PERPETUAL

TROUBLE SHOOTER'S MANUAL

Reg. U.S. Pat. Off.

VOLUME XII

by

JOHN F. RIDER

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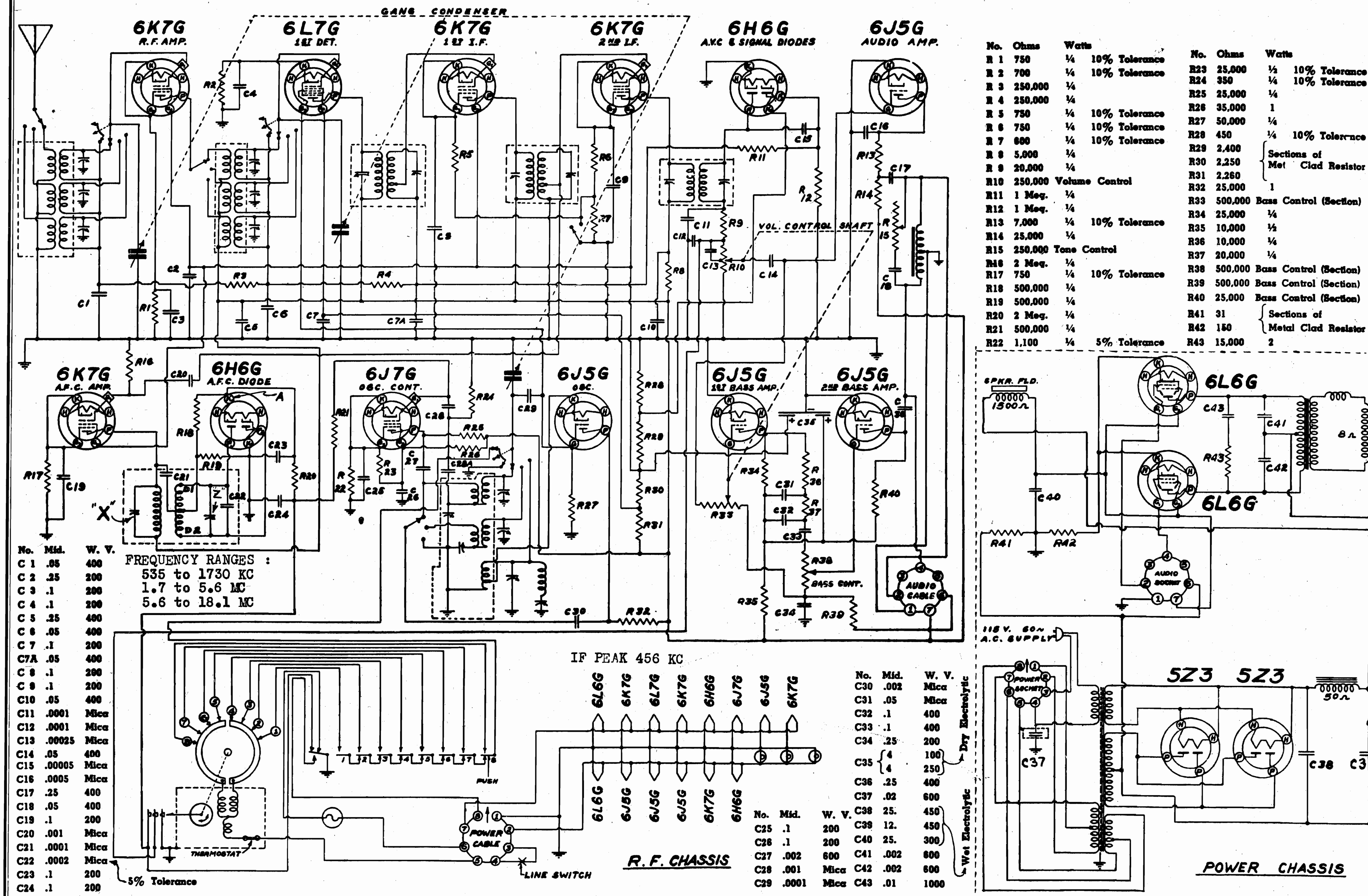
ALLIED RADIO CORP.

MODELS B10525,B10526,B10765,
B10766,B10767



FREQUENCY RANGES :
535 to 1730 KC
1.7 to 5.6 MC
5.6 to 18.1 MC

IF PEAK 456 KC

No.	Ohms	Watts	
R 1	750	¼	10% Tolerance
R 2	700	¼	10% Tolerance
R 3	250,000	¼	
R 4	250,000	¼	
R 5	750	¼	10% Tolerance
R 6	750	¼	10% Tolerance
R 7	600	¼	10% Tolerance
R 8	5,000	¼	
R 9	20,000	¼	
R10	250,000	Volume Control	
R11	1 Meg.	¼	
R12	1 Meg.	¼	
R13	7,000	¼	10% Tolerance
R14	25,000	¼	
R15	250,000	Tone Control	
R16	2 Meg.	¼	
R17	750	¼	10% Tolerance
R18	500,000	¼	
R19	500,000	¼	
R20	2 Meg.	¼	
R21	500,000	¼	
R22	1,100	¼	5% Tolerance

No.	Ohms	Watts	
R23	25,000	½	10% Tolerance
R24	350	¼	10% Tolerance
R25	25,000	¼	
R26	35,000	1	
R27	50,000	¼	
R28	450	¼	10% Tolerance
R29	2,400		Sections of Metal Clad Resistor
R30	2,250		
R31	2,260		
R32	25,000	1	
R33	500,000	Bass Control (Section)	
R34	25,000	¼	
R35	10,000	½	
R36	10,000	¼	
R37	20,000	¼	
R38	500,000	Bass Control (Section)	
R39	500,000	Bass Control (Section)	
R40	25,000	Bass Control (Section)	
R41	31		Sections of Metal Clad Resistor
R42	150		
R43	15,000	2	

No.	Mfd.	W. V.
C 1	.05	400
C 2	.25	200
C 3	.1	200
C 4	.1	200
C 5	.25	400
C 6	.05	400
C 7	.1	200
C7A	.05	400
C 8	.1	200
C 9	.1	200
C10	.05	400
C11	.0001	Mica
C12	.0001	Mica
C13	.00025	Mica
C14	.05	400
C15	.00005	Mica
C16	.0005	Mica
C17	.25	400
C18	.05	400
C19	.1	200
C20	.001	Mica
C21	.0001	Mica
C22	.0002	Mica 5% Tolerance
C23	.1	200
C24	.1	200

No.	Mfd.	W. V.
C25	.1	200
C26	.1	200
C27	.002	600
C28	.001	Mica
C29	.0001	Mica

No.	Mfd.	W. V.	
C30	.002	Mica	
C31	.05	Mica	
C32	.1	400	
C33	.1	400	
C34	.25	200	
C35	4	100	Dry Electrolytic
	4	250	Dry Electrolytic
C36	.25	400	
C37	.02	600	
C38	25.	450	Wet Electrolytic
C39	12.	450	Wet Electrolytic
C40	25.	300	Wet Electrolytic
C41	.002	600	
C42	.002	600	
C43	.01	1000	

ALLIED RADIO CORP.

MODELS B10525,B10526 B10765,B10766,B10767

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 one (1) white button (extreme left), and eight (8) brown buttons whose numerical sequence is reckoned from left to right. The white button is provided for converting the set from automatic electric push button tuning to manual knob tuning. The brown buttons are provided for automatic electric tuning.

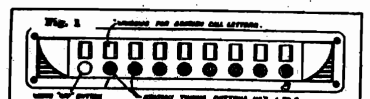
SELECTOR MECHANISM The selector mechanism is made up of the selector plate, eight (8) thumb screws, and the adjustment light bulb.

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 and a silent gear train. The bearings and the oil retainer hold sufficient oil to lubricate the motor for a lifetime.

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 white button; tune in the station of the lowest frequency, using the station selector knob. Now hold the white button in and press in button number one (1), next to the white button. (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 block and insert into the window directly above button number one (1). Now release button number one (1) by pressing the white 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 (2). 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 into the window of button number two (2).

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.



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 white 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. If by chance all of the buttons are pressed in, they may be released by pressing any one button all the way in.

To change from electric tuning to manual selecting, simply press in the white button. When the white button is in, the set may be tuned as a conventional receiver. **Note:** If it is desired to tune Short Wave or Police while the set is being operated with push buttons, it is not necessary to change over from push button tuning to manual tuning. Simply turn the band switch and proceed to tune with the selector knob. When the band switch is returned to broadcast the station last selected by button will automatically tune in by itself.

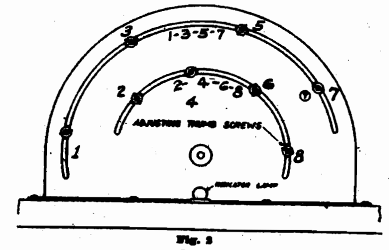
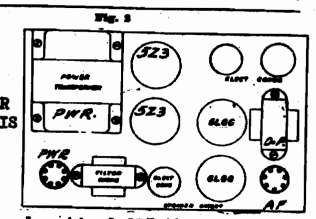


Fig. 2

POWER CHASSIS

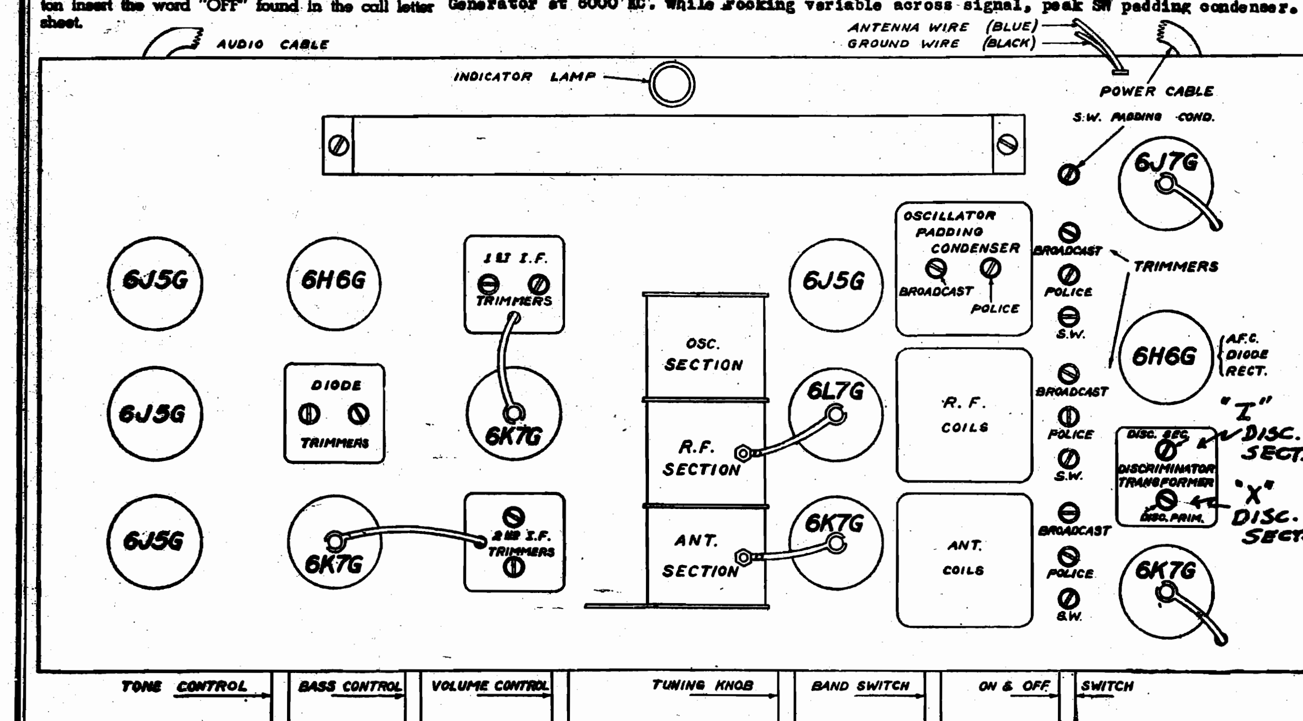


I.F. ALIGNMENT - Generator at 456 KC, connected to control grid of 6L7 thru .05 MFD condenser, align 1st, 2nd, and Diode transformer trimmers to peak. Connect a 0-200 microammeter between the ungrounded cathode of the 6H6 AFC diode rectifier, and ground. The Cathode indicated as point "A" in the schematic. Place a 100 MMFD condenser across the secondary of the discriminator transformer. These terminals are indicated as points "D1" and "D2" on the schematic. The condenser is used to detune the secondary circuit during the following primary adjustment : The primary is tuned by impressing an IF signal on the signal grid of the 6L7 and adjusting the trimmer marked "X" on the schematic and the chassis layout, to give a maximum meter indication. Signal strength should be approximately 100000 micro volts for the adjustment. With reduced signal strength repeat the adjustments of the entire I.F. system, for maximum sensitivity. The volume control should be on full for all adjustments. Without disturbing the generator or any of the other adjustments, the trimmer "Z" ("Disc. Sec.) should be adjusted as follows :Remove the 100 MMFD condenser from across the discriminator secondary, increase the generator signal to approximately 100,000 micro volts, with volume control turned down to limit audio output, slowly turn the trimmer "Z" until a sudden sharp drop in current occurs the meter will now probably read in reverse and off scale. Reverse trimmer adjustment bringing meter reading to zero. Used only a non-metallic screw driver. It is sometimes convenient to use an offset of "remote zero" setting of the micro ammeter in making the adjustments so that zero current setting is higher on the scale. After the current has been brought to zero by the above described method the I.F. alignment and discriminator tuning is completed, and R.F. alignment may be accomplished.

BROADCAST BAND - Generator at 1730 KC, connected to the antenna thru a 200 MMFD condenser, variable condenser at minimum, peak oscillator trimmer. Generator at 1400 KC, tuning in signal, peak the RF and antenna trimmers. Generator at 600 KC, while rocking variable condenser, peak the oscillator padding condenser.

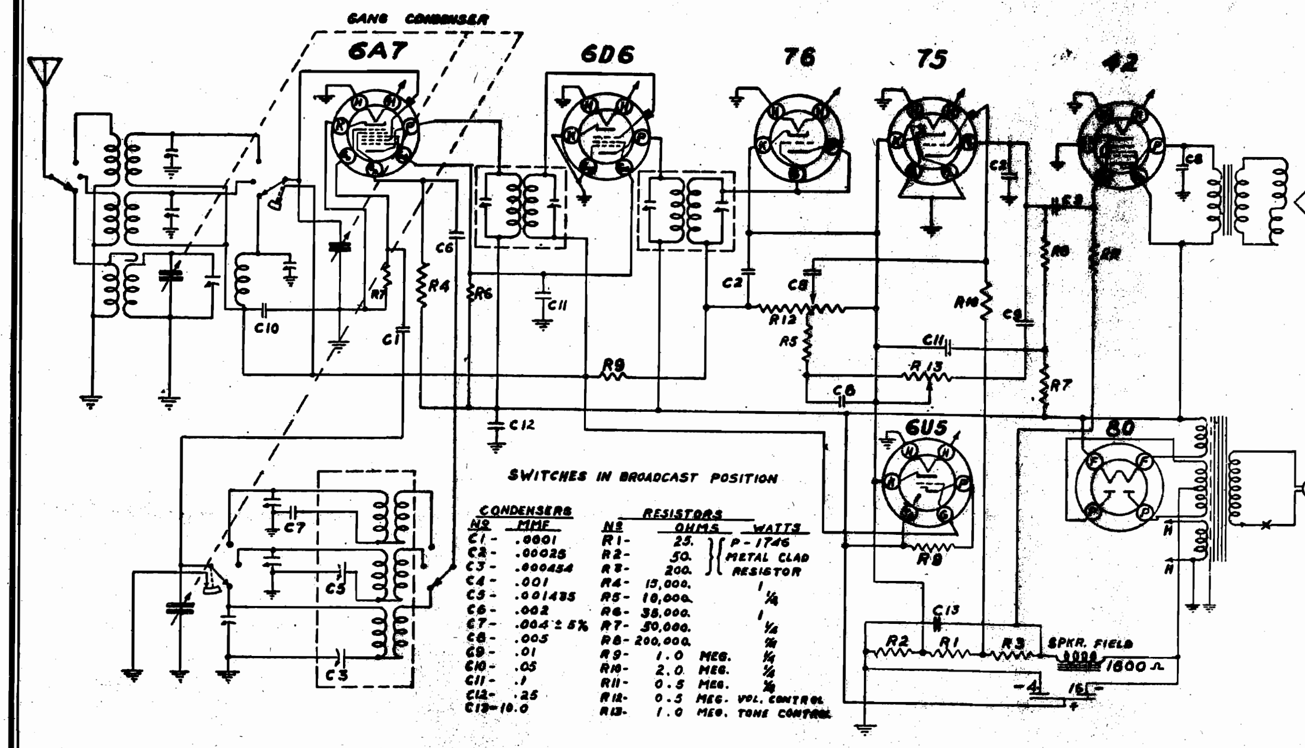
POLICE BAND - Generator at 5600 KC, connected to antenna thru 400 Ohm resistor, variable condenser at minimum, peak oscillator trimmer. Generator at 5000 KC, tune in signal, peak RF and antenna trimmers. Generator at 1800 KC, while rocking variable across signal, pad the oscillator circuit for maximum response.

SHORTWAVE BAND - Generator at 18100 KC, gang condenser at minimum, peak oscillator trimmer. Generator at 16000 KC, locate signal on receiver, peak RF and antenna trimmers. Generator at 6000 KC. while rocking variable across signal, peak SW padding condenser.



MODEL B10535

ALLIED RADIO CORP.

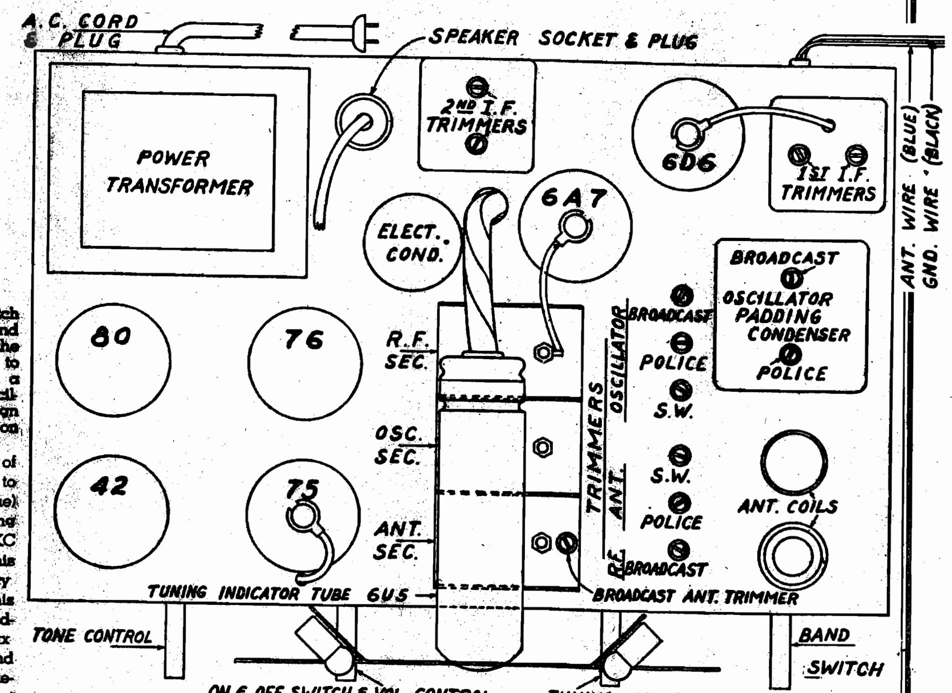


CONDENSERS NO	MMF	RESISTORS NO	OHMS	WATTS
C1-	.0001	R1-	25.	P-1746 METAL CLAD RESISTOR
C2-	.00025	R2-	50.	
C3-	.000454	R3-	200.	
C4-	.001	R4-	15,000.	1
C5-	.001435	R5-	10,000.	¼
C6-	.002	R6-	35,000.	1
C7-	.004 ± 5%	R7-	50,000.	¼
C8-	.005	R8-	200,000.	¼
C9-	.01	R9-	1.0 MEG.	¼
C10-	.05	R10-	2.0 MEG.	¼
C11-	.1	R11-	0.5 MEG.	¼
C12-	.25	R12-	0.5 MEG. VOL. CONTROL	
C13-	10.0	R13-	1.0 MEG. TONE CONTROL	

IF PEAKED AT 456 KC

FREQUENCY RANGE -

550 to 1700 KC
1700 to 5400 KC
5600 to 18100 KC



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. Align all four I.F. trimmers to peak or maximum reading on the output meter.

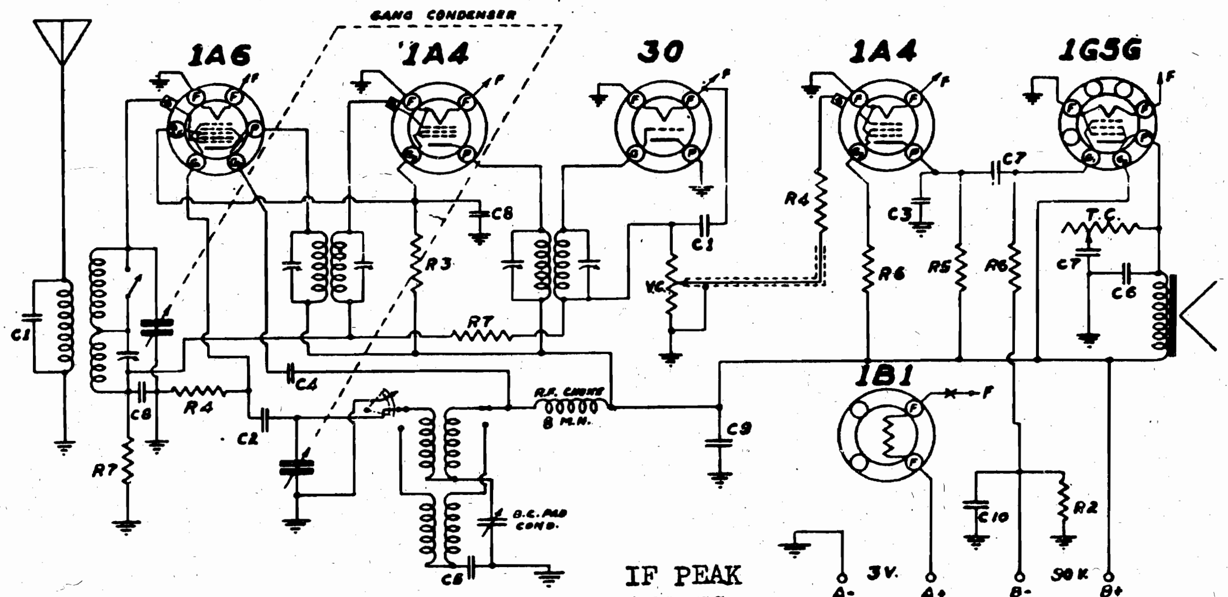
BROADCAST BAND ALIGNMENT Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency Then 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 K.C.

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 K.C. 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 at this frequency as described in the instructions for padding the broadcast circuits.

SHORT WAVE BAND ALIGNMENT The short wave band is adusted 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 B10543,B10544

ALLIED RADIO CORP.

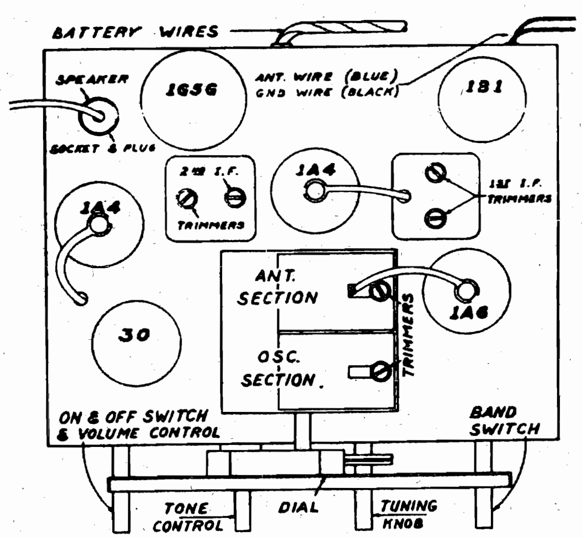


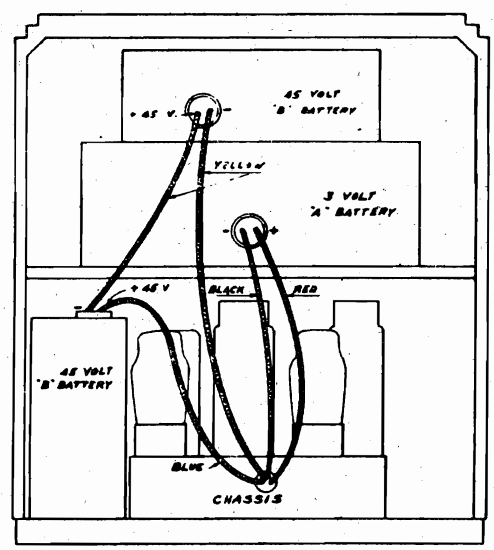
CONDENSERS

No.	MFD.	
1	.0001	MICA
2	.00025	"
3	.0005	"
4	.001	"
5	.0015	"
6	.002	200 VOLTS
7	.01	200 "
8	.05	200 "
9	.25	
10	10.0	ELECT. 25 V.

RESISTORS

No.	OHMS	WATTS
1	50.	⅛
2	535. ± 5%	½
3	10,000.	⅓
4	50,000.	¼
5	200,000.	¼
6	1. MEG.	¼
7	2. MEG.	⅛





IF ALIGNMENT - Wave change Sw. in BC position. Gang condenser at minimum, generator at 456 KC, output to 1A6 CG thru .05 MFD condenser, Generator grounded to receiver, align four trimmers of IF transformers.

