36-1444-1
Speaker (F Cabinet)	36-1445
Socket (5 prong)	27-6035
Socket (6 prong)	27-6036
Socket (7 prong)	27-6107
Tab Kit (Stations)	40-6391



June 1938

Fig. 4. Part Locations, Underside of Chassis

MODEL 39-18
Codes 121,122
Socket,Trimmers

Alignment,Voltage

PHILCO RADIO & TELEV. CORP.
SPECIFICATIONS

TYPE OF CIRCUIT: A. C. - D. C. operated; superhetrodyne circuit, covering standard broadcast (540 K. C. to 1720 K. C.) frequency; Automatic Volume Control; and pentode output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

The receiver is designed to operate from a "Philco Utility Aerial," part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts A. C. or D. C. Power consumption—55 watts.

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGE: 540 to 1720 K. C.

PHILCO TUBES USED: 1—6A7, 1st detector and oscillator; 1—78, I. F.; 1—75, 2nd detector, Automatic Volume Control, and 1st audio; 1—43, Output; 1—25Z5, Rectifier; and 1—BKV51DJ, ballast tube.

TUNING MECHANISM: Pulley and cable drive for Manual tuning. Push-Button for Automatic Tuning. The procedure for adjusting and operating the Automatic Tuning Push-Buttons will be found in the instructions supplied with each set.

CABINETS: Code 121 chassis in type "T" cabinet.
Code 122 chassis in type "F" cabinet.

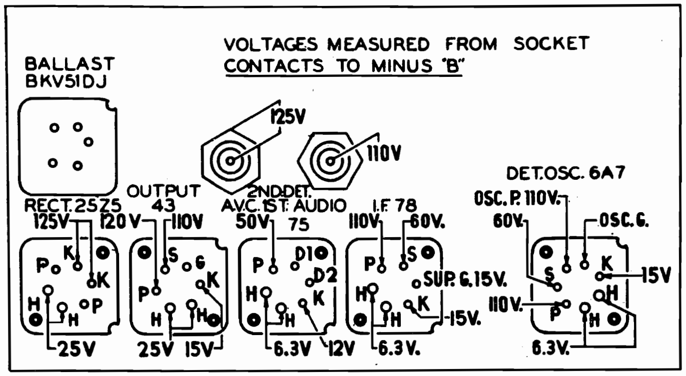


Fig. 1. Socket Voltage—Underside of Chassis View

The voltages indicated by arrows were measured with a Philco 027 Circuit Tester, which contains a sensitive voltmeter. Volume Control at minimum—Tuning Condenser set for no signal—line voltage 115 A. C.

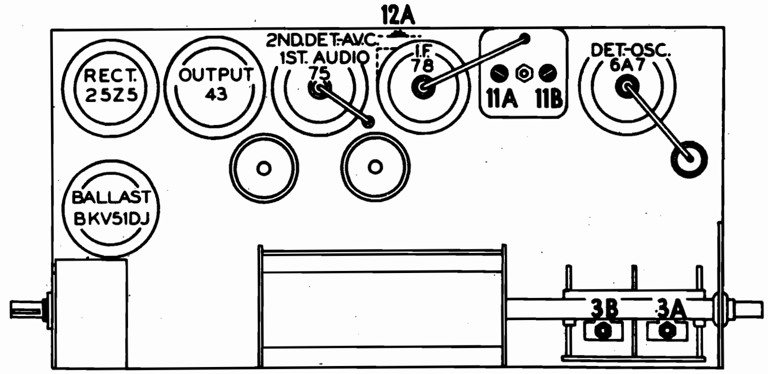


Fig. 2. Locations of Compensators

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077 Signal Generator, which has a fundamental frequency range from 115 to 36,000 KC., is the correct instrument for this purpose.

(2) Output meter; Philco Model 027 Circuit Tester incorporates a sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, part No. 27-7059 and Fiber Wrench, part No. 2164.

(4) Philco Set Transformer, part No. 32-2763.

OUTPUT METER:

The Philco 027 Output Meter is connected to the plate and cathode terminals of the Type 43 tube. Set the meter to use the 0-30 volt scale.

Operations in Order	Signal Generator			Receiver			Special Instructions
	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	6A7 Grid	.1 mf.	470 KC	580 KC	Vol. Cont. Max.	(12A) (11A) (11B)	See Note B
2	Ant. Ter.	100 mmf.	1550 KC	1550 KC	Vol. Cont. Max.	(3B) (3A)	See Note C See Note D

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" jack of the signal generator. Connect the other end of the output lead to terminal No. 1 on the Set Transformer, part No. 32-2763, and the cable ground to terminal No. 2. Nos. 3 and 4 terminals of Set Transformer are then connected to the chassis and 6A7 grid respectively of the receiver with short pieces of wire. Insert the 0.1 mf. in series with the No. 4 lead which connects to the grid.

NOTE C—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the push button unit disconnected from the gang, the pointer is to be set on the extreme left edge of the index line (low frequency end of the scale) with the gang closed. The gang is then opened until the pointer is at the right edge of the index line and, with the push-button shaft at its closed stop, the push-button coupling is tightened on the gang shaft.

NOTE D—Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" jack of the signal generator. Connect the other end of the output lead to terminal No. 1 on the Set Transformer, part No. 32-2763, and the cable ground to terminal No. 2. Nos. 3 and 4 terminals of Set Transformer are then connected to the chassis and antenna lead respectively of the receiver with short pieces of wire. Insert the 100 mmf. in series with the No. 4 lead which connects to the antenna lead.

MODEL 39-19
Codes 121,122
Schematic,Chassis
Parts List

PHILCO RADIO & TELEV. CORP.

REPLACEMENT PARTS
Model 39-19, Codes 121 & 122

Schem. No.	Description	Part No.
1	Antenna Transformer (Range 2)	32-2822
2	Antenna Transformer (Range 1)	32-2821
3	Condenser (.05 mf. tubular)	30-4519
4	Tuning Condenser Assembly	31-2273
5	Resistor (51,000 ohms, ½ watt)	33-351339
6	Oscillator Transformer (Ranges 1 and 2)	32-3036
7	Resistor (20 ohms, ½ watt)	33-020339
8	Compensator (two sections)	31-6257
9	Condenser (370 mmf., silver plated mica)	30-1110
10	Condenser (3500 mmf., mica)	30-1094
11	Condenser (250 mmf., mica)	30-1032
12	Resistor (5000 ohms, ½ watt)	33-250339
13	1st I. F. Transformer Assembly	32-3075
14	2nd I. F. Transformer Assembly	32-2944
15	Resistor (51,000 ohms, ½ watt)	33-351339
16	Condenser (.03 mf. tubular)	30-4449
17	Resistor (32,000 ohms, ½ watt)	33-332339
18	Resistor (10,000 ohms, 1 watt)	33-310439
19	Resistor (1.0 meg., 3 watts)	33-510339
20	Volume Control and On-Off Switch	33-5276
21	Resistor (1.0 meg., ½ watt)	33-510339
22	Condenser (110 mmf., mica)	30-1031
23	Condenser (250 mmf., mica)	30-1032
24	Condenser (.01 mf. tubular)	30-4572
25	Resistor (99,000 ohms, ½ watt)	33-399339
26	Resistor (490,000 ohms, ½ watt)	33-449339
27	Resistor (490,000 ohms, ½ watt)	33-449339
28	Condenser (.1 mf., tubular)	30-4499
29	Condenser (.01 mf., tubular)	30-4479
30	Resistor (4.0 meg., ½ watt)	33-540339
31	Condenser (8 mf.-4 mf., electrolytic)	30-2323
32	Condenser (.01 mf., tubular)	30-4572
33	Output Transformer	32-7980
34	Cone and Voice Coil Assembly (Speaker Part No. 36-1426-1)	36-4083
	Part No. 36-1426-3	36-4085
	Cone and Voice Coil Assembly (Speaker Part No. 36-1449)	36-4086
35	†Field Coil for Speaker (Part No. 36-1426)	
	†Field Coil for Speaker (Part No. 36-1449)	
36	Condenser (8 mf. electrolytic)	30-2319
37	Resistor (250 ohms, wire wound)	33-125431
38	Resistor (70 ohms, ½ watt)	33-070339
39	Power Transformer, 115 v., 50-60 cycles	32-7974
40	Condenser (.01 mf.-.01 mf., bakelite)	3903-DG
41	Pilot Lamp	34-2064
42	Pilot Lamp	34-2064
43	Wave Switch	42-1449

† Replace Speaker.

Description	Part No.
Automatic Tuning Unit (complete)	31-2282
Bezel Assembly (dial)	40-6364
Bezel Gasket (dial)	27-9174
Cable and Plug (power)	L 2778
Cable Speaker (F Cabinet)	41-3431
Dial and Frame Assembly	31-2298
Dial Tuning Drum Assembly	31-2281
Dial Tuning Cord Assembly	31-2275
Dial Tuning Spring (cord)	28-8919
Clip (mtg. R. F. coils)	28-5002
Clip (mtg. R. F. coils)	28-5003
Escutcheon Plate (extension shafts, F Cabinet)	56-1051
Escutcheon Pins	W-950
Knob (Tuning)	27-4750
Knob (Volume)	27-4753
Knob (Wave Switch)	27-4754
Pilot Lamp Socket Assembly	38-9612
Pointer (Dial)	28-5934
Push-Button	27-4749
Screw Tuning Knob	28-6882
Shaft Extension (Volume and Wave Switch)	38-9640
Shaft Extension (Tuning)	28-6928
Sleeve-Long-Tuning Shaft Extension (F Cabinet)	28-6935
Sleeve-Short-Tuning Shaft (T and F Cabinet)	28-6887
*Speaker (T Cabinet—code 121)	36-1426-3
optional	36-1426-1
Speaker (F Cabinet—code 122)	36-1449
Spring-Retaining Volume Shaft	28-8915

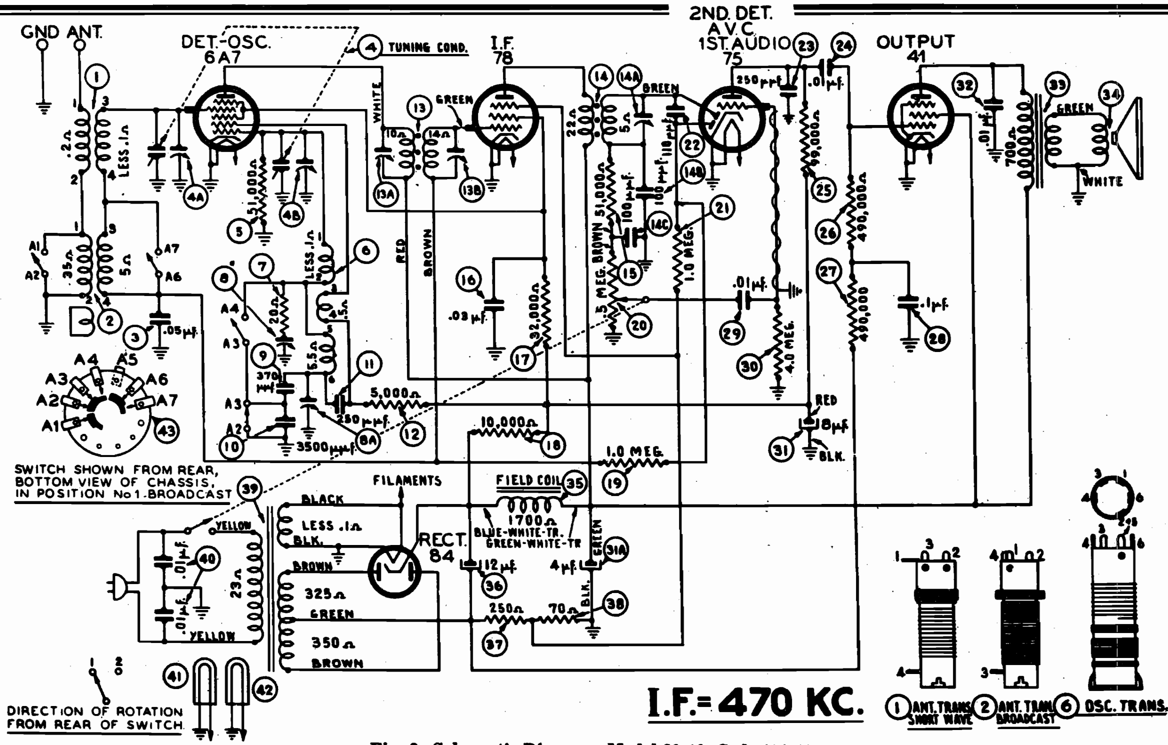
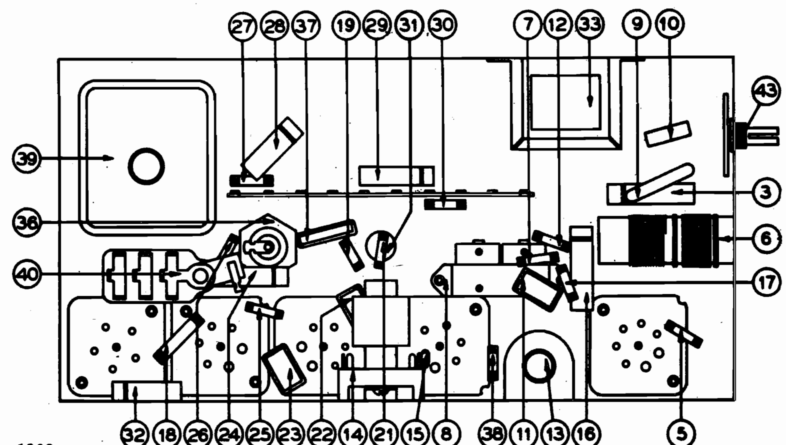


Fig. 3. Schematic Diagram, Model 39-19, Code 121-122



June 1938

Fig. 4. Part Locations, Underside of Chassis

* When ordering Speaker or Cone assembly specify which of the small numbers (-1 or -3) following the part number is required.

MODEL 39-19
Codes 121,122
Socket,Trimmers

PHILCO RADIO & TELEVISION CORP.

Alignment,Voltage

SPECIFICATIONS

TYPE OF CIRCUIT: A. C. operated; superhetrodyne circuit with two tuning ranges, covering standard broadcast (540 K. C. to 1720 K. C.) and short wave (5.6 M. C. to 18.0 M. C.) frequencies; Automatic Volume Control; and pentode output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

The receiver is designed to operate from a "Philco Utility Aerial," part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. Frequency—50-60 cycles. Power consumption—40 watts.

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGES: 540 K. C. to 1720 K. C. 5.5 M. C. to M. C. 19.0

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five tubes: 1-6A7, 1st detector and oscillator; 1-78, I. F.; 1-75, 2nd detector, Automatic Volume Control, and 1st audio; 1-41, Output; and 1-84, Rectifier.

TUNING MECHANISM: Pulley and cable drive for Manual Tuning. Push-Button for Automatic Tuning. The procedure for adjusting and operating the Automatic Tuning Push-Buttons will be found in the instructions supplied with each set

CABINETS: Code 121 chassis in type "T" cabinet.
Code 122 chassis in type "F" cabinet.

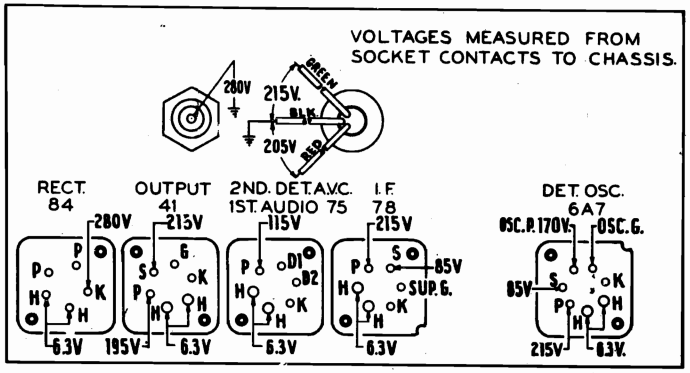


Fig. 1. Socket Voltage—Underside of Chassis View

The voltages indicated by arrows were measured with a Philco 027 Circuit Tester, which contains a sensitive voltmeter. Volume Control at minimum—Tuning Condenser set for no signal—line voltage 115 A. C.

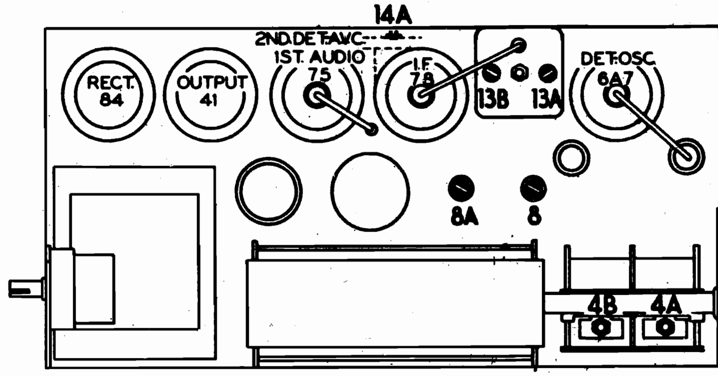


Fig. 2. Locations of Compensators

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED: (1) Signal Generator. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose. (2) Output meter: Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended. (3) Philco Fiber Handle Screw Driver, part no. 27-7059 and Fiber Wrench, part no. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 41 tube. **Set the** meter to use the 0-30 volt scale.

Operations In Order	Signal Generator			Receiver			
	Output Connections To Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators In Order	Special Instructions
1	6A7 Grid	.1mf	470 KC	580 KC	Vol. Cont. (max.)	(14A) (13B) (13A)	
2	Ant. Ter.	100mmf	18 MC	18 MC	"	(4B)	Note B
3	"	"	1550 KC	1550 KC	"	(8) (4A)	
4	"	"	580 KC	580 KC	"	(8A)	Roll Tuning Condenser
5	"	"	1550 KC	1550 KC	"	(8)	

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the push button unit disconnected from the gang, the pointer is to be set on the extreme left edge of the index line (low frequency end of the scale) with the gang closed. The gang is then opened until the pointer is at the right edge of the index line and, with the push button shaft at its closed stop, the push button coupling is tightened on the gang shaft.

MODEL 39-25, Code 121
Schematic

PHILCO RADIO & TELEV. CORP.

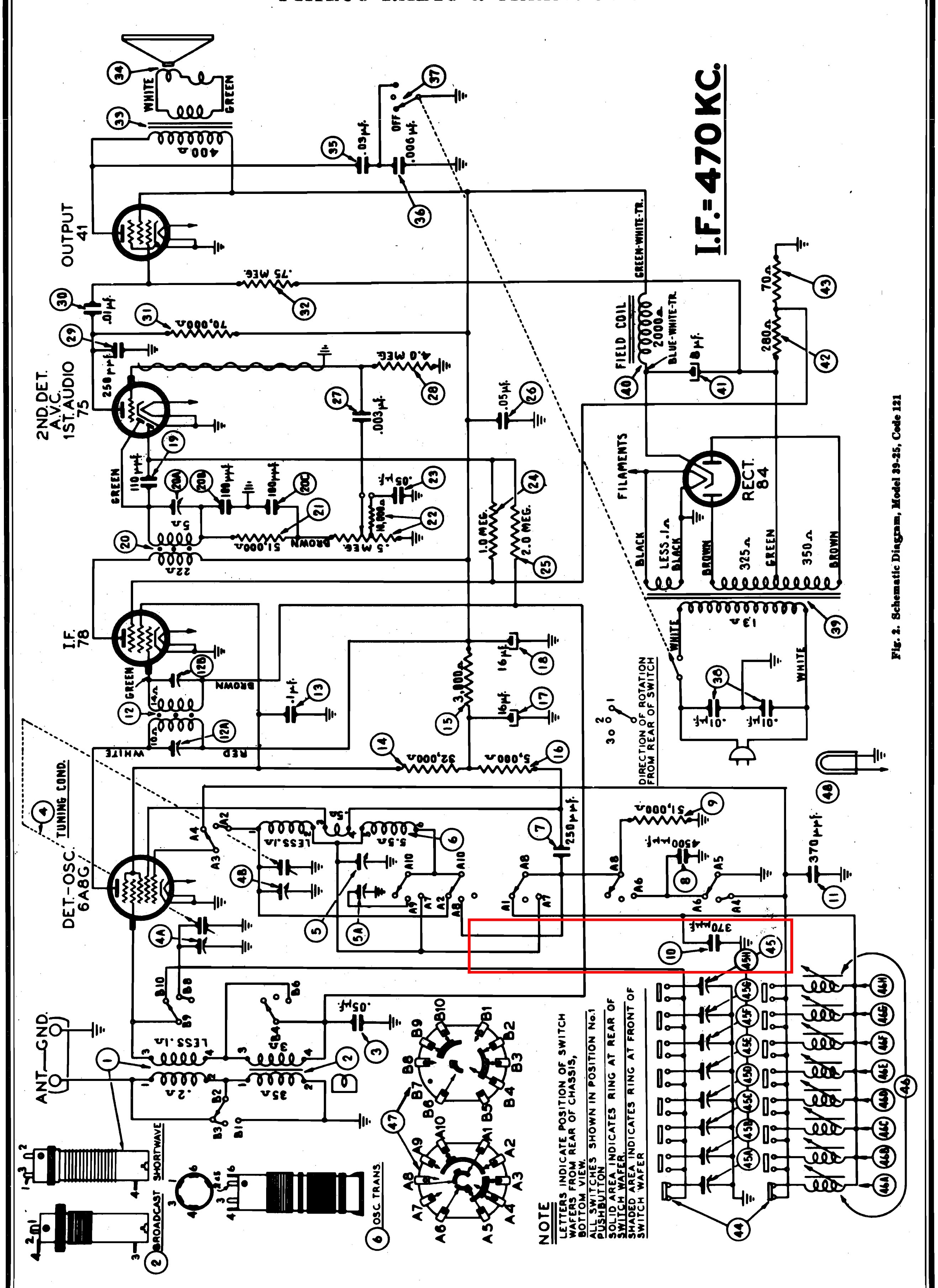


Fig. 2. Schematic Diagram, Model 39-25, Code 121

MODEL 39-25
Code 121
Alignment, Chassis
Tuner Data

PHILCO RADIO & TELEVISION CORP.

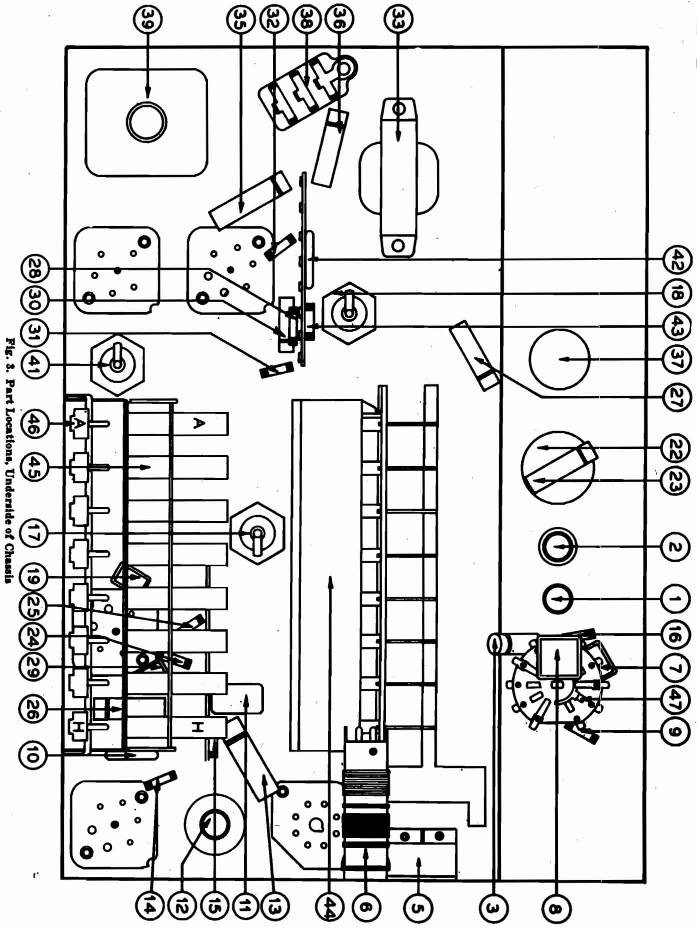


Fig. 3. Part Locations, Underside of Chassis

TYPE OF CIRCUIT: A. C. operated; superheterodyne circuit with two tuning ranges, covering standard broadcast (540 K. C. to 1720 K. C.) and short wave (4.9 M. C. to 18.0 M. C.) frequencies; Automatic Volume Control; and pentode output.

The receiver is designed to operate from a "Philco Safety Aerial," part No. 40-6371. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. Frequency 50-60 cycles. Power consumption 45 watts.

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGES: 540 K. C. to 1720 K. C.; 4.9 M. C. to 18.0 M. C.

PHILCO TUBES USED: 1-6A8G, 1st detector and oscillator; 1-78, I. F.; 1-75, 2nd detector, Automatic Volume Control, and 1st audio; 1-41, Output; and 1-84, Rectifier.

TUNING MECHANISM: Pulley and cable drive for Manual tuning. Electric Push-Button for Automatic tuning.

CABINETS: Types "T" and "XF."

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose. (2) Output meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended. (3) Philco Fiber Handle Screw Driver, part No. 27-7059, and Fiber Wrench, part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and cathode terminals of the Type 41 tube. Set the meter to use the 0-30 volt scale. After connecting the output meter adjust compensators in the order as given below.

Operations in Order	Signal Generator			Receiver			Special Instructions
	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	6A8G Grid	.1 mf.	470 KC	580 KC	Vol. Cont. max.	(20A) (12B) (12A)	
2	Ant. Ter.	100 mmf.	18.0 MC	18.0 MC	Vol. Cont. max.	(4B)	See Note B
3	Ant. Ter.	100 mmf.	1550 KC	1550 KC	Vol. Cont. max.	(5) (4A)	
4	Ant. Ter.	100 mmf.	580 KC	580 KC	Vol. Cont. max.	(5A)	
5	Ant. Ter.	100 mmf.	1550 KC	1550 KC	Vol. Cont. max.	(5)	

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

These detailed instructions have been prepared to make sure the correct procedure is followed in setting the stations on the Philco Electric Push-Button Tuning models. The work requires the use of a Philco Model 077 Station Setter and a part No. 27-7059 Insulated Screw Driver.

(A) Select eight of the most popular stations received in the locality and remove their call letters from the call letter sheets supplied. Place the call letters in the windows above the buttons, making sure that each respective button covers the frequency of the station for which it is to be used. The frequency range of the circuits are as follows:

Circuits	Frequency Range
1 and 2	540 to 1030 kilocycles
3 and 4	670 to 1160 kilocycles
5 and 6	900 to 1470 kilocycles
7 and 8	1170 to 1600 kilocycles

These numbers are stamped on the unit as seen from the rear. Looking at the front of the cabinet the numbers read from left to right.

(B) Connect the aerial and ground to the "ANT" and "GND" terminals of the receiver.

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly the dial pointer must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser closed, set the dial pointer on the extreme left index line at the low frequency end of the scale.

(C) Turn the receiver Tuning Range Selector to position two ("Manual Tuning") and tune the receiver to the station to be set on the first button.

(D) Plug the output leads of the Station Setter into the "High" and "Gnd" jacks, and turn the output controls to maximum. Turn the modulation control to "Modulation Off." Connect the output lead of the Station Setter to the "ANT" and "GND" terminals of the receiver and tune to the frequency of the station being received. As the indicator is slowly tuned through the frequency of the station there will be two points at which a high pitched swish will be heard, one above and one below the frequency of the station. When the indicator is on the frequency of the station, minimum high pitched swish will be heard.

(E) Set the modulation control of the Station Setter for "Modulation On." The modulated signal of the Station Setter will then be heard through the receiver.

(F) Turn the receiver Tuning Range Selector to position one (Automatic Tuning) and push in the first button. Using the Part No. 27-7059 Insulated Screw Driver, turn the number 1 "OSC" screw until the modulated signal of the Station Setter is tuned in to maximum volume. Then adjust the number 1 "ANT" screw for maximum signal.

(G) Remove the output lead of the Philco Station Setter from the "ANT" terminal of the receiver and turn its indicator off the frequency of the station. The program of the desired station will then be heard on the receiver.

(H) With the volume of the receiver low, slowly turn the number 1 "OSC" back and forth until maximum output is received. Repeat the same procedure for the number 1 "ANT" screw.

After setting up the first station, the same procedure given under (C) to (H) is used for the other stations.

MODEL 39-25
Code 121
Socket, Trimmers
Voltage, Parts

PHILCO RADIO & TELEV. CORP.

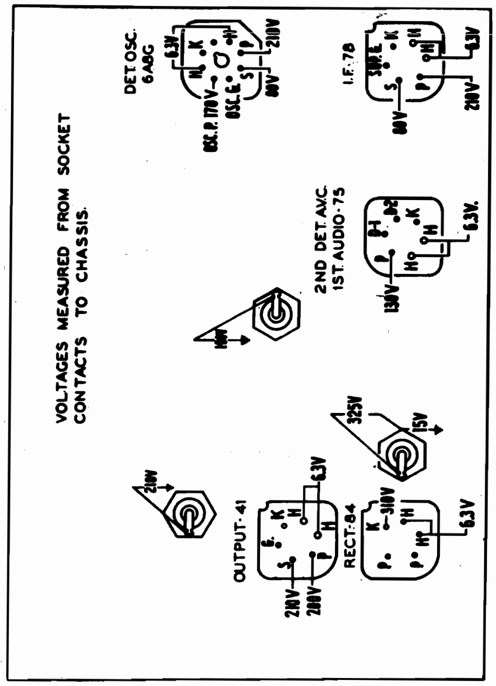


Fig. 1. Socket Voltage—Underside of Chassis

The voltages indicated by arrows were measured with a Philco 027 Circuit Tester, which contains a sensitive voltmeter. Volume Control at minimum—Tuning Condenser set for no signal—line voltage 115 A. C.

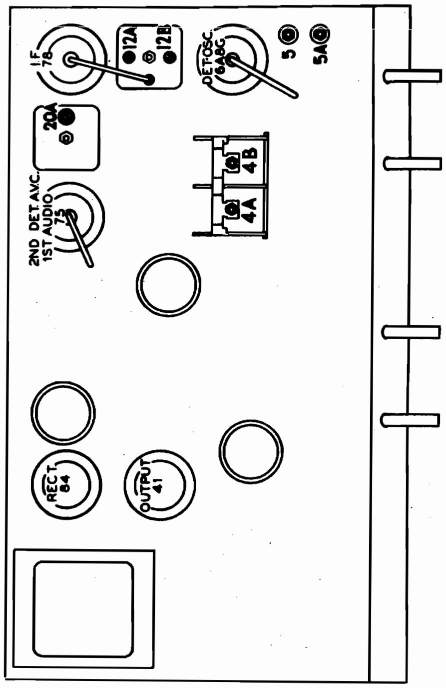


Fig. 4. Locations of Compensators

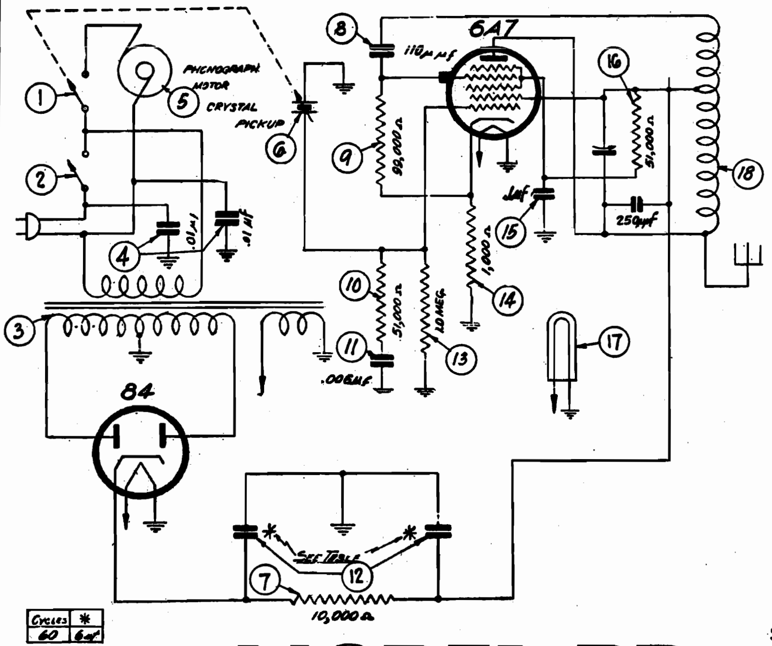
REPLACEMENT PARTS—MODEL 39-25, CODE 121

Schem. No.	Description	Part No.
1	Antenna Transformer (short wave)	32-3027
2	Antenna Transformer (broadcast)	32-3026
3	Tubular Condenser (.05 mf.)	30-4519
4	Tuning Condenser Assembly	31-2267
5	Dual Padder Unit	31-6255
6	Oscillator Transformer	32-3028
7	Condenser (250 mmf., mica)	30-1032
8	Condenser (4500 mmf., mica)	30-1109
9	Resistor (51,000 ohms, ½ watt)	33-351339
10	Condenser (370 mmf., silver plated mica)	30-1110
11	Condenser (370 mmf., silver plated mica)	30-1110
12	1st I. F. Transformer Assembly	32-3018
13	Condenser (.1 mf., tubular)	30-4455
14	Resistor (32,000 ohms, ½ watt)	33-332339
15	Resistor (3000 ohms, ½ watt)	33-230339
16	Resistor (5000 ohms, ½ watt)	33-250339
17	Electrolytic Condenser (16 mf., 250 V.)	30-2331
18	Electrolytic Condenser (16 mf., 250 V.)	30-2331
19	Condenser (110 mmf., mica)	30-1031
20	2nd I. F. Transformer Assembly	32-3030
21	Resistor (51,000 ohms, ½ watt)	33-351339
22	Volume Control (500,000 ohms)	33-5289
23	Condenser (.05 mf., tubular)	30-4444
24	Resistor (1 meg., ½ watt)	33-510339
25	Resistor (2 megs., ½ watt)	33-520339
26	Condenser (.05 mf., tubular)	30-4518
27	Condenser (.003 mf., tubular)	30-4469
28	Resistor (4.0 megs., ½ watt)	33-540339
29	Condenser (250 mmf., mica)	30-1032
30	Condenser (.01 mf., tubular)	30-4572
31	Resistor (70,000 ohms, ½ watt)	33-370339
32	Resistor (750,000 ohms, ½ watt)	33-475339
33	Output Transformer	32-7978
34	Voice Coil and Cone Assembly	
	(for "T" Speaker, part No. 36-1439)	36-4087
	(for "XF" Speaker, part No. 36-1437)	36-4088
35	Condenser (.03 mf., tubular)	30-4449
36	Condenser (.006 mf., tubular)	30-4445
37	Tone Control and On-Off Switch	42-1443
38	Condenser (.01 mf.-.01 mf., bakelite)	3903-DG
39	Power Transformer	32-7976
40*	Field Coil for Speaker, part No. 36-1439	
*	Field Coil for Speaker, part No. 36-1437	
41	Electrolytic Condenser (8 mf., 400 V.)	30-2330

Schem. No.	Description	Part No.
42	Resistor (280 ohms, wire wound)	33-128431
43	Resistor (70 ohms, ½ watt)	33-070339
44	Push-Button Switch	42-1446
45	Compensator Strip Assembly	31-6256
45A	Compensator, No. 1, 540-1030 K. C.	31-6274
45B	Compensator, No. 2, 540-1030 K. C.	31-6274
45C	Compensator, No. 3, 670-1160 K. C.	31-6276
45D	Compensator, No. 4, 670-1160 K. C.	31-6276
45E	Compensator, No. 5, 900-1470 K. C.	31-6278
45F	Compensator, No. 6, 900-1470 K. C.	31-6278
45G	Compensator, No. 7, 1170-1600 K. C.	31-6280
45H	Compensator, No. 8, 1170-1600 K. C.	31-6280
46	Electric Tuning Coil Assembly (complete)	32-3031
46A	Osc. Coil, No. 1, 540-1030 K. C.	32-3042
46B	Osc. Coil, No. 2, 540-1030 K. C.	32-3042
46C	Osc. Coil, No. 3, 670-1160 K. C.	32-3042
46D	Osc. Coil, No. 4, 670-1160 K. C.	32-3042
46E	Osc. Coil, No. 5, 900-1470 K. C.	32-3041
46F	Osc. Coil, No. 6, 900-1470 K. C.	32-3041
46G	Osc. Coil, No. 7, 1170-1600 K. C.	32-3041
46H	Osc. Coil, No. 8, 1170-1600 K. C.	32-3041
47	Range Switch	42-1445
48	Pilot Lamp	34-2210
	Bezel Assembly	40-6365
	Bezel Gasket	27-9175
	Bezel Screw	W-1834
	Cable (speaker)	41-3443
	Cable (power)	L-2778
	Dial Scale	27-5403
	Dial Spring	28-8908
	Dial Pointer	28-5941
	Dial Drive Cord Assembly	31-2269
	Dial Drive Spring	28-8913
	Dial Tuning Shaft Assembly	31-2260
	Dial Tuning Drum	31-2281
	Knob	27-4332
	Socket (5 Prong)	27-6035
	Socket (6 Prong)	27-6036
	Socket (7 Prong)	27-6099
	Pilot Lamp Socket Assembly	38-9607
	Pushbutton	27-4759
	Speaker (T Cabinet)	36-1439
	Speaker (XF Cabinet)	36-1437

* Replace Speaker.

MODEL RP-1, Code 122
Wireless Record Player PHILCO RADIO & TELEV. CORP.
Schematic, Instructions



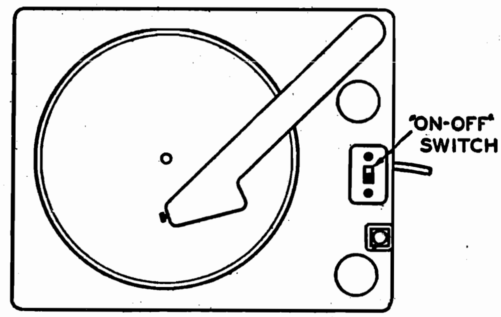


DIAGRAM A

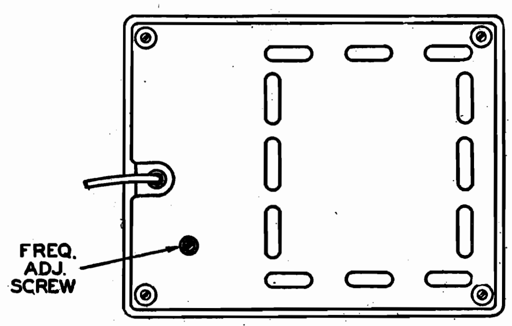


DIAGRAM B

MODEL RP-1

CODE - 122

WIRELESS RECORD PLAYER

The Model RP-1 is a remote type record player which can be used in conjunction with any standard broadcast receiver to reproduce phonograph records.

To place unit in operation:

First. Remove all packing material, being sure to save the small envelope attached to the tone arm. This envelope contains needles, needle screw, and rubber bumper.

Second. Lift off record turn-table and remove motor support tape by carefully pulling out tack and cutting the tape. Replace turn-table.

Third. Disengage tone arm (pickup") by rolling rubber locking ring down along arm rest and pushing sideways on tone arm. **Do not lift arm vertically when locked.**

Fourth. Place rubber bumper (contained in small envelope attached to tone arm) between the jaws of the arm rest, large end up. This forms a suitable rest for tone arm when not in use.

Fifth. Insert needle as far as possible into the tone arm head, and tighten securely with the needle screw, which should be inserted in the head of the tone arm. **A Philco needle (like furnished) is recommended for best results.**

Sixth. Check to make sure your electric supply agrees with that specified on the name label located on under side of cabinet and insert line cord plug into a convenient power outlet.

If in doubt as to the electric supply, check with your local power company.

The unit is now ready for operation. Place record on turn-table and slide "Off-On Switch" (Diagram "A") to "On" position; this will be indicated by pilot light in tone arm.

After allowing sufficient time for tubes to warm up, place tone arm on record; this automatically starts motor.

Next go to your radio and tune to approximately 540 KC (54 on most dials), at which setting the phonograph signal will be picked up. Volume can be regulated by the radio receiver's volume control in the normal way.

At the end of the record, return the tone arm to rest position, which will automatically turn motor off. It is not necessary to slide "Off-On Switch" to the "Off" position between records.

If interference from broadcast stations is encountered the frequency of the unit can be changed to any other frequency between 530 KC and 580 KC by adjusting the small screw indicated in Diagram "B." Turning screw clockwise lowers the frequency, counter-clockwise raises the frequency. **This adjustment is best made while the unit is in operation.**

If hum is experienced it may be necessary to reverse the power plug of the record player, the radio, or both. In some cases it may be advisable to use the same receptacle for record player and radio.

No definite rule can be established for the relative location of the record player to your radio; individual trial will establish best location. However, in general, satisfactory operation may be obtained up to a distance of fifty (50) feet, provided local noise conditions are not too severe.

IMPORTANT . . . Do not attempt to force tone arm past stops.

MODEL RP-1-122 WIRELESS RECORD PLAYER

Schem. No.	*Description*	*Philco Part No.*
1	Motor Switch and Plate Assembly	42-1486
2	Master Switch	42-1406-2
3	Power Transformer	32-8043
4	Line Condenser (.01-.01 mf., 600 v.)	3903-DG
5	Motor	35-2021
6	Crystal Pickup	35-2022
7	Filter Resistor (10,000 ohms, 1/2 watt)	33-310344
8	Oscillator Grid Condenser (110 mmf)	30-1031
9	Oscillator Grid Resistor (99,000 ohms, 1/2 watt)	33-399344
10	Comp. Resistor (51,000 ohms, 1/2 watt)	33-351344
11	Comp. Condenser (.006 mf., 200 v.)	30-4467
12	Electrolytic Condenser (6 mf.-6 mf., 150 v.)	30-2388
13	Grid Resistor (1 meg., 1/2 watt)	33-510344
14	Cathode Bias Resistor (1000 ohms, 1/2 watt)	33-210344
15	Screen By-Pass (.1 mf., 200 v.)	30-4499-S
16	Screen Resistor (51,000 ohms, 1/2 watt)	33-351344
17	Pilot Light (6-8 v., 250 amp.)	34-2064
18	Oscillator Coil and Padder Assembly	32-3218

PHILCO RADIO & TELEVISION CORP.

MODELS 39-30, 39-35
Code 121
Schematic

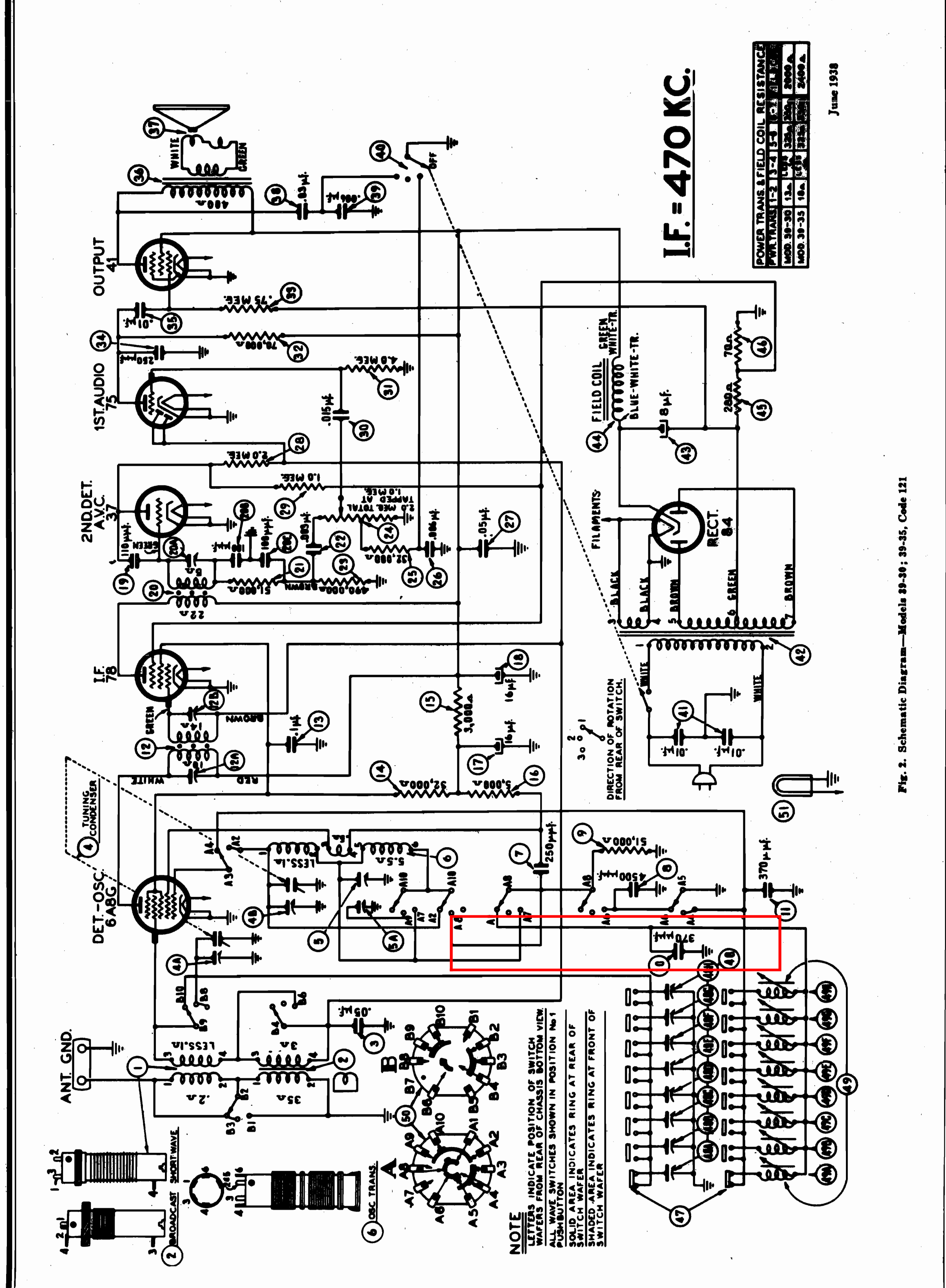
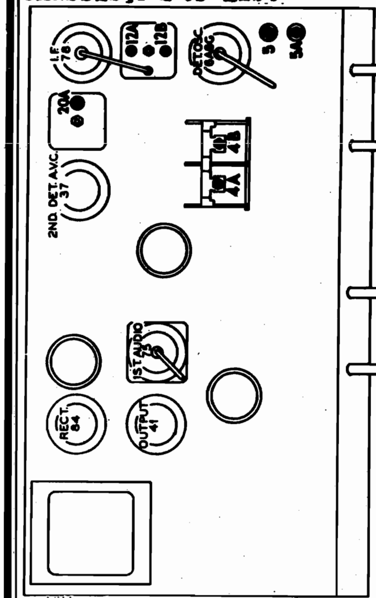


Fig. 2. Schematic Diagram—Models 39-30; 39-35, Code 121

MODELS 39-30,39-35,Code 121
Voltage,Socket,Trimmers
Chassis,Parts List

PHILCO RADIO & TELEVISION CORP.



MODELS 39-35, 39-30, CODE 121.
Fig. 4. Locations of Compensators—Top of Chassis

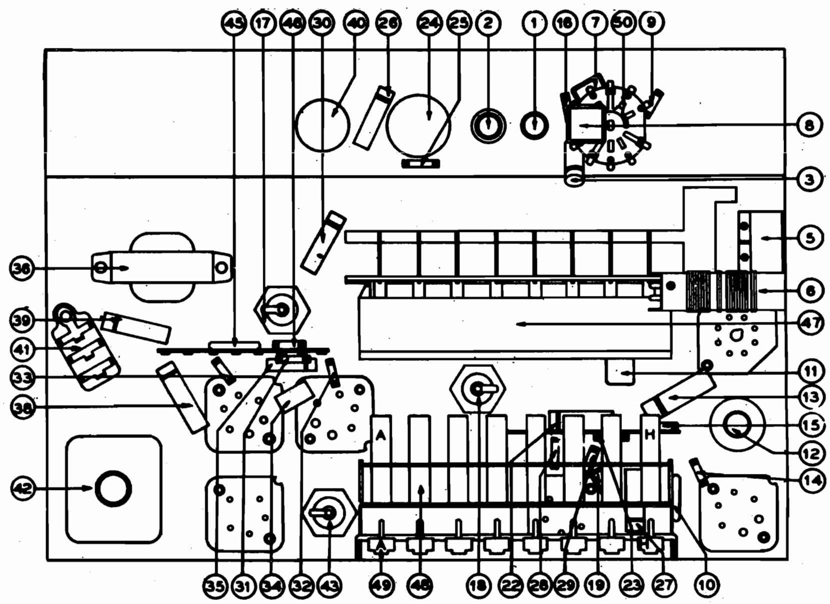


Fig. 3. Parts Locations—Underside of Chassis

No.	Description	Part No.
1	Antenna Transformer (short wave)	32-3027
2	Antenna Transformer (broadcast)	32-3026
3	Condenser (.05 mf., tubular)	30-4519
4	Tuning Condenser Assembly	31-2267
5	Dual Padder Unit	31-6255
6	Oscillator Transformer	32-3028
7	Condenser (250 mmf., mica)	30-1032
8	Condenser (4500 mmf., mica)	30-1109
9	Resistor (51,000 ohms, ½ watt)	33-351339
10	Condenser (370 mmf., silver plated mica)	30-1110
11	Condenser (370 mmf., silver plated mica)	30-1110
12	1st I. F. Transformer Assembly	32-3018
13	Condenser (.1 mf., tubular)	30-4455
14	Resistor (32,000 ohms, ½ watt)	33-332339
15	Resistor (3000 ohms, ½ watt)	33-230339
16	Resistor (5000 ohms, ½ watt)	33-250339
17	Electrolytic Condenser (16 mf., 250 V.)	30-2331
18	Electrolytic Condenser (16 mf., 250 V.)	30-2331
19	Condenser (110 mmf., mica)	30-1031
20	2nd I. F. Transformer Assembly	32-3030
21	Resistor (51,000 ohms, ½ watt)	33-351339
22	Condenser (.003 mf., tubular)	30-4469
23	Resistor (490,000 ohms, ½ watt)	33-449339
24	Volume Control (2.0 megs)	33-5275
25	Resistor (32,000 ohms, ½ watt)	33-332339
26	Condenser (.006 mf., tubular)	30-4467
27	Condenser (.05 mf., tubular)	30-4518
28	Resistor (2.0 meg., ½ watt)	33-520339
29	Resistor (1.0 meg., ½ watt)	33-510339
30	Condenser (.015 mf., tubular)	30-4515
31	Resistor (4.0 megs., ½ watt)	33-540339
32	Resistor (70,000 ohms, ½ watt)	33-370339
33	Resistor (750,000 ohms, ½ watt)	33-475339
34	Condenser (250 mf., mica)	30-1032
35	Condenser (.01 mf., tubular)	30-4572
36	Output Transformer	32-7978
37	†Cone and Voice Coil Assembly	
	for 39-30 T, speaker pt. No. 36-1439-3	36-4091
	for 39-30 T, speaker pt. No. 36-1439-2	36-4087
	for 39-35 XX, speaker pt. No. 36-1438-2	36-4089
38	Condenser (.03 mf., tubular)	30-4449
39	Condenser (.006 mf., tubular)	30-4445
40	Tone Control and On-Off Switch	42-1444
41	Condenser (.01 mf. - .01 mf., bakelite)	3903 DG
42	Power Transformer: 115 V., 60 cycle:	
	for 39-30	32-7976
	for 39-35	32-7977
43	Electrolytic Condenser (8 mf., 400 V.)	30-2330
44	*Field Coil for Speaker, part No. 36-1439	
	*Field Coil for Speaker, part No. 36-1438	
45	Resistor (280 ohms, wire wound)	33-128431
46	Resistor (70 ohms, ½ watt)	33-070339
47	Push-Button Switch	42-1446
48	Padder Strip Assembly	31-6256
48A	Compensator, No. 1, 540 — 1030 KC.	31-6274
48B	Compensator, No. 2, 540 — 1030 KC.	31-6274
48C	Compensator, No. 3, 670 — 1160 KC.	31-6276
48D	Compensator, No. 4, 670 — 1160 KC.	31-6276
48E	Compensator, No. 5, 900 — 1470 KC.	31-6278
48F	Compensator, No. 6, 900 — 1470 KC.	31-6278
48G	Compensator, No. 7, 1170 — 1600 KC.	31-6280
48H	Compensator, No. 8, 1170 — 1600 KC.	31-6280
49	Electric Push-Button Coil Assembly	32-3031
49A	Osc. Coil, No. 1, 540 — 1030 KC.	32-3042
49B	Osc. Coil, No. 2, 540 — 1030 KC.	32-3042
49C	Osc. Coil, No. 3, 670 — 1160 KC.	32-3042
49D	Osc. Coil, No. 4, 670 — 1160 KC.	32-3042
49E	Osc. Coil, No. 5, 900 — 1470 KC.	32-3041
49F	Osc. Coil, No. 6, 900 — 1470 KC.	32-3041
49G	Osc. Coil, No. 7, 1170 — 1600 KC.	32-3041
49H	Osc. Coil, No. 8, 1170 — 1600 KC.	32-3041
50	Wave Switch	42-1445
51	Pilot Lamp	34-2210
	Pilot Lamp Socket Assembly	38-9607
	Push-Button	27-4759
	Speaker (T Cabinet 39-30) optional	36-1439-3 36-1439-2
	Speaker (XX Cabinet 39-35)	36-1438
	Socket (5 Prong)	27-6035
	Socket (6 Prong)	27-6036
	Socket (7 Prong)	27-6099
	Tab Kit	40-6392

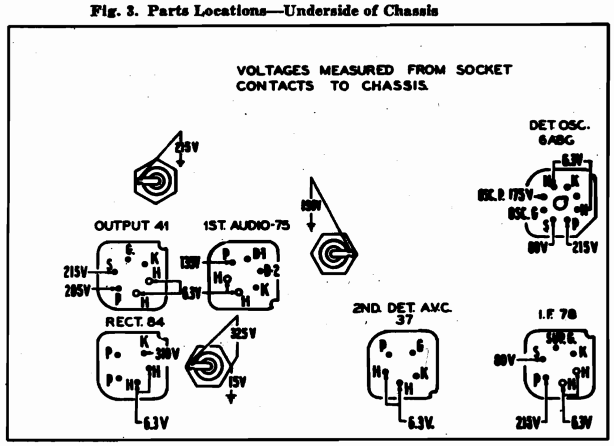


Fig. 1. Socket Voltages—Underside of Chassis

The voltages indicated by arrows were measured with a Philco 027 Circuit Tester which contains an accurate voltmeter. Volume control at minimum, range switch in broadcast position, line voltage 115 A. C.

TYPE OF CIRCUIT: A. C. operated; superheterodyne circuit with two tuning ranges, covering standard broadcast (540 K. C. to 1720 K. C.) and short-wave (4.9 M. C. to 18.0 M. C.) frequencies; Automatic Volume Control; and pentode output.

The receiver is designed to operate from a "Philco Safety Aerial," Part No. 40-6371. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage, 115 volts. Frequency, 50-60 cycles. Power consumption 45 watts.

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGES: 540 K. C. to 1720 K. C.; 4.9 M. C. to 18.0 M. C.

PHILCO TUBES USED: 1-6A8G, 1st detector and oscillator; 1-78, I. F.; 1-37, 2nd detector, Automatic Volume Control; 1-75, first audio; 1-41, output; and 1-84, Rectifier.

TUNING MECHANISM: Pulley and cable drive for Manual tuning. Electric Push-Button for Automatic tuning.

CABINETS: Types: "T" for 39-30 and "XX" for 39-35.

* Replace Speaker
† Model T Cabinet uses two optional speakers. The part numbers of the speakers are the same with the exception of a dash number (-2 or -3) following the part number. When ordering a Cone and Voice Coil Assembly, the part number as indicated must be specified.

MODEL S-1622
Alignment, Socket, Trimmers

PHILCO RADIO & TELEVISION CORP.

MODELS 39-30, 39-35
Code 121
Alignment

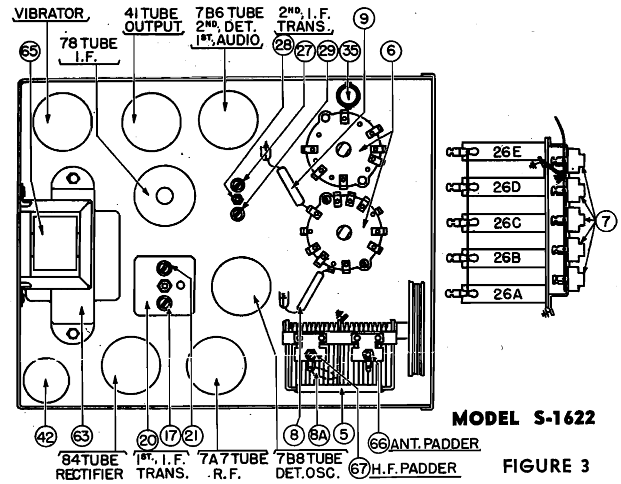
ALIGNMENT
MODELS 39-30, 39-35 (CODE 121); S1622.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.



MODEL S-1622

FIGURE 3

MODELS 39-30, 39-35, CODE 121.

Operations	Signal Generator: Output Connections To Receiver	Signal Generator: Dummy Antenna (Note A)	Signal Generator: Dial Setting	Receiver: Dial Setting	Receiver: Control Settings	Receiver: Adjust Compensators In Order	Special Instructions
1	6A8G Grid	.1 mf.	470 K. C.	580 K. C.	Vol. Cont. Max.	(20A) (12B) (12A)	
2	Ant. Ter.	100 mmf.	18.0 M. C.	18.0 M. C.	Vol. Cont. Max.	(4B)	See Note B
3	Ant. Ter.	100 mmf.	1550 K. C.	1550 K. C.	Vol. Cont. Max.	(5) (4A)	
4	Ant. Ter.	100 mmf.	580 K. C.	580 K. C.	Vol. Cont. Max.	(5A)	
5	Ant. Ter.	100 mmf.	1550 K. C.	1550 K. C.	Vol. Cont. Max.	(5)	

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly the dial pointer must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser closed, set the dial pointer on the extreme left index line at the low frequency end of the scale.

MODEL S-1622

OPERATION	SIGNAL GENERATOR: FREQUENCY	SIGNAL GENERATOR: CONNECTION	~~DUMMY CAPACITY~~	~~SPECIAL INSTRUCTIONS~~	ADJUST PADDER
1	Press the Automatic Station Selector button until "DIAL" ~~appears in the window and stations can be tuned~~ in by Manual Tuning.				
2	470 K.C.	To Antenna Receptacle on Radio	35 Mmfd. See Note 1	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	29 27 21 17
3	1580 K.C.	To Antenna Receptacle on Radio	35 Mmfd. See Note 1	Note 2	67
4	1500 K.C.	To Antenna Receptacle on Radio	35 Mmfd. See Note 1	Set Tuning Condenser at 1500 K.C.	66 Note 3

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 35 Mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODELS 39-30,39-35
MODELS 40-150,40-155
MODEL 40-160
MODELS 40-180,40-185,40-190
MODELS 40-195,40-200

PHILCO RADIO & TELEV. CORP.

MODEL 108
Tuner Data
MODELS 40-120,40-125
Alignment,Trimmers

EQUIPMENT REQUIRED: MODELS 40-120,40-125.

(1) Signal Generator; Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose.

(2) Output Meter; Philco Models 027 or 028 Vacuum Tube Voltmeters and Circuit Testers incorporate a sensitive output meter and are recommended.

(3) Philco Fiber Handle Screw Driver, Part No. 45-2610. Aligning adapter Part No. 45-2767.

OUTPUT METER: The Philco 027 or 028 Output Meter is connected to the plate and screen terminals of the type 35A5 tube and adjusted for the 0 to 30 V. A. C. scales.

VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an alignment indicator make the following connections:

Remove the 7C6 tube from its socket and insert the aligning adapter, Part No. 45-2767, then replace the tube in the adapter. Connect the negative terminal of the vacuum tube voltmeter to the wire which protrudes from the side of the adapter. Attach the positive terminal of the voltmeter to the chassis. The positive terminal is connected to the chassis.

After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	7C7 See Note C	.1 mf.	455 K. C.	580 K. C.	Vol. Cont. Max.	14A, 14B, 15A	Push "IN" Manual Button Model 40-125
2	Ant. Ter.	10 mmf.	1600 K. C.	1600 K. C.	Vol. Cont. Max.	2B	See Note B See Note C
3	Ant. Ter.	10 mmf.	1400 K. C.	1400 K. C.	Vol. Cont. Max.	2A	

NOTE A — The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (High side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — **DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set horizontal at the low frequency end of the scale (540 K. C.).

NOTE C — Compensators 2A and 2B are at the top of the tuning condenser. Compensator 2A is on the front section and compensator 2B on the rear section. When padding the I. F. the signal generator can be attached to the 7C7 grid on the front section of the tuning condenser.

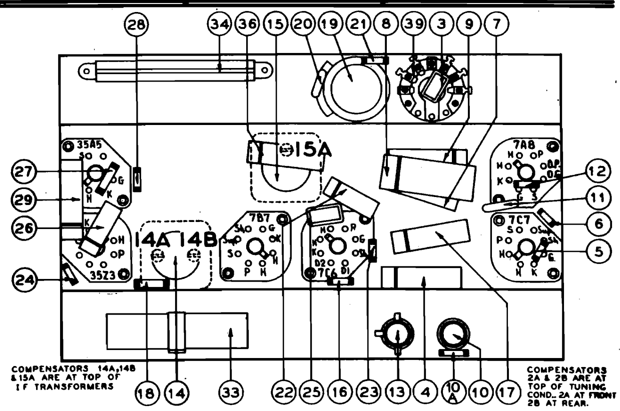


Fig. 1

Adjusting Push Button Tuning - MODELS 39-30,39-35,108 (CODE 121); 40-150,40-155; 40-160; 40-195,40-200;40-180,40-185,40-190.(FOR BUTTON ADJUSTMENT FREQUENCIES FOR MODELS 39-30,39-35, & 108 (CODE 121); SEE PARTS LISTS OF THESE MODELS).

In order to adjust the electric push buttons accurately for reception of broadcast stations, a vacuum tube voltmeter such as Philco Model 027 and 028 should be used. In addition, an insulated padding screw driver part No. 45-2610 and Loktal aligning adapter part No. 45-2767 are required. With this equipment at hand proceed as follows:

Insert the station call letters into the windows above the buttons. The station with the lowest frequency is placed in the first button on the left and the highest frequency is placed in the button on the extreme right. Each push button is adjusted by two set screws located on the rear of the push button unit. Each set of screws is numbered and covers a frequency range as follows:

MODEL 40-160

Push Button	Frequency Range
1	540-1000 K.C.
2	650-1100 K.C.
3	740-1300 K.C.
4	900-1500 K.C.
5	1100-1600 K.C.

MODELS 40-195, 40-200

Push-Button	Frequency Range
1, 2, 3	540-1030 K. C.
4, 5	670-1160 K. C.
6, 7, 8	900-1600 K. C.

MODELS 40-150,40-155,40-180,40-185,40-190.

Push-Button	Frequency Range
1, 2, 3	540-1060 K. C.
4, 5	650-1110 K. C.
6, 7	920-1600 K. C.

Looking at the front of the cabinet, the first button on the left is adjusted by set screw No. 1. The next push button by set screw No. 2 and the remaining push buttons in order.

1. Remove the 7C6 A. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the chassis.

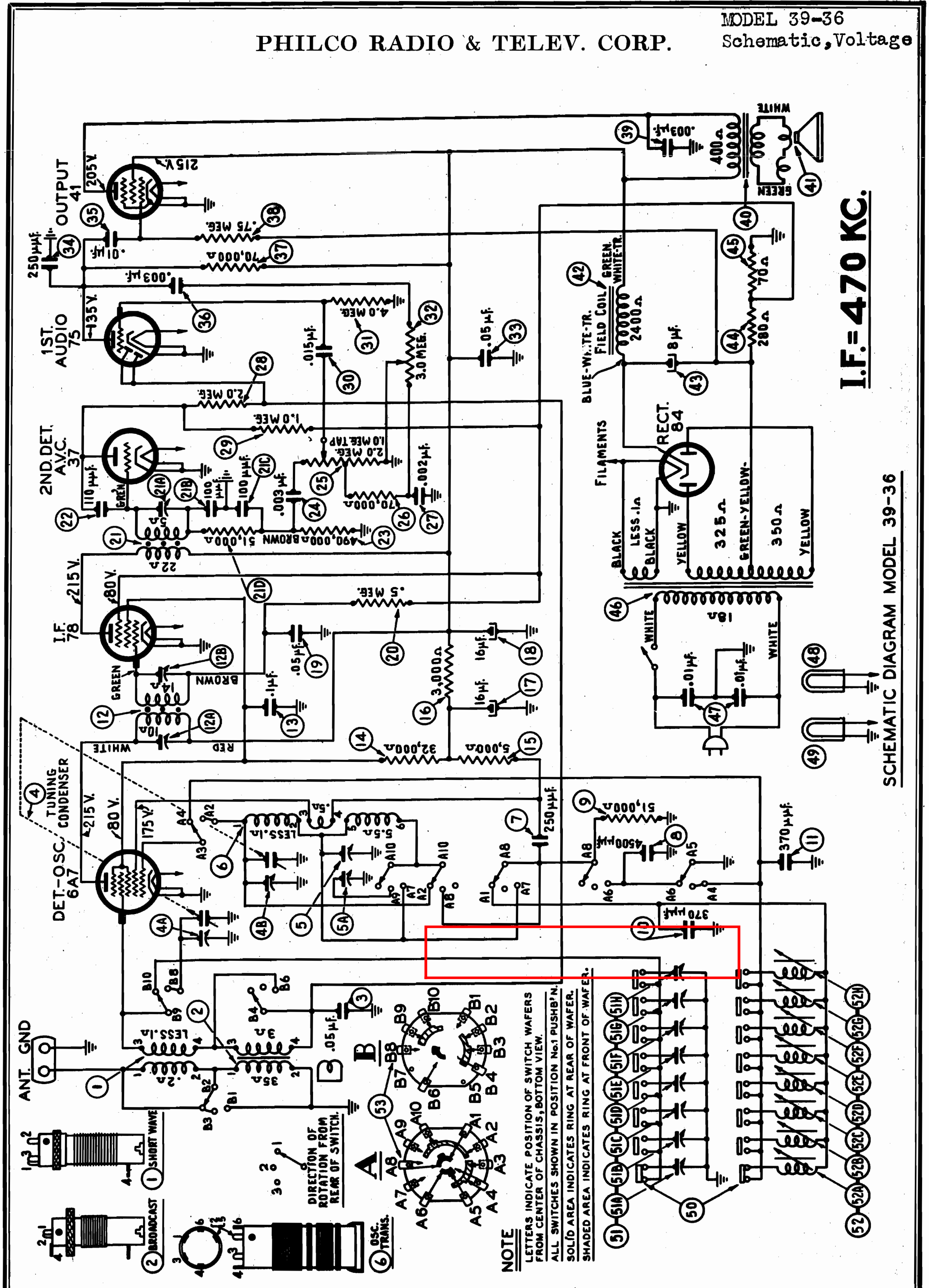
2. Turn the receiver on and set the tuning range disc to "Broadcast" (Manual Tuning).

3. Set up the Model 077 Station Setter about 3 feet from the receiver and connect a loop constructed out of about 6 feet of wire to the high and ground output jacks of the signal generator. Turn the output controls to maximum and set the modulation control to "MOD. ON". Manually tune in the first station to be set up on push button No. 1. After doing this set the indicator of the 077 Signal Generator to the frequency of the station being received. As the indicator approaches the frequency of the station a whistle will be heard; leave the indicator at this point. Turn the receiver tuning range disc to "Push Button" and press in No. 1 button. Using the insulated screw driver turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; at this point, turn the indicator of the signal generator away from the frequency of the station. Readjust No. 1 "Osc." and "Ant." screws for maximum deflection of the vacuum tube voltmeter pointer. Station No. 1 is now adjusted properly. After setting up the first station the same procedure as outlined above is used for the remaining stations.

When this model is to be set up to receive the sound of a television program tuned in by the special type Philco television sets or when it is to be used in conjunction with a Philco Record Player, push-button No. 1 should be used. To tune in these programs, the same procedure as given for ordinary broadcast stations as outlined above is used.

MODEL 39-36
Schematic, Voltage

PHILCO RADIO & TELEV. CORP.



MODEL 39-36
Alignment, Socket
Trimmers, Chassis
Tuner Chassis, Parts

PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

TYPE CIRCUIT: Philco Model 39-36, code 121 is a six tube, A.C. operated superheterodyne circuit with two tuning ranges covering standard broadcast (540-1720 K.C.) and shortwave (5 M.C. to 18.0 M.C.) frequencies. In addition, the receiver employs Electric Automatic Push-Button Tuning for automatically selecting any of eight standard broadcast stations, continuously variable tone control, automatic volume control, and pentode audio output.

POWER SUPPLY: 115 V., 60 cycle A.C. 42 watts. For operation on 115V., 25 to 40 cycles, A.C. current or 220 V. 50 to 60 cycles A.C. current, different power transformers are required, and can be obtained from your distributor.

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES USED: 6A7, First Detector Oscillator, 78, I.F. Amplifier; 37, Second Detector-A.V.C.; 75, First Audio; 41, Audio Output and 84, Rectifier.

CONTROLS: The new Philco Disc Controls are used on this model for adjusting tuning, volume, tone and frequency range.

CABINETS: Type XX.

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077.
(2) Output Meter, Philco 027 Circuit Tester.
(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 41 tube. After connecting the Output Meter, adjust compensators in the order as given in tabulations below. Locations of the compensators are shown in Fig. 1.

Operations	SIGNAL GENERATOR			RECEIVER			Special Instructions
	Output Connections To Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	6A7 Grid.	.1 mf.	470 K.C.	580 K.C.	Vol Cont. Max. Range Switch (Brdcst.)	(21A) (12B) (12A)	
2	Ant. Ter.	100mmf.	18.0 M.C.	18.0 M.C.	Vol. Cont. Max. Range Switch (S.W.)	(4B)	See Note B, C
3	Ant. Ter.	100mmf.	1550 K.C.	1550 K.C.	Vol. Cont. Max. Range Switch (Brdcst.)	(5) (4A)	
4	Ant. Ter.	100mmf.	580 K.C.	580 K.C.	Vol. Cont Max. Range Switch (Brdcst.)	(5A)	
5	Ant. Ter.	100mmf.	1550 K.C.	1550 K.C.	Vol. Cont. Max.	(5)	

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—Dial Calibration: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable is shown in Service Bulletin No. 305.

NOTE C—Compensators (4A) and (4B) are located on top of the tuning condenser. Compensator (4B) is the first one from the tuning drum side.

Replacement Parts

Schem. No.	Description	Part No.
1	Ant. Trans. (S.W.)	32-3027
2	Ant. Trans. (B.C.	32-3026
3	Tubular Cond. (.05 mf.)	30-4519
4	Tuning Cond. Assy.	31-2346
5	Dual Padder Unit	31-6255
6	Oscillator Trans.	32-3028
7	Mica Cond. (250 mmf.)	30-1032
8	Mica Cond. (4500 mmf.)	30-1109
9	Resistor (51,000 ohms, ½ watt)	33-351339
10	Condenser (Silver Mica)—370 mmf.	30-1110
11	Condenser (Silver Mica)—370 mmf.	30-1110
12	1st I.F. Trans. Assy.	32-3018
13	Tubular Cond. (.1 mf.)	30-4455
14	Resistor (32,000 ohms) ½ watt	33-332339
15	Resistor (5,000 ohms) ½ watt	33-250339
16	Resistor (3,000 ohms) ½ watt	33-230339
17	Electro. Cond. (16 mf.)—250 Volts	30-2331
18	Electro. Cond. (16 mf.)—250 Volts	30-2370
19	Tubular Cond. (.05 mf.)	30-4519
20	Resistor (490,000 ohms, ½ watt)	33-449339
21	2nd I.F. Trans. Assy.	32-3129
21A	Compensator Part of 21	
21B	Condenser Part of 21A	
21C	Condenser Part of 21A	
21D	Resistor (51,000 ohms—½ watt)	33-351339
22	Mica Cond. (110 mmf.)	30-1031
23	Resistor (490,000 ohms, ½ watt)	33-449339
24	Tubular Cond. (.003 mf.)	30-4580
25	Volume Control (2 meg.)	33-5286
26	Resistor (70,000 ohms)	33-370339
27	Tubular Cond. (.002 mf.)	30-4597
28	Resistor (2.0 meg., ½ watt)	33-520339
29	Resistor (1.0 meg., ½ watt)	33-510339
30	Tubular Cond. (.015 mf.)	30-4515
31	Resistor (4.0 meg., ½ watt)	33-540339
32	Tone Control (3 0 meg.)	33-5287
33	Tubular Cond. (.05 mf.)	30-4518
34	Mica Cond. (250 mmf.)	30-1032
35	Tubular Cond. (.01 mf.)	30-4572
36	Tubular Cond. (.003 mf.)	30-4582
37	Resistor (70,000 ohms, ½ watt)	33-370339
38	Resistor (.75 meg. ½ watt)	33-475339
39	Tubular Cond. (.003 mf.)	30-4469
40	Output Trans. for Speaker Part No. 36-1438	32-7978
41	Cone and Voice Coil Assy. for Speaker Part No. 36-1438-2	36-4089
42	Field Coil, Replace Speaker Part No. 36-1438-2	
43	Electro. Cond. (8 mf.—400 V.)	30-2371
44	Resistor (280 ohms)	33-128431
45	Resistor (70 ohms, ½ watt)	33-070339
46	Power Trans. 115V. (50 to 60 cycles)	32-7977
46A	Power Trans. 115 V. (25 to 40 cycles)	
47	Bakelite Cond. (.01 mf.—.01 mf.)	3903DG
48	Pilot Lamp (Dial)	34-2064
49	Pilot Lamp (Dial)	34-2064
50	Push Button Switch	42-1462
51	Compensator Assy.	31-6256
51A	Compensator No 1 (540-1030 K.C.)	
51B	Compensator No. 2 (540-1030 K.C.)	
51C	Compensator No. 3— 670-1160 K.C.	
51D	Compensator No. 4— 670-1160 K.C.	
51E	Compensator No. 5— 900-1470 K C.	
51F	Compensator No. 6— 900-1470 K.C.	
51G	Compensator No 7—1170-1600 K.C.	
51H	Compensator No 8—1170-1600 K.C.	
52	Electric Push-Button Coil Assy.	32-3031
52A	Osc. Coil No 1— 540-1030 K.C.	32-3042
52B	Osc. Coil No. 2— 540-1030 K C.	32-3042
52C	Osc. Coil No. 3— 670-1160 K.C.	32-3042
52D	Osc. Coil No. 4— 670-1160 K.C.	32-3042
52E	Osc Coil No. 5— 900-1470 K.C.	32-3041
52F	Osc. Coil No. 6— 900-1470 K.C.	32-3041
52G	Osc. Coil No. 7—1170-1600 K.C.	32-3041
52H	Osc. Coil No. 8—1170-1600 K.C.	32-3041
53	Wave Switch	42-1478

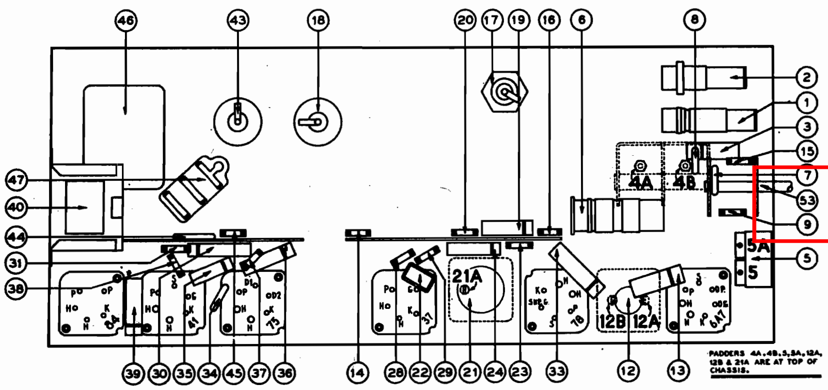


Fig. 1.—Part Locations—Underside of Chassis

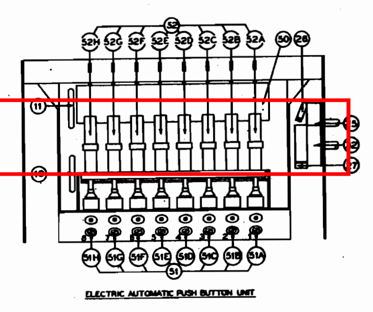


Fig. 2.—Part Locations—Push Button Unit

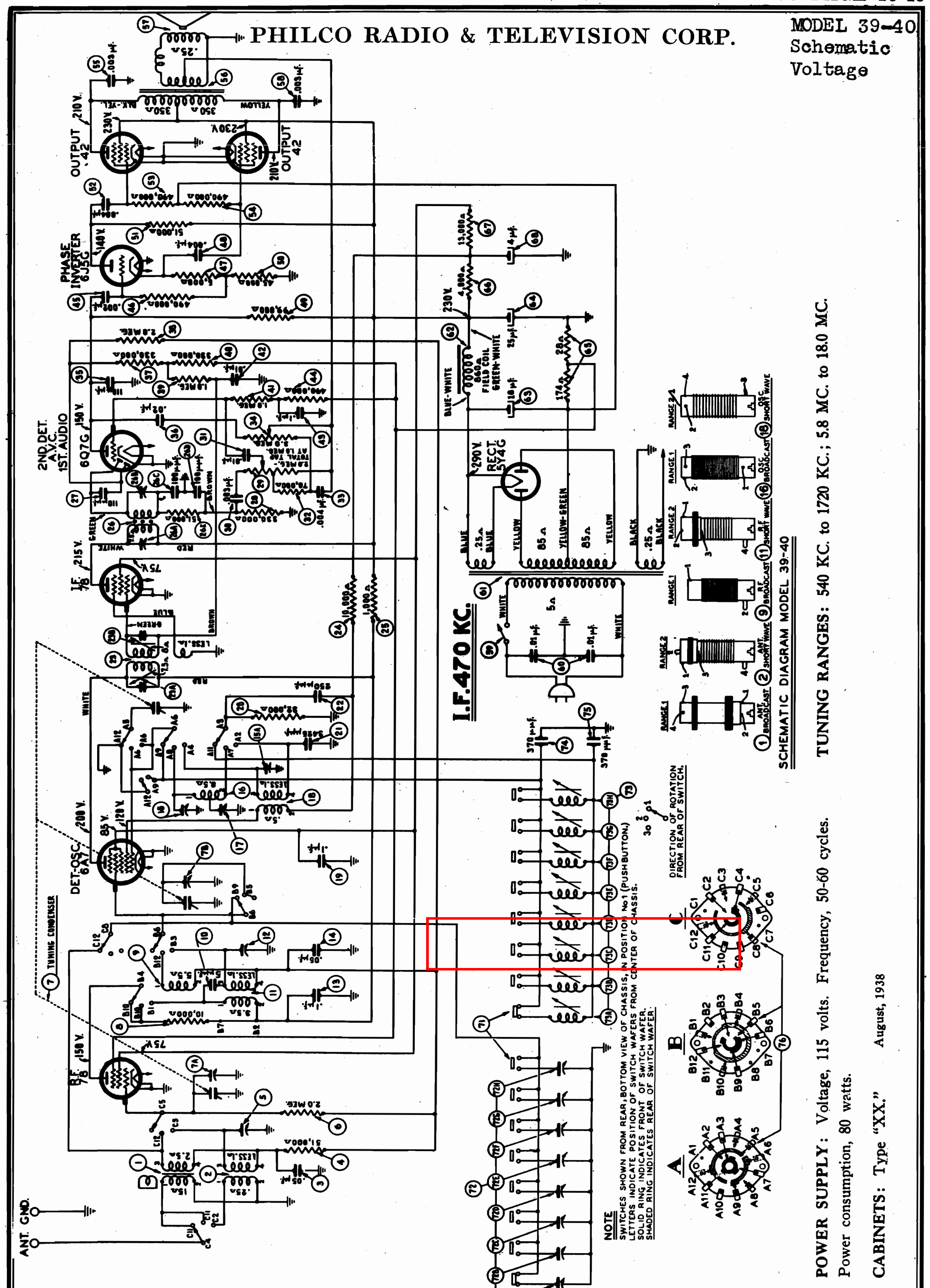
FOR PUSH-BUTTON ADJUSTMENTS
SEE INDEX

Miscellaneous Parts

Description	Part No.
Bezel	56-1104
Bracket and Bearing (Tuning Drum)	38-9662
Cable (Power)	L-2778
Coupling (Tuning Condenser)	31-2291
Dial	27-5452
Dial Pointer	56-1033
Dial Drive Cord (Tuning)	31-2315
Dial Drive Cord (Pointer)	31-2316
Disc Control (Tuning)	27-4766
Disc Control Range Switch	27-4767
Disc Control (Tone)	27-4764
Disc Control (Volume)	27-4765
Drum (Tuning Condenser)	38-9716
Push-Buttons	27-4759
Socket (5 prong)	27-6035
Socket (6 prong)	27-6036
Socket (7 prong)	27-6099
Spring (Dial Drive Cord)	28-8913
Speaker	36-1438-2

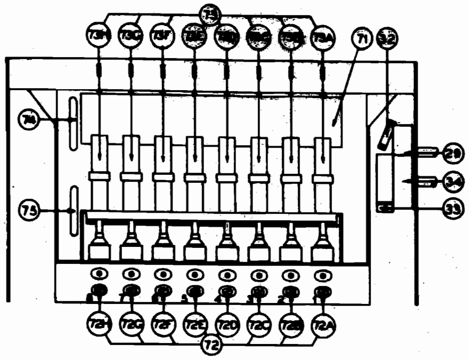
PHILCO RADIO & TELEVISION CORP.