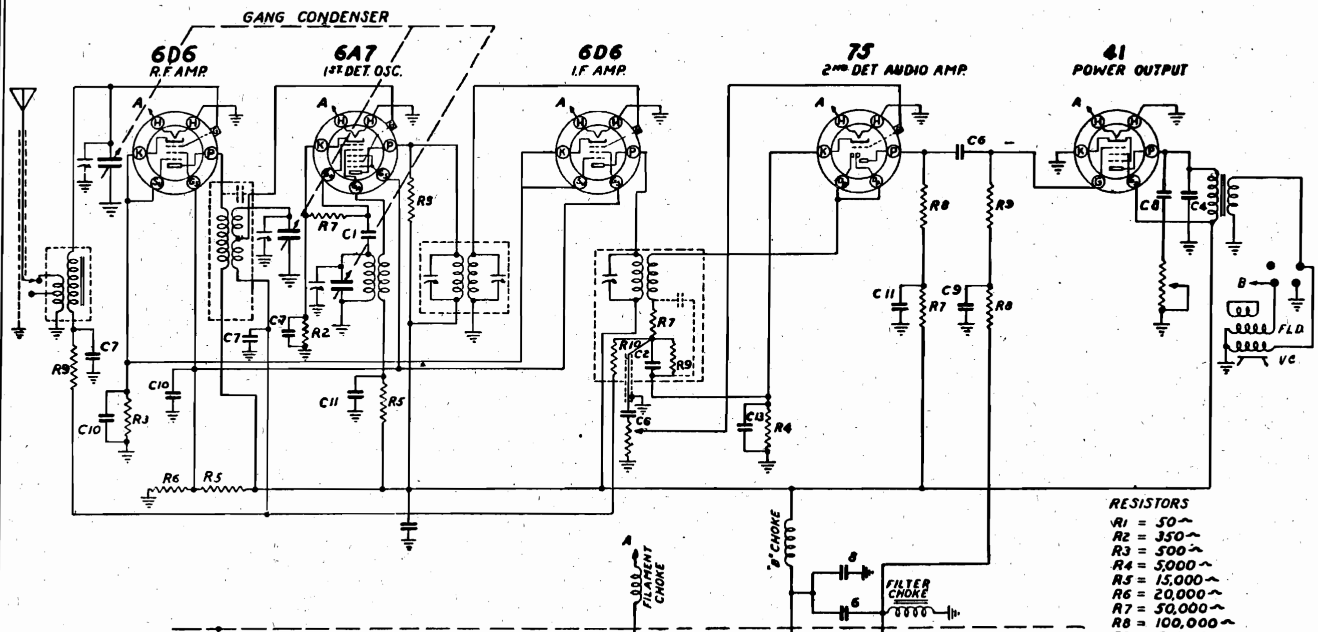
BROADCAST - Generator connected to antenna lead thru 200 MMFD condenser, and set at 1400 KC. Gang condenser at minimum. Trim oscillator then Antenna trimmers Pad the oscillator circuit at 600 KC while rocking gang condenser.

SHORT WAVE - Generator at 6000 KC, start rotating gang condenser from HF end, when signal is heard, adjust antenna trimmer (SW) for maximum peak.

Repeat all adjustments for maximum performance.

MODEL B10550

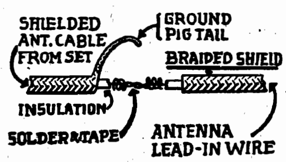
ALLIED RADIO CORP.



CONDENSERS
C1 = .0001 MICA
C2 = .00025 MICA
C3 = .002 MICA
C4 = .005-600 V.
C5 = .0075-1600 V.
C6 = .01-400 V.
C7 = .05-200 V.
C8 = .05-400 V.
C9 = .25-200 V.
C10 = .1-200 V.
C11 = .1-400 V.
C12 = .5-50 V.
C13 = 5 MF-30 V.
C14 = .01-600 V.

RESISTORS
R1 = 50 Ω
R2 = 350 Ω
R3 = 500 Ω
R4 = 5,000 Ω
R5 = 15,000 Ω
R6 = 20,000 Ω
R7 = 50,000 Ω
R8 = 100,000 Ω
R9 = 500,000 Ω
R10 = 1,000,000 Ω

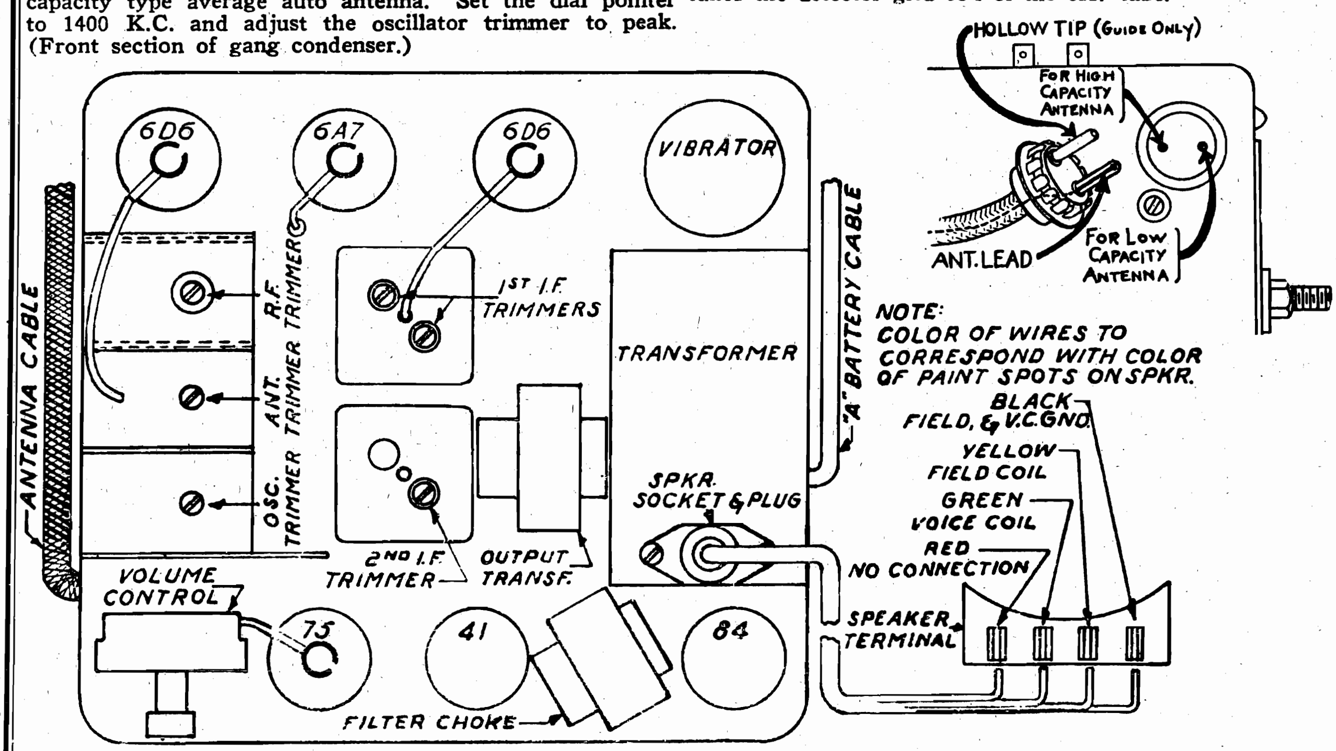
IF PEAK 175 KC



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

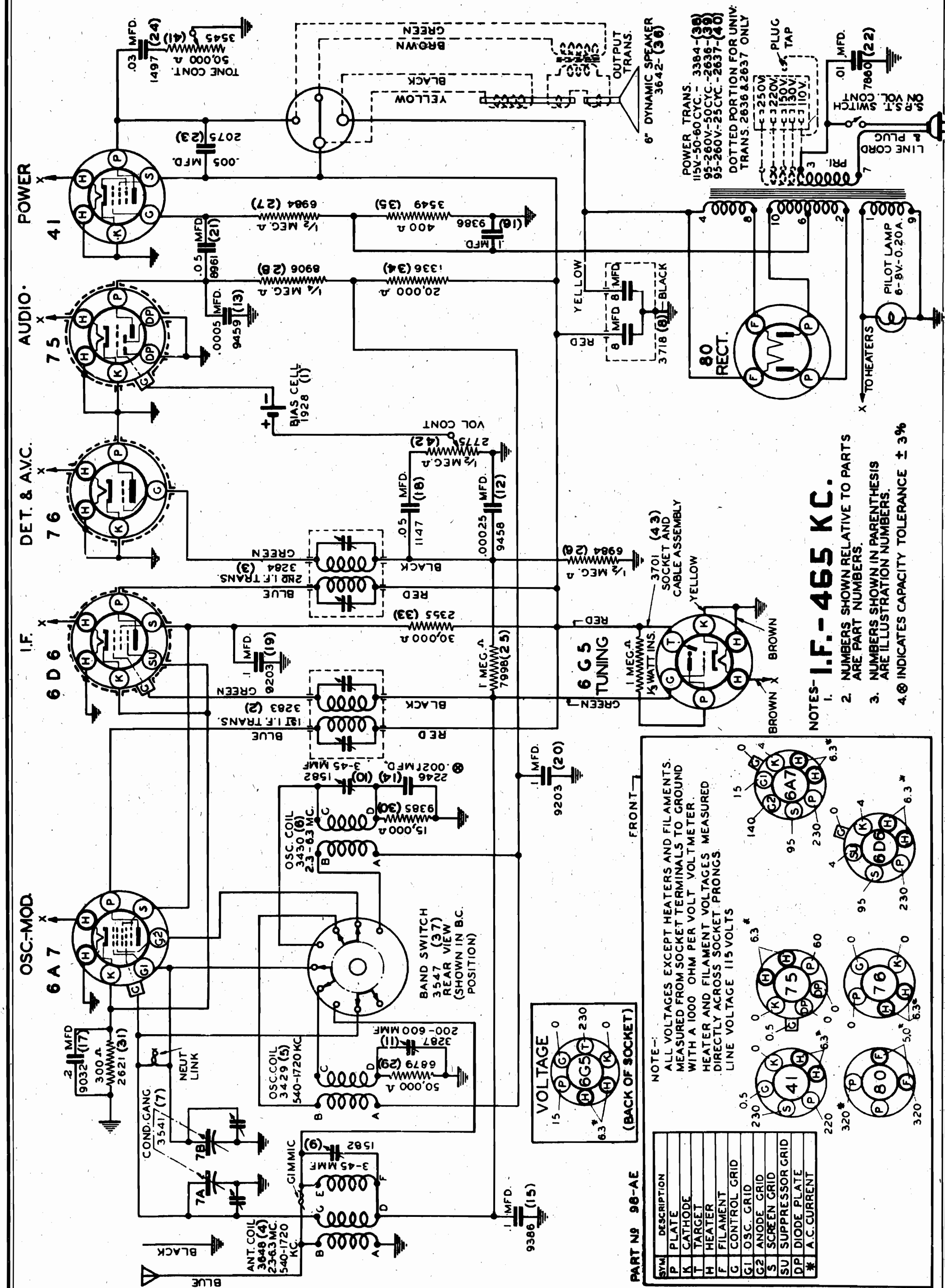
OSCILLATOR ALIGNMENT. Adjust the test oscillator to 1400 K.C. and connect the output to the antenna through a .0001 mfd. mica condenser to give the equivalent of a low capacity type average auto antenna. Set the dial pointer to 1400 K.C. and adjust the oscillator trimmer to peak. (Front section of gang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



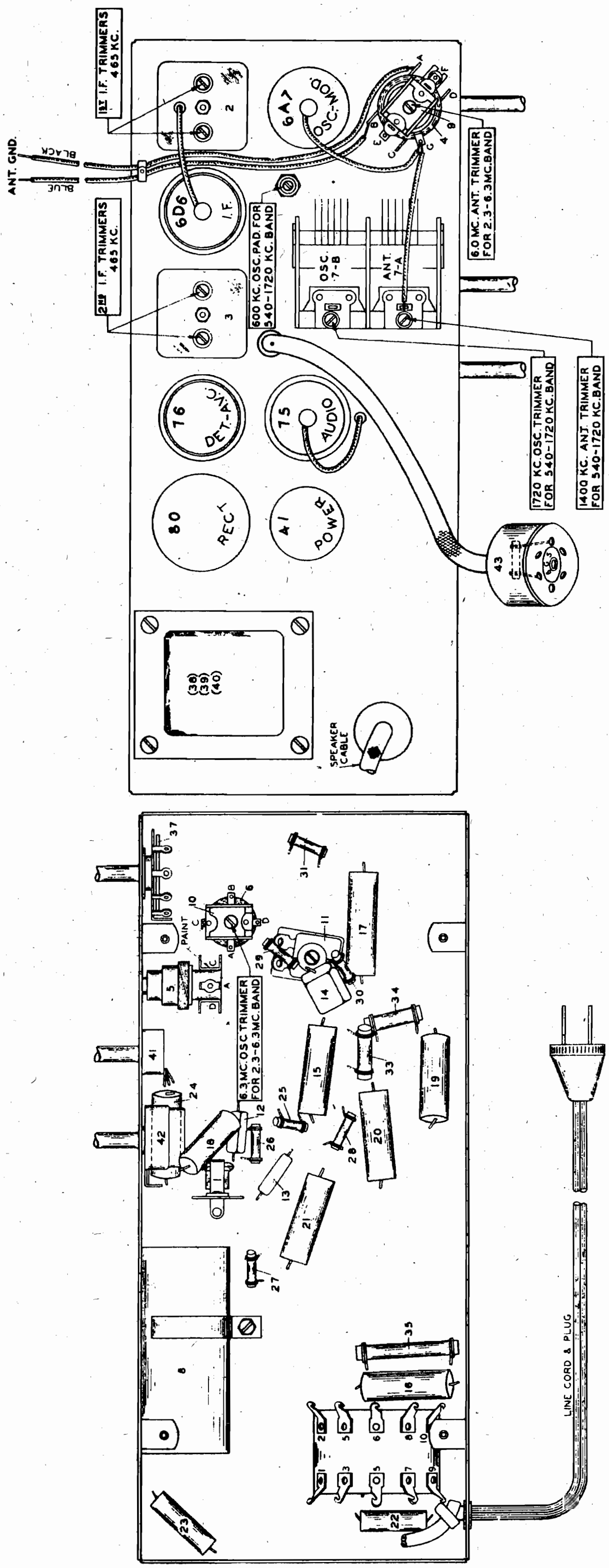
ALLIED RADIO CORP.

MODELS B10560, B10561



MODELS B10560,B10561

ALLIED RADIO CORP.



ALIGNMENT PROCEDURE:

Lack of sensitivity, selectivity or poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

(a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.

(b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.

(c) Peak each of the second I.F. transformer trimmers.

(d) Peak each of the first I.F. transformer trimmers.
To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

(a) Remove test oscillator lead from grid of the 6A7 tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.

(b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.

(c) Set receiver dial and test oscillator frequency to EXACTLY 1720 kilocycles.

(d) Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.

(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.

(f) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.

(g) Tune receiver dial and set test oscillator frequency to approximately 600 kilocycles.

(h) While rocking the tuning condenser back and forth adjust 600 KC oscillator padder condenser which is accessible through the hole in the top of the chassis adjacent to the gang condenser for maximum 600 kilocycle signal response.

ALIGNING 2.3-6.3 MEGACYCLE BAND:

(a) Replace .00025 Mfd. Test oscillator antenna lead series condenser with a 400 ohm resistor.

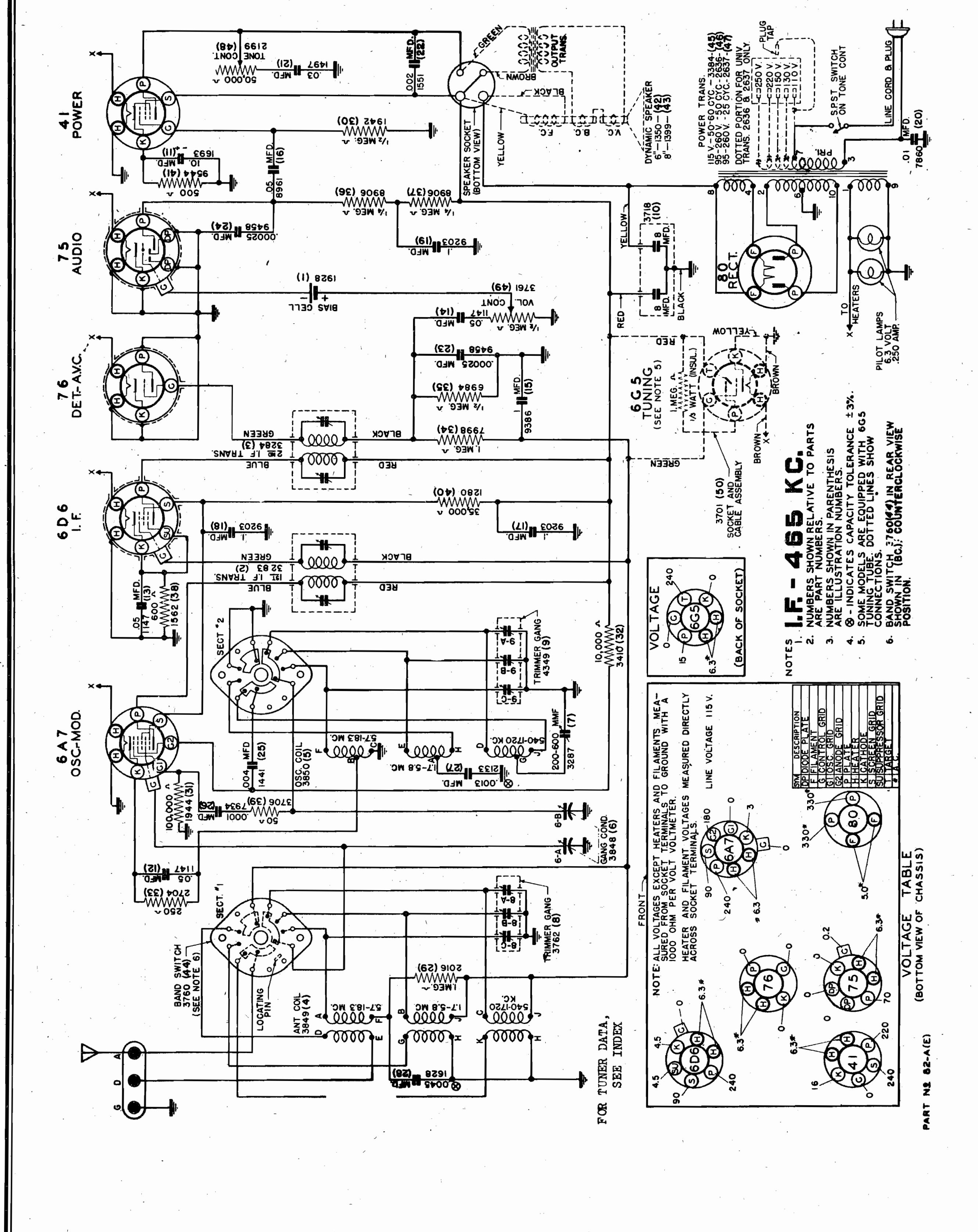
(b) Adjust band selector switch for 2.3-6.3 megacycles band operation, tune receiver dial and set test oscillator frequency to EXACTLY 6.3 megacycles.

(c) Bring in 6.3 megacycle test oscillator signal to maximum output by adjusting 6.3 M.C. oscillator trimmer on top of coil located underneath chassis.

(d) Tune receiver dial and test oscillator frequency to EXACTLY 6 megacycles, and adjust 6 M.C. antenna trimmer which is mounted on coil located on top of chassis for maximum sensitivity.

ALLIED RADIO CORP.

MODELS B10572, B10585, B10586



MODELS B10572, B10585, B10586

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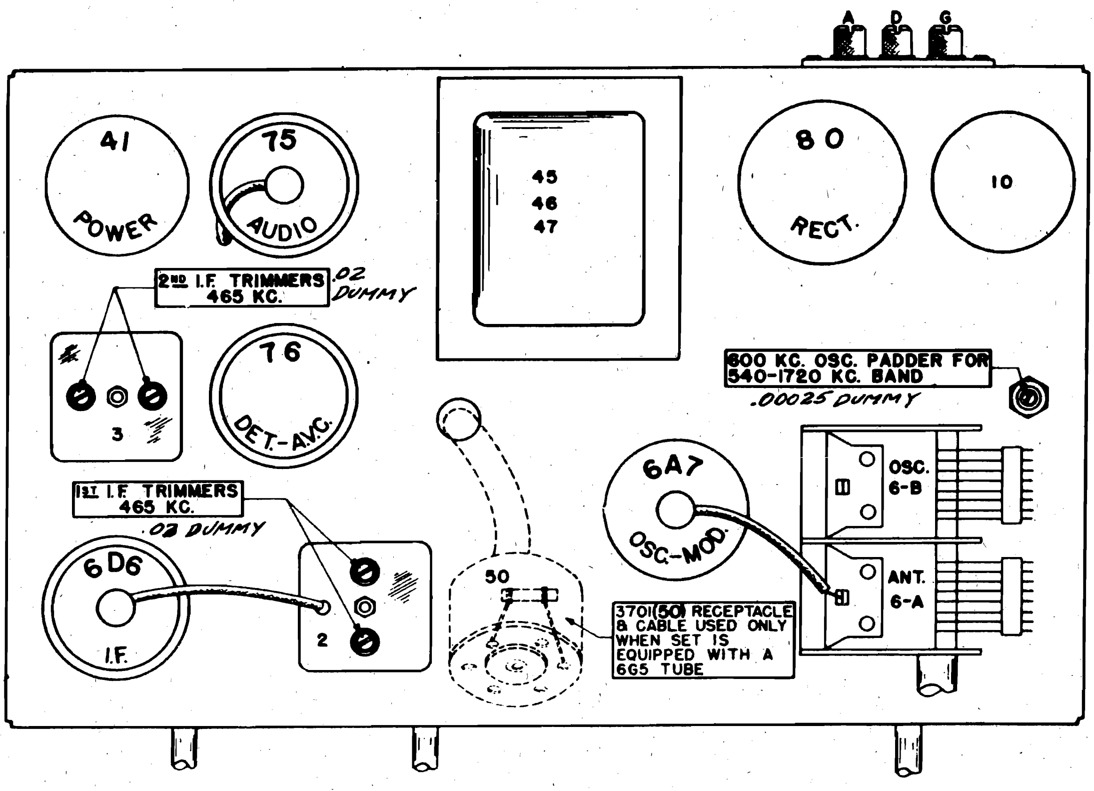
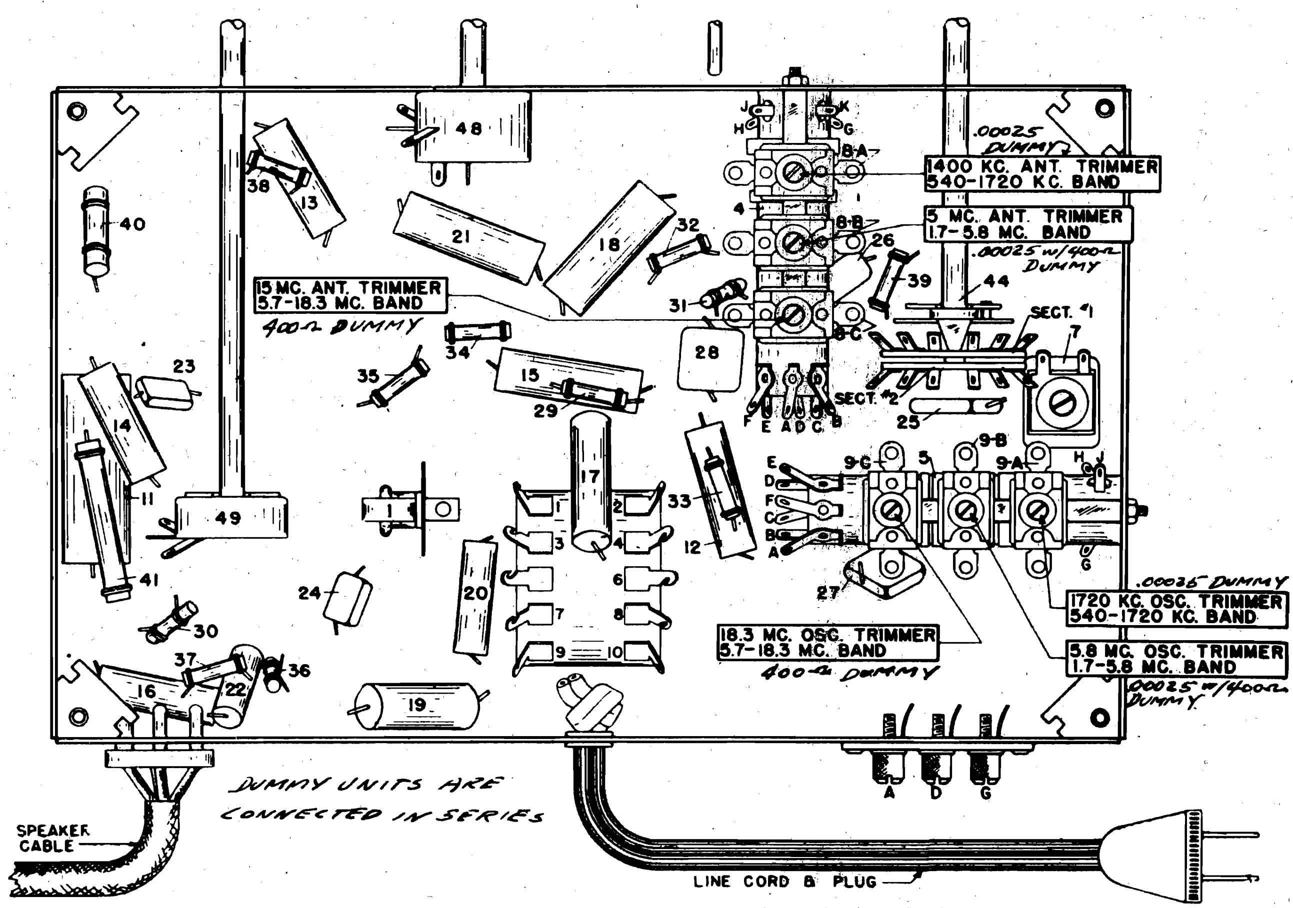


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.



MODEL B10575

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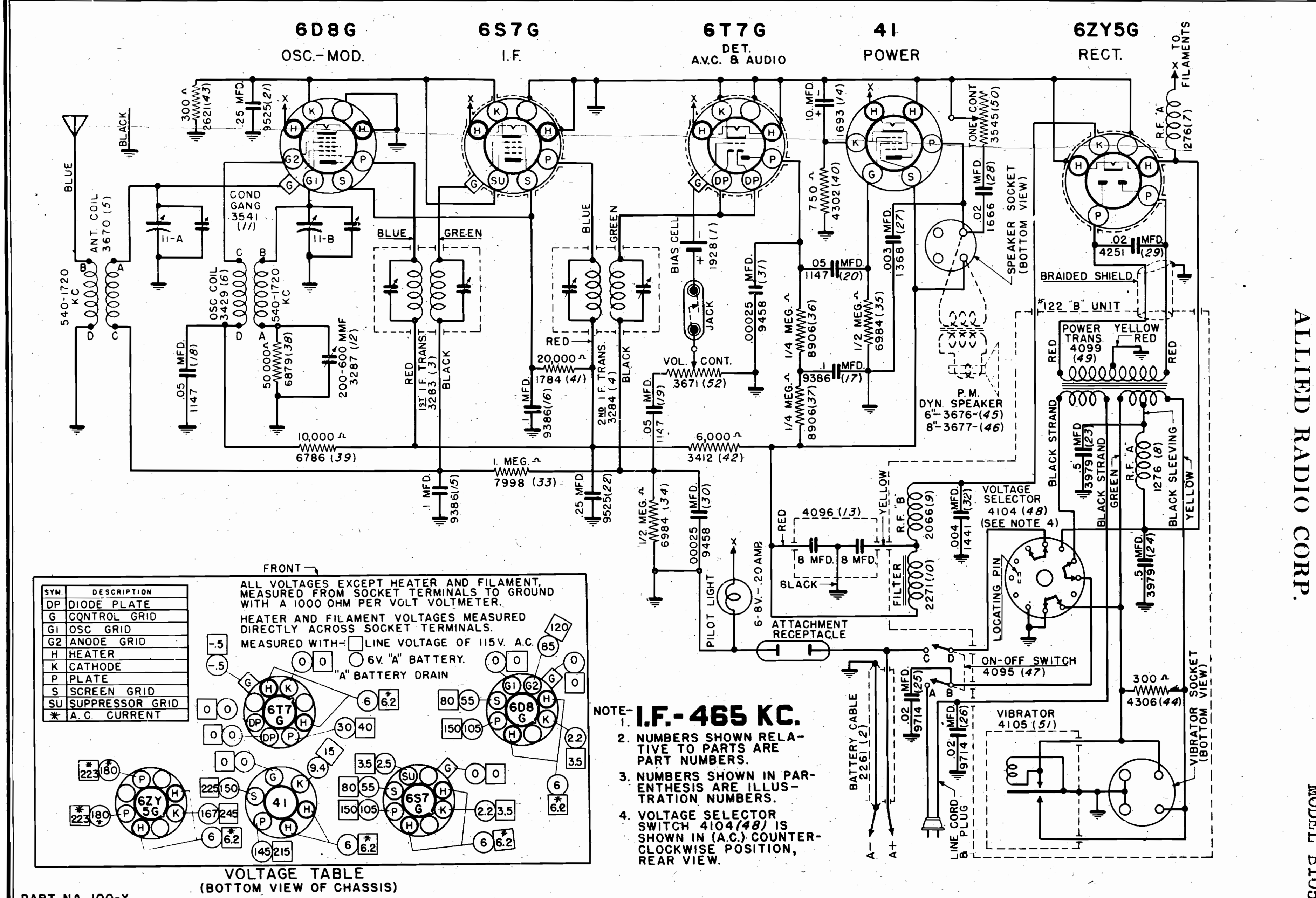


ALL VOLTAGES EXCEPT HEATER AND FILAMENT, MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER.

HEATER AND FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

MEASURED WITH- ☐ LINE VOLTAGE OF 115V. A.C.
◯ 6V. "A" BATTERY.
"A" BATTERY DRAIN

SYM.	DESCRIPTION
DP	DIODE PLATE
G	CONTROL GRID
GI	OSC GRID
G2	ANODE GRID
H	HEATER
K	CATHODE
P	PLATE
S	SCREEN GRID
SU	SUPPRESSOR GRID
✱	A.C. CURRENT

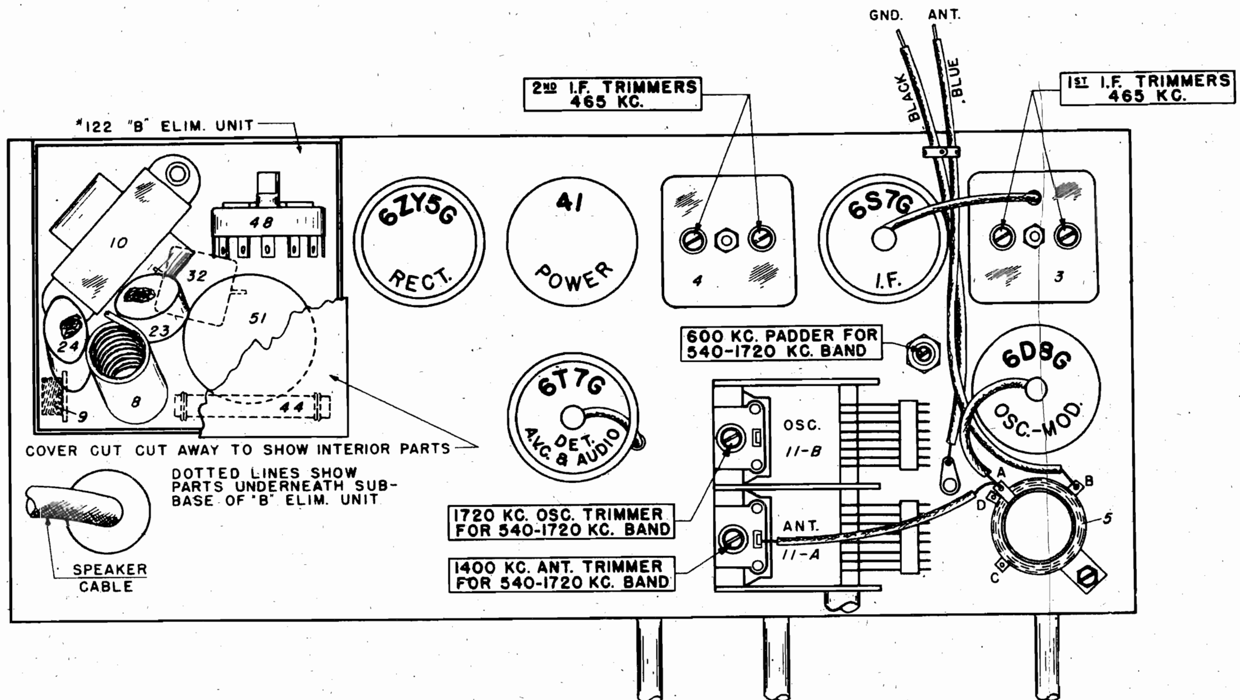
VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

NOTE-
1. I.F.-465 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
4. VOLTAGE SELECTOR SWITCH 4104 *(48)* IS SHOWN IN (A.C.) COUNTER-CLOCKWISE POSITION, REAR VIEW.

PART Nº 100-X

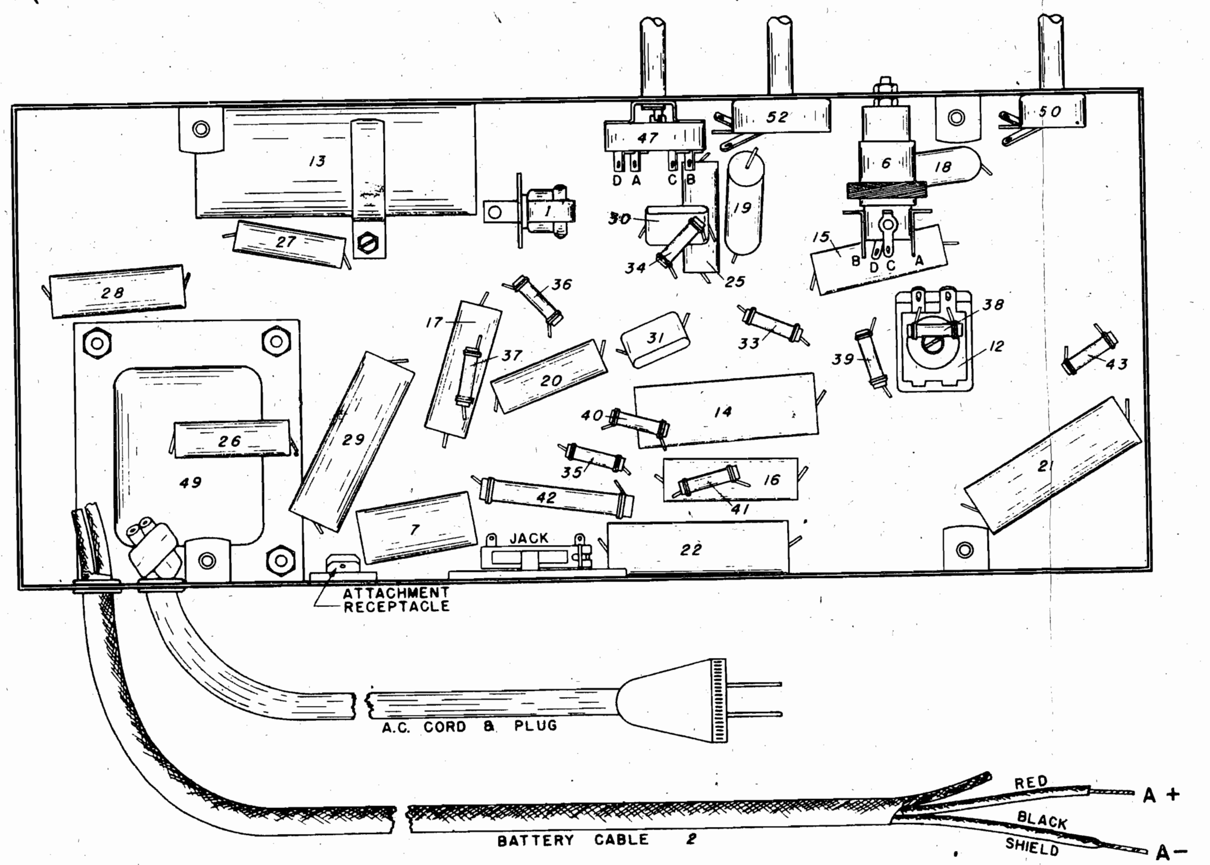
MODEL B10575

ALLIED RADIO CORP.



USE THE FOLLOWING DUMMY ANTENNAS----
I.F.---.02 MFD CONDENSER
540-1720 KC---.00025 MFD CONDENSER
(CONNECT DUMMIES IN SERIES WITH SIGNAL LEAD)

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII



MODELS B10600,B10601,B10602,
B10604,B10605
B10603

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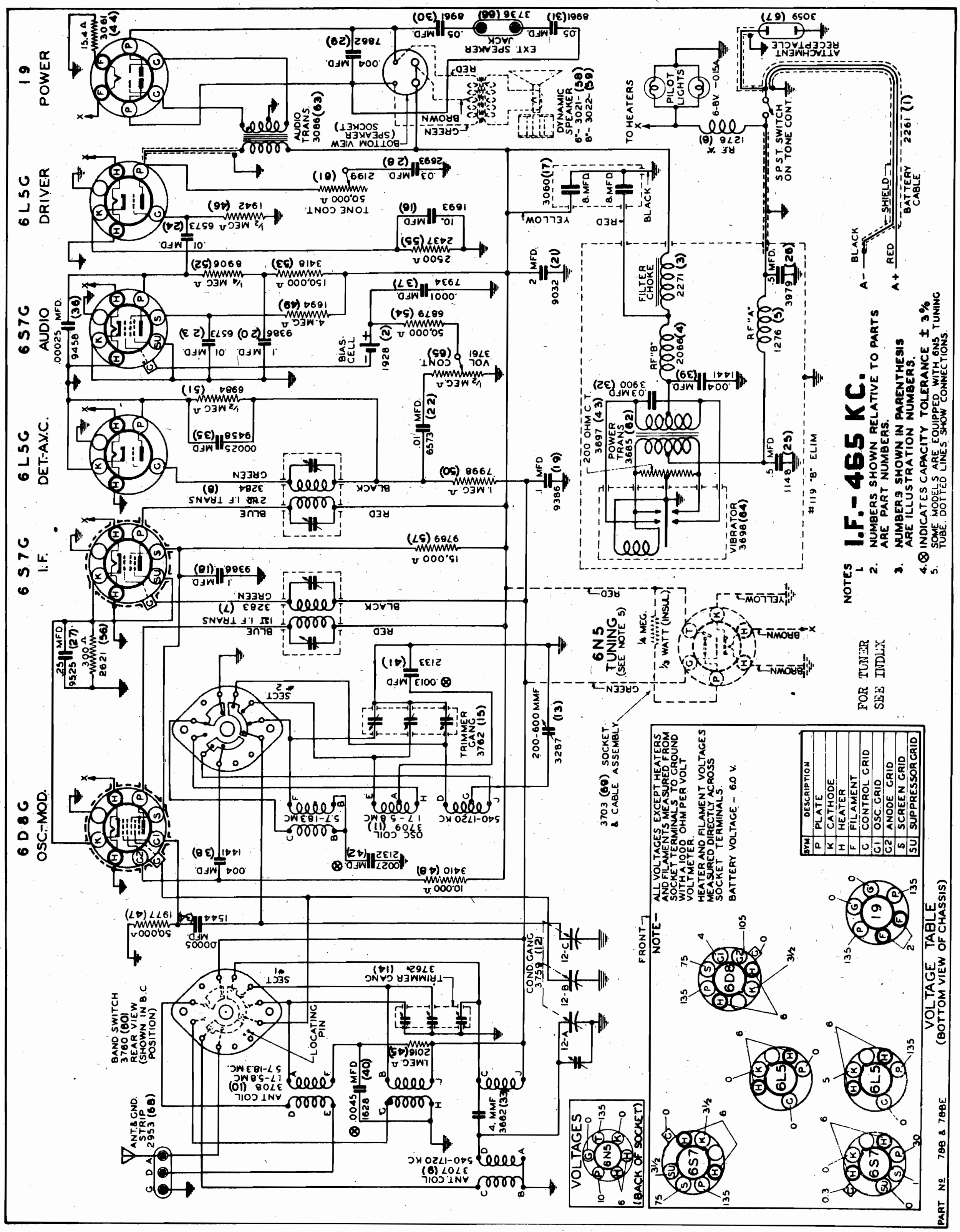

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MODELS B10600,B10601,B10602,
B10603,B10604,B10605

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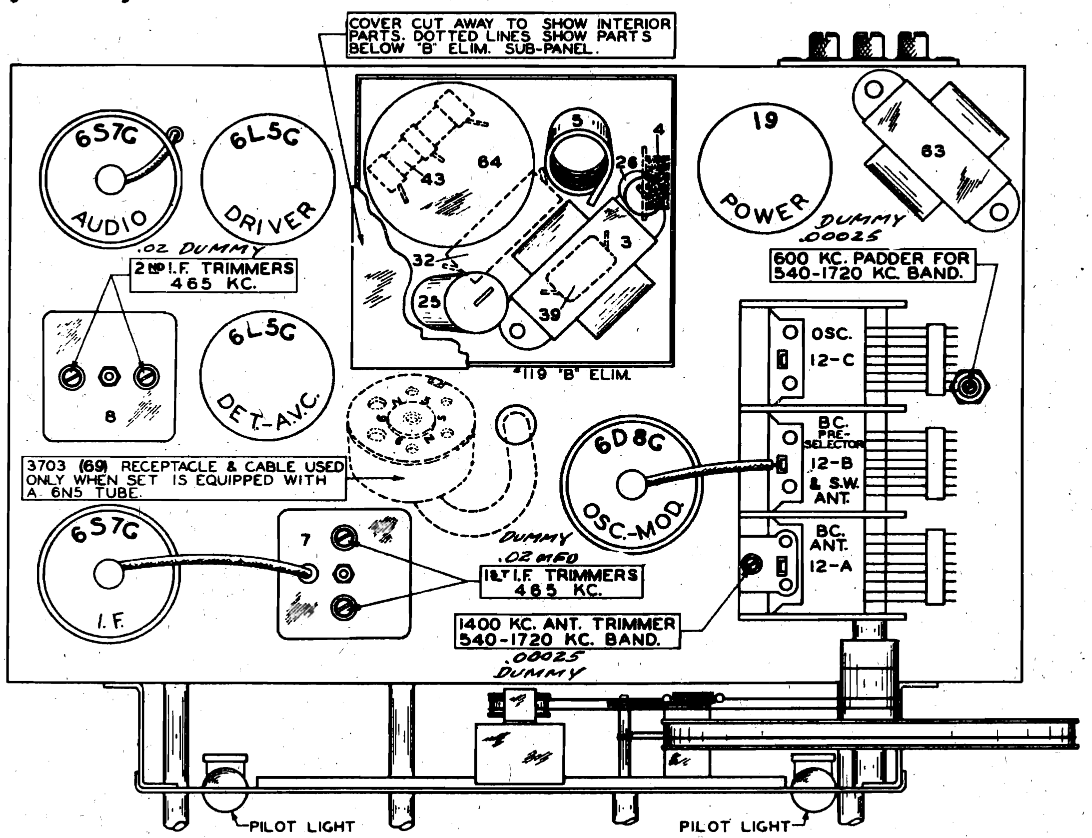
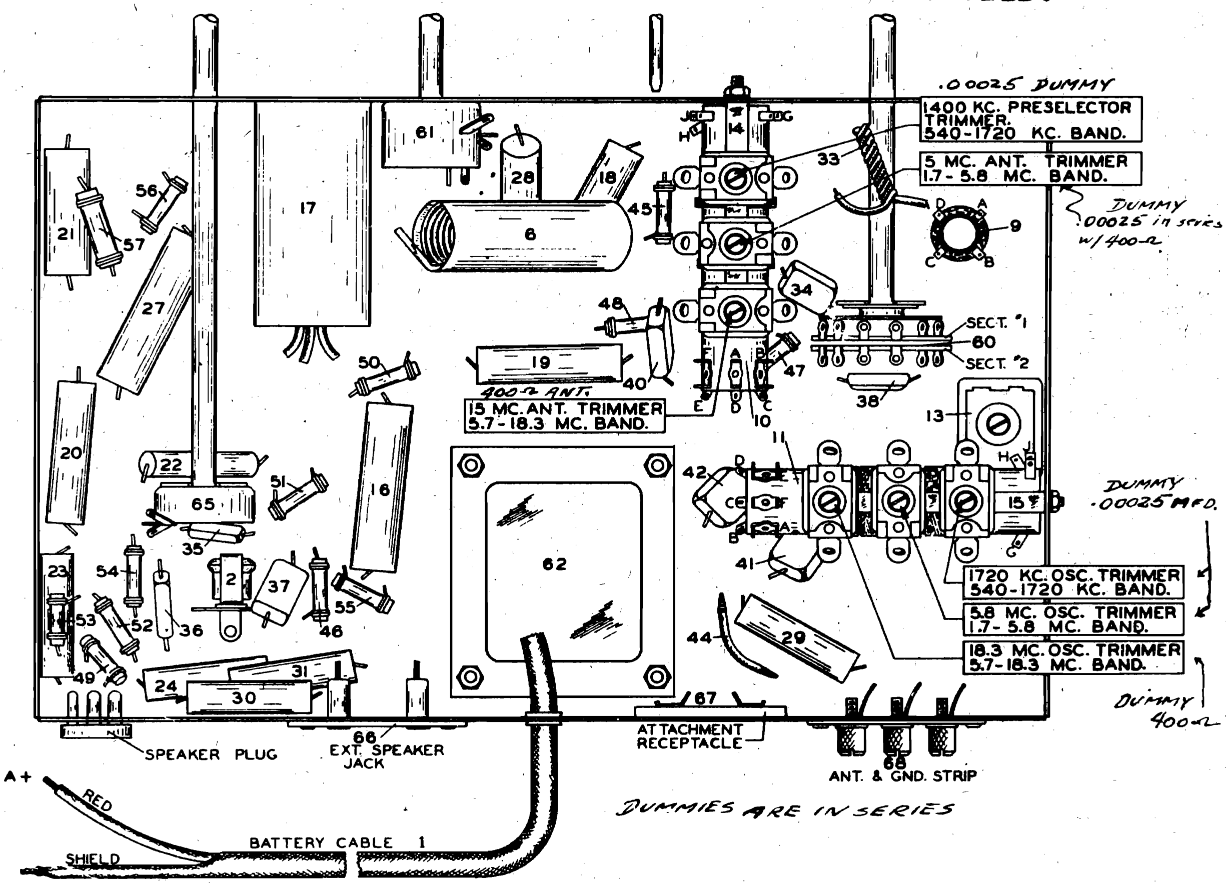
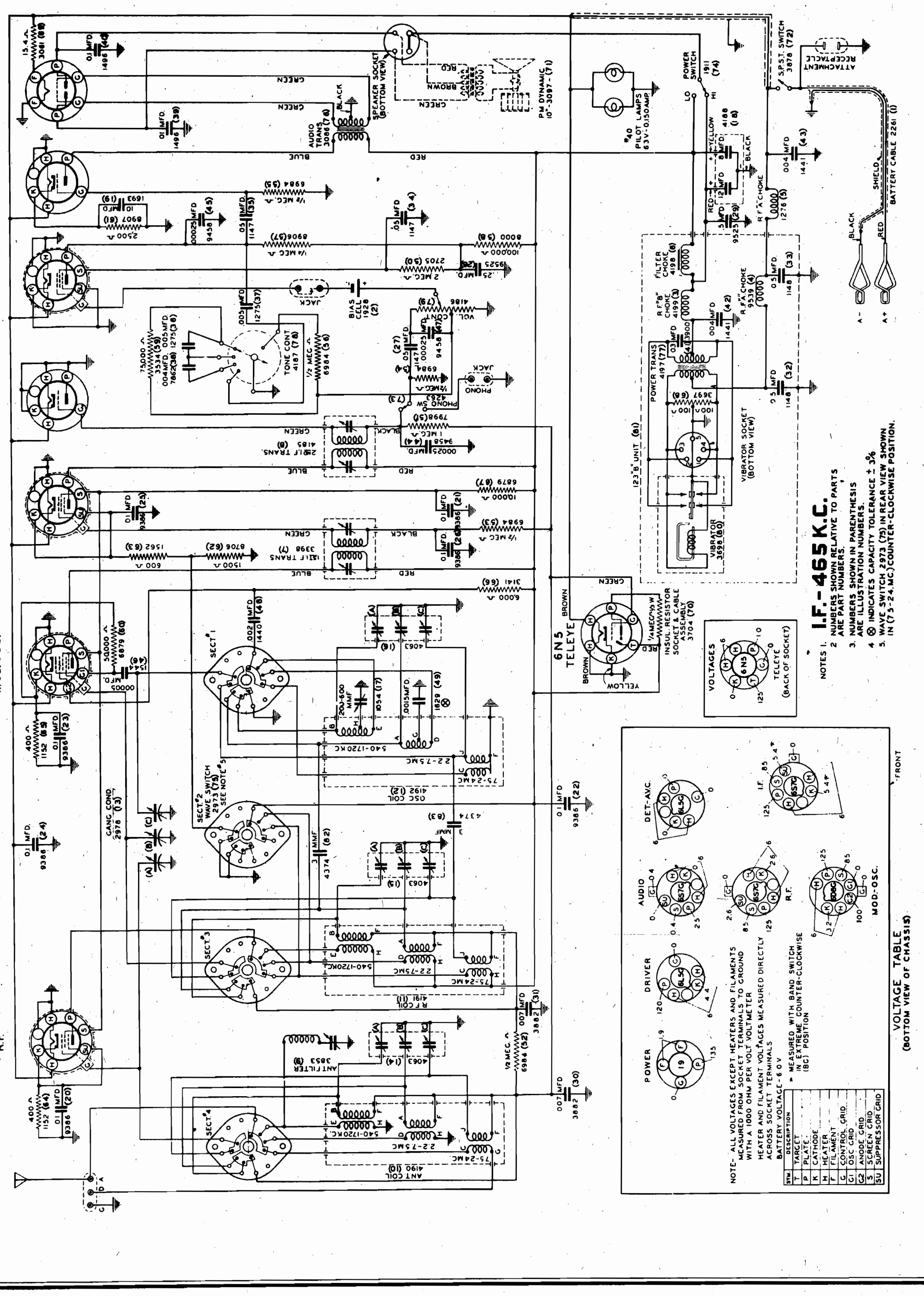


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.



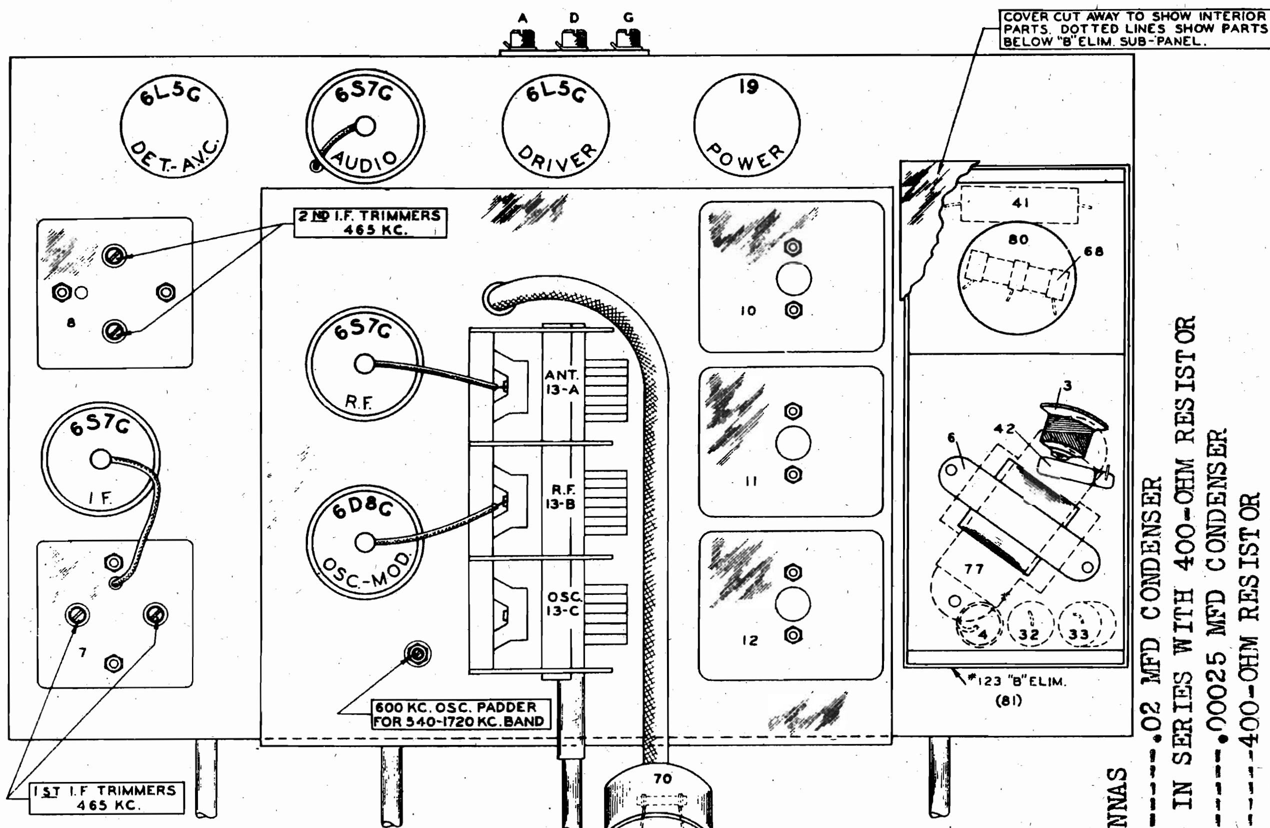
MODELS B10606, B10607, B10608
B10610, B10611
B10609

ALLIED RADIO CORP.