MODEL 39-40
Schematic
Voltage

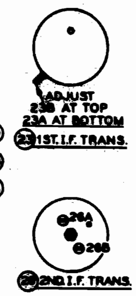


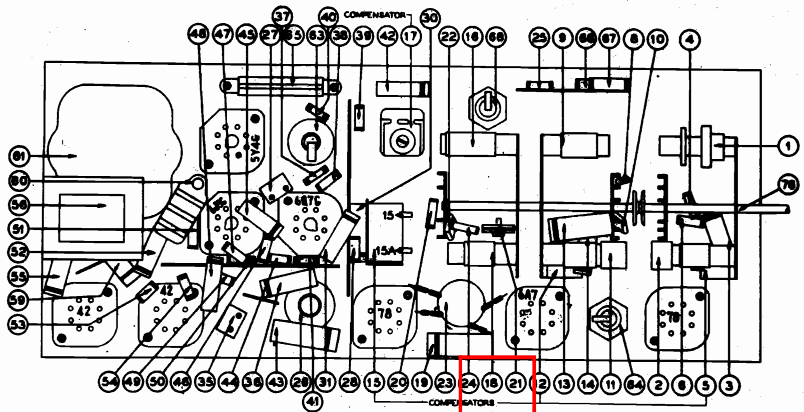
MODEL 39-40,Code 121
Socket,Trimmers
Chassis,Tuner Chassis
Drive Data,Parts

PHILCO RADIO & TELEV. CORP.

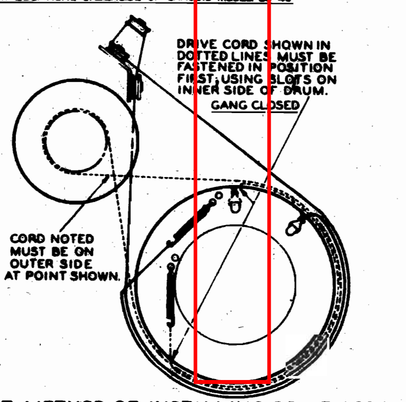


ELECTRIC AUTOMATIC PUSH BUTTON UNIT





PART LOCATIONS UNDERSIDE OF CHASSIS MODEL 39-40



CORRECT METHOD OF INSTALLING DRIVE CORDS
ON TUNING CONDENSER DRUM

Replacement Parts
Model 39-40, Code 121

Schem. No.	Description	Part No.
1	Antenna Transformer (Range 1, Brdcst.)	32-3056
2	Antenna Transformer (Range 2)	32-3055
3	Condenser (.05 mf tubular)	30-4519
4	Resistor (51,000 ohms, ½ watt)	33-351339
5	Compensator (Range 2, S. W.)	31-6212
6	Resistor (2.0 megohms, ½ watt)	33-520339
7	Tuning Condenser	31-2296
8	Resistor (10,000 ohms, ½ watt)	33-310339
9	R. F. Transformer (Range 1, Brdcst.)	32-2379
10	Condenser (5 mmf mica)	30-1083
11	R. F. Transformer (Range 2, S. W.)	32-3046
12	Compensator (Range 2, S. W.)	31-6212
13	Condenser (.1 mf tubular)	30-4455
14	Condenser (.05 mf tubular)	30-4519
15	Compensator (two sections)	31-6093
16	Oscillator Transformer (Range 1, Brdcst.)	32-2120
17	Compensator	31-6230
18	Oscillator Transformer (Range 2, S. W.)	32-3051
19	Condenser (.1 mf tubular)	30-4455
20	Resistor (32,000 ohms, ½ watt)	33-332339
21	Condenser (3425 mmf mica)	31-6263
22	Condenser (250 mmf mica)	30-1032
23	1st I. F. Transformer Assembly	32-3079
24	Resistor (10,000 ohms, ½ watt)	33-310339
25	Resistor (1000 ohms, ½ watt)	33-210339
26	2nd I. F. Transformer	32-2582
27	Condenser (110 mmf mica)	30-1031
28	Resistor (330,000 ohms, ½ watt)	33-433339
29	Volume Control (2.0 megohms)	33-5286
30	Condenser (.003 mf tubular)	30-4580
31	Condenser (.01 mf tubular)	30-4581
32	Resistor (70,000 ohms, ½ watt)	33-370339
33	Condenser (.004 mf tubular)	30-4578
34	Tone Control (3.0 megohms)	33-5287
35	Condenser (110 mmf mica)	30-1031
36	Condenser (.02 mf tubular)	30-4481
37	Resistor (330,000 ohms, ½ watt)	33-433339
38	Resistor (2.0 megohms, ½ watt)	33-520339
39	Resistor (1.0 megohm, ½ watt)	33-510339
40	Resistor (330,000 ohms, ½ watt)	33-433339
41	Resistor (1.0 megohm, ½ watt)	33-510339
42	Condenser (.01 mf tubular)	30-4581
43	Condenser (.1 mf tubular)	30-4455
44	Resistor (490,000 ohms, ½ watt)	33-449339
45	Condenser (.002 mf tubular)	30-4579
46	Resistor (490,000 ohms, ½ watt)	33-449339
47	Resistor (5000 ohms, ½ watt)	33-250339
48	Condenser (.004 mf tubular)	30-4578
49	Resistor (99,000 ohms, ½ watt)	33-399339
50	Resistor (45,000 ohms, ½ watt)	33-345339
51	Resistor (51,000 ohms, ½ watt)	33-351339
52	Condenser (.004 mf tubular)	30-4578
53	Resistor (490,000 ohms, ½ watt)	33-449339
54	Resistor (490,000 ohms, ½ watt)	33-449339
55	Condenser (.003 mf tubular)	30-4469
56	Output Transformer	32-7981
57	Cone and Voice Coil Assembly for Speaker (Part No. 36-1450)	36-4089
58	Condenser (.003 mf tubular)	30-4469
59	A. C. Switch	42-1467
60	Condenser (.01 mf to .01 mf bakelite)	3903DG
61	Pwr. Trnsfrmr., 115 v., 60 cycle	32-7998
62	Field Coil, Replace Speaker	36-1450
63	Elect. Condenser (18 mf)	30-2335
64	Elect. Condenser (25 mf), 250	30-2333
65	B. C. Resistor	33-3358
66	Resistor (4000 ohms, ½ watt)	33-240339
67	Resistor (13,000 ohms, ½ watt)	33-313339
68	Elect. Condenser (4 mf), 250	30-2334
69	Pilot Lamp .. Dial	34-2064
70	Pilot Lamp	34-2064
71	Push-Button Switch	42-1462
72	Padder Strip Assem., Complete	31-6259
72A	Compensator No. 1 (540-1030 KC.)	
72B	Compensator No. 2 (540-1030 KC.)	
72C	Compensator No. 3 (670-1160 KC.)	
72D	Compensator No. 4 (670-1160 KC.)	
72E	Compensator No. 5 (900-1470 KC.)	
72F	Compensator No. 6 (900-1470 KC.)	
72G	Compensator No. 7 (1100-1600 KC.)	
72H	Compensator No. 8 (1100-1600 KC.)	
73	Coil Strip Assembly (8 coils)	32-3031
73A	Coil No. 1 (540-1030 KC.)	32-3042
73B	Coil No. 2 (540-1030 KC.)	32-3042
73C	Coil No. 3 (670-1160 KC.)	32-3042
73D	Coil No. 4 (670-1160 KC.)	32-3042
73E	Coil No. 5 (900-1470 KC.)	32-3041
73F	Coil No. 6 (900-1470 KC.)	32-3041
73G	Coil No. 7 (1100-1600 KC.)	32-3041
73H	Coil No. 8 (1100-1600 KC.)	32-3041
74	Condenser (370 mmf silver mica)	30-1110
75	Condenser (370 mmf silver mica)	30-1110
76	Wave Switch	42-1461
	Bezel	56-1104
	Bezel Gasket	27-9245
	Bearing (Drum Shaft)	56-1036
	Cable (Power)	L-2778
	Cable (Speaker)	41-3430
	Coupling (Tuning Condenser)	31-2291
	Dial (Scale)	27-5421
	Dial Clamp	56-1034
	Dial Gasket	27-9224
	Dial Gasket	27-9225
	Dial Pointer	56-1033
	Dial Drive Cord (Tuning)	31-2315
	Dial Drive Cord, Pointer	31-2316
	Dial Drive Cord Spring	28-8913
	Disc Control (Tuning)	27-4766
	Disc Control (Range Switch)	38-9702
	Disc (Tone Control)	27-4764
	Disc (Volume Control)	27-4765
	Drum Assembly (Tuning Condenser)	38-9661
	Drum Bracket and Bearing (Tuning Condenser)	38-9662
	Shaft (Control Drums)	28-6924
	Socket Assembly Dial Lamp	38-9694
	Socket Assembly Dial Lamp	38-9695
	Socket (6-prong), 78-tube	27-6036
	Socket (6-prong), Octal	27-6086
	Socket (7-prong), Octal	27-6053
	Socket (7-prong), 6A7-tube	27-6107
	Speaker	36-1450
	Tab Kit	40-6392

Miscellaneous Parts

Description	Part No.
Grommet (Mtg. Push-Button Switch)	27-4610
Grommet (Mtg. Tuning Unit Assy.)	3914
Grommet (Mtg. Tuning Unit Assy.)	3915
Nut (A. C. Switch)	W-1757
Nut (Speaker Mtg.)	W-124
Screw (Mtg. Chassis)	W-1345
Screw (Bezel)	W-1834
Washer (Speaker Mtg.)	27-7467
Washer Rubber (Mtg. Chassis)	27-4571
Washer (A. C. Switch)	W-894

MODEL 39-40
MODEL 39-45
Alignment, Tuner Data

PHILCO RADIO & TELEVISION CORP.

MODEL 39-36
Tuner Data

ADJUSTING ELECTRIC PUSH-BUTTON TUNING FOR MODELS 39-36, 39-40, AND 39-45

In order to set the Electric Push-Buttons correctly for each station, the procedure as given below should be carefully followed. Accurate adjustment of the buttons requires the use of a Philco Model 077 Station Setter and a part No. 27-7059 insulated screw driver.

(A) Select eight of the most popular stations received in the locality and remove their call letters from the call letter sheets supplied. Place the call letters in the windows above the buttons, making sure that each button covers the frequency of the station for which it is to be used. Two adjustment screws for each button are located on the rear of the push-button unit. Each set of screws is numbered and covers a frequency range as follows:

Push-Button	Frequency Range
1 and 2	540-1030 KC.
3 and 4	670-1160 KC.
5 and 6	900-1470 KC.
7 and 8	1100-1600 KC.

Looking at the front of the cabinet, the first button on the left is adjusted by set screw No. 1, the next button by set screw No. 2, and the remaining buttons in the same order.

(B) Connect the aerial and ground to the "ANT" and "GND" terminals of the receiver.

(C) Turn the receiver Tuning Range Selector to position 2 (Broadcast) and tune the receiver to the station to be set on the first button.

(D) Plug the output leads of the Station Setter into the "High" and "Gnd" jacks, and turn the output controls to maximum.

Turn the modulation control to "Modulation On." Connect the output lead of the station setter to the "ANT" and "GND" terminals of the receiver and tune to the frequency of the station being received. As the indicator is slowly tuned through the frequency of the station, there will be two points at which a whistle will be heard, one above and one below the frequency of the station. When the indicator is on the frequency of the station the whistle will be eliminated and the modulated signal of the station setter will then be clearly heard through the receiver.

(E) Turn the receiver Tuning Range Selector to position 1 (Push-Button) and press in the first button. Using the part No. 27-7059 insulated screw driver, turn the No. 1 "OSC" screw until the broadcast station identified by the station setter signal is tuned to Maximum Volume.

(F) Remove the output lead of the station setter from the "ANT" terminal of the receiver and turn the indicator of the Station Setter off the frequency of the station. The program of the desired station will then be heard in the receiver without the modulated signal.

(G) With the volume of the receiver low, slowly turn the No. 1 "OSC" screw back and forth until maximum output is received. Repeat the same procedure for the No. 1 "ANT" screw.

After setting up the first station, the same procedure given under (C) to (G) is used for the other stations.

ALIGNMENT OF MODEL 39-40

Operations	Signal Generator: Output Connections to Receiver	Signal Generator: Dummy Antenna (Note A)	Signal Generator: Dial Setting	Receiver: Dial Setting	Receiver: Control Setting	Receiver: Adjust Compensators to Max. Reading	Special Instructions
1	6A7	.1 mf	470 KC.	580 KC.	Vol. Max. Range Switch Broadcast	26B, 26A, 23B, 23A	
2	Ant. Ter.	150 mmf	1550 KC.	1550 KC.	"	15, 7B, 7A	See Note B and C
3	Ant. Ter.	150 mmf	580 KC.	580 KC.	"	17	Roll Tuning Condenser
4	Ant. Ter.	150 mmf	1550 KC.	1550 KC.	"	15	
5	Ant. Ter.	400 ohms	18.0 MC.	18.0 MC.	Range Switch S. W.	15A, 12, 5	

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—Dial Calibration. In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the ext eme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable is shown on page 3.

NOTE C—Compensators (7A) and (7B) are located on top of the tuning condenser. Compensator (7A) is the first one from the tuning drum side.

ALIGNMENT OF MODEL 39-45

Operation	Signal Generator: Output Connections to Receiver	Signal Generator: Dummy Antenna (Note A)	Signal Generator: Dial Setting	Receiver: Dial Setting	Receiver: Control Setting	Receiver: Adjust Compensators to Max. Reading	Special Instructions
1	6A7	.1 mf	470 KC.	470 KC.	Vol. Max. Range Switch Broadcast	30B, 30A, 27B, 27A	
2	Antenna	150 mmf	1550 KC.	1550 KC.	"	21, 8B, 8A	See Note B and C
3	Antenna	150 mmf	580 KC.	580 KC.	"	22	Roll Tuning Condenser
4	Antenna	150 mmf	1550 KC.	1550 KC.	"	21	
5	Antenna	400 ohms	5.0 MC.	5.0 MC.	Range Switch Police	21A	
6	Antenna	400 ohms	18.0 MC.	18.0 MC.	Range Switch S. W.	21B, 14, 4	

NOTE A—The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable is shown on page 3.

NOTE C—Compensators (8A) and (8B) are located on top of the tuning condenser. Compensator (8A) is the first one from the tuning drum side.

MODEL 39-71
Schematic, Voltage, Socket
Alignment, Trimmers, Parts
Chassis

PHILCO RADIO & TELEV. CORP.

Operations in Order	SIGNAL GENERATOR			RECEIVER			Special Instructions
	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	1A7G Grid	.1 mfd.	470 K. C.	580 K. C.	Vol. Cont. Max.	12A, 11B, 11A	Note C
2	Ant. & Grd. Terminals	400 ohms	1550 K. C.	1550 K. C.	Vol. Cont. Max.	2B, 2A	Note B Note C

NOTE A—The "Dummy Antenna" consists of a condenser or resistor connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

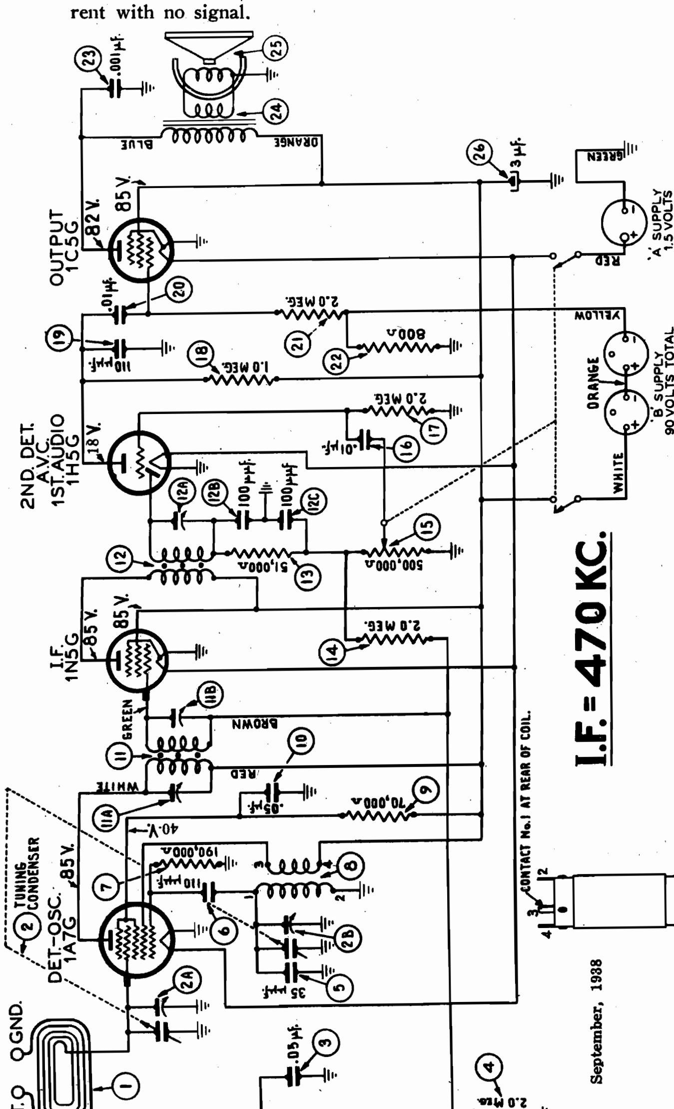
NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: Turn the tuning condenser to maximum capacity (plates fully meshed). With tuning condenser in this position set the pointer to the small "black dot" at the low frequency end of the dial scale.

NOTE C—To adjust the I. F. compensators, remove the back from the cabinet, which is held in place by four screws. The chassis is then taken out by removing the four screws and two corks underneath the cabinet, and the Tuning and Volume knobs. The I. F. compensators are located on top of the I. F. transformers.

When adjusting the Antenna (2A) and Oscillator (2B) compensators, the chassis must be assembled in the cabinet with the batteries and loop in place. The Signal Generator output lead with the "Dummy Antenna" is then connected to the terminals marked "Ant" and "Grd" underneath the cabinet. The antenna and oscillator compensators are then adjusted through the holes in the bottom of the cabinet.

BATTERIES REQUIRED: One (1) Philco "A" Pack, Part No. 41-8017; two (2) Philco "B" Packs, Part No. 41-8018.

BATTERY DRAIN: "A"—240 Ma.; "B" 8.5 Ma. Total current with no signal.



September, 1938

TUNING RANGE: 530 to 1720 K. C.

INTERMEDIATE FREQUENCY: 470 K. C.

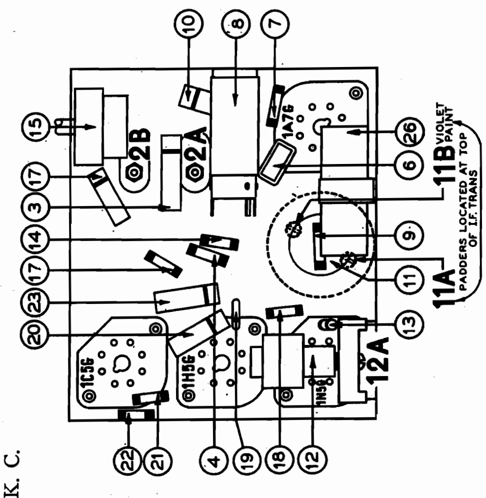
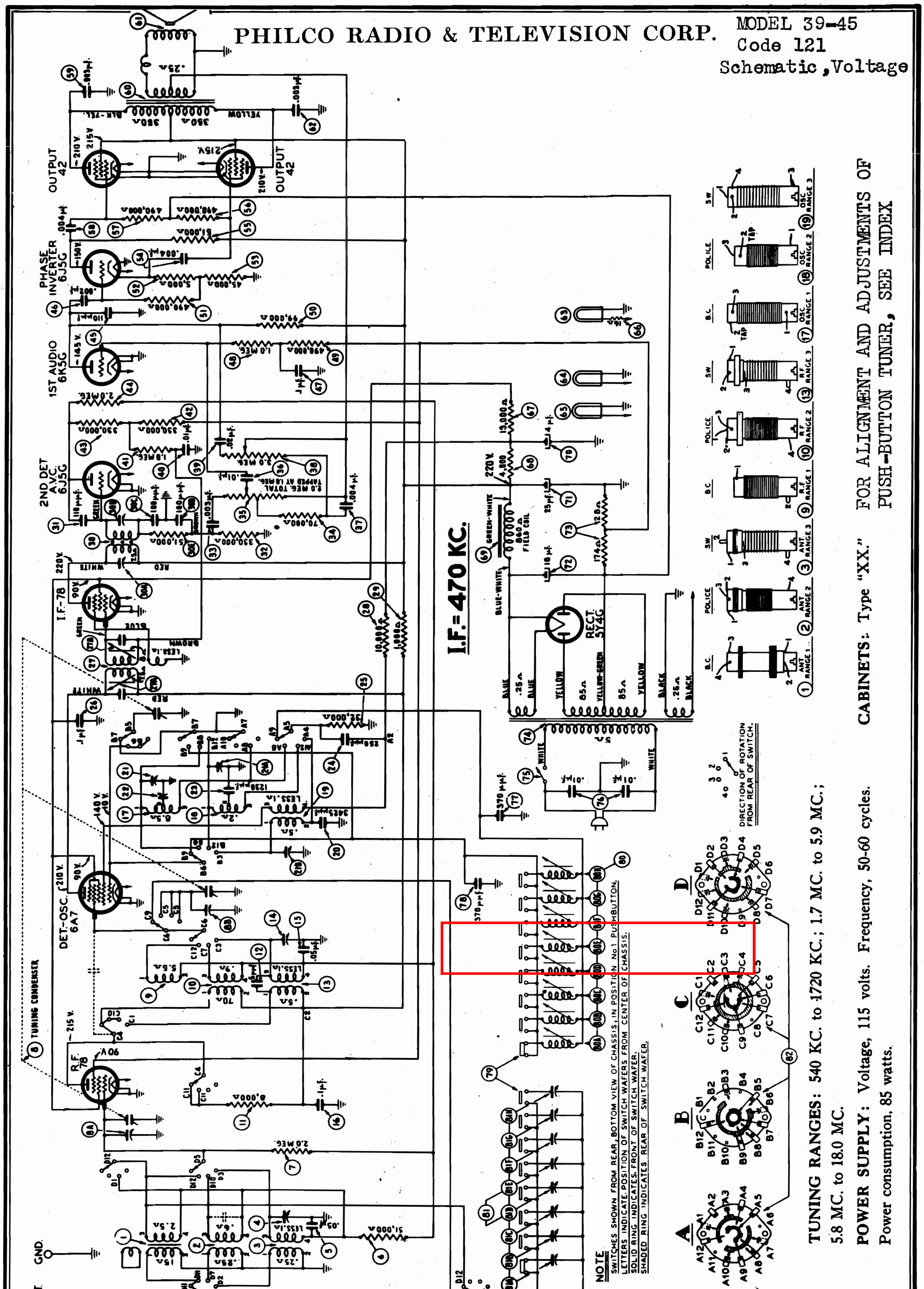


Fig. 1. Compensator and Part Locations Underside of Chassis

AERIAL AND GROUND: In localities where station signals are weak, an aerial and ground may be necessary. A terminal strip will be found underneath the cabinet marked "Ant" "Grd" for this purpose.

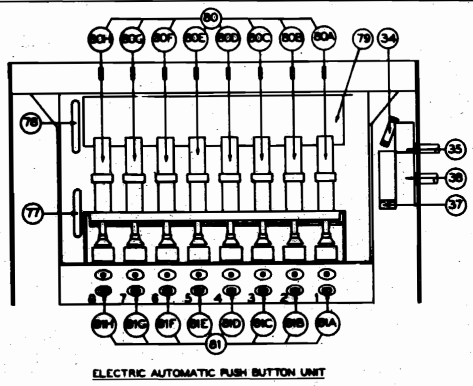
Replacement Parts

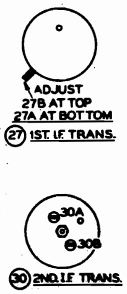
Code No.	Description	Part No.
1	Loop Assy.	40-6421
2	Tuning Cond.	31-2322
3	Tubular Cond. (.05 mf.)	30-4519
4	Resistor (2 megohm)	33-520339
5	Mica Cond. (35 mmf.)—mounted on top of tuning condenser	30-1095
6	Mica Cond. (110 mmf.)	30-1031
7	Resistor (190,000 ohms)	33-419339
8	Oscillator Trans.	32-3118
9	Resistor (70,000 ohms)	33-370339
10	Tubular Cond. (.05 mf.)	30-4444
11	1st I. F. Trans. Assy.	32-3103
12	2nd I. F. Trans. Assy.	32-3081
13	Resistor (51,000 ohms)	33-351339
14	Resistor (2 megohms)	33-520339
15	Volume Control & Switch	33-5301
16	Tubular Cond. (.01 mf.)	30-4572
17	Resistor (2 megohm)	33-520339
18	Resistor (1 megohm)	33-510339
19	Mica Cond. (110 mmf.)	30-1031
20	Tubular Cond. (.01 mf.)	30-4572
21	Resistor (2 megohm)	33-520339
22	Resistor (800 ohms)	33-180339
23	Tubular Cond. (.001 mf.)	30-4201
24	Output Trans. for Speaker No. 36-1451-3	
25	Voice Coil Assy. for Speaker No. 36-1451-3	36-4090
26	Electrolytic Cond. (3 mf.)	30-2359
	Bezel Window	27-5434
	Dial	31-2321
	Dial Pointer	28-5185
	Dial Drive Cord Assy.	31-2323
	Dial Tuning Shaft & Brkt. Assy.	31-2324
	Escutcheon (knobs)	56-1252
	Escutcheon (screws)	W-2129
	Knob (Tuning, Volume)	27-4331
	Loop Antenna	40-6421
	Pulley (Tuning Condenser)	28-6662
	Socket (6 prong)	27-6086
	Socket (7 prong)	27-6087
	Spring (Dial Cord)	28-8751
	Speaker	36-1451

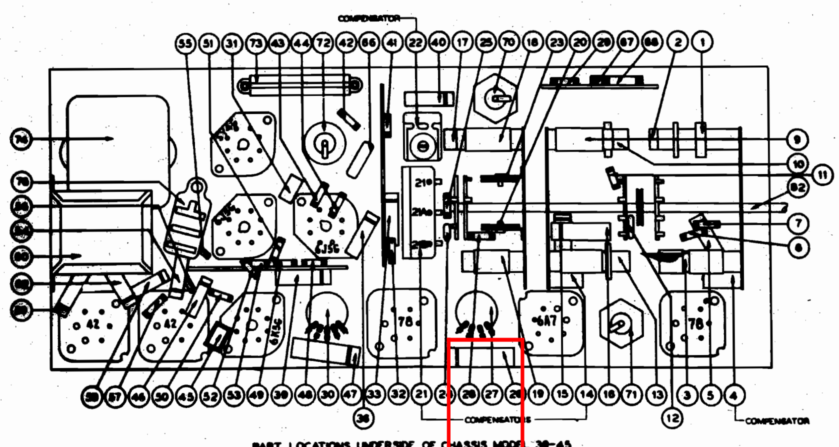

PHILCO RADIO & TELEVISION CORP.
MODEL 39-45
Code 121
Schematic, Voltage
OUTPUT 42
OUTPUT 42
PHASE INVERTER 6J5G
1ST AUDIO 6K5G
2ND DET. A.V.C. 6J5G
I.F.-78
DET.-OSC. 6A7
R.F. 78
TUNING CONDENSER
RECT. 5Y4G
FIELD COIL
I.F. = 470 KC.
ANT.
GND.
NOTE
SWITCHES SHOWN FROM REAR, BOTTOM VIEW OF CHASSIS, IN POSITION No. 1 PUSHBUTTON.
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM CENTER OF CHASSIS.
SOLID RING INDICATES FRONT OF SWITCH WAFER.
SHADED RING INDICATES REAR OF SWITCH WAFER.
DIRECTION OF ROTATION FROM REAR OF SWITCH.
CABINETS: Type "XX."
FOR ALIGNMENT AND ADJUSTMENTS OF PUSH-BUTTON TUNER, SEE INDEX
TUNING RANGES: 540 KC. to 1720 KC.; 1.7 MC. to 5.9 MC.; 5.8 MC. to 18.0 MC.
POWER SUPPLY: Voltage, 115 volts. Frequency, 50-60 cycles. Power consumption, 85 watts.

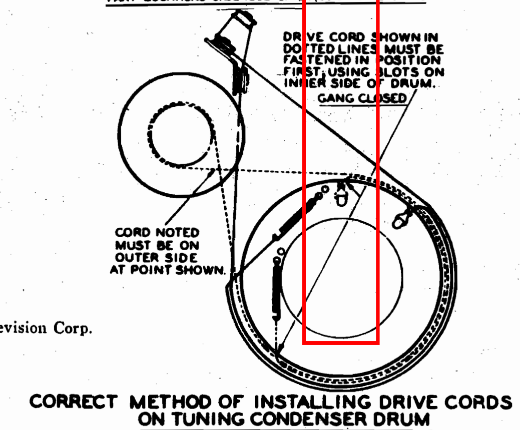
MODEL 39-45, Code 121
Socket, Trimmers, Chassis
Tuner Chassis, Drive Data
Parts List

PHILCO RADIO & TELEV. CORP.









August, 1938

Replacement Parts
Model 39-45, Code 121

Schem. No.	Description	Part No.
1	Ant. Trans. (Range 1), B. C.	32-3056
2	Ant. Trans. (Range 2), Police	32-3053
3	Ant. Trans. (Range 3), S. W.	32-3055
4	Ant. Compensator (Range 3)	31-6212
5	Tubular Cond. (.05 mf)	30-4519
6	Resistor (51,000 ohms)	33-351339
7	Resistor (2.0 megohms)	33-520339
8	Tuning Cond.	31-2296
9	R. F. Trans. (Range 1), B. C.	32-2379
10	R. F. Trans. (Range 2), Police	32-3054
11	Resistor (8000 ohms)	33-280339
12	Mica Cond. (5 mmf)	30-1083
13	R. F. Trans. (Range 3), S. W.	32-3046
14	R. F. Compensator (Range 3)	31-6212
15	Tubular Cond. (.05 mf)	30-4519
16	Tubular Cond. (.1 mf)	30-4455
17	Osc. Trans. (Range 1), B. C.	32-2120
18	Osc. Trans. (Range 2), Police	32-3052
19	Osc. Trans. (Range 3), S. W.	32-3051
20	Tracking Condenser, Semifixed (3425 mmf)	31-6263
21	Osc. Compensator (Broadcast)	31-6266
21A	Osc. Compensator (Police, Part of 21)	31-6266
21B	Osc. Compensator (s.w. part of 21)	
22	Osc. Compensator	31-6230
23	Tracking Condenser, Semifixed (1230 mmf)	31-6262
24	Mica Cond. (250 mmf)	30-1032
25	Resistor (32,000 ohms)	33-332339
26	Tubular Cond. (.1 mf)	30-4455
27	1st I. F. Trans. Assy.	32-3079
28	Resistor (10,000 ohms)	33-310339
29	Resistor (1000 ohms)	33-210339
30	2nd I. F. Trans. Assy.	32-2582
31	Mica Cond. (110 mmf)	30-1031
32	Resistor (330,000 ohms)	33-433339
33	Tubular Cond. (.003 mf)	30-4580
34	Resistor (70,000 ohms)	33-370339
35	Volume Control	33-5286
36	Tubular Cond. (.01 mf)	30-4169
37	Tubular Cond. (.004 mf)	30-4578
38	Tone Control	33-5287
39	Tubular Cond. (.02 mf)	30-4481
40	Tubular Cond. (.01 mf)	30-4169
41	Resistor (1.0 megohm)	33-510339
42	Resistor (330,000 ohms)	33-433339
43	Resistor (330,000 ohms)	33-433339
44	Resistor (2.0 megohms)	33-520339
45	Mica Cond. (110 mmf)	30-1031
46	Tubular Cond. (.002 mf)	30-4579
47	Tubular Cond. (.1 mf)	30-4455
48	Resistor (1.0 megohm)	33-510339
49	Resistor (490,000 ohms)	33-449339
50	Resistor (99,000 ohms)	33-399339
51	Resistor (490,000 ohms)	33-449339
52	Resistor (5000 ohms)	33-250339
53	Resistor (45,000 ohms)	33-345339
54	Tubular Cond. (.004 mf)	30-4578
55	Resistor (51,000 ohms)	33-351339
56	Resistor (490,000 ohms)	33-449339
57	Resistor (490,000 ohms)	33-449339
58	Tubular Cond. (.004 mf)	30-4578
59	Tubular Cond. (.003 mf)	30-4469
60	Output Trans.	32-7981
61	Cone and Voice Coil Assy. for Speaker (Part No. 36-1450)	36-4089
62	Tubular Cond. (.003 mf)	30-4469
63	Pilot Lamp Dial	34-2210
64	Pilot Lamp Dial	34-2210
65	Pilot Lamp Power	34-2210
66	Resistor (16 ohms)	33-016431
67	Resistor (13,000 ohms)	33-313439
68	Resistor (4000 ohms)	33-240339
69	Field Coil, Replace Speaker (Part No. 36-1450)	
70	Electrolytic Cond. (4 mf)	30-2334
71	Electrolytic Cond. (25 mf)	30-2333
72	Electrolytic Cond. (18 mf)	30-2335
73	B. C. Resistor	33-3358
74	Power Trans. (115v., 60 cycle)	32-7998
75	A. C. Switch	42-1467
76	Bakelite Cond. (.01 to .01 mfd)	3903DG
77	Silver Mica Cond. (370 mmf)	30-1110
78	Silver Mica Cond. (370 mmf)	30-1110
79	Push-Button Switch	42-1462
80	Push-Button Osc. Trans. Assy. (8 coils)	32-3031
80A	Coil No. 1 (540-1030 KC.)	32-3042
80B	Coil No. 2 (540-1030 KC.)	32-3042
80C	Coil No. 3 (670-1160 KC.)	32-3042
80D	Coil No. 4 (670-1160 KC.)	32-3042
80E	Coil No. 5 (900-1470 KC.)	32-3041
80F	Coil No. 6 (900-1470 KC.)	32-3041
80G	Coil No. 7 (1100-1600 KC.)	32-3041
80H	Coil No. 8 (1100-1600 KC.)	32-3041
81	Padder Strip	31-6259
81A	Comp. No. 1 (540-1030 KC.)	
81B	Comp. No. 2 (540-1030 KC.)	
81C	Comp. No. 3 (670-1160 KC.)	
81D	Comp. No. 4 (670-1160 KC.)	
81E	Comp. No. 5 (900-1470 KC.)	
81F	Comp. No. 6 (900-1470 KC.)	
81G	Comp. No. 7 (1100-1600 KC.)	
81H	Comp. No. 8 (1100-1600 KC.)	
82	Wave Switch	42-1451

Miscellaneous Parts

Description	Part No.
Bezel	56-1092
Bezel Gasket	27-9245
Bearing (Drum Shaft)	56-1036
Cable (Power)	L-2778
Cable (Speaker)	41-3430
Coupling (Tuning Condenser)	31-2291
Dial (Scale)	27-5404
Dial Clamp	56-1034
Dial Gasket	27-9224
Dial Gasket	27-9225
Dial Pointer	56-1033
Dial Drive Cord (Tuning)	31-2315
Dial Drive Cord Pointer	31-2316
Dial Drive Cord Spring	28-8913
Disc Control (Tuning)	27-4766
Disc Control (Range Switch)	38-9702
Disc (Tone Control)	27-4764
Disc (Volume Control)	27-4765
Drum Assembly (Tuning Condenser)	38-9661
Drum-Bracket and Bearing (Tuning Condenser)	38-9662
Shaft Control Drums	28-6924
Socket Assembly Dial Lamp	38-9694
Socket Assembly Dial Lamp	38-9695
Socket Pilot Lamp	38-9696
Socket (6-prong) (78-tube)	27-6036
Socket (6-prong) (Octal)	27-6086
Socket (7-prong) (Octal)	27-6053
Socket (7-prong) (6A7-tube)	27-6107
Speaker	36-1450
Tab Kit	40-6392
Mounting Parts	
Grommet (Mtg. Push-Button Switch)	27-4610
(Mtg. Tuning Unit Assy.)	3914
(Mtg. Tuning Unit Assy.)	3915
Nut (A. C. Switch)	W-1757
Nut (Speaker Mtg.)	W-124
Screw (Mtg. Chassis)	W-1345
Screw (Bezel)	W-1834
Washer (Speaker Mtg.)	27-7467
Washer Rubber (Mtg. Chassis)	27-4571
Washer (A. C. Switch)	W-894

PHILCO RADIO & TELEV. CORP.

MODELS 39-70, Code 121,
39-75, Code 121, 122
Schematic, Socket, Trimmers
Chassis

Alignment Notes

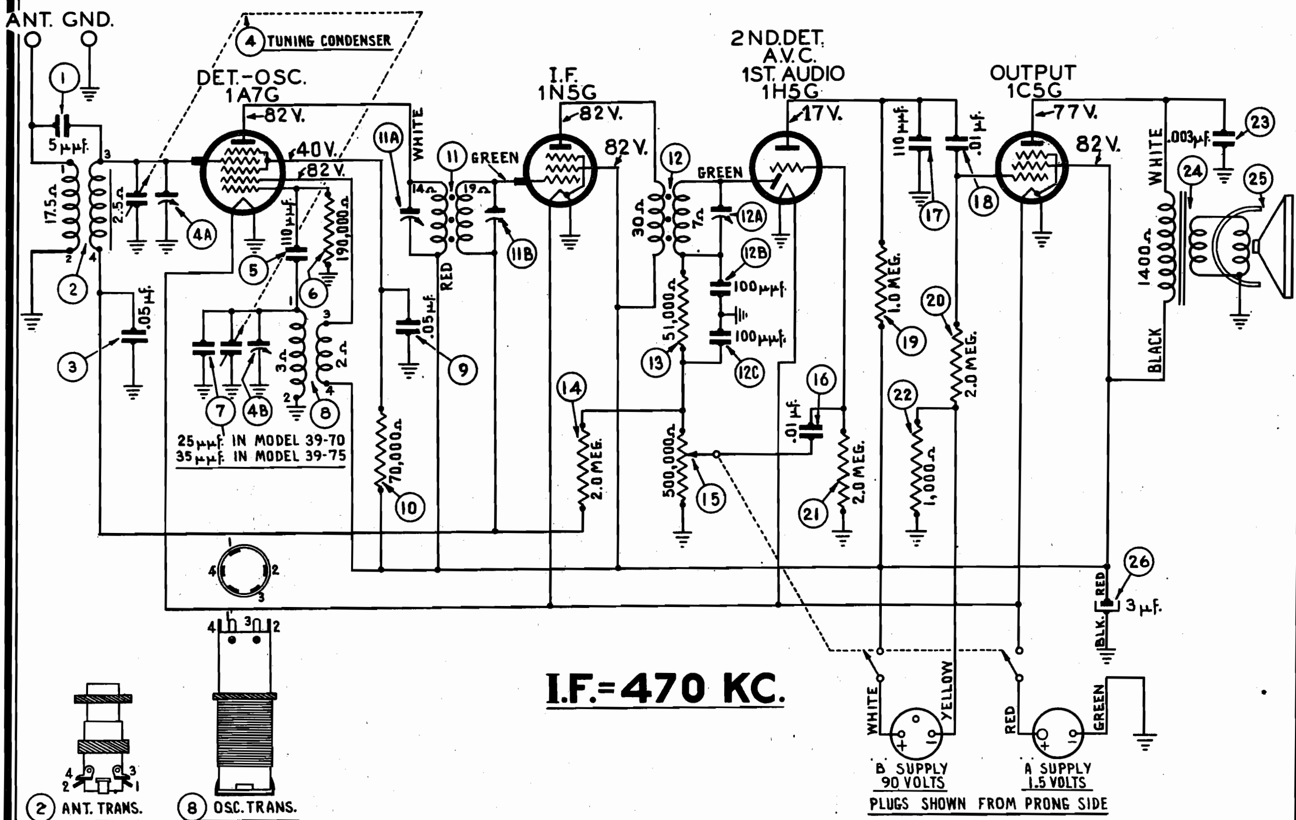
NOTE A—The "Dummy Antenna" consists of a condenser or resistor connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser.

Model 39-70 and 39-80—To adjust the dial proceed as follows: Turn the tuning condenser to maximum capacity (plates fully meshed). With the tuning condenser in this position, set the pointer horizontally across the dial.

Model 39-75—With the tuning condenser in the maximum capacity position (plates fully meshed), loosen the coupling screws connecting the push-button unit to the condenser. The pointer is then set on the extreme left edge of the index line (low frequency end of the scale) with the tuning condenser fully closed. The gang is then opened until the pointer is at the right edge of the index line. The push-button shaft is then turned counter-clockwise to its "stop." With the tuning condenser and push-button shaft in these positions tighten the coupling set screws.

NOTE C—The locations of the compensators in Models 39-70, 39-75 and 39-80 are shown in Figs. (1), (2) and (3) respectively.



SCHEMATIC DIAGRAM MODEL 39-70 & 39-75

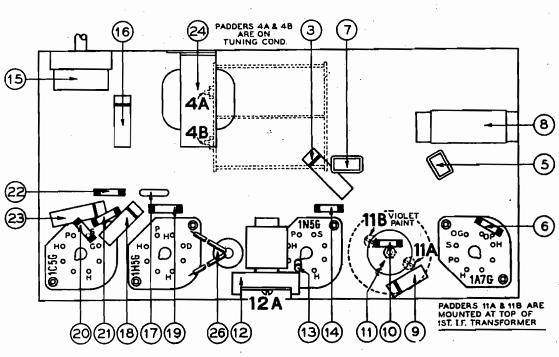


Fig. 1. Compensator and Part Locations
Model 39-70, Code 121
Underside of Chassis

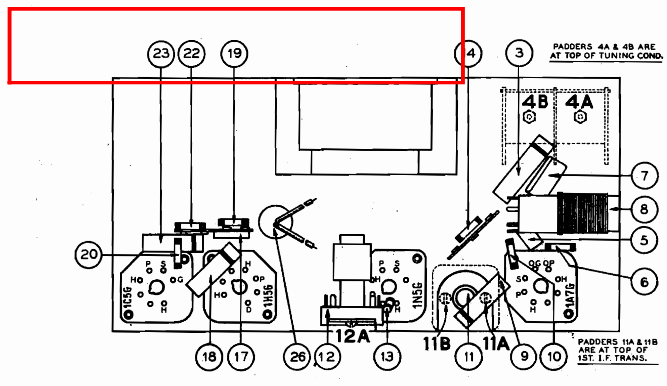


Fig. 2. Compensator and Part Locations
Model 39-75, Code 121-122
Underside of Chassis

MODELS 39-70,Code 121,
39-75,Code 121,122
Alignment,Parts List
MODEL 39-80,Code 121
Alignment

PHILCO RADIO & TELEV. CORP.

REPLACEMENT PARTS

Models 39-70, Code 121, and 39-75, Codes 121-122

Schem. No.	Description	Part No.
1	Condenser (5 mmf. mica) (Part of No. 2)	30-1097
2	Antenna Transformer (Includes No. 1)	32-3080
3	Condenser (.05 mf. tubular)	30-4519
4	Tuning Condenser Assembly, 39-70	31-2300
	Tuning Condenser Assembly, 39-75	31-2265
5	Condenser (110 mmf. mica)	30-1031
6	Resistor (190,000 ohms, ½ watt)	33-419339
7	Condenser (25 mmf. mica), 39-70	30-1067
	Condenser (35 mmf. silver plated mica), 39-75	30-1113
8	Oscillator Transformer, 39-70	32-3019
	Oscillator Transformer, 39-75	32-3083
9	Condenser (.05 mf. tubular)	30-4444
10	Resistor (70,000 ohms, ½ watt)	33-370339
11	1st I. F. Transformer Assembly, 39-70	32-2841
	1st I. F. Transformer Assembly, 39-75	32-3078
12	2nd I. F. Transformer Assembly	32-3081
13	Resistor (51,000 ohms, ½ watt)	33-351339
14	Resistor (2.0 megohms, ½ watt)	33-520339
15	Volume Control and On-Off Switch, 39-70	33-5290
	Volume Control and On-Off Switch, 39-75	33-5291
16	Condenser (.01 mf. tubular)	30-4572
17	Condenser (110 mmf. mica)	30-1031
18	Condenser (.01 mf. tubular)	30-4572
19	Resistor (1.0 megohm, ½ watt)	33-510339
20	Resistor (2.0 megohms, ½ watt)	33-520339
21	Resistor (2.0 megohms, ½ watt)	33-520339
22	Resistor (1000 ohms, ½ watt)	33-210339
23	Condenser (.003 mf. tubular)	30-4469
24	Output Transformer	32-7995
*25	Cone and Voice Coil Assemblies—	
	39-70 "B," Spkr. Pt. No. 36-1435	36-4090
	39-70 "F," Spkr. Pt. No. 36-1447	36-4092
	39-75 "B," Spkr. Pt. No. 36-1442	36-4090
	39-75 "F," Spkr. Pt. No. 36-1447	36-4092
26	Electrolytic Condenser (3 mf.)	30-2346

MISCELLANEOUS PARTS

Model 39-70, Code 121

Description	Part No.
Bezel Window	27-5417
Cable (Battery)	41-3427
Dial	27-5416
Dial Drive Cord	31-2317
Dial Drive Spring	28-8751
Dial Pointer	28-5468
Knob	27-4332
On-Off Indicator Parts—	
Hub and Lever	38-9658
Toggle Link and Brkt. Assy.	38-9700
Spring (Toggle Link and Brkt. Assy.)	28-8925
Snap Fastener	56-1156
Pulley (Tuning Condenser)	28-6662
Pulley Screw (Tuning Condenser)	W-1400
Shaft Assy. (Tuning)	31-2290
*Speaker ("B" Cabinet)	36-1435
*Speaker ("F" Cabinet)	36-1447

Model 39-75, Code 121-122

Description	Part No.
Automatic Tuning Unit Complete	31-2282
Bezel (Dial)	40-6364
Bezel Gasket (Dial)	27-9174
Bezel (Push-Button)	28-5929
Bezel Gasket (Push-Button)	27-9218
Dial	27-5420
Dial Pointer	28-5934
Dial Drive Cord	31-2275
Dial Drive Cord Spring	28-8919
Dial Drive Drum (Tuning Condenser)	31-2281
Knob (Volume)	27-4753
Knob (Tuning)	27-4750
Knob Screw (Tuning)	28-6882
Push-Button	27-4749
Push-Button Spring	28-8918
Sleeve—Short (Tuning Shaft, Code 121-122)	28-6887
*Speaker (T Cabinet)	36-1442
Socket (1A7G)	27-6099
Socket (6 prong)	27-6086
Socket (7 prong)	27-6087

Model 39-75, Code 122

Description	Part No.
Extension Shaft (Volume)	38-9640
Extension Shaft (Tuning)	28-6928
Extension Sleeve—Long (Tuning Shaft)	28-6935
Socket (Speaker)	27-6115
*Speaker (Code 122)	36-1447
Spring (Retaining Vol. Knob)	28-8915

Specifications

TYPE OF CIRCUIT: Models 39-70, 39-75 and 39-80 are four tube battery operated superheterodyne receivers covering standard broadcast and state police stations. The receivers employ the new Philco Farm Radio Tubes, which require exceptionally low current for operation, Automatic Volume Control, and a Philco Speaker designed especially for battery radio. In general these models are similar but differ in their tuning mechanisms, speakers and cabinets.

Model 39-70 is manually tuned and is assembled in cabinet types "F" (floor model) and "B" (table model).

Model 39-75, codes 121 and 122 is equipped with automatic push-button and manual tuning. The automatic tuning mechanism contains six push-buttons for selecting any of six stations in the standard broadcast band. The procedure for adjusting and operating the push-buttons will be found in the instructions supplied with each set.

Code 122 of this model is assembled in cabinet type "F" (floor model); Code 121 in cabinet type "T" (table model).

Model 39-80 is manually tuned and is assembled in cabinet type "B" (table model) and cabinet type "XF" (floor model).

In addition to the new Philco speaker in Model 39-80 a sound chamber is also built into the cabinet. This sound chamber reinforces the sound produced by the speaker and results in greater clarity of tone and intensity of sound output. Bass compensation is also included in the volume control circuit.

TUNING RANGE: 530 to 1720 K. C.

INTERMEDIATE FREQUENCY: 470 K. C.

PHILCO TUBES: One 1A7G, First Detector and Oscillator; one 1N5G, I. F. Amplifier; one 1H5G, Second Detector; First Audio and Automatic Volume Control, and one 1C5G (1A5G Model 39-80) Pentode Output.

BATTERIES REQUIRED: One (1) Philco "A" Pack, Part No. 41-8014; one (1) Philco "B" Pack, Part No. 41-8015.

INSTALLING BATTERIES: The batteries are arranged in the cabinet in such a manner that they form part of the sound chamber air column.

It is very essential, therefore, that the following instructions be carefully observed when installing the batteries. Remove the back from the cabinet after removing the wood screws which hold it in place. Place the small "A" Pack in the left side (looking at the cabinet from the rear) of the cabinet, three inches in from the rear with the slanting portion facing the front of the cabinet. Place the long "B" Pack along the rear of the cabinet with the socket for the battery cable plug at the top towards the front.

Observe the arrangement of pins on the plugs of the battery cable and the corresponding holes in the sockets of the batteries, so you will be sure to insert them correctly. Insert plug with two prongs into the small "A" Pack and the plug with three prongs into the large "B" Pack.

Replace the back on the cabinet with the wood screws, making sure all of them are screwed in tight.

BATTERY DRAIN:
Models 39-70 and 39-75.."A"—(250 M. A.) "B"—(8½ M. A.)
Model 39-80 ...."A"—(200 M. A.) "B"—(6½ M. A.)

AERIAL AND GROUND: In order to obtain the highest amount of sensitivity from these receivers the Philco Farm Radio Aerial, Part No. 40-6383, should be used. This aerial is accurately designed to match the tuned antenna circuit in the receiver so that maximum performance will be obtained.

A good ground connection to the nearest water pipe or any other good ground source is also required.

CABINET DIMENSIONS:

Model	Height	Width	Depth
39-70B	13⅞"	11⅞"	6¼"
39-70F	37⅛"	23"	9⅝"
39-75T	8⅝"	13"	6⅜"
39-75F	37⅛"	23"	9⅝"
39-80B	17 7/16"	17 7/16"	9 9/16"
39-80XF	39⅜"	24¼"	12½"

Alignment of Compensators

EQUIPMENT REQUIRED:
(1) Signal Generator: Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose.
(2) Output Meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended.
(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and screen terminals of the type 1C5G tube in Models 39-70 and 39-75 (1A5G Model 39-80) and adjusted for the 0 to 30 V. A. C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on page 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

PROCEDURE FOR MODELS 39-70 AND 39-75

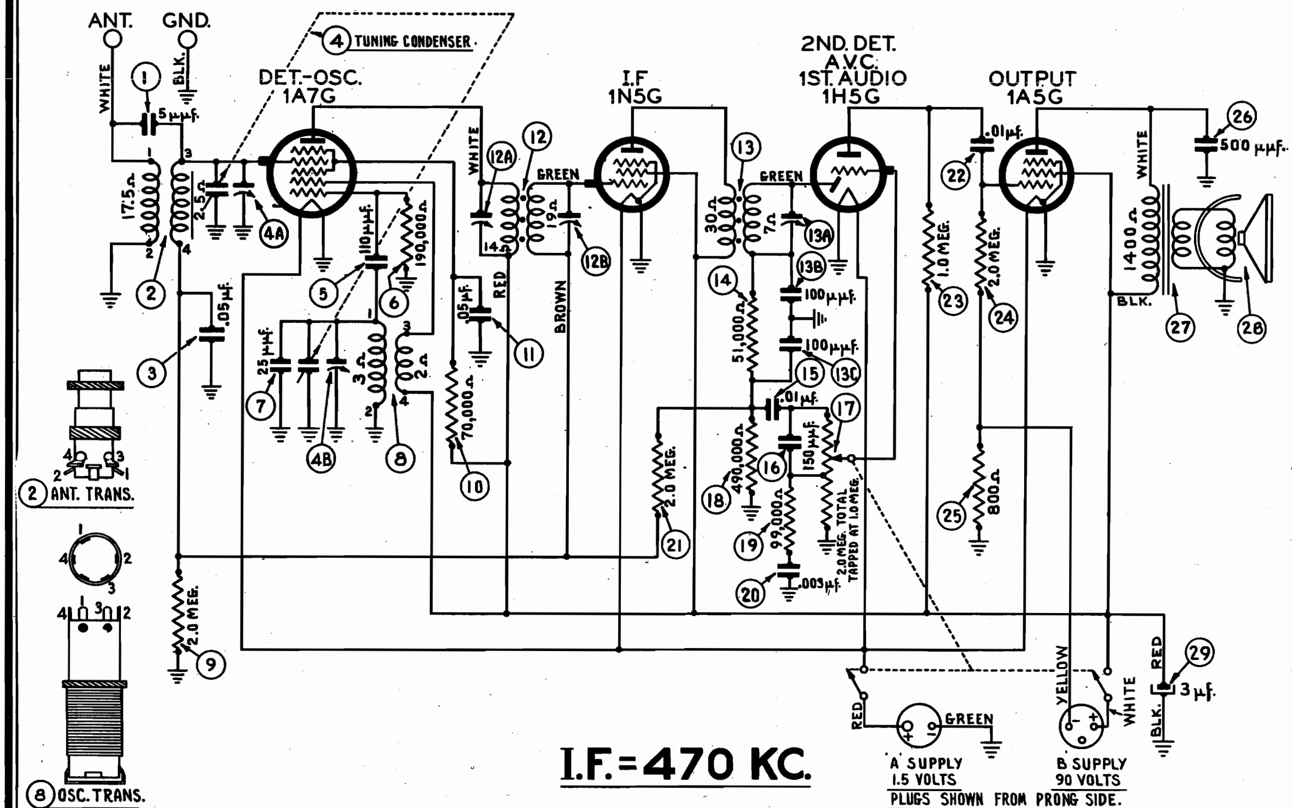
Operations in Order	Signal Generator: Output Connections to Receiver	Signal Generator: Dummy Antenna Note A	Signal Generator: Dial Setting	Receiver: Dial Setting	Receiver: Control Setting	Receiver: Adjust Compensators	Receiver: Special Instructions
1	1A7G Grid	.1 mfd.	470 K. C.	580 K. C.	Vol. Max.	12A, 11B, 11A	
2	Ant. (White)	225 mfd.	1550 K. C.	1550 K. C.	Vol. Max.	4B, 4A	Note B Note C

PROCEDURE FOR MODEL 39-80

Operations in Order	Signal Generator: Output Connections to Receiver	Signal Generator: Dummy Antenna Note A	Signal Generator: Dial Setting	Receiver: Dial Setting	Receiver: Control Setting	Receiver: Adjust Compensators	Receiver: Special Instructions
1	1A7G Grid	.1 mfd.	470 K. C.	580 K. C.	Vol. Max.	13A, 12B, 12A	
2	Ant. (White)	225 mfd.	1550 K. C.	1550 K. C.	Vol. Max.	4B, 4A	Note B Note C

PHILCO RADIO & TELEV. CORP.

MODEL 39-80, Code 121
Schematic, Socket
Trimmers, Chassis
Parts List



SCHEMATIC DIAGRAM MODEL 39-80

Replacement Parts Model 39-80, Code 121

Schem. No.	Description	Part No.
1	Condenser (mica, 5 mmf.—Part of No. 2)	30-1097
2	Antenna Trans.	32-3080
3	Condenser (tubular, .05 mf.)	30-4519
4	Tuning Cond.	31-2300
5	Condenser (mica, (110 mmf.)	30-1031
6	Resistor (190,000 ohms, ½ watt)	33-419339
7	Condenser (mica, 25 mmfd.)	30-1067
8	Oscillator Trans.	32-3019
9	Resistor (2.0 meg., ½ watt)	33-520339
10	Resistor (70,000 ohms, ½ watt)	33-370339
11	Condenser (tubular, .05 mf.)	30-4444
12	1st I. F. Trans. Assy	32-2841
13	2nd I. F. Trans. Assy	32-3081
14	Resistor (51,000 ohms, ½ watt)	33-351339
15	Condenser (tubular, .01 mf.)	30-4572
16	Condenser (mica, 150 mmf.)	30-1033
17	Volume Control and On-Off Switch	33-5238
18	Resistor (490,000 ohms, ½ watt)	33-449339
19	Resistor (99,000 ohms, ½ watt)	33-399339
20	Condenser (tubular, .003 mf.)	30-4580
21	Resistor (2.0 meg., ½ watt)	33-520339
22	Condenser (tubular, .01 mf.)	30-4479
23	Resistor (1.0 meg., ½ watt)	33-510339
24	Resistor (2.0 meg., ½ watt)	33-520339
25	Resistor (800 ohms, ½ watt)	33-180339
26	Condenser (mica, 500 mmf.)	30-1114
27	Output Trans.	32-7984
28	Cone Assy. for Speaker 36-1410	36-4093
	Cone Assy. for Speaker 36-1436	36-4094
29	Electrolytic Condenser (3 mfd.)	30-2346
	Bezel Assy.	40-6374
	Bezel Screw	W-1834
	Brkt. (Mtg. Set in XF Cabinet)	56-1058
	Cable (Battery)	41-3437
	Dial	27-5413
	Dial Pointer	56-1091
	Dial Drive Cord	31-2318
	Dial Drive Cord Spring	28-8751

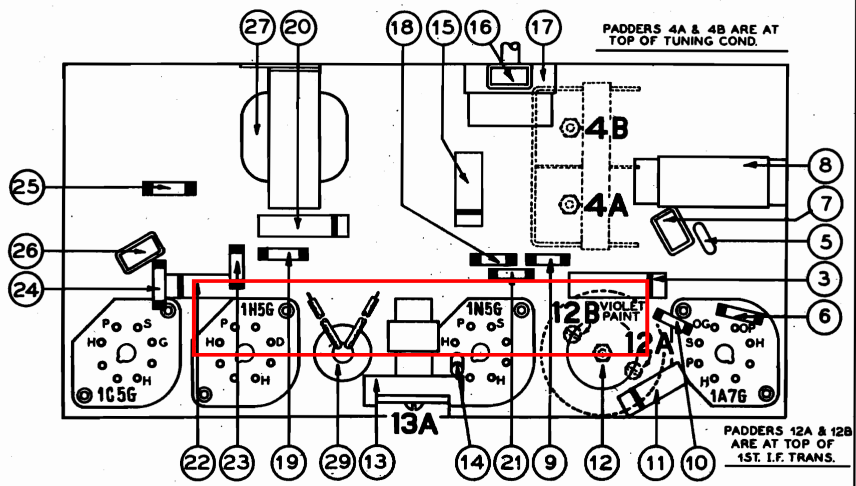


Fig. 3. Compensator and Part Locations Model 39-80, Code 121 Underside of Chassis

Description	Part No.
Knob	27-4604
On-Off Indicator Parts—	
Hub and Lever	38-9658
Toggle Link and Brkt. Assy	38-9701
Spring (Toggle Assy.)	28-8925
Snap Fastener	56-1156
Pulley (Tuning Condenser)	28-6662
Pulley Screw (Tuning Condenser)	W-1400
Shaft Assy. (Tuning)	31-2290
*Speaker (B Cabinet)	36-1410
*Speaker (XF Cabinet)	36-1436
Socket (6 prong)	27-6086
Socket (7 prong)	27-6087
Socket (Speaker)	27-6115

MODELS 40-120,40-125
Schematic, Voltage
Parts List

PHILCO RADIO & TELEV. CORP.

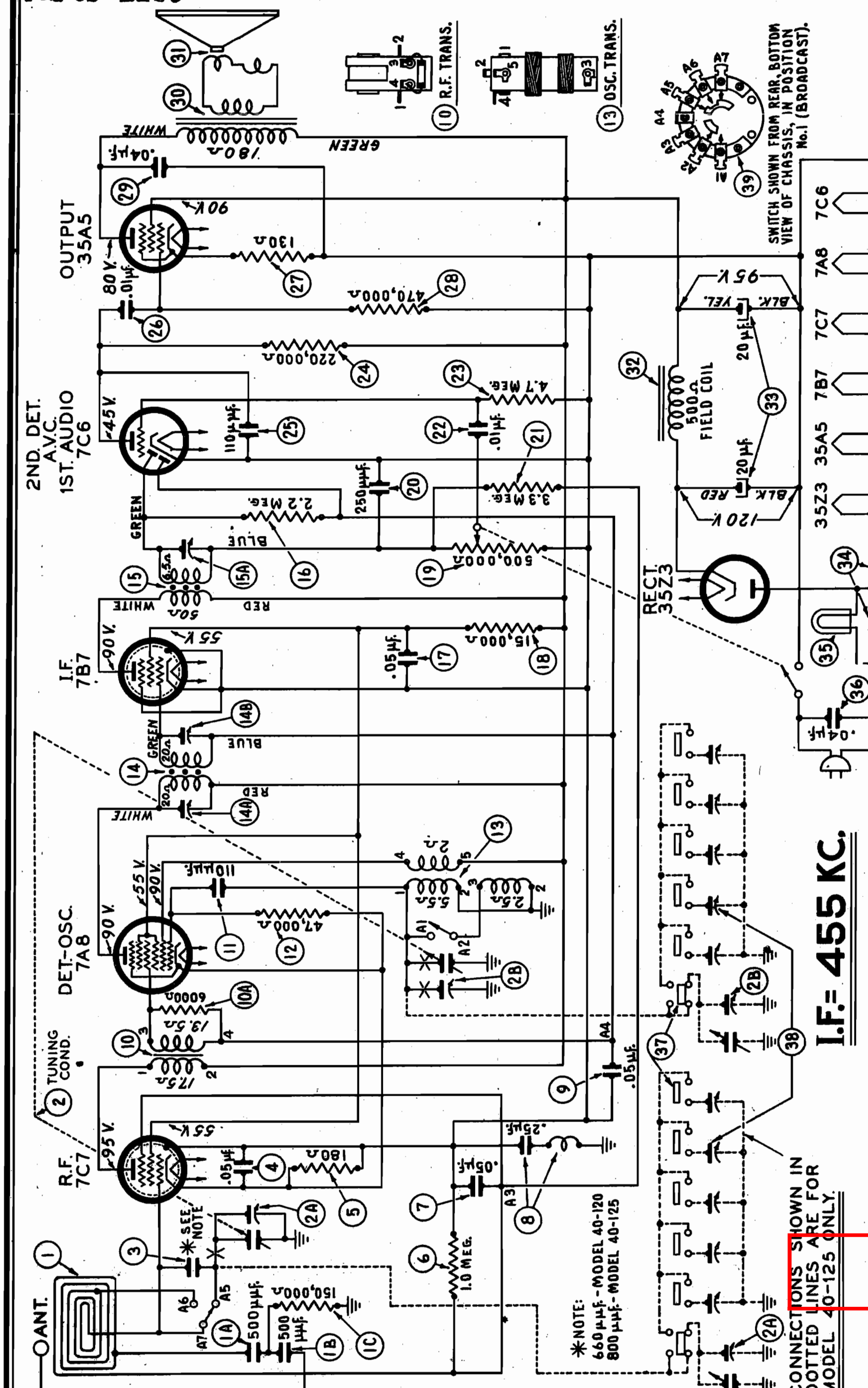


Fig. 2 SCHEMATIC DIAGRAM MODELS 40-120 & 40-125

May, 1939.

TYPE OF CIRCUIT: FOR ALIGNMENT, SEE INDEX

Models 40-120 and 40-125 are six (6) tube super-heterodyne receivers employing the new Philco built-in super aerial system which eliminate an outside aerial, and Philco High-Efficiency Loktal tubes. In addition, other features of design are: two tuning ranges; special high gain R. F. stage; automatic volume control and a Beam power audio output stage. In general, these models are similar but differ in their tuning mechanisms and cabinets.

Model 40-120 is dial tuned and assembled in cabinet type "C".

Model 40-125 is equipped with six electric push buttons for automatically selecting stations in addition to dial tuning. Five push buttons are used for stations one of which can be used in combination with a Special type PHILCO TELEVISION receiver for reception of television sound programs. The sixth push button selects dial tuning. The procedure for adjusting and operating push button tuning will be found in the instructions supplied with each receiver. Instructions for setting up the television push button is supplied with Philco Television Receivers. This model is assembled in special type "C" cabinet.

TUNING RANGE: 540 to 1600 K. C. 1.6 to 3.3 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 volts A. C. or D. C. current.

POWER CONSUMPTION: 28 watts.

AUDIO OUTPUT: 1 watt.

PHILCO TUBES USED:

7C7, R. F.; 7A8, oscillator and first detector; 7B7, I. F.; 7C6, second detector, first audio; 35A5, output; 35Z3, rectifier.

CABINET DIMENSIONS:	Height	Width	Depth
Model 40-120	6 9/16	1 1/8	6 9/16
Model 40-125	7 7/16	11	6 5/8

SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assy. (Model 40-120)	38-9889
	(Model 40-125)	38-9890
1A	Mica Cond. (500 mmfd.)	30-1114
1B	Mica Cond. (500 mmfd.)	30-1114
1C	Resistor (150,000 ohms, 1/2 watt)	33-415339
2	Tuning Cond. Assy. (Model 40-120)	31-2388
	(Model 40-125)	31-2397
3	Mica Cond.	
	(660 mmfd., Model 40-120)	30-1136
	(800 mmfd., Model 40-125)	30-1135
4	Tubular Cond. (.05 mfd.)	30-4519
5	Resistor (180 ohms, 1/2 watt)	33-118339
6	Resistor (1.0 meg., 1/2 watt)	33-510339
7	Tubular Cond. (.05 mfd.)	30-4519
8	Tubular Cond. & Choke Assy.	
	(.25 mfd.)	38-9851
9	Tubular Cond. (.05 mfd.)	30-4519
10	R. F. Trans. Assy.	32-3273
10A	Resistor (6000 ohms, 1/2 watt)	33-260339
11	Mica Cond. (110 mmfd.)	30-1130
12	Resistor (47,000 ohms, 1/2 watt)	33-347339
13	Oscillator Trans. (Model 40-120)	32-3255
	(Model 40-125)	32-3256
14	1st I. F. Trans. Assy.	32-3237
15	2nd I. F. Trans. Assy.	32-3238
16	Resistor (2.2 meg., 1/2 watt)	33-522339
17	Tubular Cond. (.05 mfd.)	30-4519
18	Resistor (15,000 ohms, 1/2 watt)	33-315339
19	Volume Control & On-Off Switch	33-5306
20	Mica Cond. (250 mmfd.)	30-1074
21	Resistor (3.3 meg., 1/2 watt)	33-533339
22	Tubular Cond. (.01 mfd.)	30-4479
23	Resistor (4.7 meg., 1/2 watt)	33-547339
24	Resistor (220,000 ohms, 1/2 watt)	33-422339
25	Mica Cond. (110 mmfd.)	30-1130
26	Tubular Cond. (.01 mfd.)	30-4572
27	Resistor (130 ohms, 1/2 watt)	33-113336
28	Resistor (470,000 ohms, 1/2 watt)	33-447339
29	Tubular Cond. (.04 mfd.)	30-4119
30	Output Trans.	
	(Spkr. Part No. 36-1469-1)	32-8047
	(Spkr. Part No. 36-1469-9)	32-8044
31	Cone & Voice Coil Assy.	
	(Spkr. Part No. 36-1469-1)	36-4115
	(Spkr. Part No. 36-1469-9)	36-4113
32	Field Coil	
	(Replace Spkr. Part No. 36-1469)	
33	Electrolytic Cond. (20-20 mfd.)	30-2403
34	Filament Resistor	33-3375
35	Pilot Lamp	34-2068
36	Tubular Cond. (.04 mfd.)	30-4119
37	Push Button Switch (Model 40-125)	42-1512
38	Padder Strip (Model 40-125)	31-6312
39	Wave Switch	42-1505
	Cable & Plug (Power Supply)	L-3199
	Cabinet (Model 40-120)	10389A
	Clip (Coil Mtg.)	28-5002
	Dial	27-5517
	Drive Cord Assy.	31-2387
	Drive Shaft Assy.	31-2370
	Knobs (Volume-Tuning-Wave Switch)	27-4809
	Pilot Lamp Socket Assy.	38-9825
	Pointer (Dial)	27-4845
	Pointer (Knob)	56-1465
	Spring (Drive Cord Assy.)	28-8954
	Speaker Assy.	36-1469
	Sockets (Loktal)	55-0575

MISCELLANEOUS PARTS—MODEL 40-125

DESCRIPTION	PART No.
Cabinet	10390A
Escutcheon Plate (Pushbutton)	28-5742
Escutcheon Pins	W-1074
Knobs (Pushbutton)	27-4824
Tab (Dial)	27-5526
Tab Kit	40-6473

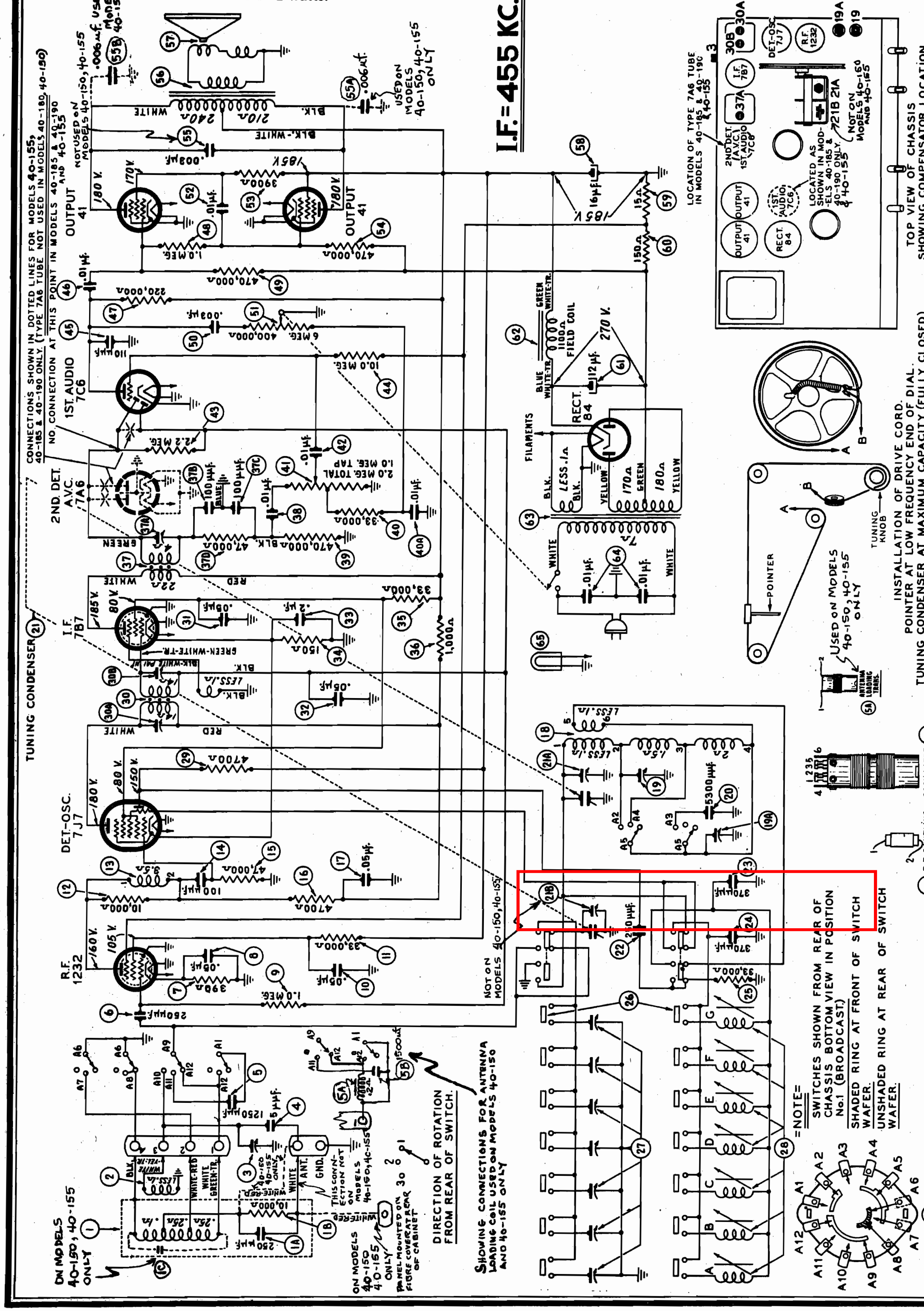
Schematic, Socket, Trimmers

PHILCO RADIO & TELEV. CORP.