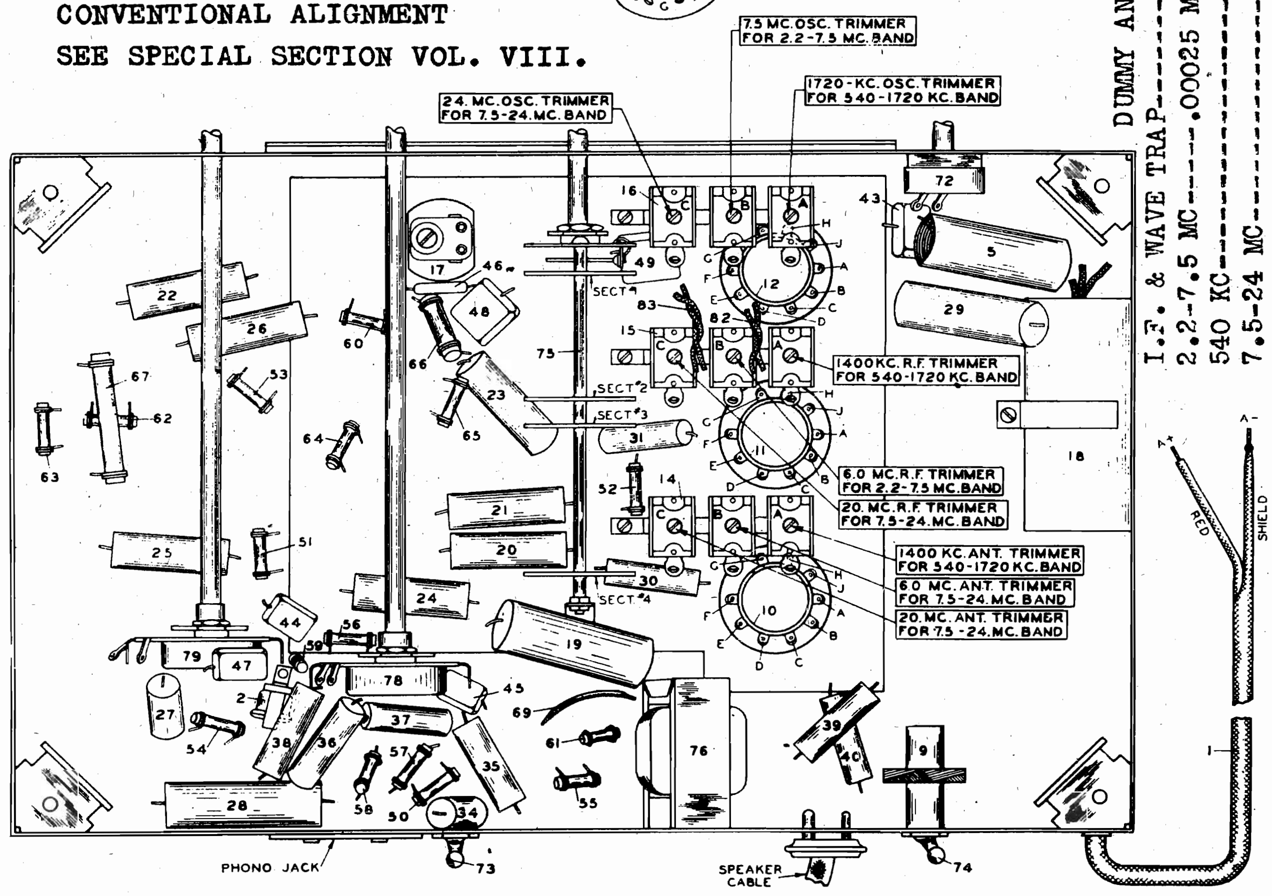
MODELS B10606, B10607, B10608,
B10609, B10610, B10611

ALLIED RADIO CORP.



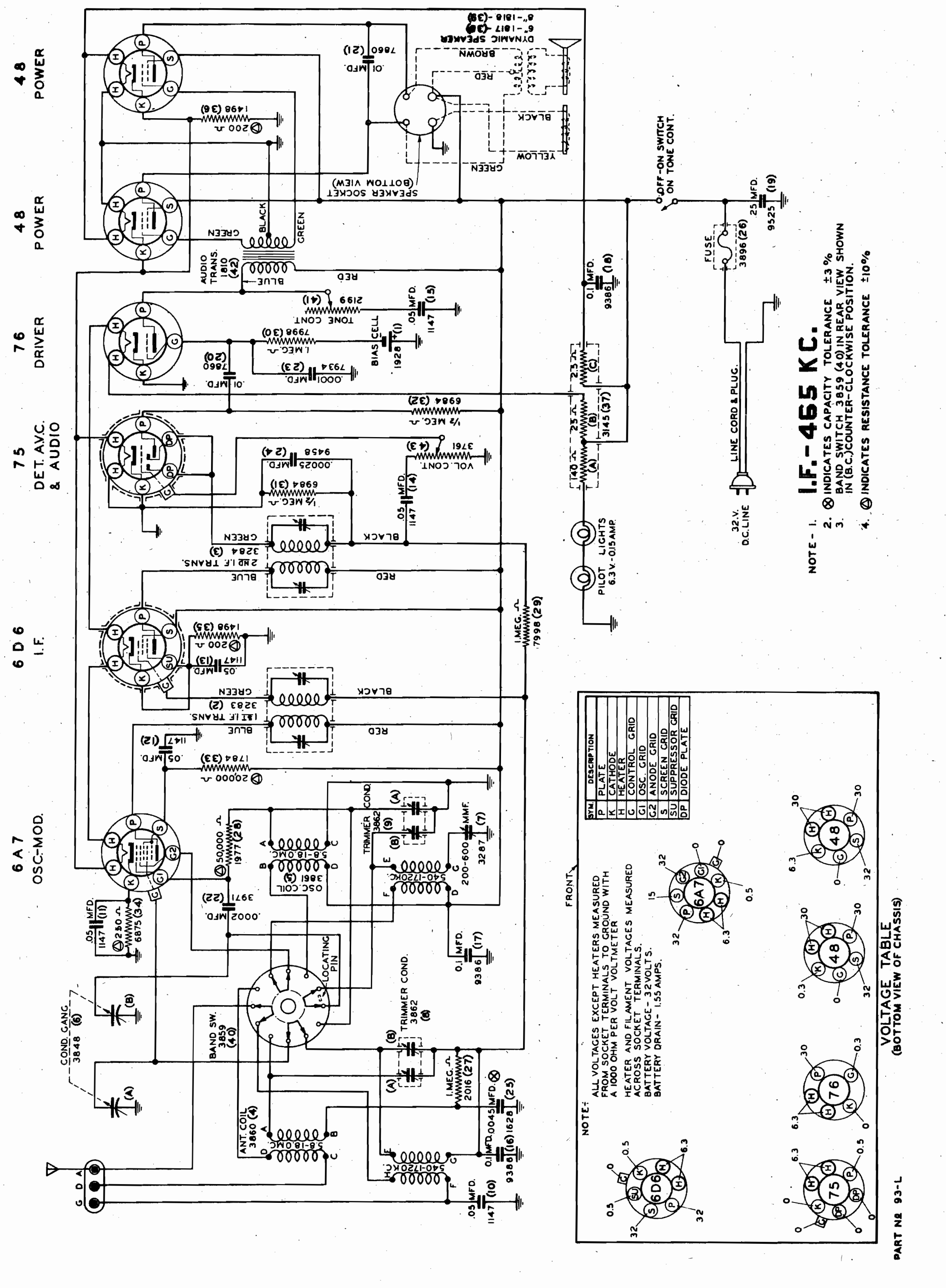
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

DUMMY ANTENNAS
I.F. & WAVE TRAP--------.02 MFD CONDENSER
2.2-7.5 MC------.00025 MFD IN SERIES WITH 400-OHM RESISTOR
540 KC-----------------.00025 MFD CONDENSER
7.5-24 MC---------------400-OHM RESISTOR
ALL UNITS ARE USED IN SERIES WITH SIGNAL LEAD



MODELS B10612, B10615, B10617

ALLIED RADIO CORP.



SYM.	DESCRIPTION
P	PLATE
K	CATHODE
H	HEATER
G	CONTROL GRID
G1	OSC. GRID
G2	ANODE GRID
S	SCREEN GRID
SU	SUPPRESSOR GRID
DP	DIODE PLATE

MODELS
B10612, B10615, B10617

ALLIED RADIO CORP.

32-V. Interference Data

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.

ELIMINATION OF INTERFERENCE CAUSED BY A 32-VOLT LIGHT PLANT

General

Two kinds of static-like noise may be heard when you operate your 32 volt radio at the same time the generating plant is charging the plant batteries.

Static-like noise, due to the action of the brushes on the commutator, may reach the set through the supply lines. Such noise can generally be eliminated by the use of .5 Mfd. 200 volt condensers, as shown in Figs. 1 and 3.

Static-like noise, due to the operation of the high tension circuit may radiate through the air to the antenna of the set. Radiation has been found to extend a half mile in extreme cases. Proper placement of the antenna, along with the use of a spark plug suppressor and correct shielding will entirely eliminate this type of noise.

When eliminating these electrical disturbances always apply the remedies given in the order in which they appear.

Usual Installations

Install spark plug suppressor on the spark plug and connect the high tension lead to the suppressor, as shown in Figure 3.

For four cylinder plants use four spark plug suppressors, one attached to each spark plug.

CAUTION: Disconnect batteries from generator before attaching suppressor equipment.

Connect one .5 Mfd. 200 volt condenser between one positive brush and the generator frame and one condenser between one negative brush and the generator frame as shown in Figure 1.

FOUR CYLINDER PLANTS. For four cylinder plants attach a condenser to the positive and negative brushes as shown in Figure 2.

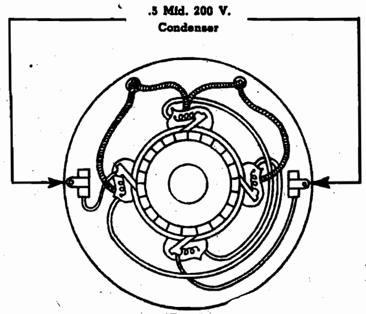


Fig. 1

Extreme Cases

To determine if the high tension wiring is radiating into the antenna disconnect the antenna and ground from the receiver and if the noise is eliminated or materially reduced, the noise is being picked up by the antenna. In such a case, obtain a piece of electrician's loom which will just slide over the high tension wire and a piece of copper braid shielding which will just slip over the loom. Cut a piece of loom just long enough to cover the high tension wire from the coil to the spark plug suppressor. Cut a piece of shielding that will be one inch shorter than the loom when the shielding is extended over the loom.

Ignition Noise on Battery Leads

Sometimes the ignition interference will travel up the battery leads. This condition can be corrected as follows: Attach a .5 Mfd. condenser between the POSITIVE terminal at the top of the control box and the frame of the box. (Be sure the frame of the box is well grounded to the generator frame.) Attach a .5 Mfd. condenser between the NEGATIVE terminal at the top of the control box and the control box frame.

Ignition Interference on Supply Leads

In extreme cases the ignition interference will travel up the supply leads to the radio receiver. This condition can be corrected by attaching a .5 Mfd. condenser between the ungrounded side of the line (in the main switch box) and ground (or the grounded side of the line if one side of the line is grounded).

Grounding

Some cases may require a thorough grounding of the system. This may be accomplished by running a No. 12 B. & S. gauge wire from the generator frame to a good ground. Conduit and metal switch boxes should also be grounded.

If it is necessary to ground one side of the supply lines, first ground them temporarily, one at a time through a 32 volt lamp. One side of the line will light the light, the other will not. The side which WILL NOT light the light should be grounded.

DO NOT apply any of the remedies listed under "Extreme Cases", before trying the ones listed under "Usual Cases".

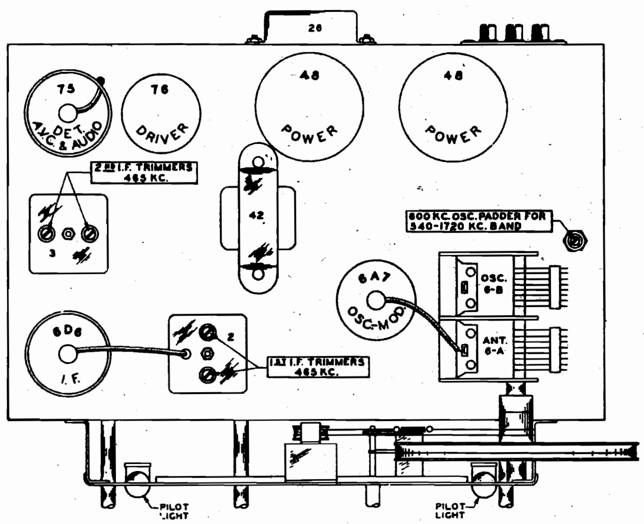
Slip the loom over the high tension lead. Slip the shielding over the loom so that it is one-half inch from each end of the loom. Wrap some fine copper wire around the shielding near the end of the shielding to hold the shielding in place. Solder the wire to the shielding so it will not slip due to plant vibration. The shield may be taped in place if the tape is very adhesive. DO NOT USE FRICTION TAPE.

Solder a short braid pig-tail to the shielding and ground it under the nearest screw in the generator frame.

This receiver is designed for operation on 32 volt battery plants only and must not be used on battery plants of a HIGHER RATED VOLTAGE than 32 volts without a voltage regulator.

The power plug attached to the end of the power cord must be inserted correctly IN THE 32 VOLT POWER SUPPLY OUTLET OR RECEPTACLE, OTHERWISE THE SET WILL NOT OPERATE. If after inserting the plug and turning the receiver on, the set does not operate after approximately two minutes, remove this plug and turn it half-way around and reinsert it in the power receptacle.

A 4 AMPERE FUSE is located on the back of the chassis underneath receptacle marked "Fuse" and protects the receiver from damage should a defect occur in the set or if it is connected to the improper power supply. Continued burning out of fuses on the proper power supply is indicative of some defect. THE WARRANTY IS VOID IF THE RECEIVER IS OPERATED WITH THE FUSE SHORTED OUT OR WITH A FUSE LARGER THAN 4 AMPERES.



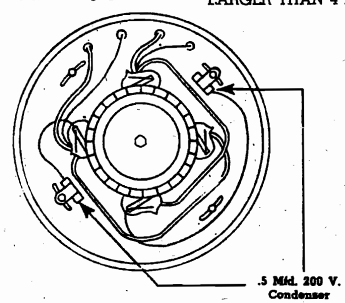


Fig. 2

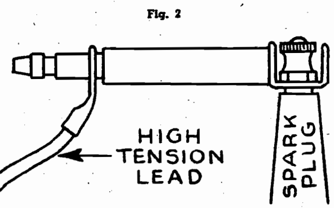
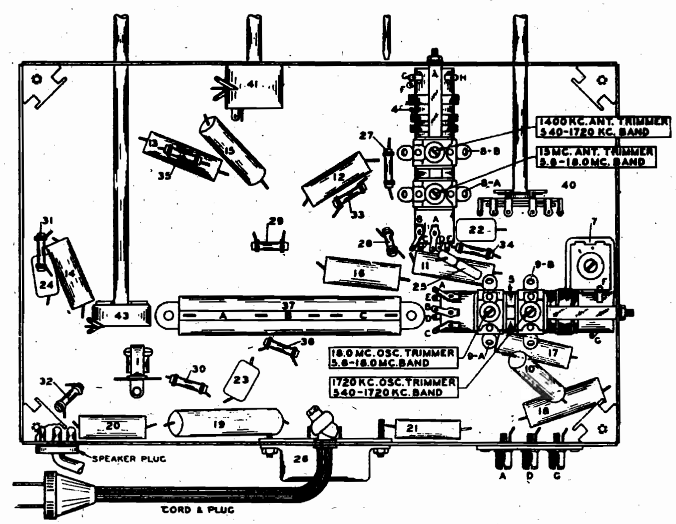
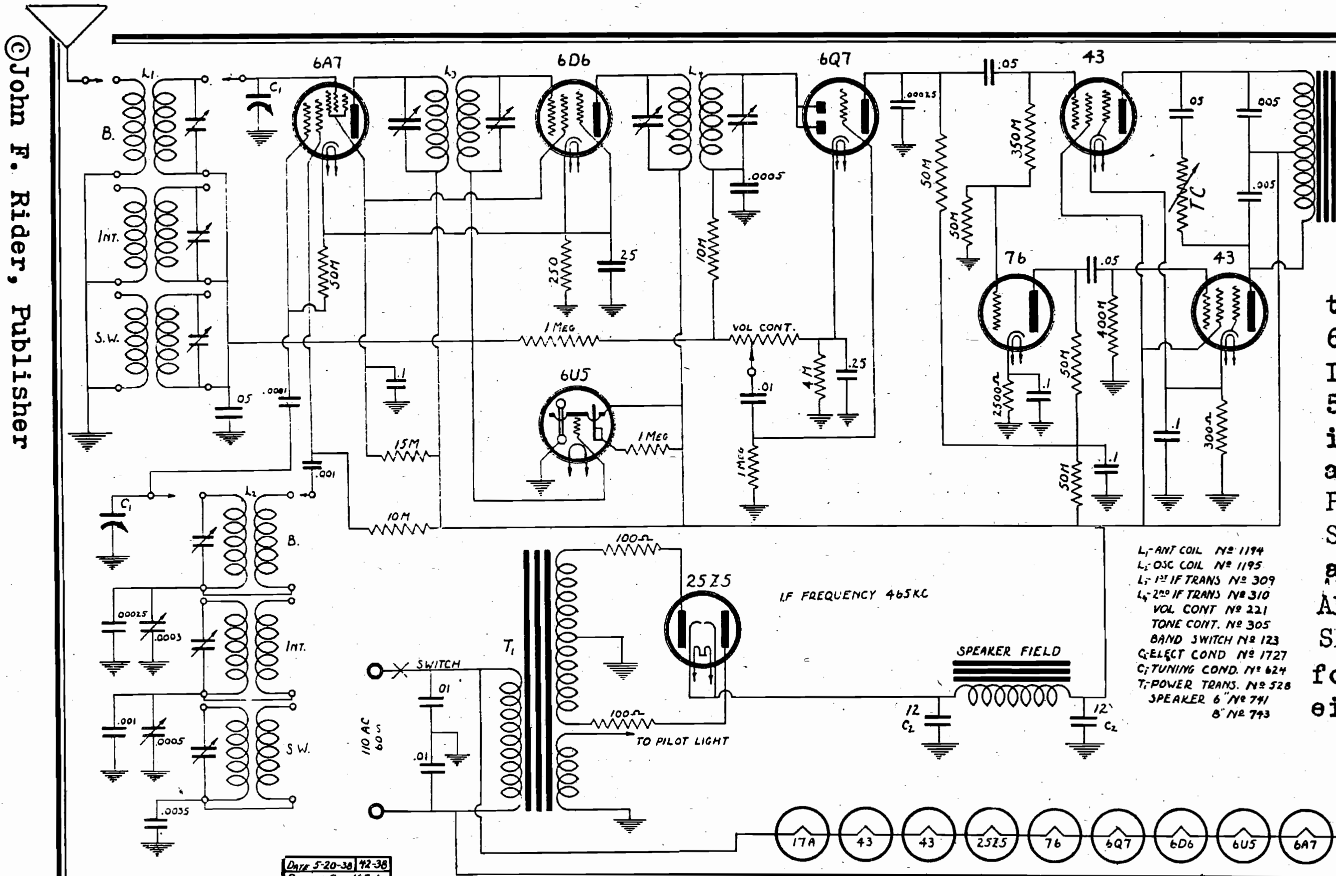


Fig. 3



MODELS B10704, B10705

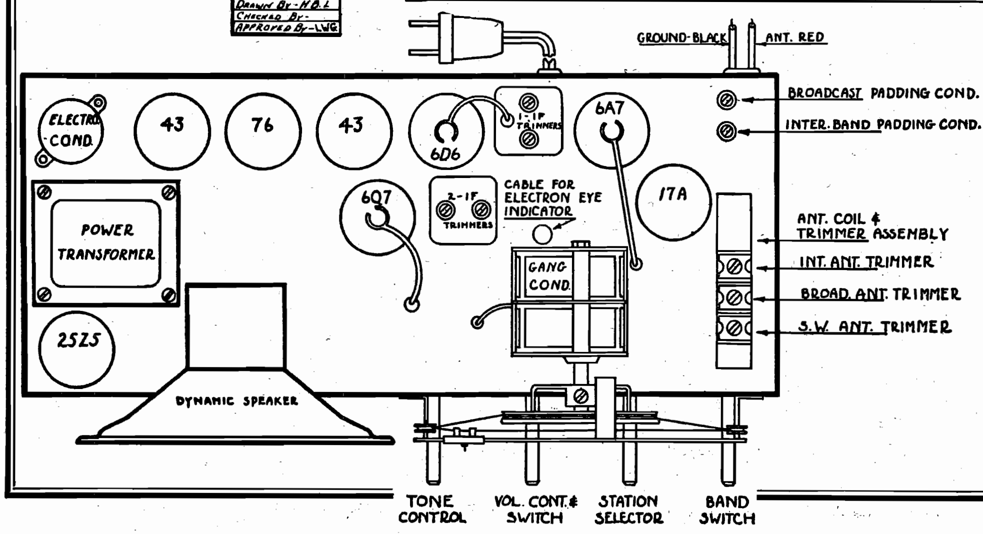
ALLIED RADIO CORP.

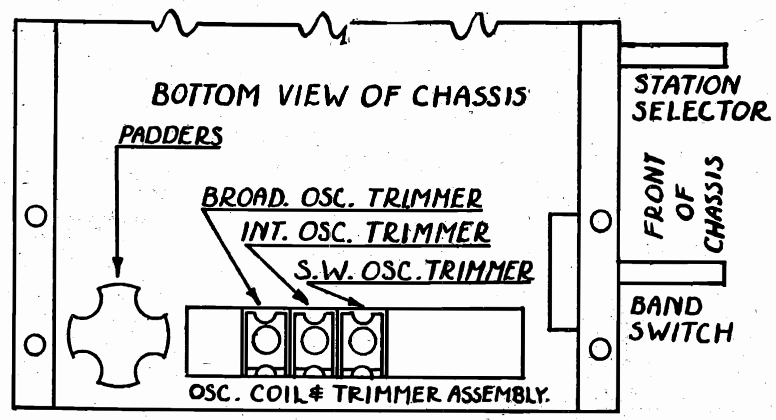


ALIGNMENT

I.F. 465 KC to grid of 6A7. Adj. IF trimmers. B.C.BAND. Osc. and dial at 1400 KC, .0002 mfd. dummy, Vol. Contr. max. Adjust B.C. OSC. trimmer to max. Similarly B.C. Pad at 600 KC. Then recheck at 1400 KC. INT. BAND. Dial and osc. at 5100 KC .0002 mfd. with 400 ohm in series as dummy. Adj. ANT. and OSC trimmers to max. Adj. Pad at 1800 KC. Recheck 5100 KC. S.W. BAND. 400 ohm dummy. Osc. and dial at 15 MC. Adjust S.W. ANT. and OSC trimmers to max. SENSITIVITY Check at 6000 KC for proper alignment. If receiver lacks sensitivity check the .0035 mica condenser for short circuit.

IF PEAK 465 KC



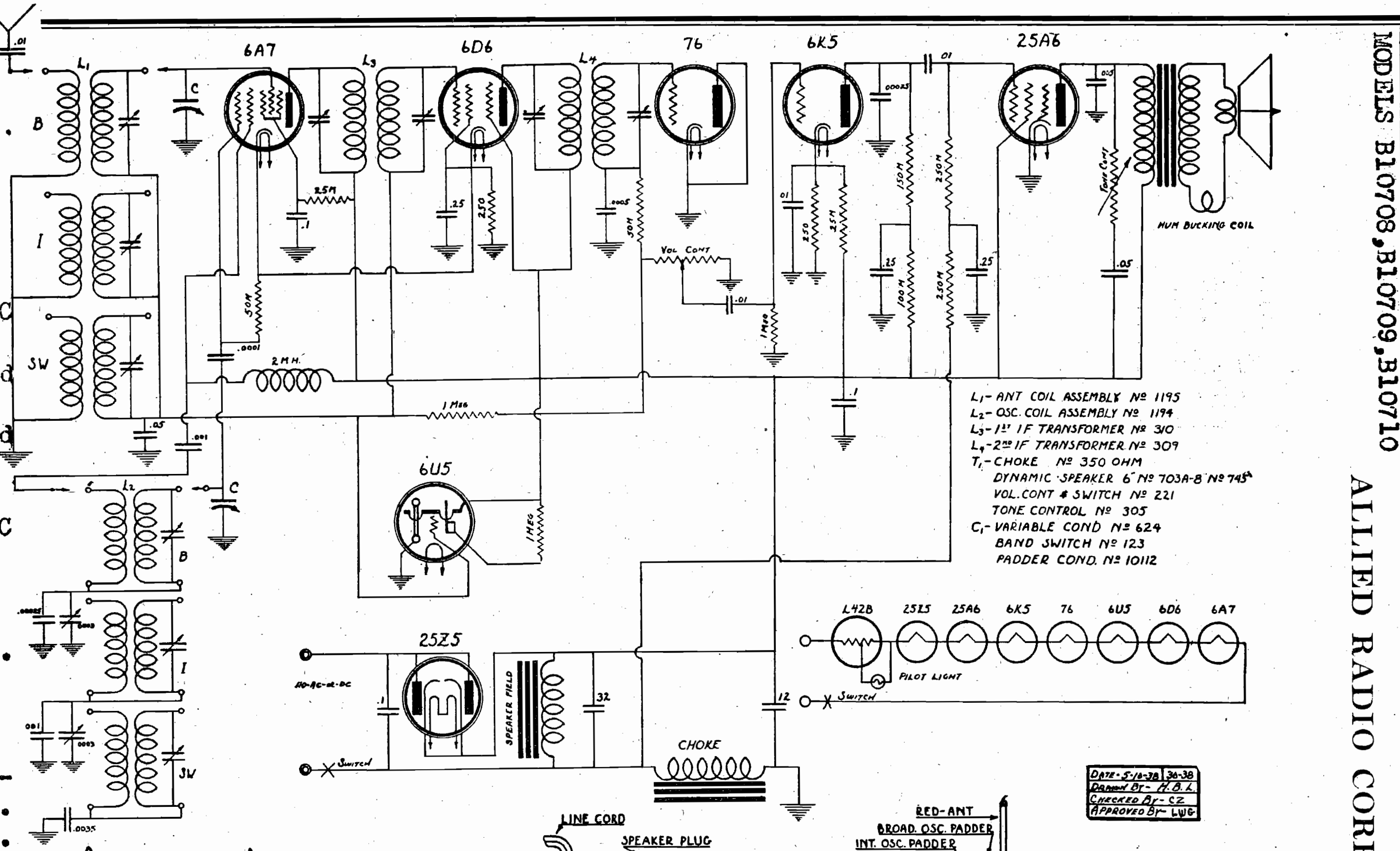


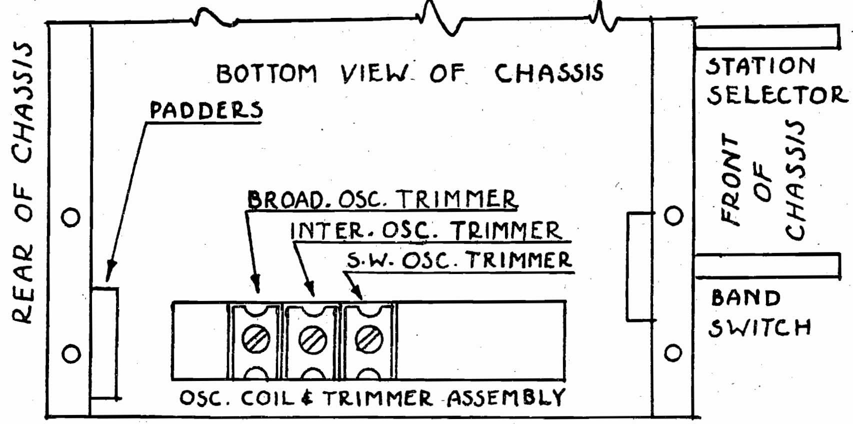
MODELS B10708,B10709,B10710

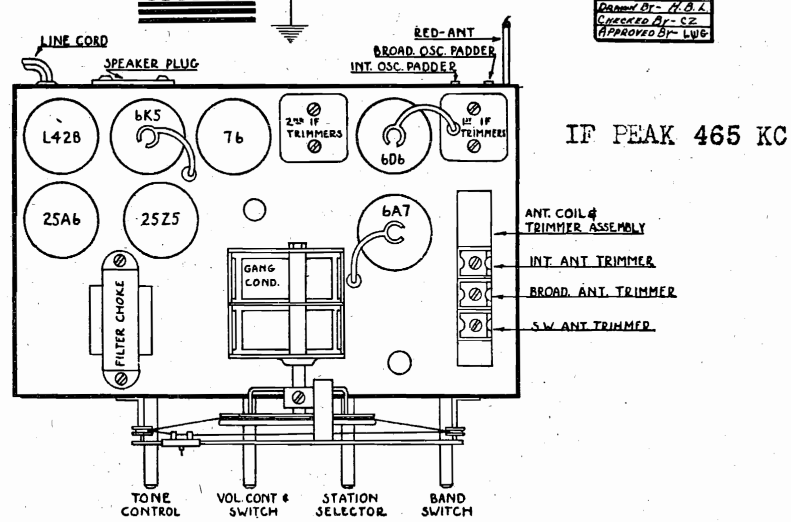
ALLIED RADIO CORP.