MODELS 40-150, 40-155
MODELS 40-180, 40-185
40-190

POWER SUPPLY: 115 Volts, 25 and 60 cycle AC.
POWER CONSUMPTION: 60 watts.
AUDIO OUTPUT: 2 watts.

FREQUENCY TUNING RANGES: Three.
540 to 1550 K. C.
1.5 to 3.4 K. C.
6.0 to 18 M. C.



May, 1939.

SCHEMATIC DIAGRAM MODELS 40-180, 40-185 & 40-190, models 40-150, 40-155

Fig. 1—Schematic Diagram

The voltages indicated were measured with a Philco Model 027 Voltmeter (1000 ohms per volt) — Power supply 115 volts, 60 cycle — Volume control minimum — No signal being received — Range switch "Brdcst."

FOR TUNER ADJUSTMENTS SEE INDEX

MODELS 40-150,40-155
MODELS 40-180,40-185,40-190
Alignment

PHILCO RADIO & TELEV. CORP.

TYPE OF CIRCUIT: Models 40-150 and 40-155 / Models 40-180, 40-185 and 40-190 are Electric Push-button and dial tuned radios incorporating the new Philco Built-in Super Aerial system which eliminates an outside aerial and reduces local static interference to a minimum. The models are also designed to receive the sound of a television program tuned in by special type Philco Television Sets.

PHILCO BUILT-IN SUPER AERIAL SYSTEM—Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. A feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the loop may be set in the position where best reception is obtained.

In general, these models are similar with the exception of the number of tubes used and cabinet design. Model 40-180 employs a seven tube receiver. Models 40-185 and 40-190 employ eight tube receivers assembled in different type cabinets.

Each model is equipped with eight electric tuning push buttons for automatically selecting stations. Six of the push buttons are used for broadcast stations, one for selecting dial tuning and one push button may be set up for use with a Philco wireless Record Player or the sound program tuned in by special Philco Television Sets. Model 40-150 employs seven (7) tubes and Model 40-155, eight (8) tubes.

Aligning of Compensating Condensers
Equipment Required

(1) *Signal Generator.* In order to properly adjust this receiver an accurately calibrated signal generator such as Philco Model 077 is required. This signal generator covers a frequency range of 540 to 36,000 K. C. (2) *Indicating Device.* To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. When using the vacuum tube voltmeter, an aligning adapter, Philco Part No. 45-2767, is necessary for connecting to the A. V. C. circuit. These testers also contain an audio output meter which may also be used as an indicating device. (3) *Aligning Tools.* Fiber handle screw driver, Philco Part No. 45-2610, and fiber wrench, Philco Part No. 7696.

Connecting Aligning Instruments

VACUUM TUBE VOLTMETER—To use the vacuum tube voltmeter as an alignment indicator make the following connections:

1. Adjusting I. F. Circuit.

Remove the 1232 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the wire (light color) which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the black wire.

2. Adjusting R. F. Circuit.

To adjust the R. F. circuit, the aligning adaptor is inserted in the 7C6 A. F. tube socket. The vacuum tube voltmeter remains connected to the adaptor as given in the above paragraph.

With the voltmeter connected in this manner a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted. If an audio output meter is used, connect it to the plate and socket terminals of the 41 output tube and adjust the output meter for the 0 to 30 A. C. scale.

After connecting the aligning indicator, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on the schematic diagram, page No. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

SIGNAL GENERATOR: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders that the receiver be left in the cabinet.

Models 40-150, 40-155 40-180 – 185 – 190

Operations	SIGNAL GENERATOR Output Connections	SIGNAL GENERATOR Dial Frequency	RECEIVER Dial Frequency	RECEIVER Control Settings	RECEIVER Adjust Compensators for Max. Signal	Remarks
1	High Side to No. 1 Ter. Loop Panel	I. F. 455 K. C.	580 K. C. No Signal	Range Sw. "Brdcst." Volume "Max." Push-Button "Dial"	37A, 30, 30A	See Note A.
2	Use Loop on Generator	18 M. C.	18 M. C.	Range Sw. "SW." Volume "Max." Push-Button "Dial."	21A	Note B. Note D.
3	Use Loop on Generator	1400 K. C.	1400 K. C.	Range Sw. "Brdcst." Volume "Max."	19A, 21B	
4	Use Loop on Generator	580 K. C.	580 K. C.	Range Sw. "Brdcst." Volume "Max."	19	Roll Cond. Note C.
5	Use Loop on Generator	1400 K. C.	1400 K. C.	Range Sw. "Brdcst." Volume "Max."	19A, 21B	Roll Cond. Note C.
6	Use Loop on Generator	18 M. C.	18 M. C.	Range Sw. "SW."	3	Roll Cond. Note C.

NOTE A—A "Dummy Antenna" consisting of a .1 mfd. condenser is connected in series with the signal generator output lead (high side).

NOTE B—**DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in the schematic diagram.

NOTE C—When adjusting the low frequency compensator of Range One (Broadcast) or the antenna and R. F. compensators of the high frequency tuning ranges; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

NOTE D—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second peak is obtained on the output meter. Adjust the compensator for maximum output at this second peak.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 910 K. C. below the frequency being used on any high frequency range.

Socket, Trimmers
Chassis, Parts

PHILCO RADIO & TELEV. CORP.

MODELS 40-150, 40-155
MODELS 40-180, 40-185
40-190

PHILCO TUBES USED:

MODEL 40-150, 40-180—1232, R. F.; 7J7, Converter; 7B7, I. F.; 7C6, Second Detector and First Audio; two 41, Audio Power Outputs; 84, Rectifier.

MODEL 40-155, 40-185 AND 40-190—1232, R. F.; 7J7, Converter; 7B7, I. F.; 7A6, Detector; 7C6, First Audio; two 41, Power Outputs; 84, Rectifier.

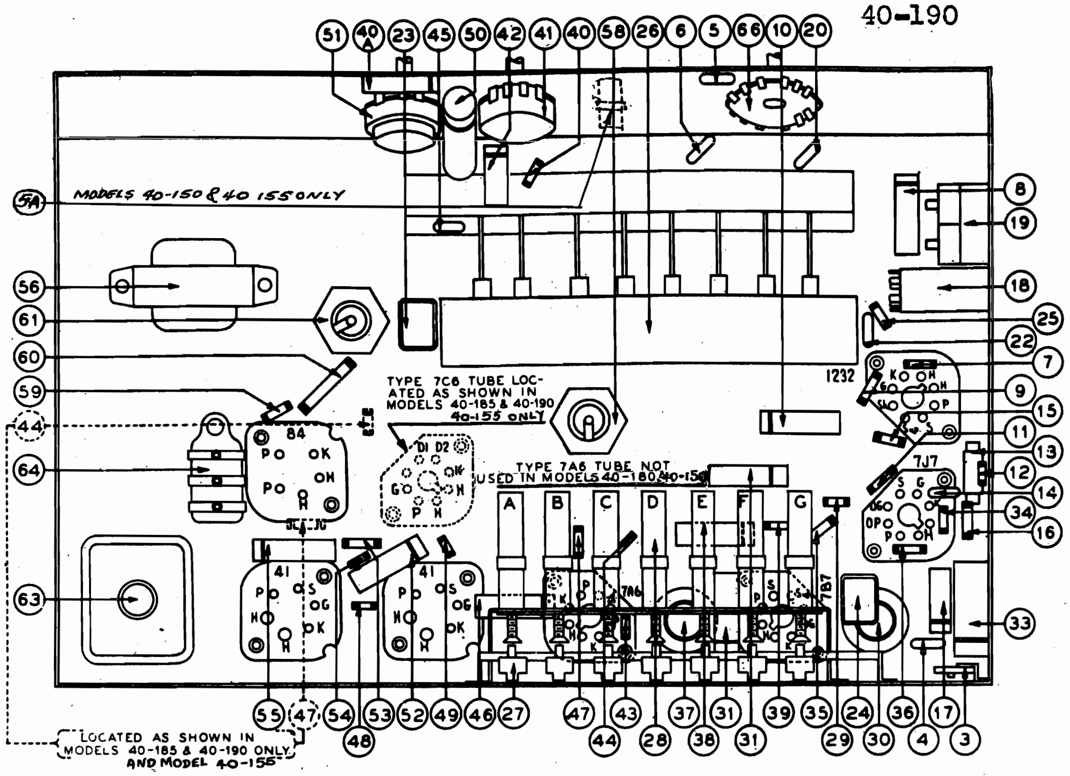


Fig. 2—Part locations underside of chassis

Replacement Parts—Models 40-180, 40-185, 40-190

Sch. No.	Description	Part No.
1	Loop Ass'y (Broadcast)	38-9880
1A	Mica Cond. (250 mmfd.)	61-0033
1B	Resistor (10,000 ohms, ½ watt)	33-310339
2	Loop Ass'y (Short Wave)	38-9884
3	Compensator	31-6308
4	Mica Cond. (5 mmfd.)	30-1097
5	Mica Cond. (1250 mmfd.)	5886
6	Mica Cond. (250 mmfd.)	61-0033
7	Resistor (390 ohms, ½ watt)	33-139339
8	Tubular Cond. (.05 mfd.)	30-4444
9	Resistor (1.0 meg., ½ watt)	33-510339
10	Tubular Cond. (.05 mfd.)	30-4123
11	Resistor (33,000 ohms, ½ watt)	33-333339
12	Resistor (10,000 ohms, ½ watt)	33-310339
13	R. F. Coupling Trans.	32-3194
14	Mica Cond. (100 mmfd.)	30-1128
15	Resistor (47,000 ohms, ½ watt)	33-347339
16	Resistor (4700 ohms, ½ watt)	33-247339
17	Tubular Cond. (.05 mfd.)	30-4123
18	Oscillator Trans.	32-3195
19	Compensator (2 Section)	31-6298
20	Mica Cond. (5300 mmfd.)	30-1134
21	Tuning Cond. Ass'y	31-2391
22	Mica Cond. (250 mmfd.)	61-0033
23	Silver Mica Cond. (370 mmfd.)	30-1110
24	Silver Mica Cond. (370 mmfd.)	30-1110
25	Resistor (33,000 ohms, ½ watt)	33-333339
26	Push Button Switch	42-1489
27	Padder Strip (Push Buttons)	31-6299
28	Coil Strip Ass'y	
28A	Coil No. 1 } 540-1060 K. C.	32-3042
28B	Coil No. 2	
28C	Coil No. 3	
28D	Coil No. 4 } 650-1110 K. C.	32-3042
28E	Coil No. 5	
28F	Coil No. 6 } 920-1600 K. C.	32-3041
28G	Coil No. 7	
29	Resistor (4700 ohms, ½ watt)	33-247339
30	1st I. F. Trans. Ass'y	32-3245
31	Tubular Cond. (.05 mfd.)	30-4123
32	Tubular Cond. (.05 mfd.)	30-4519
33	Tubular Cond. (.2 mfd.)	30-4536
34	Resistor (150 ohms, ½ watt)	33-115339
35	Resistor (33,000 ohms, ½ watt)	33-333339
36	Resistor (1000 ohms, ½ watt)	33-210339
37	2nd I. F. Trans. Ass'y	32-3246
38	Tubular Cond. (.01 mfd.)	30-4479
39	Resistor (470,000 ohms, ½ watt)	33-447339
40	Resistor (33,000 ohms, ½ watt)	33-333339
40A	Tubular Cond. (.01 mfd.)	30-4479
41	Volume Control (2.0 meg.)	33-5275
42	Tubular Cond. (.01 mfd.)	30-4479
43	Resistor (2.2 megs., ½ watt)	33-522339
44	Resistor (10.0 megs., ½ watt)	33-610339
45	Mica Cond. (110 mmfd.)	30-1130
46	Tubular Cond. (.01 mfd.)	30-4572
47	Resistor (220,000 ohms, ½ watt)	33-422339
48	Resistor (1.0 meg., ½ watt)	33-510339
49	Resistor (470,000 ohms, ½ watt)	33-447339
50	Tubular Cond. (.003 mfd.)	30-4469
51	Tone Control & On-Off Switch	33-5314
52	Tubular Cond. (.01 mfd.)	30-4572
53	Resistor (3900 ohms, ½ watt)	33-239339
54	Resistor (470,000 ohms, ½ watt)	33-447339
55	Tubular Cond. (.003 mfd.)	30-4469
56	Output Trans.	32-8053
57	Cone & Voice Coil Ass'y	
	(Spkr. Part No. 36-1479-2)	36-4089
	(Spkr. Part No. 36-1479-4)	36-4111
58	Electrolytic Cond. (16 mfd., 200 V.)	30-2406
59	Resistor (15 ohms, ½ watt)	33-015351
60	Resistor (150 ohms, 1 watt)	33-115451
61	Electrolytic Cond. (12 mfd., 350 V.)	30-2405
62	Field Coil (Replace Spkr., Part No. 36-1479)	
63	Power Trans. (115 Volts, 50 to 60 Cycle)	32-8052
64	Line Cond. (Bakelite, .01-.01 mfd.)	3903-DG
65	Pilot Lamp	34-2210
66	Wave Switch	42-1490
	Speaker	36-1479

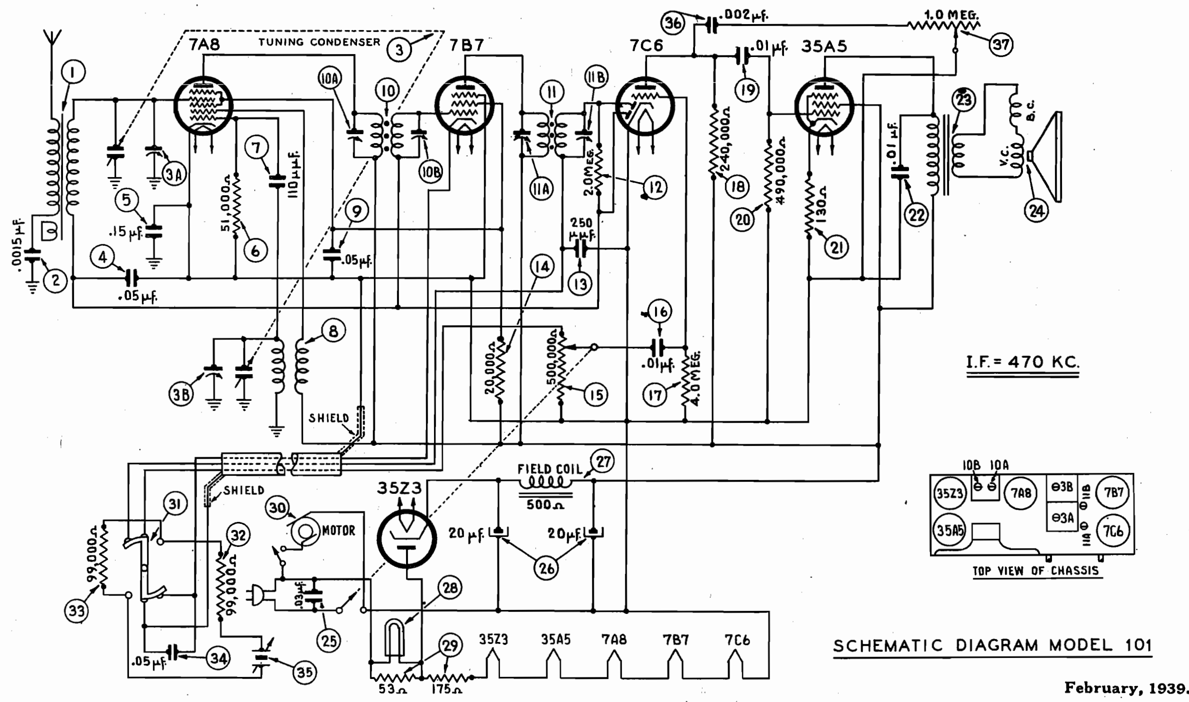
Models 40-150, 40-155

Parts listed below apply to Models 40-150, 40-155 only. For parts not found below refer to list for Models 40-180, 40-185 and 40-190 above.

Sch. No.	Description	Part No.
1	Loop Ass'y (Broadcast)	38-9894
1C	Compensator Ass'y	31-6318
4	Mica Cond. (5 mmfd.)	30-1120
5B	Mica Cond. (1500 mmfd.)	7139
5A	Ant. Loading Trans.	32-3290
8	Tubular Cond. (.05 mfd.)	30-4519
21	Tuning Cond. Ass'y	31-2401
33	Tubular Cond. (.2 mfd.)	30-4587
38	Tubular Cond. (.01 mfd.)	30-4581
40A	Tubular Cond. (.01 mfd.)	30-4581
42	Tubular Cond. (.01 mfd.)	30-4581
55B	Tubular Cond. (.006 mfd.)	30-4504
55A	Tubular Cond. (.006 mfd.)	30-4504
57	Cone and Voice Coil Ass'y	
	(Spkr. Part No. 36-1483-2)	
62	Field Coil (Replace Spkr. Part No. 36-1483)	
63	Power Trans. (110 Volts, 60 Cycles)	32-8065
	Speaker	36-1483

MODEL 101
Schematic, Socket, Trimmers
Alignment, Parts

PHILCO RADIO & TELEV. CORP.



SCHEMATIC DIAGRAM MODEL 101

February, 1939.

Model 101 is a combination Phonograph and Radio Receiver. The phonograph section is designed to play 10 or 12 inch standard records (78 R. P. M.) and includes a manually operated crystal pickup and Turntable Motor.

The radio receiver employs an A. C. or D. C. operated superheterodyne circuit covering standard broadcast and police stations. (540 to 1720 K. C.)

POWER SUPPLY: Radio, 115 volts A. C. or D. C. Phonograph, 115 volts — 60 cycles **only.**

POWER CONSUMPTION: 57 watts.

INTERMEDIATE FREQUENCY: 470 K. C.

PHILCO TUBES USED: Five tubes; 1-7A8, first detector oscillator; 1-7B7, I. F. amplifier; 1-7C6, 2nd detector, A. V. C., first audio; 1-35A5, audio output, and 1-35Z3, rectifier.

ALIGNMENT OF COMPENSATORS

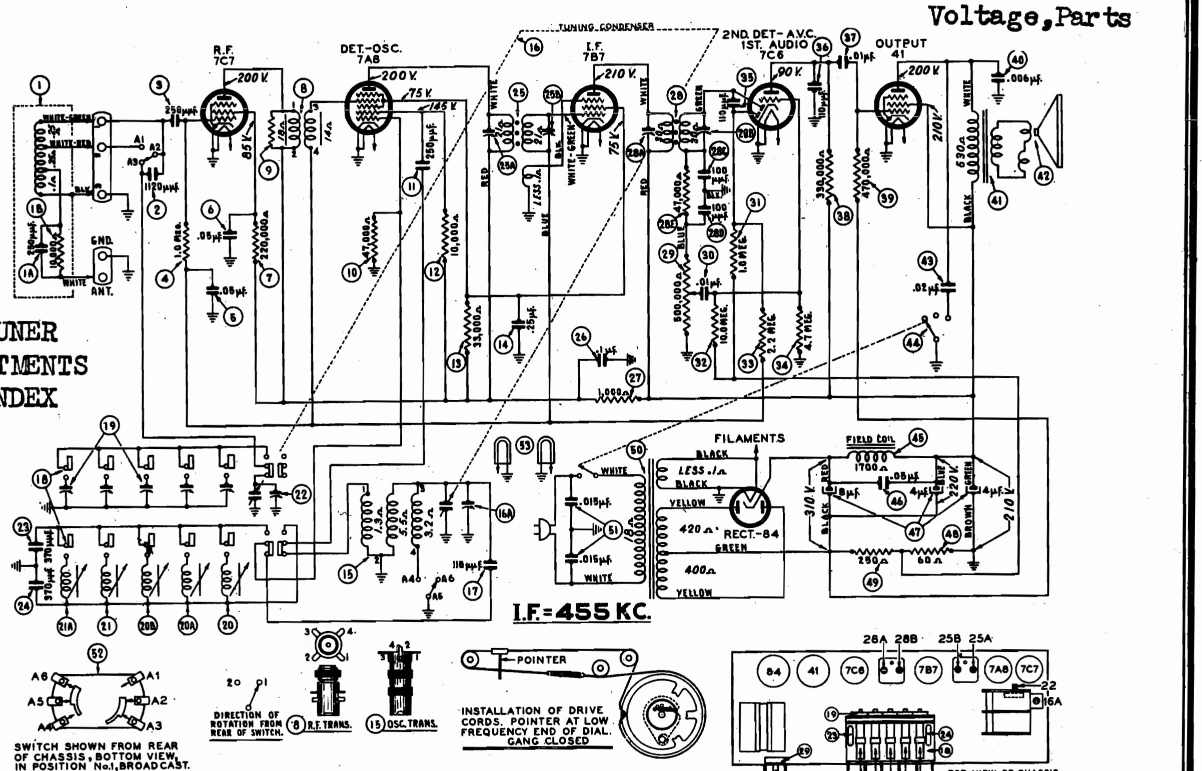
Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	Ant. Section of Gang	.004 mfd.	470 K. C.	540 K. C.	Vol. Max. Tone Treble	11A, 11B. 10A, 10B and 11B	Adjust for max. output
2	Ant.	100 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Tone Treble	3B, 3A	Adjust for max. output

Sche. No.	Description	Part No.	Sche. No.	Description	Part No.
1	Ant. Trans.	32-3151	21	Resistor (130 ohms, ½ watt)	33-113339
2	Tubular Cond. (.0015 mfd., 200 V.)	30-4555	22	Tubular Cond. (.01 mfd., 400 V.)	30-4572
3	Tuning Cond.	31-2354	23	Output Trans. (for speaker 36-1469-1)	32-8047
4	Tubular Cond. (.05 mfd., 400 V.)	30-4519		Output Trans. (for speaker 36-1469-9)	32-8044
5	Tubular Cond. (.15 mfd., 400 V.)	30-4505	24	Speaker	36-1469
6	Resistor (51,000 ohms, ½ watt)	33-351339	25	Tubular Cond. (.03 mfd., 400 V.)	30-4449
7	Mica Cond. (110 mmfd.)	30-1031	26	Electrolytic Cond. (20-20 mfd., 150 V.)	30-2382
8	Osc. Trans.	32-3152	27	Field Coil (Replace Speaker 36-1469)	
9	Tubular Cond. (.05 mfd., 400 V.)	30-4519	28	Pilot Lamp	34-2068
10	1st I. F. Trans.	32-3149	29	Line Resistor	33-3367
11	2nd I. F. Trans.	32-3150	30	Phono Motor	35-1158
12	Resistor (2.0 megohms, ½ watt)	33-520339	31	Radio Phono Switch	42-1500
13	Mica Cond. (250 mmfd.)	30-1032	32	Resistor (99,000 ohms, ½ watt)	33-399339
14	Resistor (20,000 ohms, ½ watt)	33-320339	33	Resistor (99,000 ohms, ½ watt)	33-399339
15	Volume Control (500,000 ohms)	33-5306	34	Tubular Cond. (.05 mfd., 400 V.)	30-4519
16	Tubular Cond. (.01 mfd., 200 V.)	30-4479	35	Crystal Pickup	415-1027
17	Resistor (4.0 megohms, ½ watt)	33-540339		Tone Arm and Crystal Pickup complete	35-2026
18	Resistor (240,000 ohms, ½ watt)	33-424339	36	Tubular Cond. (.002 mfd., 400 V.)	30-4579
19	Tubular Cond. (.01 mfd., 400 V.)	30-4572	37	Tone Control	33-5320
20	Resistor (490,000 ohms, ½ watt)	33-449339	38	Motor Switch	42-1498

PHILCO RADIO & TELEV. CORP.

MODEL 40-160
Schematic, Socket Trimmers, Chassis Voltage, Parts

FOR TUNER ADJUSTMENTS SEE INDEX



SCHEMATIC DIAGRAM MODEL 40-160

May, 1939

Power Supply: 115 V., 25 and 60 Cyc. A. C.
Power Consumption: 45 watts.
Frequency Tuning Ranges: (Two) 540 to 1550 K.C. 1500 to 3350 K.C.
Intermediate Frequency: 455 K.C.
Audio Output: 2 watts.

Sch. No.	Description	Part No.
1	Loop Ass'y	38-9897
1A	Mica Cond. (250 mmfd.)	61-0033
1B	Resistor (10,000 ohms, ½ watt)	33-310339
2	Mica Cond. (1120 mmfd.)	30-1140
3	Mica Cond. (250 mmfd.)	61-0033
4	Resistor (1.0 meg., ½ watt)	33-510339
5	Tubular Cond. (.05 mfd.)	30-4519
6	Tubular Cond. (.05 mfd.)	30-4123
7	Resistor (220,000 ohms, ½ watt)	33-422339
8	R. F. Trans.	32-3283
9	Resistor (6800 ohms, ½ watt)	33-268339
10	Resistor (470,000 ohms, ½ watt)	33-447339
11	Mica Cond. (250 mmfd.)	61-0033
12	Resistor (10,000 ohms, ½ watt)	33-310339
13	Resistor (33,000 ohms, ½ watt)	33-333339
14	Tubular Cond. (.25 mfd.)	30-4448
15	Oscillator Trans.	32-3212
16	Tuning Cond.	31-2374
17	Mica Cond. (110 mmfd.)	30-1130
18	Push Button Switch	42-1493
19	Padder Strip and Bracket Assy.	31-6325
20	Coil No. 1—540-1000 K.C.	32-3042
20A	Coil No. 2—650-1100 K.C.	32-3042
20B	Coil No. 3—740-1300 K.C.	32-3042
21	Coil No. 4—900-1500 K.C.	32-3041
21A	Coil No. 5—1100-1600 K.C.	32-3041
22	Compensator	31-6308
23	Silver Mica Cond. (370 mmfd.)	30-1110
24	Silver Mica Cond. (370 mmfd.)	30-1110
25	1st I.F. Trans.	32-3210
26	Tubular Cond. (.1 mfd.)	30-4455
27	Resistor (1000 ohms, ½ watt)	33-210339
28	2nd I.F. Trans. Assy.	32-3211
29	Volume Control	33-5319
30	Tubular Cond. (.01 mfd.)	30-4572
31	Resistor (1.0 meg., ½ watt)	33-510339
32	Resistor (10.0 meg., ½ watt)	33-610339
33	Resistor (2.2 meg., ½ watt)	33-522339
34	Resistor (4.7 meg., ½ watt)	33-547339
35	Mica Cond. (110 mmfd.)	30-1130
36	Mica Cond. (110 mmfd.)	30-1130
37	Tubular Cond. (.01 mfd.)	30-4572
38	Resistor (330,000 ohms, ½ watt)	33-433339
39	Resistor (470,000 ohms, ½ watt)	33-447339
40	Tubular Cond. (.006 mfd.)	30-4504
41	Output Trans.	32-8056
42	Cone and Voice Coil Assy. (Spkr. Part No. 36-1480-3)	36-4086
43	Tubular Cond. (.02 mfd.)	30-4599
44	Tone Control and On-Off Switch	42-1520
45	Field Coil (Replace Spkr. Part No. 36-1480)	
46	Tubular Cond. (.05 mfd.)	30-4123
47	Electrolytic Cond. (8-4-4 mfd.)	30-2400
48	Resistor (60 ohms, ½ watt)	33-060339
49	Resistor (250 ohms, ½ watt)	33-125339
50	Power Trans.	32-8055
51	Line Cond. (.015-.015 mfd.)	3903-DG
52	Wave Switch	42-1494
53	Pilot Lamps	34-2064

MISCELLANEOUS PARTS

Description	Part No.
Bezel	27-4842
Cabinet	10398A
Cable and Plug (Power Supply)	L-3199
Clip (Coil Mtg.)	28-5002
Dial	27-5506
Drive Cord Assy. (Pointer)	31-2382
Drive Cord Assy. (Tuning Cond.)	31-2400
Escutcheon (Push Button)	27-4843
Insulating Bushing (Insulate Drive Shaft)	27-9437
Knobs (Tuning, Tone, Volume, Wave Switch)	27-4332
Knobs (Push Buttons)	27-4824
Pilot Lamp Socket Assy.	38-9908
Pointer	56-1479
Reflector (Pilot Lamp)	27-9455
Rubber Hose (Tuning Cond. Drive)	27-9432
Spring (Tuning, Drive Cord)	28-8751
Spring (Pointer, Drive Cord)	28-8953
Spring (Drive Shaft, Grounding)	28-8955
Screw (Bezel Mtg.)	W-1834
Speaker	36-1480
Socket (Type 84 Tube)	27-6035
Socket (Type 41 Tube)	27-6036
Socket (Loktal, Type 7A8 Tube)	27-6129
Socket (Loktal, Type 7C7, 7B7, 7C6 Tubes)	27-6131
Tab (Dial)	27-5528
Tab (Television)	27-9451
Tab Kit	40-6474
Tuning Shaft	56-6052
Tuning Drive Drum Assy.	38-9883
Washer ("C" Type, Tuning Shaft)	28-2043

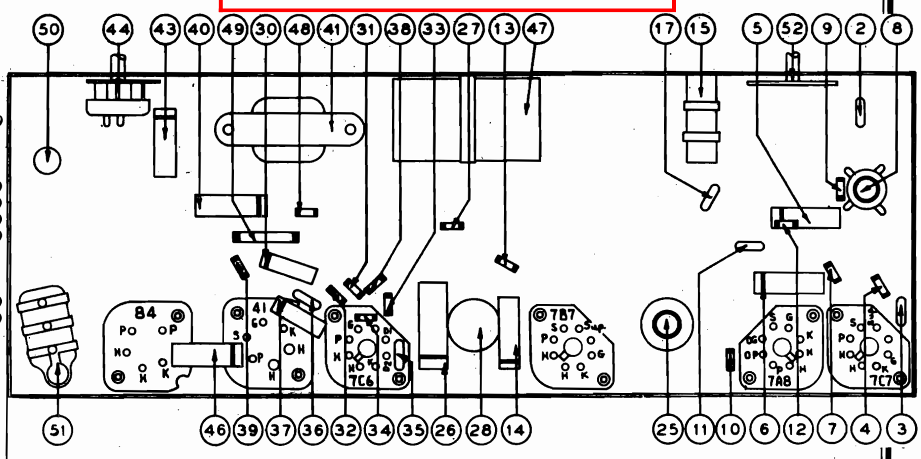


Fig. 2—Part Locations, Underside of Chassis

MODEL 108, Code 121
Socket, Trimmers, Chassis
Tuner Unit Chassis
Alignment

PHILCO RADIO & TELEV. CORP.

MODEL 40-160
Alignment

MODEL 40-160. Aligning of Compensating Condensers

Equipment Required

(1) Signal Generator. In order to properly adjust this receiver an accurately calibrated signal generator such as Philco Model 077 is required. This signal generator covers a frequency range of 540 to 36,000 K.C. (2) Indicating Device. To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device. (3) Aligning Tools. Fiber handle screw driver Philco Part No. 45-2610 and when using the vacuum tube voltmeter for adjusting the set, an aligning adaptor Part No. 45-2767 is required.

Connecting Aligning Instruments

VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an alignment indicator make the following connections:

1. Adjusting I.F.: Remove the 7C7 R.F. tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the black wire.

2. Adjusting R.F. Padders: To adjust the R.F. padders, insert the aligning adaptor in the 7C6 socket and place the tube in the adaptor. The vacuum voltmeter remains connected to the adaptor as given in the Adjusting I.F. above.

With the voltmeter connected in this manner a very sensitive indication of the output voltage is obtained when the padders are adjusted. If an audio output meter is used, connect it to the plate and socket terminals of the 41 type tube and adjust the output meter for the 0 to 30 A.C. scale.

After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on the schematic diagram page No. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

SIGNAL GENERATOR: When adjusting the I.F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R.F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

SIGNAL GENERATOR			RECEIVER			
Operations in Order	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	adjust compensators	Special Instructions
1	High Side to No. 1 Ter. Loop Panel	455 K.C.	580 K.C.	Vol. Max. Range Switch "Broadcast." Dial push button "In"	28A 25A 28B 25B	See Paragraph on Signal Generator Above
2	Use Loop on Generator	1500 K.C.	1500 K.C.	Vol. Max. Range Switch "Broadcast"	16A 22	Note A

NOTE A—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in Schematic Diagram.

MANY OF THE PARTS IN THIS PHILCO, SUCH AS CONDENSERS AND RESISTORS, ARE HELD TO MUCH CLOSER TOLERANCE THAN STANDARD REPLACEMENT PARTS. GENUINE PHILCO REPLACEMENT PARTS MUST BE USED TO OBTAIN SATISFACTORY PERFORMANCE OF THIS MODEL.

MODEL 108, CODE 121. ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED:
(1) Signal Generator; Philco Model 077.
(2) Output Meter, Philco 027 Vacuum Tube Voltmeter and Circuit Tester.
(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 41 tube. The Vacuum Tube Voltmeter can also be used in aligning the receiver by connecting the Negative terminal through a one megohm Resistor to the 6A7 grid. The Positive terminal is connected to the chassis. After connecting the Output Meter, adjust compensators in the order as given in tabulation below. Locations of the compensators are shown in Fig. 1.

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	6A7 Grid	.1 mf.	470 K. C.	580 K. C.	*Vol. Cont. Max. Range Sw. (Brdcst)	(21A) (12B) (12A)	
2	Ant. Ter.	100 mmf.	18.0 M. C.	18.0 M. C.	Vol. Cont. Max. Range Sw. (S. W.)	(4B)	See Note B, C
3	Ant. Ter.	100 mmf.	1550 K. C.	1550 K. C.	Vol. Cont. Max. Range Sw. (Brdcst)	(5) (4A)	
4	Ant. Ter.	100 mmf.	580 K. C.	580 K. C.	Vol. Cont. Max. Range Sw. (Brdcst)	(5A)	
5	Ant. Ter.	100 mmf.	1550 K. C.	1550 K. C.	Vol. Cont. Max.	(5)	

NOTE A — The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable is shown in Service Bulletin No. 305.

NOTE C — Compensators (4A) and (4B) are located on top of the tuning condenser. Compensator (4B) is the first one from the tuning drum side.

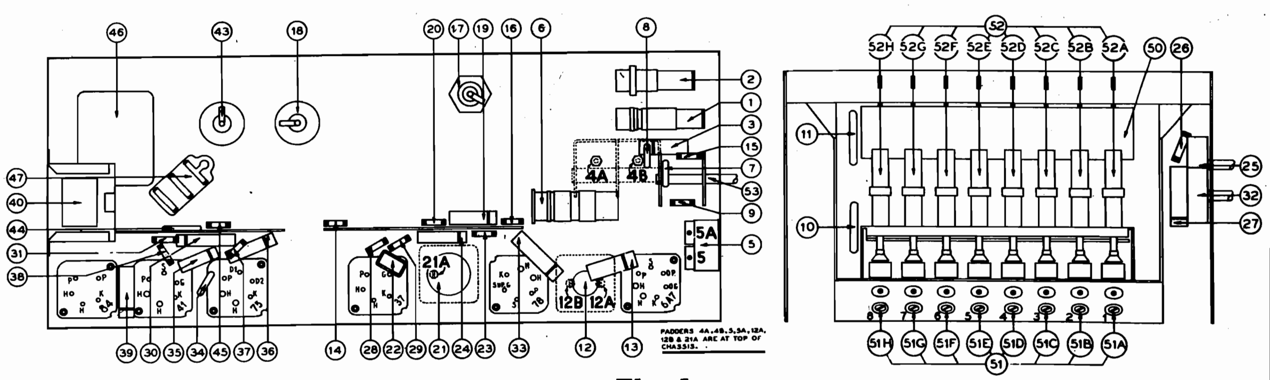


Fig. 1

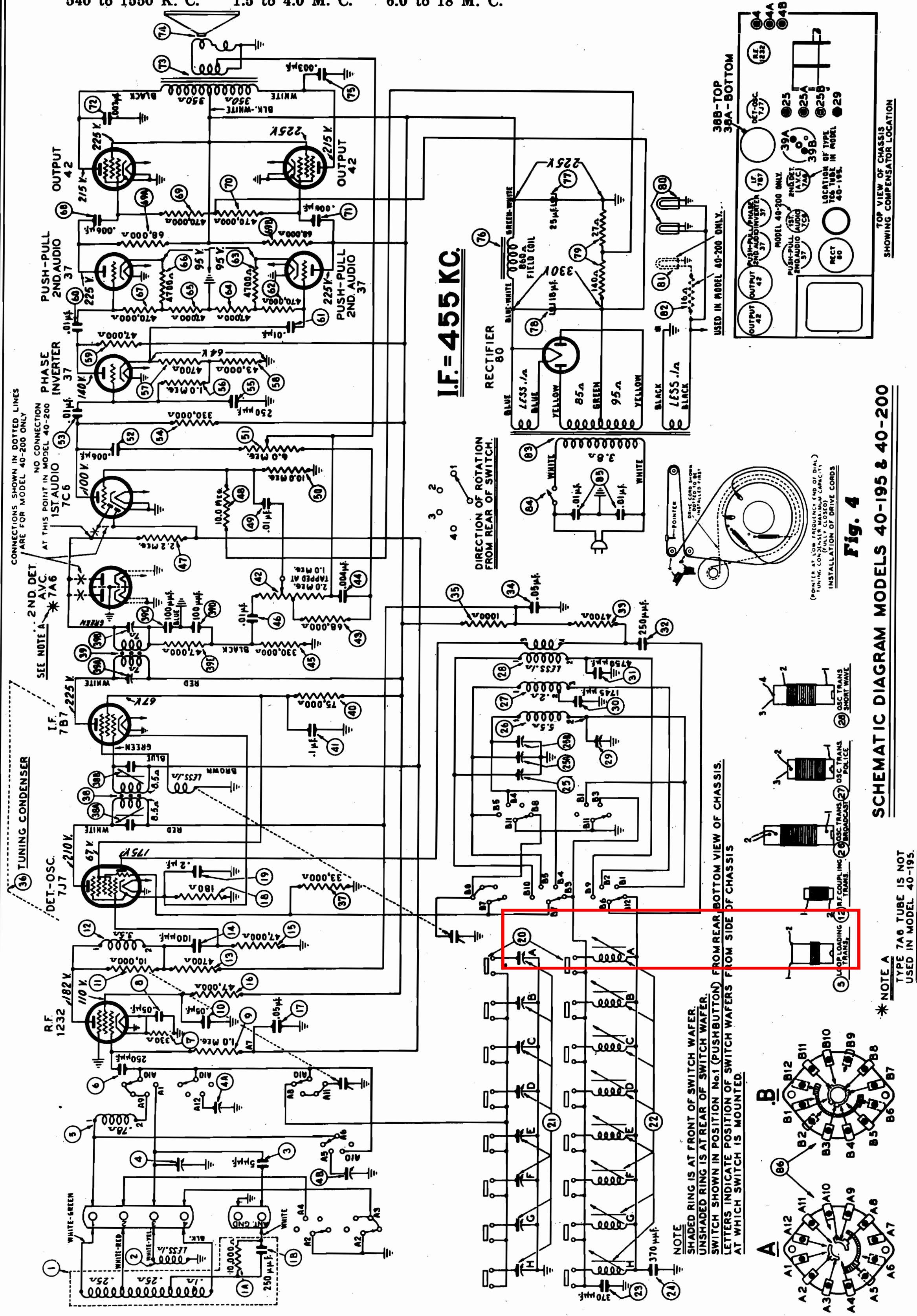
ELECTRIC AUTOMATIC PUSH BUTTON UNIT

PHILCO RADIO & TELEV. CORP.

MODELS 40-195, 40-200
Schematic, Voltage, Socket
Trimmers

POWER SUPPLY: 115 Volts, 25 and 60 cycle A. C.
POWER CONSUMPTION: 110 watts.
FREQUENCY TUNING RANGES: (Three)
540 to 1550 K. C. 1.5 to 4.0 M. C. 6.0 to 18 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.
AUDIO OUTPUT: 5 watts.



SCHEMATIC DIAGRAM MODELS 40-195 & 40-200

FOR TUNER ADJUSTMENTS, SEE INDEX

***Fig. 1* — Schematic Diagram**

The voltages indicated were measured with a Philco Model 027 Voltmeter (1000 ohms per volt) — Power supply 115 volts, 60 cycle — Volume control minimum — No signal being received — Range switch "Brdcst."

May, 1939.

MODELS 40-195,40-200
Chassis,Tuner Unit Chassis
Parts List

PHILCO RADIO & TELEV. CORP.

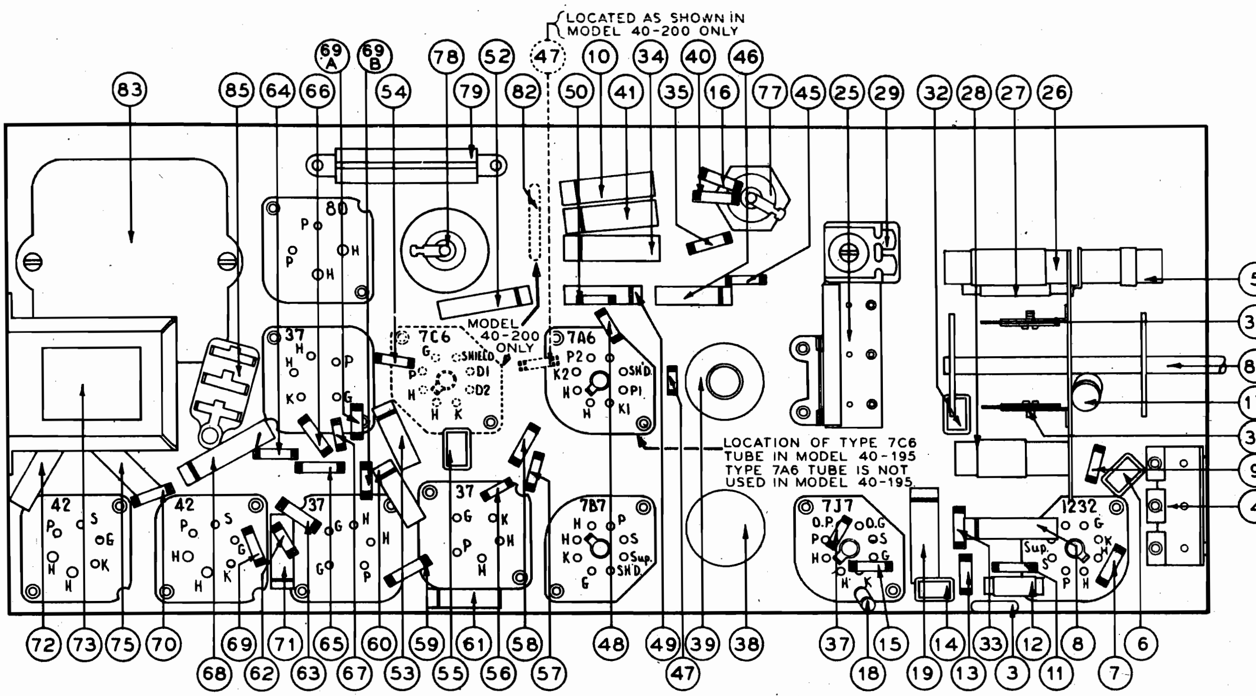
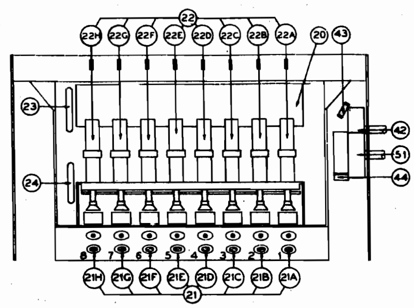


Fig. 2

Replacement Parts
Models 40-195 and 40-200

SCHE. No.	DESCRIPTION	PART No.	LIST PRICE
1	Loop Assy. (Broadcast)	38-9881	
1A	Resistor (10,000 ohms, 1/2 watt)	33-310339	.17
1B	Mica Cond. (250 mmfd.)	61-0033	.20
2	Loop Assy. (Short Wave)	38-9867	
3	Mica Cond. (5 mmfd.)	30-1097	.20
4	Compensator (3 section)	31-6305	
4A	Part of No. 4		
4B	Part of No. 4		
5	Loop Loading Coil	32-3252	
6	Mica Cond. (250 mmfd.)	61-0033	.20
7	Resistor (330 ohms, 1/2 watt)	33-133339	.17
8	Tubular Cond. (.05 mfd.)	30-4444	.15
9	Resistor (1.0 meg., 1/2 watt)	33-510339	.17
10	Tubular Cond. (.05 mfd.)	30-4518	.15
11	Resistor (10,000 ohms, 1/2 watt)	33-310339	.17
12	R. F. Coupling Coil	32-3194	
13	Resistor (4700 ohms, 1/2 watt)	33-247339	.17
14	Mica Cond. (100 mmfd.)	30-1128	.15
15	Resistor (47,000 ohms, 1/2 watt)	33-347339	.17
16	Resistor (47,000 ohms, 1/2 watt)	33-347339	.17
17	Tubular Cond. (.05 mfd.)	30-4519	.15
18	Resistor (180 ohms, 1/2 watt)	33-118339	.17
19	Tubular Cond. (.2 mfd.)	30-4587	.20
20	Push Button Switch	42-1515	
21	Compensator Strip	31-6313	
	Compensator		
21A	No. 1 (540-1030 K.C.)	Part of 31-6313	
21B	No. 2 (540-1030 K.C.)	Part of 31-6313	
21C	No. 3 (540-1030 K.C.)	Part of 31-6313	
21D	No. 4 (670-1160 K.C.)	Part of 31-6313	
21E	No. 5 (670-1160 K.C.)	Part of 31-6313	
21F	No. 6 (900-1600 K.C.)	Part of 31-6313	
21G	No. 7 (900-1600 K.C.)	Part of 31-6313	
21H	No. 8 (900-1600 K.C.)	Part of 31-6313	
22	Coil Strip (Complete)		
22A	Coil No. 1 (540-1030 K.C.)	32-3042	.50
22B	Coil No. 2 (540-1030 K.C.)	32-3042	.50
22C	Coil No. 3 (540-1030 K.C.)	32-3042	.50
22D	Coil No. 4 (670-1160 K.C.)	32-3042	.50
22E	Coil No. 5 (670-1160 K.C.)	32-3042	.50
22F	Coil No. 6 (900-1600 K.C.)	32-3041	.50
22G	Coil No. 7 (900-1600 K.C.)	32-3041	.50
22H	Coil No. 8 (900-1600 K.C.)	32-3041	.50
23	Silvered Mica Cond. (370 mmfd.)	30-1110	.45
24	Silvered Mica Cond. (370 mmfd.)	30-1110	.45
25	Compensator (3 section)	31-6092	.60
25A	Part of No. 25		
25B	Part of No. 25		
26	Broadcast Oscillator Coil	32-3240	
27	Police Oscillator Coil	32-3052	.75
28	Short Wave Oscillator Coil	32-3242	
29	Compensator	31-6230	.40
30	Tracking Cond. (1745 mmfd.)	31-6307	
31	Tracking Cond. (4750 mmfd.)	31-6306	
32	Mica Cond. (250 mmfd.)	61-0033	.20
33	Resistor (4700 ohms, 1/2 watt)	33-247339	.17
34	Tubular Cond. (.05 mfd.)	30-4518	.15
35	Resistor 1000 ohms, 1/2 watt)	33-210339	.17
36	Tuning Cond. Assy.	31-2389	
37	Resistor (33,000 ohms, 1/2 watt)	33-333339	.17
38	1st I. F. Trans. Assy.	32-3243	
39	2nd I. F. Trans. Assy.	32-3250	
39A	Part of No. 39		
39B	Part of No. 39		
39C	Part of No. 39		
39D	Part of No. 39		
39E	Resistor (47,000 ohms, 1/2 watt). (Part of No. 39)	33-347339	.17
40	Resistor (75,000 ohms, 1/2 watt)	33-375339	.17
41	Tubular Cond. (.1 mfd.)	30-4455	.20
42	Volume Control (2 meg.)	33-5286	1.00
43	Resistor (68,000 ohms, 1/2 watt)	33-368339	.17
44	Tubular Cond. (.004 mfd.)	30-4334	.15
45	Resistor (330,000 ohms, 1/2 watt)	33-433339	.17
46	Tubular Cond. (.01 mfd.)	30-4572	.15
47	Resistor (2.2 meg., 1/2 watt)	33-522339	.17
48	Resistor (10.0 meg., 1/2 watt)	33-610339	.17
49	Tubular Cond. (.01 mfd.)	30-4572	.15
50	Resistor (10.0 meg., 1/2 watt)	33-610339	.17
51	Tone Control (6 meg.)	33-5325	
52	Tubular Cond. (.006 mfd.)	30-4445	.15
53	Tubular Cond. (.01 mfd.)	30-4572	.15
54	Resistor (330,000 ohms, 1/2 watt)	33-433339	.17
55	Mica Cond. (250 mmfd.)	61-0033	.20
56	Resistor (1.0 meg., 1/2 watt)	33-510339	.17
57	Resistor (4700 ohms, 1/2 watt)	33-247339	.17
58	Resistor (43,000 ohms, 1/2 watt)	33-343339	.17
59	Resistor (47,000 ohms, 1/2 watt)	33-347339	.17
60	Tubular Cond. (.01 mfd.)	30-4572	.15
61	Tubular Cond. (.01 mfd.)	30-4572	.15
62	Resistor (470,000 ohms, 1/2 watt)	33-447339	.17
63	Resistor (4700 ohms, 1/2 watt)	33-247339	.17
64	Resistor (47,000 ohms, 1/2 watt)	33-347339	.17
65	Resistor (47,000 ohms, 1/2 watt)	33-347339	.17
66	Resistor (4700 ohms, 1/2 watt)	33-247339	.17
67	Resistor (470,000 ohms, 1/2 watt)	33-447339	.17
68	Tubular Cond. (.006 mfd.)	30-4583	.15
69	Resistor (470,000 ohms, 1/2 watt)	33-447339	.17
70	Resistor (470,000 ohms, 1/2 watt)	33-447339	.17
71	Tubular Cond. (.006 mfd.)	30-4583	.15
72	Tubular Cond. (.003 mfd.)	30-4469	.20
73	Output Trans.	32-7981	1.80
74	Cone and Voice Coil Assy.		
	(for Speaker 36-1450-2)	36-4089	2.50
	(for Speaker 36-1450-4)	36-4111	2.50
75	Tubular Cond. (.003 mfd.)	30-4469	.20
76	Field Coil (Replace Spkr. No. 36-1450)		
77	Electrolytic Con. (25 mfd., 250V.)	30-2333	1.00
78	Electrolytic Con. (18 mfd., 400V.)	30-2335	1.35
79	B. C. Resistor	33-3376	
80	Pilot Lamps	34-2064	.09
81	Pilot Lamps	34-2210	.18
82	Resistor (16 ohms, pilot lamp)	33-016431	.20
83	Power Trans. (110V, 60 cycle)	32-8059	
84	A. C. Switch	42-1517	
85	Line Con. (.01-.01 mfd., Bakelite)	3903-DG	.30
86	Wave Switch	42-1507	



ELECTRIC AUTOMATIC PUSH BUTTON UNIT

Fig. 3

SCHE. No.	DESCRIPTION	PART No.	LIST PRICE
	Coupling Assy. (Tuning Cond.)	31-2291	.35
	Dial	27-5513	
	Dial Clamp	56-1034	.05
	Dial Gasket	27-9224	.01
	Drive Cord Assy. (Pointer)	31-2316	.25
	Drive Cord Assy. (Tuning Cond.)	31-2350	.20
	Disc Control (Tuning)	27-4766	
	Disc Control (Volume)	27-4765	.30
	Disc Control (Tone)	27-4764	.30
	Disc Control (Wave Switch)	27-4767	.15
	Drum Assy. (Tuning Cond.)	38-9716	.60
	Drum Bracket & Bearing Assy.	38-9662	.10
	Pointer (Dial)	56-1033	.15
	Pilot Light Jewel	27-4777	.10
	Knobs (Push Buttons)	27-4852	
	Shaft (Control Drums)	28-6924	.05
	Spring (Drive Cord)	28-8913	.05
	Socket Assy. (Dial Lamp)	38-9694	.20
	Socket Assy. (Dial Lamp)	38-9695	.20
	Socket Assy. (Pilot Lamp)	38-9696	.40
	Socket (5 Prong, 37-Tube)	27-6035	.11
	Socket (6 Prong, 42-Tube)	27-6036	.11
	Socket (4 Prong, 80-Tube)	27-6044	.10
	Socket (Loktal, 7J7-Tube)	27-6129	
	Socket (Loktal, 7A6, 7C6, Tubes)	27-6131	
	Speaker	36-1450	9.00
	Tab Kit	40-6475	
	Phono Tab	27-9418	
	Dial Tab	27-5530	
	MOUNTING PARTS		
	Grommet (Push Button Sw. Mtg.)	27-4596	.03
	Grommet (Tuning Unit Assy. Mtg.)	3914	.02
	Grommet (Tuning Unit Assy. Mtg.)	3915	.02
	Screw (Bezel Mtg.)	W-1834	.90 Per C.
	Nut (Spkr. Mtg.)	W-124	.35 Per C.
	Screw (Loop Mtg. Rail)	W-546	.45 Per C.

Miscellaneous Parts
Model 40-200

Bezel Ass'y	40-6490	
Bearing (Drum Shaft)	56-1036	.10
Cable and Plug (Power Supply)	L-2778	.40
Cable (Speaker)	41-3430	.50

Prices subject to change without notice

PHILCO RADIO & TELEV. CORP.

MODELS 40-195, 40-200
Alignment

TYPE OF CIRCUIT: Models 40-195 and 40-200 are Electric Push-Button and dial tuned radios incorporating the new Philco Built-in Super Aerial system which eliminates an outside aerial and reduces local static interference to a minimum. These models are also designed to receive the sound of a television program tuned in by special type Philco Television Sets.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

Included in the built-in aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the loop may be set in the position where best reception is obtained.

In general, both radios are similar with the exception of the number of tubes used and cabinet design. Models 40-195 and 40-200 employ ten and eleven tubes respectively.

Each receiver is equipped with eight electric tuning push buttons for automatically selecting stations. Seven of the push buttons are used for broadcast stations and one push button (left hand push button preferably) may be set up for use with a Philco wireless Record Player or the sound programs tuned in by Special Philco Television sets.

PHILCO TUBES USED: Model 40-195

1232, R. F.; 7J7, Converter; 7B7, I. F.; 7C6, Second Detector, A. V. C., and First Audio; 37, Phase Inverter; two 37, Drivers; two 42, Audio Power Outputs; 80, Rectifier.

Model 40-200

1232, R. F.; 7J7, Converter; 7B7, I. F.; 7A6 Detector A. V. C.; 7C6 First Audio; 37, Phase Inverter; two 37, Audio Drivers; two 42, Power Outputs; 80, Rectifier.

CABINET DIMENSIONS:	Height	Width	Depth
Model 40-195 type "XX".....	38"	29½"	13¾"
Model 40-200 type "RX".....	36⅝"	34⅝"	14⅜"

Aligning of Compensating Condensers

Equipment Required

(1) Signal Generator. In order to properly adjust this receiver an accurately calibrated signal generator such as Philco Model 077 is required. This signal generator covers a frequency range of 540 to 36,000 K. C. (2) Indicating Device, to obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. When using the vacuum tube voltmeter, an aligning adaptor Philco part No. 45-2767 is necessary for connecting to the A. V. C. circuit. These testers also contain an audio output meter which may also be used as an indicating device. (3) Aligning Tools, fiber handle screw driver Philco part No. 45-2610 and fiber wrench Philco part No. 7696.

Connecting Aligning Instruments

VACUUM TUBE VOLTMETER — To use the vacuum tube voltmeter as an alignment indicator make the following connections:

1. ADJUSTING I. F. CIRCUIT:

Remove the 1232 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the chassis.

2. ADJUSTING R. F. CIRCUIT:

To adjust the R. F. circuit, the aligning adaptor is inserted in the 7C6 A. F. tube socket. The vacuum tube voltmeter remains connected to the adaptor as given in the above paragraph.

With the voltmeter connected in this manner a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted. If an audio output meter is used, connect it to the plate and socket terminals of the 42 type tube and adjust the output meter for the 0 to 30 A. C. scale.

After connecting the aligning indicator, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on the schematic diagram page No. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

SIGNAL GENERATOR: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiving loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order See Fig.	
1	High Side to No. 1 Ter. Loop Panel	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst."	39B, 39A 38B, 38A	See Note A
2	Use Loop on Generator		1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst."	29B, 4B	See Note B
3	Use Loop on Generator		580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst."	29	Roll Tuning Condenser Note C
4	Use Loop on Generator		1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst."	25B, 4B	
5	Use Loop on Generator		3.5 M. C.	3.5 M. C.	Vol. Max. Range Switch "Police"	25A, 4A	
6	Use Loop on Generator		18.0 M. C.	18.0 M. C.	Vol. Max. Range Switch "S. W."	25, 4	Check Image Signal Note D

NOTE A — A "Dummy Antenna" consisting of a .1 mfd. condenser is connected in series with the signal generator output lead (high side).

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in Fig. 4.

NOTE C — When adjusting the low frequency compensator of Range One (Broadcast) or the antenna and R. F. compensators of the high frequency tuning ranges; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

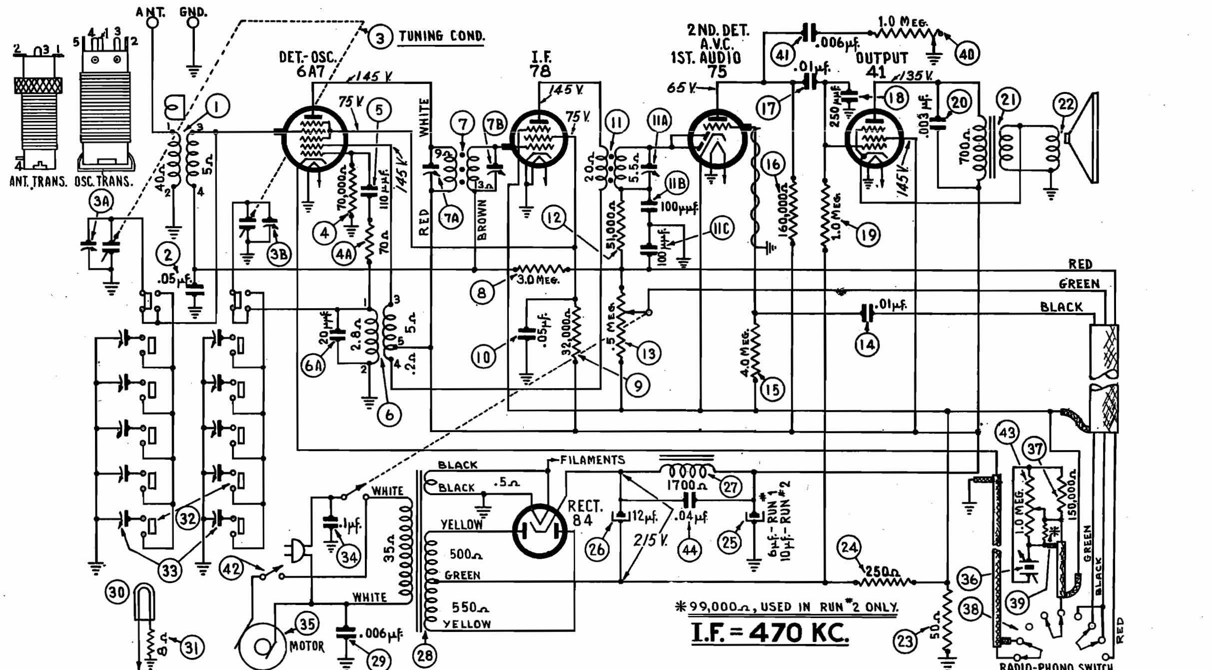
NOTE D — To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second peak is obtained on the output meter. Adjust the compensator for maximum output at this second peak.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 910 K. C. below the frequency being used on any high frequency range.

MODEL 105
Schematic, Voltage, Socket

PHILCO RADIO & TELEV. CORP.

Trimmers, Chassis, Parts
Alignment



SCHEMATIC DIAGRAM. MODEL 105

March, 1939

POWER SUPPLY: 115 V., 60 cycle A. C. **POWER CONSUMPTION:** 57 watts. **AUDIO OUTPUT:** One (1) watt.

Model 105 is a combination Phonograph and Electric Automatic Tuning Radio Receiver. The phonograph is designed to play 10 or 12 inch standard records (78 R. P. M.) and consists of a semi-automatically operated crystal pickup and Turntable Motor.

The radio receiver consists of a five tube A. C. operated superheterodyne circuit, covering standard broadcast frequencies (530 to 1720 K. C.) with Automatic Volume Control and Pentode Audio Output. In addition to being manually tuned, there are six Electric Automatic Push Buttons. Five push buttons are used for selecting any one of six stations and one for changing to manual tuning. The procedure for adjusting the push buttons for reception of stations will be found in the instructions supplied with each receiver.

NOTE —DIAL CALIBRATION: With the tuning condenser in "maximum capacity" position (plates fully meshed), set the dial pointer between the two horizontal lines at the low frequency end of the scale (550 K. C.).

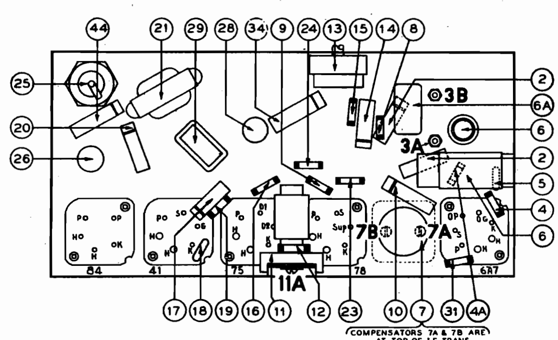


Fig. 1

PART LOCATIONS — UNDERSIDE OF CHASSIS

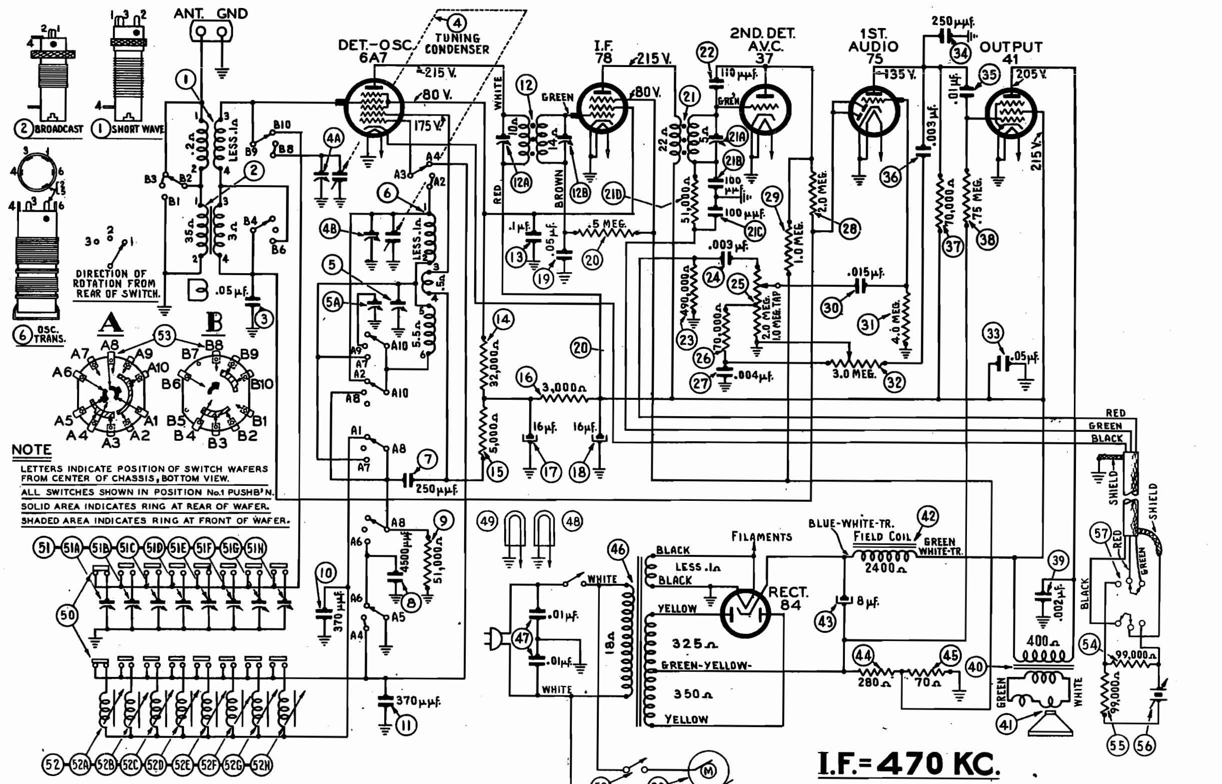
ALIGNMENT OF COMPENSATORS

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	6A7	.1 mf.	470 K. C.	580 K. C.	Vol. Cont. Max.	11A, 7B, 7A	Adjust for max. output
2	Ant. Lead	100 mf.	1550 K. C.	1550 K. C.	Vol. Cont. Max.	3B, 3A	Adjust for max. output. Note A, B

Sche. No.	Description	Part No.
1	Ant. Trans.	32-3039
2	Tubular Cond. (.05 mfd.)	30-4519
3	Tuning Cond.	31-2338
4	Resistor (70,000 ohms, ½ watt)	33-370339
4A	Resistor (70 ohms, ½ watt)	33-070339
5	Mica Cond. (110 mmfd.)	30-1031
6	Osc. Trans.	32-2122
6A	Mica Cond. (20 mmfd., silver cap)	30-1123
7	1st I. F. Trans. Assy.	32-3121
8	Resistor (3.0 meg., ½ watt)	33-530339
9	Resistor (32,000 ohms, ½ watt)	33-332339
10	Tubular Cond. (.05 mfd.)	30-4444
11	2nd I. F. Trans. Assy.	32-2674
12	Resistor (51,000 ohms, ½ watt)	33-351339
13	Volume Control (.5 meg.)	33-5254
14	Tubular Cond. (.01 mfd.)	30-4479
15	Resistor (4.0 meg., ½ watt)	33-540339
16	Resistor (160,000 ohms, ½ watt)	33-416339
17	Tubular Cond. (.01 mfd.)	30-4572
18	Mica Cond. (250 mmfd.)	30-1032
19	Resistor (1.0 meg., ½ watt)	33-510339
20	Tubular Cond. (.003 mfd.)	30-4582
21	Output Trans.	32-7980
22	Cone & Voice Coil Assy.	
	Run #1 Speaker No. 36-1440-3	36-4086
	Run #2 Speaker No. 36-1473	36-4120
23	Resistor (50 ohms, ½ watt)	33-050339
24	Resistor (250 ohms, ½ watt)	33-125339
25	Electrolytic Cond.	
	Run #1, 6 mfd., 450 V.	30-2265
	Run #2, 10 mfd., 450 V.	30-2091
26	Electrolytic Cond. (12 mfd., 300 V.)	30-2404
27	Field Coil	
	Replace Speaker Part No. 36-1440, Run #1	
	Replace Speaker Part No. 36-1473, Run #2	
28	Power Trans.. (115 V., 50-60 cycles)	32-7979
29	Condenser (.006 mfd., moulded)	30-4423
30	Pilot Lamp	34-2064
31	Pilot Lamp Resistor (8 ohms, ½ watt)	33-980331
32	Push Button Switch	42-1477
33	Padder Strip Assy.	31-6290
34	Tubular Cond. (.1 mfd.)	30-4122
35	Phono Motor	35-1158
36	Crystal Pickup without mtg. parts	35-2031
	Crystal Pickup complete with mtg. parts	35-2027
37	Resistor (150,000 ohms, ½ watt)	33-415339
38	Radio Phono Switch	42-1502
*39	Resistor (99,000 ohms, ½ watt) used in Run 2 only	33-399339
40	Tone Control (1.0 meg.)	33-5320
41	Tubular Cond. (.006 mfd.)	30-4591
42	Motor Switch	42-1498
43	Phono Volume Control (1.0 meg.)	33-5323
44	Tubular Cond. (.04 mfd.)	30-4119

PHILCO RADIO & TELEV. CORP.

MODEL 108, Code 121
Schematic, Voltage
Parts



FOR ALIGNMENT, SEE INDEX

SCHEMATIC DIAGRAM MODEL 108

I.F.=470 KC.

March, 1939

ADJUSTING ELECTRIC PUSH BUTTON TUNING:- For frequency ranges of buttons see parts 51A through 51H in parts list. For adjusting procedure see INDEX.

POWER SUPPLY: 115 V., 60 cycle A. C. 69 watts.
INTERMEDIATE FREQUENCY: 470 K. C.

PHILCO TUBES USED: 6A7, First Detector Oscillator; 78, I. F. Amplifier; 37, Second Detector, A. V. C.; 75, First Audio; 41, Audio Output and 84, Rectifier.

Sche. No.	Description	Part No.
1	Ant. Trans. (S. W.)	32-3027
2	Ant. Trans. (B. C.)	32-3026
3	Tubular Cond. (.05 mf.)	30-4519
4	Tuning Cond. Assy.	31-2346
5	Dual Padder Unit	31-6255
6	Osc. Trans.	32-3028
7	Mica Cond. (250 mmf.)	30-1032
8	Mica Cond. (4500 mmf.)	30-1109
9	Resistor (51,000 ohms, ½ watt)	33-351339
10	Condenser (Silver Mica) (370 mmf.)	30-1110
11	Condenser (Silver Mica) (370 mmf.)	30-1110
12	1st I. F. Trans. Assy.	32-3018
13	Tubular Cond. (.1 mf.)	30-4455
14	Resistor (32,000 ohms, ½ watt)	33-332339
15	Resistor (5,000 ohms, ½ watt)	33-250339
16	Resistor (3,000 ohms, ½ watt)	33-230339
17	Electro. Cond. (16 mf.) 250 volts	30-2331
18	Electro. Cond. (16 mf.) 250 volts	30-2370
19	Tubular Cond. (.05 mf.)	30-4519
20	Resistor (490,000 ohms, ½ watt)	33-449339
21	2nd I. F. Trans. Assy.	32-3129
21A	Compensator Part of 21	
21B	Condenser Part of 21A	
21C	Condenser Part of 21A	
21D	Resistor (51,000 ohms, ½ watt)	33-351339
22	Mica Cond. (110 mmf.)	30-1031
23	Resistor (490,000 ohms, ½ watt)	33-449339
24	Tubular Cond. (.003 mf.)	30-4580
25	Volume Control (2 meg.)	33-5286
26	Resistor (70,000 ohms)	33-370339
27	Tubular Cond. (.004 mf.)	30-4334
28	Risistor (2.0 meg., ½ watt	33-520339
29	Resistor (1.0 meg., ½ watt)	33-510339
30	Tubular Cond. (.015 mf.)	30-4515
31	Resistor (4.0 meg., ½ watt)	33-540339
32	Tone Control (3 meg.)	33-5287
33	Tubular Cond. (.05 mf.	30-4518
34	Mica Cond. (250 mmf.)	30-1032
35	Tubular Cond. (.01 mf.)	30-4572

Sche. No.	Description	Part No.
36	Tubular Cond. (.003 mf.)	30-4582
37	Resistor (70,000 ohms, ½ watt)	33-370339
38	Resistor (75 meg., ½ watt)	33-475339
39	Tubular Cond. (.002 mf.)	30-4177
40	Output Trans. for Speaker Part No. 36-1438-2	32-7978
41	Cone and Voice Coil Assy. for Speaker Part No. 36-1438-2	36-4089
42	Field Coil, Replace Speaker Part No. 36-1438-2	
43	Electro. Cond. (8 mf. 400 V.)	30-2371
44	Resistor (280 ohms)	33-128431
45	Resistor (70 ohms, ½ watt)	33-070339
46	Power Trans. (115 V. 50 to 60 cycles)	32-7977
47	Bakelite Cond. (.01 mf. .01 mf.)	3903DG
48	Pilot Lamp (Dial)	34-2064
49	Pilot Lamp (Dial)	34-2064
50	Push Button Switch	42-1462
51	Compensator Assy.	31-6256
51A	Compensator No. 1 (540-1030 K. C.)	
51B	Compensator No. 2 (540-1030 K. C.)	
51C	Compensator No. 3 (670-1160 K. C.)	
51D	Compensator No. 4 (670-1160 K. C.)	
51E	Compensator No. 5 (900-1470 K. C.)	
51F	Compensator No. 6 (900-1470 K. C.)	
51G	Compensator No. 7 (1170-1600 K. C.)	
51H	Compensator No. 8 (1170-1600 K. C.)	
52	Electric Push Button Coil Assy.	32-3031
52A	Osc. Coil No. 1 (540-1030 K.C.)	32-3042
52B	Osc. Coil No. 2 (540-1030 K.C.)	32-3042
52C	Osc. Coil No. 3 (670-1160 K.C.)	32-3042
52D	Osc. Coil No. 4 (670-1160 K.C.)	32-3042
52E	Osc. Coil No. 5 (900-1470 K.C.)	32-3041
52F	Osc. Coil No. 6 (900-1470 K.C.)	32-3041
52G	Osc. Coil No. 7 (1170-1600 K.C.)	32-3041
52H	Osc. Coil No. 8 (1170-1600 K.C.)	32-3041
53	Wave Switch	42-1478
54	Resistor (99,000 ohms, ½ watt)	33-399339
55	Resistor (99,000 ohms, ½ watt)	33-399339

Sche. No.	Description	Part No.
56	Crystal Pickup (without mtg. Parts)	35-2031
	Crystal Pickup (complete with mtg. Parts)	35-2027
57	Radio Phono Switch	42-1509
58	Phono Motor (115 volt, 60 cycle)	35-1158
59	Motor Switch	42-1498
	Bezel	56-1104
	Bracket & Bearing (Tuning Drum)	38-9662
	Cable (Power)	L-2778
	Coupling (Tuning Condenser)	31-2291
	Dial	27-5452
	Drive Cord Assy. (Tuning)	31-2315
	Drive Cord Assy. (Pointer)	31-2316
	Disc Control (Tuning)	27-4766
	Disc Control (Range Switch)	27-4767
	Disc Control (Tone)	27-4764
	Disc Control (Volume)	27-4765
	Drum & Shaft (Tuning Cond.)	38-9716
	Needle Screw	218-1047
	Nut ("T" Type Motor Mtg.)	W-1758
	Knob (Pushbutton)	27-4758
	Pointer	56-1033
	Screw (Pickup Mtg.)	W-2027
	Screw (Motor Mtg.)	W-599
	Screw (Chassis Mtg.)	W-454
	Sleeve (Motor Mtg.)	28-5274
	Spring (Drive Cord Assy.)	28-8913
	Spring (Pushbutton)	56-1238
	Socket (5 prong)	27-6035
	Socket (6 prong)	27-6036
	Socket (7 prong)	27-6099
	Speaker	36-1438-2
	Turntable	315-1007
	Washer (Rubber coupling, Turntable shaft)	315-1002
	Washer (Metal coupling, Turntable shaft)	315-1003
	Washer (Rubber, Motor Mtg., top)	3915
	Washer (Rubber, Motor Mtg., bottom)	27-4818

MODEL 936
Schematic, Socket
Trimmers, Chassis
Parts

PHILCO RADIO & TELEV. CORP.

PHILCO MODEL 936

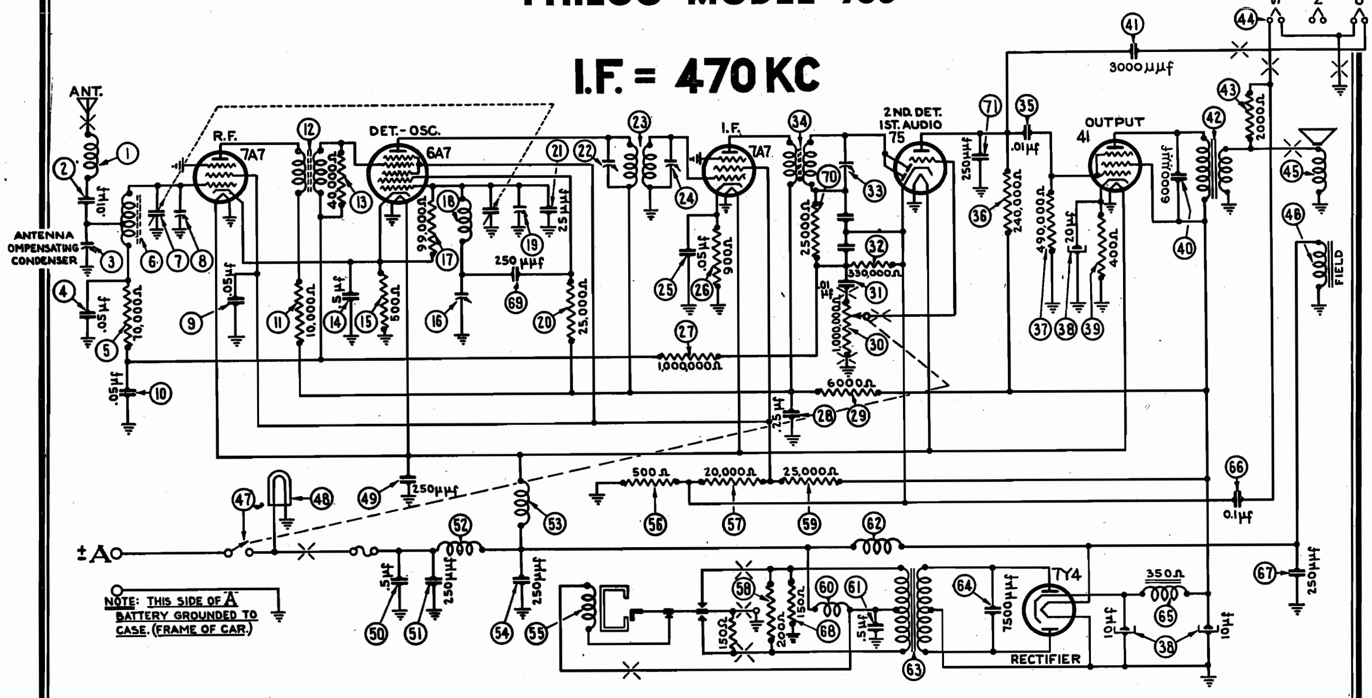


FIGURE 2

FOR ALIGNMENT, SEE INDEX

MODEL 936 PARTS LIST

No.	Description	Part No.
1	Antenna Choke	32-1956
2	Condenser (.01 mfd.)	30-4479
3	Antenna Compensator	31-6248
4	Condenser (.05 mfd.)	30-4444
5	Resistor (70,000 ohms)	33-370257
6	Antenna Transformer	65-0085
7	Tuning Condenser	63-0016
8	First Padder (on Tun. Cond.)	
9	Condenser (.05 mfd.)	30-4569
10	Condenser (.05 mfd.)	30-4444
11	Resistor (10,000 ohms)	33-310337
12	R. F. Transformer	65-0009
13	Resistor (40,000 ohms)	33-340237
14	Condenser (.5 mfd.)	30-4565
15	Resistor (500 ohms)	33-150438
16	Low Frequency Padder	31-6230
17	Resistor (99,000 ohms)	33-399337
18	Oscillator Transformer	65-0052
19	Second Padder (on Tun. Cond.)	
20	Resistor (25,000 ohms)	33-325337
21	Condenser (25 mmfd.)	30-1108
22	Padder (Pri. 1st I. F. Trans.)	
23	First I. F. Transformer	65-0044
24	Padder (Sec. 1st I. F. Trans.)	
25	Condenser (.05 mfd.)	30-4444
26	Resistor (900 ohms)	33-190438
27	Resistor (1,000,000 ohms)	33-510257
28	Condenser (.25 mfd.)	30-4448
29	Resistor (6,000 ohms)	33-260337
30	Vol. Control (1,000,000 ohms) and On-Off Switch	33-5268
31	Condenser (.01 mfd.)	61-0014
32	Resistor (330,000 ohms)	33-433337
33	Padder (Sec. 2nd I. F. Trans.)	
34	Second I. F. Transformer	65-0045
35	Condenser (.01 mfd.)	30-4501
36	Resistor (240,000 ohms)	33-424337
37	Resistor (490,000 ohms)	33-449337
38	Filter Condenser (10-10-20 mfd.)	61-0028
39	Resistor (400 ohms)	33-140438
40	Condenser (6,000 ohms)	30-4024
41	Condenser (3,000 mmfd.)	30-4469
42	Output Transformer	65-0048
43	Resistor (2,000 ohms)	33-220447
44	Reception Control	412-1004
45	Cone and Voice Coil Kit	91-0028
46	Field Coil	Not Replaceable
47	On-Off Switch and Vol. Control (1,000,000 ohms)	33-5268
48	Pilot Lamp	34-2040
49	Condenser (250 mmfd.)	61-0033
50	Condenser (.5 mfd.)	30-4474
51	Condenser (250 mmfd.)	61-0033
52	"A" Choke	65-0057
53	Filament Choke	65-0057
54	Condenser (250 mmfd.)	61-0033
55	Vibrator	41-3398
56	Resistor (500 ohms)	33-150438
57	Resistor (20,000 ohms)	33-320337
58	Resistor (200 ohms)	33-120347
59	Resistor (25,000 ohms)	33-325437
60	Vibrator Choke	32-2483
61	Condenser (.5 mfd.)	30-4565
62	Choke	32-1374
63	Power Transformer	65-0046
64	Condenser (7,500 mmfd.)	30-4567
65	Filter Choke	32-7959
66	Condenser (.01 mfd.)	30-4499
67	Condenser (250 mmfd.)	61-0033
68	Resistor (150 ohms)	33-115337
69	Condenser (250 mmfd.)	61-0034
70	Resistor (25,000 ohms)	33-325344
71	Condenser (250 mmfd.)	30-1032
	Control Unit	85-0058
	Dial	55-0304
	Tuning and Volume Knob	27-4725
	Distributor Resistor	33-1196
	Interference Condenser	30-4007
	Control Mtg. Bracket	28-5790

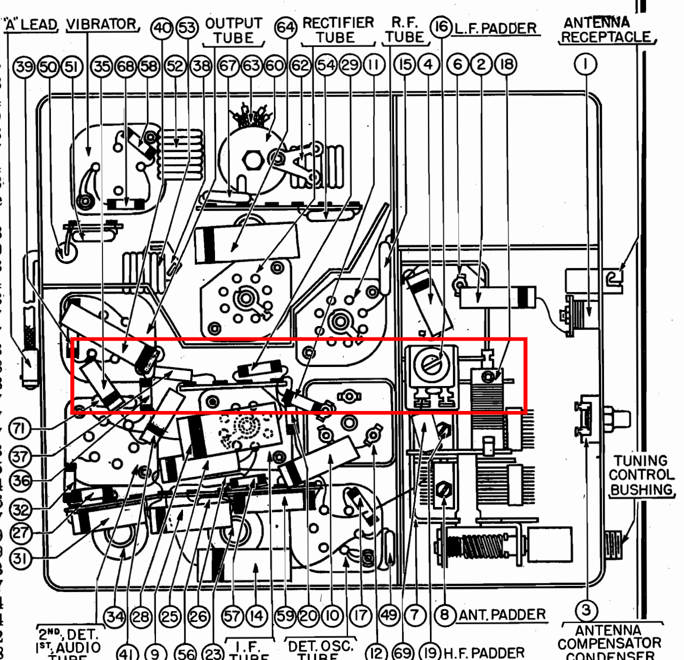


FIGURE 1

No.	Description	Part No.	No.	Description	Part No.
	Reception Control Mtg. Bracket	28-5852		"T" Bolt	28-6161
	Flexible Shaft	57-0631		Nut	W518

JANUARY 5, 1939

Trimmers, Chassis Parts

PHILCO RADIO & TELEV. CORP.

MODEL 937
Schematic, Socket

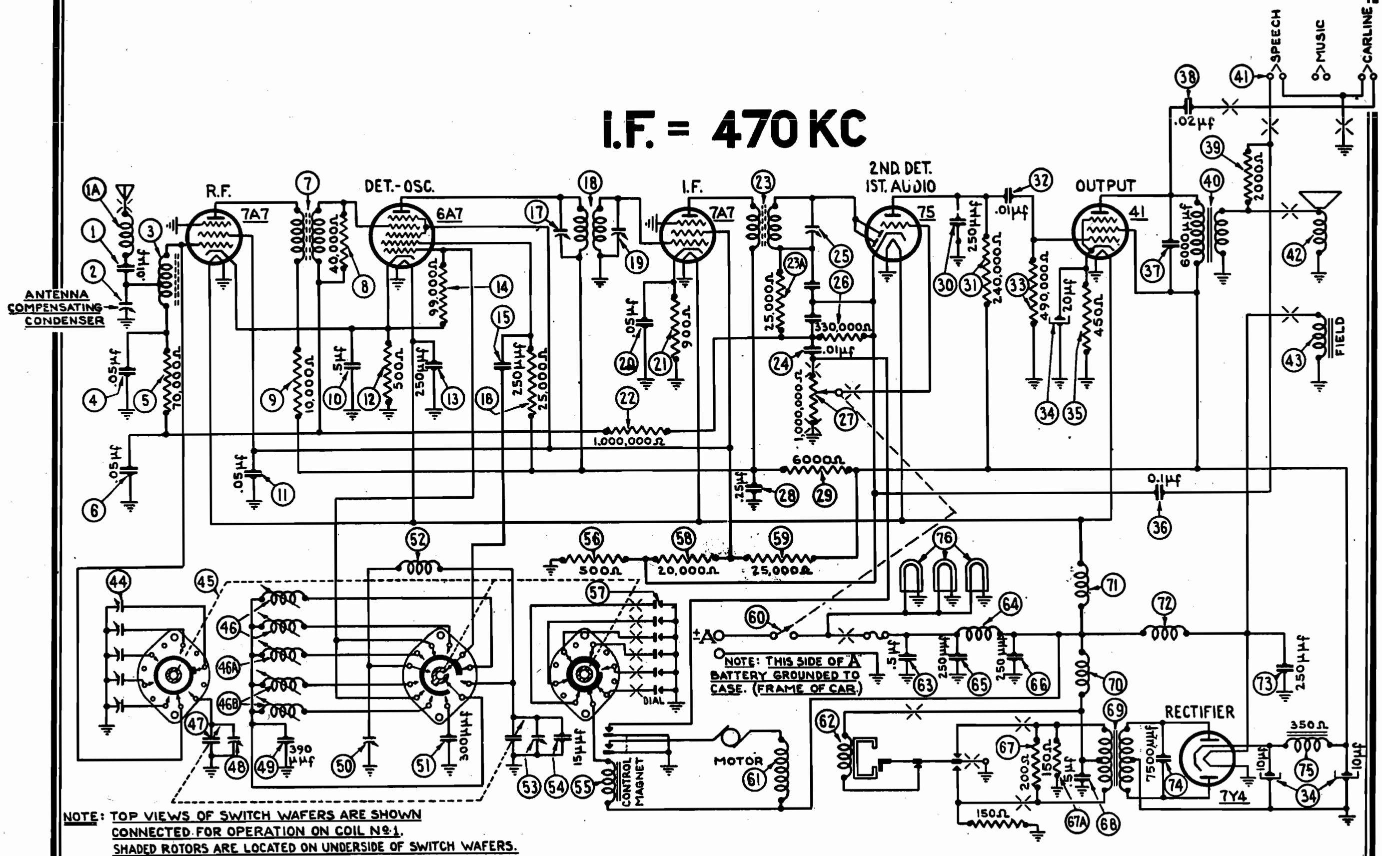


FIGURE 1

MODEL 937 PARTS LIST

No.	Description	Part No.
1	Condenser (.01 mfd.)	30-4479
1a	Antenna Choke	77-0161
2	Antenna Compensating Condenser	Part of 44
3	Antenna Transformer	65-0085
4	Condenser (.05 mfd.)	30-4444
5	Resistor (70,000 ohms)	33-370257
6	Condenser (.05 mfd.)	30-4444
7	R. F. Transformer	65-0009
8	Resistor (40,000 ohms)	33-339137
9	Resistor (10,000 ohms)	33-310337
10	Condenser (.5 mfd.)	30-4565
11	Condenser (.05 mfd.)	30-4569
12	Resistor (500 ohms)	33-150438
13	Condenser (250 mmfd.)	61-0033
14	Resistor (99,000 ohms)	33-399337
15	Condenser (250 mmfd.)	61-0033
16	Resistor (25,000 ohms)	33-325337
17	Padder (Pri. 1st I. F. Trans.)	
18	First I. F. Transformer	65-0044
19	Padder (Sec. 1st I. F. Trans.)	
20	Condenser (.05 mfd.)	30-4444
21	Resistor (900 ohms)	33-190438
22	Resistor (1,000,000 ohms)	33-510257
23	Second I. F. Transformer	65-0045
23a	Resistor (25,000 ohms)	33-325337
24	Condenser (.01 mfd.)	61-0014
25	Padder (Sec. 2nd I. F. Trans.)	
26	Resistor (330,000 ohms)	33-433337
27	Vol. Control (1,000,000 ohms) and On-Off Switch	33-5268
28	Condenser (.25 mfd.)	30-4448
29	Resistor (6,000 ohms)	33-260337
30	Condenser (250 mmfd.)	30-1032
31	Resistor (240,000 ohms)	33-424337
32	Condenser (.01 mfd.)	30-4501
33	Resistor (490,000 ohms)	33-449337
34	Filter Condenser (10-10-20 mfd.)	61-0028
35	Resistor (450 ohms)	33-145337
36	Condenser (.1 mfd.)	30-4499
37	Condenser (6,000 mmfd.)	30-4024
38	Condenser (.02 mfd.)	30-4495
39	Resistor (2,000 ohms)	33-220447
40	Output Transformer	65-0048
41	Reception and Push Button Control	77-0179
42	Cone Kit	91-0028
43	Field Coil	Not Replaceable
44	Antenna Padder Assembly	77-0172
45	Wafer Switch	77-0180
46	Oscillator Transformer (High Freq.)	65-0088
46a	Oscillator Transformer (Med. Freq.)	65-0089
46b	Oscillator Transformer (Low Freq.)	65-0090
47	Tuning Condenser	63-0016
48	First Padder (on Tun. Cond.)	
49	Silver Cap Condenser (390 mmfd.)	61-0031
50	Low Frequency Padder	31-6230
51	Silver Cap Condenser (330 mmfd.)	61-0003
52	Oscillator Transformer	65-0052
53	Second Padder (on Tun. Cond.)	
54	Condenser (15 mmfd.)	61-0038
55	Motor and Relay Assembly	77-0178
56	Resistor (500 ohms)	33-150438
57	Push Button and Reception Control Assembly	77-0179
58	Resistor (20,000 ohms)	33-320337
59	Resistor (25,000 ohms)	33-325437
60	On-Off Switch and Volume Control (1,000,000 ohms)	33-5268
61	Motor	83-0001
62	Vibrator	41-3398
63	Condenser (.5 mfd.)	30-4474
64	"A" Choke	65-0057
65	Condenser (250 mmfd.)	61-0033
66	Condenser (250 mmfd.)	61-0033
67	Resistor (200 ohms)	33-120347
67a	Resistor (150 ohms)	33-115347
68	Condenser (.5 mfd.)	30-4565
69	Power Transformer	65-0046
70	Vibrator Choke	32-2483
71	Filament Choke	65-0057
72	Choke	32-1374
73	Condenser (250 mmfd.)	61-0033

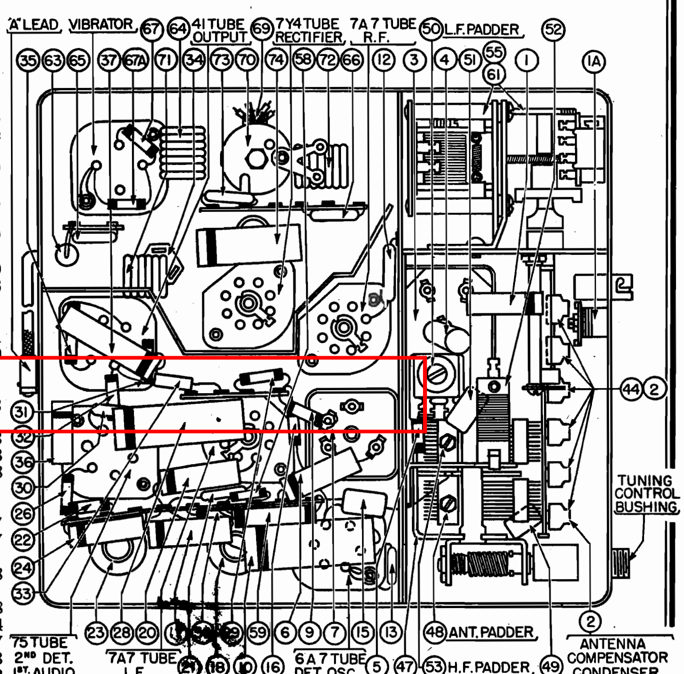


FIGURE 2

No.	Description	Part No.
74	Condenser (7,500 mmfd.)	30-4567
75	Filter Choke (350 ohms)	32-7959
76	Pilot Lamp	34-2040
	Call Letter Kit	81-0088
	Tuning Control (Manual)	85-0060

Description	Part No.
Bracket (Automatic Control Mtg.)	57-0638
Distributor Resistor	33-1196
Interference Condenser	30-4007
Dial	55-0304
Tuning and Volume Knob	27-4689

JANUARY 3, 1939

MODEL 936
MODEL 937
Trimmers, Alignment

PHILCO RADIO & TELEV. CORP.

MODEL 937 — ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6 volt power pack, 077 or 177 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

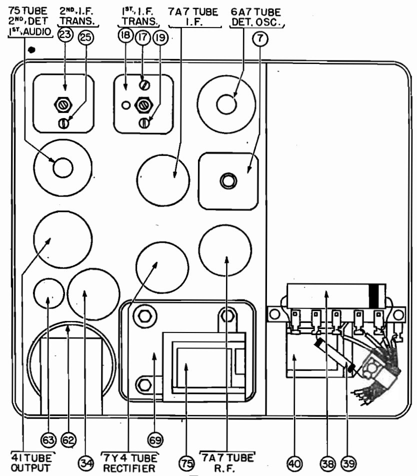


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	PRESS THE RETURN TO DIAL BUTTON UNTIL STATIONS CAN BE TUNED IN BY MANUAL TUNING. ADJUST THE ANTENNA COMPENSATOR ② TWO TURNS FROM TIGHT				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	㉕ ⑲ ⑰
3	1580 K.C.	To Antenna Receptacle on Radio	See Note 1	Note 2	53
4	1400 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	48 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	50 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	See Note 1	Note 2	53
7	1400 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	48 Note 4
8	1200 to 1400 K.C.	Note 5	Note 5	Note 5	②

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 50 Mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

NOTE 5 — When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal between 1200 and 1400 Kilocycles on the control scale. Remove the plug button on the end of the radio and adjust the antenna compensator ② (See Figure 2) for maximum signal.

MODEL 936 — ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6 volt power pack, 077 or 177 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

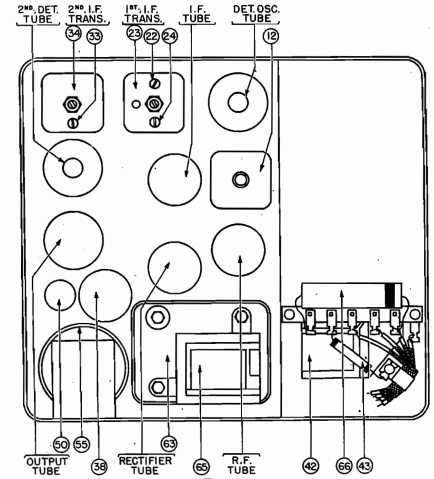


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	ADJUST THE ANTENNA COMPENSATOR ③ TWO TURNS FROM TIGHT				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	33 ㉔ ㉒
3	1580 K.C.	To Antenna Receptacle on Radio	See Note 1	Note 2	⑲
4	1400 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	⑧ Note 4
5	580 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	⑯ Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	See Note 1	Note 2	⑲
7	1400 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	⑧ Note 4
8	1200 to 1400 K.C.	Note 5	Note 5	Note 5	③

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 50 Mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

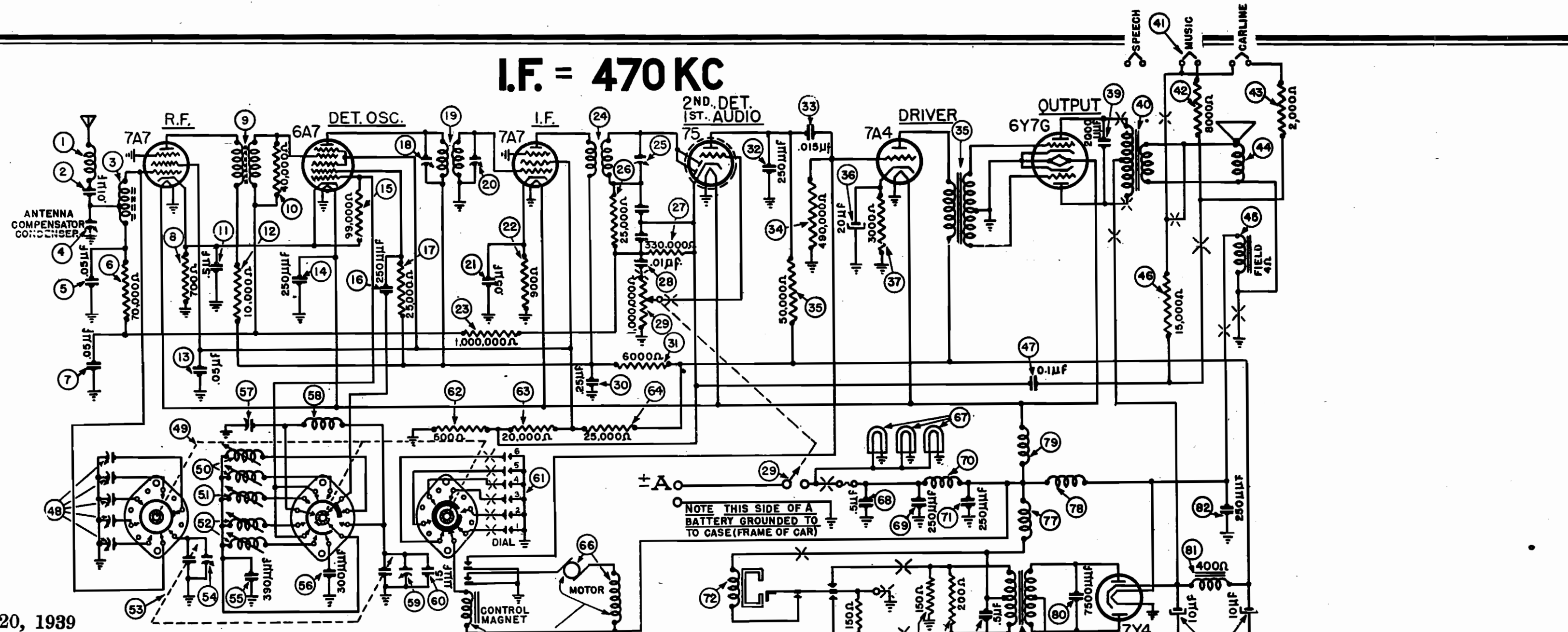
NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

NOTE 5 — When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal between 1200 and 1400 Kilocycles on the control scale. Remove the plug button on the end of the radio and adjust the antenna compensator ③ (See Figure 2) for maximum signal.

PHILCO RADIO & TELEV. CORP.

MODEL 938K
Schematic, Chassis
Parts

I.F. = 470 KC



JANUARY 20, 1939

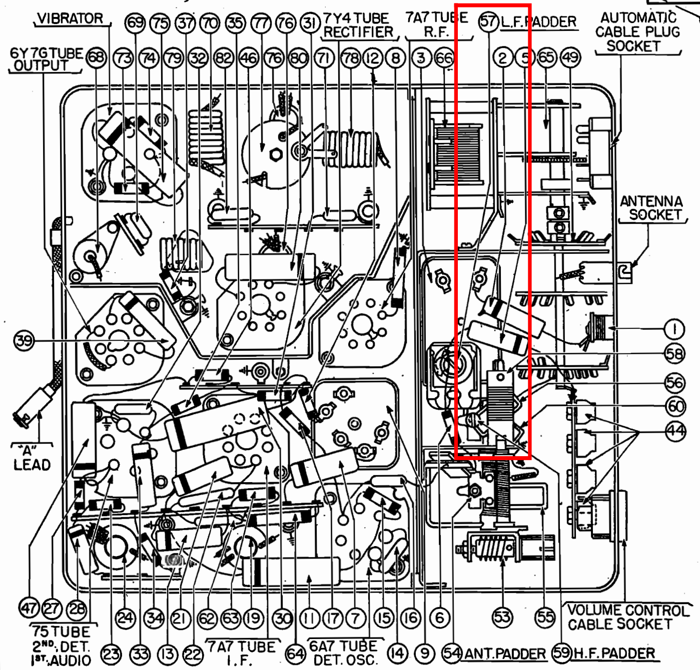


FIGURE 2

No.	Description	Part No.
1	Antenna Choke	77-0161
2	Condenser (.01 mfd.)	30-4479
3	Antenna Transformer	65-0085
4	Antenna Compensator	31-6248
5	Condenser (.05 mfd.)	30-4444
6	Resistor (70,000 ohms)	33-370257
7	Condenser (.05 mfd.)	30-4444
8	Resistor (700 ohms)	33-170438
9	R. F. Transformer	65-0009
10	Resistor (40,000 ohms)	33-340257
11	Condenser (.5 mfd.)	30-4565
12	Resistor (10,000 ohms)	33-310337
13	Condenser (.05 mfd.)	30-4569
14	Condenser (250 mmfd.)	61-0033
15	Resistor (99,000 ohms)	33-399337
16	Condenser (250 mmfd.)	61-0034
17	Resistor (25,000 ohms)	33-325337
18	Padder (Pri. 1st I. F. Trans.)	
19	First I. F. Transformer	65-0044
20	Padder (Sec. 1st I. F. Trans.)	
21	Condenser (.05 mfd.)	30-4444
22	Resistor (900 ohms)	33-190438
23	Resistor (1,000,000 ohms)	33-510257
24	Second I. F. Transformer	65-0045
25	Padder (Sec. 2nd I. F. Trans.)	
26	Resistor (25,000 ohms)	33-325257
27	Resistor (330,000 ohms)	33-433337
28	Condenser (.01 mfd.)	61-0014
29	Volume Control (1,000,000 ohms) and On-Off Switch	33-5268
30	Condenser (.25 mfd.)	30-4448
31	Resistor (6,000 ohms)	33-260337
32	Condenser (250 mmfd.)	30-1032
33	Condenser (.015 mfd.)	30-4515
34	Resistor (490,000 ohms)	33-449337
35	Resistor (50,000 ohms)	33-351337
36	Filter Condenser (10-10-20 mfd.)	61-0028
37	Resistor (3,000 ohms)	33-230337
38	Input Transformer	65-0097
39	Condenser (2,000 mmfd.)	30-4177
40	Output Transformer	65-0093
41	Automatic Station Selector and Reception Control	77-0204
42	Resistor (8,000 ohms)	33-280337
43	Resistor (2,000 ohms)	33-220337
44	Cone and Voice Coil Kit	45-2653
45	Field Coil Assembly	Not Replaceable
46	Resistor (15,000 ohms)	33-315337
47	Condenser (.1 mfd.)	30-4122
48	Antenna Padder Assembly	77-0172
49	Wafer Switch	77-0207
50	Oscillator Transformer (High Freq.)	65-0088
51	Oscillator Transformer (Med. Freq.)	65-0089
52	Oscillator Transformer (Low Freq.)	65-0090
53	Tuning Condenser	63-0016
54	First Padder (on Tun. Cond.)	
55	Silver Cap Condenser (390 mmfd.)	61-0031
56	Silver Cap Condenser (300 mmfd.)	61-0003
57	Low Frequency Padder	31-6230
58	Oscillator Transformer	65-0052
59	Second Padder (on Tun. Cond.)	
60	Condenser (.15 mmfd.)	61-0038
61	Station Selector Assembly	Part of 41
62	Resistor (500 ohms)	33-150438
63	Resistor (20,000 ohms)	33-320337
64	Resistor (25,000 ohms)	33-325447
65	Motor and Relay Assembly	77-0229
66	Motor	83-0001
67	Pilot Lamp	34-2040
68	Condenser (.5 mfd.)	30-4474
69	Condenser (250 mmfd.)	61-0033
70	"A" Choke	65-0057
71	Condenser (250 mmfd.)	61-0033
72	Vibrator	41-3398
73	Resistor (150 ohms)	33-115337
74	Resistor (200 ohms)	33-120347
75	Condenser (.5 mfd.)	30-4565
76	Power Transformer	65-0095
77	Vibrator Choke	32-2537
78	Choke	32-1374
79	Filament Choke	65-0057
80	Condenser (7,500 mmfd.)	30-4567
81	Filter Choke	65-0092
82	Condenser (250 mmfd.)	61-0033
83	Resistor (150 ohms)	33-115337
	Call Letter Kit	81-0088
	Automatic Tuning Unit	77-0204
	Tuning Control (Manual) (Automatic Control Mtg.)	85-0060 57-0638
	Distributor Resistor	33-1196
	Interference Condenser	30-4007
	Dial	55-0304
	Tuning & Volume Knob	27-4689
	Speech Knob	27-4733
	Music Knob	27-4732
	Car Line Knob	27-4731
	Fuse	7227
	Fuse Insulator	27-7729
	"T" Bolt (Rec. Mtg.)	28-6161
	Nut (Rec. Mtg.)	W518
	Stud (Speaker Mtg.)	6122
	Nut (Speaker Mtg.)	W55A
	Call Letter Kit	81-0088

NOTE: TOP VIEWS OF SWITCH WAFERS ARE SHOWN. CONNECTED FOR OPERATION ON COIL NO. 1 SHADED ROTORS ARE LOCATED ON UNDERSIDE OF SWITCH WAFERS.

MODEL 938K
Socket, Trimmers
Alignment

PHILCO RADIO & TELEV. CORP.

Alignment MODEL 938K

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6 volt power pack, 077 or 177 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 6Y7G output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

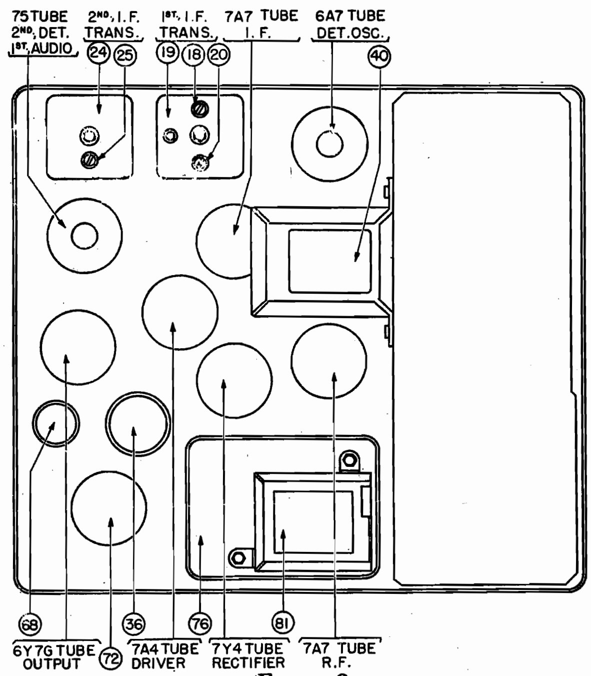


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	PRESS THE RETURN TO DIAL BUTTON UNTIL STATIONS CAN BE TUNED IN BY MANUAL TUNING. ADJUST THE ANTENNA COMPENSATOR ④ TWO TURNS FROM TIGHT.				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	25 20 18
3	1580 K.C.	To Antenna Receptacle on Radio	See Note 1	Note 2	59
4	1400 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	54 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	57 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	See Note 1	Note 2	59
7	1400 K.C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	54 Note 4
8	1200 to 1400 K.C.	Note 5	Note 5	Note 5	4

Make all adjustments for maximum reading on the output meter.

1 — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 50 Mmfd. Condenser in series between the signal generator and the antenna lead.

2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

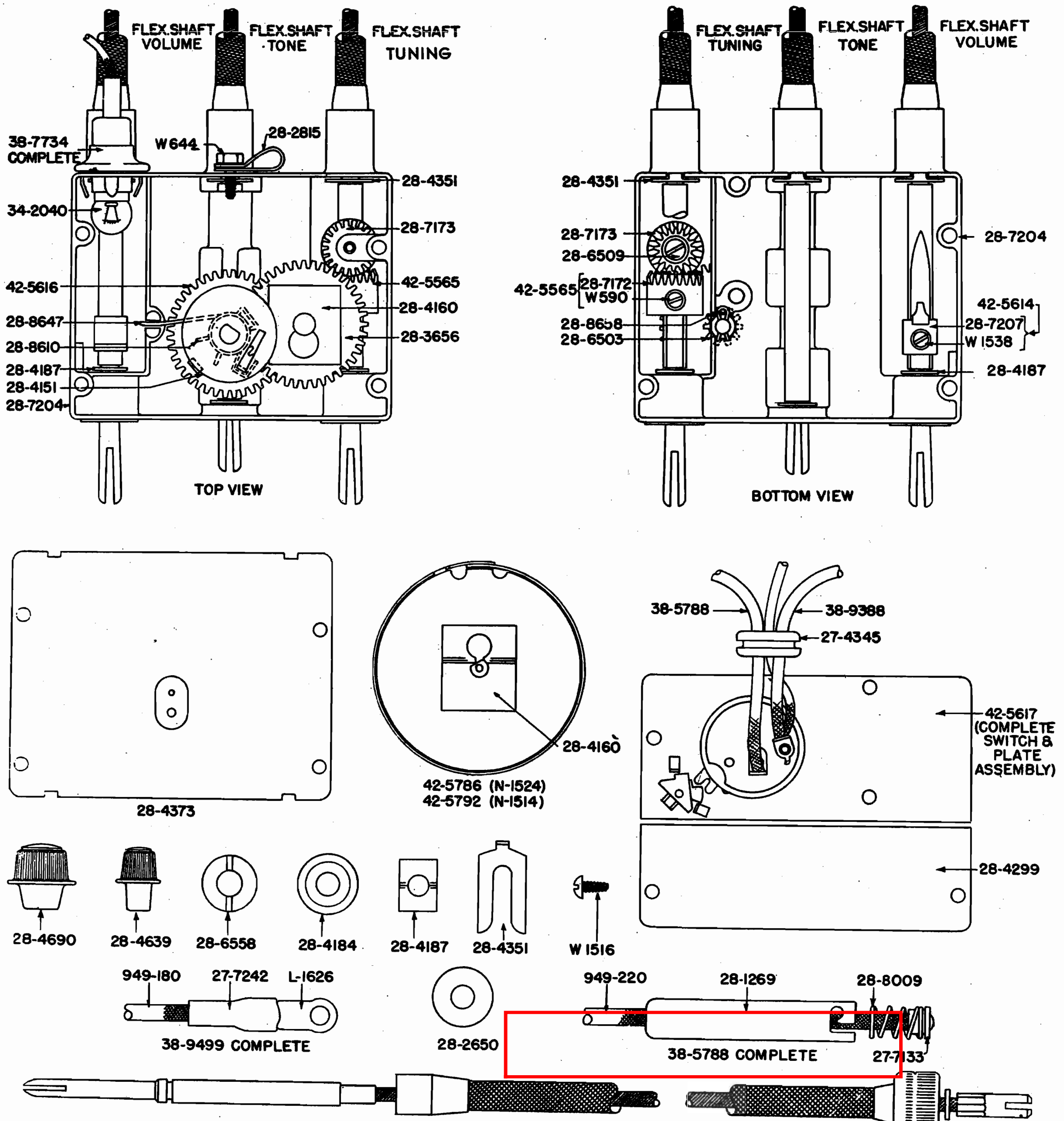
4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

5 — When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal between 1200 and 1400 Kilocycles on the control scale. Remove the plug button on the end of the radio and adjust the antenna compensator ④ (See Figure 2) for maximum signal.

PHILCO RADIO & TELEV. CORP.

MODELS N-1514,N-1524
Nash Controls Details

NASH CONTROLS — MODELS N-1514 — N-1524



28-8813 TUNING CONTROL SHAFT (N-1524)
28-8815 TUNING CONTROL SHAFT (N-1514)

28-8814 VOLUME CONTROL SHAFT (N-1524)
28-8816 VOLUME CONTROL SHAFT (N-1514)

28-8798 TONE CONTROL SHAFT (N-1524)
28-8817 TONE CONTROL SHAFT (N-1514)

PARTS LIST AND PRICES (Prices Subject to Change Without Notice)

Part No.	Description	List Price
L-1626	Lug	$ .02
W-590	Screw per 100	2.00
W-644	Screw per 100	1.50
W-1516	Screw per 100	1.30
W-1538	Screw per 100	1.80
27-4345	Grommet	.02
27-7133	Terminal	.01
27-7242	Sleeve per 100	.40
28-1269	Fuse Housing	.01
28-2650	Washer per 100	.45
28-2815	Clamp	.01
28-3656	Gear	.02
28-4151	Friction Washer	.02
28-4160	Spring	.01
28-4184	Knob Base	.02
28-4187	Washer	.01

Part No.	Description	List Price
28-4299	Cover	.03
28-4351	Shaft Retainer	.01
28-4373	Cover	.10
28-4639	Tone Knob	*
28-4690	Tuning & Volume Knob	*
28-6503	Gear	.05
28-6509	Screw	.03
28-6558	Gland Nut	.25
28-7172	Miter Gear	.10
28-7173	Miter Idler Gear	.10
28-7204	Housing	.50
28-7207	Switch Arm	.05
28-8009	Spring per 100	.50
28-8610	Spring	.03
28-8647	Anti-back Lash Spring	.02
28-8658	Spring	.03

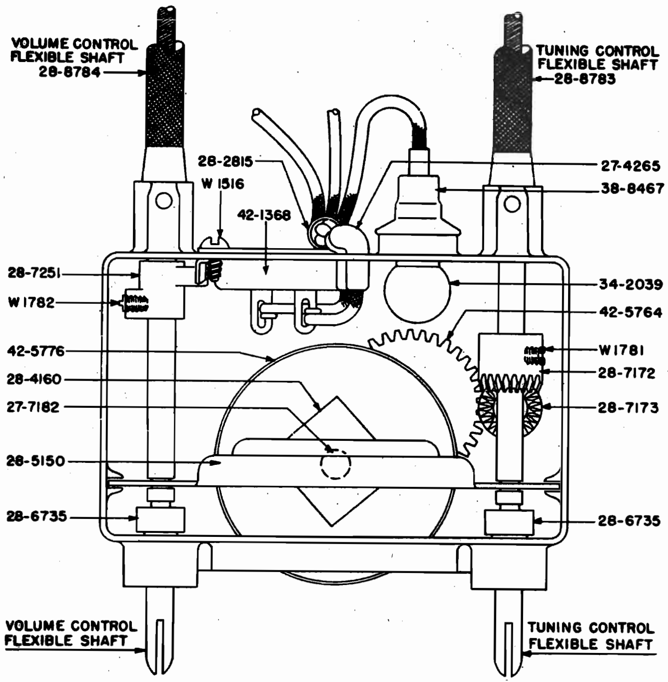
Part No.	Description	List Price
28-8798	Tone Shaft (N-1524)	1.00
28-8813	Tuning Shaft (N-1524)	1.00
28-8814	Volume Shaft (N-1524)	1.00
28-8815	Tuning Shaft (N-1514)	1.00
28-8816	Volume Shaft (N-1514)	1.00
28-8817	Tone Shaft (N-1514)	1.00
34-2040	Pilot Lamp	.09
38-5788	"A" Lead	*
38-7734	Pilot Lamp Assembly	.35
38-9388	"A" Lead	.20
42-5565	Miter Gear Assembly	.15
42-5614	Switch Arm Assembly	.15
42-5616	Drum Shaft & Gear	.10
42-5617	On-Off Switch	.40
42-5786	Dial Assembly (N-1524)	.35
42-5792	Dial Assembly (N-1514)	.40

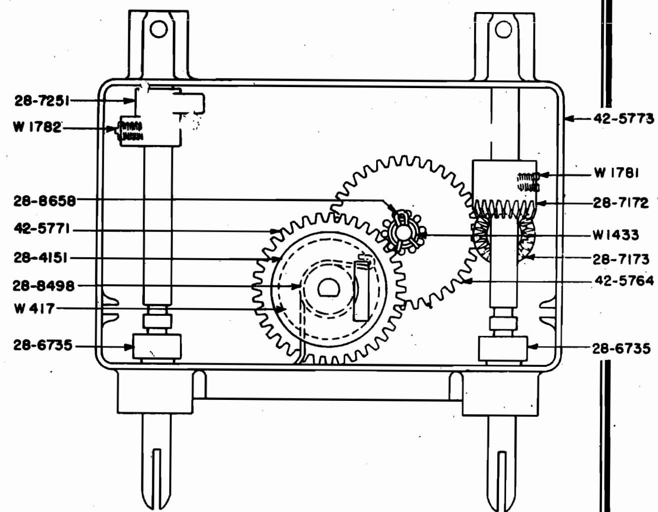
* Prices not available at this time.

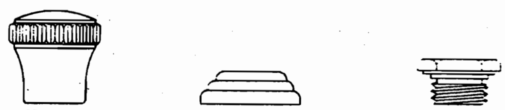
MODEL P-1517 Packard
Controls Details

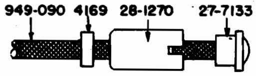
PHILCO RADIO & TELEV. CORP.

PACKARD MODEL P-1517 CONTROL UNIT

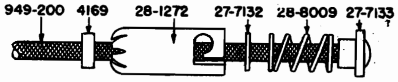




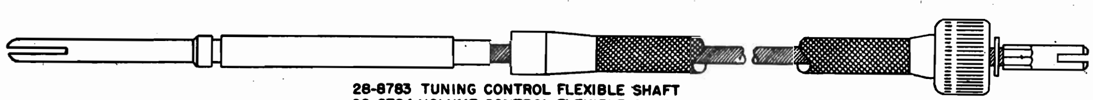




38-5778 "A" LEAD COMPLETE



38-7993 "A" LEAD COMPLETE



28-8783 TUNING CONTROL FLEXIBLE SHAFT
28-8784 VOLUME CONTROL FLEXIBLE SHAFT

PARTS LIST AND PRICES
(Prices Subject to Change Without Notice)

PART NUMBER	DESCRIPTION		LIST PRICE
W-417	Washer	per 100	$.50
W-1433	Washer	per 100	.15
W-1516	Screw	per 100	1.30
W-1781	Set Screw	per 100	2.00
W-1782	Set Screw	per 100	2.50
4169	Washer	per 100	1.20
27-4265	Sleeve	per 100	1.25
27-4688	Tuning and Volume Knob		.20
27-7132	Washer	per 100	.40
27-7133	Ferrule		.01
28-1270	Housing		.01
28-1272	Housing	per 100	.85
28-2815	Clamp		.01
28-4151	Washer		.02
28-4160	Spring		.01
28-5149	Cover		.10
28-5150	Shaft Retaining Plate		.05
28-6735	Bushing		*
28-6773	Gland Nut		.15

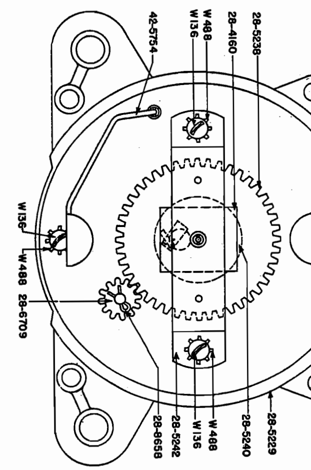
* Prices not available at this time.

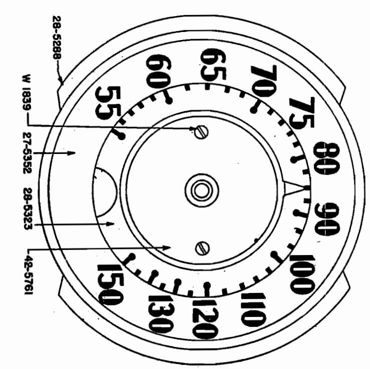
PART NUMBER	DESCRIPTION		LIST PRICE
28-7172	Miter Drive Gear		.10
28-7173	Miter Gear		.10
28-7182	Felt Washer	per 100	.30
28-7251	Switch Lever		.15
28-7264	Knob Base		.20
28-8009	Spring	per 100	.50
28-8498	Anti Back Lash Spring		.10
28-8658	Spring		.03
28-8783	Tuning Control Flex. Shaft		1.00
28-8784	Volume Control Flex. Shaft		1.00
34-2039	Pilot Lamp		.09
38-5778	"A" Lead		.10
38-7993	"A" Lead		.20
38-8467	Pilot Lamp Assembly		.30
42-1368	On-Off Switch		.35
42-5764	Intermediate Gear Assembly		.20
42-5771	Drum Shaft and Gear Assembly		.15
42-5773	Housing and Stud Assembly		.85
42-5776	Dial Assembly		.35

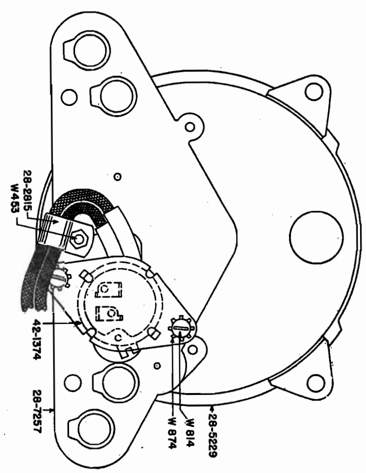
MODEL P-1535 Packard
Controls Details

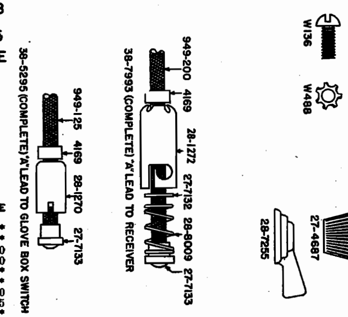
PHILCO RADIO & TELEV. CORP.

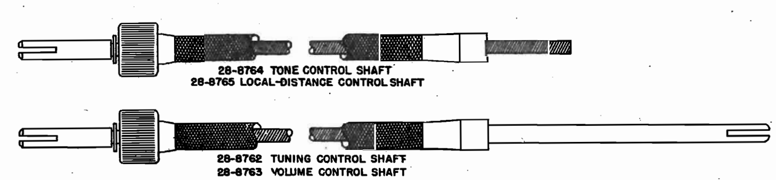
PACKARD CONTROL MODEL P-1535





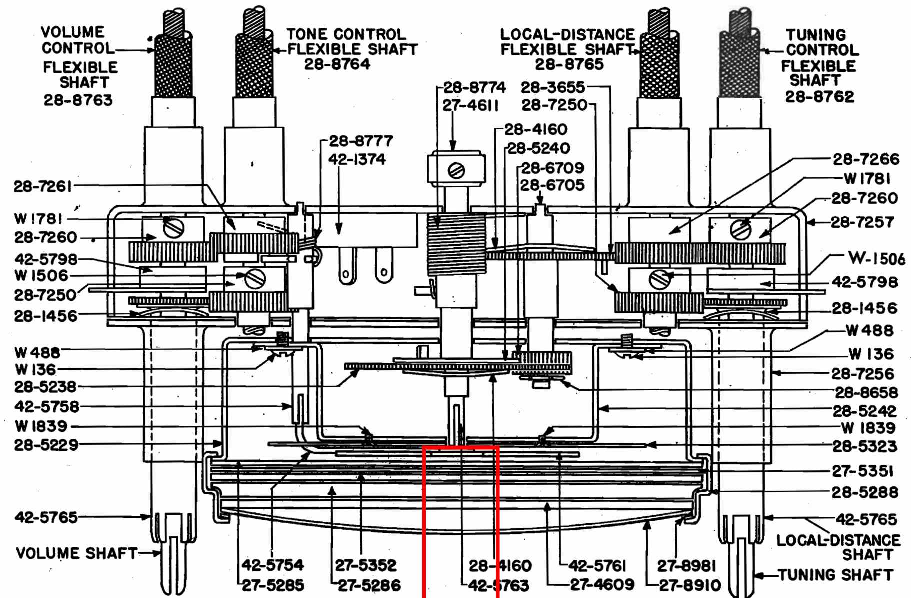






NOVEMBER 24, 1937

PACKARD MODEL P-1535 CONTROL



PARTS LIST AND PRICES

(Prices Subject to Change Without Notice)

PART NUMBER	DESCRIPTION	LIST PRICE
4169	Rubber Washers ....per 100	$1.[illegible]0
W-136	Screw ....per 100	.[illegible]0
W-453	Screw ....per 100	1.[illegible]0
W-488	Lockwasher ....per 100	.[illegible]5
W-775	Button ....per 100	1.[illegible]0
W-814	Screw ....per 100	.[illegible]5
W-874	Lockwasher ....per 100	.[illegible]0
W-1506	Set Screw ....per 100	1.[illegible]0
W-1781	Set Screw ....per 100	2.[illegible]0
W-1839	Screw ....per 100	1.[illegible]5
949-125	Wire	*
949-200	Wire	*
27-4609	Gasket	.[illegible]0
27-4611	Pointer Knob	*
27-4687	Tuning and Volume Knob	*
27-5285	Retainer	.[illegible]0
27-5286	Glass Retainer	*
27-5351	Gasket ....per 100	2.[illegible]0
27-5352	Dial Face Glass	[illegible]
27-7132	Washer ....per 100	.40
27-7133	Ferrule	.01
27-8910	Glass	.25
27-8981	Front Gasket	*
28-1270	Housing	.01
28-1272	Housing ....per 100	.85
28-1456	Spring Washer ....per 100	.75
28-2815	Clamp	.01
28-3655	Drive Gear	*
28-4160	Friction Spring	.01
28-5229	Dial Cover	*
28-5238	Dial Gear (large)	*

PART NUMBER	DESCRIPTION	LIST PRICE
28-5240	Washer	*
28-5242	Bracket	*
28-5288	Bezel	.40
28-5323	Face	.10
28-6705	Intermediate Gear	*
28-6709	Dial Gear (small)	*
28-7250	Gear	.10
28-7255	Tone and Local Distance Knob	.35
28-7256	Control Shaft Cover	*
28-7257	Back Housing	*
28-7260	Gear	*
28-7261	Switch Gear	*
28-7266	Idler Gear	*
28-8009	Spring ....per 100	.50
28-8658	Spring	.03
28-8762	Tuning Shaft	1.00
28-8763	Volume Shaft	1.00
28-8764	Tone Control	1.00
28-8765	Local — Distance Shaft	1.00
28-8774	Anti Back-lash Spring	*
28-8777	Spring	*
38-5295	"A" Lead	.15
38-7993	"A" Lead	.20
42-1374	On-Off Switch	.35
42-5754	Signal Panel Assembly	*
42-5758	Signal Panel Shaft	*
42-5761	Pointer Assembly	*
42-5763	Pointer Shaft Assembly	.25
42-5765	Gear and Sleeve Assembly	.20
42-5798	Friction Gear Assembly	*

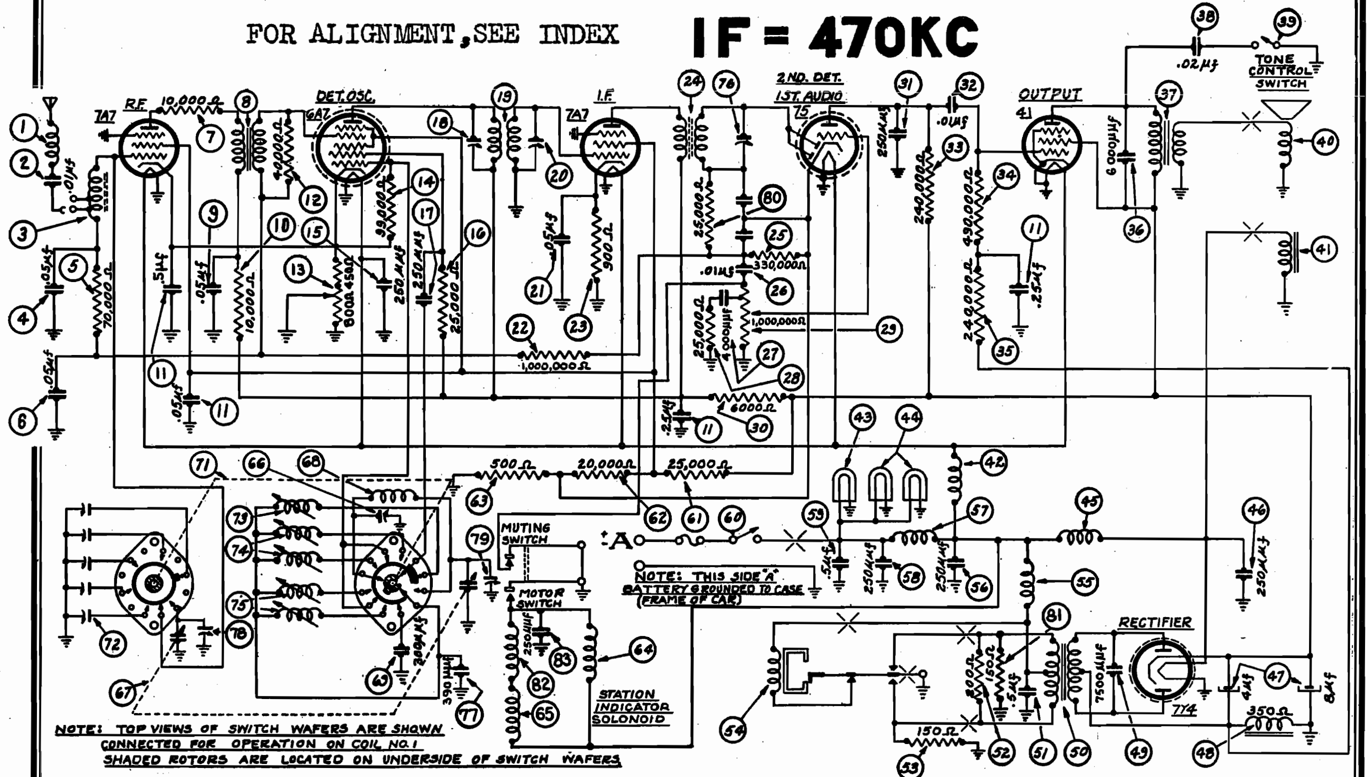
*Prices not available at this time.

MODEL S-1616 Studebaker
Schematic, Chassis
Parts

PHILCO RADIO & TELEV. CORP.

FOR ALIGNMENT, SEE INDEX

IF = 470KC



JANUARY 1939

FIGURE 1

PARTS LIST

No.	Description	Part No.
1	Antenna Choke	65-0062
2	Condenser (.01 mfd.)	61-0014
3	Antenna Transformer	65-0047
4	Condenser (.05 mfd.)	30-4444
5	Resistor (70,000 ohms)	33-370337
6	Condenser (.05 mfd.)	30-4444
7	Resistor (10,000 ohms)	33-310337
8	R. F. Transformer	65-0009
9	Condenser (.05 mfd.)	30-4123
10	Resistor (10,000 ohms)	33-310337
11	Condenser (.05-.25-.25-.5 mfd.)	61-0016
12	Resistor (40,000 ohms)	33-340137
13	Sensitivity Control	33-5264
14	Resistor (99,000 ohms)	33-399337
15	Condenser (250 mmfd.)	61-0033
16	Resistor (25,000 ohms)	33-325337
17	Condenser (250 mmfd.)	30-1038
18	Padder (Pri. 1st I. F. Trans.)	
19	First I. F. Transformer	65-0044
20	Padder (Sec. 1st I. F. Trans.)	
21	Condenser (.05 mfd.)	30-4444
22	Resistor (1,000,000 ohms)	33-510337
23	Resistor (900 ohms)	33-190438
24	Second I. F. Transformer	65-0045
25	Resistor (330,000 ohms)	33-433337
26	Condenser (.01 mfd.)	61-0014
27	Condenser (4,000 mmfd.)	61-0020
28	Resistor (25,000 ohms)	33-325337
29	Volume Control & Switch (1,000,000 ohms) ..opt.	67-0014-1 67-0014-2
30	Resistor (6,000 ohms)	33-260337
31	Condenser (250 mmfd.)	61-0033
32	Condenser (.01 mfd.)	30-4169
33	Resistor (240,000 ohms)	33-424337
35	Resistor (240,000 ohms)	33-424337
36	Condenser (6,000 mmfd.)	30-4024
37	Output Transformer	65-0048
38	Condenser (.02 mfd.)	30-4495
39	Tone Control Switch	42-1140
40	Cone & Voice Coil Kit	91-0047
41	Field Coil	Not Replaceable
42	Filament Choke	65-0057
43	Pilot Lamp	34-2040
44	Pilot Lamp	34-2040
45	Choke	32-1374
46	Condenser (250 mmfd.)	61-0033
47	Filter Condenser (4-8 mfd.)	61-0018
48	Filter Choke	32-7959
49	Condenser (7,500 mmfd.)	30-4567
50	Power Transformer	65-0046
51	Condenser (.5 mfd.)	30-4565
52	Resistor (200 ohms)	33-120337
53	Resistor (150 ohms)	In Vibrator
54	Vibrator	41-3398
55	Vibrator Choke	32-2537
56	Condenser (250 mmfd.)	61-0033
57	"A" Choke	65-0057
58	Condenser (250 mmfd.)	61-0033
59	Condenser (.5 mfd.)	30-4474
60	On-Off Switch and Volume Control opt.	67-0014-1 67-0014-2
61	Resistor (25,000 ohms)	33-325437
62	Resistor (20,000 ohms)	33-320337
63	Resistor (500 ohms)	33-150438
64	Solenoid	77-0227
65	Impulse Motor	77-0259
66	Low Frequency Padder	31-6230
67	Tuning Condenser	63-0011
68	Oscillator Transformer	65-0058
69	Silver Cap Condenser (300 mmfd.)	61-0003
71	Selector Switch	77-0198
72	Antenna Padder Assembly	77-0126
73	Oscillator Transformer (High Freq.)	65-0049
74	Oscillator Transformer (Med. Freq.)	65-0050
75	Oscillator Transformer (Low Freq.)	65-0051
76	Padder (Sec. 2nd I. F. Trans.)	
77	Silver Cap Condenser (390 mmfd.)	61-0031
78	First Padder (on Tun. Cond.)	Part of Ant. Padder Assy.
79	Second Padder (on Tun. Cond.)	
80	Resistor (25,000 ohms)	33-325337
81	Resistor (150 ohms)	33-115337
82	Choke	32-1644
83	Condenser (250 mmfd.)	61-0033
	Dial Assembly	85-0079
	Tone Control and Automatic Drum	415-1009
	Automatic Push Button (Commander)	55-0100
	Automatic Push Button (President)	55-0172
	Tuning and Volume Knob (President)	27-4689
	Tuning and Volume Knob (Commander)	55-0102
	Flexible Shaft	57-0467

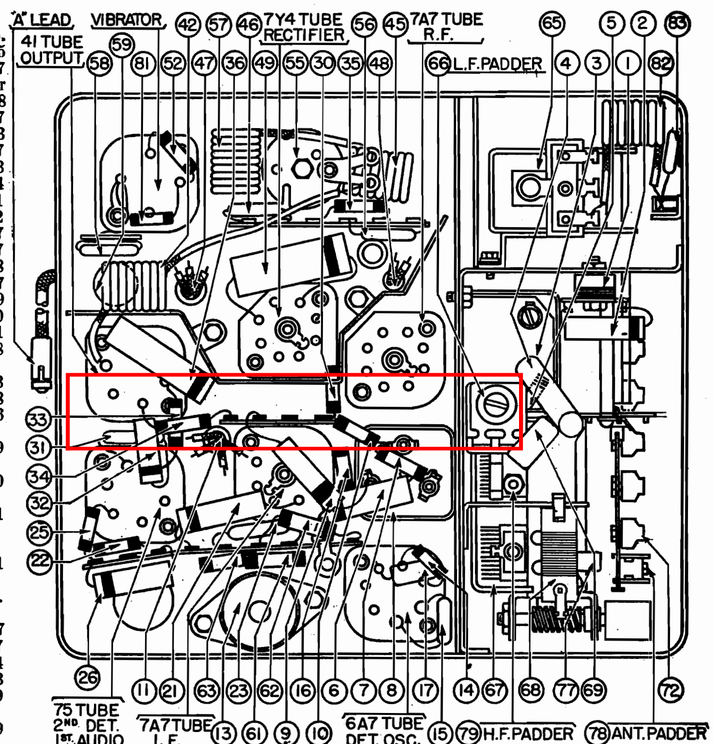


FIGURE 2

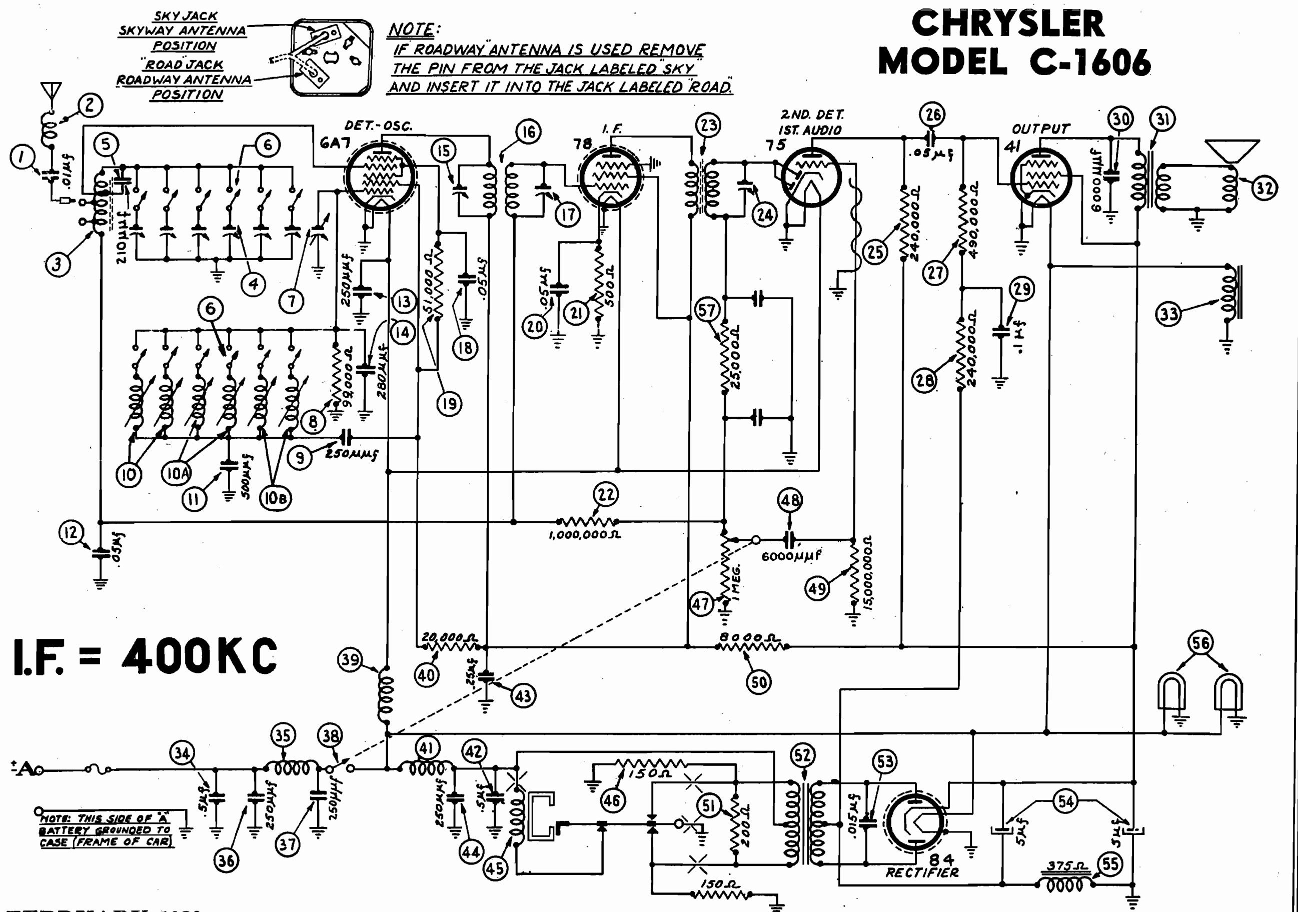
Description	Part No.
Call Letter Kit	81-0052
Condenser and Lug Assy.	30-1087
Interference Condenser	30-4007
Distributor Resistor	32-2250

Description	Part No.
"T" Bolt (Rec. Mtg.)	28-6161
Nut (Rec. Mtg.)	W518
Automatic Cable	95-0030
Tone and Volume Cable	95-0076

PHILCO RADIO & TELEV. CORP.

MODEL C-1606 Chrysler
Schematic, Chassis
Parts List

CHRYSLER MODEL C-1606



FEBRUARY 1939

FIGURE I

MODEL C-1606 PARTS LIST

No.	Description	Part No.
1	Condenser (.01 mfd.)	61-0014
2	Antenna Choke	65-0102
3	Antenna Transformer	65-0120
4	Antenna Padder Assembly	77-0141
5	Condenser (210 mmfd.)	61-0044
6	Automatic Switch	85-0046
7	Variator	63-0019
8	Resistor (99,000 ohms)	33-399337
9	Condenser (250 mmfd.)	61-0034
10	Oscillator Transformers	65-0125
10a	Oscillator Transformers	65-0126
10b	Oscillator Transformers	65-0127
11	Condenser (500 mmfd.)	61-0027
12	Condenser (.05 mfd.)	30-4444
13	Condenser (250 mmfd.)	61-0033
14	Condenser (280 mmfd.)	61-0043
15	Padder (Pri. 1st I. F. Trans.)	
16	First I. F. Transformer	65-0118
17	Padder (Sec. 1st I. F. Trans.)	
18	Condenser (.05 mfd.)	30-4444
19	Resistor (51,000 ohms)	33-351337
20	Condenser (.05 mfd.)	30-4444
21	Resistor (500 ohms)	33-150438
22	Resistor (1,000,000 ohms)	33-510337
23	Second I. F. Transformer	65-0119
24	Padder (Sec. 2nd I. F. Trans.)	
25	Resistor (240,000 ohms)	33-424337
26	Condenser (.05 mfd.)	30-4123
27	Resistor (490,000 ohms)	33-449337
28	Resistor (240,000 ohms)	33-424437
29	Condenser (.1 mfd.)	61-0023
30	Condenser (6,000 mmfd.)	30-4504
31	Output Transformer	65-0071
32	Cone Kit	91-0043
33	Field Coil	Not Replaceable
34	Condenser (.5 mfd.)	30-4565
35	"A" Choke	32-1374
36	Condenser (250 mmfd.)	61-0033
37	Condenser (250 mmfd.)	61-0033
38	On-Off Switch and Volume Control	67-0010
39	Filament Choke	32-1604
40	Resistor (20,000 ohms)	33-320337
41	Vibrator Choke	65-0075
42	Condenser (.5 mfd.)	30-4565
43	Condenser (.25 mfd.)	30-4446
44	Condenser (250 mmfd.)	61-0033
45	Vibrator	41-3398
46	Resistor (150 ohms)	33-115337
47	Volume Control (1,000,000 ohms) and On-Off Switch	67-0010
48	Condenser (6,000 mmfd.)	30-4445
49	Resistor (15,000,000 ohms)	33-615347
50	Resistor (8,000 ohms)	33-280337
51	Resistor (200 ohms)	33-120337
52	Power Transformer	65-0072
53	Condenser (.015 mfd.)	61-0030
54	Filter Condenser (5-5 mfd.)	61-0022
55	Filter Choke	65-0073
56	Pilot Lamps	34-2064
57	Resistor (25,000 ohms)	33-325237
	Tuning and Volume Knob	55-0164
	Push Button Knob	55-0206
	Station Tab Holder	57-0227FA7
	Push Button Bezel	57-0327FA7
	Oscillator Coil Bezel	57-0508FA3
	Oscillator Coil Bezel Cover	57-0509FA7
	Fuse	45-2559
	Call Letter Kit	81-0025
	Fuel Gauge Resistor	67-0011
	Interference Condenser	30-4490
	Antenna Lead (Cowl)	95-0065
	Bracket (Set Mtg.)	57-0502FA1
	Bolt (Set Mtg.)	97-0034
	Nut (Set Mtg.)	W55
	Bolt	97-0024
	Nut	W1667

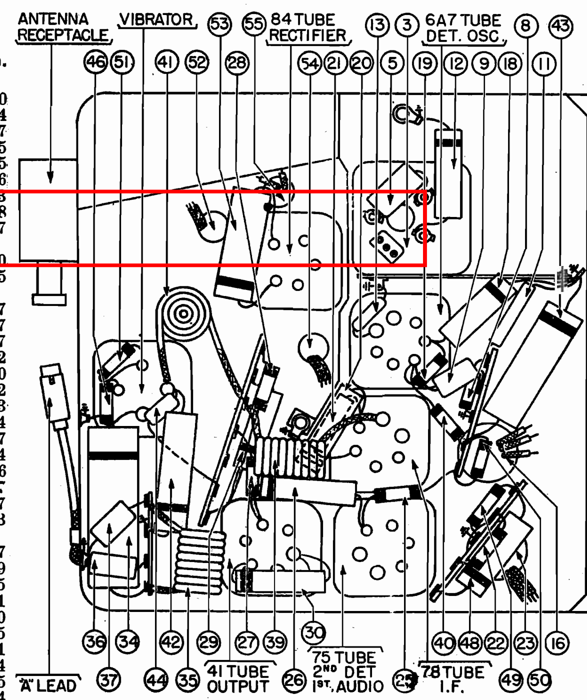


FIGURE 2

MODEL C-1606
Chrysler
Socket, Trimmers, Tuner
Alignment

PHILCO RADIO & TELEVISION CORP.

ADJUSTMENTS MODEL C-1606

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077A or 177 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

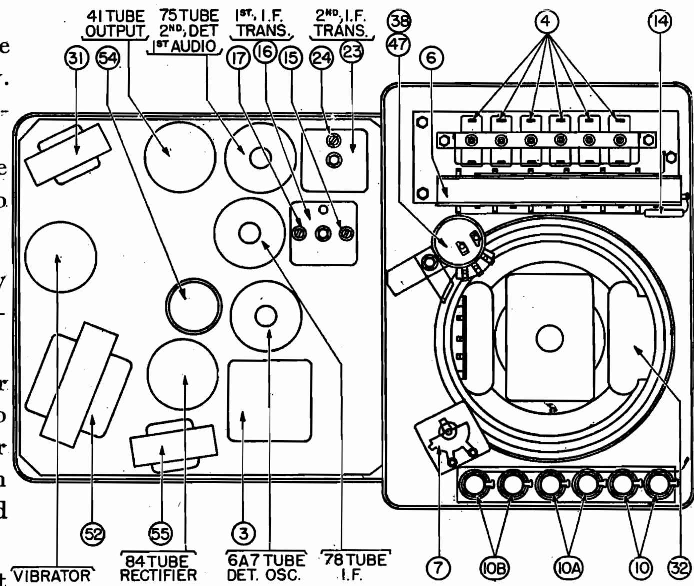


FIGURE 3

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	400 K.C.	To Grid of 6A7 Tube	.5 Mfd.	Turn Variator to the Indexed Position	24 17 15
2	950 to 1500 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Press Push Button No. 1 and adjust No. 1 Antenna Padder and No. 1 Oscillator Coil (Fig. 4)	Note 2 Fig. 4
3	950 to 1500 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Press Push Button No. 2 and adjust No. 2 Antenna Padder and No. 2 Oscillator Coil (Fig. 4)	Note 2 Fig. 4
4	750 to 1250 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Press Push Button No. 3 and adjust No. 3 Antenna Padder and No. 3 Oscillator Coil (Fig. 4)	Note 2 Fig. 4
5	750 to 1250 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Press Push Button No. 4 and adjust No. 4 Antenna Padder and No. 4 Oscillator Coil (Fig. 4)	Note 2 Fig. 4
6	550 to 950 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Press Push Button No. 5 and adjust No. 5 Antenna Padder and No. 5 Oscillator Coil (Fig. 4)	Note 2 Fig. 4
7	550 to 950 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Press Push Button No. 6 and adjust No. 6 Antenna Padder and No. 6 Oscillator Coil (Fig. 4)	Note 2 Fig. 4

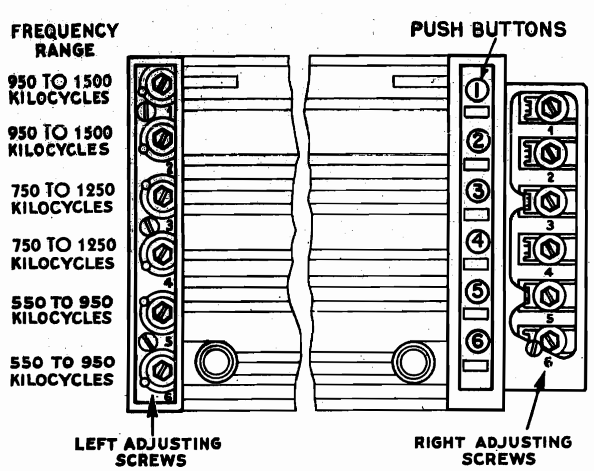


FIGURE 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 25 Mmfd. Condenser in series between the signal generator and the antenna lead.

Special Note: — When the cowl antenna is used follow the above procedure. Be sure the lead to the antenna transformer is plugged into the "SKY" socket of the Antenna Transformer.

*When the undercar is used, connect the antenna lead, Part No. 41-3191 to the antenna receptacle in the Radio. Connect a 250 Mmfd. condenser in series between the signal generator and the antenna lead. Be sure the lead to the antenna transformer is plugged into the "ROAD" socket of the antenna transformer.

NOTE 2 — The antenna padder screw is on the right, the oscillator coil screw is on the left (see Figure 4).

ALL ADJUSTMENTS MUST BE REPEATED.

PHILCO RADIO & TELEV. CORP.