ALIGNMENT

I.F. 465 KC. to grid of 6a7 , Adjust IF trimmers. B.C.Band. Osc at 1400 KC .0002 dummy, Vol. Contr. at max. Dial at 1400 KC Adjust B.C.OSC trim. to max. Similarly B.C. Pad at 600 KC. Recheck 1400KC INT.BAND. Dial and Osc. at 5100KC,.0002 mfd. cond with 400 ohm series res. as dummy. Adjust ant. and osc. trimmers to max. Adjust Pad at 1800 KC. Recheck adjustment 5100KC S.W.BAND. 400 ohm dummy Oscillator and dial at 15 MC. adjust S.W. ant. and osc. trimmers to max. Check sensitivity at 6000 KC to check for proper alignment. If the receiver lacks sensitivity check the .0035 cond. (mica) for short circuit.



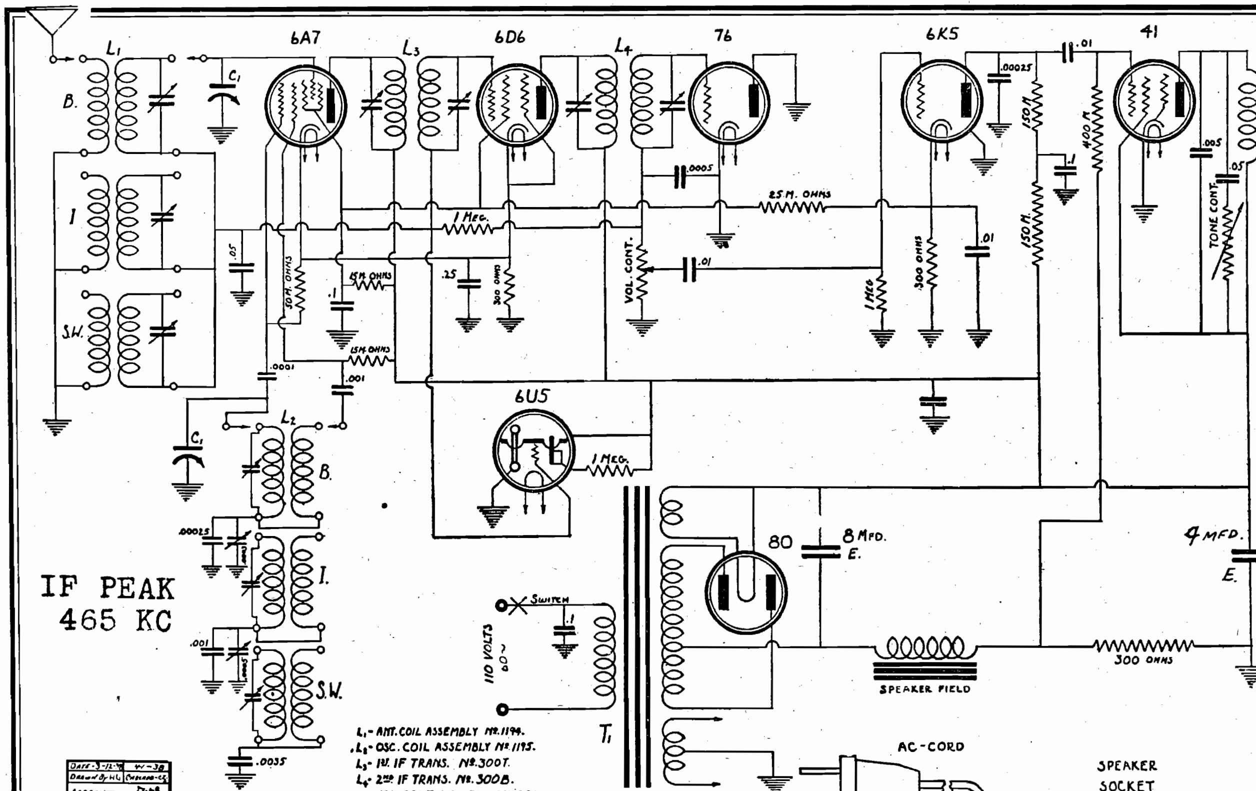




IF PEAK 465 KC

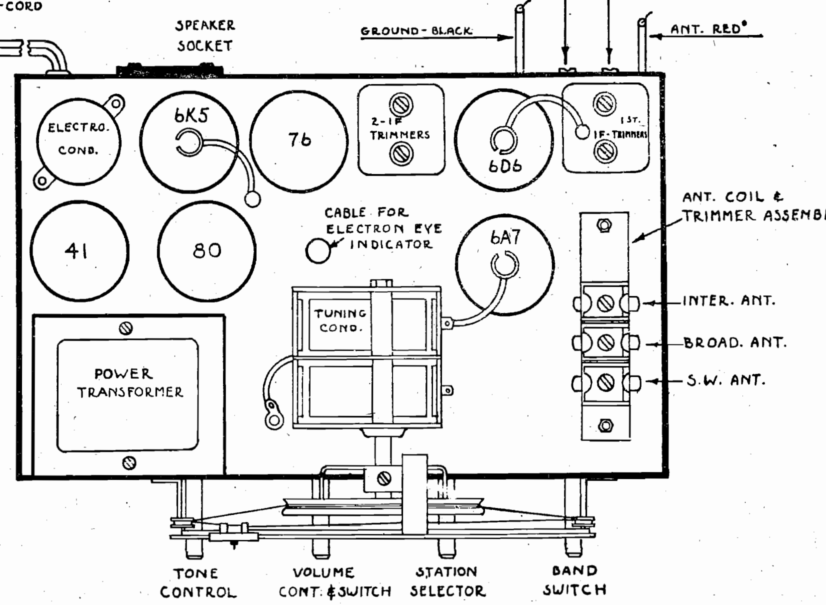
ALLIED RADIO CORP.

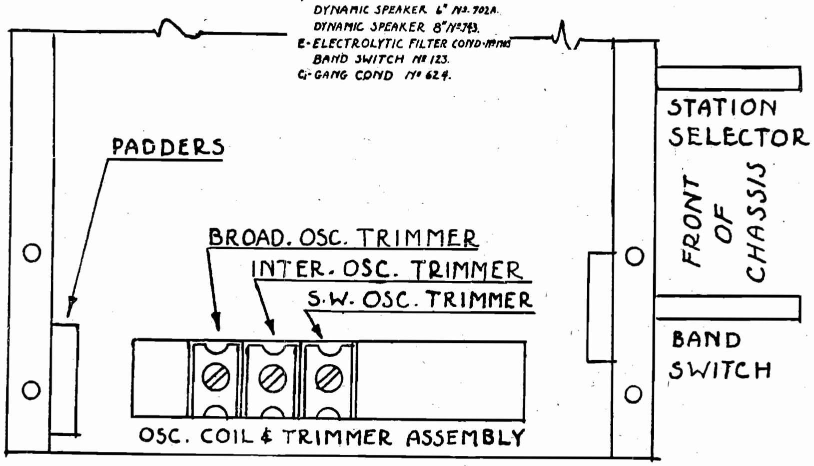
MODELS B10713,B10714,B10715



IF PEAK
465 KC

I.F. 465 KC to grid of 6A7. Adj. IF trimmers. B.C.BAND. Osc and dial at 1400 KC,.0002 mfd. dummy, Vol. Contr. max. Adj. B.C. OSC. trimmer to to max. Similarly B.C. Pad at 600 KC. Then recheck 1400
INT.BAND. Dial and osc. at 5100KC .0002 mfd. with 400 ohm in series as dummy. Adj. ANT.and OSC. trimmers to max. Adj. Pad at 1800KC Recheck at 5100 KC.
S.W.BAND. 400 ohm dummy. Osc and dial at 15 MC.adjust S.W. ANT. and OSC trimmers to max.
SENSITIVITY check at 6000 KC for proper alignment. If receiver lacks sensitivity check the .0035 mica cond. for short circuit.

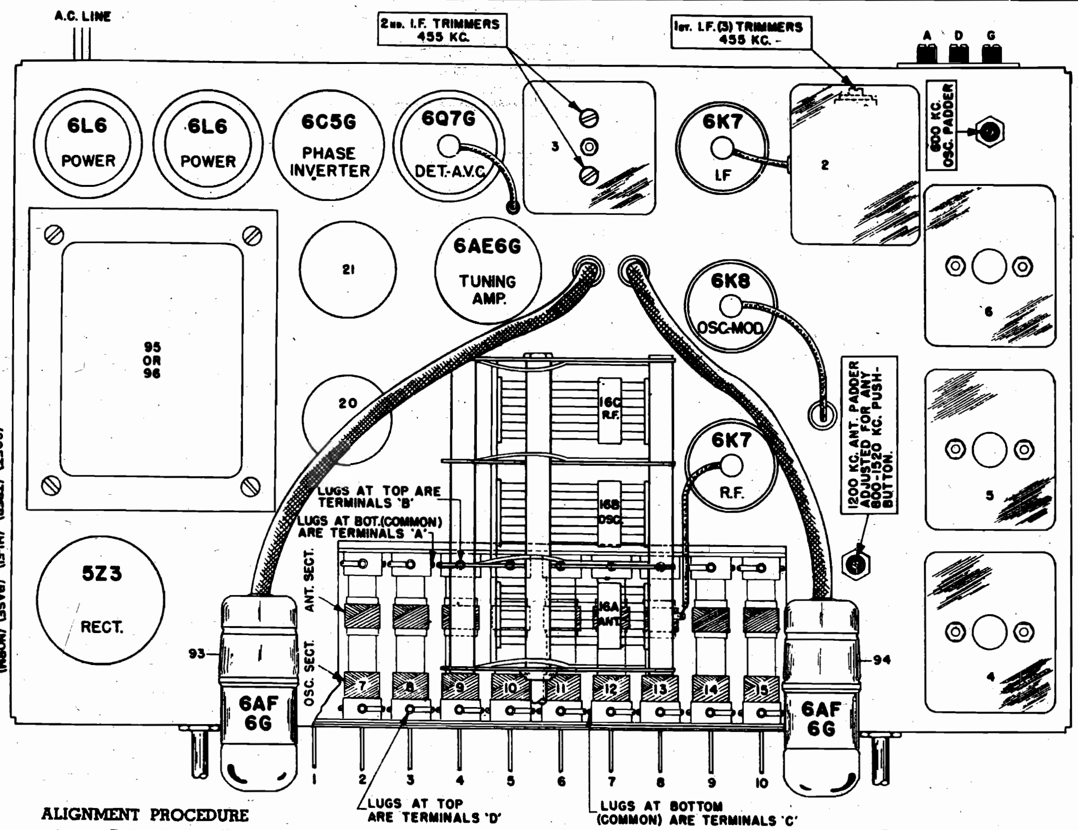




BOTTOM VIEW OF CHASSIS

MODEL E10797

ALLIED RADIO CORP.



ALIGNMENT PROCEDURE

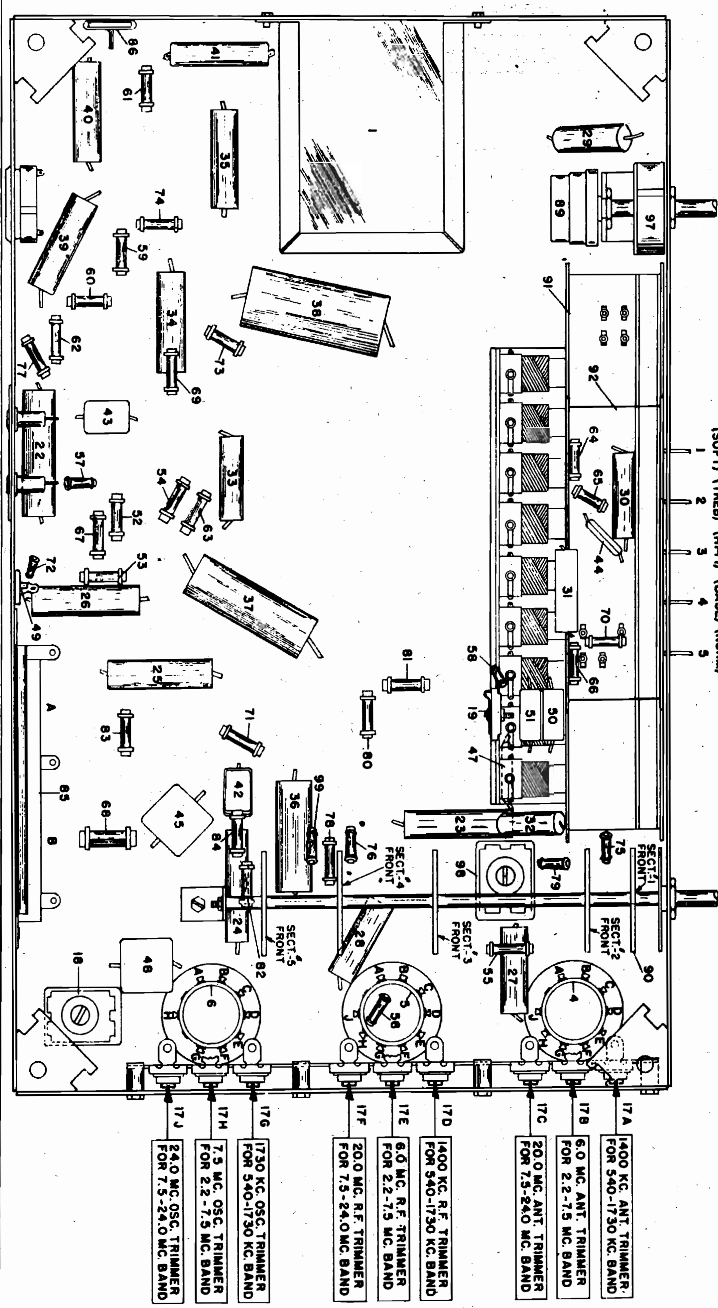
Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

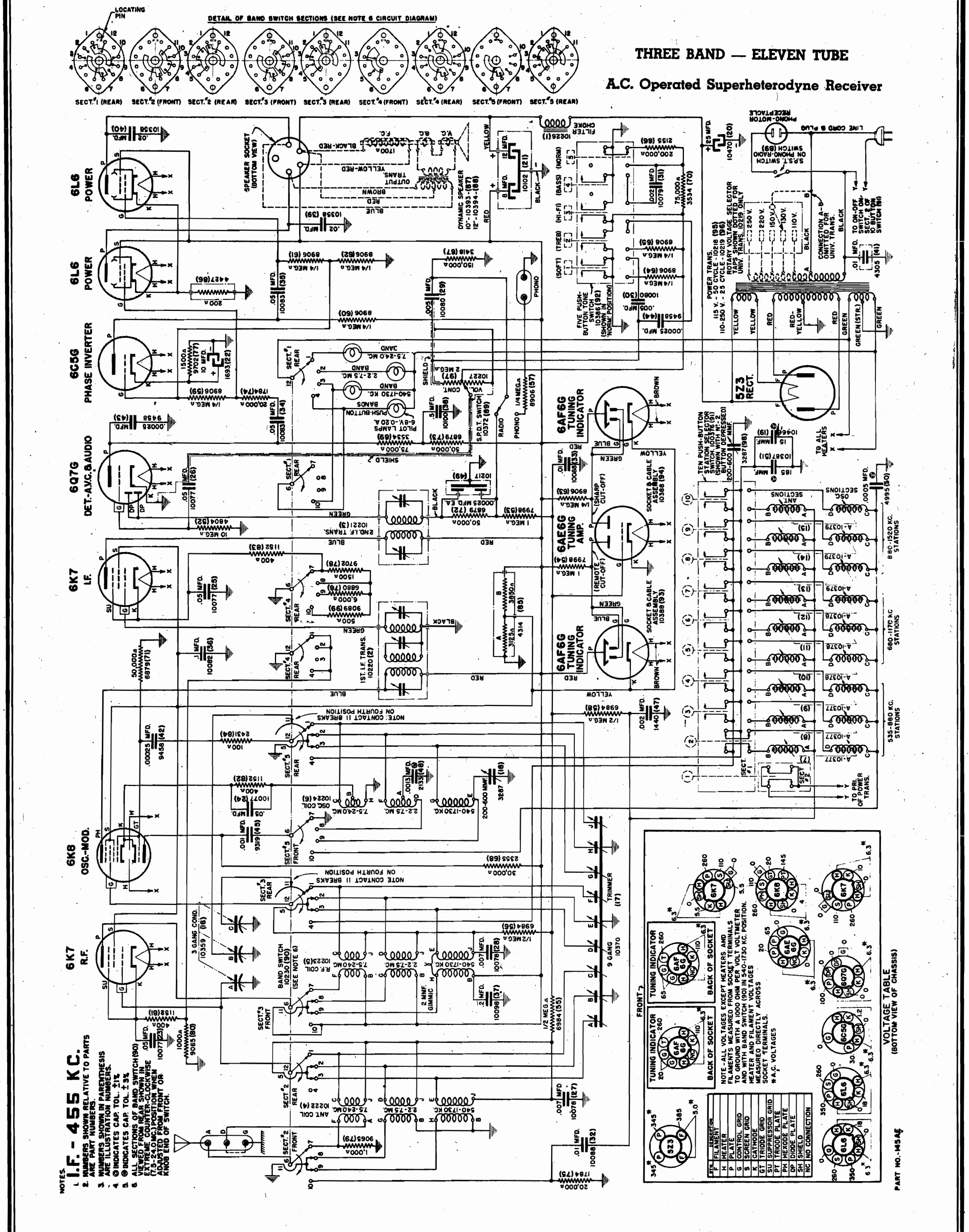
(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I.F. ALIGNMENT use any band position	Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 TO 540 K.C. BAND	(1) Exactly 1730 K.C.	Exactly 1730 K.C	.00025 Mfd. condenser	Receiver antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	(2) Exactly 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver antenna lead	While rocking gang condenser adjust 1400 K.C. antenna and R.F. trimmers for maximum output.
	(3) Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
2.2 TO 7.5 M.C. BAND	(1) Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna lead	Adjust 7.5 M.C. oscillator trimmer for maximum output.
	(2) Exactly 6. M.C.	Exactly 6. M.C.	400 Ohm carbon resistor	Receiver antenna lead	While rocking gang condenser adjust 6 M.C. antenna and R.F. trimmers for maximum output
7.5 TO 24 M.C. BAND	(1) Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna lead	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	(2) Approx. 20 M.C.	Exactly 20 M.C.	400 Ohm carbon resistor	Receiver antenna lead	While rocking gang condenser adjust 20 M.C. antenna and R.F. trimmers for maximum output.



MODEL E10797

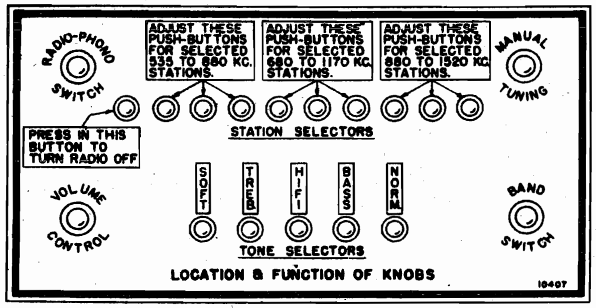
ALLIED RADIO CORP.



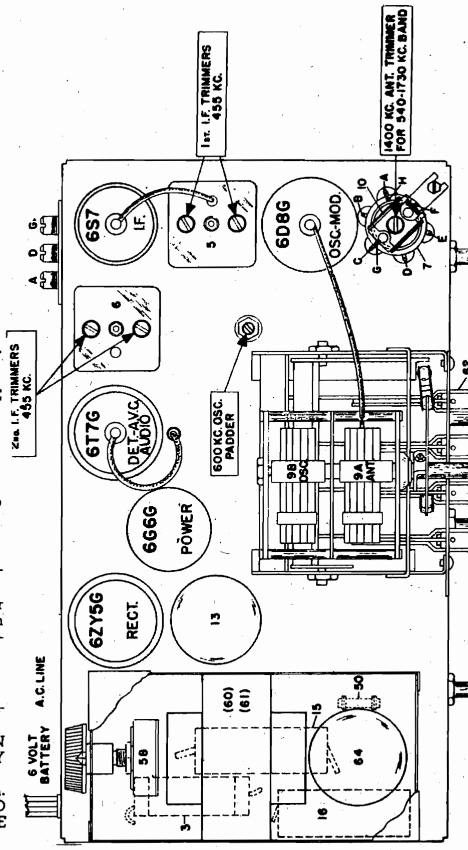
MODEL E10797
MODEL E10882A

ALLIED RADIO CORP.

MODEL E10797



MODEL E10882A



PUSH- BUTTON ADJUSTMENT

Nine stations operating in the 1500-540 kilocycle band may be automatically push button tuned by properly setting each station selector push button.

AS THE PUSH BUTTONS ARE NOT PRE-SET AT THE FACTORY FOR ANY DEFINITE STATIONS BE SURE TO SET EACH ONE.

Before Attempting to Set Push Buttons Be Sure to:

(a) Have aerial which will be used with the radio attached to the receiver when setting push buttons.
(b) Operate radio at least 15 minutes before adjusting push buttons.
(c) Obtain transmitter frequency—number of kilocycles—and call letters of the nine stations you wish to push button tune from radio log or newspaper radio station list.

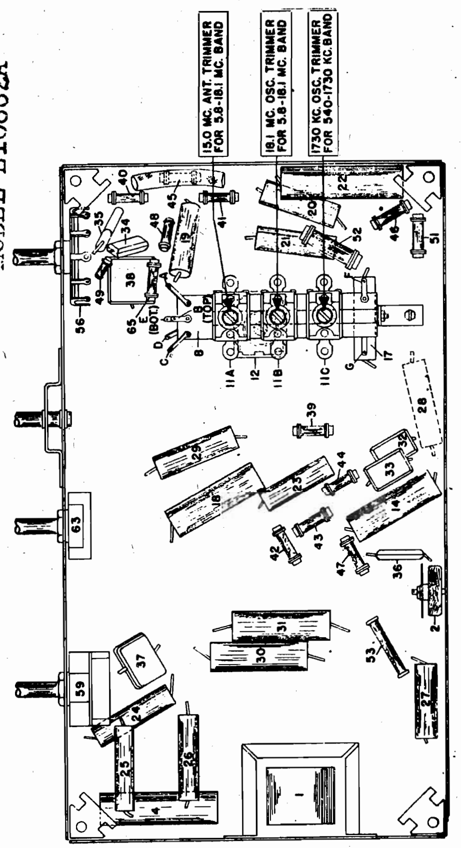
Adjust Push Buttons for Selected Stations by:

(a) Rotate band switch knob to the NEXT TO MAXIMUM RIGHT HAND POSITION—540-1730 KILOCYCLE BAND MANUAL TUNING POSITION.
(b) Using regular manual tuning knob carefully tune in one of the selected stations whose transmitter frequency is somewhere between 535-880 kilocycles. Make a mental note of the kind of program on this station, so that when push button is adjusted for this particular station (as instructed in paragraph (e)) it will be easy to recognize the station by the type of program being transmitted.
(c) Rotate band switch knob to maximum right hand position.
(d) Press in one of the three push buttons marked 535-880 kylocycles on diagram.
NOTE: STATION MAY DISAPPEAR, BE DISTORTED OR IN SOME INSTANCES ANOTHER STATION MAY BE HEARD.
(e) GRASP END OF PUSH BUTTON JUST PRESSED IN AND BY SLOWLY TURNING THIS BUTTON CAREFULLY TUNE IN THE SELECTED 535-880 KILOCYCLE STATION THAT WAS PREVIOUSLY TUNED IN WITH MANUAL CONTROL.
Slowly—turn first in one direction, then if the wanted station is not heard turn in opposite direction. WATCH TUNING EYE AND ADJUST SO THAT THE TWO OPEN ENDS OF THE GREEN INVERTED "V" ON THE TUNING EYE ARE CLOSEST TOGETHER—AT WHICH POINT THE SIGNAL WILL BE HEARD WITH GREATEST VOLUME AND CLEAREST TONE.
(f) Press station call letter of the station just tuned in out of call letter sheet supplied and insert into depression adjacent to push button just adjusted.
(g) After the first 535-880 kilocycle push button has been properly set, the other eight push buttons should be adjusted in the same manner preferably in the following order:
1. Set remaining two push buttons marked 535-880 kilocycles on diagram for any two stations operating between 535-880 kilocycles.
2. The three push buttons marked 680-1170 kilocycles on diagram should be adjusted for any three selected stations operating between 680 and 1170 kilocycles.
3 Adjust the three push buttons marked 880-1520 kilocycles on diagram for any three selected stations operating between 880 and 1520 kilocycles.

IMPORTANT

For Manual Tuning the Band Switch must be in next to maximum right hand position. When adjusting Push Buttons or when Push Button tuning after Push Buttons have been set, Band Switch must be in maximum right hand position.

MODEL E10882A



MODEL E10882A

ALIGNMENT PROCEDURE IN TABULATED FORM

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment, check tuning dial adjustment by: Turn gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

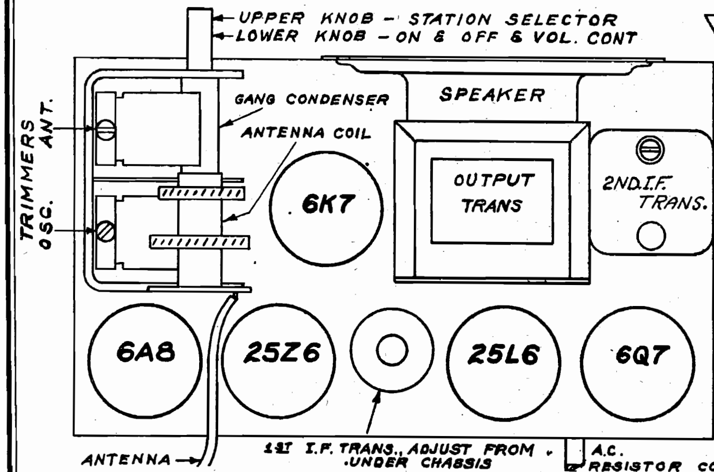
Use an accurately calibrated test oscillator with some type of output measuring device.