MODEL C-1608 Chrysler
Schematic, Chassis
Parts

CHRYSLER MODEL C-1608 SINGLE UNIT DELUXE CAR RADIO

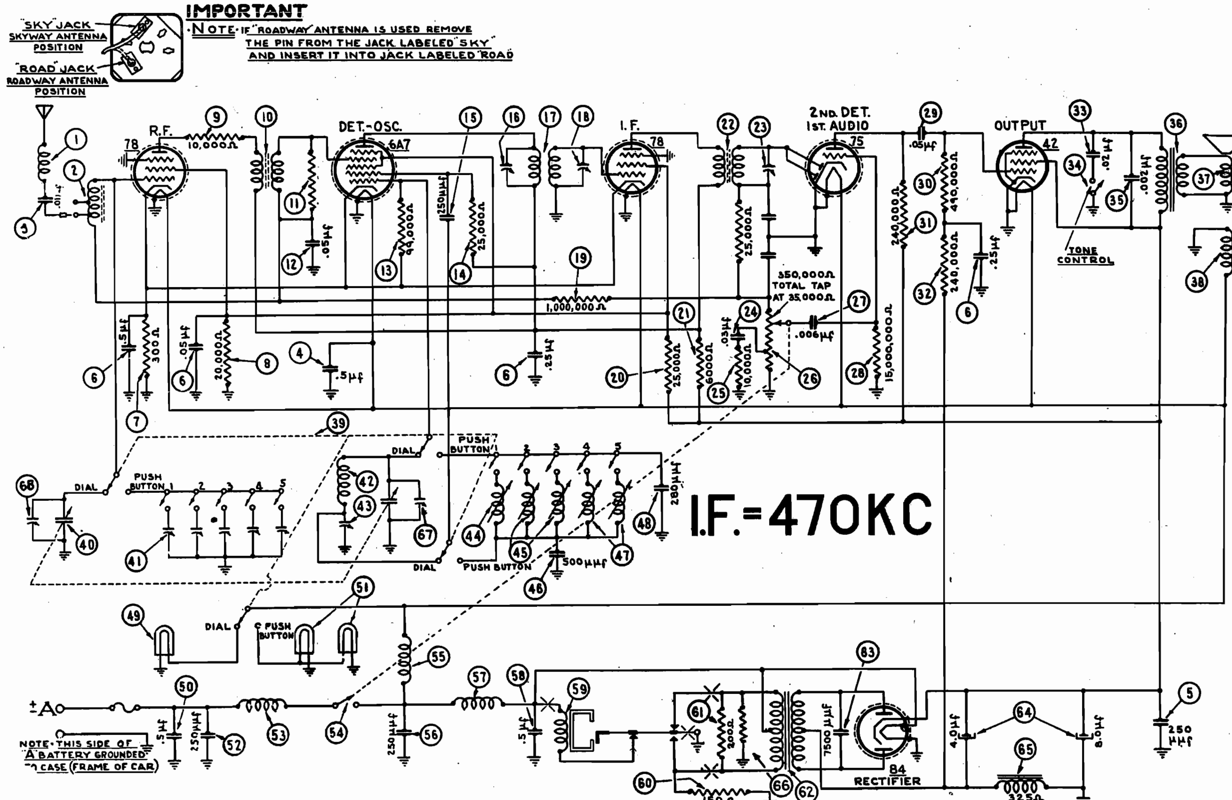


FIGURE 1

PARTS LIST

No.	Description	Part No
1	Antenna Choke	65-0026
2	Antenna Transformer	65-0021
3	Condenser (.01 mfd.)	61-0014
4	Condenser (.5 mfd.)	30-4565
5	Condenser (250 mmfd.)	61-0033
6	Condenser — (.05-.25-.25-.5 mfd.)	61-0008
7	Resistor (300 ohms)	33-130438
8	Resistor (20,000 ohms)	33-320337
9	Resistor (10,000 ohms)	33-310337
10	R. F. Transformer	65-0009
11	Resistor (39,000 ohms)	33-339137
12	Condenser (.05 mfd.)	30-4444
13	Resistor (99,000 ohms)	33-399337
14	Resistor (25,000 ohms)	33-325437
15	Condenser (250 mmfd.)	61-0034
16	Padder (Pri. 1st I. F. Trans.)	
17	First I. F. Transformer	65-0041
18	Padder (Sec. 1st I. F. Trans.)	
19	Resistor (1,000,000 ohms)	33-510337
20	Resistor (25,000 ohms)	33-325437
21	Resistor (6,000 ohms)	33-260337
22	Second I. F. Transformer	65-0043
23	Padder (Sec. 2nd I. F. Transformer)	
24	Condenser (.03 mfd.)	30-4449
25	Resistor (10,000 ohms)	33-310337
26	Volume Control (350,000 ohms) & On-Off Switch	67-0003
27	Condenser (6,000 mmfd.)	30-4467
28	Resistor (15,000,000 ohms)	33-615347
29	Condenser (.05 mfd.)	30-4518
30	Resistor (490,000 ohms)	33-449337
31	Resistor (240,000 ohms)	33-424437
32	Resistor (240,000 ohms)	33-424337
33	Condenser (.02 mfd.)	30-4419
34	Tone Control Switch	85-0010
35	Condenser (2,000 mmfd.)	30-4177
36	Output Transformer	65-0020
37	Cone & Voice Coil Kit	91-0028
38	Field Coil	Not Replaceable
39	Push Button Switch Assy.	85-0011
40	Tuning Condenser (manual)	63-0009
41	Antenna Push Button Padders	77-0091
42	Oscillator Transformer	65-0031
43	Low Freq. Padder	31-6230
44	Oscillator Transformer (High Freq.)	65-0038
45	Oscillator Transformer (Med. Freq.)	65-0039
46	Condenser (500 mmfd.)	61-0027
47	Osc. Transformer (Low Freq.)	65-0004
48	Condenser (280 mmfd.)	61-0010
49	Pilot Lamp	34-2039
50	Condenser (.5 mfd.)	30-4565
51	Pilot Lamps	34-2040
52	Condenser (250 mmfd.)	61-0033
53	"A" Choke	32-1644
54	Volume Control On-Off Switch	67-0003
55	Filament Choke	65-0037
56	Condenser (250 mmfd.)	61-0033
57	Vibrator Choke	65-0034
58	Condenser (.5 mfd.)	30-4465
59	Vibrator	41-3170
60	Resistor (150 ohms)	33-115337
61	Resistor (200 ohms)	33-120337
62	Power Transformer	65-0033
63	Buffer Condenser (7,500 mmfd.)	30-4567
64	Filter Condenser (4-8 mfd.)	61-0009
65	Filter Choke (325 ohms)	65-0035
66	Resistor (150 ohms)	33-115337
67	First Padder on Tun. Cond.	
68	Second Padder on Tun. Cond.	
	Receiver Housing	77-0096
	Four Prong Socket	27-6044
	Five Prong Socket	27-6035
	Six Prong Socket	27-6036
	Seven Prong Socket	27-6037
	Fuse	45-2559
	Tuning & Vol. Knob (P7-8)	55-0164
	Tuning & Vol. Knob (D11-12)	55-0170
	Tuning & Vol. Knob (C22)	55-0168
	Tuning & Vol. Knob (S6)	55-0166
	Push Button & Spring (S6)	55-0167

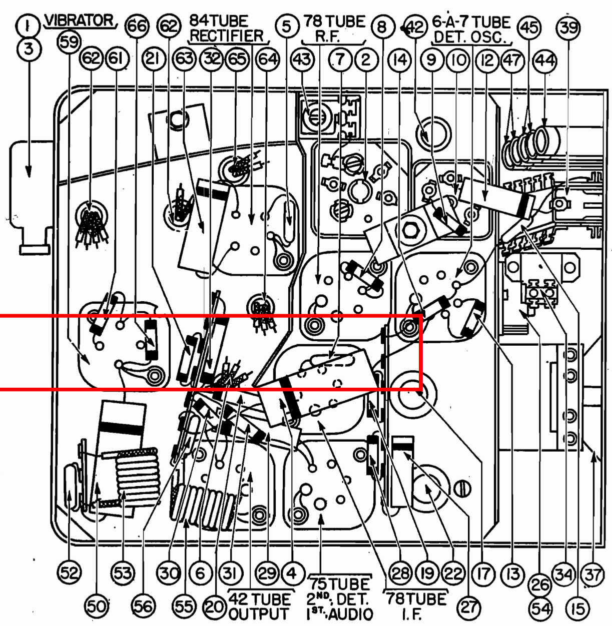


FIGURE 2

No.	Description	Part No.
	Push Button & Spring (P7-8)	55-0165
	Push Button & Spring (C22)	55-0169
	Push Button & Spring (D11)	55-0171
	Distributor Resistor Assy.	38-9562
	Interference Cond.	30-4490
	Dial Scale	55-0068
	Glass	55-0332
	Pointer	77-0042

OCTOBER, 1938

MODEL C-1608
Chrysler
MODEL S-1616
Studebaker

PHILCO RADIO & TELEV. CORP.

Socket, Trimmers
Alignment

MODEL C-1608

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 42 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

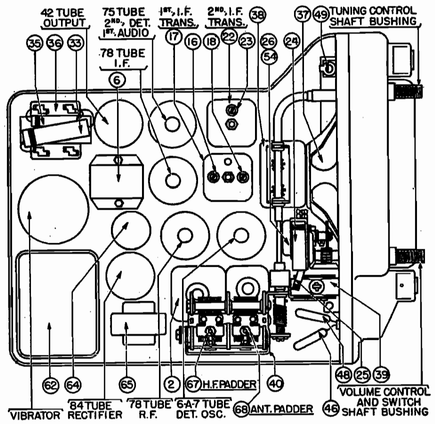


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	PADDER ADJUST
1	Press the "DIAL" button and stations can be tuned in by "DIAL" tuning.				
2	470 K.C.	To Grid of 6A7 Tube	.5 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	23 16 18
3	1580 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Note 2	67
4	1400 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	68 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	43 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Note 2	67
7	1400 K.C.	To Antenna Receptacle on Radio	*25 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	68 Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 25 Mmfd. Condenser in series between the signal generator and the antenna lead.

Special Note: — When the cowl antenna is used follow the above procedure. Be sure the lead to the antenna transformer is plugged into the "SKY" socket of the Antenna Transformer.
*When the undercar is used, connect the antenna lead, Part No. 41-3191 to the antenna receptacle in the Radio. Connect a 250 Mmfd. condenser in series between the signal generator and the antenna lead. Be sure the lead to the antenna transformer is plugged into the "ROAD" socket of the antenna transformer.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODEL S-1616

MODEL S-1616

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077A or 177 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

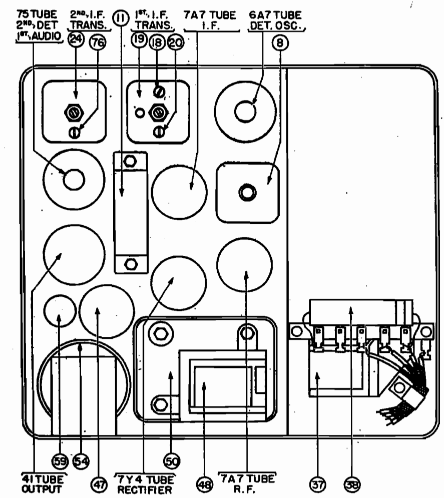


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning.				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	76 20 18
3	1580 K.C.	To Antenna Receptacle on Radio	20 Mmfd. See Note 1	Note 2	79
4	1400 K.C.	To Antenna Receptacle on Radio	20 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	78 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	20 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	66 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	20 Mmfd. See Note 1	Note 2	79
7	1400 K.C.	To Antenna Receptacle on Radio	20 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	78 Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 20 Mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

PHILCO RADIO & TELEV. CORP.

MODEL P-1617 Packard
Schematic, Chassis
Parts

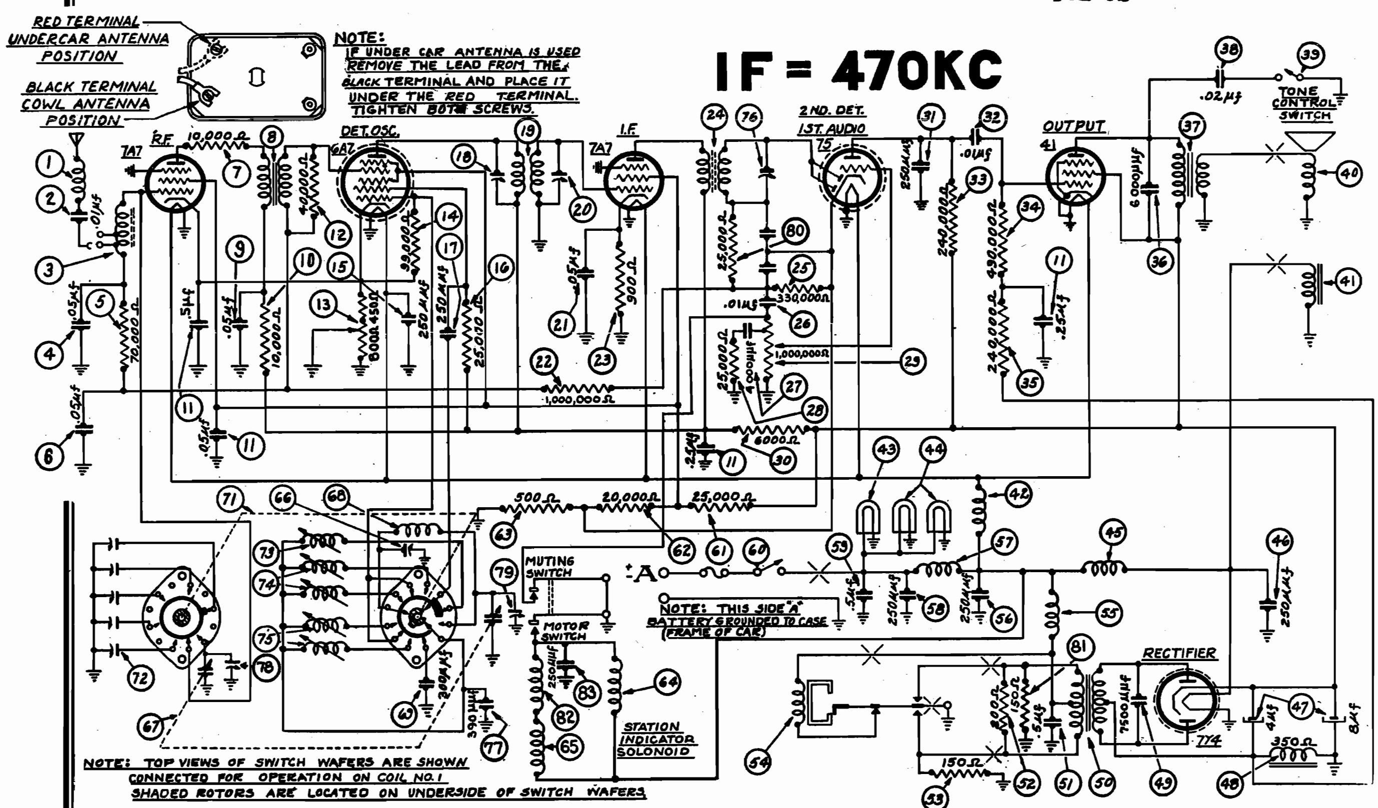


FIGURE 1

PARTS LIST

No.	Description	Part No.
1	Antenna Choke	65-0062
2	Condenser (.01 mfd.)	61-0014
3	Antenna Transformer	65-0047
4	Condenser (.05 mfd.)	30-4444
5	Resistor (70,000 ohms)	33-370337
6	Condenser (.05 mfd.)	30-4444
7	Resistor (10,000 ohms)	33-310337
8	R. F. Transformer	65-0009
9	Condenser (.05 mfd.)	30-4123
10	Resistor (10,000 ohms)	33-310337
11	Condenser (.05-.25-.25-.5 mfd.)	61-0016
12	Resistor (40,000 ohms)	33-340137
13	Sensitivity Control	33-5264
14	Resistor (99,000 ohms)	33-399337
15	Condenser (250 mmfd.)	30-1032
16	Resistor (25,000 ohms)	33-325337
17	Condenser (250 mmfd.)	30-1038
18	Padder (Pri. 1st I. F. Trans.)	
19	First I. F. Transformer	65-0044
20	Padder (Sec. 1st I. F. Trans.)	
21	Condenser (.05 mfd.)	30-4444
22	Resistor (1,000,000 ohms)	33-510337
23	Resistor (900 ohms)	33-190438
24	Second I. F. Transformer	65-0045
25	Resistor (330,000 ohms)	33-433337
26	Condenser (.01 mfd.)	61-0014
27	Condenser (4,000 mmfd.)	61-0020
28	Resistor (25,000 ohms)	33-325337
29	Volume Control (1,000,000 ohms)	67-0004-1
30	Resistor (6,000 ohms)	33-260337
31	Condenser (250 mmfd.)	30-1032
32	Condenser (.01 mfd.)	30-4169
33	Resistor (240,000 ohms)	33-424337
34	Resistor (490,000 ohms)	33-449337
35	Resistor (240,000 ohms)	33-424337
36	Condenser (6,000 mmfd.)	30-4024
37	Output Transformer	65-0048
38	Condenser (.02 mfd.)	30-4495
39	Tone Control Switch	42-1140
40	Cone & Voice Coil Kit	91-0047
41	Field Coil	Not Replaceable
42	Filament Choke	65-0057
43	Pilot Lamp	34-2040
44	Pilot Lamp	34-2040
45	Choke	32-1374
46	Condenser (250 mmfd.)	30-1032
47	Filter Condenser (4-8 mfd.)	61-0018
48	Filter Choke	32-7959
49	Condenser (7,500 mmfd.)	30-4567
50	Power Transformer	65-0046
51	Condenser (.5 mfd.)	30-4565
52	Resistor (200 ohms)	33-120337
53	Resistor (150 ohms)	In Vibrator
54	Vibrator	41-3170
55	Vibrator Choke	32-2537
56	Condenser (250 mmfd.)	30-1032
57	"A" Choke	65-0057
58	Condenser (250 mmfd.)	30-1032
59	Condenser (.5 mfd.)	30-4474
60	On-Off Switch	77-0175
61	Resistor (25,000 ohms)	33-325437
62	Resistor (20,000 ohms)	33-320337
63	Resistor (500 ohms)	33-150438
64	Solenoid	
65	Impulse Motor	77-0108
66	Low Frequency Padder	31-6230
67	Tuning Condenser	63-0011
68	Oscillator Transformer	65-0058
69	Silver Cap Condenser (300 mmfd.)	61-0003
71	Selector Switch	77-0198
72	Antenna Padder Assembly	77-0126
73	Oscillator Transformer (High Freq.)	65-0049
74	Oscillator Transformer (Med. Freq.)	65-0050
75	Oscillator Transformer (Low Freq.)	65-0051
76	Padder (Sec. 2nd I. F. Trans.)	
77	Silver Cap Condenser (390 mmfd.)	61-0031
78	First Padder (on Tun. Cond.)	Part of Ant. Padder Assy.
79	Second Padder (on Tun. Cond.)	
80	Resistor (25,000 ohms)	33-325337
81	Resistor (150 ohms)	33-115337
82	Choke	32-1644
83	Condenser (250 mmfd.)	30-1032
	Interference Condenser	30-4007
	Interference Condenser	30-4475
	Distributor Resistor	33-1196
	Push Button	55-0173
	Push Button Cover	57-0472
	Tuning & Volume Knob	27-4687

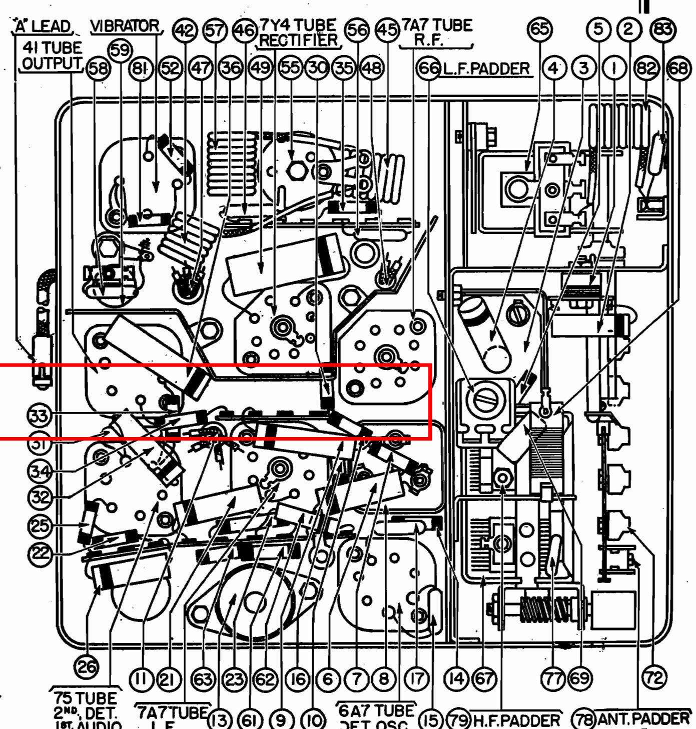


FIGURE 2

Description	Part No.	Description	Part No.
Knob Base	28-4184	Nut	W518
Call Letter Kit	81-0045	Station Indicator	85-0047
"T" Bolt	28-6268		

DECEMBER, 1938

MODEL P-1617 Packard
MODEL P-1630 Packard
Socket, Trimmers
Alignment

PHILCO RADIO & TELEV. CORP.

MODEL P-1617

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

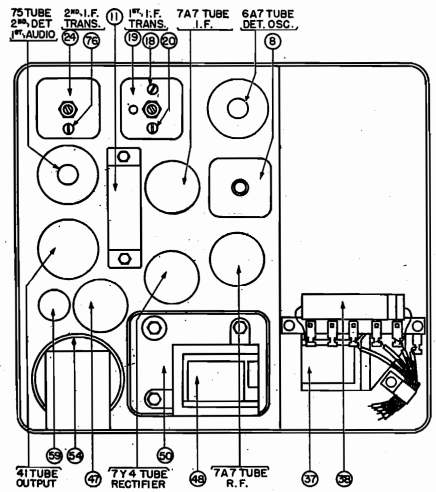


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	76 20 18
3	1580 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Note 2	79
4	1400 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	78 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	80 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Note 2	79
7	1400 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	78 Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 20 Mmfd. Condenser in series between the signal generator and the antenna lead.

Special Note: — When the cowl antenna is used follow the above procedure. Be sure the lead to the antenna transformer is connected to the black terminal of the Antenna Transformer.
*When the undercar or roof antenna is used, connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the Radio. Connect a 250 Mmfd condenser in series between the signal generator and the antenna lead. Be sure the lead to the antenna transformer is connected to the red terminal of the antenna transformer.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODEL P-1630

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 42 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

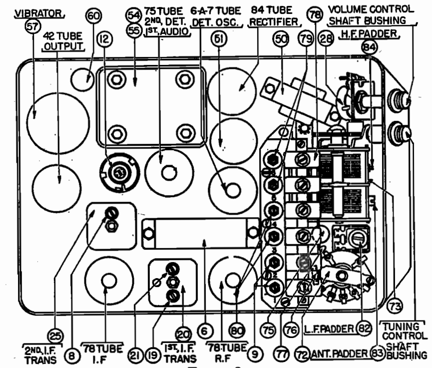


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	Press the return to dial button until stations can be tuned in by manual tuning.				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	8 19 21
3	1580 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Note 2	84
4	1400 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	83 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	82 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Note 2	84
7	1400 K.C.	To Antenna Receptacle on Radio	*20 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	83 Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 20 Mmfd. Condenser in series between the signal generator and the antenna lead.

Special Note: — When the cowl antenna is used follow the above procedure. Be sure the lead to the antenna transformer is conncted to the black terminal of the Antenna Transformer.
*When the undercar or roof antenna is used, connect the antenna lead, Part No. 41-3191 to the antenna receptacle in the Radio. Connect a 250 Mmfd. condenser in series between the signal generator and the antenna lead. Be sure the lead to the antenna transformer is connected to the red terminal of the antenna transformer.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

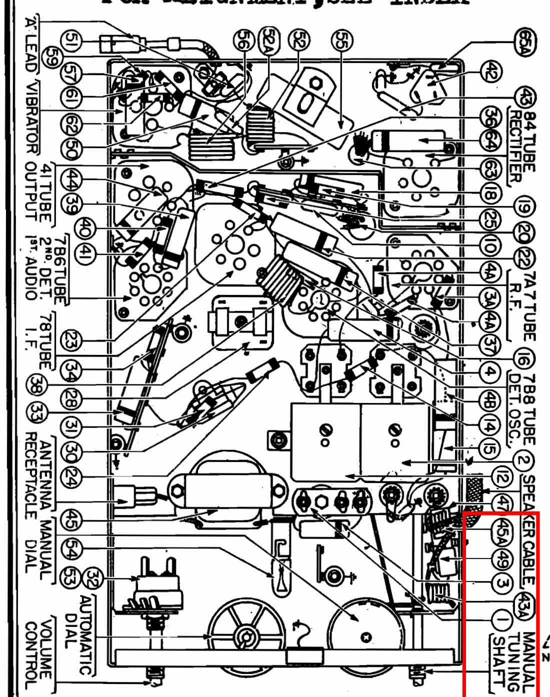
NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODEL S-1622
Studebaker
Schematic, Chassis
Parts

PHILCO RADIO & TELEV. CORP.

FOR ALIGNMENT, SEE INDEX



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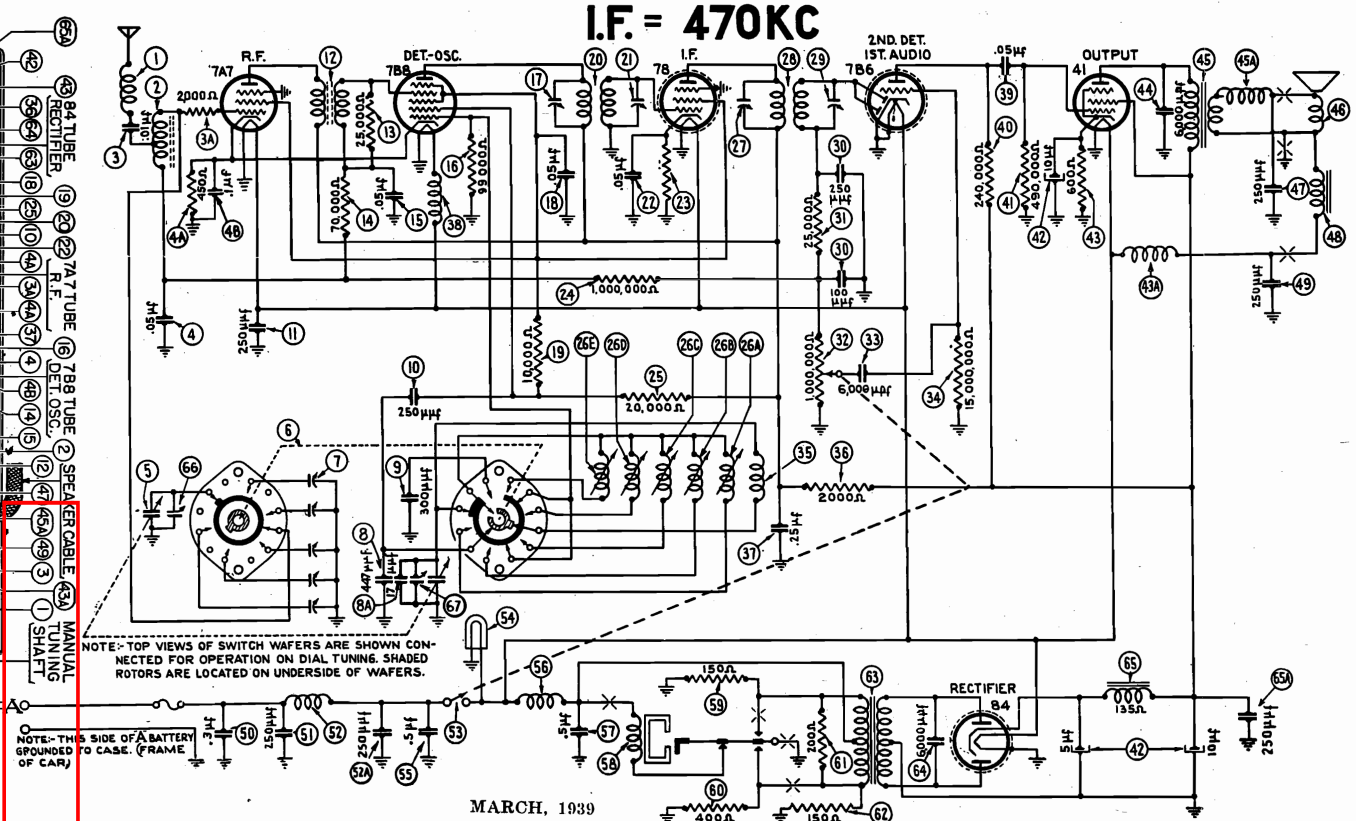


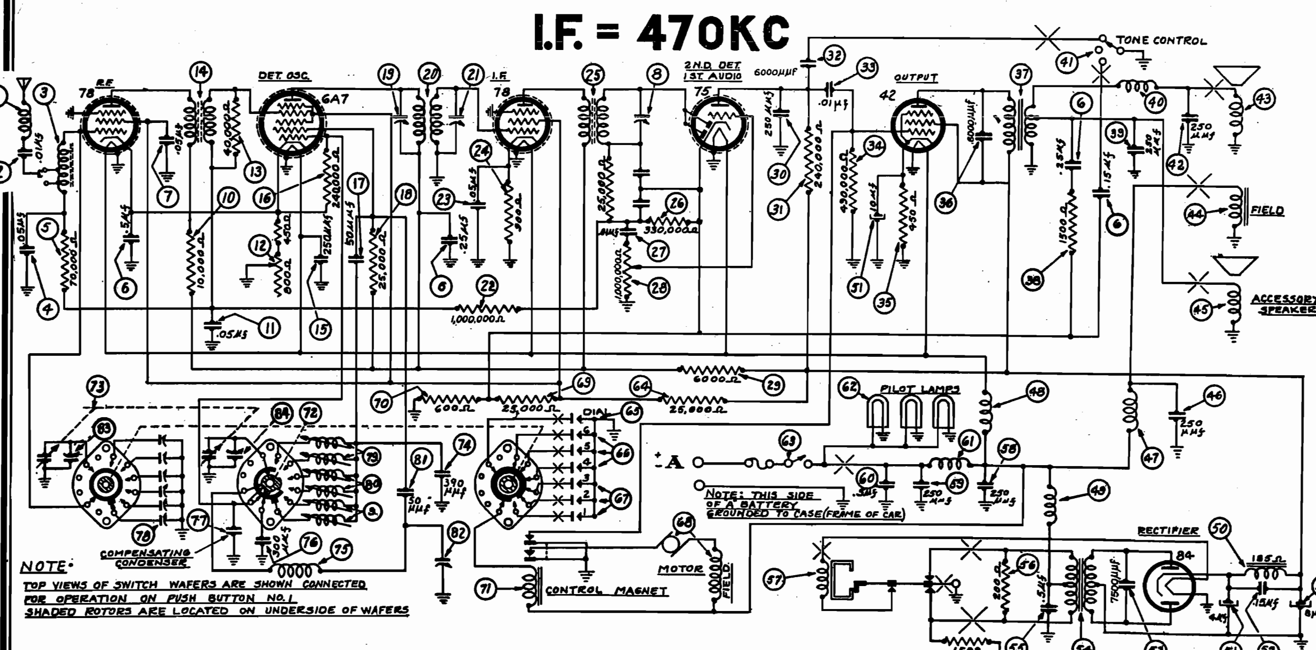
STUDEBAKER
MODEL S-1622

MARCH, 1939

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Antenna Transformer	65-0115
3	Condenser (.01 mfd.)	61-0014
3a	Resistor (2,000 ohms)	33-220337
4	Condenser (.05 mfd.)	30-4444
4a	Resistor (450 ohms)	33-145438
4b	Condenser (.1 mfd.)	30-4499
5	Tuning Condenser	63-0028
6	Wafer Switch	412-1023
7	Antenna Padder Assy.	77-0262
8	Silver Mica Condenser (447 mmfd.)	61-0047
8a	Condenser (17 mmfd.)	61-0039
9	Silver Mica Condenser (300 mmfd.)	61-0003
10	Condenser (250 mmfd.)	30-1038
11	Condenser (250 mmfd.)	61-0033
12	R. F. Transformer	65-0114
13	Resistor (25,000 ohms)	33-325337
14	Resistor (70,000 ohms)	33-370337
15	Condenser (.05 mfd.)	30-4444
16	Resistor (99,000 ohms)	33-399337
17	Padder (Pri. 1st I. F. Trans.)	
18	Condenser (.05 mfd.)	30-4569
19	Resistor (10,000 ohms)	33-310337
20	First I. F. Transformer	65-0148
21	Padder (Sec. 1st I. F. Trans.)	
22	Condenser (.05 mfd.)	30-4444
23	Resistor (1,000 ohms)	33-210337
24	Resistor (1,000,000 ohms)	33-510337
25	Resistor (20,000 ohms)	33-320337
26a	Oscillator Transformer	65-0169
26b	Oscillator Transformer	65-0136
26c	Oscillator Transformer	65-0137
26d	Oscillator Transformer	65-0138
26e	Oscillator Transformer	65-0139
27	Padder (Pri. 2nd I. F. Trans.)	
28	Second I. F. Transformer	65-0149
29	Padder (Sec. 2nd I. F. Trans.)	
30	Condenser (100—250 mmfd.)	61-0049
31	Resistor (25,000 ohms)	33-325237
32	Volume Control (1,000,000 ohms) and On-Off Switch	67-0015
33	Condenser (6,000 mmfd.)	30-4467
34	Resistor (15,000 000 ohms)	33-615337
35	Oscillator Transformer	65-0134
36	Resistor (2,000 ohms)	33-220437
37	Condenser (.25 mfd.)	30-4446
38	Choke	65-0158
39	Condenser (.05 mfd.)	61-0053
40	Resistor (240,000 ohms)	33-424337
41	Resistor (490,000 ohms)	33-449337
42	Filter Condenser (5—10—10 mfd.)	61-0050
43	Resistor (600 ohms)	33-160338
43a	Choke	32-1438
44	Condenser (6,000 mmfd.)	30-4024
45	Output Transformer	65-0147
45a	Choke	32-1561
46	Cone and Voice Coil	91-0065
47	Condenser (250 mmfd.)	61-0033
48	Field Coil	Not Replaceable
49	Condenser (250 mmfd.)	61-0033
50	Condenser (.3 mfd.)	61-0056
51	Condenser (250 mmfd.)	61-0033
52	"A" Choke	32-1644
52a	Condenser (250 mmfd.)	61-0033
53	On-Off Switch and Volume Control	67-0015
54	Pilot Lamp	34-2064
55	Condenser (.5 mfd.)	30-4306
56	Vibrator Choke	65-0151
57	Condenser (.5 mfd.)	61-0054
58	Vibrator	41-3398
59	Resistor (150 ohms)	33-115337
60	Resistor (400 ohms)	33-140237
61	Resistor (200 ohms)	33-120337
62	Resistor (150 ohms)	33-115337
63	Power Transformer	65-0152
64	Condenser (6,000 mmfd.)	61-0052
65	Filter Choke	65-0150
65a	Condenser (250 mmfd.)	61-0033
66	First Padder (on Tun. Cond.)	
67	Second Padder (on Tun. Cond.	
	Drive Cord	55-0413
	Dial Disc and Drive Assy.	77-0233
	Automatic Dial	55-0197
	Call Letter Kit	81-0143
	Tuning and Volume Knob	27-4689
	Push Button	55-0412
	Mounting Bracket	57-0667FA3
	Fuse	45-2559
	"A" Lead	95-0032
	Complete Speaker	73-0022
	Interference Condenser	30-4007
	Distributor Resistor	33-1196
	Fuse Gauge Resistor	77-0335
	Steering Post Mtg. Strap	77-0336
	Bolt	77-0056FA3

MODEL P-1630 Packard
Schematic, Chassis
Parts

PHILCO RADIO & TELEV. CORP.

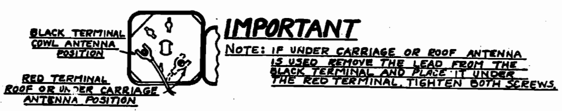


FOR ALIGNMENT, SEE INDEX

Figure 1

PARTS LIST

No.	Description	Part No.
1	Antenna Choke	32-1956
2	Condenser (.01 mfd.)	61-0014
3	Antenna Transformer	65-0008
4	Condenser (.05 mfd.)	30-4569
5	Resistor (70,000 ohms)	33-370337
6	Condenser (.15-.25-.25-.5 mfd.)	61-0013
7	Condenser (.05 mfd.)	30-4123
8	Padder (Sec. 2nd I. F. Trans.)	
9	Oscillator Transformers (High Freq.)	65-0004
10	Resistor (10,000 ohms)	33-310337
11	Condenser (.05 mfd.)	30-4444
12	Sensitivity Control (1,250 ohms)	33-5264-4
13	Resistor (40,000 ohms)	33-340337
14	R. F. Transformers	65-0009
15	Condenser (250 mmfd.)	30-1032
16	Resistor (240,000 ohms)	33-424337
17	Condenser (50 mmfd.)	30-1101
18	Resistor (25,000 ohms)	33-325337
19	Padder (Pri. 1st I. F. Trans.)	
20	First I. F. Transformer	65-0002
21	Padder (Sec. 1st I. F. Trans.)	
22	Resistor (1,000,000 ohms)	33-510337
23	Condenser (.05 mfd.)	30-4569
24	Resistor (900 ohms)	33-190438
25	Second I. F. Transformer	65-0003
26	Resistor (330,000 ohms)	33-433337
27	Condenser (.01 mfd.)	30-4479
28	Volume Control (1,000,000 ohms)	67-0002
29	Resistor (6,000 ohms)	33-260337
30	Condenser (250 mmfd.)	30-1032
31	Resistor (240,000 ohms)	33-424337
32	Condenser (6,000 mmfd.)	30-4504
33	Condenser (.01 mfd.)	30-4501
34	Resistor (490,000 ohms)	33-449337
35	Resistor (450 ohms)	33-145438
36	Condenser (6,000 mmfd.)	30-4024
37	Output Transformer	65-0024
38	Resistor (1,500 ohms)	33-215337
39	Condenser (250 mmfd.)	30-1032
40	Choke	32-1374
41	Tone Control Switch	77-0026
42	Condenser (250 mmfd.)	30-1032
43	Cone & Voice Coil	91-0047
44	Field Coil Assembly	Not Replaceable
45	Accessory Speaker	36-1384
46	Condenser (250 mmfd.)	30-1032
47	Choke	32-2657
48	Filament Choke	32-1604
49	Vibrator Choke	32-2537
50	Filter Choke	65-0022
51	Filter Condenser (4-8-10 mfd.)	61-0012
52	Condenser (.15 mfd.)	30-4571
53	Condenser (7,500 mmfd.)	30-4567
54	Power Transformer	65-0016
55	Condenser (.5 mfd.)	30-4565
56	Resistor (200 ohms)	33-120337
57	Vibrator	41-3170
58	Condenser (250 mmfd.)	30-1032
59	Condenser (250 mmfd.)	30-1032
60	Condenser (.5 mfd.)	30-4474
61	"A" Choke	32-1644
62	Pilot Lamp	34-2040
63	On-Off Switch	85-0009
64	Resistor (25,000 ohms)	33-325437
65	Padder & Bracket Assembly	77-0017
66	Push Button Switch	77-0024
67	Push Button Switch	77-0024
68	Motor	83-0001
69	Resistor (25,000 ohms)	33-325337
70	Resistor (600 ohms)	33-160438
71	Motor & Relay Assembly	77-0178
72	Switch Mechanism Assembly	77-0034
73	Tuning Condenser	63-0003
74	Silver Cap Condenser (390 mmfd.)	61-0031
75	Oscillator Transformer	65-0007
76	Silver Cap Condenser (300 mmfd.)	61-0003
77	Thermel Compensating Condenser	61-0011
78	Antenna Padders	77-0017
79	Oscillator Transformer (Low Freq.)	65-0006
80	Oscillator Transformer (Medium Freq.)	65-0005



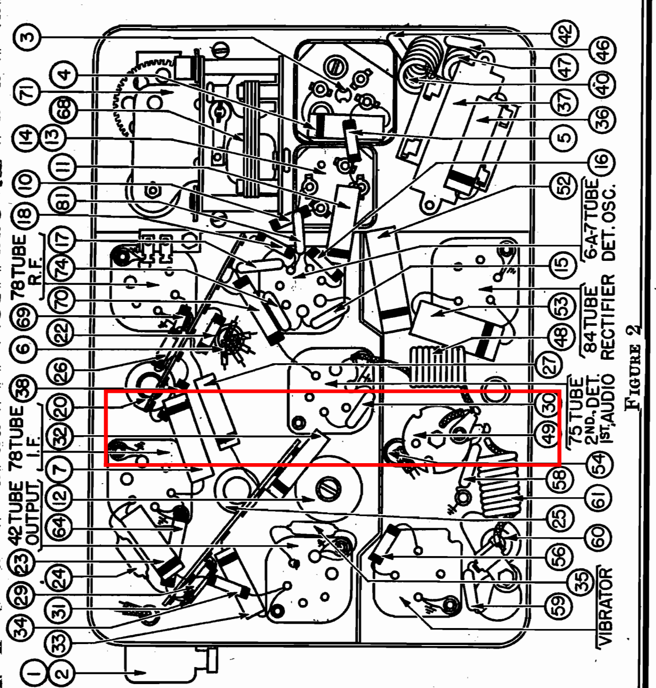


Figure 2

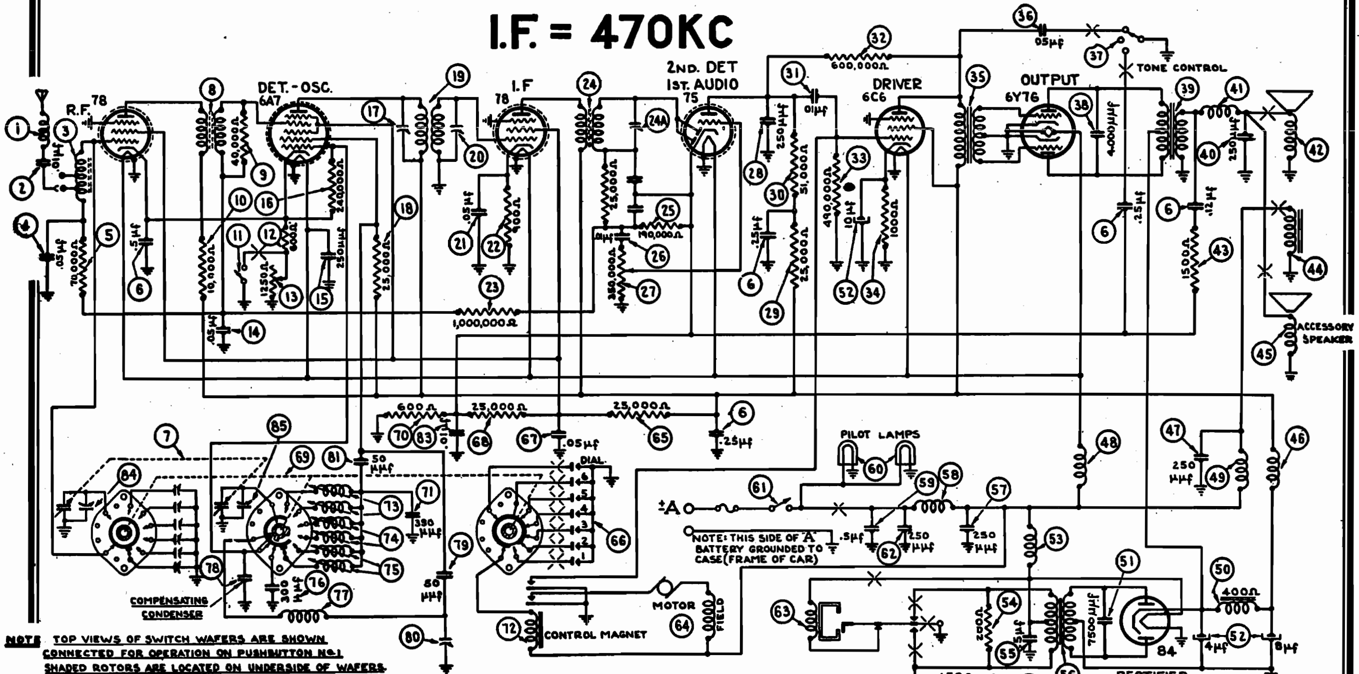
No.	Description	Part No.
81	Condenser (50 mmfd.)	30-1101
82	Low Frequency Padder	31-6230
83	First Padder on Tun. Cond.	
84	Second Padder on Tun. Cond.	
	Interference Condenser	30-4007
	Interference Condenser	30-4475
	Distributor Resistor	33-1196
	Push Buttons	85-0027

No.	Description	Part No.
	Return to Dial Switch	77-0025
	Tone Control Switch	77-0026
	On-Off Switch	85-0009
	Tuning & Volume Knob	27-4687
	Knob Base	28-4184
	"T" Bolt (Rec. Mtg.)	28-6268
	Nuts (Rec. Mtg.)	W518
	Call Letter Kit	81-0018

SEPTEMBER, 1938

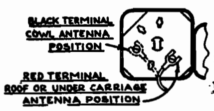
MODEL P-1635 Packard
Schematic, Chassis
Parts

PHILCO RADIO & TELEV. CORP.



PARTS LIST

No.	Description	Part No.
1	Antenna Choke	32-1956
2	Condenser (.01 mfd.)	61-0014
3	Antenna Transformer	65-0008
4	Condenser (.05 mfd.)	30-4569
5	Resistor (70,000 ohms)	33-370337
6	Condenser (.12-.25-.25-.25-.5 mfd.)	61-0019
7	Tuning Condenser	63-0003
8	R. F. Transformer	65-0009
9	Resistor (40,000 ohms)	33-339137
10	Resistor (10,000 ohms)	33-310337
11	Local-Distant Switch	42-1429
12	Resistor (600 ohms)	33-160438
13	Sensitivity Control (1,250 ohms)	33-5248-4
14	Condenser (.05 mfd.)	30-4444
15	Condenser (250 mmfd.)	30-1032
16	Resistor (240,000 ohms)	33-424337
17	Padder (Pri. 1st I. F. Trans.)	
18	Resistor (25,000 ohms)	33-325337
19	First I. F. Transformer	65-0002
20	Padder (Sec. 1st I. F. Trans.)	
21	Condenser (.05 mfd.)	30-4569
22	Resistor (900 ohms)	33-190438
23	Resistor (1,000,000 ohms)	33-510337
24	Second I. F. Transformer	65-0003
24a	Padder (Sec. 2nd I. F. Trans.)	
25	Resistor (190,000 ohms)	33-419337
26	Condenser (.01 mfd.)	30-4479
27	Volume Control (350,000 ohms)	67-0005
28	Condenser (250 mmfd.)	30-1032
29	Resistor (25,000 ohms)	33-325337
30	Resistor (51,000 ohms)	33-351337
31	Condenser (.01 mfd.)	30-4501
32	Resistor (600,000 ohms)	33-460337
33	Resistor (490,000 ohms)	33-449337
34	Resistor (1,000 ohms)	33-210337
35	Input Transformer	32-7779
36	Condenser (.05 mfd.)	30-4012
37	Tone Control Switch	42-1430
38	Condenser (4,000 mmfd.)	30-4185
39	Output Transformer	32-7778
40	Condenser (250 mmfd.)	30-1032
41	Choke	32-1604
42	Cone and Voice Coil	91-0048
43	Resistor (1,500 ohms)	33-215337
44	Field Coil	Not Replaceable
45	Accessory Speaker	73-0019
46	"B" Choke	32-1281
47	Condenser (250 mmfd.)	30-1032
48	Filament Choke	32-1604
49	Choke	32-2657
50	Filter Choke	32-7811
51	Condenser (7,500 mmfd.)	30-4567
52	Filter Condenser (4-8-10 mfd.)	61-0012
53	Vibrator Choke	32-2537
54	Resistor (200 ohms)	33-120337
55	Condenser (.5 mfd.)	30-4474
56	Power Transformer	32-7720
57	Condenser (250 mmfd.)	30-1032
58	"A" Choke	32-1644
59	Condenser (.5 mfd.)	30-4474
60	Pilot Lamp	34-2064
61	On-Off Switch	42-1374
62	Condenser (250 mmfd.)	30-1032
63	Vibrator	41-3170
64	Motor	83-0001
65	Resistor (25,000 ohms)	33-325437
66	Push Button Switch	85-0017
67	Condenser (.05 mfd.)	30-4444
68	Resistor (25,000 ohms)	33-325337
69	Rotary Switch Assembly	77-0174
70	Resistor (600 ohms)	33-160438
71	Silver Cap Condenser (390 mmfd.)	61-0031
72	Motor and Relay Assembly	77-0178
73	Oscillator Transformer (Low Freq.)	65-0006
74	Oscillator Transformer (Med. Freq.)	65-0005
75	Oscillator Transformer (High Freq.)	65-0004
76	Silver Cap Condenser (300 mmfd.)	61-0003
77	Oscillator Transformer	65-0007
78	Thermel Comp. Condenser	61-0011
79	Condenser (50 mmfd.)	30-1101
80	Low Frequency Padder	31-6230
81	Condenser (50 mmfd.)	30-1101



IMPORTANT
NOTE: IF COWL ANTENNA IS USED REMOVE THE LEAD FROM THE RED TERMINAL AND PLACE IT UNDER THE BLK. TERMINAL. TIGHTEN BOTH SCREWS.

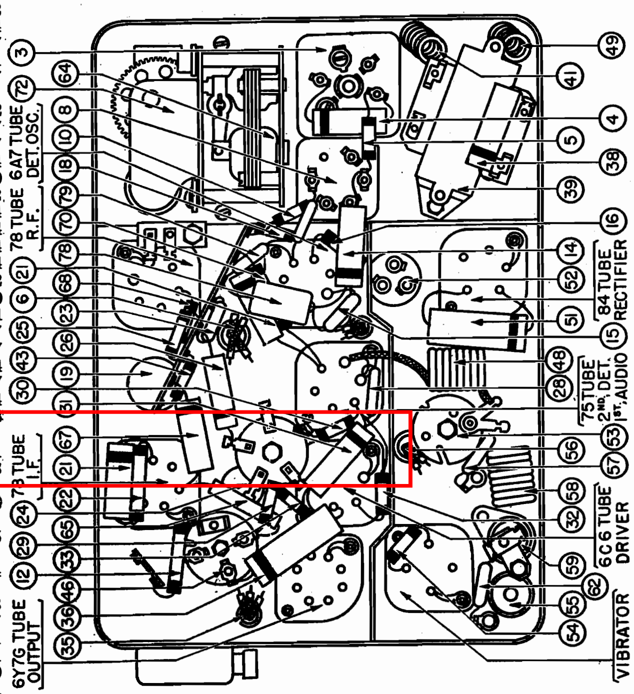


FIGURE 2

No.	Description	Part No.
82	Resistor (150 ohms)	33-115337
83	Condenser (.01 mfd.)	30-4479
84	First Padder (on Tun. Cond.)	
85	Second Padder (on Tun. Cond.)	
86	Resistor (25,000 ohms)	33-325337
87	Antenna Padder Assembly	77-0017
	Interference Condenser	30-4007
	Interference Condenser	30-4475
	Distributor Suppressor	32-2250
	Push Button	55-0021
	Return to Manual Button	55-0096

No.	Description	Part No.
	Tuning and Volume Knob	27-4687
	Return to Dial Switch	Part of 66
	Switch Knob	28-7255
	Call Letter Kit	81-0024
	"T" Bolt (Set Mtg.)	28-6161
	Nut (Set Mtg.)	W518
	Stud (Speaker Mtg.)	28-6088
	Nut (Speaker Mtg.)	W55
	Dial Face Glass	55-0014
	Pointer	57-0238

DECEMBER 20, 1938

MODEL P-1635 Packard
Socket, Trimmers
Alignment

PHILCO RADIO & TELEV. CORP.

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 6Y7G output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attentuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

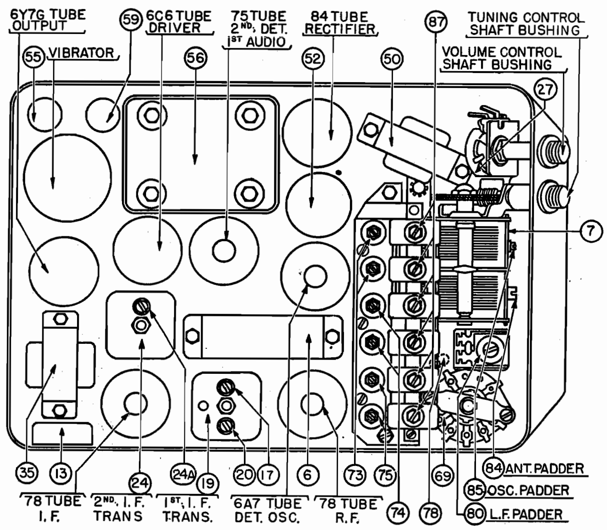


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	Press the return to dial button until stations can be tuned in by manual tuning.				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	24A 20 17
3	1580 K.C.	To Antenna Receptacle on Radio	*250 Mmfd. See Note 1	Note 2	85
4	1400 K.C.	To Antenna Receptacle on Radio	*250 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	84 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	*250 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	80 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	*250 Mmfd. See Note 1	Note 2	85
7	1400 K.C.	To Antenna Receptacle on Radio	*250 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	84 Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 250 Mmfd. Condenser in series between the signal generator and the antenna lead.

Special Note: — When the roof or undercarriage antenna is used follow the above procedure. Be sure the lead to the antenna transformer is connected to the red terminal of the Antenna Transformer.

*When the cowl antenna is used, connect the antenna lead, Part No. L-2765, to the antenna receptacle in the Radio. Connect a 20 mmfd. condenser in series with the signal generator and the antenna lead. Be sure the lead to the antenna transformer is connected to the black terminal of the antenna transformer.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODEL F-1640 Ford
Schematic, Chassis
Parts

PHILCO RADIO & TELEV. CORP.

I.F. PEAK 470 KC.

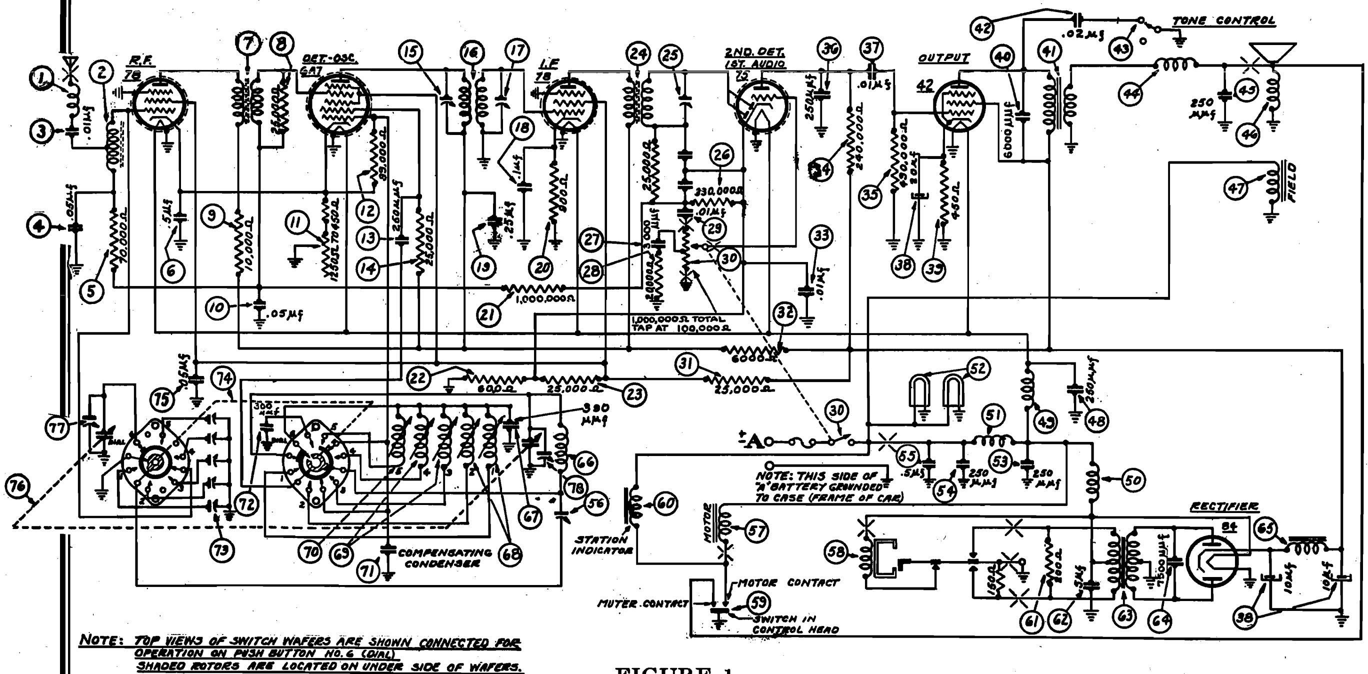


FIGURE 1

FORD MODEL F-1640 TWO UNIT DELUXE CAR RADIO

NOVEMBER, 1938

PARTS LIST

No.	Description	Part No.
1	Antenna Choke	32-1956
2	Antenna Transformer	65-0079
3	Condenser (.01 mfd.)	61-0014
4	Condenser (.05 mfd.)	30-4569
5	Resistor (70,000 ohms)	33-370337
6	Condenser (.5 mfd.)	61-0035
7	R. F. Transformer	65-0083
8	Resistor (25,000 ohms)	33-325337
9	Resistor (10,000 ohms)	33-310337
10	Condenser (.05 mfd.)	30-4444
11	Sensitivity Control	33-5264-4
12	Resistor (99,000 ohms)	33-399337
13	Condenser (250 mmfd.)	61-0034
14	Resistor (25,000 ohms)	33-325437
15	Padder (Pri. 1st I. F. Trans.)	
16	First I. F. Transformer	65-0002
17	Padder (Sec. 1st I. F. Trans.)	
18	Condenser (.1 mfd.)	30-4122
19	Condenser (.25 mfd.)	61-0036
20	Resistor (900 ohms)	33-190438
21	Resistor (1,000,000 ohms)	33-510437
22	Resistor (600 ohms)	33-160438
23	Resistor (25,000 ohms)	33-325437
24	Second I. F. Transformer	65-0003
25	Padder (Sec. 2nd I. F. Trans.)	
26	Resistor (330,000 ohms)	33-433337
27	Condenser (3,000 mmfd.)	30-4469
28	Resistor (20,000 ohms)	33-320337
29	Condenser (.1 mfd.)	30-4479
30	Volume Control (1,000,000 ohms) & On-Off Switch	67-0008
31	Resistor (25,000 ohms)	33-325437
32	Resistor (6,000 ohms)	33-260337
33	Condenser (.01 mfd.)	30-4479
34	Resistor (240,000 ohms)	33-424337
35	Resistor (490,000 ohms)	33-449347
36	Condenser (250 mmfd.)	30-1032
37	Condenser (.01 mfd.)	30-4501
38	Filter Condenser (10-10-20 mfd.)	61-0028
39	Resistor (450 ohms)	33-145437
40	Condenser (6,000 mmfd.)	30-4024
41	Output Transformer	65-0077
42	Condenser (.02 mfd.)	30-4495
43	Tone Control Switch	42-1406
44	Choke	32-1561
45	Condenser (250 mmfd.)	30-1032
46	Cone & Voice Coil	91-0042
47	Field Coil	Not Replaceable
48	Condenser (250 mmfd.)	30-1032
49	Filament Choke	32-1604
50	Vibrator Choke	32-2537
51	"A" Choke	32-2477
52	Pilot Lamp	34-2040
53	Condenser (250 mmfd.)	61-0033
54	Condenser (250 mmfd.)	61-0033
55	Condenser (.5 mfd.)	30-4474
56	Low Frequency Padder	63-0017
57	Impulse Motor	77-0148
58	Vibrator	41-3398
59	Automatic Control Switch	77-0171
60	Control Mechanism Coil	
61	Resistor (200 ohms)	33-120347
62	Condenser (.5 mfd.)	30-4565
63	Power Transformer	65-0016
64	Condenser (7,500 mmfd.)	30-4567
65	Filter Choke	65-0022
66	Oscillator Transformer	65-0052
67	Silver Cap Condenser (390 mmfd.)	61-0031
68	Oscillator Transformer (High Freq.)	65-0049
69	Oscillator Transformer (Med. Freq.)	65-0050
70	Oscillator Transformer (Low Freq.)	65-0051
71	Thermol Coupling Condenser	61-0011
72	Silver Cap Condenser (300 mmfd.)	61-0003
73	Antenna Padder Assy.	77-0035
74	Wafer Switch Assy.	77-0185
75	Condenser (.05 mfd.)	30-4569
76	Tuning Condenser	63-0015
77	First Padder (on Tun. Cond.)	
78	Second Padder (on Tun. Cond.)	
	Call Letter Kit	81-0091

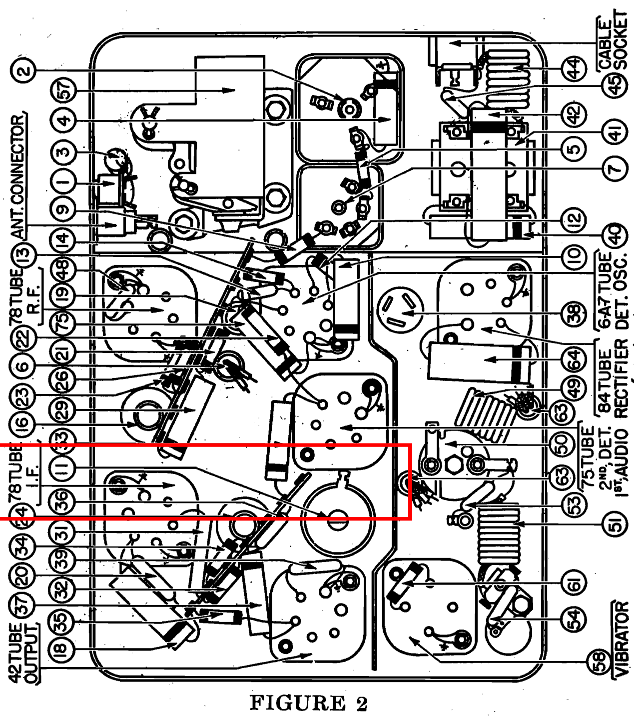


FIGURE 2

Description	Part No.
Flexible Shaft	57-0425
Dial Assembly	85-0052
Push Button Knob	55-0196
Tuning Control Knob	55-0234
Volume Control Knob	55-0235

Description	Part No.
"Tee" Bolt (Rec. Mtg.)	28-6161
Nut (Rec. Mtg.)	W518
Hook Bolt (Control Mtg.)	97-0043
Nut (Control Mtg.)	97-0048
Antenna Lead	95-0063

The letter "P" is stamped on the left end of the housing near the top cover on all Ford Philco Model F-1640 Radios.

MODEL F-1640 Ford
Socket, Trimmers
Alignment

PHILCO RADIO & TELEV. CORP.

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. 95-0063, to the antenna receptacle in the radio. Connect a 30 Mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 42 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

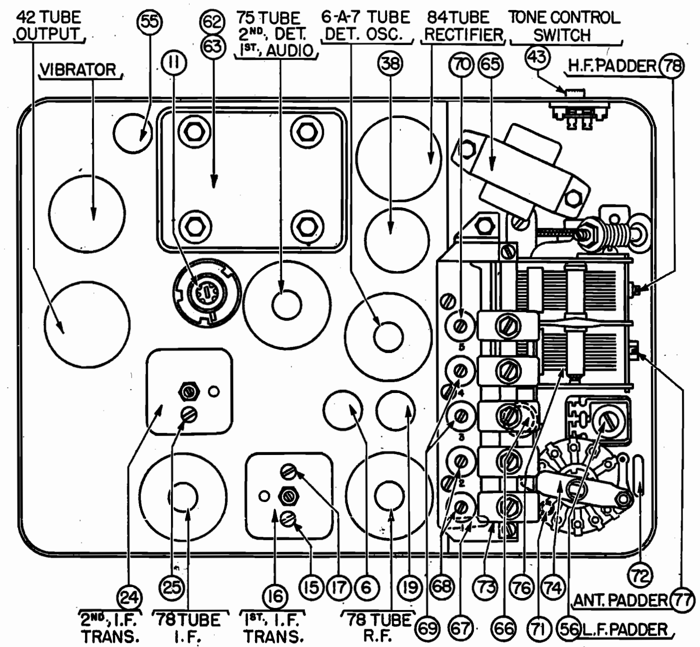


FIGURE 3

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning				
2	470 K.C.	To Grid of 6A7 Tube	.5 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	25 15 17
3	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Note 2	78
4	1400 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	77 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	56 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Note 2	78
7	1400 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	77 Note 4

MODEL L-1660
Lincoln Zephyr
Schematic, Chassis
Parts

PHILCO RADIO & TELEV. CORP.

I.F. = 470KC.

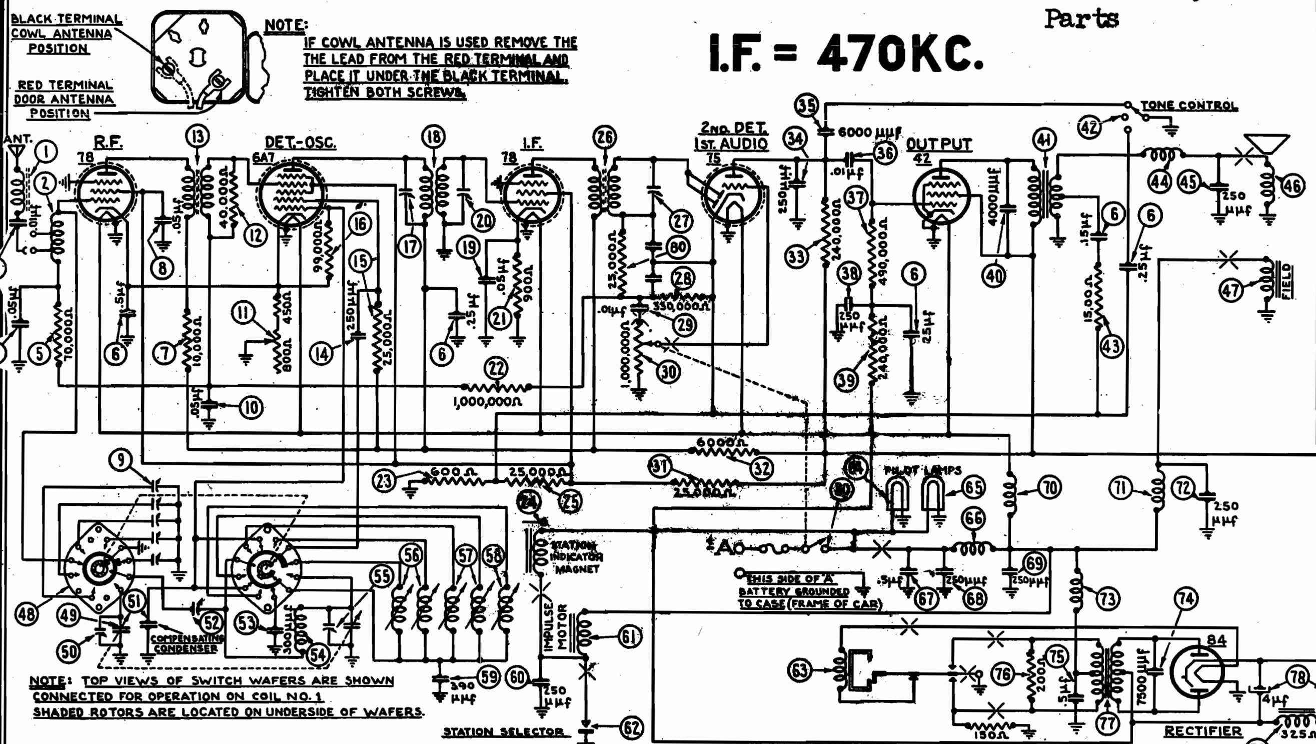
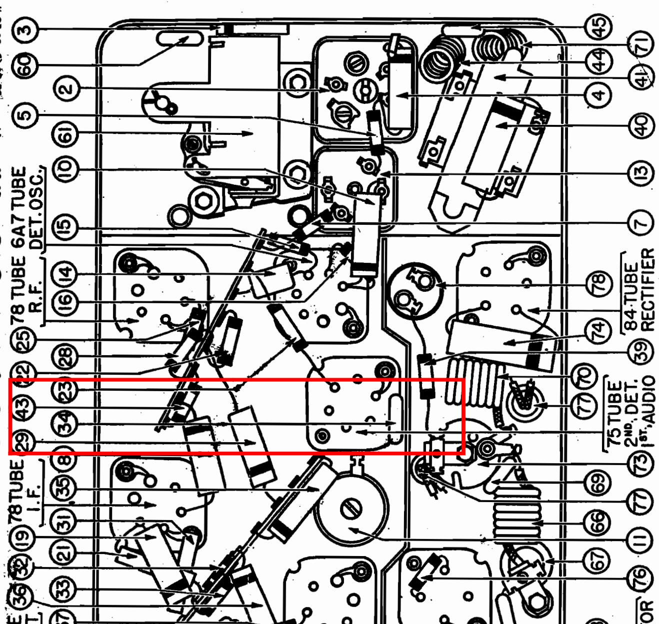


FIGURE 1

PARTS LIST

No.	Description	Part No.
1	Antenna Choke	65-0062
2	Antenna Transformer	65-0063
3	Condenser (.01 mfd.)	61-0014
4	Condenser (.05 mfd.)	30-4569
5	Resistor (70,000 ohms)	33-370337
6	Condenser (.15-.25-.25-.25-.5 mfd.)	61-0024
7	Resistor (10,000 ohms)	33-310337
8	Condenser (.05 mfd.)	30-4444
9	Antenna Padder Assembly	77-0035
10	Condenser (.05 mfd.)	30-4444
11	Sensitivity Control	33-5264-4
12	Resistor (40,000 ohms)	33-339137
13	R. F. Transformer	65-0009
14	Condenser (250 mmfd.)	30-1038
15	Resistor (25,000 ohms)	33-325337
16	Resistor (99,000 ohms)	33-399337
17	Padder (Pri. 1st I. F. Trans.)	
18	First I. F. Transformer	65-0002
19	Condenser (.05 mfd.)	30-4569
20	Padder (Sec. 1st I. F. Trans.)	
21	Resistor (900 ohms)	33-190438
22	Resistor (1,000,000 ohms)	33-510337
23	Resistor (600 ohms)	33-160438
24	Solenoid	
25	Resistor (25,000 ohms)	33-325337
26	Second I. F. Transformer	65-0003
27	Padder (Sec. 2nd I. F. Trans.)	
28	Resistor (330,000 ohms)	33-433337
29	Condenser (.01 mfd.)	30-4479
30	Volume Control (1,000,000 ohms) and On-Off Switch	67-0009
31	Resistor (25,000 ohms)	33-325437
32	Resistor (6,000 ohms)	33-260337
33	Resistor (240,000 ohms)	33-424337
34	Condenser (250 mmfd.)	30-1032
35	Condenser (6,000 mmfd.)	30-4504
36	Condenser (.01 mfd.)	30-4501
37	Resistor (490,000 ohms)	33-449337
38	Condenser (250 mmfd.)	30-1032
39	Resistor (240,000 ohms)	33-424337
40	Condenser (4,000 mmfd.)	30-4185
41	Output Transformer	65-0024
42	Tone Control Switch	85-0042
43	Resistor (1,500 ohms)	33-215337
44	Choke	32-1374
45	Condenser (250 mmfd.)	30-1032
46	Cone and Voice Coil Kit	91-0053
47	Field Coil	Not Replaceable
48	Wafer Switch	77-0203
49	Tuning Condenser	63-0012
50	First Padder (on Tun. Cond.)	
51	Thermel Compensating Cond.	61-0011
52	Low Frequency Padder	63-0017
53	Silver Cap Condenser (300 mmfd.)	61-0003
54	Oscillator Transformer	65-0052
55	Second Padder (on Tun. Cond.)	
56	Oscillator Trans. (High Freq.)	65-0049
57	Oscillator Trans. (Med. Freq.)	65-0050
58	Oscillator Trans. (Low Freq.)	65-0051
59	Silver Cap Condenser (390 mmfd.)	61-0031
60	Condenser (250 mmfd.)	30-1032
61	Impulse Motor	77-0120
62	Station Indicator Switch	85-0041
63	Vibrator	41-3170
64	Pilot Lamp	34-2039
65	Pilot Lamp	34-2040
66	"A" Choke	32-1644
67	Condenser (.5 mfd.)	30-4474
68	Condenser (250 mmfd.)	30-1032
69	Condenser (250 mmfd.)	30-1032
70	Filament Choke	32-1604
71	Choke	32-2657
72	Condenser (250 mmfd.)	30-1032
73	Vibrator Choke	32-2812
74	Condenser (7,500 mmfd.)	30-4567
75	Condenser (.5 mfd.)	30-4565
76	Resistor (200 ohms)	33-120387
77	Power Transformer	65-0016
78	Filter Condenser (4-8 mfd.)	30-2295
79	Filter Choke	32-7910
80	Resistor (25,000 ohms)	33-325337
	Scale Assembly	85-0040
	Tuning Control Knob	55-0179

FIGURE 2



No.	Description	Part No.
	Volume Control Knob	55-0180
	Push Button Knob	55-0184
	Tuning Shaft	57-0491
	Call Letter Kit	81-0066
	Interference Condenser	30-4564
	Interference Condenser	30-4181
	Interference Condenser	30-4404
	Interference Condenser	30-4307
	Interference Condenser	30-4663
	"T" Bolt (Rec. Mtg.)	28-6641
	Nut (Rec. Mtg.)	57-0489
	Bolt (Spker. Mtg.)	W1721
	Nut (Spker. Mtg.)	W317
	Automatic Station Selector Drum	55-0197

DECEMBER 1, 1938

MODEL L-1660
Socket, Trimmers

PHILCO RADIO & TELEV. CORP.

Alignment

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 800 Mmfd. Condenser in series between the signal generator and the antenna lead.

Special Note: — When the tire compartment door antenna is used follow the above procedure. Be sure the lead to the antenna transformer is connected to the red terminal of the Antenna Transformer.
*When the cowl antenna is used, connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the Radio. No dummy capacity is necessary. Be sure the lead to the antenna transformer is connected to the black terminal of the antenna transformer.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

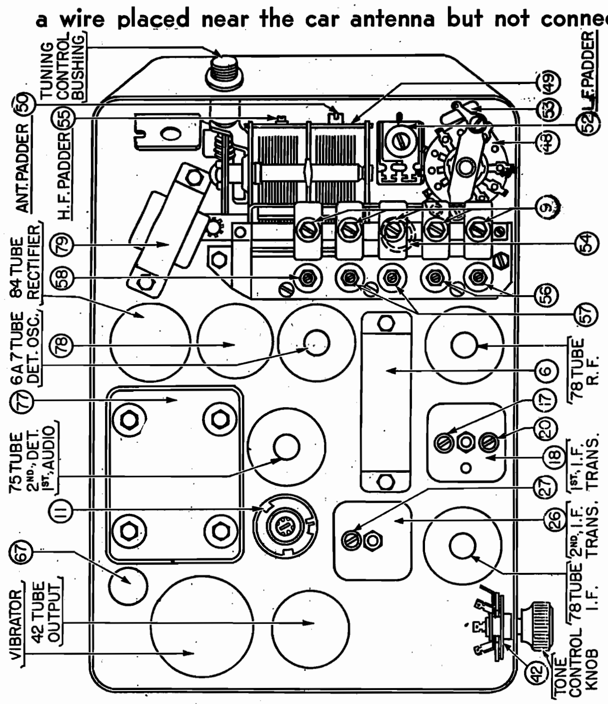


FIGURE 3

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty shortage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 27-7159 Padding screw driver.

General — The output meter must be connected by means of an adapter to the plate of the type 42 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

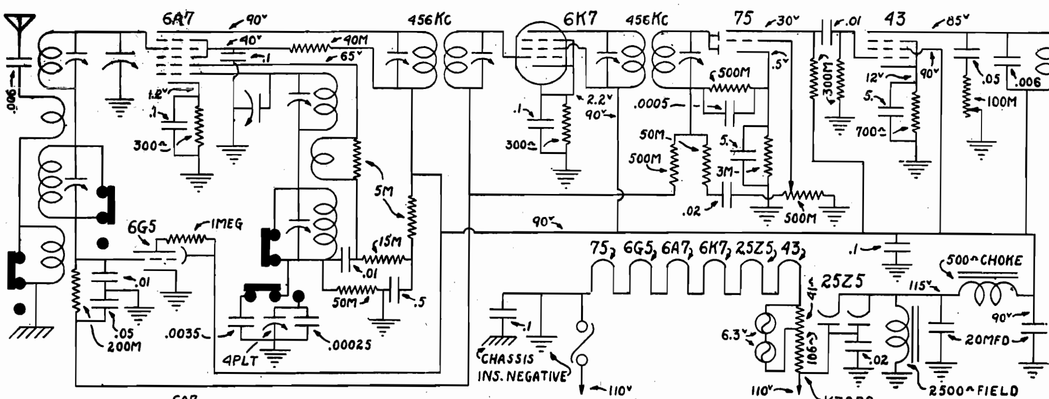
The shielding on the generator output lead must be connected to the Radio housing.

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning.				
2	470 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	27 20 17
3	1580 K.C.	To Antenna Receptacle on Radio	*800 Mmfd. See Note 1	Note 2	55
4	1400 K.C.	To Antenna Receptacle on Radio	*800 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	50 Note 4
5	580 K.C.	To Antenna Receptacle on Radio	*800 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	52 Note 3
6	1580 K.C.	To Antenna Receptacle on Radio	*800 Mmfd. See Note 1	Note 2	55
7	1400 K.C.	To Antenna Receptacle on Radio	*800 Mmfd. See Note 1	Set Tuning Condenser at 1400 K.C.	50 Note 4

MODEL 930
Wireless Record Player
Schematic

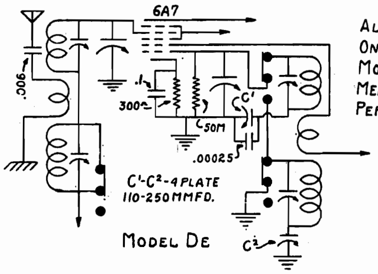
PILGRIM ELECTRIC CORP.

MODELS D,DE
MODELS GH,GHE
Schematics,Voltage



Model D
428,001 AND UP.