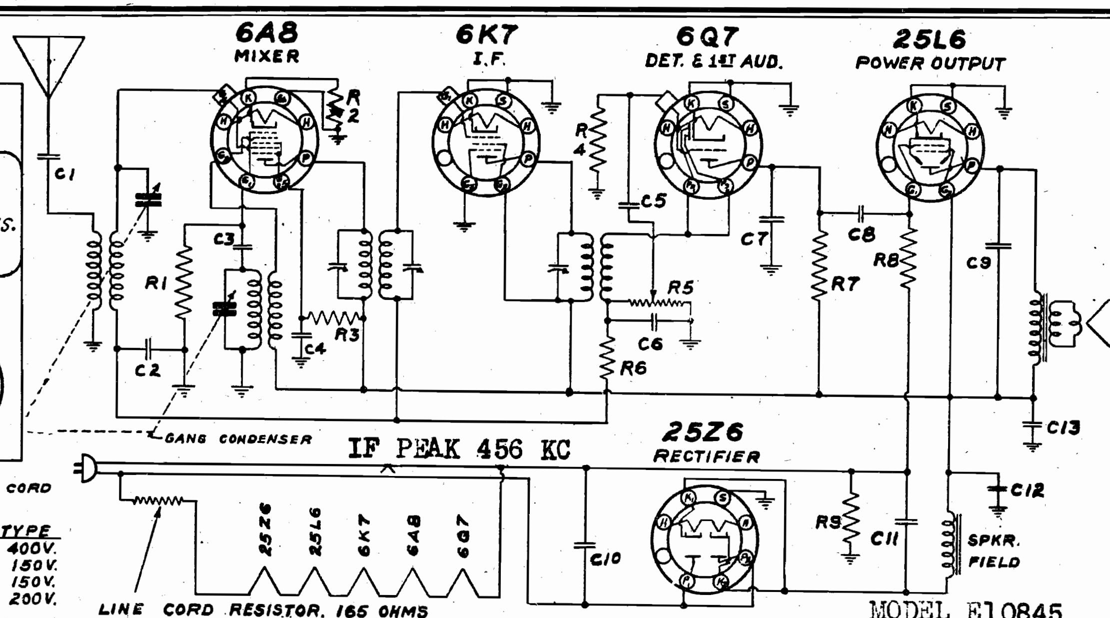
Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator, frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below and:
I.F. alignment use any band position		Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6D8G tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C.	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2	Exactly 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1400 K.C. antenna trimmer for maximum output.
	3	Approximately 600 K.C.	Approximately 600 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.8 to 18.1 M.C. BAND	1	Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18.1 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak, is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2	Exactly 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 15 M.C. antenna trimmer for maximum output.

MODEL E10845
MODEL E10860

ALLIED RADIO CORP.





MODEL E10845

RESISTORS

No	OHMS	WATTS	SPL.
R1	50,000	¼	
R2	110	¼	
R3	40,000	¼	
R4	15 Meg.	¼	
R5	500,000		VOL. CONT.
R6	2 Meg.	¼	
R7	250,000	¼	
R8	500,000	¼	
R8	150	¼	±10%

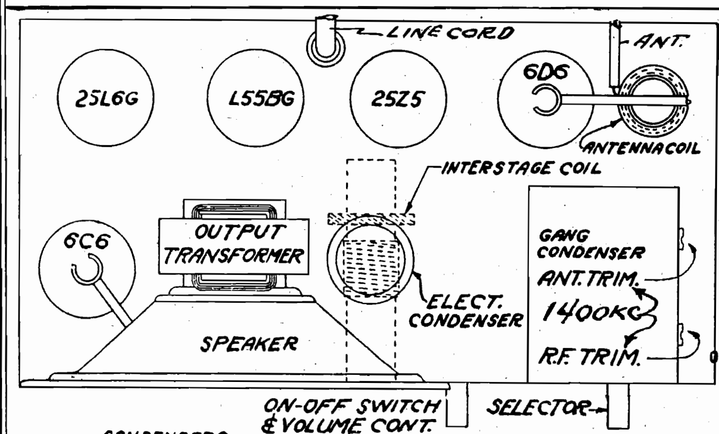
CONDENSERS

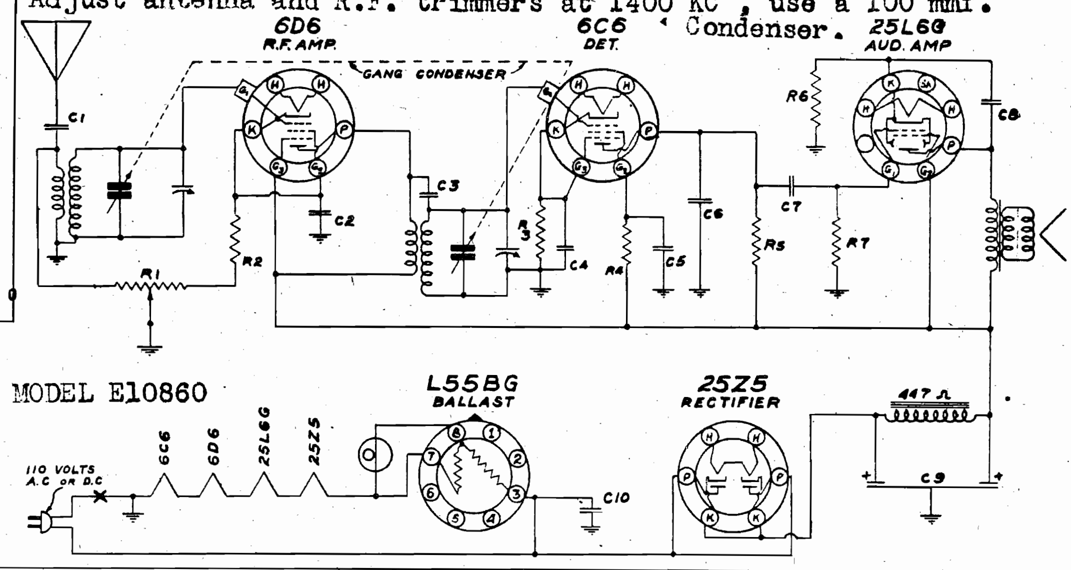
No	Mfd.	TYPE
C1	.000250	MICA
C2	.02	400V.
C3	.000050	MICA
C4	.01	400V.
C5	.01	300V.
C6	.00025	MICA
C7	.0005	MICA
C8	.01	400V.
C9	.005	600V.
C10	.05	400V.
C11	30.	150V.
C12	10.	150V.
C13	.05	200V.

I.F. Adjust at 456KC, connect oscillator to grid of 6A8 through .05 mfd. condenser, align all three trimmers to peak.

B.C. Adjust at 1730 KC through a .0001 mfd. condenser for oscillator trimmer. Peak antenna trimmer at 1400 KC

Adjust antenna and R.F. trimmers at 1400 KC, use a 100 mmf. Condenser.





MODEL E10860

CONDENSERS

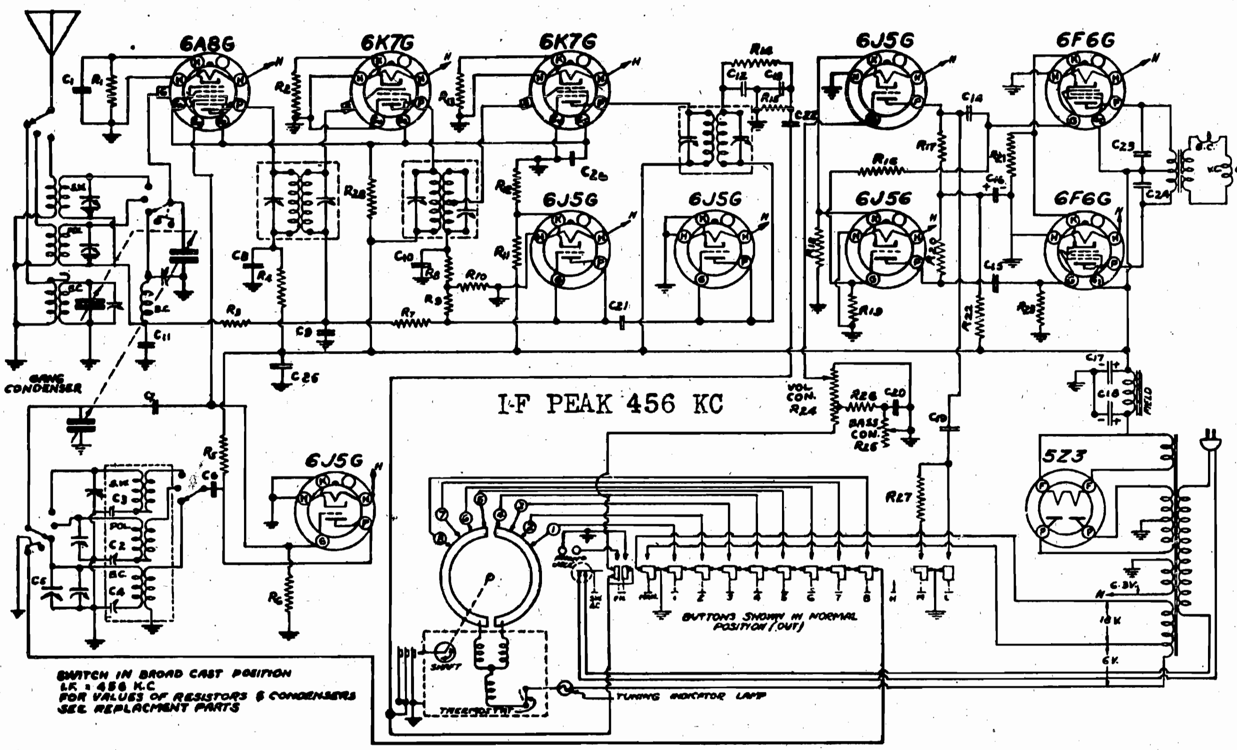
No	CAPACITY	TYPE
C1	.002 MFD.	400V.
C2	.1 "	200V.
C3	1.5 μμf.	GIMMIK
C4	.25 Mfd.	200V.
C5	.1 "	200V.
C6	.0002 "	600V.
C7	.01 "	400V.
C8	.02 "	400V.
C9	16.0-16.0 -	150V. ELECT.

RESISTORS

No	OHMS R.	WATTS	
R1	75,000		VOL. CONT.
R2	250	¼	
R3	25,000	¼	
R4	2,000,000	¼	
R5	500,000	¼	
R6	110	½	WIRE WOUND
R7	500,000	¼	
C10	.1 Mfd	400V	

MODEL E10850

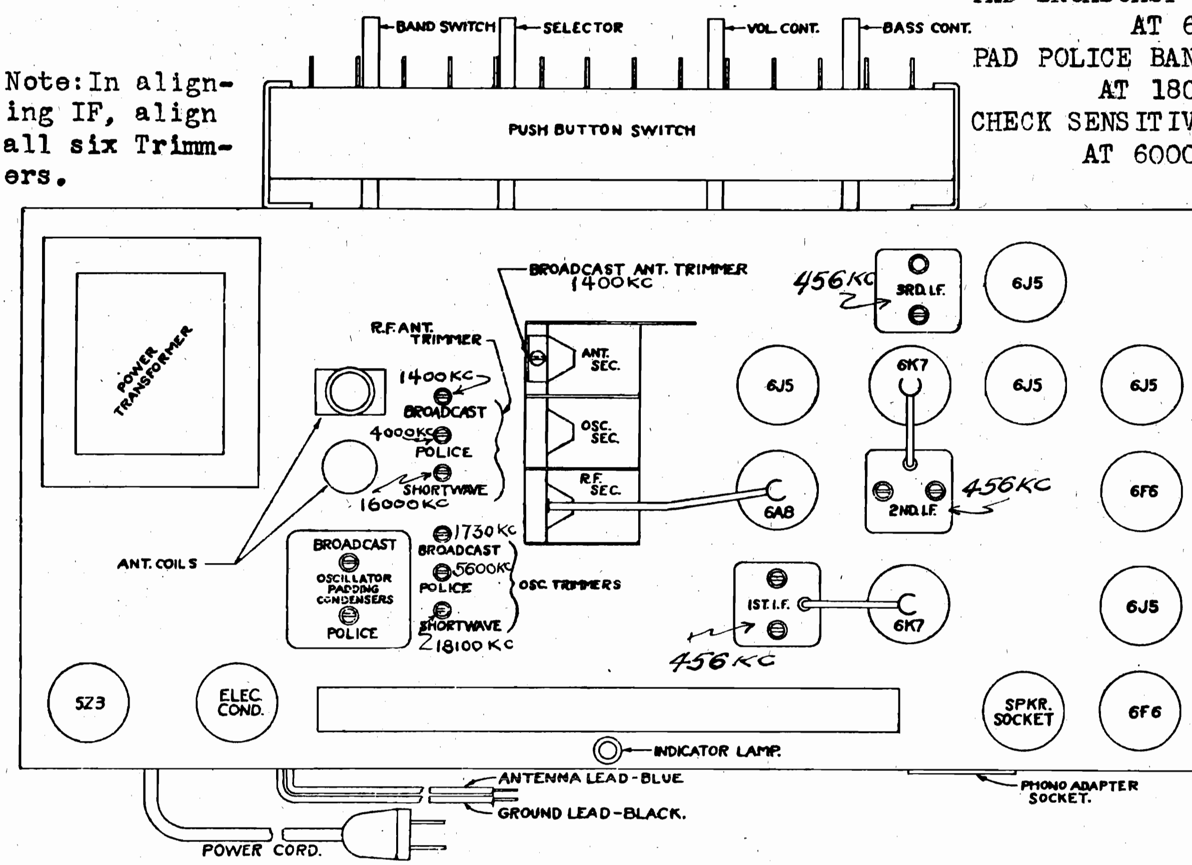
ALLIED RADIO CORP.



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII

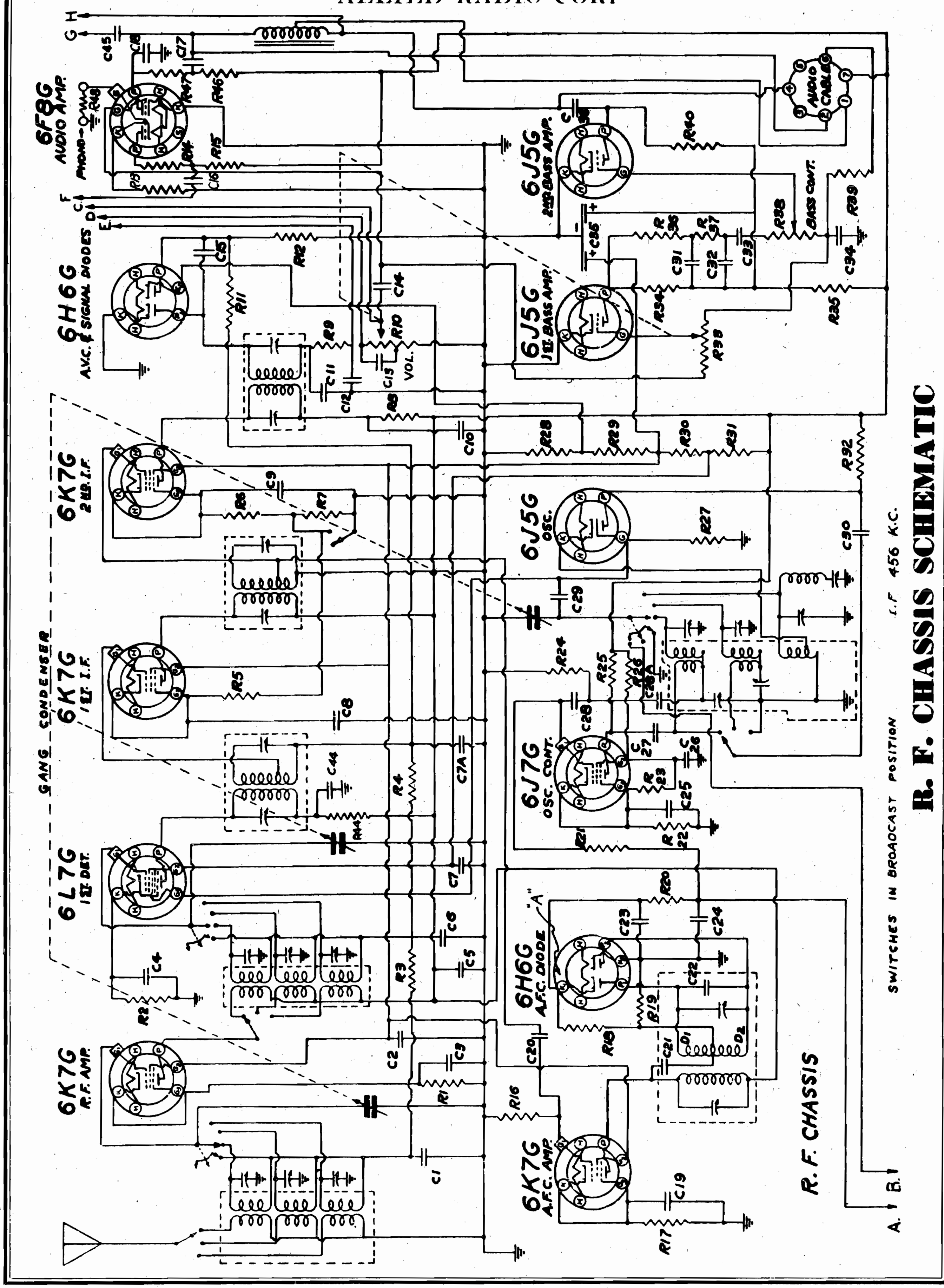
PAD BROADCAST BAND AT 600KC
PAD POLICE BAND AT 1800 KC
CHECK SENSITIVITY AT 6000 KC

Note: In aligning IF, align all six Trimmers.



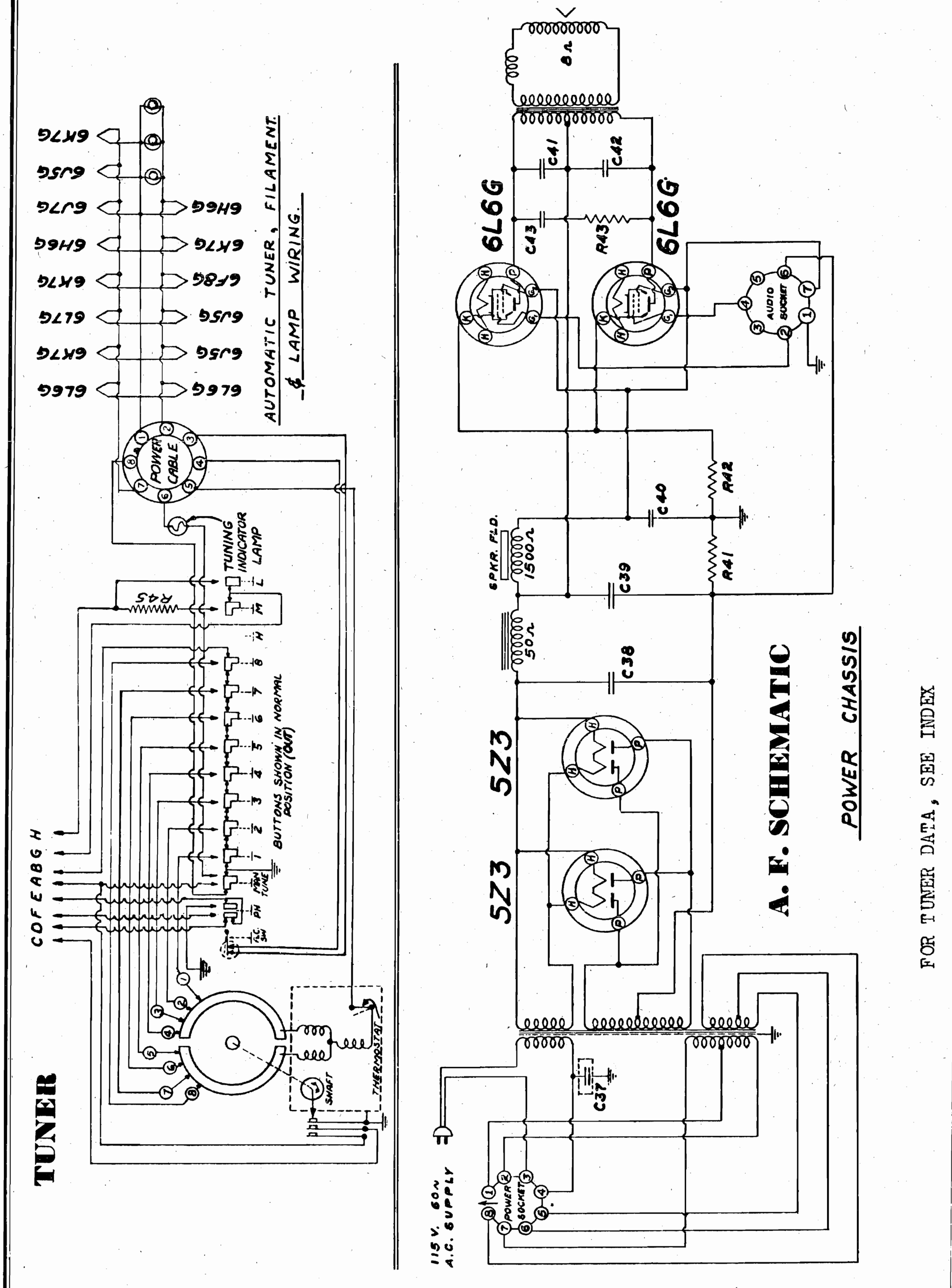
ALLIED RADIO CORP

MODEL E10880



MODEL E10880

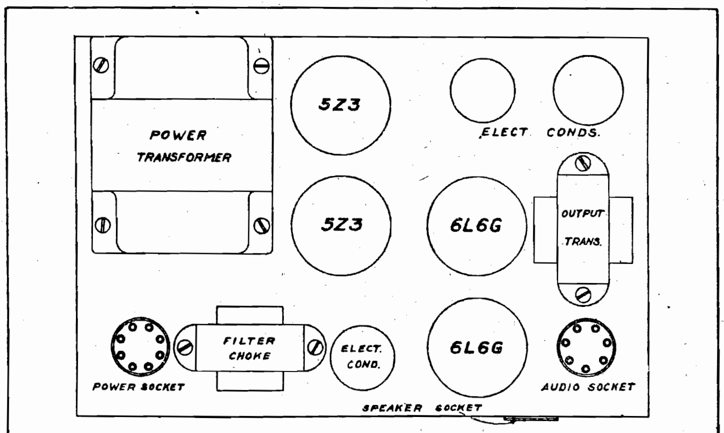
ALLIED RADIO CORP.



MODEL E10880

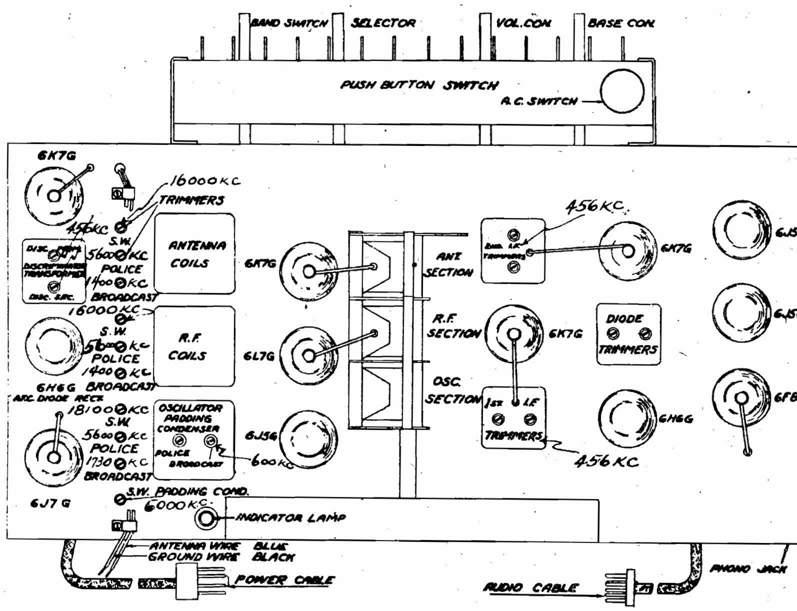
ALLIED RADIO CORP.

CONVENTIONAL ALIGNMENT--SEE SPECIAL SECT. VOL. VIII



Power Chassis

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

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	P2013	2400 Ohms
R30	P2013	2250 Ohms
R31	P2013	2260 Ohms
R41	P2010	150 Ohms
R42	P2010	31 Ohms

ELECTROLYTIC CONDENSERS

C35	4	100 W. V.	Dry
C35	4	250 W. V.	Dry
C38	25	450 W. V.	Wet
C39	12	450 W. V.	Wet
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

MODEL E10850
MODEL E10880

ALLIED RADIO CORP

ELECTRIC TUNER

MODELS E10850 and E10880

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.

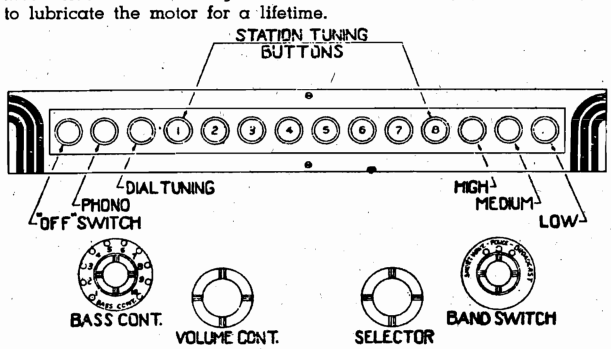


Fig. 1

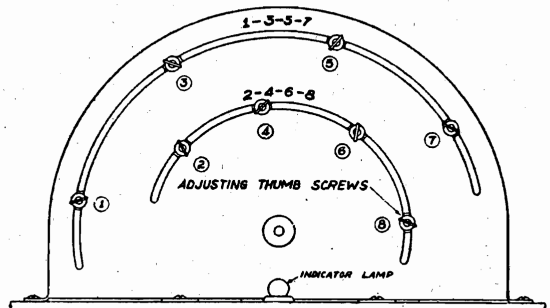


Fig. 2

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.