IF PEAK 456 KC

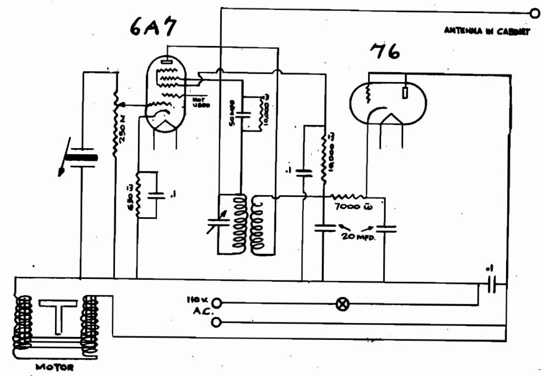


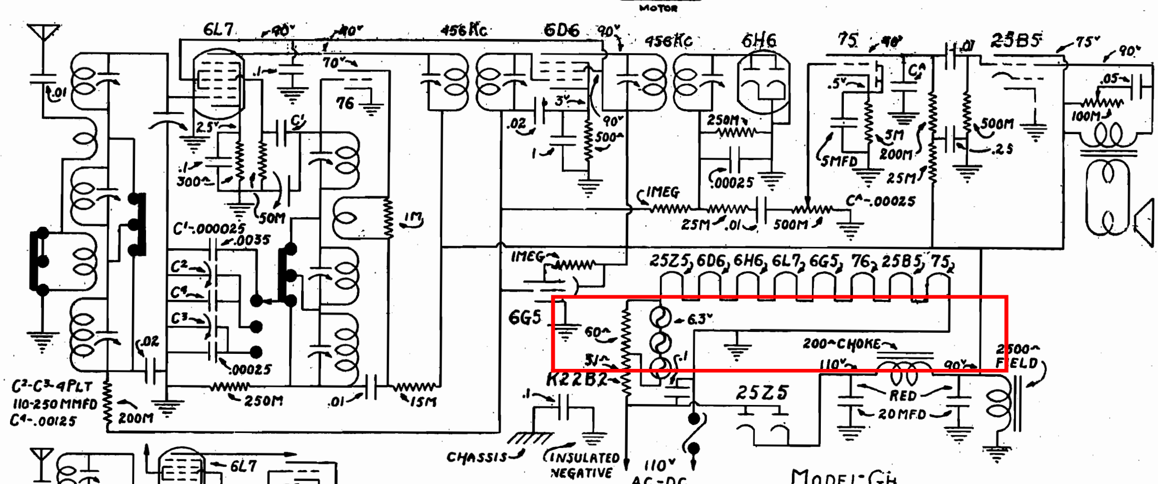
Model De

All Other Constants On Model De Same As Model D. All Voltages Measured With 1000^ Per Volt Meter.

MODEL "D"

Pilgrim Model 930 Electric Wireless Record Player

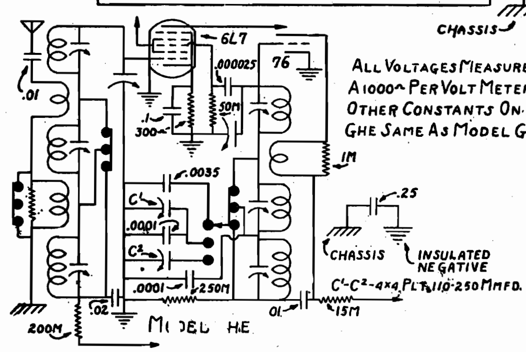




Model GH
707,001 AND UP.

IF PEAK 456 KC

All Voltages Measured With A 1000^ Per Volt Meter. All Other Constants On Model GHE Same As Model GH.

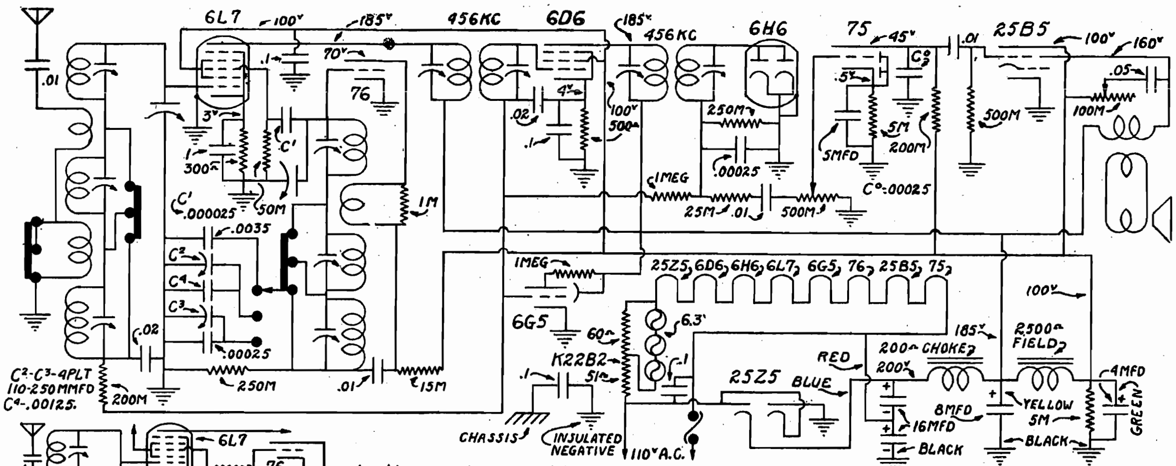


Model HE

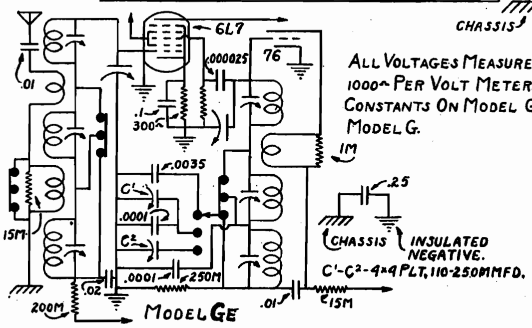
MODEL "GH"

MODELS G,GE
MODELS GB,GF,GBE,GFE
Schematics,Voltage

PILGRIM ELECTRIC CORP.



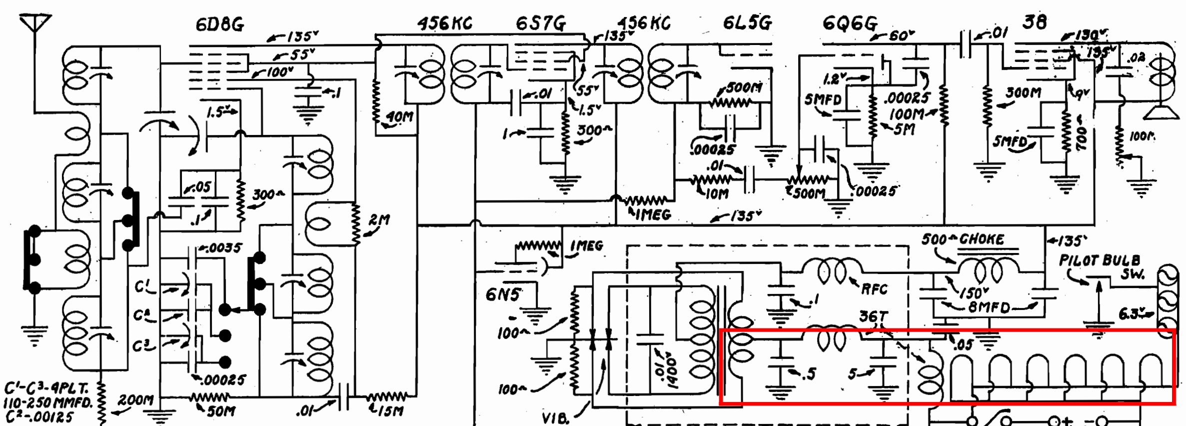
Model G
707,001 AND UP.



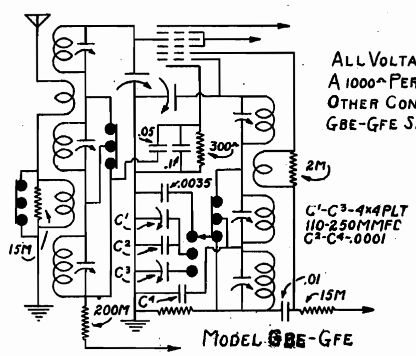
All Voltages Measured With A 1000^ Per Volt Meter. All Other Constants On Model GE Same As Model G.

IF PEAK 456 KC

MODEL "G"



Model GB-GF
780,001 AND UP.



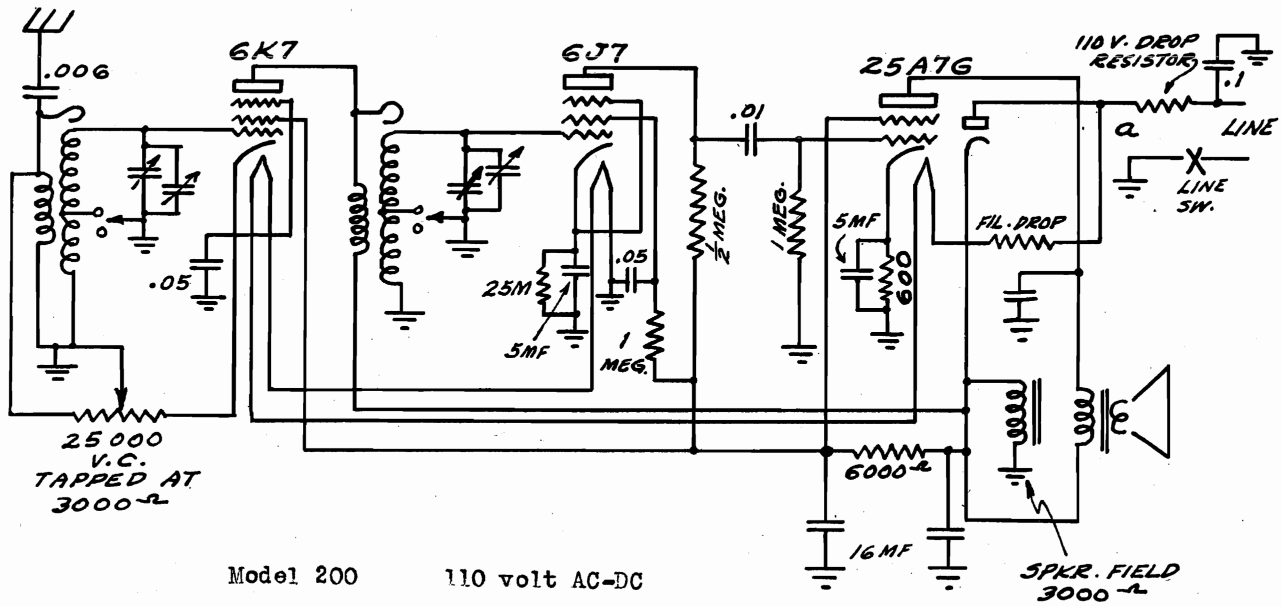
All Voltages Measured With A 1000^ Per Volt Meter. All Other Constants On Models GBE-GFE Same As Models GB-GF.

IF PEAK 456 KC

MODEL "GB-GF"

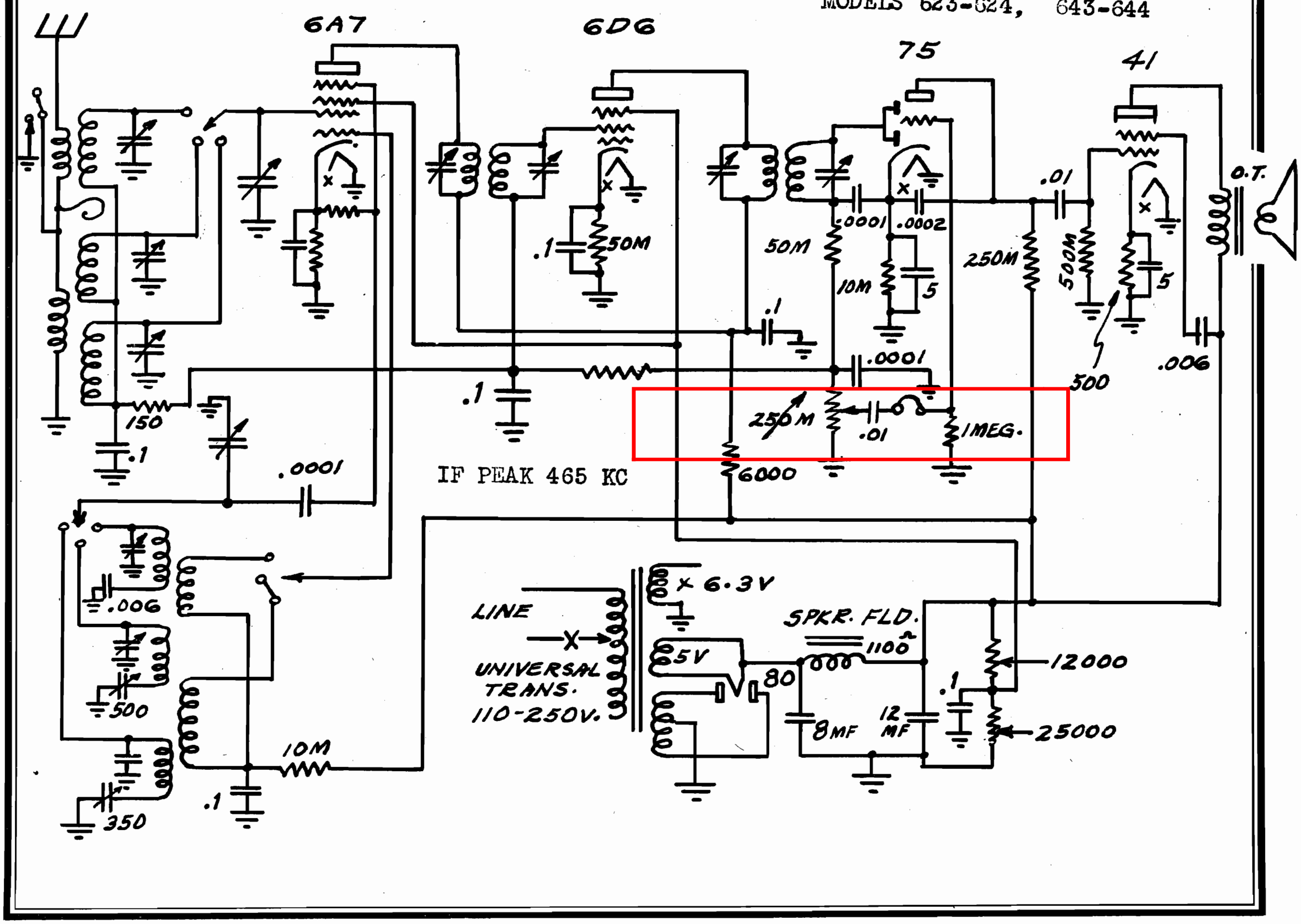
PILGRIM ELECTRIC CORP.

MODEL 200
MODELS 623,624,643,644
Schematics



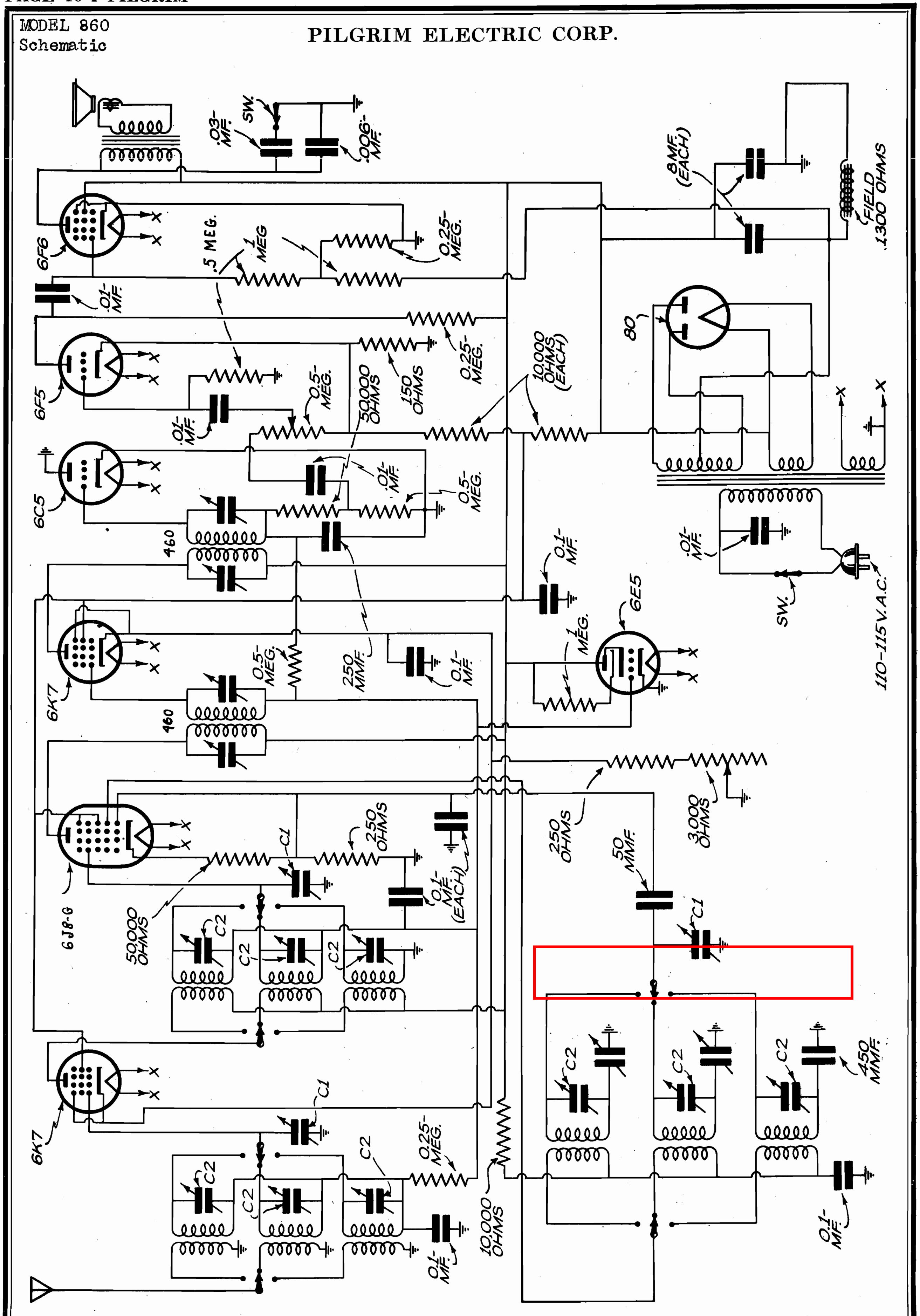
Model 200 110 volt AC-DC

MODELS 623-624, 643-644



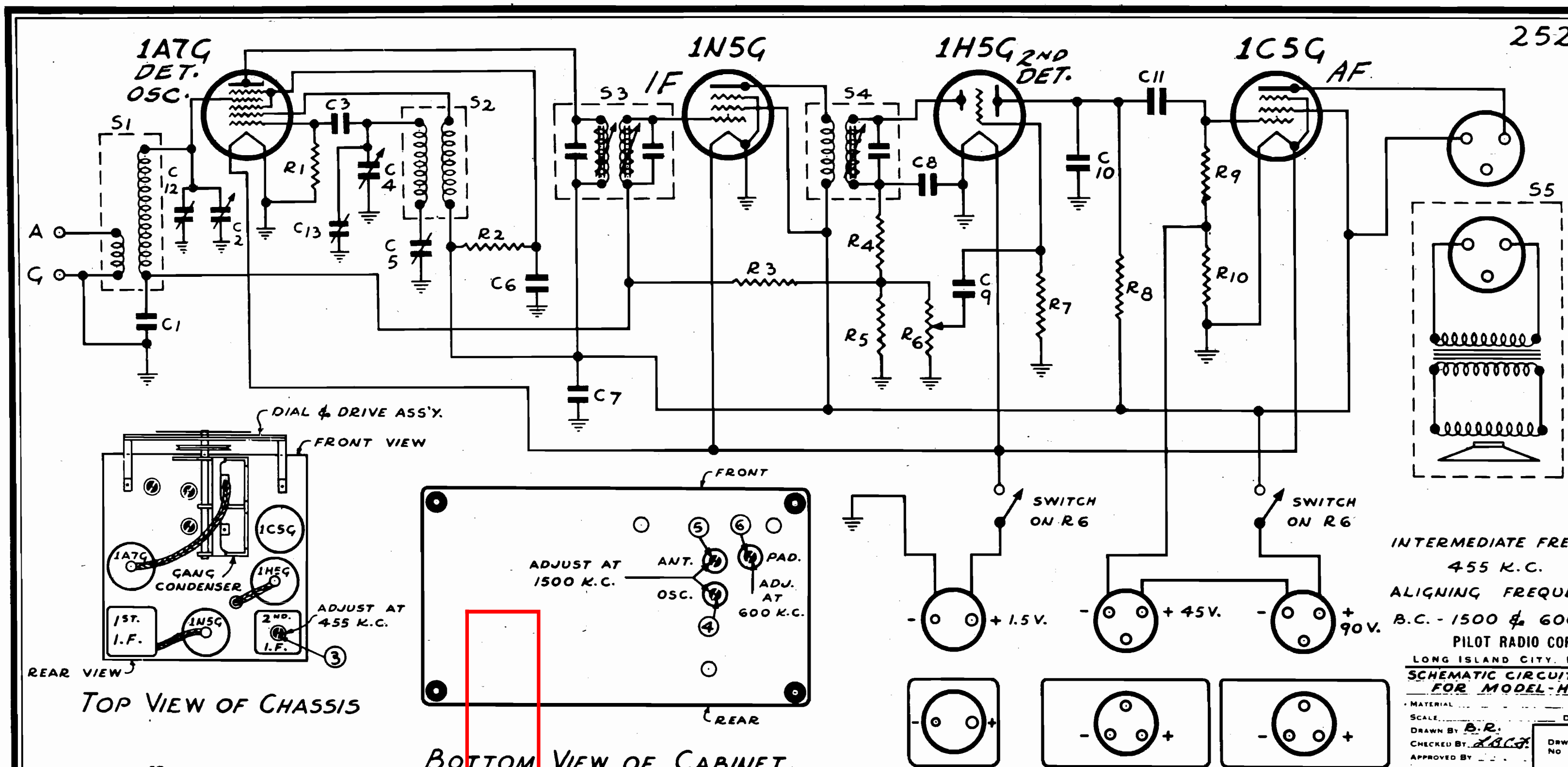
MODEL 860
Schematic

PILGRIM ELECTRIC CORP.



PILOT RADIO CORP.

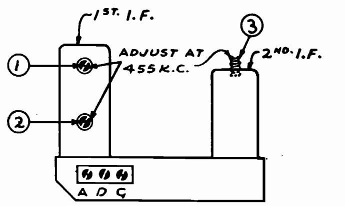
MODEL H-11
Schematic, Socket
Trimmers, Alignment



INTERMEDIATE FREQUENCY:-
455 K.C.
ALIGNING FREQUENCIES:-
B.C. - 1500 & 600 K.C.

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-11
MATERIAL
SCALE DATE 11-22-38
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DRWG No 25213-

BOTTOM VIEW OF CABINET
FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION, VOL. VIII

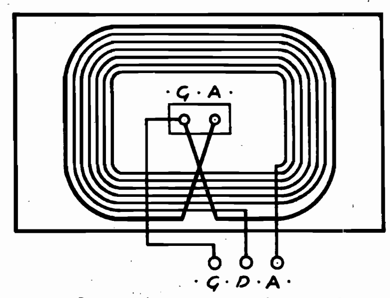


REAR VIEW OF CHASSIS

CONDENSERS FOR MODEL-H-11		
C1, C6, C9	22055-T	.01 MFD. 200 V. PAPER
C2, C4	79664	GANG CONDENSER
C3	28016-0	.0001 MFD. MICA
C5	79431-B	385 MMFDS. PADDER
C7	78704	4 MFD. 150 V. ELECTRO.
C8, C10	27701-0	.00025 MFD. MICA
C11	22055-W	.01 MFD. 400 V. PAPER
C12, C13	70969-E	TRIMMER STRIP ASS'Y.

RESISTORS FOR MODEL-H-11		
R1	13191	200,000 OHMS 1/4 WATT
R2	13241	60,000 OHMS 1/4 WATT
R3, R5, R7, R9	13223	3.3 MEGOHMS 1/4 WATT
R4	13164	50,000 OHMS 1/4 WATT
R6	83763-B	1 MEGOHM VOL. CONT. & SW.
R8	13171	250,000 OHMS 1/4 WATT
R10	13028	1,000 OHMS 1/4 WATT

MISCELLANEOUS FOR MODEL-H-11		
S1	68040	ANTENNA LOOP ASS'Y.
S2	73243	OSCILLATOR COIL ASS'Y.
S3	73192-2-C	1ST. I.F. TRANSFORMER ASS'Y.
S4	73244	2ND. I.F. " "
S5	40864	5" P.M. SPEAKER



CABINET BACK & ANTENNA LOOP ASS'Y.

GENERAL SPECIFICATIONS.

Circuit Battery-powered Super-Heterodyne, for operation with a conventional antenna, or as a portable receiver with self-contained loop antenna. Permeability tuned IF transformers. Permanent magnet speaker. Automatic volume control, Class A output stage.

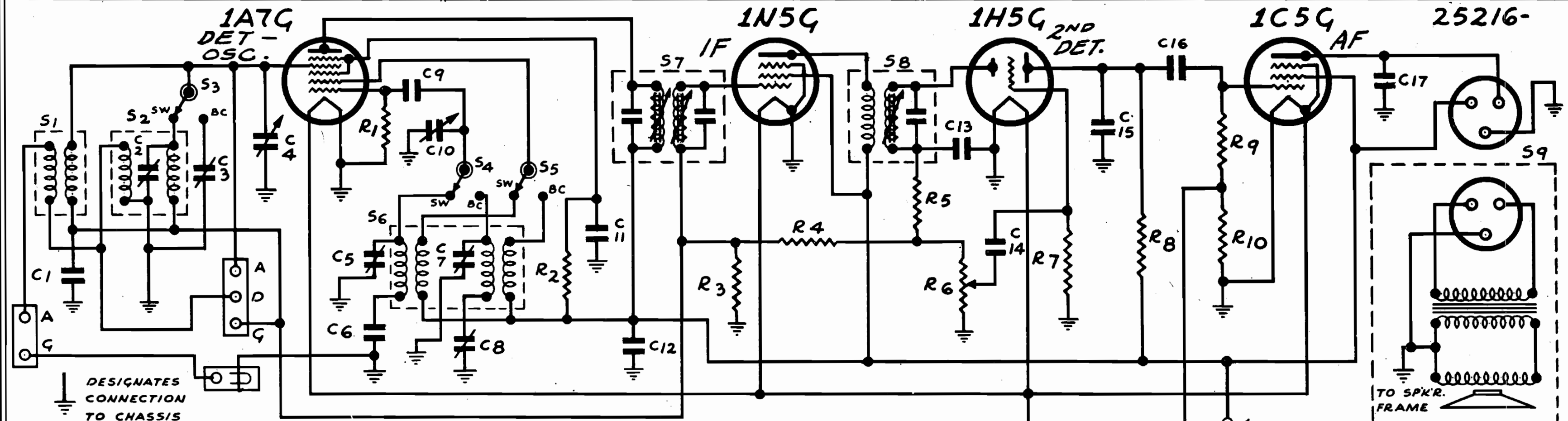
Tuning Range. 535 to 1600 kc or 560 to 187.5 meters

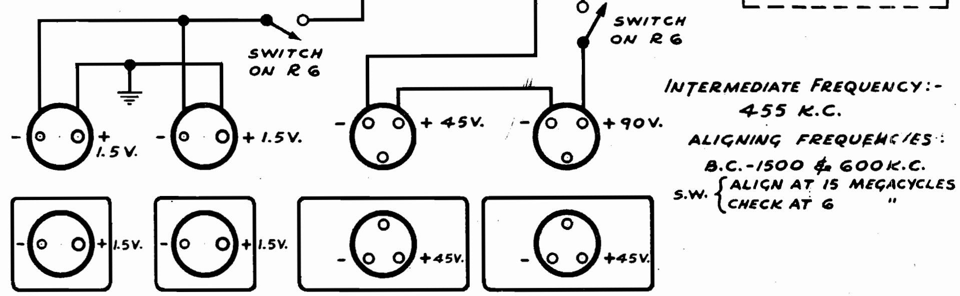
Batteries Required.

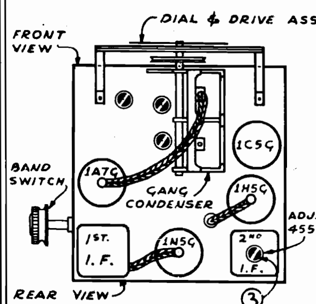
One 1-1/2 volt "A" Battery
Two 45 volt "B" Batteries

MODEL H-12
Schematic, Socket
Trimmers, Alignment

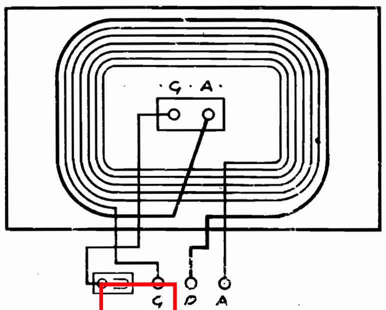
PILOT RADIO CORP.



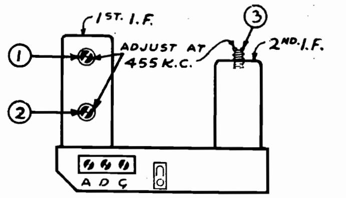




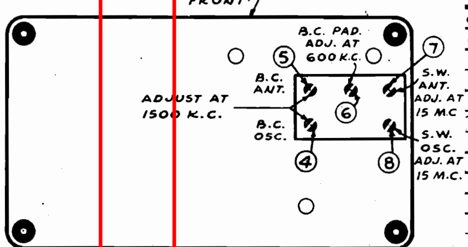
TOP VIEW OF CHASSIS



CABINET BACK & ANTENNA LOOP ASS'Y.



REAR VIEW OF CHASSIS



BOTTOM VIEW OF CABINET

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION, VOL. VIII

CONDENSERS FOR MODEL-H-12

C1, C11, C14	22055-T	.01 MFD. 200 V. PAPER
C2, C3, C5, C7	70969-E	TRIMMER STRIP ASS'Y.
C4, C10	79664	GANG CONDENSER
C6	28120-W	.005 MFD. MICA ± 5%
C8	79431-B	385 MMFDS. PADDER
C9	28016-O	.0001 MFD. MICA
C12	23500-H	4 MFD. 150 V. ELECTRO.
C13, C15	27701-O	.00025 MFD. MICA
C16	22055-W	.01 MFD. 400 V. PAPER
C17	22055-K	.002 MFD. 600 V. PAPER

RESISTORS FOR MODEL-H-12

R1	13191	200,000 OHMS 1/4 WATT
R2	13241	60,000 OHMS 1/4 WATT
R3, R4, R7, R9	13223	3.3 MEGOHMS 1/4 WATT
R5	13164	50,000 OHMS 1/4 WATT
R6	83903	2 MEGOHMS VOLUME CONTROL & SWITCH
R8	13001	1 MEGOHM 1/4 WATT
R10	13048	800 OHMS 1/4 WATT

Tuning Range.

535 to 1600 kc or 560 to 187.5 meters
5.4 to 15.7 mc or 55.5 to 19.1 meters

Batteries Required

Two 1-1/2 volt "A" Batteries
Two 45 volt "B" Batteries

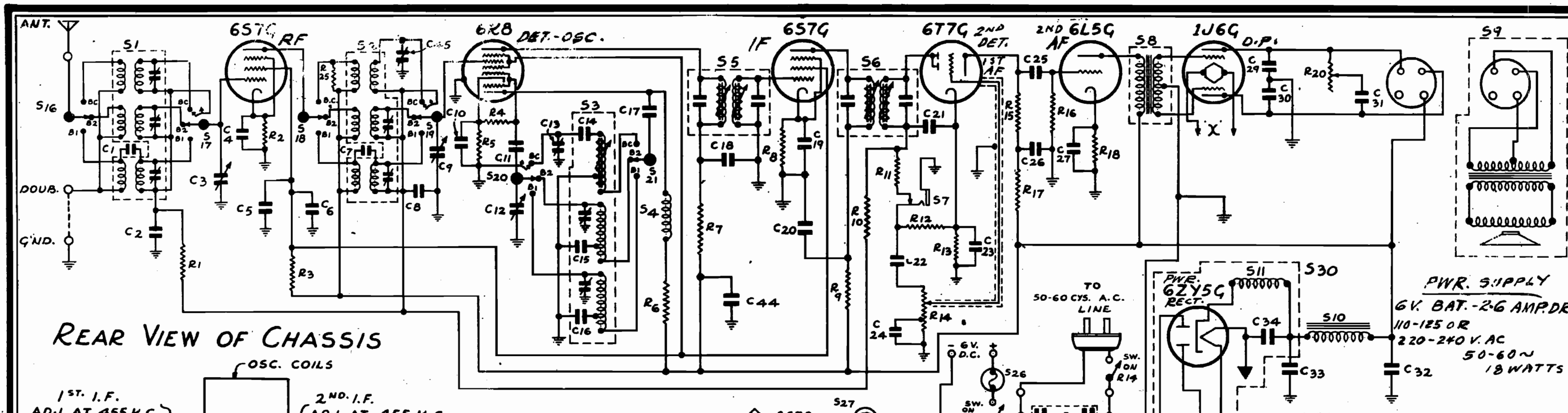
GENERAL SPECIFICATIONS.

Circuit Battery-powered Super-Heterodyne, for operation with a conventional antenna, or as a portable receiver with self-contained loop antenna. Two tuning ranges as listed below. Permeability tuned IF transformers. Permanent magnet speaker. Automatic Volume control, Class A output stage.

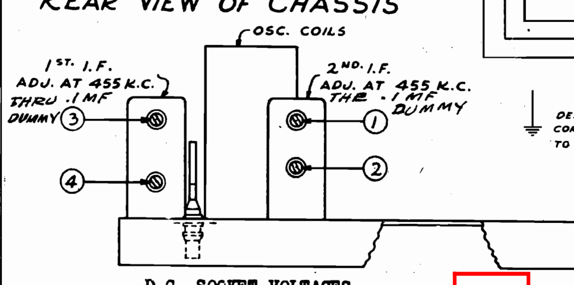
PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-12
MATERIAL
SCALE
DATE 1-11-39
DRAWN BY B.R.
CHECKED BY
APPROVED BY J.S.E.
DRWG NO 25216

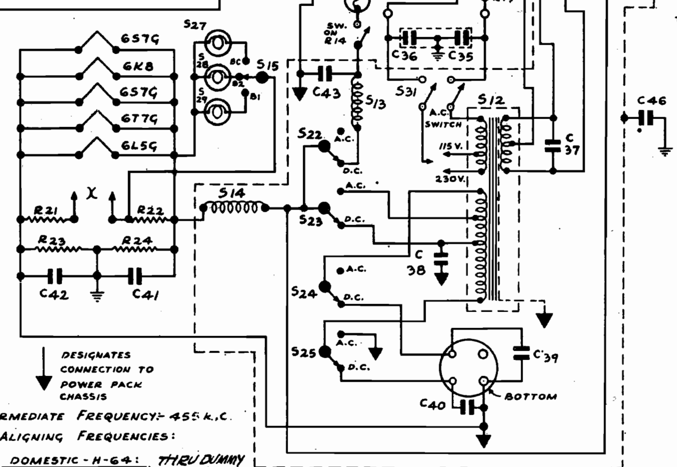
PILOT RADIO CORP.

MODEL H-64
Chassis H60
Schematic, Voltage
Socket, Trimmers
Alignment



REAR VIEW OF CHASSIS





DESIGNATES CONNECTION TO SET CHASSIS

DESIGNATES CONNECTION TO POWER PACK CHASSIS

INTERMEDIATE FREQUENCY: 455 K.C.

ALIGNING FREQUENCIES:

DOMESTIC - H-64: THRU DUMMY

B1 - 23 MEGACYCLES "400 Ω RES

B2 - 9 " 400 Ω RES

B.C. - 1500 & 600 K.C. .0002 MF

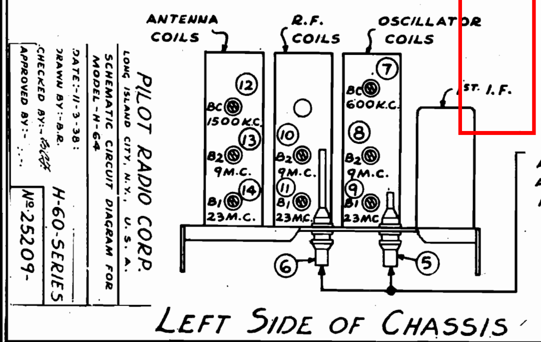
D.C. SOCKET VOLTAGES

Tube		Socket Terminals 1	2	3	4	5	6	7	8
R.F.	6S7-G	-	-	145	62.5	2.5	-	-	2.5
1st Det.	6K8	-	-	150	62.5	-	140	-	1.6
I.F.	6S7-G	-	-	145	62.5	2.7	-	-	2.7
2nd Det.	6T7-G	-	-	80	-	-	-	-	1.2
A.F.	6L5-G	-	-	125	-	-	-	-	5.7
A.F.	1J6-G	-	-	145	-	-	145	-	0
Rect.	6ZY5-G	-	-	-	-	-	-	-	150

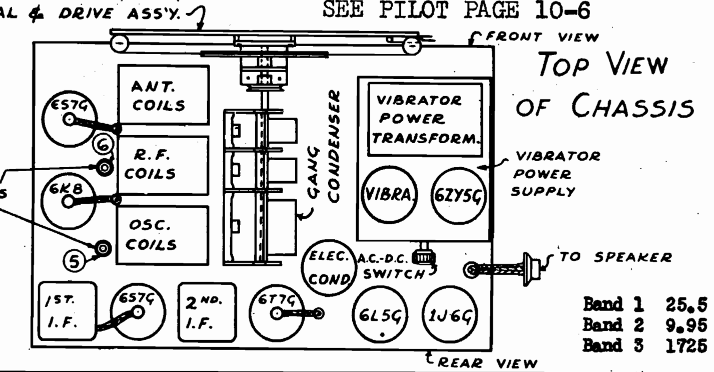
All voltage measurements are those between the indicated tube terminal and the chassis, and are made with a 1000 ohms per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

FOR ALIGNMENT PROCEDURE SEE PILOT PAGE 10-6

DIAL & DRIVE ASS'Y.



LEFT SIDE OF CHASSIS



TOP VIEW OF CHASSIS

CONDENSERS FOR MODEL-H-64		
C1	27737-O	.00001 MFD. MICA
C2, C8	22055-I	.05 MFD. 200 V. PAPER
C3, C9, C12	83359	GANG CONDENSER
C4, C10, C19	22055-M	.1 MFD. 200 V. PAPER
C5, C32, C33	23600-C	5-30-10 MFD. 300 V. ELECTRO.
C6, C26	22055-L	.1 MFD. 400 V. PAPER
C7.	28115-O	.000015 MFD. MICA
C11	27723-O	.00005 MFD. MICA
C13, C45	83415	20 MMFDS. AIR TRIMMER
C14	92000-C	450 MMFDS. SILVER CAP PAD.
C15	27732	.0016 MFD. MICA
C16	28023-W	.0038 MFD. MICA
C17	27704-W	.002 MFD. MICA
C18, C20, C44	22055-P	.05 MFD. 400 V. PAPER
C21	27701-O	.00025 MFD. MICA
C22, C25	22055-W	.01 MFD. 400 V. PAPER
C23, C27	23500-B	10 MFDS. 25 V. MIDGET ELEC.
C24	22055-AY	.001 MFD. 200 V. PAPER
C29, C30	22055-K	.002 MFD. 600 V. PAPER
C31	22055-AJ	.03 MFD. 600 V. PAPER
C46	22490-F	.5 MFD. 50 V.-H.F. PAPER
C34, C39, C40	22055-A	.01 MFD. 600 V. PAPER
C35, C36	78503	.01-.01 MFD. 1000 V. SHIELDED
C37	22055-U	.01 MFD. 1000 V. PAPER
C38, C43	22492-B	.5 MFD. 50 V. PAPER
C41 C42	22492-B	.5 MFD. 50 V. PAPER

RESISTORS FOR MODEL-H-64		
R1, R17	13031	100,000 OHMS 1/4 WATT
R2	13115	400 OHMS 1/4 WATT
R3, R13	13074	20,000 OHMS 1/4 WATT
R4	13164	50,000 OHMS 1/4 WATT
R5	13203	200 OHMS 1/4 WATT
R6, R7, R9	13028	1000 OHMS 1/4 WATT
R8	13131	600 OHMS 1/4 WATT
R10	13001	1 MEGOHM 1/4 WATT
R11, R12	13043	150,000 OHMS 1/4 WATT
R14	83763	1 MEGOHM VOLUME CONTROL & D.P.S.T. SWITCH
R15	13147	300,000 OHMS 1/4 WATT
R16	13024	500,000 OHMS 1/4 WATT
R18, R25	13133	3,000 OHMS 1/4 WATT
R20	83447-C	100,000 OHMS TONE CONT.
R21	83656-B	8.5 OHMS 1/2 WATT. FLEX.
R22	83656-C	11.1 OHMS 1/2 WATT. FLEX.
R23, R24	13028	1000 OHMS 1/4 WATT
S26	70053-M	5 AMP. FUSE
S27, S28, S29	72127	PILOT LIGHT 2V.-.06 AMP.

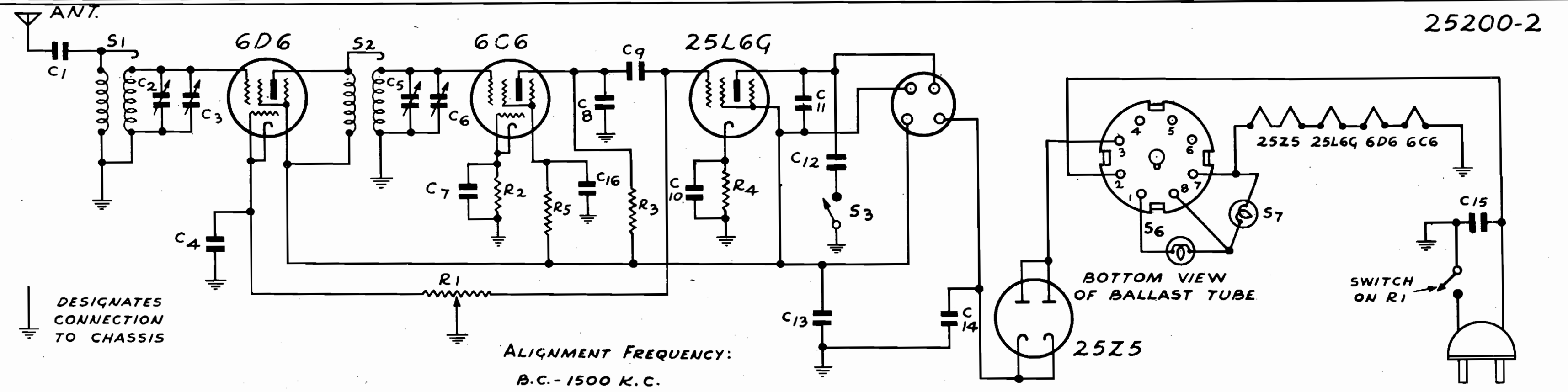
Band 1	25.5 - 8.85 mc.	11.7 - 33.9 meters
Band 2	9.95 - 2.96 mc.	30.1 - 101.3 meters
Band 3	1725 - 520 kc.	174 - 576 meters

PILOT RADIO CORP.
LONG ISLAND CITY, N.Y., U.S.A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-64
DATE:-11-3-38:
DRAWN BY:-B.R.
CHECKED BY:-
APPROVED BY:-
H-60-SERIES
No. 25209-

MODEL H-141
Schematic, Socket
Voltage, Trimmers
Alignment

PILOT RADIO CORP.

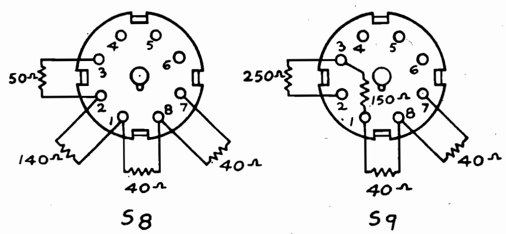
25200-2

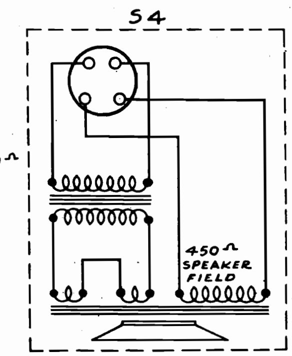


DESIGNATES CONNECTION TO CHASSIS

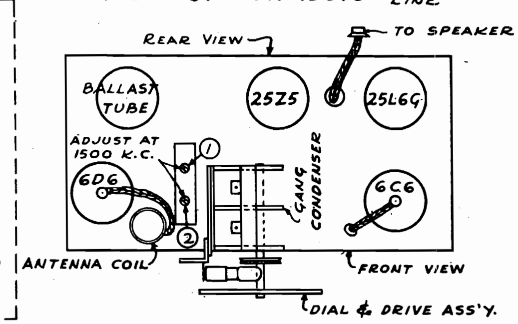
ALIGNMENT FREQUENCY:
B.C. - 1500 K.C.

CONDENSERS FOR MODEL-H-141		
C1	27726	200 MMFDS. MICA
C2, C5	70969-E	TRIMMER ASS'Y.
C3, C6	79664	GANG CONDENSER
C4	22055-I	.05 MFD. 200V. PAPER
C7, C10	23500-B	10 MFD. 25V. MIDGET TUB
C8	28016-O	.0001 MFD. MICA
C9	22055-W	.01 MFD. 400V. PAPER
C11	22055-AJ	.03 MFD. 600V. PAPER
C12	22055-AB	.1 MFD. 600V. PAPER
C13, C14	23500-A	16 MFD. 150V. MIDGET TUB
C15	22055-AF	.05 MFD. 1000V. PAPER
C16	22055-Z	.02 MFD. 400V. PAPER





TOP VIEW OF CHASSIS



RESISTORS FOR MODEL-H-141		
R1	83625	1/2 MEGOHM VOL. CONT. & SW.
R2	13183	36,000 OHMS 1/4 WATT
R3	13024	500,000 OHMS 1/4 WATT
R4	13055	150 OHMS 1/2 WATT
R5	13007	2 MEGOHMS 1/4 WATT

MISCELLANEOUS FOR MODEL-H-141		
S1	73214	ANTENNA COIL ASS'Y.
S2	73215	DETECTOR COIL ASS'Y.
S3	71657-B	TONE CONTROL
S4	40852	5" A.C.-D.C. SPEAKER-450Ω FIELD
S6, S7	71282	DIAL LAMP
S8	81974	BALLAST TUBE 110/125 V
S9	81975	BALLAST TUBE 220/240 V

ALTERATIONS (2) ADDED C16 & R5.- C.O.#2188.-B.R.-8-30-38. | FINISH

CLASSIFICATION: MODEL-H-141 | THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO | DO NOT SCALE THIS PRINT

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y., U. S. A.
SCHEMATIC CIRCUIT DIAGRAM
FOR MODEL-H-141
MATERIAL
SCALE | DATE 8-22-38
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DRWG No 25200-2

D.C. SOCKET VOLTAGES

	P	SG	Cath
6D6	100	100	21*
6C6	-*	8	8
25L6-G	95	100	8
25Z5	-	-	110

The above figures are for a supply voltage of 115 volts, on 230 volt operation they will be 10% higher.
* Cannot be measured.

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION, VOL. VIII

Panel Controls   Volume control with On-Off Power Supply switch, Tuning Control, Tone Control.

Maximum Power Output   1.25 Watts with 81974 ballast tube.
1.50 watts with 81975 ballast tube.

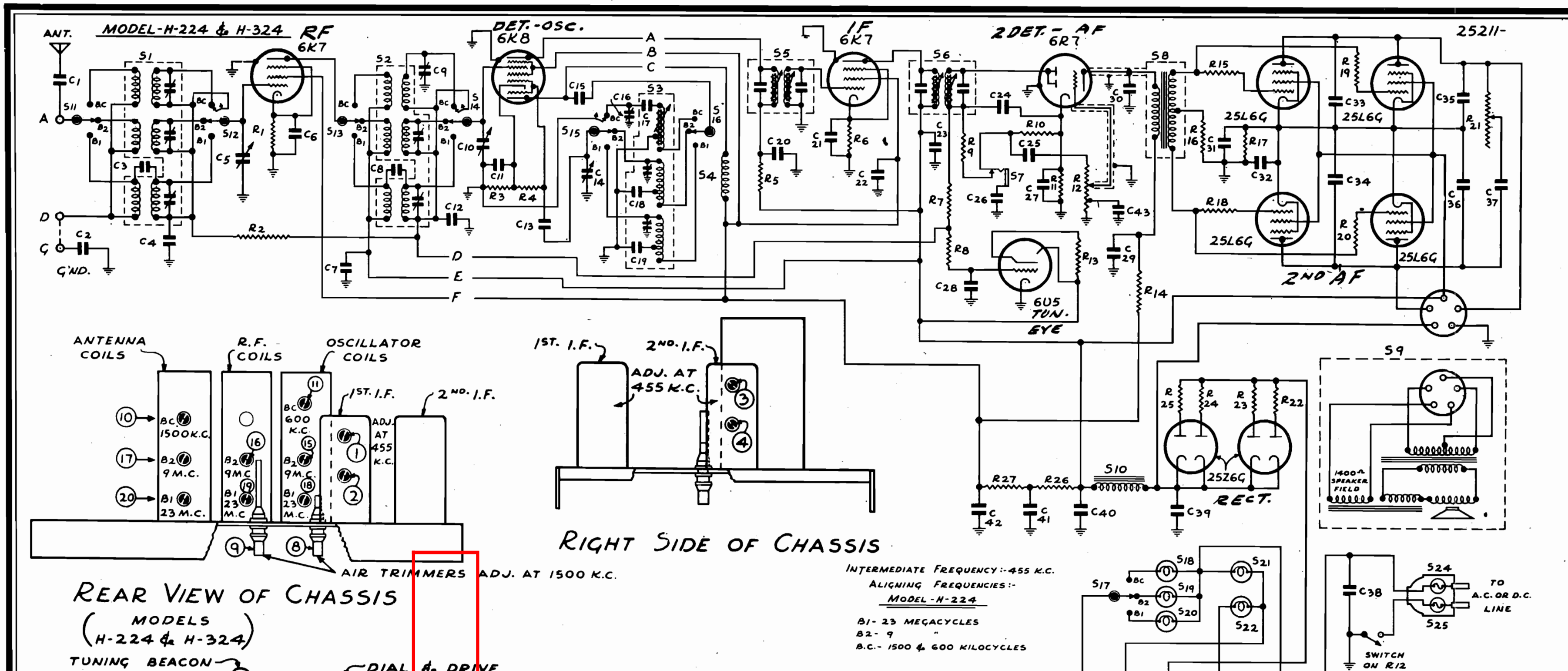
PILOTUBES Required   One 6K6 RF Amplifier, one 6C6 Detector, one 25L6-G Output Tube, and one 25Z5 power supply rectifier.

Power Supply

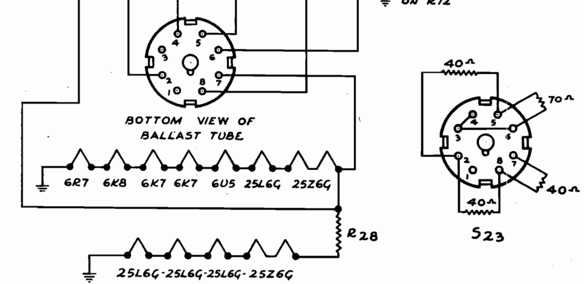
Voltage	Watts	Ballast Tube
110-125 AC or DC	40	#81974
220-240 AC or DC	90	#81975

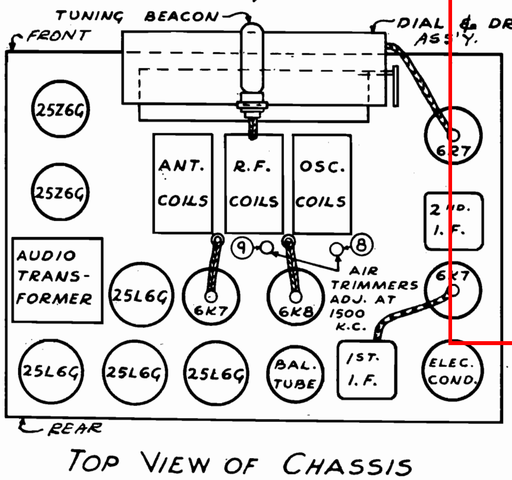
PILOT RADIO CORP.

MODELS H-224, Chassis H-220
H-324, Chassis H-320
Schematic, Voltage, Socket
Trimmers, Alignment



INTERMEDIATE FREQUENCY:- 455 K.C.
ALIGNING FREQUENCIES:-
MODEL-H-224
B1- 23 MEGACYCLES
B2- 9 "
B.C.- 1500 & 600 KILOCYCLES





TOP VIEW OF CHASSIS

CONDENSERS FOR MODEL-H-224 & H-324		
C1, C2, C33, C34, C35, C36	22055-R	.005 MFD. 1000V. PAPER
C3	27737-0	10 MMFDS. MICA
C4, C12	22055-I	.05 MFD. 200V. PAPER
C5, C10, C14	83863	GANG CONDENSER
C6, C11, C21	22055-M	.1 MFD. 200V. PAPER
C7, C22	22055-P	.05 MFD. 400 V. PAPER
C8	28115	15 MMFDS. MICA ±10% T.
C9, C16	83415	20 MMFDS. AIR TRIMMER
C13	27723-0	50 MMFDS. MICA
C15	27704	.002 MFD. MICA
C17	92000-C	450 MMFDS. SILVER CAP
C18	27732	.0016 MFD. MICA
C19	28023-W	.0038 MFD. MICA
C20	22055-Z	.02 MFD. 400V. PAPER
C23	22055-L	.1 MFD. 400 V. PAPER
C24	27701-0	.00025 MFD. MICA
C25	22055-W	.01 MFD. 400V. PAPER
C26	22055-S	.5 MFD. 200V. PAPER
C27	23500-B	10 MFD. 25 V. ELECTRO.
C28	22055-T	.01 MFD. 200V. PAPER
C29, C41, C42	23600-A	10-10-10 MFD. 300V. ELEC.
C30	27726	.0002 MFD. MICA
C31	23500-G	30 MFD. 25 V. ELECTRO.
C32	27746-W	.001 MFD. MICA
C37	22055-AB	.1 MFD. 600V. PAPER
C38	22055-U	.01 MFD. 1000V. PAPER
C39, C40	23600-B	40-40 MFD. 300V. ELEC.
C43	22055-AY	.001 MFD. 200 V. PAPER

RESISTORS FOR MODEL-H-224 & H-324		
R1, R6	13115	400 OHMS 1/4 WATT
R2	13031	100,000 OHMS 1/4 WATT
R3	13203	200 OHMS 1/4 WATT
R4, R9	13164	50,000 OHMS 1/4 WATT
R5, R14, R26, R27	13028	1,000 OHMS 1/4 WATT
R7	13001	1 MEGOHM 1/4 WATT
R8	13007	2 MEGOHMS 1/4 WATT
R10	13171	250,000 OHMS 1/4 WATT
R11, R15, R18, R19, R20	13012	500 OHMS 1/4 WATT
R12	83529-A	1 MEGOHM VOL. CONT. & SW.
R13	13024	500,000 OHMS 1/4 WATT
R16	13030	10,000 OHMS 1/4 WATT
R17	83014	65 OHMS 2 WATT VITREOUS
R21	79209-B	10,000 OHMS TONE CONT.
R22, R23, R24, R25	13207	100 OHMS 1 WATT
R28	83038	50 OHMS 10 WATT VITREOUS

PILOT RADIO CORP.
LONG ISLAND CITY, N.Y., U. S. A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODELS-H-224 & H-324.
DATE:- 11-16-38
DRAWN BY:- B.R.
CHECKED BY:- [illegible]
APPROVED BY:-
No. 25211-

D.C. SOCKET VOLTAGES
Socket Terminals

Tube	1	2	3	4	5	6	7	8
6K7	-	-	95	75	2.45	-	-	2.45
6K8	-	-	93	75	-	74	-	1.8
6K7	-	-	95	75	2.1	-	-	2.1
6R7	-	-	62	-	-	-	-	1.5
25L6-G	-	-	94	104	-	-	-	7.7
25Z6-G	-	-	-	104	-	-	-	104

MODELS H-224, Chassis H-220
H-324, Chassis H-320
Alignment Procedure

PILOT RADIO CORP.

PILOTUBES Required.

One	6K7	R.F. Amplifier
One	6K8	1st Detector-Oscillator
One	6K7	I.F. Amplifier
One	6R7	2nd Detector-AVC-1st Audio Amplifier
Four	25L6-G	Output Tubes
Two	25Z6-G	Power Supply Rectifiers
One	6U5	Cathode Ray Tuning Beacon

Power Supply. A.C. or D.C.

Voltage	Ballast Tubes	Watts
110-125	81973	110

Intermediate Frequency. 455 kc.

Panel Controls. Volume with On-Off switch, Tone, Band Selector Switch, Manual Tuning Control and an 8 key mechanically operated PIANO TUNING mechanism, with key locking knob. The PIANO TUNING mechanism is only on the H-320 series.

TUNING RANGES. The models H-324 and H-224 chassis have the following tuning ranges:

Band 1	8.72 - 25.5 mc.	or	11.8 - 34.4 meters
Band 2	2.96 - 9.95 mc.	or	30.2 -101.4 meters
Band 3	520 - 1725 kc.	or	174 - 577 meters

Maximum Power Output. 6 watts

SERVICE DATA

Removal of the chassis from the cabinet, when necessary is done as follows:

1. Remove the power supply cord from the supply outlet.
2. Remove the knobs and felt washers from all shafts on the front of the cabinet. These knobs, except the "locking" knob, are of the "push-on" type.
3. Remove the back of the cabinet.
4. Remove the speaker cord from the socket on the speaker.
5. Remove the four mounting screws located under the cabinet, and carefully slide the chassis out of the cabinet.

RECEIVER ALIGNMENT

Equipment Required.

1. Signal Generator. One using fundamental frequencies for all the frequencies used in the receiver is preferred.
2. Output Meter. Generally a copper-oxide rectifier meter is the most convenient.

Dummy Antennas. .1 mfd. condenser
.0002 mfd. mica condenser
400 ohm, non-inductive resistor

Alignment Connections.

The posts marked "D" and "G" on the rear of the chassis should be connected to the ground side of the signal generator.

Connect the "hot" post of the signal generator through the .1 mfd. condenser to the grid of the 6K8 detector-oscillator tube or the 6K7 I.F. Amplifier tubes when aligning the I.F. amplifier.

Connect the "hot" post of the signal generator through the 200 mmf. condenser to the post marked "A" on the rear of the chassis when aligning the Long-Wave and Broadcast Bands. Use the same connections for both short-wave bands, but replace the 200 mmf. condenser with the 400 ohm, non-inductive resistor.

In all measurements, connect the output meter through .1 mfd. 600 volt condensers, from plate to plate terminals of the 25L6-G tubes, as this is a push-pull amplifier.

Procedure.

The volume and tone controls should be turned to the extreme clockwise positions, before starting.

The location of all trimmers is shown in the accompanying figure. Always keep the output from the signal generator at the lowest value which will give a readable deflection on the output meter.

I.F. Amplifier Alignment.

Turn the Band Selector Switch to Band 3 and turn the ROTOR dial to the low frequency end.

Connect the output meter as described under "Connections" and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd. condenser. Then proceed with the alignment as follows:

1. Adjust the signal generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the screws 1, 2, 3, and 4 (see figure), for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the I.F. amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the I.F. amplifier tube, and align the last I.F. transformer. Always finish the alignment with the signal input to the 6K8 tube.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

R.F. Alignment

Band 3 (Model H-324 and H-224)

Connect the "hot" terminal of the generator to the antenna post marked "A" through the .0002 mfd. condenser.

Set the generator frequency to 1500 kc., and the ROTOR dial to the same frequency, with the Band Selector Switch set appropriately. Adjust trimmer #8 for maximum reading of the output meter. (This trimmer is adjusted by moving the brass rod in or out, with a hooked wire, and with a twisting motion. First loosen the lock nut). Then without touching any tuning controls adjust trimmers #9 and #10 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc. and accurately set the ROTOR dial to the 600 kc. mark. Then adjust trimmer #11 for maximum reading of the output meter. Do not move the tuning control while making this adjustment. Finally return and repeat the 1500 kc. adjustments and then tighten the lock nut on trimmers #8 and #9.

Band 2 (Model H-324 & H-224 Short-Wave)

Remove the .0002 mfd. dummy antenna used in aligning the lower frequency bands and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator, and the ROTOR dial to 9 mc. Adjust trimmer #15 for maximum reading of the output meter. Be careful you do not tune in at the Image Frequency.

Then adjust trimmers #16 and #17 for maximum reading of the output meter, while slightly "rocking" the gang condenser. Readjust trimmer #15 if necessary to correct the calibration.

Band 1 (Model H-324 & H-224 Short-Wave)

Connections and dummy antenna are the same as on Band 1 above.

Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 23 mc. and the ROTOR dial to 23 mc. Adjust trimmer #18 to 23 mc. for maximum reading of the output meter. Be careful that the receiver is not adjusted to the Image Frequency. Then adjust trimmers #19 and #20 while "rocking" the gang condenser, for maximum reading of the output meter. Reset trimmer #18 so that calibration is correct if necessary.

Image Frequency

All bands in these two models must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in doing this on the Long-Wave and Broadcast Bands. However, on the higher frequency bands it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver, seperated by twice the Intermediate Frequency, set the ROTOR dial to that one which comes in at the higher frequency marking on the ROTOR dial.

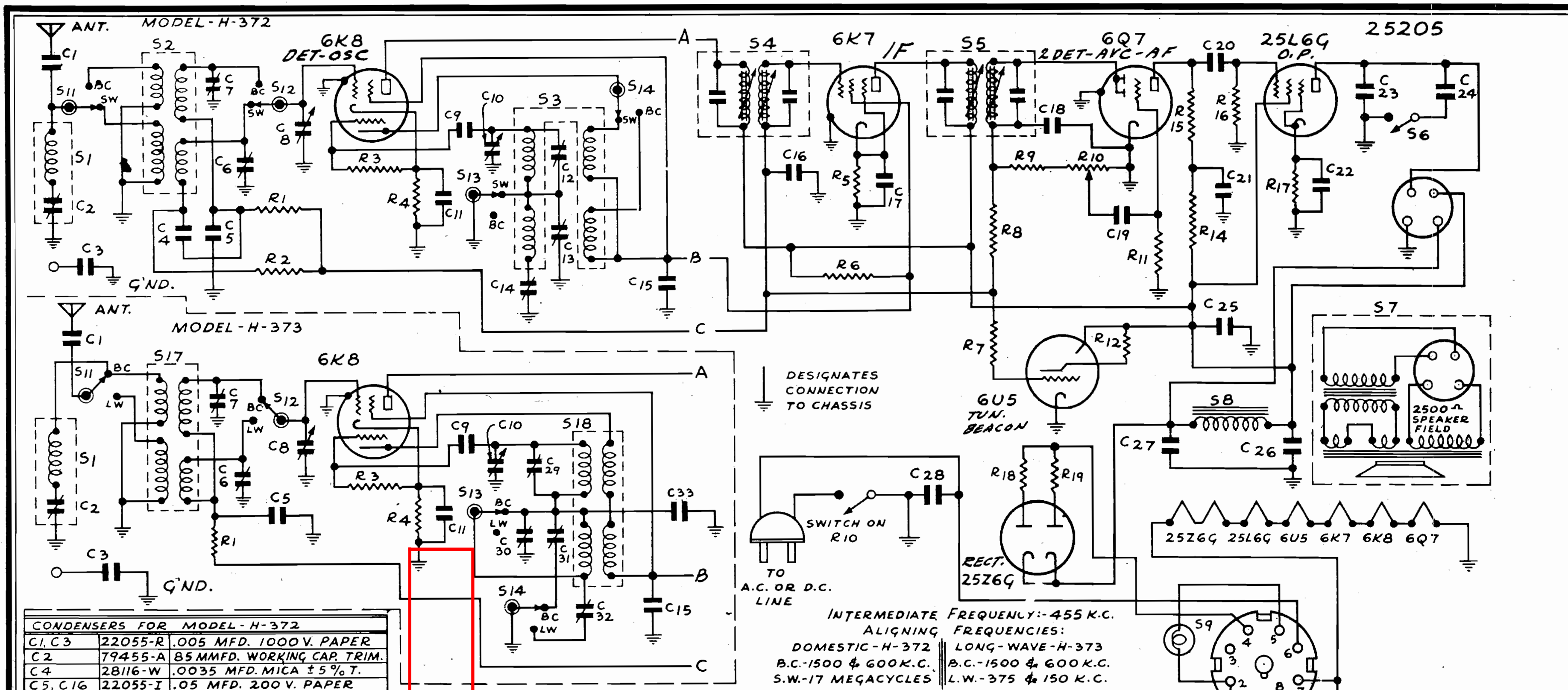
Miscellaneous Service Notes.

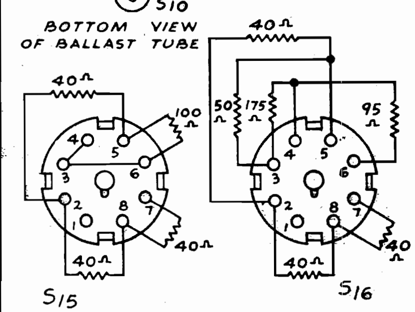
If a howling noise (sometimes referred to as Microphonic Howl) is heard, it is very probably because the four red screws under the cabinet have not been removed, along with the two narrow metal strips between the chassis and the bottom of the cabinet. These strips and screws are only intended as additional bracing during shipment, and must be removed before the receiver is put in operation.

The howl can also be caused by a defective tube, or when some part of the receiver which is rigidly fastened to the chass rubs against the cabinet. The remedy is obvious.

PILOT RADIO CORP.

MODELS H-372, H-373, Chassis H370
Schematic





CONDENSERS FOR MODEL-H-372		
C1, C3	22055-R	.005 MFD. 1000 V. PAPER
C2	79455-A	85 MMFD. WORKING CAP. TRIM.
C4	28116-W	.0035 MFD. MICA ±5% T.
C5, C16	22055-I	.05 MFD. 200 V. PAPER
C6, C7	70969-J	TRIMMER ASS'Y.
C8, C10	79664-B	GANG CONDENSER
C9	27723-O	50 MMFD. MICA
C11, C17	22055-M	.1 MFD. 200 V. PAPER
C12, C13	70969-J	TRIMMER ASS'Y.
C14	79431-B	300-500 MMFDS. PADDER
C15	22055-P	.05 MFD. 400 V. PAPER
C18	27701-O	250 MMFD. MICA
C19, C20	22055-W	.01 MFD. 400 V. PAPER
C21, C25	22055-L	.1 MFD. 400 V. PAPER
C22	22481	10 MFD. 25 V. ELECTRO.
C23	22055-A	.01 MFD. 600 V. PAPER
C24	22055-C	.05 MFD. 600 V. PAPER
C26, C27	23500-E	30 MFD. 300 V. SMALL TUB.
C28	22055-U	.01 MFD. 1000 V. PAPER

CONDENSERS FOR MODEL-H-373 SAME AS FOR MODEL-H-372, EXCEPT FOLLOWING:		
C4, C12, C13, C14		NOT USED
C29, C30	70969-E	TRIMMER ASS'Y.
C31	72355-C	250-500 MMFDS. PADDER
C32	72355-C	30-150 MMFDS. PADDER
C33	28101-O	.00015 MFD. MICA

RESISTORS FOR MODEL-H-372		
R1, R2, R14	13031	100,000 OHMS 1/4 WATT
R3, R9	13164	50,000 OHMS 1/4 WATT
R4	13203	200 OHMS 1/4 WATT
R5	13115	400 OHMS 1/4 WATT
R6	13086	2000 OHMS 1/2 WATT
R7	13007	2 MEGOHMS 1/4 WATT
R8	13001	1 MEGOHM 1/4 WATT
R10	79540	250,000 OHMS VOL. CONT. & SW.
R11	13237	15 MEGOHMS 1/2 WATT
R12, R16	13024	500,000 OHMS 1/4 WATT
R15	13171	250,000 OHMS 1/4 WATT
R17	13235	150 OHMS 1 WATT
R18, R19	13207	100 OHMS 1 WATT

RESISTORS FOR MODEL-H-373 SAME AS FOR MODEL-H-372, EXCEPT FOLLOWING:		
R2		NOT USED

MISCELLANEOUS FOR MODEL-H-372		
S1	73119	WAVE TRAP ASS'Y.
S2	73240	ANTENNA COIL ASS'Y.
S3	73228	OSCILLATOR COIL ASS'Y.
S4	73192-C	1ST I.F. TRANSFORMER ASS'Y.
S5	73193	2ND I.F. " "
S6	72049	TONE CONTROL SWITCH
S7	40853	6" AC-DC SPEAKER-2500Ω FIELD
S8	79029-A	FILTER CHOKE
S9, S10	71282	DIAL LAMP
S11-TO-S14	79454	BAND SWITCH
S15	81971	BALLAST TUBE 110/125 V.
S16	81972	BALLAST TUBE 220/240 V.

MISCELLANEOUS FOR MODEL-H-373 SAME AS FOR MODEL-H-372, EXCEPT FOLLOWING:		
S2, S3		NOT USED
S17	73241	ANTENNA COIL ASS'Y.
S18	73226	OSCILLATOR COIL ASS'Y.

SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-372 & MODEL-H-373
MATERIAL
SCALE
DATE 9-21-38
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DRWG. NO. 25205

MODELS H-372,H-373
Chassis H-370

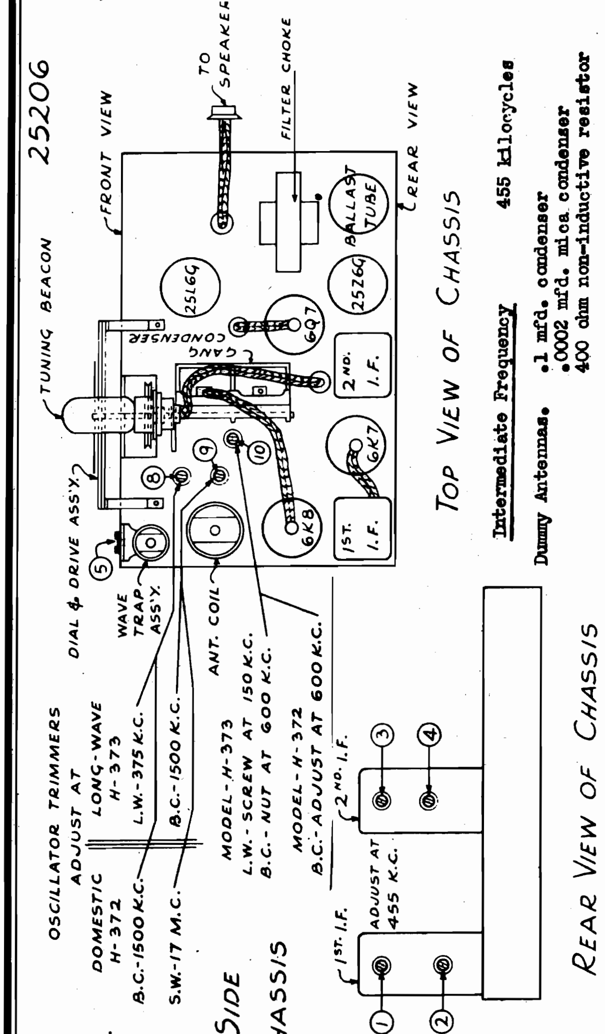
PILOT RADIO CORP.

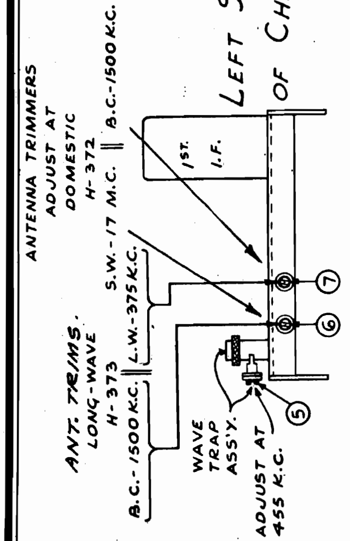
Voltage,Socket,Trimmers
Alignment

IF Amplifier Alignment

1. Adjust the signal generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the trimmer screws 1, 2, 3, and 4, (see figure) for maximum reading of the output meter. Keep reducing the generator output as the output meter reading increases. When the reading of the output meter cannot be increased by adjusting the four screws of the IF transformers, the IF amplifier is aligned.





Intermediate Frequency 455 kilocycles

Dummy Antennas. .1 mfd. condenser
.0002 mfd. mica condenser
400 ohm non-inductive resistor

Maximum Power Output	Watts
with #81971	2.0
with #81976	2.2
with #81972	3.0

Power Supply Voltage	Watts	Ballast Tube
110-125 volts AC-DC	55	81971
150 volts AC-DC	75	81976
220-240 volts AC-DC	115	81972

R.F. Alignment

Long Wave Band (Model H-373)

Connect the "hot" terminal of the generator to the blue antenna wire through the .0002 mfd. condenser.

Set the generator frequency to 375 kilocycles and with the Band Selector Switch set to the Long Wave Band, turn the pointer of the receiver to 375 kilocycles. Adjust trimmer #8 for maximum reading of the output meter. Do likewise with trimmer #7. Then set the generator frequency to 150 kilocycles and the receiver dial pointer to approximately the same frequency. Adjust the screw of trimmer #10 for maximum reading of the output meter, while "rocking" the gang condenser carefully back and forth. Then go back and repeat the 375 kilocycle alignment.

Broadcast, or Medium Wave, Band (Models H-373 and H-372)

Connections are the same for the alignment of this band as they are for the Long Wave Band.

Set the generator frequency to 1500 kilocycles, and the receiver dial pointer to the same frequency, with the Band Selector Switch set appropriately. Adjust trimmer #9 of Model H-373, or trimmer #8 of Model H-372 for maximum reading of the output meter. Also adjust trimmer #6 of Model H-373, or trimmer #7 of Model H-372 for maximum reading of the output meter. Next, set the generator frequency to 600 kilocycles. Then with the receiver dial pointer set at approximately the same frequency, adjust trimmer #10 for maximum reading of the output meter while carefully "rocking" the gang condenser. Finally, return and repeat the 1500 kilocycle adjustment.

Short Wave Band (Model H-372)

When aligning this band connect the "hot" terminal of the signal generator to the blue antenna wire of the receiver through the 400 ohm resistor.

Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 17 mc., and also tune the receiver to this frequency, as marked on the dial.

Carefully adjust trimmer #9 for maximum reading of the output meter. Be careful you do not adjust to the "Image Frequency".

Then adjust trimmer #6 for maximum output meter reading, while slightly "rocking" the gang condenser.

Readjust trimmer #9, if necessary, to keep the calibration correct.

Image Frequency

The Short Wave Band in model H-372 must be aligned with the oscillator frequency lower than the signal frequency. On the high frequency band, it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver, separated by twice the Intermediate Frequency, turn the tuning knob so that the dial pointer points to that one which comes in at the lower frequency marking on the dial.

Wave Trap Alignment

With the Band Selector Switch set on the Broadcast or Medium Wave position, connect the generator to the blue antenna wire, with the .0002 mfd. condenser. Set the generator frequency to 455 kilocycles and adjust trimmer #5 for minimum reading of the output meter. There must always be sufficient output from the Signal Generator to have a reading on the output meter to make this adjustment.

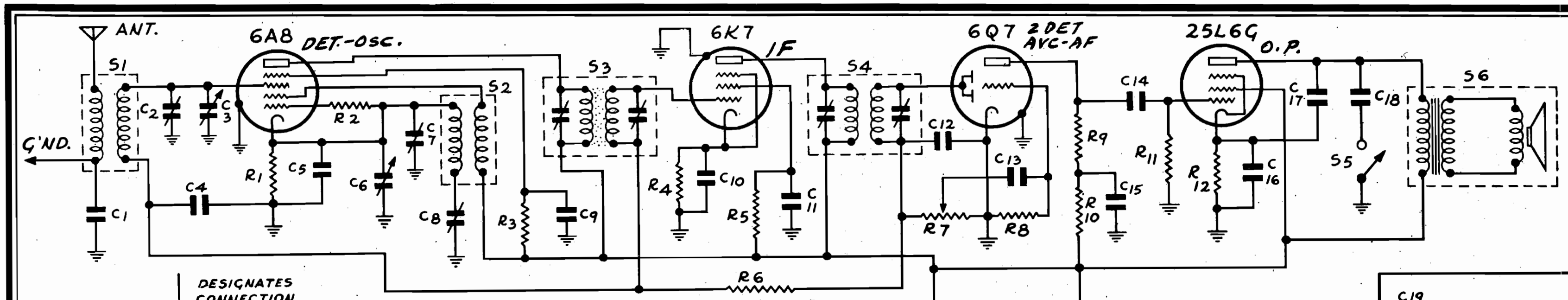
Socket Terminals **D.C. SOCKET VOLTAGES**

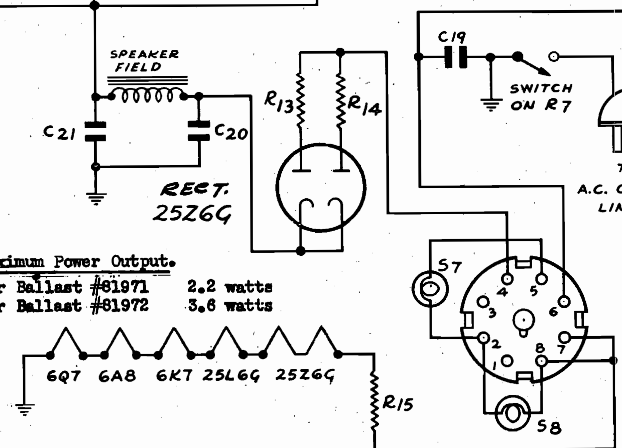
Tube	1	2	3	4	5	6	7	8
6K8	-	-	102(130)	85(110)	-	85(110)	-	2.(2.6)
6K7	-	-	102(130)	85(110)	1.7(2.5)	-	-	1.7(2.5)
6Q7	-	-	45(53)	-				
25L6-G	-	-	96(125)	102(130)	-	-	-	6.5(8.8)
25Z6-G	-	-	-	110(145)	-	-	-	110(145)

Above figures in parenthesis are for Ballast tube #81972.
Figures not in parenthesis are for ballast tube #81971.

PILOT RADIO CORP.

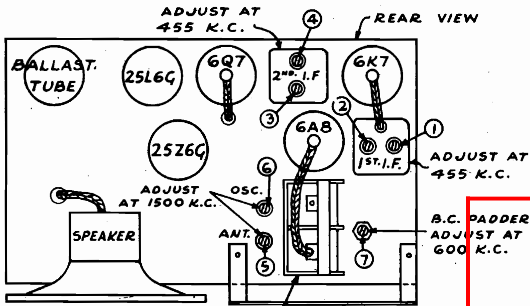
MODELS TH-150, H-151
Chassis H-150
Schematic, Voltage
Socket, Trimmers
Alignment





DESIGNATES CONNECTION TO CHASSIS

INTERMEDIATE FREQUENCY :- 455 K.C.
ALIGNING FREQUENCIES:
B.C.-1500 & 600 K.C.

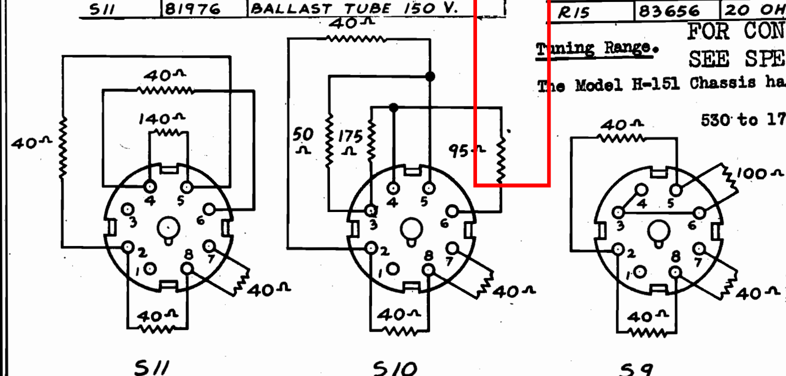


TOP VIEW OF CHASSIS

S6	40860	5" A.C.-D.C. SPEAKER-450Ω FIELD
S7, S8	71282	DIAL LAMP
S9	81971	BALLAST TUBE 110/125 V.
S10	81972	BALLAST TUBE 220/240 V.
S11	81976	BALLAST TUBE 150 V.

CONDENSERS FOR MODEL-H-151		
C1	22055-R	.005 MFD. 1000 V. PAPER
C2, C7	70969-E	TRIMMER ASS'Y.
C3, C6	79664	GANG CONDENSER
C4, C5, C10	22055-I	.05 MFD. 200 V. PAPER
C8	79431-B	300-500 MMFDS. PADDER
C9, C11	22055-Z	.02 MFD. 400 V. PAPER
C12	27726-O	.0002 MFD. MICA
C13, C14	22055-W	.01 MFD. 400 V. PAPER
C15, C22	22055-L	.1 MFD. 400 V. PAPER
C16	23500-B	10 MFD. 25 V. ETCH FOIL ELECT.
C17	22055-A	.01 MFD. 600 V. PAPER
C18	22055-AB	.1 MFD. 600 V. PAPER
C19	22055-C	.05 MFD. 600 V. PAPER
C20	23500-F	16 MFD. 300 V. ETCH FOIL ELECT.
C21	23500-E	30 MFD. 300 V. ETCH FOIL ELECT.

RESISTORS FOR MODEL-H-151		
R1, R4	13115	400 OHMS 1/4 WATT
R2	13164	50,000 OHMS 1/4 WATT
R3	13186	25,000 OHMS 1/4 WATT
R5	13074	20,000 OHMS 1/4 WATT
R6	13001	1 MEGOHM 1/4 WATT
R7	79429	500,000 OHMS VOL. CONT. & SW.
R8	13237	15 MEGOHMS 1/2 WATT.
R9	13171	250,000 OHMS 1/4 WATT
R10	13031	100,000 OHMS 1/4 WATT
R11	13024	500,000 OHMS 1/4 WATT
R12	13240	150 OHMS 1 WATT ±10% T
R13 & 14	13207	100 OHMS 1 WATT
R15	83656	20 OHMS 2 WATT FLEXIBLE



FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION, VOL. VIII

Tuning Range.
The Model H-151 Chassis has the following tuning range:
530 to 1720 kc or 566 to 174 meters

Maximum Power Output.
For Ballast #81971 2.2 watts
For Ballast #81972 3.6 watts

Power Supply.

Voltage	Ballast Tube Number	Watts
110 to 125 volts	#81971	45
150 volts	81976	60
220 to 240 volts	81972	100

D.C. SOCKET VOLTAGES

All voltages are those between the indicated tube terminal and the chassis, and are made with a 1000 ohm per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

Make sure that the AC or DC supply voltage is correct for the Ballast tube being used at the time of measurement.

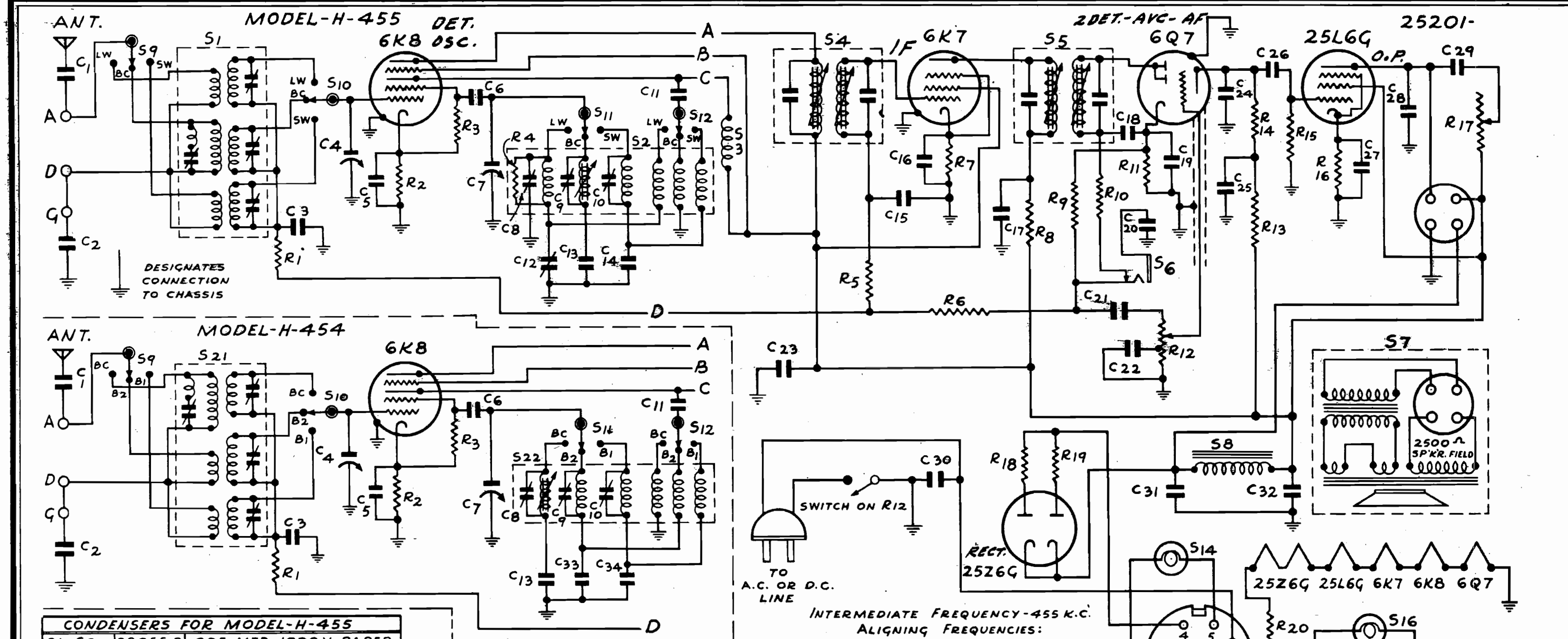
Tube	1	2	3	4	5	6	7	8
	Socket Terminals							
6A8	-	-	95(145)	52(87)	-	95(145)	-	1.7(2.6)
6K7	-	-	95(145)	65(110)	2.(3.1)	-	-	2(3.1)
6Q7	-	-	-	-	-	-	-	-
25L6-G	-	-	90(135)	95(145)	-	-	-	5.7(9.0)

Figures in parenthesis are for ballast tube #81971
Figures not in parenthesis are for ballast tube #81972

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-151
MATERIAL
SCALE DATE 10-12-38
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DRWG No 25208

MODELS H-454, H-455
Chassis H-450
Schematic

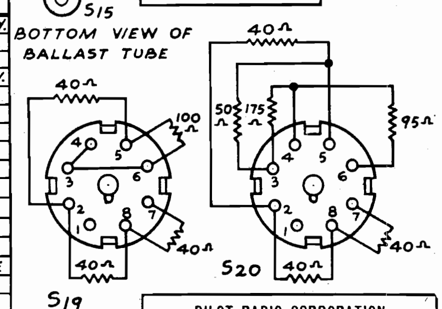
PILOT RADIO CORP.



INTERMEDIATE FREQUENCY-455 K.C.
ALIGNING FREQUENCIES:

LONG-WAVE H-455
- S.W. - 18 MEGACYCLES
- B.C. - 1500 & 600 K.C.
- L.W. - 300 & 175 K.C.

DOMESTIC H-454
- B1 - 24 MEGACYCLES
- B2 - 9 MEGACYCLES
- B.C. - 1500 & 600 K.C.



CONDENSERS FOR MODEL-H-455		
C1, C2	22055-R	.005 MFD. 1000 V. PAPER
C3, C15	22055-T	.01 MFD. 200 V. PAPER
C4, C7	83628	GANG CONDENSER
C5, C16	22055-M	.1 MFD. 200 V. PAPER
C6	27723-0	.00005 MFD. MICA
C8, C12	83416	DOUBLE TRIMMER BASE
C9	83415	AIR TRIMMER
C10	72283-A	TRIMMER ASS'Y.
C11	27704-W	.002 MFD. MICA
C13	92000-D	400 MMFD. SILVER CAP
C14	28106	.00325 MFD. MICA
C17, C21, C26	22055-W	.01 MFD. 400 V. PAPER
C18	27701-0	.00025 MFD. MICA
C19, C27	22481	10 MFD. 25 V. ELECTRO.
C20	22055-F	.25 MFD. 200 V. PAPER
C22	22055-AY	.001 MFD. 200 V. PAPER
C23, C25	22055-L	.1 MFD. 400 V. PAPER
C24	27701-W	.00025 MFD. MICA
C28, C30	22055-U	.01 MFD. 1000 V. PAPER
C29	22055-AB	.1 MFD. 600 V. PAPER
C31, C32	85039	30-40 MFD. 300 V. ELECT.
CONDENSERS FOR MODEL-H-454 SAME AS FOR MODEL-H-455, EXCEPT FOLLOWING:		
C12, C14		NOT USED
C33	27704-W	.002 MFD. MICA
C34	28106	.00325 MFD. MICA

RESISTORS FOR MODEL-H-455		
R1, R5, R10	13031	100,000 OHMS 1/4 WATT
R13		
R2	13018	150 OHMS 1/4 WATT
R3	13164	50,000 OHMS 1/4 WATT
R4	13230	33,000 OHMS 1/4 WATT
R6	13001	1 MEGOHM 1/4 WATT
R7	13115	400 OHMS 1/4 WATT
R8	13028	1,000 OHMS 1/4 WATT
R9	13171	250,000 OHMS 1/4 WATT
R11	13030	10,000 OHMS 1/4 WATT
R12	83529-C	1 MEGOHM VOL. CONT. & SW.
R14	13043	150,000 OHMS 1/4 WATT
R15	13024	500,000 OHMS 1/4 WATT
R16	13055	150 OHMS 1/2 WATT
R17	83447-C	100,000 OHMS TONE CONT.
R18, R19	13207	100 OHMS 1 WATT
R20	83656	20 OHMS 2 WATT FLEXI.
RESISTORS FOR MODEL-H-454 SAME AS FOR MODEL-H-455, EXCEPT FOLLOWING:		
R4		NOT USED

MISCELLANEOUS FOR MODEL-H-455		
S1	73172	ANTENNA COILS & CAN ASS'Y.
S2	73179-B	OSCILLATOR COILS ASS'Y.
S3	73088	R.F. "B" CHOKE
S4	73192-C	1ST. I.F. TRANSFORMER ASS'Y.
S5	73193	2ND. I.F. " "
S6	70950	PHONO JACK
S7	40855	8" SPEAKER-2500 Ω FIELD
	40817	12" SPEAKER-2500 Ω FIELD
S8	79029-A	FILTER CHOKE
S9-TO-S13	83414-B	BAND SWITCH
S14-TO-S18	71282	DIAL LAMPS
S19	81971	BALLAST TUBE 110/125 V.
S20	81972	BALLAST TUBE 220/240 V.
MISCELLANEOUS FOR MODEL-H-454 SAME AS FOR MODEL-H-455, EXCEPT FOLLOWING:		
S1, S2		NOT USED
S21	73177	ANTENNA COILS & CAN ASS'Y.
S22	73178-C	OSCILLATOR COILS ASS'Y.

Intermediate Frequency 455 kilocycles

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-454 & MODEL-H-455
MATERIAL
SCALE
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DATE 8-29-38
DRWG NO 25201-

MODELS H-454,H-455
Chassis H-450
Socket,Trimmers
Voltage

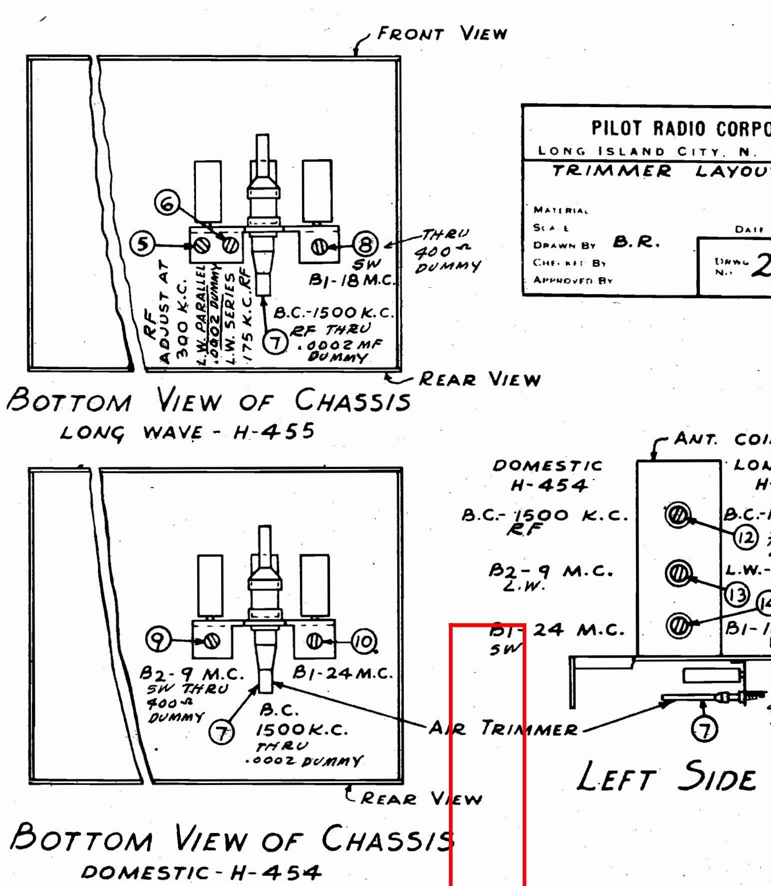
PILOT RADIO CORP.

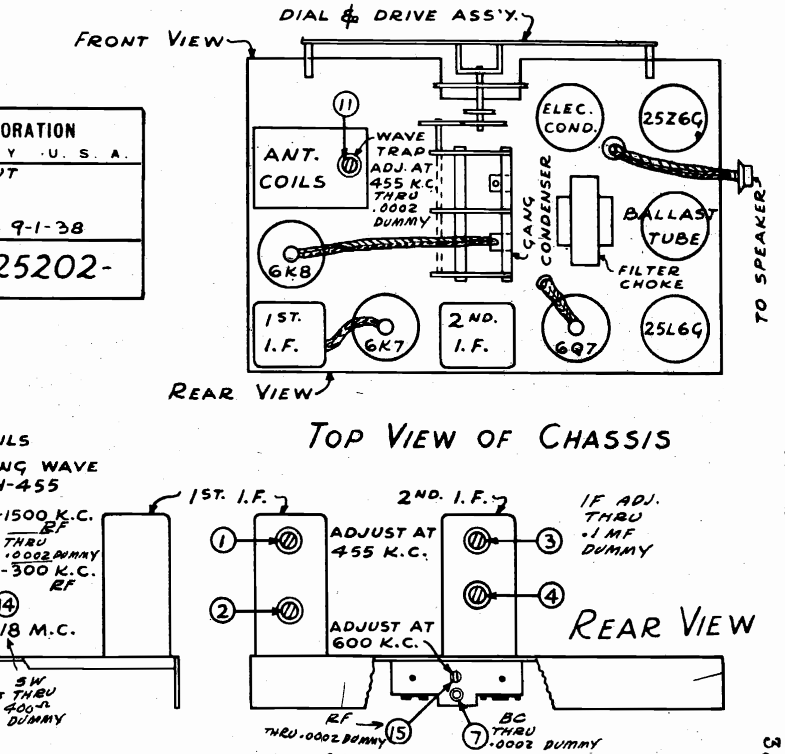
Power Supply

Voltage	Watts	Ballast Tube
110 to 125 volts AC-DC	50	81971
220 to 240 volts AC-DC	115	81972

Circuit Super-Heterodyne, with Class A output stage. Three tuning ranges as listed below. Permeability tuned IF transformers. Tone compensated volume control. Continuously variable tone control, Automatic Volume Control.

Maximum power Output
2.0 watts with 81971 ballast tube
3.4 watts with 81972 ballast tube





D.C. SOCKET VOLTAGES

All voltages are those between the indicated tube terminal and the chassis, and are made with a 1000 ohm per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

Make sure that the AC or DC supply voltage is correct for the ballast tube being used at the time of measurement.

Numbers in parentheses indicate use of ballast tube 81972.

Socket Terminals

Tube	1	2	3	4	5	6	7	8
6K8	--	--	95(125)	95(125)	--	95(125)	--	2.3(3)
6K7	--	--	88(115)	95(125)	--	3(4)	--	3(4)
6Q7	--	--	60 (80)	--	--	--	--	1.(1.)
25L6-G	--	--	91(119)	95(125)	--	--	--	6(8.2)
25Z6-G	--	--	--	110(140)	--	--	--	110(140)

Tuning Ranges The model H 454 Chassis has the following tuning ranges:

Band 1	24.8 to 8.3 mc	or	12.09 to 36.12 meters
Band 2	9.7 to 2.9 mc	or	30.9 to 103 meters
Band 3	1725 to 530 kc	or	174 to 566 meters

The model H 455 Chassis has the following tuning ranges:

Band 1	18.8 to 5.35 mc	or	15.9 to 56.04 meters
Band 2	1725 to 530 kc	or	174 to 566 meters
Band 3	375 to 145 kc	or	800 to 2069 meters

MODELS H-454,H-455
Chassis H-450
Alignment Procedure

PILOT RADIO CORP.

IF Amplifier Alignment Turn the Band Selector Switch to Band 3 and turn the receiver dial pointer to the low frequency end.

Connect the output meter as described under "Connections", and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd condenser. Then proceed with the alignment as follows:-

1. Adjust the signal generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the screws 1, 2, 3, and 4 (see figure), for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the IF amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the IF amplifier tube, and align the last IF transformer. Always finish the alignment with the signal input to the 6K8 tube.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

Wave Trap Alignment With the Band Selector Switch set on the Broadcast Band, replace the .1 mfd dummy antenna with the .0002 mfd dummy antenna. Set the generator frequency at 455 kc and tune trimmer #11 for minimum reading of the output meter. There must be sufficient output from the signal generator to always have a reading on the output meter; do not allow the meter to go to zero and call that the correct adjustment point.

R.F. Alignment

Band 3 (Model 455 Long-Wave) Connect the "hot" terminal of the generator to the blue wire and clip through the .0002 mfd condenser.

Set the generator frequency to 300 kc and with the Band Selector Switch set to Band 3, turn the receiver dial pointer to 300 kc. Adjust trimmer #5 for maximum reading of the output meter. Do likewise with trimmer #13. Then set the generator frequency to 175 kc and the receiver dial pointer to approximately the same. Adjust trimmer #6 for maximum reading of the output meter, while "rocking" the gang condenser carefully back and forth. Then go back and repeat the 300 kc alignment.

Band 2 (Model 455) Band 3 (Model 454) (Standard Broadcast)

Connections are the same for the alignment of this band as they are for the long-wave band.

Set the generator frequency to 1500 kc., and the receiver dial pointer to the same frequency, with the band selector switch set appropriately. Adjust trimmer #7 for maximum reading of the output meter. (This trimmer is adjusted by moving the brass rod in or out, with a hooked wire, and with a twisting motion. First loosen the lock nut). Then without touching any tuning controls adjust trimmer #12 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc., and accurately set the receiver dial pointer to the 600 kc mark. Then adjust trimmer #15 for maximum reading of the output meter. Do not move the tuning control while making this adjustment. Finally return and repeat the 1500 kc adjustments and then tighten the lock nut on trimmer #7.

Band 1 (Model 455 Short-Wave)

Remove the .0002 mfd dummy antenna used in aligning the lower frequency bands and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator frequency to 18 mc and also set the receiver dial pointer to this frequency. Carefully adjust trimmer #8 for maximum reading of the output meter; be careful you do not tune in at the Image Frequency.

Then adjust trimmer #14 for maximum output meter reading, while slightly "rocking" the gang condenser. Readjust trimmer #8 if necessary to keep the calibration correct. These are the only adjustments on this band.

Band 2 (Model 454 - Short-Wave)

Connections and dummy antenna same as on Band 1 above.

Before aligning this band refer to the paragraph headed, "Image Frequency".

Set the generator and the receiver dial pointer to 9 mc. Adjust trimmer #9 for maximum reading of the output meter; be careful you do not tune in at the Image Frequency.

Then adjust trimmer #13 for maximum reading of the output meter while slightly "rocking" the gang condenser. Readjust trimmer #9 if necessary to correct the calibration.

Band 1 Alignment (Model 454 Short-Wave)

Connections and dummy antenna are the same as on Band 2 of model 554.

Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 24 mc and the receiver dial pointer to 24 mc. Adjust trimmer #10 to 24 mc for maximum reading of the output meter. Be careful that the receiver is not adjusted to the Image Frequency. Then adjust trimmer #14 while "rocking" the gang condenser, for maximum reading of the output meter. Reset trimmer #10 so that calibration is correct if necessary.

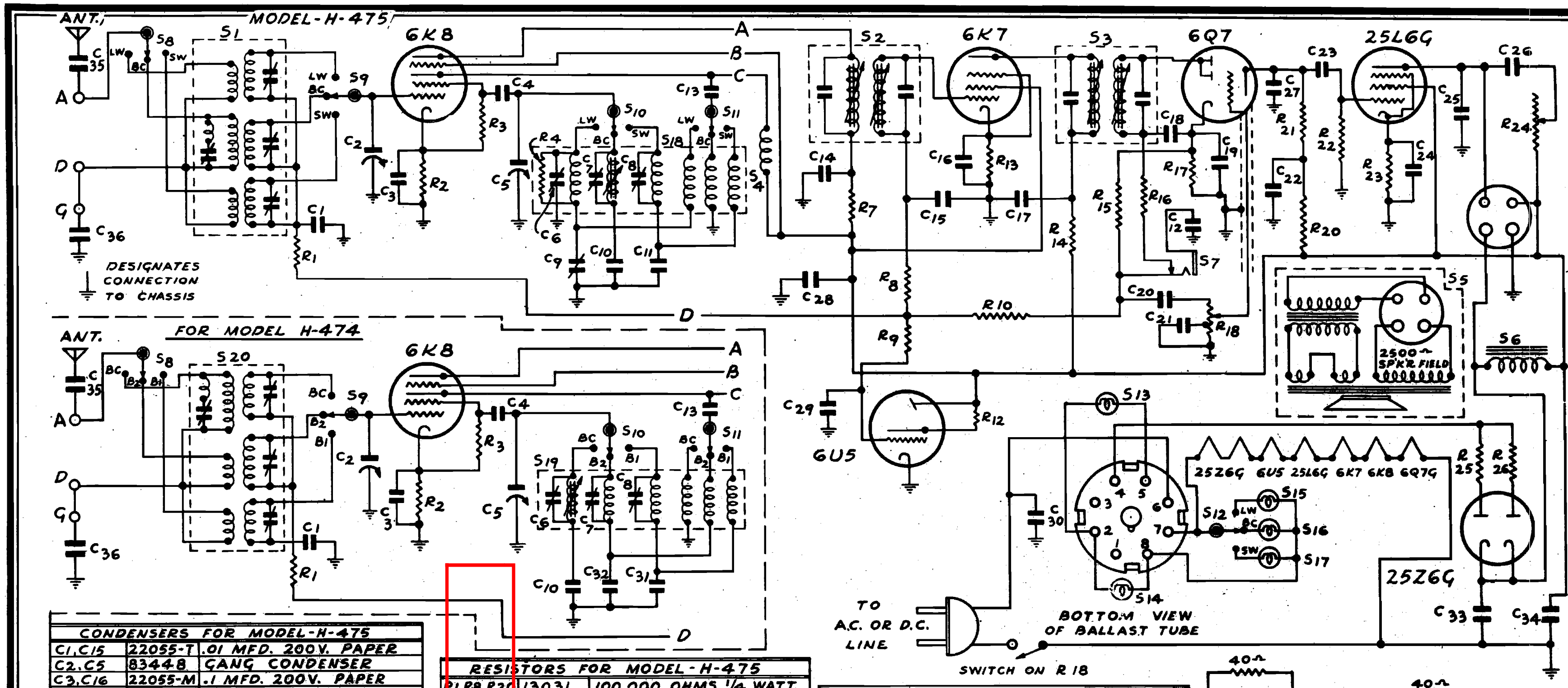
IMAGE FREQUENCY

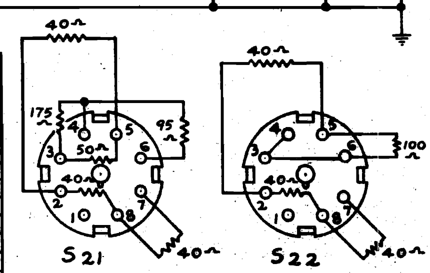
All bands in these two models must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in doing this on the long-wave and Broadcast Bands. However, on the higher frequency bands it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the image frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver, separated by twice the intermediate frequency, set the receiver dial pointer to that one which comes in at the higher frequency marking on the receiver dial pointer.

PILOT RADIO CORP.

MODELS H-474, H-475
Chassis H-470
MODELS H-134, H-135
Chassis H-130
Schematic





CONDENSERS FOR MODEL-H-475		
C1, C15	22055-T	.01 MFD. 200V. PAPER
C2, C5	83448	GANG CONDENSER
C3, C16	22055-M	.1 MFD. 200V. PAPER
C4	27723-O	.00005 MFD. MICA
C6, C9	83416	DOUBLE TRIMMER BASE
C7	83415	AIR TRIMMER
C8	72283-A	TRIMMER ASS'Y.
C10	92000-E	375 MMFD. SILVER CAP
C11	28106	.00325 MFD. MICA
C12	22055-S	.5 MFD. 200 V. PAPER
C13	27704-W	.002 MFD. MICA
C14, C17, C20, C23, C29	22055-W	.01 MFD. 400 V. PAPER
C18	27701-O	.00025 MFD. MICA
C19, C24	22481	10 MFD. 25 V. ELECTRO.
C21	22055-AY	.001 MFD. 200 V. PAPER
C22, C26, C28	22055-L	.1 MFD. 400 V. PAPER
C25, C30, C35, C36	22055-U	.01 MFD. 1000V. PAPER
C27	27701-W	.00025 MFD. MICA
C33, C34	85039	30-40 MFD. 300V. ELECT.

CONDENSERS FOR MODEL-H-474 SAME AS FOR MODEL-H-475, EXCEPT FOLLOWING:		
C9, C11		NOT USED
C31	27705-W	.003 MFD. MICA
C32	27716-W	.0015 MFD. MICA

RESISTORS FOR MODEL-H-475		
R1, R8, R20	13031	100,000 OHMS 1/4 WATT
R 2	13203	200 OHMS 1/4 WATT
R3, R16	13164	50,000 OHMS 1/4 WATT
R4	13230	33,000 OHMS 1/4 WATT
R7, R14	13028	1,000 OHMS 1/4 WATT
R9, R10, R12	13001	1 MEGOHM 1/4 WATT
R 13	13115	400 OHMS 1/4 WATT
R15, R22	13024	500,000 OHMS 1/4 WATT
R 17	13116	12,000 OHMS 1/4 WATT
R 18	83529-B	1 MEGOHM VOL. CONT. & SW.
R 21	13171	250,000 OHMS 1/4 WATT
R 23	13055	150 OHMS 1/2 WATT
R 24	83447-B	100,000 OHMS TONE CONT.
R25, R26	13207	100 OHMS 1 WATT

RESISTORS FOR MODEL-H-474 SAME AS FOR MODEL-H-475, EXCEPT FOLLOWING		
R 4		NOT USED

MISCELLANEOUS FOR MODEL-H-475		
S1	73172	ANTENNA COILS & CAN ASS'Y.
S2	73192-A	1ST. I.F. TRANSFORMER ASS'Y.
S3	73193	2ND. I.F. " "
S4	73088	R.F. "B" CHOKE ASS'Y.
S5	40816	8" SPEAKER-2500~FIELD
	40817	12" SPEAKER-2500~FIELD
S6	79029-A	FILTER CHOKE
S7	70950	PHONO JACK
S8-TO-S12	83414	BAND SWITCH
S13-TO-S17	71282	DIAL LAMPS
S18	73179-A	OSCILLATOR COILS ASS'Y.
S21	81972	BALLAST TUBE 220/240V.
S22	81971	BALLAST TUBE 110/125 V.

MISCELLANEOUS FOR MODEL-H-474 SAME AS FOR MODEL-H-475, EXCEPT FOLLOWING		
S1, S18		NOT USED
S19	73178-A	OSCILLATOR COILS ASS'Y.
S20	73177	ANTENNA COILS & CAN ASS'Y.

INTERMEDIATE FREQUENCY - 455 K.C.
ALIGNING FREQUENCIES:

LONG-WAVE-H-475	DOMESTIC-H-474
S.W.-18 & 6 MEGACYCLES	B1-24 MEGACYCLES
B.C.-1500 & 600 K.C.	B2-9 MEGACYCLES
L.W.-300 & 175 K.C.	B.C.-1500 & 600 K.C.

NOTE: Chassis H-470 has push-button tuner; H-130 does not. Otherwise chassis are the same.

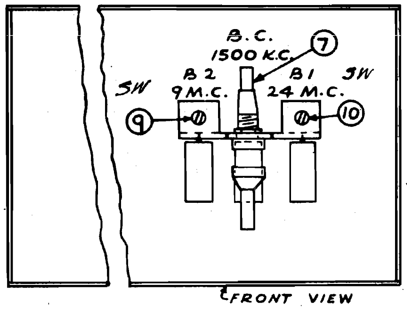
PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-474 AND FOR MODEL-H-475
DRAWN BY B.R. DATE 8-3-38
DWG. NO. 25196-2

ALTERATIONS (2) REVISED DIAL LAMPS.-B.R.- 8-17-38.
CLASSIFICATION H-470 SERIES
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO
DO NOT SCALE THIS PRINT

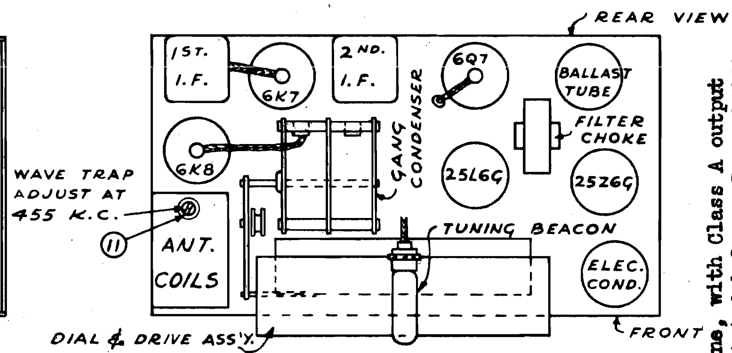
MODELS H-474,H-475
Chassis H-470
MODELS H-134,H-135
Chassis H-130

PILOT RADIO CORP.

Voltage,Socket
Trimmers,Alignment

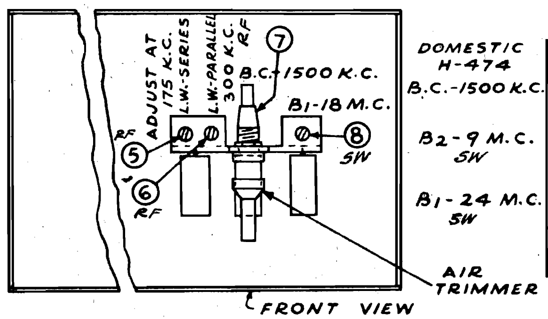


BOTTOM VIEW OF CHASSIS
DOMESTIC-H-474

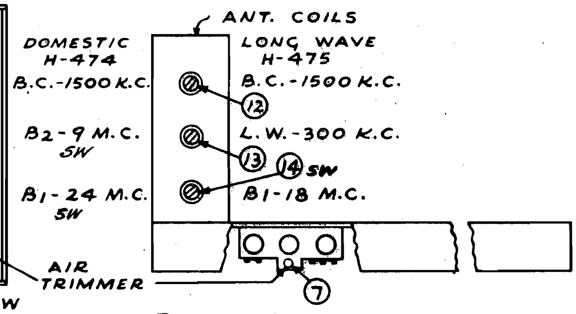


TOP VIEW OF CHASSIS

Circuit Super-Heterodyne, with Class A output stage. Three tuning ranges as listed below. Permeability tuned IF transformers. Tone compensated volume control. Continuously variable tone control. Automatic Volume Control and Cathode Ray Tuning Beacon.



BOTTOM VIEW OF CHASSIS
LONG WAVE-H-475



FRONT VIEW OF CHASSIS

D.C. SOCKET VOLTAGES

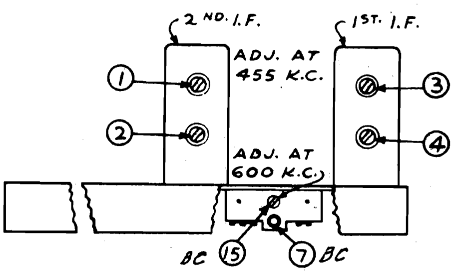
All voltages are those between the indicated tube terminal and the chassis, and are made with a 1000 ohms per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

Make sure that the A.C. supply voltage is correct for the ballast tube being used at the time of measurement.

Figures in parenthesis are for ballast tube #81972, other figures are for ballast tube #81971.

Socket Terminals

Tube	1	2	3	4	5	6	7	8
6K8	-	-	95(125)	95(125)	-	95(125)	-	2.3(3)
6K7	-	-	88(115)	95(125)	-	3(4)	-	3(4)
6Q7	-	-	60(80)	-	-	-	-	1.(1.)
25L6-G	-	-	91(119)	95(125)	-	-	-	6(8.2)
25Z6-G	-	-	-	110(140)	-	-	-	110(140)



REAR VIEW OF CHASSIS

Maximum Power Output

With #81971 Ballast Tube 2.0 watts
With #81972 Ballast Tube 3.4 watts

Power Supply A.C. or D.C.

Voltage	Ballast Tube	Watts
110-125	#81971	50
220-240	#81972	115

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
TRIMMER LAYOUT
MATERIAL
SCALE
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DATE 8-5-38.
DRWG. NO. 25197

Intermediate Frequency 455 kc.

Tuning Ranges The model H-474 chassis has the following tuning ranges:

Band 1	24.8	to	8.3 mc	or	12.09	to	36.1 meters
Band 2	9.7	to	2.9 mc	or	30.9	to	103.4 meters
Band 3	1725	to	530 kc	or	174	to	566 meters

The model H-475 chassis has the following tuning ranges:

Band 1	18.8	to	5.35 mc	or	15.95	to	56.04 meters
Band 2	1725	to	530 kc	or	174	to	566 meters
Band 3	375	to	145 kc	or	800	to	2068 meters

PILOTUBES Required

One 6K8 1st detector-oscillator
One 6K7 IF amplifier
One 6Q7 2nd detector-AVC-1st audio ampl
One 25L6-G Output tube
One 25Z6-G Power supply rectifier
One 6U5 Cathode ray tuning beacon

MODELS H-134,H-135
Chassis H-130
Alignment Procedure

PILOT RADIO CORP.

MODELS H-474,H-475
Chassis H-470

Alignment Connections

Connect the Black and Yellow wires together and to the ground post of the signal generator.

Connect the "hot" post of the generator through the correct dummy antenna or condenser to the appropriate point as noted hereafter. In all the measurements to follow, the output meter should be connected to the plate and screen grid terminals of the 25L6-G through .1 mfd. condensers in any convenient manner.

IF Amplifier Alignment Turn the Band Selector Switch to Band 3 and turn the ROTOR dial to the low frequency end. Connect the output meter as described under "Connections", and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd. condenser. Then proceed with the alignment as follows:-

1. Adjust the Signal Generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the screws 1, 2, 3, and 4, (see figure) for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the IF amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the IF amplifier tube, and align the last IF transformer. Always finish the alignment with the signal input to the 6K8 tube.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

Wave Trap Alignment With the Band Selector Switch set on the Broadcast Band, replace the .1 mfd. dummy antenna with the .0002 mfd. dummy antenna. Set the generator frequency at 455 kc. and tune trimmer #11 for minimum reading of the output meter. There must be sufficient output from the signal generator to always have a reading on the output meter. Do not allow the meter to go to zero and call that the correct adjustment point.

R.F. Alignment

Band 3 (Model H-475 - Long-Wave) Connect the "hot" terminal of the generator to the blue wire and clip through the .0002 mfd. condenser.

Set the generator frequency to 300 kc., and with the Band Selector Switch set to Band 3, turn the ROTOR dial to 300 kc. Adjust trimmer #6 for maximum reading of the output meter. Do likewise with trimmer #13. Then set the generator frequency to 175 kc., and the ROTOR dial to approximately the same. Adjust trimmer #5 for maximum reading of the output meter, while "rocking" the gang condenser carefully back and forth. Then go back and repeat the 300 kc. alignment.

Band 2 (Model H-475) **Band 3** (Model H-474)
(Standard Broadcast)

Connections are the same for the alignment of this band as they are for the Long-Wave Band.

Set the generator frequency to 1500 kc., and the ROTOR dial to the same frequency, with the Band Selector Switch set appropriately. Adjust trimmer #7 for maximum reading of the output meter. (This trimmer is adjusted by moving the brass rod in or out, with a hooked wire, and with a twisting motion. First loosen the lock nut). Then without touching any tuning controls adjust trimmer #12 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc. and accurately set the ROTOR dial to the 600 kc. mark. Then adjust trimmer #15 for maximum reading of the output meter. Do not move the tuning control while making this adjustment. Finally, return and repeat the 1500 kc. adjustments and then tighten the lock nut on trimmer #7.

Band 1 (Model H-475 - Short-Wave)

Remove the .0002 mfd. dummy antenna used in aligning the lower frequency bands and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator frequency to 18 mc. and also set the ROTOR dial to this frequency. Carefully adjust trimmer #8 for maximum reading of the output meter. Be careful you do not tune in at the Image Frequency.

Then adjust trimmer #14 for maximum output meter reading, while slightly "rocking" the gang condenser. Readjust trimmer #8 if necessary to keep the calibration correct. These are the only adjustments on this band.

Band 2 (Model H-474 - Short-Wave)

Connections and dummy antenna same as on Band 1 above.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator and the ROTOR dial to 9 mc. Adjust trimmer #9 for maximum reading of the output meter. Be careful you do not tune in at the Image Frequency.

Then adjust trimmer #13 for maximum output meter reading, while slightly "rocking" the gang condenser. Readjust trimmer #9 if necessary to correct the calibration.

Band 1 (Model H-474 - Short-Wave)

Connections and dummy antenna are the same as on Band 1 above.

Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 24 mc. and the ROTOR dial to 24 mc. Adjust trimmer #10 to 24 mc. for maximum reading of the output meter. Be careful that the receiver is not adjusted to the Image Frequency. Then adjust trimmer #14, while "rocking" the gang condenser for maximum reading of the output meter. Reset trimmer #10 so that calibration is correct if necessary.

Image Frequency

All bands in these two models must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in doing this on the Long-Wave and Broadcast Bands. However, on the higher frequency bands it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator, to pick up two signals with the receiver, separated by twice the Intermediate Frequency, set the ROTOR dial to that one which comes in at the higher frequency marking on the ROTOR dial.

Miscellaneous Service Notes

If a howling noise (sometimes referred to as Microphonic howl) is heard, it is very probably because the four red screws under the cabinet have not been removed along with the two narrow metal strips between the chassis and the bottom of the cabinet. These strips and screws are only intended as additional bracing during shipment and must be removed before the receiver is put in operation.

The howl can also be caused by a defective tube, or when some part of the receiver which is rigidly fastened to the chassis rubs against the cabinet. The remedy is obvious.

In replacing or resetting the ROTOR dial, always set the gang condenser at maximum capacity.

To reset the dial, loosen the set screws in the ROTOR dial pinion gear. Then, adjust the dial so that the low frequency end of the calibration line, at the base of the arrow tip, is directly under the indicator wire. Then, tighten the pinion gear set screws.

If it should be necessary to remove the ROTOR dial, first remove the top plate which carries the Tuning Beacon Clamp. Next, remove the bearing plates which hold the dial shaft in place, and lift out the whole dial assembly.

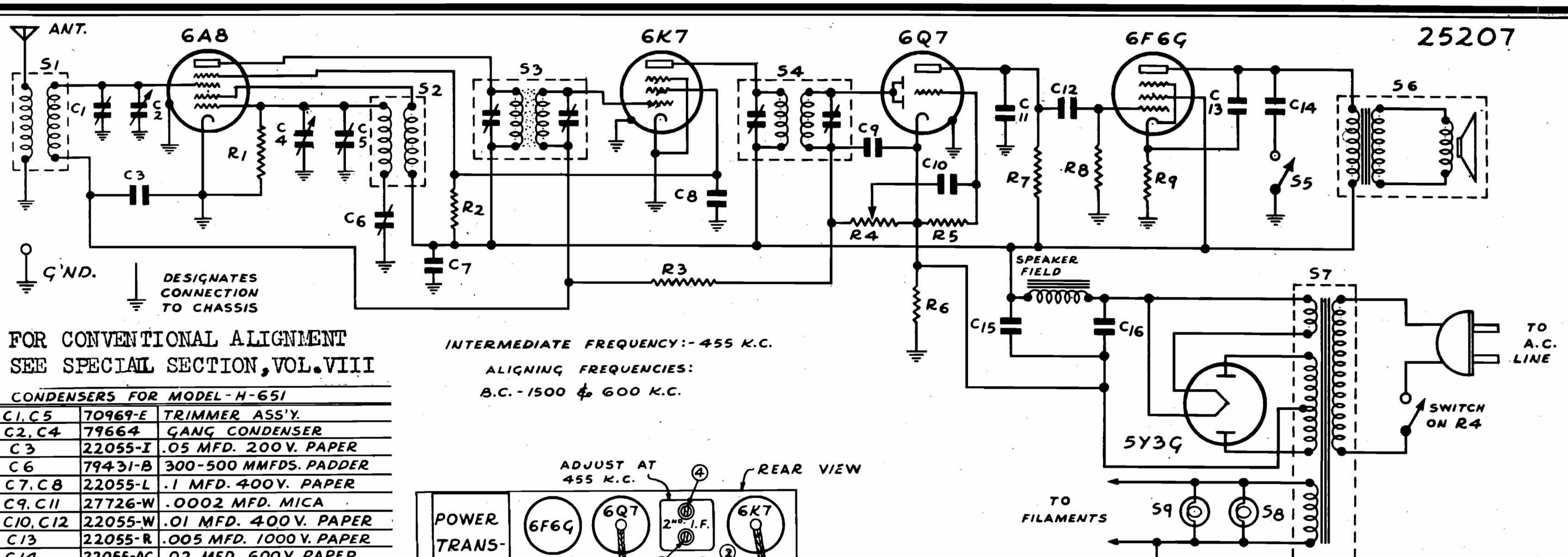
In replacing the dial, be sure to compress the "back lash" springs in the double gear approximately 1/16 of an inch.

Never loosen the set screws which connect the link motion to the gang condenser. If this should be done, the calibration of the receiver will be affected.

MODELS TH-650,H-651
Chassis H-650
Schematic,Voltage,Socket
Trimmers,Alignment

PILOT RADIO CORP.

25207



INTERMEDIATE FREQUENCY:- 455 K.C.
ALIGNING FREQUENCIES:
B.C. - 1500 & 600 K.C.

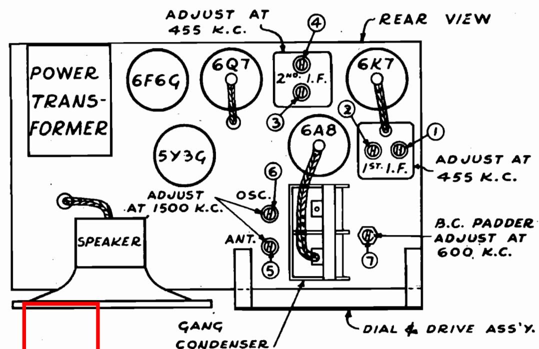
FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION, VOL. VIII

CONDENSERS FOR MODEL-H-651		
C1, C5	70969-E	TRIMMER ASS'Y.
C2, C4	79664	GANG CONDENSER
C3	22055-I	.05 MFD. 200 V. PAPER
C6	79431-B	300-500 MMFDS. PADDER
C7, C8	22055-L	.1 MFD. 400 V. PAPER
C9, C11	27726-W	.0002 MFD. MICA
C10, C12	22055-W	.01 MFD. 400 V. PAPER
C13	22055-R	.005 MFD. 1000 V. PAPER
C14	22055-AC	.02 MFD. 600 V. PAPER
C15, C16	23500-D	8 MFD. 450 V. MIDGET ELEC.

RESISTORS FOR MODEL-H-651		
R1	13164	50,000 OHMS 1/4 WATT
R2	13068	30,000 OHMS 1/2 WATT
R3, R5	13001	1 MEGOHM 1/4 WATT
R4	79429	500,000 OHMS VOL. CONT. & SW
R6	13080	50 OHMS 1/4 WATT
R7	13171	250,000 OHMS 1/4 WATT
R8	13024	500,000 OHMS 1/4 WATT
R9	13238	400 OHMS 1/2 WATT

MISCELLANEOUS FOR MODEL-H-651		
S1	73115-B	ANTENNA COIL ASS'Y.
S2	73200	OSCILLATOR COIL ASS'Y.
S3	73108-B	1ST. I.F. TRANSFORMER ASS'Y.
S4	73103	2ND. I.F. " "
S5	71657	TONE CONTROL
S6	40854	5" A.C. SPEAKER 2000 Ω FIELD
S7	79428-R	PWR. TRANSFOR. 117 V.-60 CY.
	79428-AB	" " .220 V.-60 CY.
	79428-RA	" " .115-230 V.-60 CY.
	79428-L	" " .150 V.-60 CY.
S8, S9	78889	DIAL LAMP

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAGRAM
FOR MODEL-H-651
MATERIAL
SCALE
DRAWN BY B.R. DATE 10-7-38.
CHECKED BY
APPROVED BY
DRWG. NO. 25207



TOP VIEW OF CHASSIS

D.C. SOCKET VOLTAGES

All voltages are those between the indicated tube terminal and the chassis, and are made with a 1000 ohm per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

Make sure that the A.C. supply voltage is correct for the transformer tap being used at the time of measurement.

Tube	Socket Terminals 1	2	3	4	5	6	7	8
6A8	-	-	185	70	-	185	-	-
6K7	-	-	185	70	-	-	-	-
6Q7	-	-	-	-	-	-	-	-2
6F6-G	-	-	170	185	-	-	-	11.5
5Y3-G	-	-	-	-	-	-	-	270

Maximum Power Output 2 watts

Tuning Range

The Model H-651 Chassis has the following tuning range:

530 to 1720 kc or 566 to 174 meters

Power Supply

Voltage	Frequency	Watts
110 to 125 volts	60	50
150 volts	60	50
220 to 240 volts	60	50
110 to 125 or 220 to 240 volts	60	50

TUBES Required

One 6A8	1st detector-oscillator
One 6K7	IF amplifier
One 6Q7	2nd detector-AVC-1st audio amplifier
One 6F6-G	output tube
One 5Y3-G	power supply rectifier

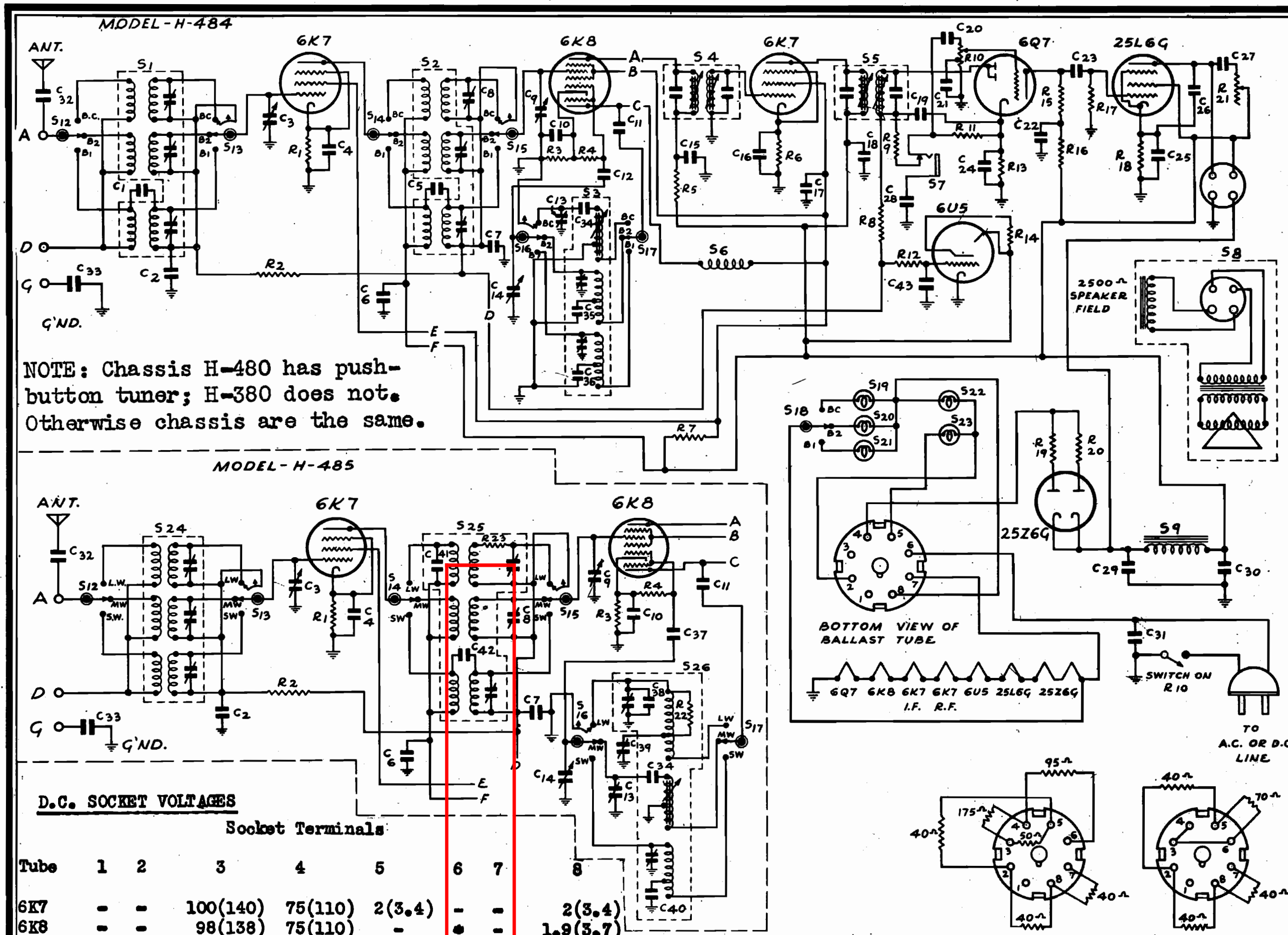
Total 5 tubes

GENERAL SPECIFICATIONS.

Circuit Super-Heterodyne, with Class A output stage. Tuning range as listed below. Continuously variable tone control and automatic volume control.

PILOT RADIO CORP.

MODELS H-484, H-485
Chassis H-480
MODELS H-384, H-385
Chassis H-380
Schematic, Voltage



NOTE: Chassis H-480 has push-button tuner; H-380 does not. Otherwise chassis are the same.

CONDENSERS FOR MODEL-H-484		
C1	27737-0	10 MMFDS. MICA
C2, C7	22055-I	.05 MFD. 200V. PAPER
C3, C9, C14	83542	3 GANG CONDENSER
C4, C10, C16	22055-M	.1 MFD. 200V. PAPER
C5	28115	15 MMFDS. MICA ±10%
C6, C17	22055-P	.05 MFD. 400 V. PAPER
C8, C13	83415	20 MMFDS. AIR TRIMMER
C11	27704	.002 MFD. MICA
C12	27723-0	50 MMFDS. MICA
C15, C23	22055-Z	.02 MFD. 400V. PAPER
C18, C22	22055-L	.1 MFD. 400V. PAPER
C19	27726	.0002 MFD. MICA
C20	22055-W	.01 MFD. 400V. PAPER.
C21	22055-AY	.001 MFD. 200V. PAPER
C27	22055-AB	.1 MFD. 600V. PAPER
C24, C25	22481	10 MFD. 25V. ELECTRO.
C26	22055-A	.01 MFD. 600V. PAPER
C28	22055-S	.5 MFD. 200V. PAPER
C29, C30	85042	30-30 MFD. 300 V. ELECT.
C31	22055-U	.01 MFD. 1000V. PAPER
C32, C33	22055-R	.005 MFD. 1000V. PAPER
C34	92000-C	450 MMFD. SILVER CAP.
C35	27732	.0016 MFD. MICA
C36	28023-W	.0038 MFD. MICA
C43	22055-T	.01 MFD. 200V. PAPER

CONDENSERS FOR MODEL-H-485 SAME AS FOR MODEL-H-484, EXCEPT FOLLOWING:		
C1, C5, C12		NOT USED
C37	28016-0	100 MMFDS. MICA
C38	27736	25 MMFDS. MICA
C39	83394-B	150 MMFDS. PADDER
C40	28106	.00325 MFD. MICA
C41	27701-0	.00025 MFD. MICA
C42	27737-0	10 MMFDS. MICA

RESISTORS FOR MODEL-H-484		
R1, R6	13115	400 OHMS 1/4 WATT
R2, R16	13031	100,000 OHMS 1/4 WATT
R3	13003	300 OHMS 1/4 WATT
R4, R9	13164	50,000 OHMS 1/4 WATT
R5	13028	1,000 OHMS 1/4 WATT
R7	13086	2,000 OHMS 1/2 WATT
R8	13001	1 MEGOHM 1/4 WATT
R10	83529-A	1 MEGOHM VOL. CONT. & SW.
R11	13171	250,000 OHMS 1/4 WATT
R12	13007	2 MEGOHMS 1/4 WATT
R13	13030	10,000 OHMS 1/4 WATT
R14, R17	13024	500,000 OHMS 1/4 WATT
R15	13043	150,000 OHMS 1/4 WATT
R18	13235	150 OHMS 1 WATT ±5%
R19, R20	13207	100 OHMS. 1 WATT
R21	83447-A	100,000 OHMS TONE CONT.

RESISTORS FOR MODEL-H-485 SAME AS FOR MODEL-H-484, EXCEPT FOLLOWING:		
R22	13148	30,000 OHMS 1/4 WATT
R23	13029	250 OHMS 1/4 WATT

MISCELLANEOUS FOR MODEL-H-484		
S1	73205	ANTENNA COILS & CAN ASS'Y.
S2	73207	R.F. " " " " .
S3	73209	OSCILLATOR " " " " .
S4	73192-B	1ST. I.F. TRANSFORMER ASS'Y.
S5	73193	2ND. I.F. " " .
S6	73088	R.F. "B" CHOKE ASS'Y.
S7	70950	PHONO JACK
S8	40816	8" SPEAKER-2500 Ω FIELD
	40817	12" SPEAKER-2500 Ω FIELD
S9	79029-A	FILTER CHOKE
S10	81972	BALLAST TUBE 220/240 V.
S11	81973	BALLAST TUBE 110/125 V.
S12 TO S18	83438	BAND SWITCH
S19 TO S23	71282	PILOT LIGHTS

MISCELLANEOUS FOR MODEL-H-485 SAME AS FOR MODEL-H-484, EXCEPT FOLLOWING:		
S1, S2, S3		NOT USED
S24	73204	ANTENNA COILS & CAN ASS'Y.
S25	73206	R.F. " " " " .
S26	73208	OSCILLATOR " " " " .

D.C. SOCKET VOLTAGES

Socket Terminals

Tube	1	2	3	4	5	6	7	8
6K7	-	-	100(140)	75(110)	2(3.4)	-	-	2(3.4)
6K8	-	-	98(138)	75(110)	-	*	-	1.9(3.7)
6K7	-	-	100(140)	75(110)	2(3.4)	-	-	2(3.4)
6Q7	-	-	*	-	-	-	-	1.05(1.5)
25L6-G	-	-	98(135)	100(140)	-	-	-	6(9)

Figures in Parenthesis are for 230 volt operation, other figures are for 115 volt operation.

*Cannot be measured.

Power Supply. A.C. or D.C.

Voltage	Ballast Tubes	Watts
110-125	81973	50
220-240	81972	120

6K7	R.F. Amplifier
6K8	1st detector-oscillator
6K7	IF amplifier
6Q7	2nd detector-AVC-1st Audio amplifier
25L6-G	Output tube
25Z6-G	Power supply rectifier
6U5	Cathode ray tuning beacon

PILOT RADIO CORP.
LONG ISLAND CITY, N.Y., U.S.A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-484 & MODEL-H-485
DATE:- 8-15-38
DRAWN BY:- B.R.
CHECKED BY:-
APPROVED BY:-
No. 25198-

INTERMEDIATE FREQUENCY:- 455 K.C.
ALIGNING FREQUENCIES:

FOR MODEL-H-484
B1-23 MEGACYCLES
B2-9 "
B.C.-1500 & 600 K.C.

FOR MODEL-H-485
S.W.-17.6 MEGACYCLES
M.W.-1500 & 600 K.C.
L.W.-350 & 160 K.C.

MODELS H-484, H-485
Chassis H-480
MODELS H-384, H-385
Chassis H-380

PILOT RADIO CORP.

Socket, Trimmers
Alignment

IF Amplifier Alignment. Turn the Band Selector Switch to Band 3 and turn the ROTOR dial to the low frequency end.

Connect the output meter as described under "Connections", and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd. condenser. Then proceed with the alignment as follows:

1. Adjust the signal generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the screws 1, 2, 3, and 4 (see figure), for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

R.F. ALIGNMENT

Band 3 (Model H-485, Long-Wave) Connect the "hot" terminal of the generator to the blue wire and clip through the .0002 mfd. condenser.

Set the generator frequency to 300 kc., and with the Band Selector Switch set to band 3, turn the ROTOR dial to 300 kc. Adjust trimmer #5 for maximum reading of the output meter. Do likewise with trimmer #6 and #7. Then set the generator frequency to 160 kc. and the ROTOR dial to approximately the same. Adjust trimmer #21 for maximum reading of the output meter, while "rocking" the gang condenser carefully back and forth. Then go back and repeat the 300 kc. alignment.

Band 2 (Model H-485) Band 3 (Model H-484) (Standard Broadcast)

Connections are the same for the alignment of this band as they are for the Long-Wave Band.

Set the generator frequency to 1500 kc., and the ROTOR dial to the same frequency, with the Band Selector Switch set appropriately. Adjust trimmer #8 for maximum reading of the output meter. (This trimmer is adjusted by moving the brass rod in or out, with a hooked wire, and with a twisting motion. First loosen the lock nut). Then without touching any tuning controls adjust trimmers #9 and #10 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc. and accurately set the ROTOR dial to the 600 kc. mark. Then adjust trimmer #11 for maximum reading of the output meter. Do not move the tuning control while making this adjustment. Finally return and repeat the 1500 kc. adjustments and then tighten the lock nut on trimmers #8 and #9.

Band 1 (Model H-485 Short-Wave)

Remove the .0002 mfd. dummy antenna used in aligning the lower frequency bands and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph headed "Image Frequency" (SEE MODEL H-151)

Set the generator frequency to 17.6 kc. and also set the ROTOR dial to this frequency. Carefully adjust trimmer #12 for maximum reading of the output meter. Be careful you do not tune in at the image frequency.

Then adjust trimmers #13 and #14 for maximum output meter reading, while slightly "rocking" the gang condenser. Readjust trimmer #12 if necessary to keep the calibration correct. These are the only adjustments on this band.

Band 2 (Model H-484 Short-Wave)

Connections and dummy antenna same as on Band 1 above.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator, and the ROTOR Dial to 9 mc. Adjust trimmer #15 for maximum reading of the output meter. Be careful you do not tune in at the Image Frequency.

Then adjust trimmers #16 and #17 for maximum reading of the output meter, while slightly "rocking" the gang condenser. Readjust trimmer #15 if necessary to correct the calibration.

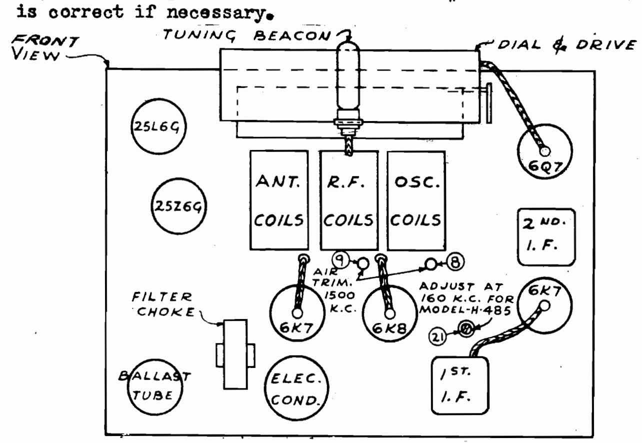
Band 1 (Model H-484 Short-Wave)

Connections and dummy antenna are the same as on Band 1 above

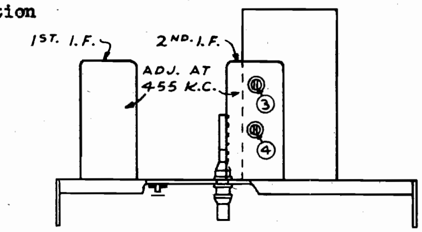
Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 23 mc. and the ROTOR dial to 23 mc. Adjust trimmer #18 to 23 mc. for maximum reading of the output meter. Be careful that the receiver is not adjusted to the Image Frequency. Then adjust trimmers #19 and #20 while "rocking" the gang condenser, for maximum reading of the output meter. Reset trimmer #18 so that calibration is correct if necessary.

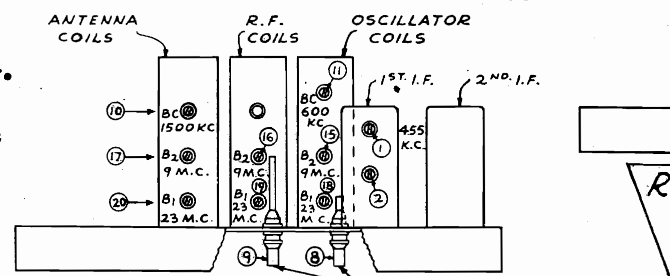
PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
TRIMMER LAYOUT
Material
Scale
Drawn By B.R.
Checked By
Approved By
Date 8-17-38
Drwg No 25199



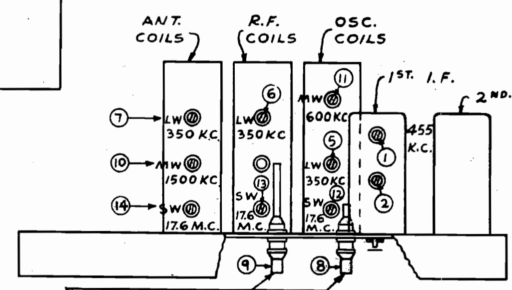
TOP VIEW OF CHASSIS



RIGHT SIDE OF CHASSIS



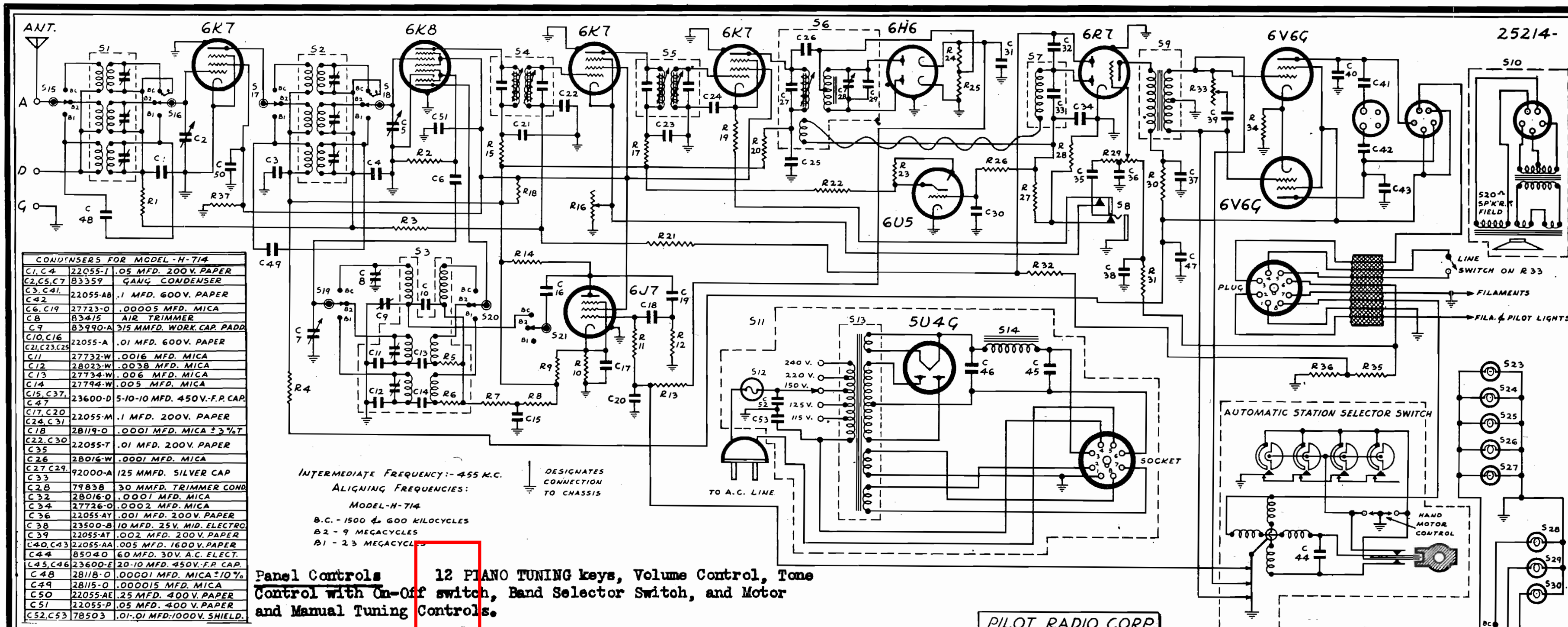
REAR VIEW OF CHASSIS (MODEL-H-484)



REAR VIEW OF CHASSIS (MODEL-H-485)

PILOT RADIO CORP.

MODEL H-710
Schematic
Voltage



CONDENSERS FOR MODEL-H-714		
C1, C4	22055-I	.05 MFD. 200V. PAPER
C2, C5, C7	83359	GANG CONDENSER
C3, C41, C42	22055-AB	.1 MFD. 600V. PAPER
C6, C19	27723-O	.00005 MFD. MICA
C8	83415	AIR TRIMMER
C9	83990-A	315 MMFD. WORK. CAP. PADD.
C10, C16, C21, C23, C25	22055-A	.01 MFD. 600V. PAPER
C11	27732-W	.0016 MFD. MICA
C12	28023-W	.0038 MFD. MICA
C13	27734-W	.006 MFD. MICA
C14	27794-W	.005 MFD. MICA
C15, C37, C47	23600-D	5-10-10 MFD. 450V.-F.P. CAP.
C17, C20, C24, C31	22055-M	.1 MFD. 200V. PAPER
C18	28119-O	.0001 MFD. MICA ±3%T
C22, C30, C35	22055-T	.01 MFD. 200V. PAPER
C26	28016-W	.0001 MFD. MICA
C27, C29, C33	92000-A	125 MMFD. SILVER CAP
C28	79838	30 MMFD. TRIMMER COND.
C32	28016-O	.0001 MFD. MICA
C34	27726-O	.0002 MFD. MICA
C36	22055-AY	.001 MFD. 200V. PAPER
C38	23500-B	10 MFD. 25V. MID. ELECTRO.
C39	22055-AT	.002 MFD. 200V. PAPER
C40, C43	22055-AA	.005 MFD. 1600V. PAPER
C44	85040	60 MFD. 30V. A.C. ELECT.
C45, C46	23600-E	20-10 MFD. 450V.-F.P. CAP.
C48	28118-O	.00001 MFD. MICA ±10%
C49	28115-O	.000015 MFD. MICA
C50	22055-AE	.25 MFD. 400V. PAPER
C51	22055-P	.05 MFD. 400 V. PAPER
C52, C53	78503	.01-.01 MFD.-1000V. SHIELD.

RESISTORS FOR MODEL-H-714		
R1, R3	13164	50,000 OHMS 1/4 WATT
R2	13225	47,000 OHMS 1/4 WATT
R4	83656-D	500 OHMS 2 WATT FLEX.
R5, R6, R7	13030	10,000 OHMS 1/4 WATT
R8	13092	30,000 OHMS 1 WATT
R9	13236	30,000 OHMS 2 WATT
R10, R12	13227	620 OHMS 1/4 WATT
R11, R26	13217	470,000 OHMS 1/4 WATT ±10%
R13	13223	3.3 MEGOHMS 1/4 WATT
R14	13232	15,000 OHMS 1/2 WATT
R15, R17, R20	13028	1,000 OHMS 1/4 WATT
R16	83870	1500 OHMS SENSITIV. CONT.
R19	13243	1500 OHMS 1/4 WATT ±10%
R21, R23, R32	13001	1 MEGOHM 1/4 WATT
R22	13200	75,000 OHMS 1/4 WATT
R24, R25	13231	470,000 OHMS 1/4 WATT ±5%
R27	13031	100,000 OHMS 1/4 WATT
R28	13191	200,000 OHMS 1/4 WATT
R29	83364	1 MEGOHM VOL. CONT.
R30	13013	10,000 OHMS 1/2 WATT
R31	13171	250,000 OHMS 1/4 WATT
R33	83871	750,000 OHMS TONE CONTROL & SWITCH
R34	83656-E	190 OHMS 2 WATT FLEX.
R35	13242	40 OHMS 1 WATT ±10%
R36	13188	23 OHMS 1 WATT
R37	13053	10,000 OHMS 1 WATT
R18	83656-F	8,000 OHMS 4 WATT FLEX.

MISCELLANEOUS FOR MODEL-H-714		
S1	73245	ANTENNA COIL & CAN ASS'Y.
S2	73247	DETECTOR " " " "
S3	73249	OSCILLATOR " " " "
S4, S5	73166	1ST & 2ND I.F TRANSFOR. ASS'Y.
S6	73167	DISCRIMINATOR TRANSFOR. ASSY.
S7	73168	AUDIO DET. A.V.C. COUP. COIL ASSY.
S8	83873	PHONO JACK
S9	83877	PUSH-PULL INPUT TRANSFORMER ASS'Y.
S10	40865	10" SPEAKER 520^ FIELD
	40866	12" SPEAKER 520^ FIELD
S11	83859	POWER SUPPLY ASS'Y.
S12	70053-E	3 AMP FUSE
S13	83890-R	P'W'R TRANSFO.-50-60CY-117.5V.
	83891	P'W'R. TRANSFO.-50-60CY. UNIV.
S14	83980	FILTER CHOKE 100^3H
S15 TO S22	83866	BAND SWITCH
S23 TO S30	78889	DIAL LIGHTS

PILOT RADIO CORP.
LONG ISLAND CITY, N.Y., U.S.A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-710
DATE:-1-3-39
DRAWN BY:- B.R.
CHECKED BY:- G.J.
APPROVED BY:-
H-710 SERIES
Nº 25214-

Panel Controls 12 PIANO TUNING keys, Volume Control, Tone Control with On-Off switch, Band Selector Switch, and Motor and Manual Tuning Controls.

Tuning Ranges

Maximum Power Output 12 watts

Band 1	25.3 - 8.92 mc	or	11.85 - 33.65 meters
Band 2	9.88 - 2.97 mc	or	30.3 - 100.8 meters
Band 3	1730 - 526 kc	or	173.4 - 570.3 meters

D.C. SOCKET VOLTAGES

Tubes	Socket Terminals 1	2	3	4	5	6	7	8
6K7 RF	-	-	240	92	0	-	-	0
6K8	-	-	232	92	0	-	-	0
6J7	-	-	225	92	4.5	-	-	4.5
6K7 IF	-	-	230	92	0	-	-	0
6K7 IF	-	-	232	92	5	-	-	5
6H6	-	-	0	0	0	-	-	0
6R7	-	-	200	-	-	-	-	0
6V6-G	-	-	252	260	0	-	-	15
5U4-G	-	345	-	-	-	-	-	345

Power Supply

Voltage	Frequency	Watts
117.5	60 cycles	90
115, 125, 150, 220, 240*	60 cycles	90

Universal Transformer
* (Not supplied in the United States).