PARTS LIST FOR MODEL E10850

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

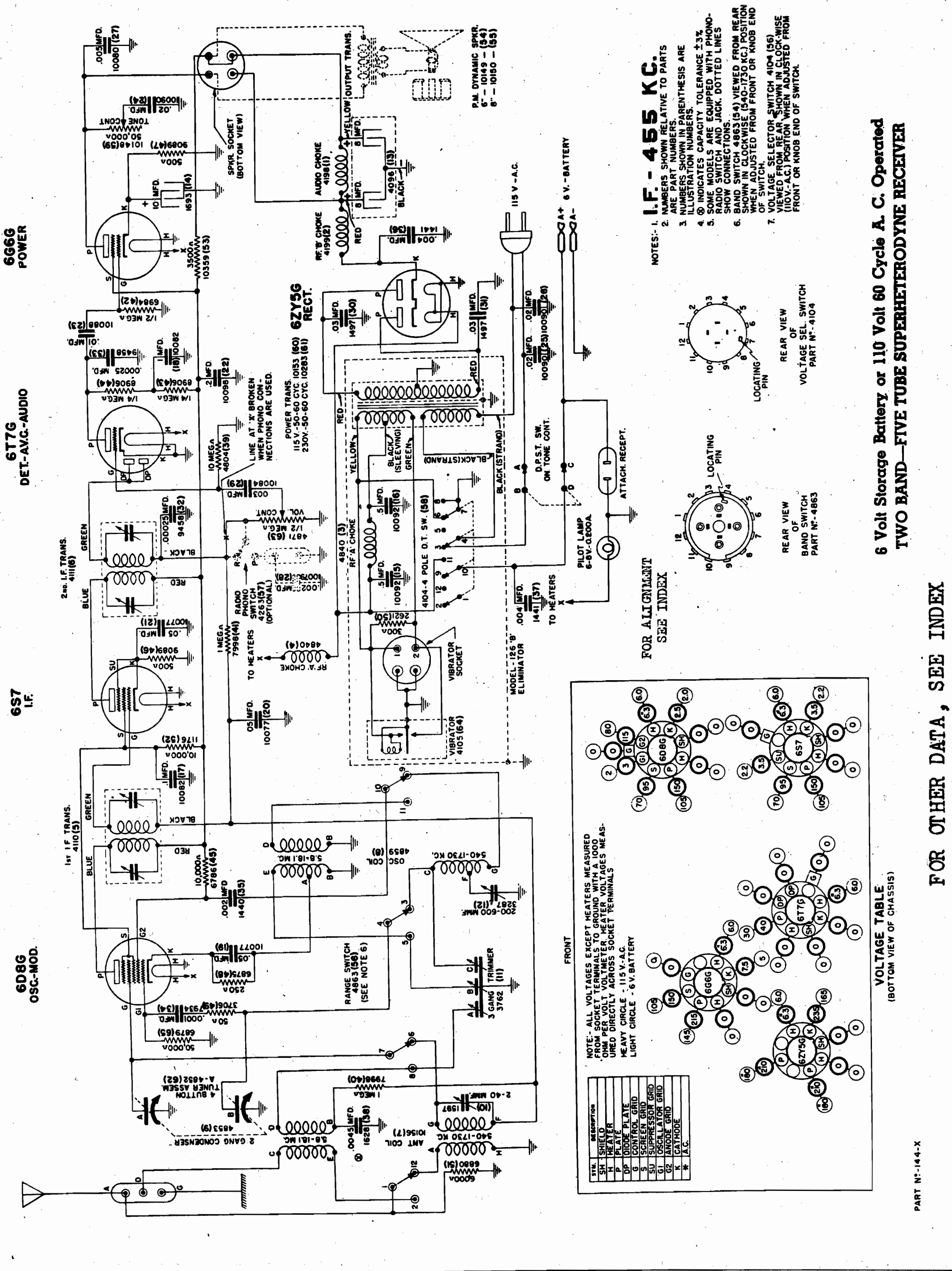
C16, C17	P1939	Dual Electrolytic
C18—P1937		Electrolytic

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

MODEL E10882A

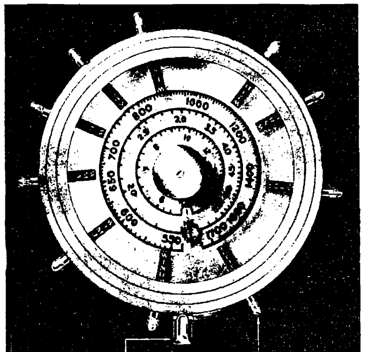
ALLIED RADIO CORP



MODELS B10565,-6,-7,-8
MODELS B10572,-35,-86
MODELS B10590,-1,-2,-3,-5,-6
MODELS B10600,-1,-2,-3,-4,-5

ALLIED RADIO CORP.

SERVICE NOTES for "AUTOMATIC-TUNE" WHEEL DIAL

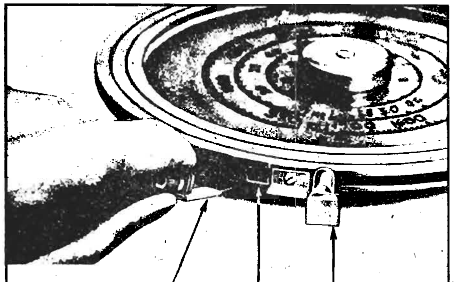


INDICATOR STOP: TO TUNE...GRASP KNURLED METAL TAB BELOW THE STATION CALL LETTER OF THE DESIRED STATION BETWEEN THUMB AND FOREFINGER AND SWING DIAL UNTIL KNURLED TAB IS UNDERNEATH INDICATOR STOP.

KNURLED METAL TAB: . AFTER PROPERLY SETTING TAB HOLDERS, FIRMLY TIGHTEN SO THAT THEY CANNOT MOVE ON DIAL RAIL.

FROM 1 TO 10 STATIONS OPERATING ON FREQUENCIES SEPARATED BY 40 KILOCYCLES OR MORE MAY BE AUTOMATIC TUNE ...... BY PROPERLY SETTING TAB HOLDERS

FIG. 1



INSERT CELLULOID ENVELOPE BETWEEN EDGE OF DIAL AND METAL FACE PLATE THEN LIGHTLY PRESS NUT INTO SQUARE NOTCH

INDICATOR STOP

SLOTTED DIAL TAB RAIL

FIG. 3

While an "AUTOMATIC-TUNE" tab may be set for distant weak stations, better results will be obtained if the stations selected for "AUTOMATIC-TUNE" are strong nearby or local stations.

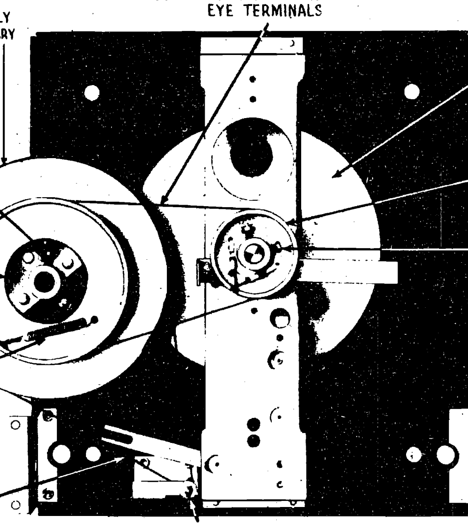
AFTER IT IS DETERMINED WHAT STATIONS YOU WISH TO "AUTOMATIC-TUNE", OBTAIN THE FREQUENCIES USED AND CALL LETTERS OF THESE STATIONS AND SET STATION TABS BY:

1. Lay station call letter tab sheet on flat surface and with a razor or sharp knife cut out desired station tab by cutting around black edges of each desired tab.
2. To illustrate the proper setting of station paper strip and metal tab holder the receiver is shipped from the factory with a station tab properly set for Station WGN 720 kilocycles.
   Carefully note that the station call letter tab appears directly below the 720 kilocycle calibration on the face of the dial and that the knurled tab is firmly screwed down on slotted tab rail. If Station WGN is not one of the selected stations or if a tab is to be set for a station which operates on a frequency less than 720 kilocycles, remove WGN celluloid envelope and station call letter paper strip by:
   (a) Loosen tab holder by grasping knurled end of metal tab with finger tips and turn one or two turns to the left.
   (b) Slide the metal holder tab to square notch in dial tab rail—adjacent to permanently attached tab stop—and pull outward on tab until it is pulled free from tab holder rail.
   (c) Slide the celluloid envelope out of the metal tab frame.
3. **PLACE EACH SELECTED STATION CALL LETTER PAPER STRIP INSIDE OF CELLULOID ENVELOPE BY:**
   (a) Hold celluloid envelope with curved end upward.
   (b) Place station call letter paper strip inside of celluloid envelope with printed call letters upward.
4. **INSERT CELLULOID ENVELOPE INTO A METAL TAB FRAME BY:**
   (a) Hold curved end of celluloid envelope towards metal knurled tab holder and insert celluloid into metal frame.
   (b) Gently push celluloid inward until curved end of envelope touches edge of celluloid envelope tab frame.
   (c) Arrange tabs in numerical order according to station frequency.
5. **SET THE METAL TAB HOLDERS ON DIAL BY:** (See Fig. 3)
   (a) Set the first metal tab holder for the station that broadcasts on the lowest frequency—least number of kilocycles—and then set the next station tab for the selected station operating on the next lowest frequency, continuing on in this way until a tab has been set for all of the selected stations.
   (b) Carefully tune in the station which broadcasts on the lowest frequency—least number of kilocycles.
   (c) Insert celluloid envelope between edge of dial and metal face plate—Lightly press nut on end of knurled tab into square notch in slotted dial rail—then slide tab holder along rail until the knurled tab is underneath the indicator stop on the dial at which point station call letter strip will appear directly below the indicator line on the face of the dial.
   (d) Tighten tab holders as much as possible without moving dial by turning knurled tab to the right—then swing dial so knurled tab is away from indicator stop on the dial and firmly tighten so that it cannot move on the dial rail. DO NOT USE PLIERS TO TIGHTEN.

REPLACING No. 4000 DIAL GLASS SCALE ASSEMBLY

As it requires special tools to properly set part No. 4005 shaft assembly on part No. 4000 glass scale—we will ship all orders for No. 4000 glass scales with the No. 4005 shaft assembled on the glass scale.

DIAL MECHANISM



WHEN INSTALLING PART No. 4000 GLASS ASSEMBLY WITH No. 4005 SHAET ATTACHED carefully follow procedure in order given:

(a) Insert No. 4005 shaft into main bushing attached to the cadmium plated bracket on back of dial face.

b) Place steel spacer washer and brass tension spring in order named over end of No. 4005 shaft.

(c) Place the small die cast primary pulley No. 4009 on shaft—do not tighten No. 2754 set screws.

(d) Loosen the two set screws in brass spacer collar on the No. 4005 shaft.

(e) Adjust brass spacer collar—by sliding collar on shaft—so that there will be approximately 1/8" clearance between the bottom of metal tab holder and the face plate. Firmly retighten brass collar and No. 2754 die cast pulley set screws. Failure to provide proper clearance will result in scratches on dial face and the dial mechanism will not operate freely.

TO INSTALL No. 3814 PRIMARY DRIVE CORD:

(a) Looking at back of dial, wrap dial cord twice around No. 4355 drive shaft in CLOCKWISE direction.

(b) Hook No. 3462 tension spring into loops at end of dial cord.

NEVER LOOSEN THE FOUR SCREWS THAT HOLD THE CADMIUM PLATED BRACKET TO DIAL FACE—OTHERWISE THE MAIN BUSHING WILL BE THROWN OUT OF CENTER.

"Automatic Tune" Wheel Dial

ALLIED RADIO CORP.

TO INSTALL No. 4013 SECONDARY DRIVE CORD:

The dial mechanism picture shows and refers to eye terminals on drive cord—these were used in early production. Loops made by knots in the cords are now used to attach cord to lugs in the No. 4009 die cast pulley and to the No. 4352 & 3462 tension springs.

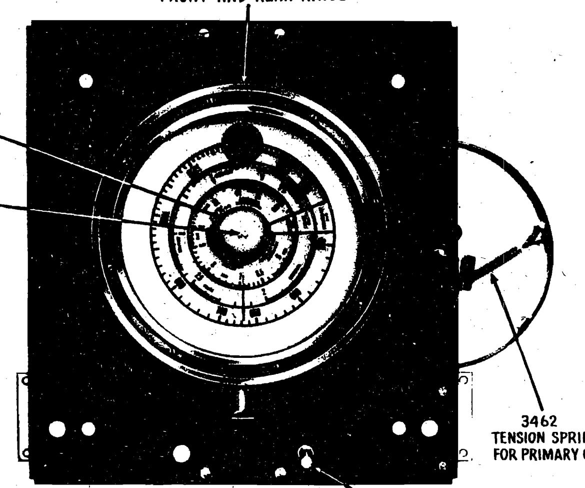
(a) Looking at the front of the dial rotate dial scale COUNTER-CLOCKWISE until dial stop is reached.

(b) Loosen the two No. 2754 set screws in small die cast pulley No. 4009.

(c) Looking at front of dial turn the small die cast pulley so that the cut out in pulley will be towards the left and approximately in line with the upper edge of the dial light bracket. This bracket which is only used in six volt battery and 110 volt AC models is shown mounted on the cadmium plated dial face plate bracket in dial mechanism picture.

(d) Hook No. 4352 tension spring in dial cord loop.

(e) Turn No. 4011 drum so that the hole in the No. 4012 large die cast pulley—through which the secondary drive cord is pulled—is towards the top of face plate. This will bring the hole approximately in line with the left hand edge (looking at back of dial) of face plate.

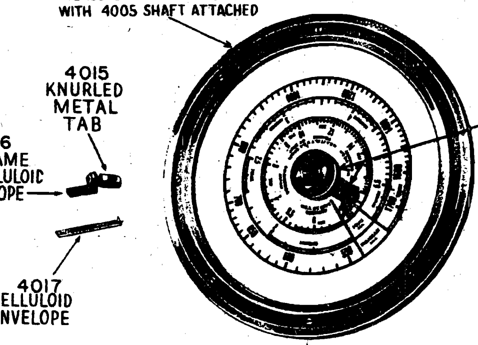


(f) Take long end of No. 4013 secondary drive cord—measured from knot at spring to end of cord—then looking at the front of dial, wrap cord one complete turn CLOCK WISE around the No. 4009 small die cast pulley. The other end of the cord (short end) is placed on bottom half of secondary and primary die cast pulleys.

(g) Firmly tighten No. 2754 set screws in small die cast pulley.

NOTE************************

FOR ##1, MODEL NUMBERS ARE B10600,-1,-2,-3,-4,-5
" ##2, " " " B10572,-85,-86
" ##3, " " " B10565,-6,-7,-8
" ##4, " " " B10590,-1,-2,-3,-5,-6



COMPLETE WHEEL DIAL ASSEMBLY LESS ESCUTCHEON

SEE NOTE BELOW

Part No.	Part Name	Description	List Price
205	Dial Assembly	Used With Model 1 Complete Assembly Less Escutcheon	$12.75
206	Dial Assembly	Used With Model 1 Complete Assembly Less Escutcheon	12.75
207	Dial Assembly	Used With Model 2 Complete Assembly Less Escutcheon	12.75
201	Dial Assembly	Used With Model 2 & 3 Complete Assembly Less Escutcheon	12.75
204	Dial Assembly	Used With Model 4 Complete Assembly Less Escutcheon	12.25

MISCELLANEOUS PARTS USED IN ABOVE ASSEMBLIES

Part No.	Part Name	Description	List Price
4016	Celluloid Envelope	Station Call Letter Cover	.05
3814	Cord	Primary Drive Cord	.15
4013	Cord	Secondary Drive Cord	.15
3995	Band Indicator Assem.	For Model 1 & 4 SEE NOTE	.75
3992	Band Indicator Assem.	For Model 2 & 3 BELOW	.75
4011	Drive Drum Assem. with	4012 Secondary Pulley and Rubber Disc Coupler	1.25
4355	Drive Shaft		.12
4027	Disc	Translucent Dial Scale Background for Model 1	.50
3984	Disc	Translucent Dial Scale Background for Model 2 & 3	.55
4024	Disc	Translucent Dial Scale Background for Model 2	.55
4029	Disc	Translucent Dial Scale Background for Model 1 & 4	.50
3771	Escutcheon	For Cabinet—All Models	1.00
4017	Frame	Metal Holder for Celluloid Envelope	.05
4040	Hub Cap		.15
4015	Knurled Tab		.05
4009	Pulley	Dial Scale Drive (Die Cast)	.45
4000	Scale	Calibrated Glass Scale With 4005 Shaft Assem.	2.75
8071	Screw	For Hub Cap 3-48 x 1/4" O.H.I.M.	.005
2754	Screw	For Pulley 6-32 x 1/4" S.H.H. Cup Point	.01
4356	Spring Lock	For Drive Shaft	.01 net
4352	Spring Tension	For Secondary Cord	.07
3462	Spring Tension	For Primary Cord	.07

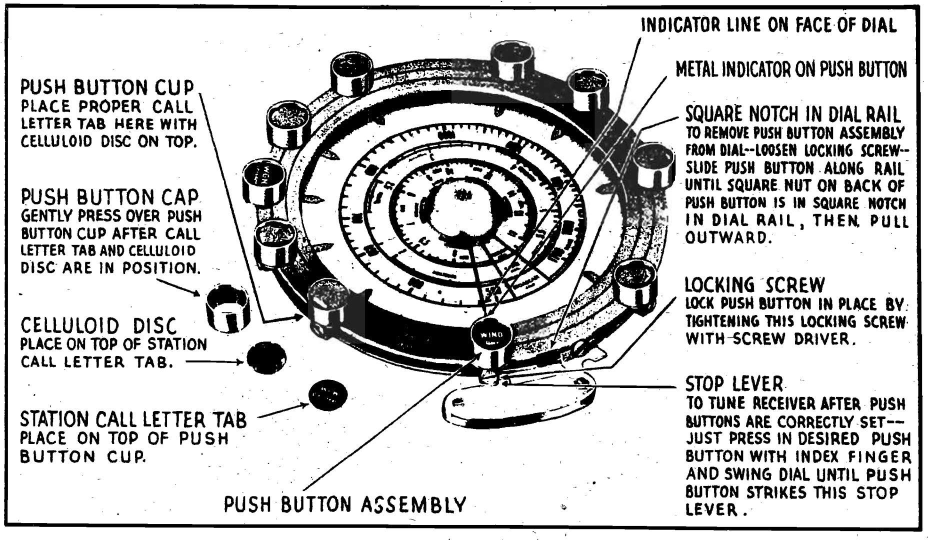
Prices are subject to change without notice.

MODEL Push Button Dial

ALLIED RADIO CORP.

SERVICE NOTES for PUSH BUTTON DIAL

FOR OTHER ASSEMBLIES SEE "AUTOMATIC TUNE" WHEEL DIAL ASSEMBLIES.



FROM ONE TO TEN STATIONS OPERATING ON FREQUENCIES SEPARATED BY FORTY KILOCYCLES OR MORE MAY BE AUTOMATICALLY TUNED BY PROPERLY SETTING PUSH BUTTONS.

IT IS A SIMPLE MATTER TO "AUTOMATIC TUNE" AFTER THE STATION PUSH BUTTONS HAVE BEEN PROPERLY SET—JUST PLACE INDEX FINGER INTO THE PUSH BUTTON HAVING CALL LETTERS OF THE DESIRED STATION PUSHING INWARD—THEN SWING DIAL UNTIL DIAL STOPS, AT WHICH POINT THE DESIRED STATION SHOULD BE PROPERLY TUNED IN AND THE METAL INDICATOR ATTACHED TO THE PUSH BUTTON SHOULD POINT TO THE INDICATOR LINE ON FACE OF DIAL. If reception is slightly distorted—which may be particularly noticeable when tuning weak stations—retune for maximum clarity by using conventional tuning knobs.

WHILE A PUSH BUTTON MAY BE SET FOR DISTANT WEAK STATIONS, BETTER RESULTS WILL BE OBTAINED IF THE STATIONS SELECTED FOR AUTOMATIC PUSH BUTTON TUNING ARE STRONG NEARBY OR LOCAL STATIONS.

AFTER IT IS DETERMINED WHAT STATIONS YOU WISH TO "AUTOMATIC PUSH BUTTON TUNE" OBTAIN THE FREQUENCY USED AND CALL LETTERS OF THESE STATIONS AND SET PUSH BUTTONS BY:

To illustrate the proper installation and setting of the Push Buttons, the receiver is shipped from the factory with a Push Button properly set for station WGN, Chicago, 720 kilocycles. If station WGN is not one of the selected stations, remove call letters by:

a. Grasp cap section of Push Button between fingers and gently pull outward until it is clear of dial.

b. Carefully remove the station call letter tab and celluloid disc.

SET STATION PUSH BUTTON BY:

a. Gently press desired round paper station call letter tabs out of station tab sets.

b. Always set the first push button for the desired station that broadcasts on the lowest frequency—the least number of kilocycles—and then set the next push button for the selected station operating on the next lowest frequency, continuing on in this manner until a Push Button has been set for all of the desired stations.

c. Loosen Push Button locking screw and remove cups on all Push Buttons by grasping cap between fingers and gently pulling outward—then remove celluloid discs.

d. Carefully tune in the station which broadcasts on the lowest frequency—least number of kilocycles.

e. Slide the Push Button nearest to the low frequency end of dial scale—without moving dial—until metal indicator attached to Push Button is exactly even with the indicator line on the face of the dial,—then with a small screw driver firmly lock Push Button in place by tightening Push Button locking screw.

f. Place printed paper station call letter tab, having call letters of station tuned in—on top of Push Button cup, then—place celluloid protective disc on top of this and gently press Push Button cap firmly down over Push Button cup.

g. Next set a Push Button for the desired station operating on the next lowest frequency in the same manner as above and continue on in this way until all the Push Buttons have been properly set.

AFTER THE TEN PUSH BUTTONS HAVE BEEN PROPERLY SET THEY WILL NOT REQUIRE FURTHER ATTENTION — EXCEPT WHEN MOVED FROM THEIR POSITION OR WHEN AN ADDITIONAL TAB IS INCLUDED WHICH WOULD DISTURB THE POSITION OF THE OTHER TABS.

PARTS LIST

COMPLETE PUSH BUTTON DIAL ASSEMBLY LESS ESCUTCHEON

SEE NOTE BELOW

Part No.	Part Name	Description	List Price
211	Dial Assembly	Used With Model 1 Complete Assembly Less Escutcheon	$12.75
212	Dial Assembly	Used With Model 1 Complete Assembly Less Escutcheon	12.75
208	Dial Assembly	Used With Model 2 Complete Assembly Less Escutcheon	12.75
209	Dial Assembly	Used With Model 2 & 3 Complete Assembly Less Escutcheon	12.75
210	Dial Assembly	Used With Model 4 3 Complete Assembly Less Escutcheon	12.25

MISCELLANEOUS PARTS USED IN ABOVE ASSEMBLIES

Part No.	Part Name	Description	List Price
4047	Cap	Push Button	.15
4046	Celluloid Disc	Station Call Letter Cover	.05
3814	Cord	Primary Drive Cord	.15
4013	Cord	Secondary Drive Cord	.15
4041	Cup Assembly	Push Button—With Clip and Compression Spring	.15
3995	Band Indicator Assem.	For Model 1 & 4 SEE NOTE	.75
3992	Band Indicator Assem.	For Model 2 & 3 BELOW	.75
4011	Drive Drum Assem. with	4012 Secondary Pulley and Rubber Disc Coupler	1.25
4355	Drive Shaft		.12
4027	Disc	Translucent Dial Scale Background for Model 1	.50
3984	Disc	Translucent Dial Scale Background for Model 2 & 3	.55
4024	Disc	Translucent Dial Scale Background for Model 2	.55
4029	Disc	Translucent Dial Scale Background for Model 1 & 4	.50
3771	Escutcheon	For Cabinet—All Models	1.00
4040	Hub Cap		.15
4009	Pulley	Dial Scale Drive (Die Cast)	.45
4039	Plate	Slide Stop	.10
4000	Scale	Calibrated Glass Scale With 4005 Shaft Assem.	2.75
8071	Screw	For Hub Cap 3-48 x ¼" O.H.I.M.	.005
2754	Screw	For Pulley 6-32 x ¼" S.H.H. Cup Point	.01
4037	Slide Stop	Push Button Stop	.10
4356	Spring Lock	For Drive Shaft	.01 net
4352	Spring Tension	For Secondary Cord	.07
3462	Spring Tension	For Primary Cord	.07

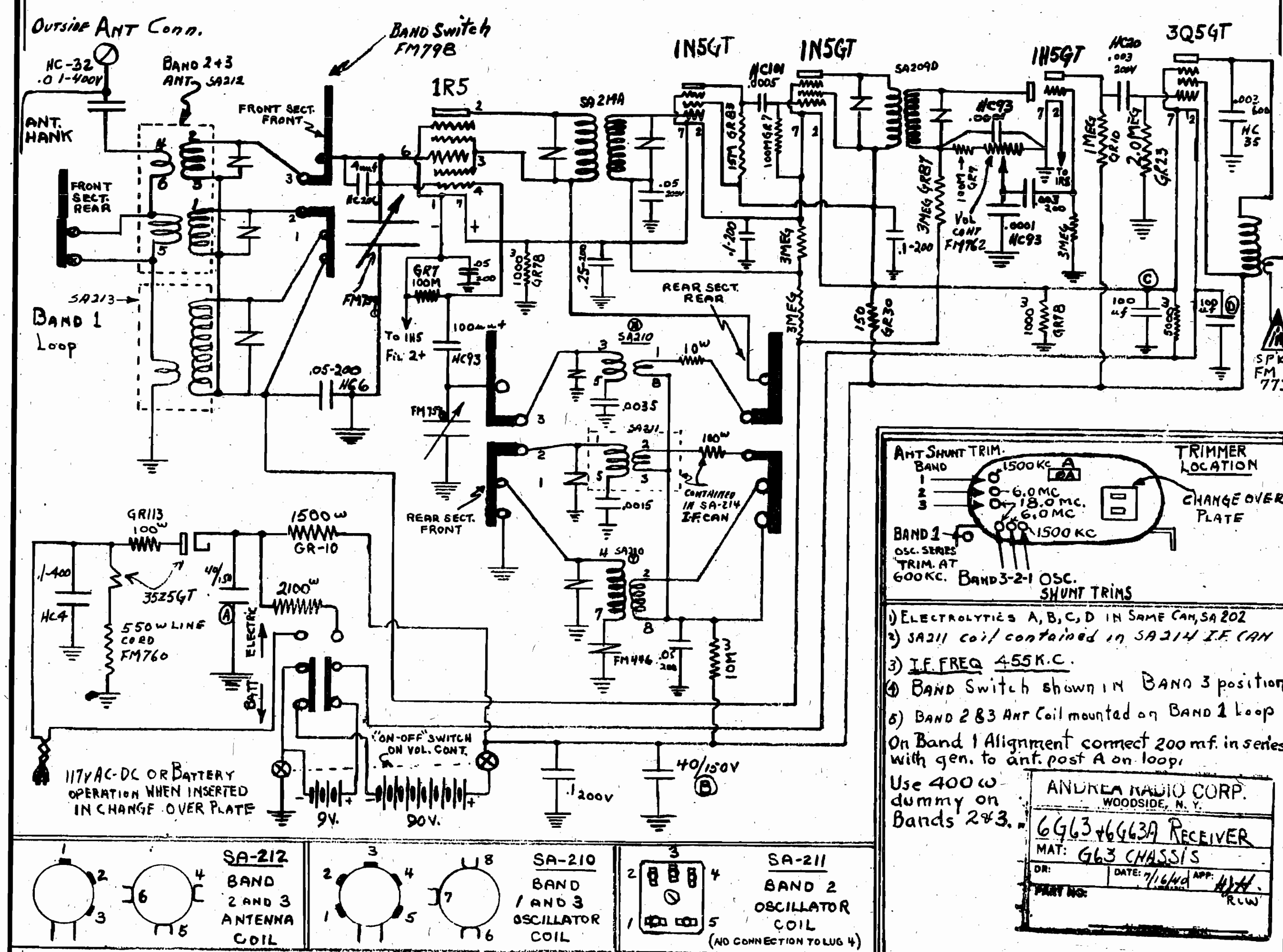
Prices are subject to change without notice.