6K7	R.F. Amplifier
6K8	1st Detector-Oscillator
6J7	Oscillator Frequency Control
6K7	IF Amplifiers
6H6	Discriminator
6R7	2nd Detector-AVC-1st Audio Amplifier
6V6-G	Output Tubes
5U4-G	Power Supply Rectifier
6U5	Cathode Ray Tuning Beacon

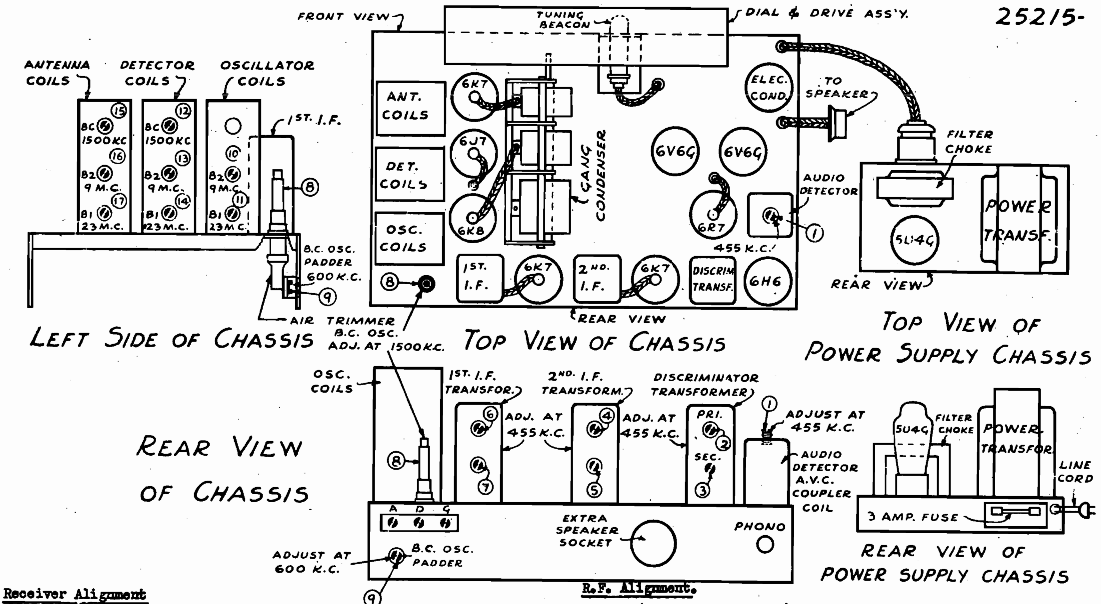
Circuit Super-Heterodyne, with push-pull output stage, and with Automatic Frequency Control of the oscillator on the Standard Broadcast Band. An R.F. stage is used on all bands. Iron Core, Permeability Tuned IF and Discriminator Transformers, which use, in addition, Silver-Mica Condensers.

Other features of the Receiver are:-

Continuously variable Tone Control, Tone Compensated Volume Control, Visible Indicators on all controls, Motor operated PIANO TUNING on the Broadcast Band. Manual Tuning is instantly available without extra switching. Motor Tuning, without the keys is also available on all bands. These receivers are supplied with a fuse in the power supply circuit, and a jack is provided for plugging in a high impedance phonograph pick-up. There is also provision for an external speaker.

MODEL H-710
Socket, Trimmers
Alignment

PILOT RADIO CORP.



Receiver Alignment

1. Signal Generator. One using fundamental frequencies for all the frequencies used in the receiver is preferred.
2. Output meter. Generally a copper-oxide rectifier meter is the most convenient.
3. Dummy Antennas. .1 mfd. condenser
   .0002 mfd. mica condenser
   400 ohm non-inductive resistor

IF Amplifier Alignment.

Turn the Band Selector Switch to Band 3 and turn the ROTOR dial to the low frequency end.

Connect the output meter as described under "Connections", and connect the "hot" post of the generator to the grid of the 6K8 tube through the .1 mfd. condenser. See that none of the PIANO KEYS is down. Then proceed with the alignment as follows:-

1. Adjust the Signal Generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.
2. Adjust the screws 1, 2, 4, 5, 6, and 7, (see figure) for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the IF amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the last IF amplifier tube, and then to the first IF amplifier tube, while aligning the transformers following these tubes. Always finish the alignment with the signal input to the 6K8 tube and, with this connection, readjust all screws in the IF amplifier, except the discriminator trimmer #3.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

If the receiver is placed in a noisy location when the above adjustments are being made, it may be convenient to reduce the sensitivity of the amplifier by means of the sensitivity control.

Discriminator Alignment

CAUTION: The discriminator compensator #3 has been accurately adjusted during manufacture. It will probably never need adjustment, even when tubes are replaced, and for these reasons should never be touched unless there is no doubt about its being out of adjustment, in which case, the following procedure should be followed carefully. The adjustment is quite critical and cannot be done correctly in a hasty manner.

1. Set compensator (3) at the minimum position. This is the setting when the screw slot is vertical and when the red half of the adjusting screw is at the left.
2. Tune the IF amplifier to 455 kc as described under "IF Amplifier Alignment".
3. With the signal generator connected to the grid of the 6K8 tube and with the output of the generator at a low value, note the reading of the output meter. Then very carefully turn compensator (3) until the output meter reading reaches a minimum value. That is the correct setting of this compensator.

It will be necessary to use a screw driver made from some insulating material in making this adjustment. If a metal tool is used, the adjustment will not be correct.

If the adjustment is not correctly made, the oscillator or control tube will not function properly. It may even detune the oscillator instead of tuning it.

R.F. Alignment.

Band 3 (Standard Broadcast)

Connect the "hot" terminal of the generator to the post marked "A" on the rear of the chassis through the .0002 mfd. condenser.

Set the generator frequency to 1500 kc., and the ROTOR dial to the same frequency, with the Band Selector Switch set to Band 3. Adjust trimmer #8 for maximum reading of the output meter. (This trimmer is adjusted by drawing the brass rod up or pushing it down with a hooked wire, and with a twisting motion. First loosen the lock nut). Then, without touching the tuning controls, adjust trimmer #12 and trimmer #15 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc., and the ROTOR dial to approximately the same. Adjust trimmer #9 for maximum output reading while "rocking" the gang condenser. Then go back and repeat the 1500 kc. adjustment, and tighten the lock nut on trimmer #8.

Band 2 (Short-Wave) Remove the .0002 mfd. dummy antenna used in aligning Band 3 and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator frequency to 9,000 kc. (9 mc.) and also set the ROTOR dial to this frequency. Carefully adjust the oscillator trimmer #10 for maximum reading of the output meter. Be very careful that this trimmer is not set on the Image Frequency.

After the oscillator is set, trimmers #13 and #16 are adjusted for greatest reading of the output meter, resetting trimmer #10 if necessary to keep the calibration correct.

The adjustments on this band are more critical than the similar ones on the lower frequency bands and must be more carefully made.

The above adjustments, at the high frequency end of the band, are the only ones to be made on this band.

Band 1 (Short-Wave) Connections and dummy antenna are the same as on Band 2.

Set the generator, and the ROTOR dial to 23 mc. Adjust trimmer #11 for maximum reading of the output meter, when the lower frequency peak of the two which can be located coincides with the 23 mc. calibration point on the dial. Then adjust trimmers #14 and #17 while "rocking" the gang condenser, until the maximum reading is obtained on the output meter, resetting trimmer #11 if necessary to keep the calibration correct.

These are the only adjustments on this band.

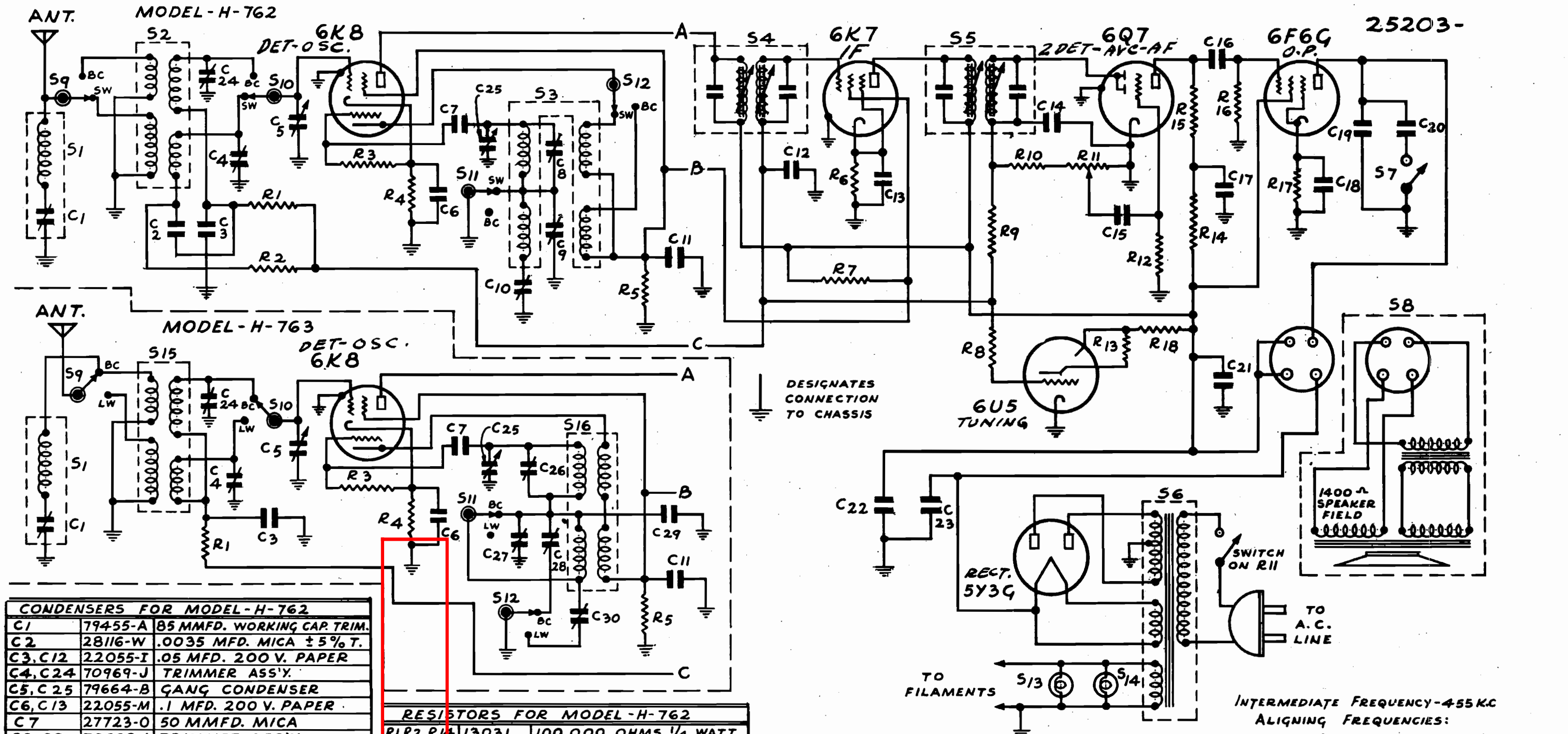
Image Frequency

All bands in this receiver, except Band 1 must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in doing this on Band 3. However, on the two high frequency bands it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver, separated by twice the Intermediate Frequency, set the dial on Band 2 to that one which comes in at the higher frequency marking on the ROTOR dial. That is, on Band 2 the two frequencies which will be picked up when the generator is set at 9 mc., will be at 9 mc. and at 8 mc. on the ROTOR dial. Adjust the oscillator trimmer so that the 9 mc. frequency one coincides with 9 mc. on the dial. Exactly the reverse is true on Band 1.

PILOT RADIO CORP.

MODELS H-762, H-763
Chassis H-760
Schematic



INTERMEDIATE FREQUENCY-455 K.C.
ALIGNING FREQUENCIES:

DOMESTIC H-762	LONG-WAVE H-763
B.C.-1500 & 600 K.C.	B.C.-1500 & 600 K.C.
S.W.-17 MEGACYCLES	L.W.-375 & 150 K.C.

CONDENSERS FOR MODEL-H-762		
C1	79455-A	85 MMFD. WORKING CAP. TRIM.
C2	28116-W	.0035 MFD. MICA ±5% T.
C3, C12	22055-I	.05 MFD. 200 V. PAPER
C4, C24	70969-J	TRIMMER ASS'Y.
C5, C25	79664-B	GANG CONDENSER
C6, C13	22055-M	.1 MFD. 200 V. PAPER
C7	27723-O	50 MMFD. MICA
C8, C9	70969-J	TRIMMER ASS'Y.
C10	79431-B	300-500 MMFDS. PADDER
C11	22055-P	.05 MFD. 400 V. PAPER
C14	27726-O	.0002 MFD. MICA
C15	22055-AU	.005 MFD. 400 V. PAPER
C16	22055-AC	.02 MFD. 600 V. PAPER
C17, C21	22055-AB	.1 MFD. 600 V. PAPER
C18	22481	10 MFD. 25 V. ELECTRO.
C19	22055-R	.005 MFD. 1000 V. PAPER
C20	22055-AD	.02 MFD. 1000 V. PAPER
C22	23500-C	16 MFD. 450 V. ELECTRO.
C23	23500-D	8 MFD. 450 V. ELECTRO.

CONDENSERS FOR MODEL-H-763 SAME AS FOR MODEL-H-762, EXCEPT FOLLOWING:		
C2, C8		NOT USED
C9, C10		NOT USED
C26, C27	70969-E	TRIMMER ASS'Y.
C28	72355-C	250-500 MMFDS. PADDER
C30	72355-C	30-150 MMFDS. PADDER
C29	28101-O	.000015 MFD. MICA

RESISTORS FOR MODEL-H-762		
R1, R2, R14	13031	100,000 OHMS 1/4 WATT
R3, R5, R10	13164	50,000 OHMS 1/4 WATT
R4	13003	300 OHMS 1/4 WATT
R6	13115	400 OHMS 1/4 WATT
R7	13239	12,000 OHMS 2 WATT
R8	13007	2 MEGOHMS 1/4 WATT
R9	13001	1 MEGOHM 1/4 WATT
R11	79429	1/2 MEGOHM VOL. CONT. & SW.
R12	13237	15 MEGOHMS 1/2 WATT
R13, R16	13024	500,000 OHMS 1/4 WATT
R15	13171	250,000 OHMS 1/4 WATT
R17	13108	410 OHMS 1 WATT
R18	13074	20,000 OHMS 1/4 WATT

RESISTORS FOR MODEL-H-763 SAME AS FOR MODEL-H-762, EXCEPT FOLLOWING:	
R2	NOT USED

MISCELLANEOUS FOR MODEL-H-762		
S1	73119	WAVE TRAP ASS'Y.
S2	73224	ANTENNA COIL ASS'Y.
S3	73228	OSCILLATOR COIL ASS'Y.
S4	73192-C	1ST. I.F. TRANSFORMER ASS'Y.
S5	73193	2ND. I.F. " "
S6	83412-R	P'WR. TRANSFORMER-117V.-50-60CY.
	83412-AB	" " 230V.-50-60CY.
	83412-FB	" " 115-230V.-50-60CY.
	83412-L	" " 150V.-50-60CY.
	83697	" " UNIVE.-50-60CY.
S7	72049	TONE CONTROL SWITCH
S8	40851	6" A.C. SPEAKER-1400Ω FIELD
S9 TO S12	79454	BAND SWITCH
S13, S14	78889	DIAL LAMP

MISCELLANEOUS FOR MODEL-H-763 SAME AS FOR MODEL-H-762, EXCEPT FOLLOWING:		
S2, S3		NOT USED
S15	73225	ANTENNA COIL ASS'Y.
S16	73226	OSCILLATOR COIL ASS'Y.

SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-762 & MODEL-H-763
MATERIAL
SCALE
DATE 9-9-38.
DRAWN BY B.R.
CHECKED BY G.J.
APPROVED BY 2.S.L.
DRWG. No. 25203

Power Supply Voltage	Watts	Frequency
110-125 volts AC	60	60
150 volts AC	60	60
220-240 volts AC	60	60
110-125 or 220-240 Volts AC	60	60
Universal primary (115,125,150,220,240)	60	60

Maximum Power Output 4.7 watts

Intermediate Frequency 455 kilocycles

MODELS H-762,H-763
Chassis H-760

PILOT RADIO CORP.

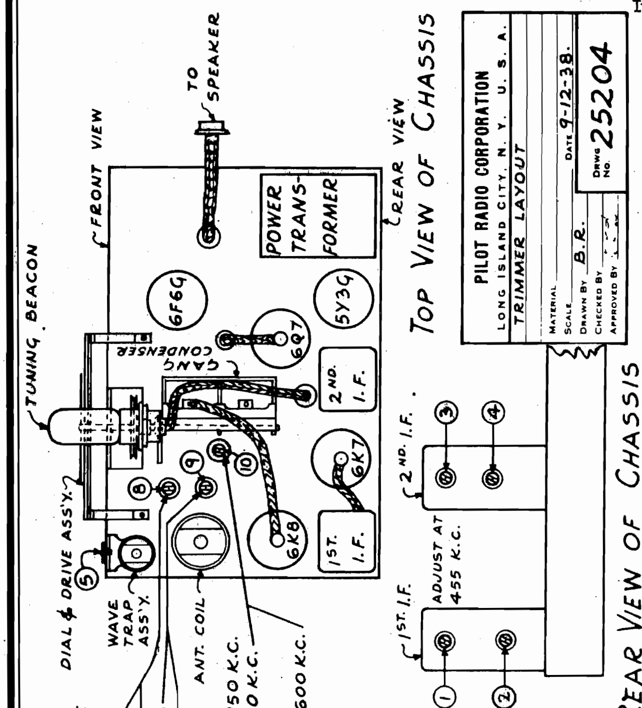
Voltage,Socket,Trimmers
Alignment

D.C. SOCKET VOLTAGES

Socket Terminals

Tube	1	2	3	4	5	6	7	8
6K8	-	-	240	95	-	95	-	2.8
6K7	-	-	240	95	3.3	-	-	3.3
6Q7	-	-	*105	-	-	-	-	1.4
6F6-G	-	-	225	245	-	-	-	16.
5Y3-G	-	-	-	-	-	-	340	340
6U5	Voltages at the prongs of this tube cannot be measured, however, if the tube is removed from the socket, the voltages on the various terminals may be measured. As all these measured voltages would be measured through a high resistance, except the Cathode which is grounded, none of them are noted here.							

* Not true value, but as measured with voltmeter.



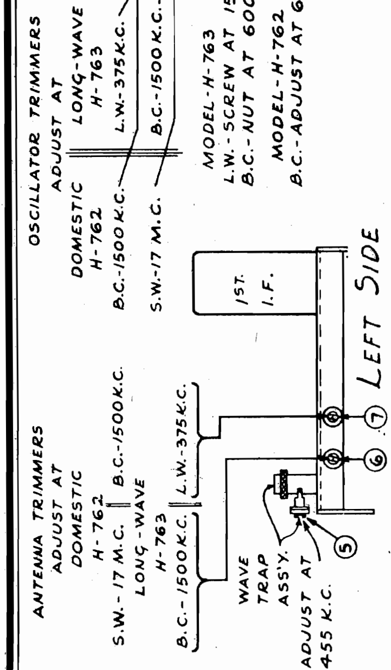


Image Frequency

The short wave band in the Model H-762 must be aligned with the oscillator frequency lower than the signal frequency. On the high frequency band, it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the Image Frequency.

The chance of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver, separated by twice the Intermediate Frequency, turn the tuning knob so that the dial pointer points to that one which comes in at the higher frequency marking on the dial.

IF Amplifier Alignment

Turn the Band Selector Switch to the Broadcast, or Medium Wave Band, and tune the gang condenser to the low frequency end of the dial. That is the condenser plates completely enmeshed.

Connect the output meter as described under "Connections" and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd condenser. Then proceed with the alignment as follows:

1. Adjust the signal generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the trimmer screws 1, 2, 3, and 4, (see Figure for maximum reading of the output meter. Keep reducing the generator output as the output meter reading increases. When the reading of the output meter cannot be increased by adjusting the four screws of the IF transformers, the IF amplifier is aligned.

If the output of the generator is too great, while aligning the receivers, the alignment will be incorrect. It is very important that this be kept in mind.

It will seldom, if ever, be found necessary to more than touch up the alignment of the IF amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the IF amplifier tube, and then align the last IF amplifier transformer. Always finish the alignment of the IF amplifier with the signal input to the grid of the 6K8 tube.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

Wave Trap Alignment

With the Band Selector Switch set on the Broadcast, or Medium Wave, position connect the generator to the blue antenna wire with the .0002 mfd. condenser. Set the generator frequency to 455 kilocycles and adjust trimmer #5 for minimum reading of the output meter. There must always be sufficient output from the signal generator to have a reading on the output meter to make this adjustment.

R.F. ALIGNMENT

Long Wave Band (Model H-763). Connect the "hot" terminal of the generator to the blue antenna wire through the .0002 mfd. condenser.

Set the generator frequency to 375 kilocycles and with the Band Selector Switch set to the Long Wave Band turn the pointer of the receiver to 375 kilocycles. Adjust trimmer #8 for maximum reading of the output meter. Do likewise with trimmer #7. Then set the generator frequency to 150 kilocycles and the receiver dial pointer to approximately the same frequency. Adjust the screw of trimmer #10 for maximum reading of the output meter, while "rocking" the gang condenser carefully back and forth. Then go back and repeat the 375 kilocycle alignment.

Broadcast, or Medium Wave, Band (Models H-763 & H-762) Connections are the same for the alignment of this band as they are for the Long Wave Band.

Set the generator frequency to 1500 kilocycles, and the receiver dial pointer to the same frequency, with the Band Selector Switch set appropriately. Adjust trimmer #9 of Model H-763, or trimmer #8 of Model H-762 for maximum reading of the output meter. Also adjust trimmer #6 of Model H-763, or trimmer #7 of Model H-762 for maximum reading of the output meter. Next, set the generator frequency to 600 kilocycles. Then with the receiver dial pointer set at approximately the same frequency, adjust trimmer #10 for maximum reading of the output meter while carefully "rocking" the gang condenser. Finally return and repeat the 1500 kilocycle adjustment.

Short Wave Band (Model H-762)

When aligning this band connect the "hot" terminal of the signal generator to the blue antenna wire of the receiver through the 400 ohm resistor.

Before aligning this band, refer to the paragraph headed "Image Frequency".

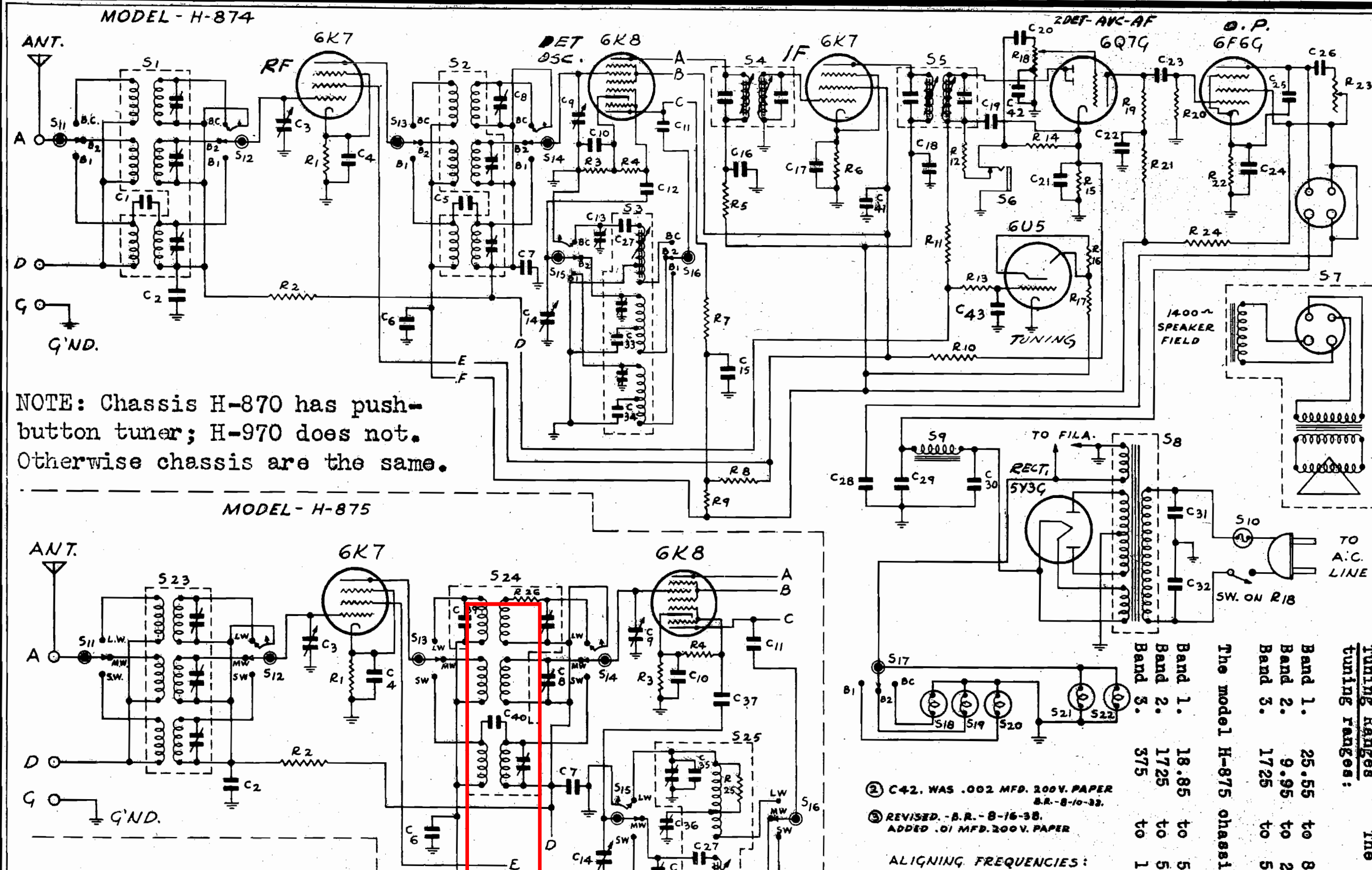
Set the generator frequency to 17 mc., and also the receiver to this frequency, as marked on the dial. Carefully adjust trimmer #9 for maximum reading of the output meter. Be careful you do not adjust to the Image Frequency.

Then adjust trimmer #6 for maximum output meter reading, while slightly "rocking" the gang condenser.

Adjust trimmer #9, if necessary, to keep the calibration correct.

MODELS H-874, H-875
Chassis H-870
MODELS H-974, H-975
Chassis H-970
Schematic, Voltage

PILOT RADIO CORP.



NOTE: Chassis H-870 has push-button tuner; H-970 does not. Otherwise chassis are the same.

CONDENSERS FOR MODEL-H-874		
C1	27737-0	10 MMFDS. MICA
C2, C7	22055-I	.05 MFD. 200 V. PAPER
C3, C9, C14	83542	3 GANG CONDENSER
C4, C10, C17	22055-H	.1 MFD. 200 V. PAPER
C5	28115	15 MMFDS. MICA
C6, C18, C26	22055-C	.05 MFD. 600 V. PAPER
C8, C13	83415	20 MMFDS. AIR TRIMMER
C11	27704	.002 MMFDS. MICA
C12	27723-0	50 MMFDS. MICA
C15, C28	85038	4-8 MFD. 450 V. ELECTRO.
C16, C23	22055-AC	.02 MFD. 600 V. PAPER
C19	27726	.0002 MFD. MICA
C20	22055-W	.01 MFD. 400 V. PAPER
C21, C24	22481	10 MFD. 25 V. ELECTRO.
C22	22055-AB	.1 MFD. 600 V. PAPER
C25	22055-R	.005 MFD. 1000 V. PAPER
C27	92000-C	450 MMFD. SILVER CAP
C29, C30	71045-A	8-8 MFD. 475 V. ELECTRO.
C31, C32	78503	.01-.01 - 1000 V. PAPER
C33	27732	.0016 MFD. MICA
C34	28023-W	.0038 MFD. MICA
C41	22055-P	.05 MFD. 400 V. PAPER
C42	22055-AY	.001 MFD. 200 V. PAPER
C43	22055-T	.01 MFD. 200 V. PAPER

CONDENSERS FOR MODEL H-875 SAME AS FOR MODEL H-874 EXCEPT FOLLOWING		
C1, C5, C12		NOT USED
C35	27736	25 MMFDS. MICA
C36	83394-B	150 MMFDS. - PADDER
C38	28106	.00325 MFD. MICA
C39	27701-0	.00025 MFD. MICA
C40	27737-0	10 MMFDS. MICA
C37	28016-0	100 MMFDS. MICA

RESISTORS FOR MODEL-H-874		
R1, R6, R15	13115	400 OHMS 1/4 WATT
R2, R21	13031	100,000 OHMS 1/4 WATT
R3	13003	300 OHMS 1/4 WATT
R4, R12	13164	50,000 OHMS 1/4 WATT
R5	13028	1,000 OHMS 1/4 WATT
R7	13117	15,000 OHMS 1/4 WATT
R8	13234	6,000 OHMS 1 WATT
R9	13233	6,000 OHMS 2 WATT
R10	13068	30,000 OHMS 1/2 WATT
R11, R16	13001	1 MEGOHM 1/4 WATT
R13	13007	2 MEGOHMS 1/4 WATT
R14	13147	300,000 OHMS 1/4 WATT
R17	13199	22,000 OHMS 1/4 WATT
R18	83529-A	1 MEGOHM VOL. CONT. & SW.
R19	13171	250,000 OHMS 1/4 WATT
R20	13024	500,000 OHMS 1/4 WATT
R22, R24	13108	410 OHMS 1 WATT
R23	83447-A	100,000 OHMS TONE CONT.

RESISTORS FOR MODEL H-875 SAME AS FOR MODEL H-874 EXCEPT FOLLOWING:		
R25	13148	30,000 OHMS 1/4 WATT
R26	13029	250 OHMS 1/4 WATT

MISCELLANEOUS FOR MODEL H-874		
S1	73205	ANTENNA COILS & CAN ASS'Y.
S2	73207	INTERSTAGE " " " "
S3	73209	OSCILLATOR " " " "
S4	73192-B	1ST. I.F. TRANSFORMER ASS'Y.
S5	73193	2ND. I.F. " "
S6	70950	PHONO JACK
S7	40849	8" A.C.-SPEAKER-1400~ FIELD
	40784	12" A.C.-SPEAKER-1400~ FIELD
S8	83605	P'W'R. TRANSF. UNIV.
	83606-R	P'W'R. TRANSF.-117V.-60 CY.
	83607-AB	P'W'R. TRANSF.-230V.-25 CY.
S9	79029-B	FILTER CHOKE
S10	70053-2	1/4 AMP. FUSE
S11 TO S17	83438	BAND SWITCH
S18 TO S22	78889	PILOT LIGHTS

MISCELLANEOUS FOR MODEL H-875 SAME AS FOR MODEL H-874 EXCEPT FOLLOWING:		
S1, S2, S3		NOT USED
S23	73204	ANTENNA COILS & CAN ASS'Y.
S24	73206	INTERSTAGE " " " "
S25	73208	OSCILLATOR " " " "

Tuning Ranges — The model H-874 chassis has the following tuning ranges:

Band 1.	25.55	to	8.86 mc	or	11.75	to	33.8 meters
Band 2.	9.95	to	2.96 mc	or	30.13	to	101.3 meters
Band 3.	1725	to	520 kc.	or	174	to	576 meters

The model H-875 chassis has the following tuning ranges:

Band 1.	18.85	to	5.5 mc	or	15.9	to	54.5 meters
Band 2.	1725	to	520 kc	or	174	to	576 meters
Band 3.	375	to	140 kc	or	800	to	2142 meters

② C42. WAS .002 MFD. 200V. PAPER B.R.-8-10-38.

③ REVISED.-B.R.-8-16-38. ADDED .01 MFD. 200V. PAPER

ALIGNING FREQUENCIES:

FOR MODEL-H-874
B1 - 23 MEGACYCLES.
B2 - ?
B.C. - 1500 & 600 K.C.

FOR MODEL H-875
S.W. - 17.6 MEGACYCLES.
M.W. - 1500 & 600 K.C.
L.W. - 350 & 160 K.C.

INTERMEDIATE FREQUENCY :- 455 K.C.

Maximum Power Output 5.8 watts

Power Supply

Voltage	Frequency	Watts
117.5	50-60	65
115, 125, 150, 220, 240*	50-60	65

* Universal primary Power Transformer

SOCKET TERMINALS

Tube	1	2	3	4	5	6	7	8
6K7	-	-	250	95	3.18	-	-	3.18
6K8	-	-	247	95	5*	82	-	3.2
6K7	-	-	248	95	2.83	-	-	2.8
6Q7	-	-	97*	-	-	-	-	2.8
6F6-G	-	-	240	260	-	-	-	17.0
5Y3-G	-	395	-	-	-	-	-	395

* measurement made on 1000 volt scale.

SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-H-874 & MODEL-H-875
DATE :- 7-5-38
DRAWN BY :- B.R.
CHECKED BY :- G.JACOBS
APPROVED BY :- [illegible]
No. 25192-3

H-870-SERIES

MODELS H-874, H-875
Chassis H-870

PILOT RADIO CORP.

MODELS H-974, H-975
Chassis H-970
Alignment Procedure

PILOT RECEIVERS OF THE H-870 SERIES

SERVICE DATA

Removal of the chassis from the cabinet, when necessary, is done as follows:-

1. Remove the power supply cord from the supply outlet.
2. Remove the knobs and felt washers from all shafts on the front of the cabinet. These knobs, except the "locking" knob, are of the "push-on" type.
3. Remove the speaker cord from the socket on the speaker.
4. Remove the four mounting screws located under the cabinet, and carefully slide the chassis out of the cabinet.

Receiver Alignment

Equipment Required.

1. Signal Generator. One using fundamental frequencies for all the frequencies used in the receiver is preferred.
2. Output Meter. Generally a copper-oxide rectifier meter is the most convenient.
3. Dummy Antennas. .1 mfd. condenser
   .0002 mfd. mica condenser
   400 ohm, non-inductive resistor

Alignment Connections

The posts marked D and G on the rear of the chassis should be connected to the ground side of the signal generator.

Connect the "hot" post of the signal generator through the .1 mfd condenser to the grid of the 6K8 detector-oscillator tube or the 6K7 I.F. amplifier tubes when aligning the I.F. amplifier.

Connect the "hot" post of the signal generator through the 200 mmf condenser to the post marked A on the rear of the chassis when aligning the Long-Wave and Broadcast Bands. Use the same connections for both short-wave bands, but replace the 200 mmf condenser with the 400 ohm non-inductive resistor.

In all measurements connect the output meter, through .1 mfd 600 volt condensers, to the plate and screen terminals of the 6F6-G tube.

Procedure The volume and tone controls should all be turned to the extreme clockwise positions, before starting.

The location of all trimmers is shown in the accompanying figure. Always keep the output from the signal generator at the lowest value which will give a readable deflection on the output meter.

I.F. Amplifier Alignment Turn the Band Selector Switch to Band 3 and turn the ROTOR-DIAL to the low frequency end.

Connect the output meter as described under "Connections" and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd condenser. Then proceed with the alignment as follows:-

1. Adjust the signal generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the screws 1, 2, 3, and 4 (see figure), for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the I.F. amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the I.F. amplifier tube, and align the last I.F. transformer. Always finish the alignment with the signal input to the 6K8 tube.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

R.F. ALIGNMENT

Band 3. (model 875, Long-Wave) Connect the "hot" terminal of the generator to the blue wire and clip, through the .0002 mfd condenser.

Set the generator frequency to 350 kc., and with the Band Selector Switch set to Band 3 turn the ROTOR-DIAL to 350 kc. Adjust trimmer #5 for maximum reading of the output meter. Do likewise with trimmer #6 and #7. Then set the generator frequency to 160 kc and the ROTOR-DIAL to approximately the same. Adjust trimmer #21 for maximum reading of the output meter, while "rocking" the gang condenser carefully back and forth. Then go back and repeat the 350 kc. alignment.

Band 2. (Model 875) Band 3. (Model 874) (Standard Broadcast)

Connections are the same for the alignment of this band as they are for the Long-Wave Band.

Set the generator frequency to 1500 kc., and the ROTOR-DIAL to the same frequency, with the Band Selector Switch set appropriately. Adjust trimmer #8 for maximum reading of the output meter. (This trimmer is adjusted by moving the brass rod in or out, with a hooked wire, and with a twisting motion. First loosen the lock nut.) Then without touching any tuning controls adjust trimmers #9 and #10 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc. and set the ROTOR-DIAL to the 600 kc. mark. Then adjust trimmer #11 for maximum reading of the output meter, while "rocking" the gang condenser. Finally return and repeat the 1500 kc. adjustments and then tighten the lock nut on trimmers #8 and #9.

Band 1. (Model 875 Short-Wave)

Remove the .0002 mfd dummy antenna used in aligning the lower frequency bands and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph head "Image Frequency".

Set the generator frequency to 17.6 mc and also set the ROTOR-DIAL to this frequency. Carefully adjust trimmer #12 for maximum reading of the output meter. Be careful you do not tune in at the image frequency.

Then adjust trimmers #13 and #14 for maximum output meter reading, while slightly "rocking" the gang condenser. Readjust trimmer #12 if necessary to keep the calibration correct. These are the only adjustments on this band.

Band 2. (Model 874 Short-Wave)

Connections and dummy antenna same as on Band 1 above.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator, and the ROTOR-DIAL to 9 mc. Adjust trimmer #15 for maximum reading of the output meter. Be careful you do not tune in at the Image Frequency.

Then adjust trimmers #16 and #17 for maximum reading of the output meter, while slightly "rocking" the gang condenser. Readjust trimmer #15 if necessary to correct the calibration.

Band 1. Alignment (Model 874 Short-Wave)

Connections and dummy antenna are the same as on Band 2 of Model 874.

Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 23 mc and the ROTOR-DIAL to 23 mc. Adjust trimmer #18 to 23 mc for maximum reading of the output meter. Be careful that the receiver is not adjusted to the Image Frequency. Then adjust trimmers #19 and #20 while "rocking" the gang condenser, for maximum reading of the output meter. Reset trimmer #18 so that calibration is correct if necessary.

Image Frequency

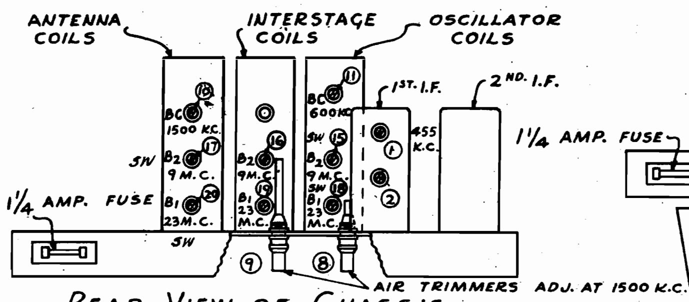
All bands in these two models must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in doing this on the Long-Wave and Broadcast Bands. However, on the higher frequency bands it is possible to incorrectly adjust the alignment in this respect and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver, separated by twice the Intermediate Frequency, set the ROTOR-DIAL to that one which comes in at the higher frequency marking on the ROTOR-DIAL.

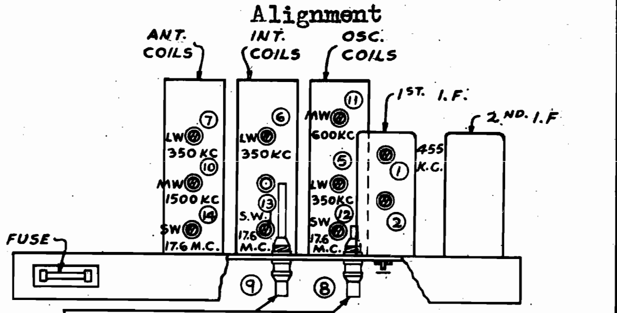
MODELS H-874, H-875
Chassis H-870
MODELS H-974, H-975
Chassis H-970
Socket, Trimmers

PILOT RADIO CORP.

MODEL T-1252
Schematic, Socket, Trimmers
Alignment



REAR VIEW OF CHASSIS
(MODEL-H-874)

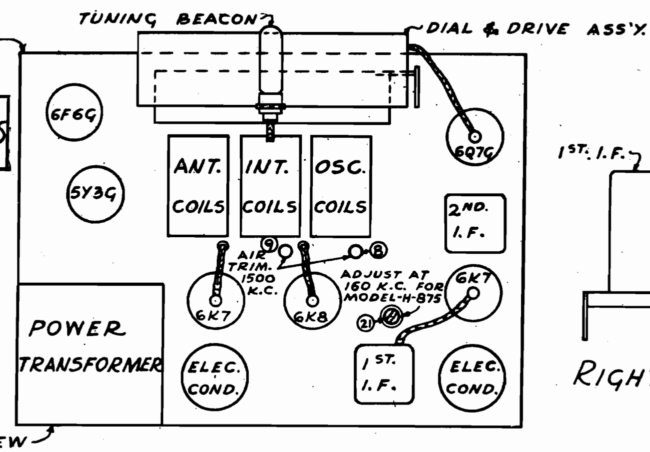


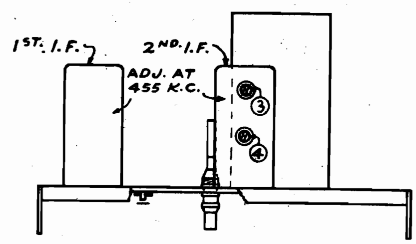
REAR VIEW OF CHASSIS
(MODEL-H-875)

TRIMMER LAYOUT	
MATERIAL	
SCALE	DATE 7-5-38
DRAWN BY B.R.	DRWG. NO. 25193
CHECKED BY G.J.	
APPROVED BY	

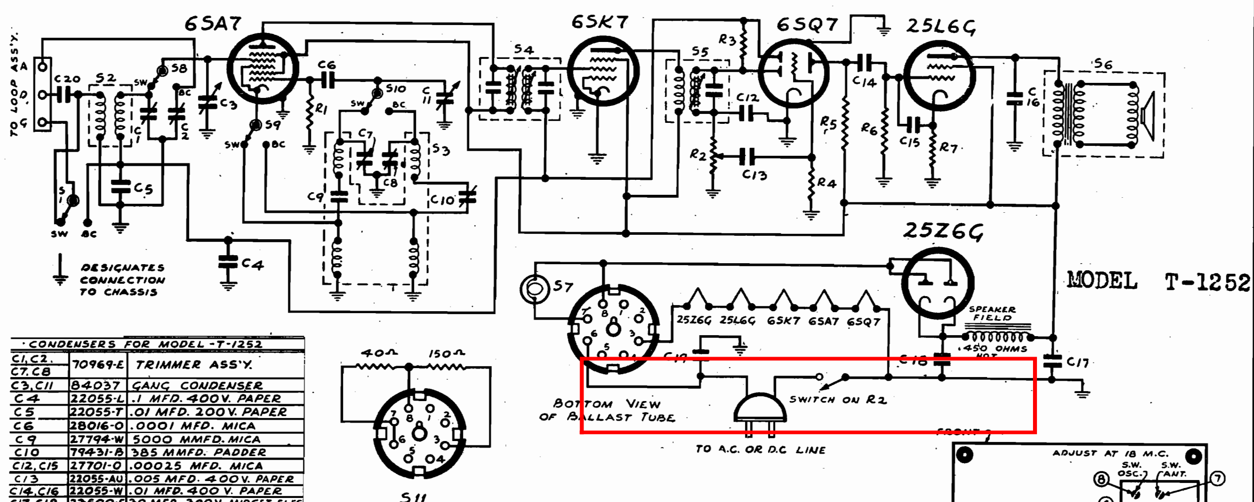
CLASSIFICATION
H-870-SERIES

TOP VIEW OF CHASSIS





RIGHT SIDE OF CHASSIS



CONDENSERS FOR MODEL-T-1252		
C1, C2. C7. C8	70969-E	TRIMMER ASS'Y.
C3, C11	84037	GANG CONDENSER
C4	22055-L	.1 MFD. 400V. PAPER
C5	22055-T	.01 MFD. 200V. PAPER
C6	28016-O	.0001 MFD. MICA
C9	27794-W	5000 MMFD. MICA
C10	79431-B	385 MMFD. PADDER
C12, C15	27701-O	.00025 MFD. MICA
C13	22055-AU	.005 MFD. 400V. PAPER
C14, C16	22055-W	.01 MFD. 400 V. PAPER
C17. C18	23500-E	30 MFD. 300V. MIDGET ELEC
C19	22055-AC	.02 MFD. 600V. PAPER
C20	22055-W	.01 MFD. 400V. PAPER

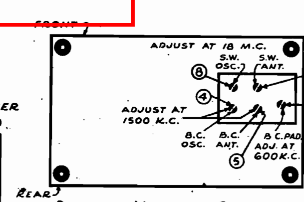
MISCELLANEOUS FOR MODEL-T-1252		
S1	84060	BAND SWITCH
S2	73263	S.W. ANTENNA COIL ASS'Y.
S3	73262	B.C. & S.W. OSCILLATOR COIL ASS'Y.
S4	73192-D	1ST. I.F. TRANSFORMER ASS'Y.
S5	73267	2ND. I.F. " "
S6	40869	5" SPEAKER
S7	71282	PILOT LIGHT
S8; S9; S10	84060	BAND SWITCH
S11	81985	BALLAST TUBE "O/125 V.

RESISTORS FOR MODEL-T-1252		
R1	13074	20.000 OHMS 1/4 WATT
R2	79429-B	500.000 OHMS VOL. CONT. & SW
R3, R4	13007	2 MEGOHMS 1/4 WATT
R5	13147	300.000 OHMS 1/4 WATT
R6	13024	500.000 OHMS 1/4 WATT
R7	13018	150 OHMS 1/4 WATT

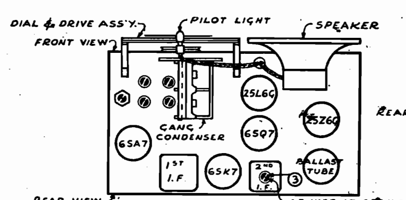
PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-T-1252
DRWG. NO. 25219-

CONVENTIONAL
ALIGNMENT
SEE INDEX

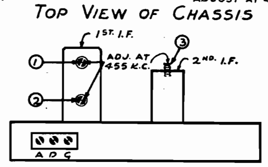
INTERMEDIATE FREQUENCY:- 455 K.C.
ALIGNING FREQUENCIES:
B.C. - 1500 & 600 KILOCYCLES.
S.W. - ALIGN AT 18 MEGACYCLES. CHECK AT 6 "



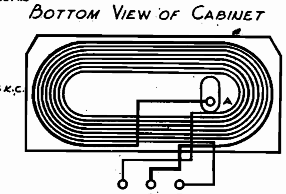
BOTTOM VIEW OF CABINET



TOP VIEW OF CHASSIS



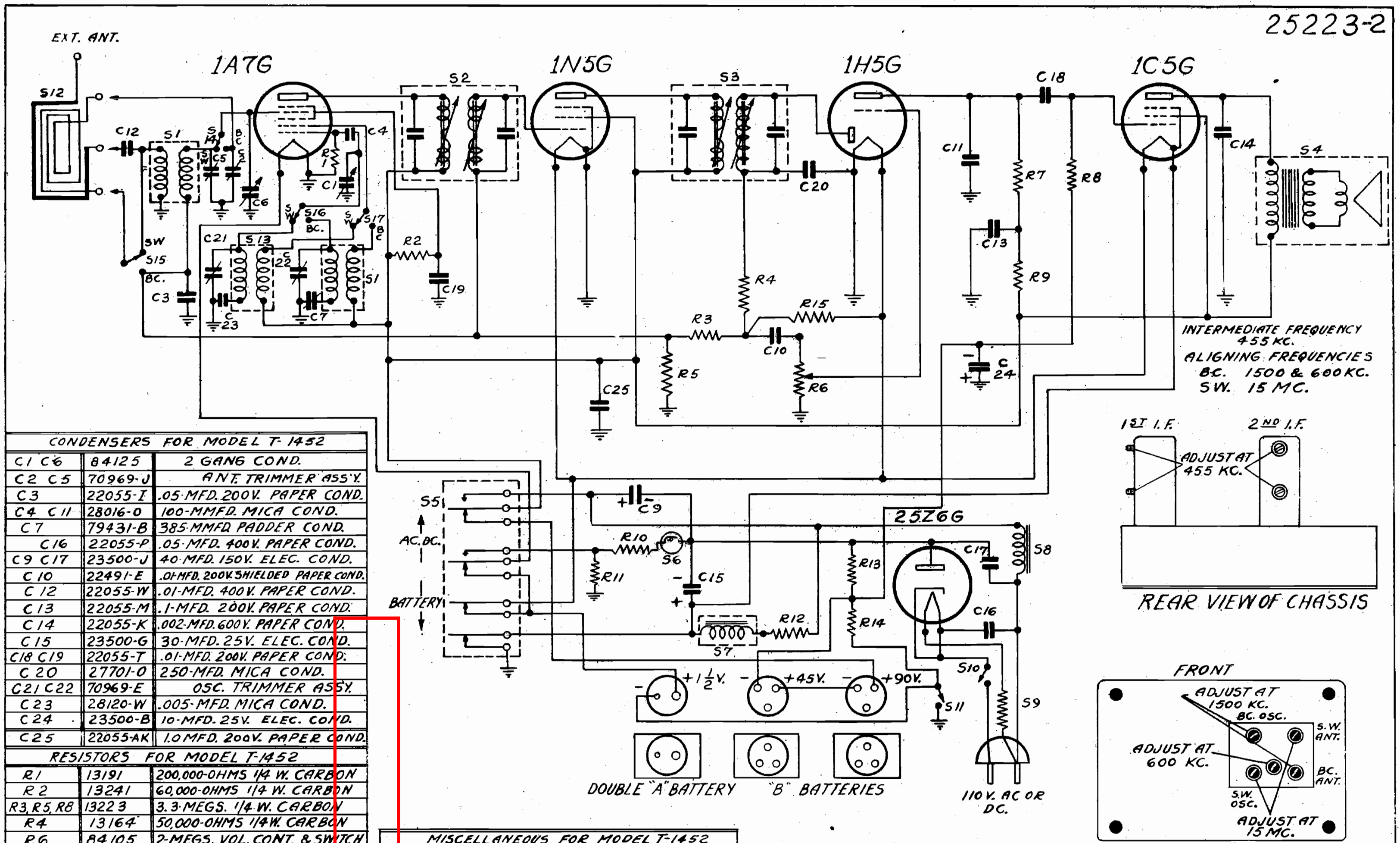
REAR VIEW OF CHASSIS



CABINET BACK & ANTENNA LOOP ASS'Y.

MODEL T-1452
Schematic, Trimmers
Alignment, Changes

PILOT RADIO CORP.



CONDENSERS FOR MODEL T-1452		
C1 C6	84125	2 GANG COND.
C2 C5	70969-J	ANT. TRIMMER ASS'Y.
C3	22055-I	.05-MFD. 200V. PAPER COND.
C4 C11	28016-O	100-MMFD. MICA COND.
C7	79431-B	385-MMFD. PADDER COND.
C16	22055-P	.05-MFD. 400V. PAPER COND.
C9 C17	23500-J	40-MFD. 150V. ELEC. COND.
C10	22491-E	.01-MFD. 200V. SHIELDED PAPER COND.
C12	22055-W	.01-MFD. 400V. PAPER COND.
C13	22055-M	.1-MFD. 200V. PAPER COND.
C14	22055-K	.002-MFD. 600V. PAPER COND.
C15	23500-G	30-MFD. 25V. ELEC. COND.
C18 C19	22055-T	.01-MFD. 200V. PAPER COND.
C20	27701-O	250-MFD. MICA COND.
C21 C22	70969-E	OSC. TRIMMER ASS'Y.
C23	28120-W	.005-MFD. MICA COND.
C24	23500-B	10-MFD. 25V. ELEC. COND.
C25	22055-AK	1.0 MFD. 200V. PAPER COND.

RESISTORS FOR MODEL T-1452		
R1	13191	200,000-OHMS 1/4 W. CARBON
R2	13241	60,000-OHMS 1/4 W. CARBON
R3, R5, R8	13223	3.3-MEGS. 1/4 W. CARBON
R4	13164	50,000-OHMS 1/4 W. CARBON
R6	84105	2-MEGS. VOL. CONT. & SWITCH
R7	13001	1-MEG 1/4 W. CARBON
R9	13031	100,000-OHMS 1/4 W. CARBON
R10	83656-J	50-OHMS 1W. FLEXIBLE
R11	83656-G	25-OHMS .5W. FLEXIBLE
R12	84116	700-OHMS 8W. W.W. IRON CLAD
R13	13019	2000-OHMS 1/4 W. CARBON
R14	13246	1200-OHMS 1/4 W. CARBON
R15	13007	2-MEGS. 1/4 W. CARBON

MISCELLANEOUS FOR MODEL T-1452		
S1	73273	S.W. ANT. & BC. OSC. COIL ASS'Y.
S2	73277	1ST. I.F. TRANS. ASS'Y.
S3	73274	2ND. I.F. TRANS. ASS'Y.
S4	40872	5" P.M. SPEAKER
S5 S7	84110	RELAY
S6	72151	DIAL LIGHT .15 AMPS.
S8	84115	CHOKE 5HS. 200Ω 100-MA.
S9	84106	LINE CORD 310 OHMS
S10 S11		SWITCHES ON VOL. CONT.
S12	73264	ANT. LOOP ASSY.
S13	73272	SW. OSC. COIL ASS'Y.
S14,15,16,17	84060-B	BAND SWITCH

ALTERATIONS & DATE

② REMOVED C8-.06-400V. COND. ADDED C24-C25 REVISED WIRING. C.O.2558 E.F. 6-2-39

PILOT RADIO CORPORATION	LONG ISLAND CITY N.Y. U.S.A.
SCHEMATIC WIRING DIAGRAM	
MATERIAL	
SCALE	DATE 5-24-39
DRAWN BY E.F.	
CHECKED BY	
APPROVED BY	
DRWG. NO.	25223-2

ALTERATIONS

FINISH

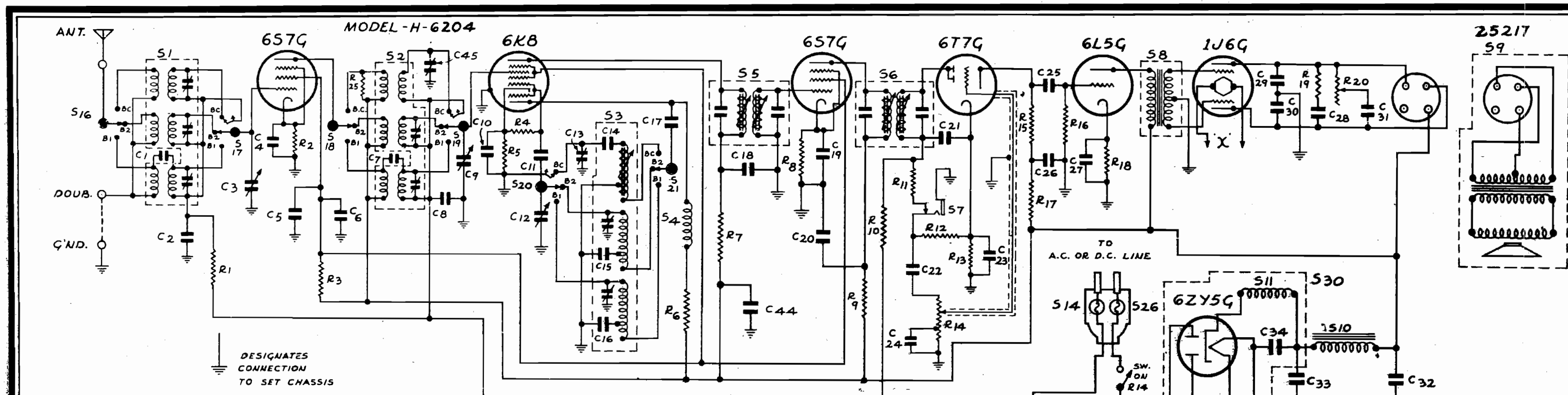
CLASSIFICATION T-1452

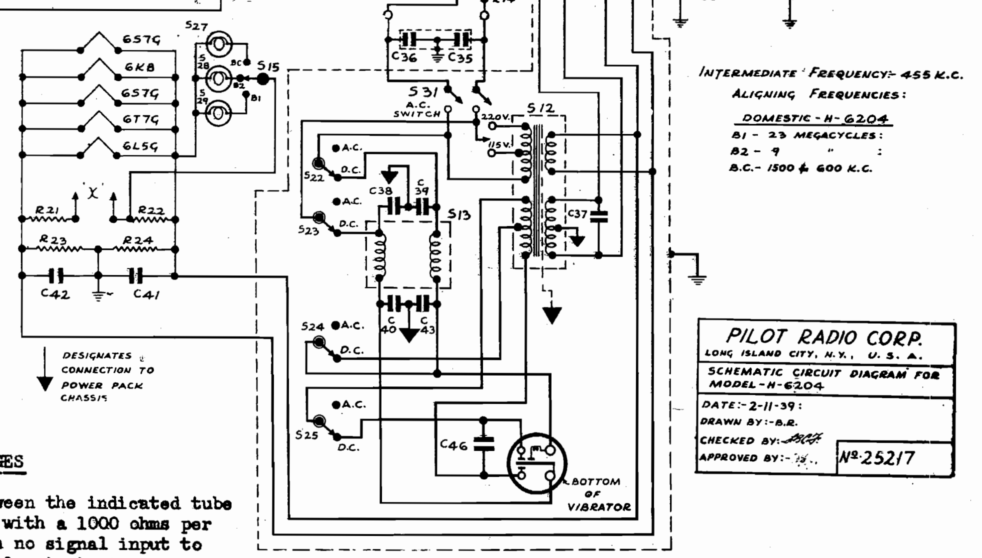
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO

DO NOT SCALE THIS PRINT

MODEL H-6204
Chassis H-6200
Schematic, Voltage

PILOT RADIO CORP.





CONDENSERS FOR MODEL-H-6204		
C1	27737-O	.00001 MFD. MICA
C2, C8	22055-I	.05 MFD. 200 V. PAPER
C3, C9, C12	83359	GANG CONDENSER
C4, C10, C19	22055-M	.1 MFD. 200 V. PAPER
C5, C32, C33	23600-C	5-30-10 MFD. 300 V. ELECTRO.
C6, C26	22055-L	.1 MFD. 400 V. PAPER
C7	28115-O	.000015 MFD. MICA
C11	27723-O	.00005 MFD. MICA
C13, C45	83415	20 MMFDS. AIR TRIMMER
C14	92000-C	450 MMFDS. SILVER CAP PAD.
C15	27732	.0016 MFD. MICA
C16	28023-W	.0038 MFD. MICA
C17	27704-W	.002 MFD. MICA
C18, C20, C44	22055-P	.05 MFD. 400 V. PAPER
C21	27701-O	.00025 MFD. MICA
C22, C25	22055-W	.01 MFD. 400 V. PAPER
C23, C27	23500-B	10 MFDS. 25 V. MIDGET ELEC.
C24	22055-AY	.001 MFD. 200 V. PAPER
C28	22055-G	.005 MFD. 600 V. P.T.C.
C29, C30	22055-K	.002 MFD. 600 V. PAPER
C31	22055-AJ	.03 MFD. 600 V. PAPER
C46	22055-S	.5 MFD. 200 V. PAPER
C34	22055-A	.01 MFD. 600 V. PAPER
C35, C36	78503	.01-.01 MFD. 1000 V. SHIELDED
C37	22055-U	.01 MFD. 1000 V. PAPER
C38, C43, C41, C42, C39, C40	22492-R	.5 MFD. 50 V. PAPER

RESISTORS FOR MODEL-H-6204		
R1, R17	130[illegible]	100,000 OHMS 1/4 WATT
R2	13115	400 OHMS 1/4 WATT
R3, R13	13074	20,000 OHMS 1/4 WATT
R4	13164	50,000 OHMS 1/4 WATT
R5	13203	200 OHMS 1/4 WATT
R6, R7, R9	13028	1000 OHMS 1/4 WATT
R8	13131	600 OHMS 1/4 WATT
R10	13001	1 MEGOHM 1/4 WATT
R11, R12	13043	150,000 OHMS 1/4 WATT
R14	83763	1 MEGOHM VOLUME CONTROL & D.P.S.T. SWITCH
R15	13147	300,000 OHMS 1/4 WATT
R16	13024	500,000 OHMS 1/4 WATT
R18, R25	13133	3,000 OHMS 1/4 WATT
R19	13013	10,000 OHMS 1/2 WATT C.[illegible]
R20	83447-C	100,000 OHMS TONE CONT.
R21	83656-B	8.5 OHMS 1/2 WATT, FLEX.
R22	83656-C	11.1 OHMS 1/2 WATT, FLEX.
R23, R24	13028	1000 OHMS 1/4 WATT

RESISTORS FOR MODEL- SAME AS FOR MODEL- EXCEPT FOLLOWING:

MISCELLANEOUS FOR MODEL H-6204		
S1	73205-B	ANTENNA COILS & CAN ASS'Y.
S2	73207-B	R.F. " " " "
S3	73209-B	OSCILLATOR " " " "
S4, S11	73088	R.F. "B" CHOKE ASS'Y.
S5	73192-2-C	1ST. I.F. TRANSFORMER ASS'Y.
S6	73193	2ND. I.F. " "
S7	70950	PHONO JACK
S8	83748	CLASS "B" INPUT TRANSFORMER
S9	40859	8" P.M. SPEAKER
S10	79029-A	FILTER CHOKE
S12	84026	VIBRATOR P'W'R. TRANSFORM.
S13	83744	R.F. "A" CHOKE
S15, S16, S17, S18, S19, S20, S21	83759	BAND SWITCH
S22, S23, S24, S25	83745	A.C.-D.C. SWITCH
S26, S14	70053-C	1 AMP. FUSE
S27, S28, S29	72127	PILOT LIGHT 2V.-.06 AMP.
S30	84021	VIBRATOR P'WR. SUPPLY ASS'Y.
S31	83745	A.C. LINE SWITCH ON A.C.-D.C. SWIT.

MISCELLANEOUS FOR MODEL- SAME AS FOR MODEL- EXCEPT FOLLOWING:

D.C. SOCKET VOLTAGES

All voltage measurements are those between the indicated tube terminal and the chassis, and are made with a 1000 ohms per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

	Tube	Socket Terminals 1	2	3	4	5	6	7	8
R.F.	6S7-G	-	-	145	62.5	2.5	-	-	2.5
1st Det.	6K8	-	-	150	62.5	-	140	-	1.6
I.F.	6S7-G	-	-	145	62.5	2.7	-	-	2.7
2nd Det.	6T7-G	-	-	80	-	-	-	-	1.2
A.F.	6L5-G	-	-	125	-	-	-	-	5.7
A.F.	1J6-G	-	-	145	-	-	145	-	0
Rect.	6ZY5-G	-	-	-	-	-	-	-	150

The above voltages apply with either the nominal Battery Supply or with the AC supply.

Tuning Ranges
The model H-6204 chassis has the following ranges:

Band 1	25.5 - 8.85 mc.	11.7 - 33.9 meters
Band 2	9.95 - 2.96 mc.	30.1 - 101.3 meters
Band 3	1725 - 520 kc.	174 - 576 meters

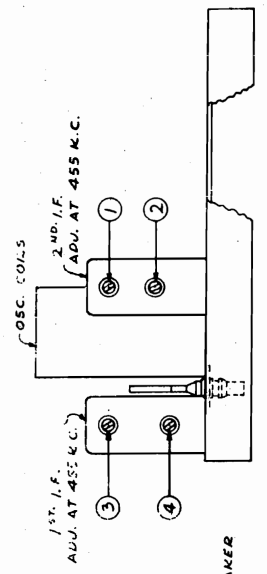
Maximum Power Output 2 watts

POWER SUPPLY
32 volt Storage Battery .5 amperes drain
110-125 or 220-240 volts AC 50-60 cycles 18 Watts

Intermediate Frequency 455 kc

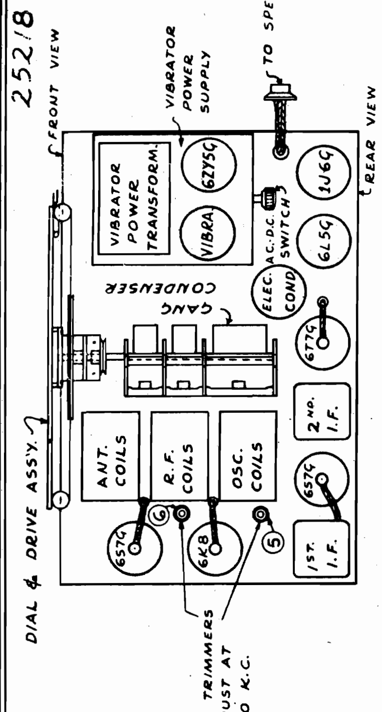
MODEL H-6204
Chassis H-6200
Socket, Trimmers
Alignment

PILOT RADIO CORP.

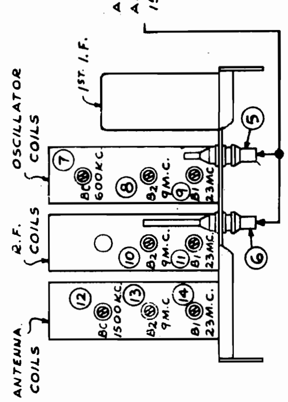


REAR VIEW OF CHASSIS

25218



TOP VIEW OF CHASSIS



LEFT SIDE OF CHASSIS
(MODEL H-6204)

PILOTUBES Required

One	6S7-G	R.F. Amplifier
One	6K8	1st detector-oscillator
One	6S7-G	I.F. Amplifier
One	6T7-G	2nd Detector
One	6L5-G	A.F. Amplifier
One	1J6-G	Output Tube
One	6ZY5-G	Power Supply Rectifier

Miscellaneous Service Notes

If a howling noise (sometimes referred to as Microphonic howl) is heard, it is probably because the four red screws under the cabinet and the two narrow metal strips between the chassis and the bottom of the cabinet, have not been removed. These strips and screws are only intended as additional bracing during shipment and must be removed before the receiver is put in operation.

The howl can also be caused by a defective tube, or when some part of the receiver which is rigidly fastened to the chassis rubs against the cabinet.

If the vibrator noise becomes loud or objectional, it is probably because the battery connections are not clean, or because the battery is old and its internal resistance is high, or because the vibrator is wearing out.

I.F. Alignment

Turn the Band Selector Switch to the Broadcast Band and tune the receiver to the low frequency end of the Band.

Connect the output meter as described under "Connections", and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd. condenser. Then proceed with the alignment as follows:-

1. Adjust the signal generator to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the trimmer screws #1, 2, 3 and 4 (see figure), for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the I.F. Amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the 6S7-G I.F. tube, and align the last I.F. transformer. Always finish the alignment with the signal input to the 6K8 tube.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

R.F. ALIGNMENT

Standard Broadcast Band

Connect the "hot" terminal of the generator to the post marked "A" on the rear of the chassis, through the .0002 mfd. condenser.

Set the generator frequency to 1500 kc., and the dial pointer of the receiver to the same frequency with the Band Selector Switch set appropriately. Adjust trimmer #5 for maximum reading of the output meter. Loosen the lock nut and adjust trimmer by moving the brass rod in or out with a hooked wire, and with a twisting motion. Then without touching the tuning controls adjust trimmers #6 and #12 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc., and move the receiver pointer to the same frequency. Adjust trimmer screw #7 for maximum reading of the output meter, while "rocking" the gang condenser. Finally, repeat the 1500 kc. adjustments, and tighten the lock nuts on trimmers #5 and #6.

Band #2

Remove the .0002 mfd. dummy antenna used in aligning the Broadcast Band and substitute the 400 ohm non-inductive resistor in its place.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator frequency to 9 mc. and the receiver dial pointer to the same frequency with the Band Selector Switch set appropriately. Adjust trimmer #8 for maximum reading of the output meter. Be careful you do not tune in at the Image Frequency.

Then adjust trimmer #10 for maximum output meter reading, while slightly "rocking" the gang condenser. Readjust trimmer #8 if necessary to correct the calibration, and finally adjust trimmer #13 for maximum output meter reading.

Band #1

The connections and Dummy Antenna are the same as used in aligning Band #2.

Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 23 mc. and the receiver dial pointer to the same frequency. Adjust trimmer #9 for maximum reading of the output meter. Be careful you do not tune in at the Image Frequency. Then adjust trimmer #11, while "rocking" the gang condenser, for maximum reading of the output meter. Readjust trimmer #9, if necessary, to correct the calibration, and then adjust trimmer #14 for maximum reading of the output meter.

Image Frequency

All bands in this receiver must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in doing this on the Broadcast Band. However, on the higher frequency bands it is possible to incorrectly adjust the alignment in this respect and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency. With sufficient output from the generator to pick up two signals with the receiver, separated by twice the Intermediate Frequency, set the receiver dial pointer to that one which comes in at the higher frequency marking on the receiver dial calibration.

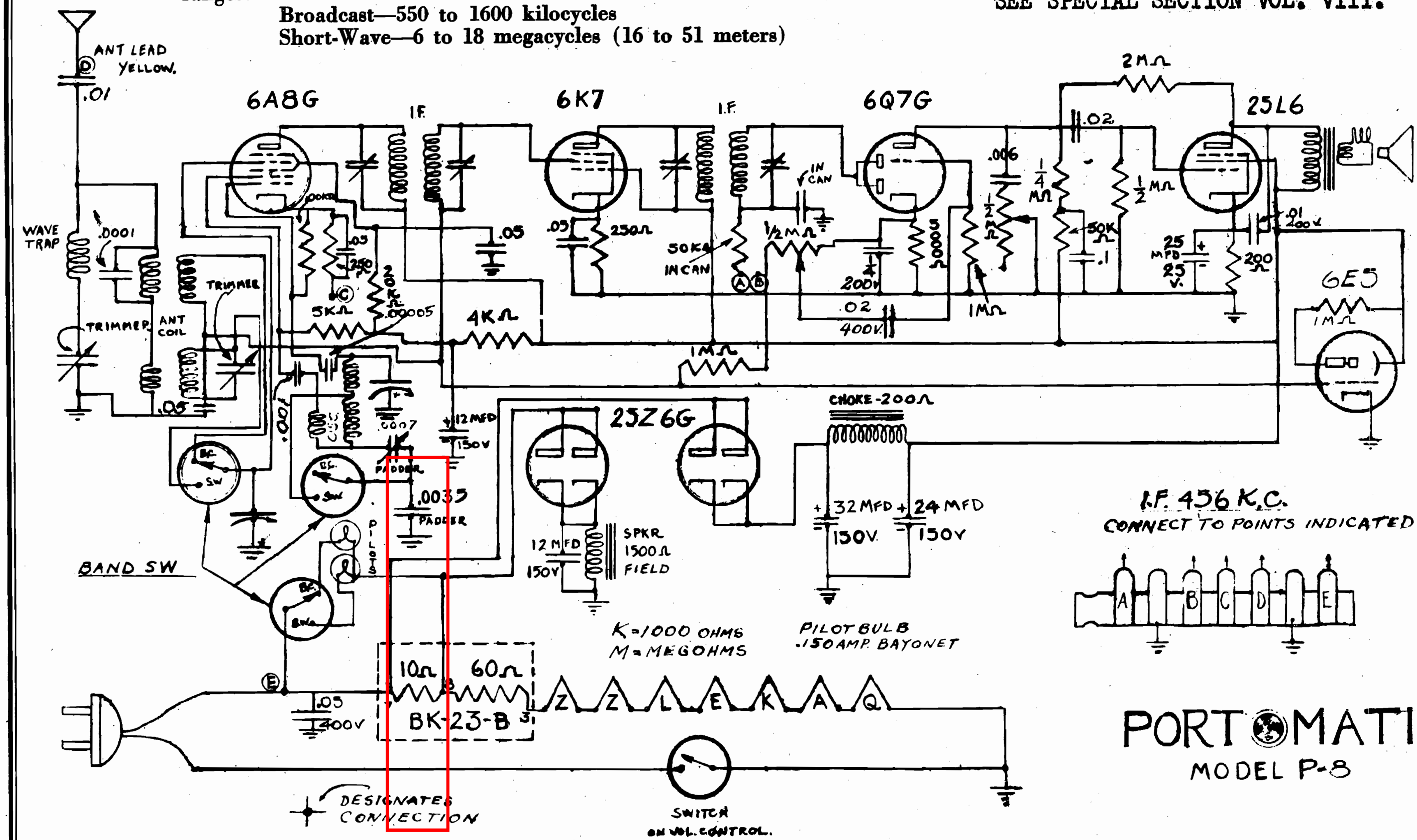
MODELS 18A,18C,18R
80F,80A,80C,210F,
210C,210R,212F,212C
212R.Chassis P-8
Schematic,Alignment

PORT-O-MATIC CORP.

The receiver is designed to operate over the following two tuning ranges:

Broadcast—550 to 1600 kilocycles
Short-Wave—6 to 18 megacycles (16 to 51 meters)

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.



PORT-O-MATIC MODEL P-8

STANDARD MODEL
100-125 Volts
AC or DC Current
40-60 Cycles
65 Watts

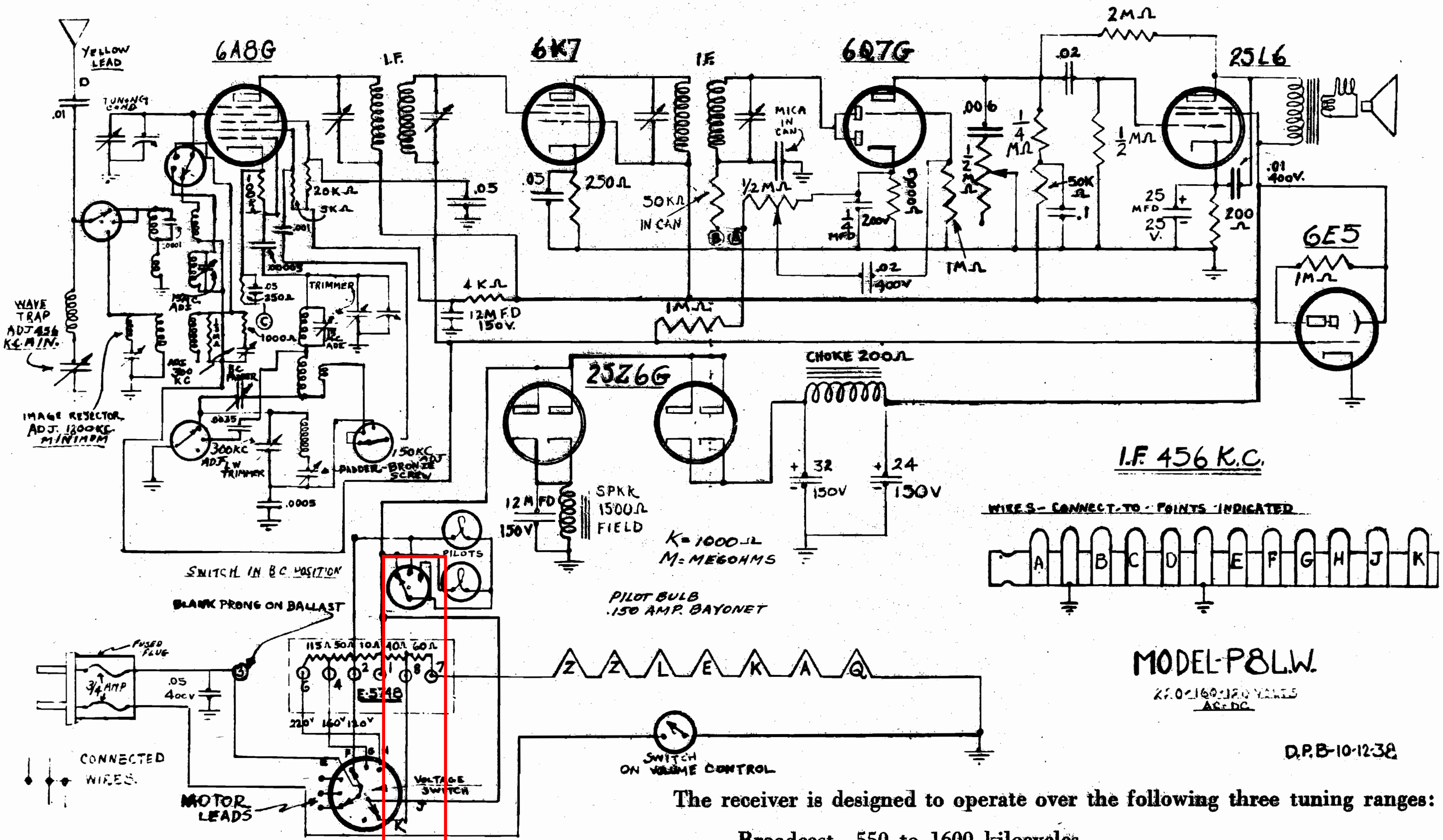
EUROPEAN MODEL—A special switch is provided on the motor-plate located underneath the pick-up arm, and is marked "110-220." With this switch in 220 Volt position, the PORT-O-MATIC will operate safely on voltages from 200 to 250. To avoid damage, if switch is accidentally placed in wrong position, this particular model is equipped with a fused plug at the end of the electric cord. Should these fuses blow, replace same with no higher than ¾ to 1 amp. standard automobile cartridge fuses.

D.P.B 9-29-38.

MODELS 25A, 25C, 25R, 25OF, 25OC, 25OR
Chassis P8LW
Schematic, Alignment

PORT-O-MATIC CORP.

This portable radio will operate on any current or principal voltage throughout the world. By setting the knob, in the back of the radio, it can be used on AC or DC at 120, 160, or 240 volts.



The receiver is designed to operate over the following three tuning ranges:

Broadcast—550 to 1600 kilocycles

Short-Wave—6 to 18 megacycles (16 to 51 meters)

Long-Wave—800-2000 Meters

PORTOMATIC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII.

IMPORTANT:—To avoid damage if switch is accidentally placed in wrong position, this particular model is equipped with a fused plug at the end of the electric cord. Should these fuses blow, replace with no higher than ¾ to 1 amp. standard automobile cartridge fuses.