When ordering parts be sure to mention part number and order all parts from:

NOTE**********************

FOR ##1, MODEL NUMBERS ARE B10600,-1,-2,-3,-4,-5
" ##2, " " " B10572,-86,-85
" ##3, " " " B10565,-6,-7,-8
" ##4, " " " B10590,-1,-2,-3,-5,-6

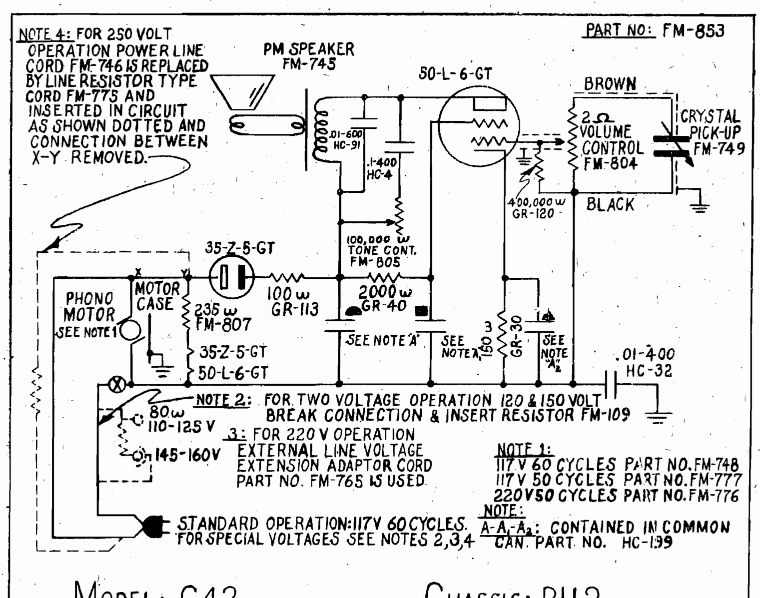
ANDREA RADIO CORP. Models 6G63, 6G63A, Ch. 6G3 Model G42, Ch. PH2



1) Electrolytics A, B, C, D in same can, SA 202
2) SA211 coil contained in SA214 I.F. can
3) I.F. Freq 455 K.C.
4) Band Switch shown in Band 3 position
5) Band 2 & 3 Ant Coil mounted on Band 1 Loop

On Band 1 Alignment connect 200 mf. in series with gen. to ant. post A on loop.
Use 400 ω dummy on Bands 2 & 3.

ANDREA RADIO CORP. WOODSIDE, N. Y.	
6G63 & 6G63A Receiver	
MAT: G63 Chassis	
DR:	DATE: 7/16/40 APP: RLW
PART NO:	



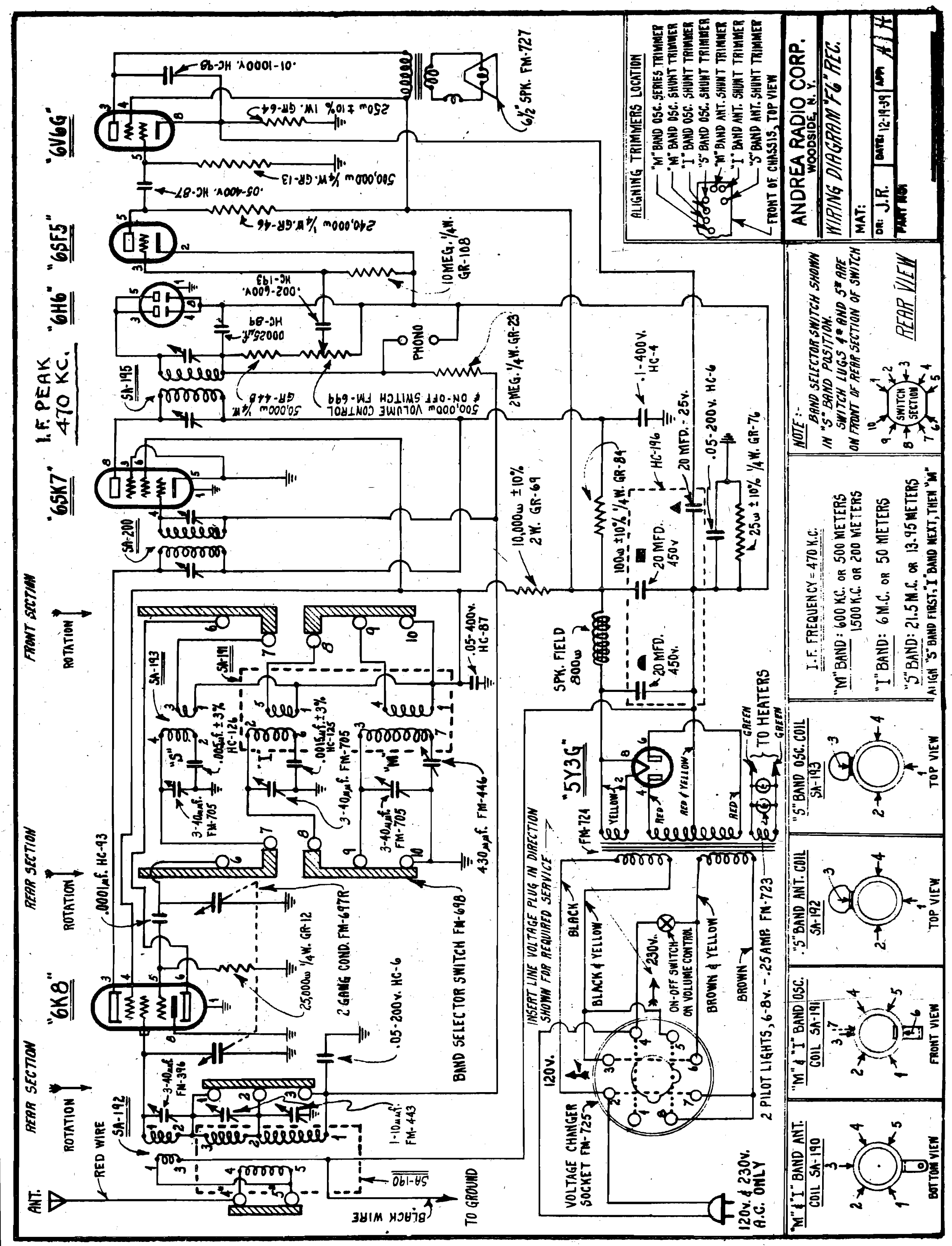
MODEL: G42 CHASSIS: PH2

POWER CONSUMPTION AT 117 VOLTS 60 CYCLES 40 WATTS

DRAWN BY: IE 1/25/41

Model 43F6. Ch. F6

ANDREA RADIO CORP.



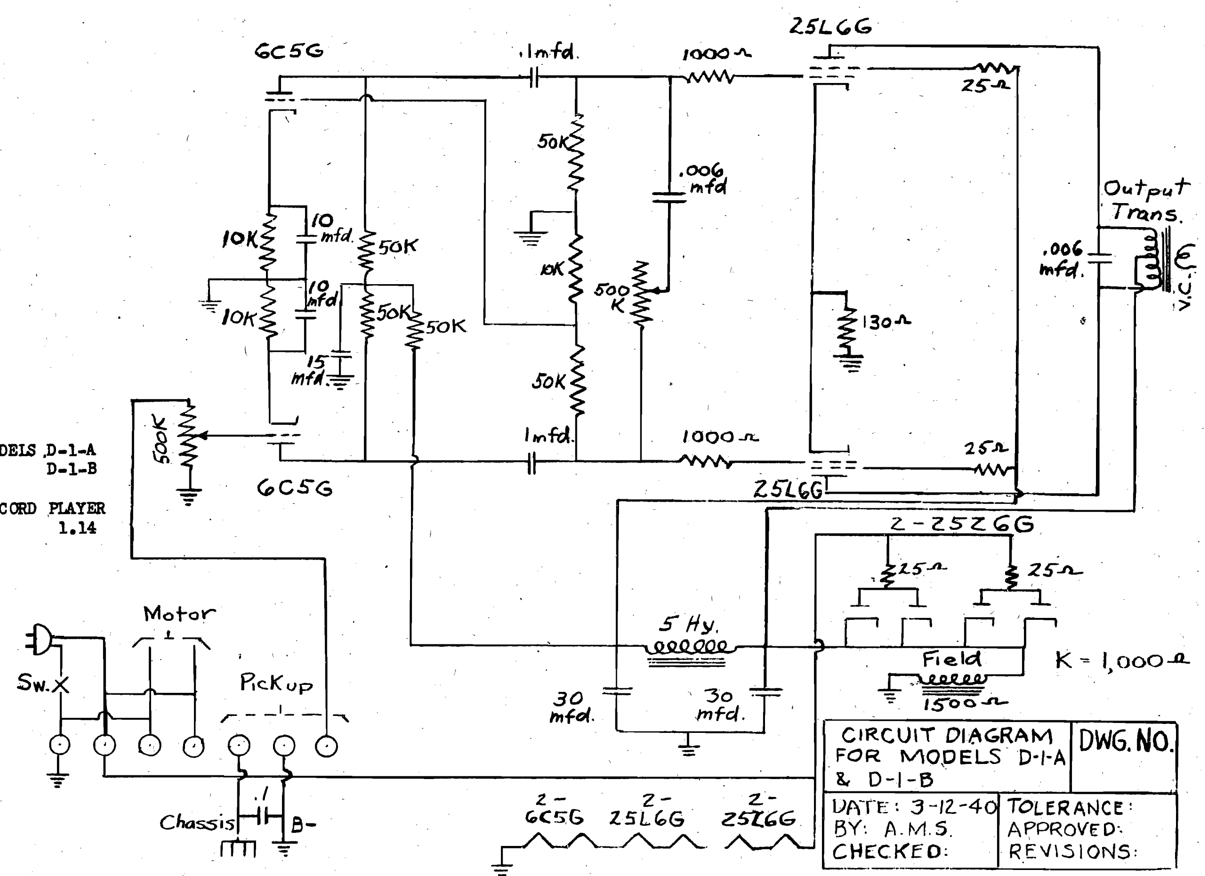
ALIGNMENT NOTE: Use 0.1 mf condenser as dummy antenna when aligning the i-f transformers; use a 400-ohm resistor for the S and I bands and a 0.00025-mf condenser for the M band.

ANSLEY RADIO CORP.

MODELS D-1-A, D-1-B
MODEL D-10A

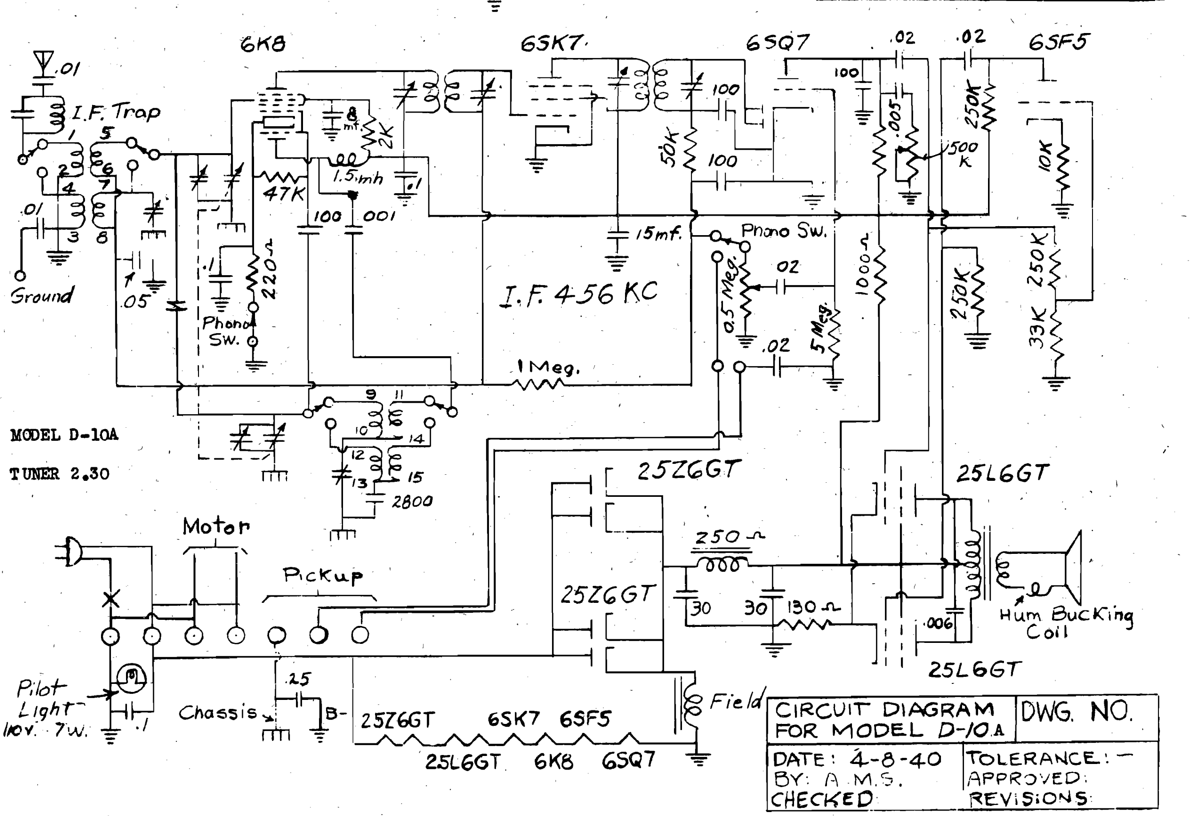
MODELS D-1-A
D-1-B

RECORD PLAYER
1.14

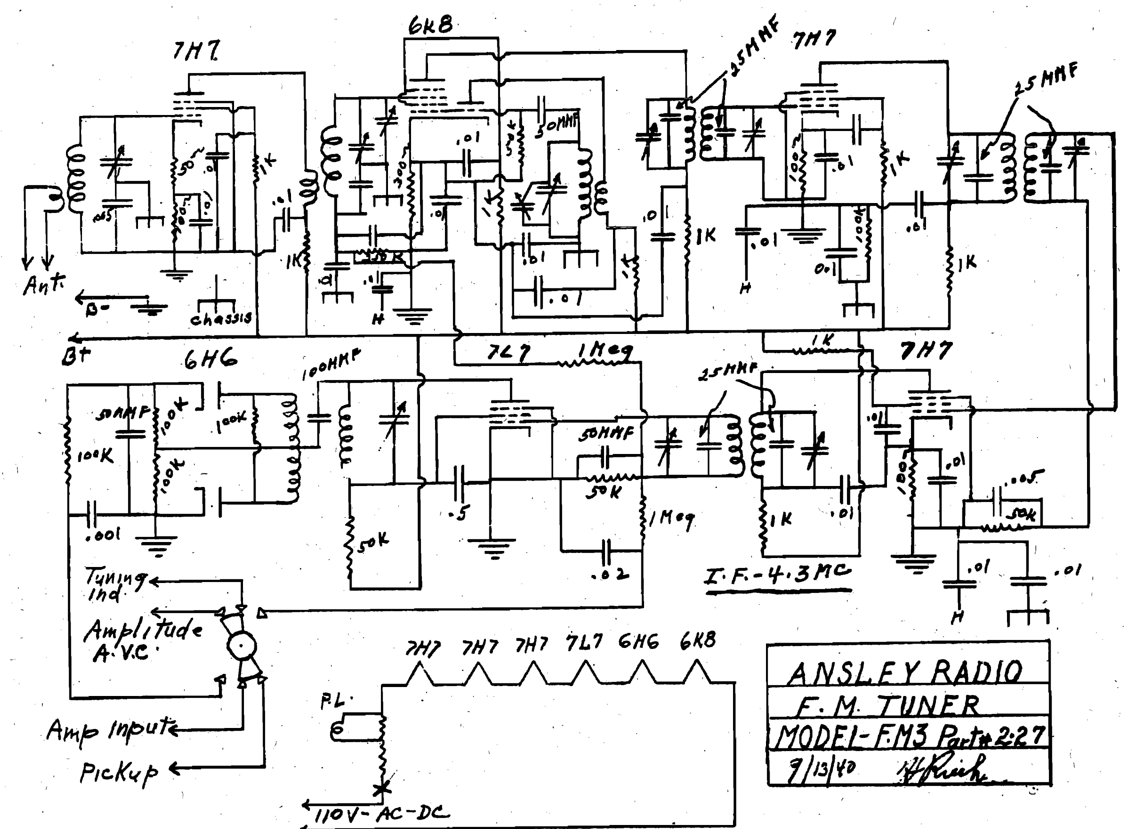


MODEL D-10A

TUNER 2.30



ANSLEY RADIO CORP.



Directions for Alignment of the FM Tuner

Remove the grid lead from the 6K8 converter tube. Connect the live side of the signal generator to the grid of the 6K8 through a small mica condenser 200 to 500 mmf. Connect the ground side of the signal generator through a similar condenser to the lead that was removed from the cap of the tube. Connect a resistor of 200 to 500 ohms between the grid of the tube and the grid lead. Connect the ground or shield of the signal generator to B--. Be sure that there is no direct connection between the signal generator and an external ground or directly to the power supply line.

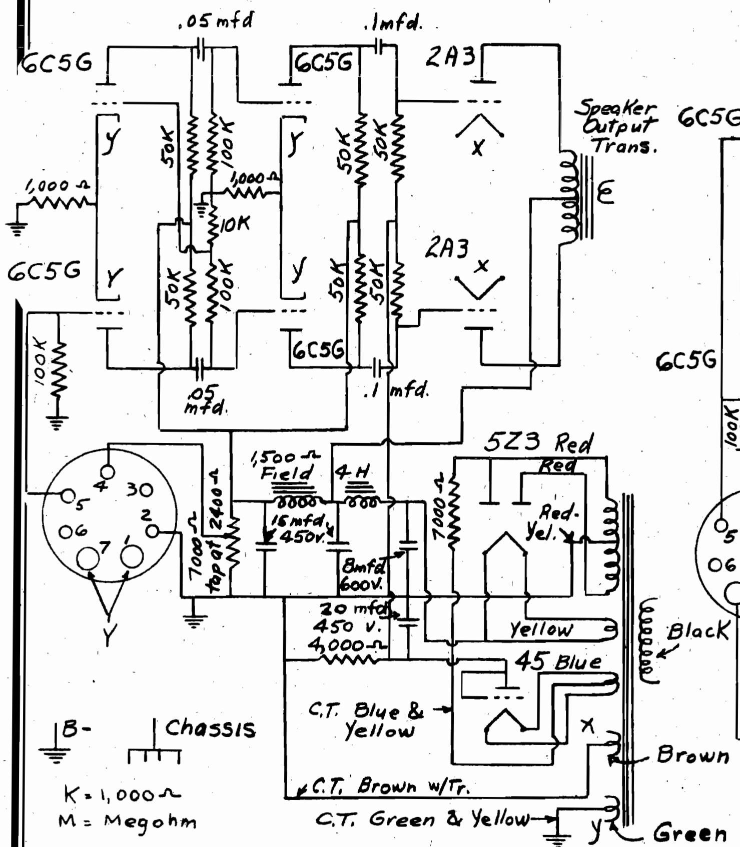
Using a 5,000 ohm per volt D.C. meter with a voltage range of 20 volts as a resonance indicator, connect it across the 50,000 ohm limiting resistor. Set the signal generator at 4.3 M.C. and set the attenuator for about a 5-volt reading on the voltmeter. Align the three I.F. coils for a maximum reading, the same as an amplitude set.

Check the shape of the resonance curve by changing the signal generator to 4.2 M.C. and 4.4 M.C. The output reading either side of resonance should be about the same.

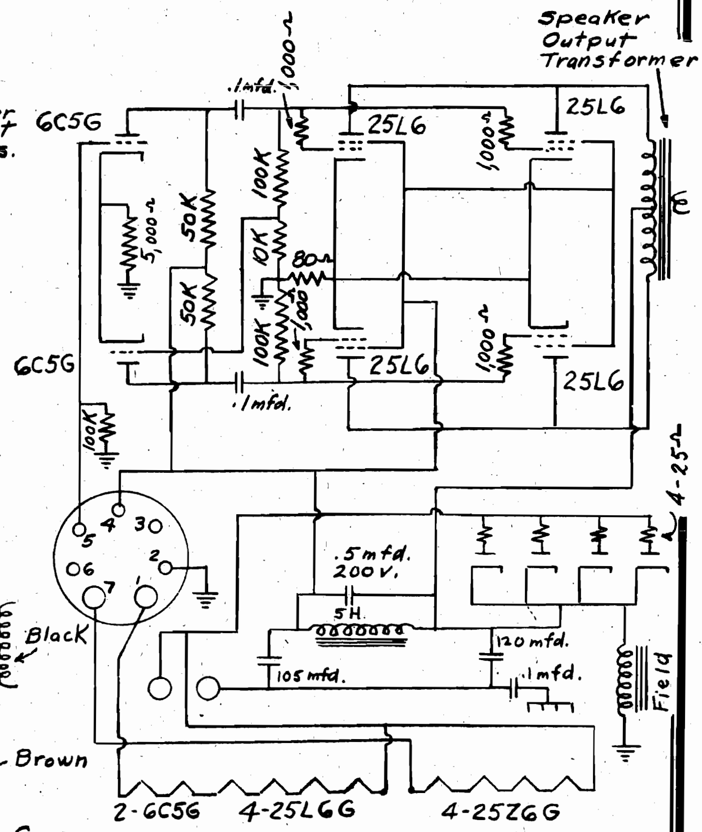
To align the discriminator, connect the signal generator, the same as for the I.F. alignment. Set the generator at 4.3 M.C. Connect the voltmeter across the two diode load resistors. Using an insulated screw driver adjust the secondary trimmer to zero voltage. Shift the signal generator to 4.2 M.C. and 4.4 M.C. Adjust the primary trimmer so that the D.C. readings are equal and opposite in polarity.

To align the R.F. and oscillator, connect the signal generator to the two leads at the back of the chassis. With the generator set at 40 M.C. adjust the oscillator, R.F. and antenna trimmers for maximum signal with the set tuned to the low frequency end of the dial, 50 M.C. and check the frequency and the alignment.

ANSLEY RADIO CORP.

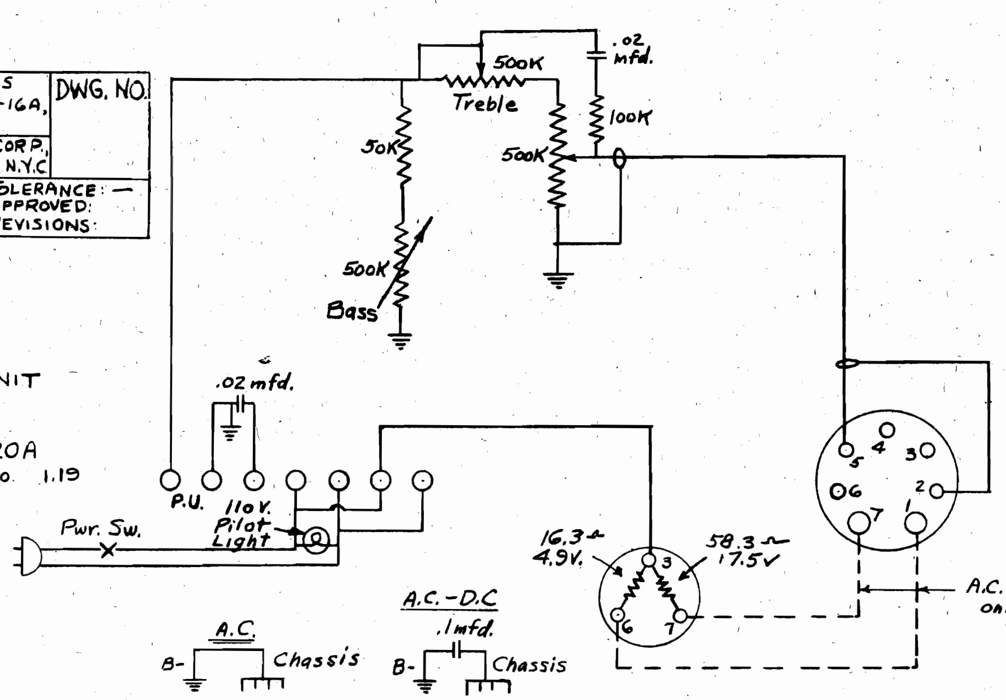


PART NO. 1.12
A.C. AUDIO AMPLIFIER
AND POWER SUPPLY



PART NO. 1.13
A.C.-D.C. AUDIO AMPLIFIER
AND POWER SUPPLY

CIRCUIT DIAGRAMS FOR MODELS D-16A, AND D-20 A	DWG. NO.
ANSLEY RADIO CORP., 4377 BRONX BLVD., N.Y.C.	
DATE: 2-1-40 BY: A.M.S. CHECKED:	TOLERANCE: — APPROVED: REVISIONS:

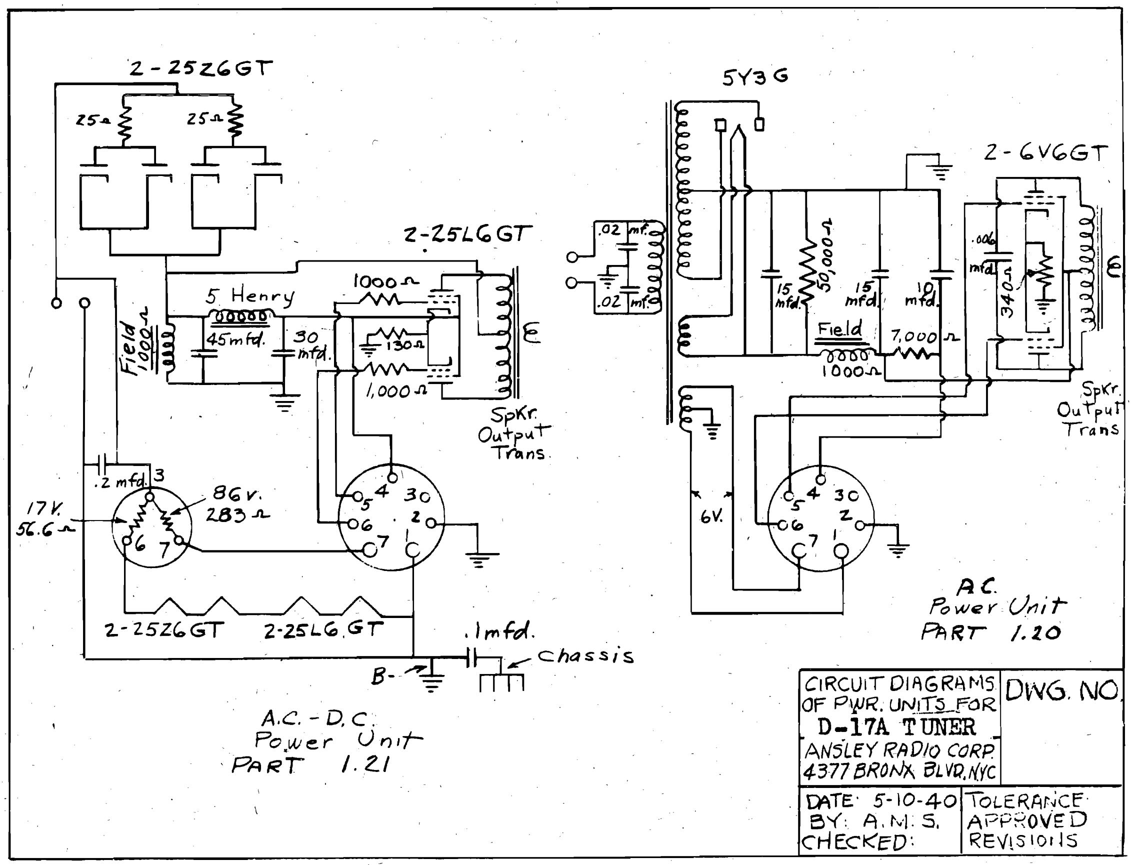


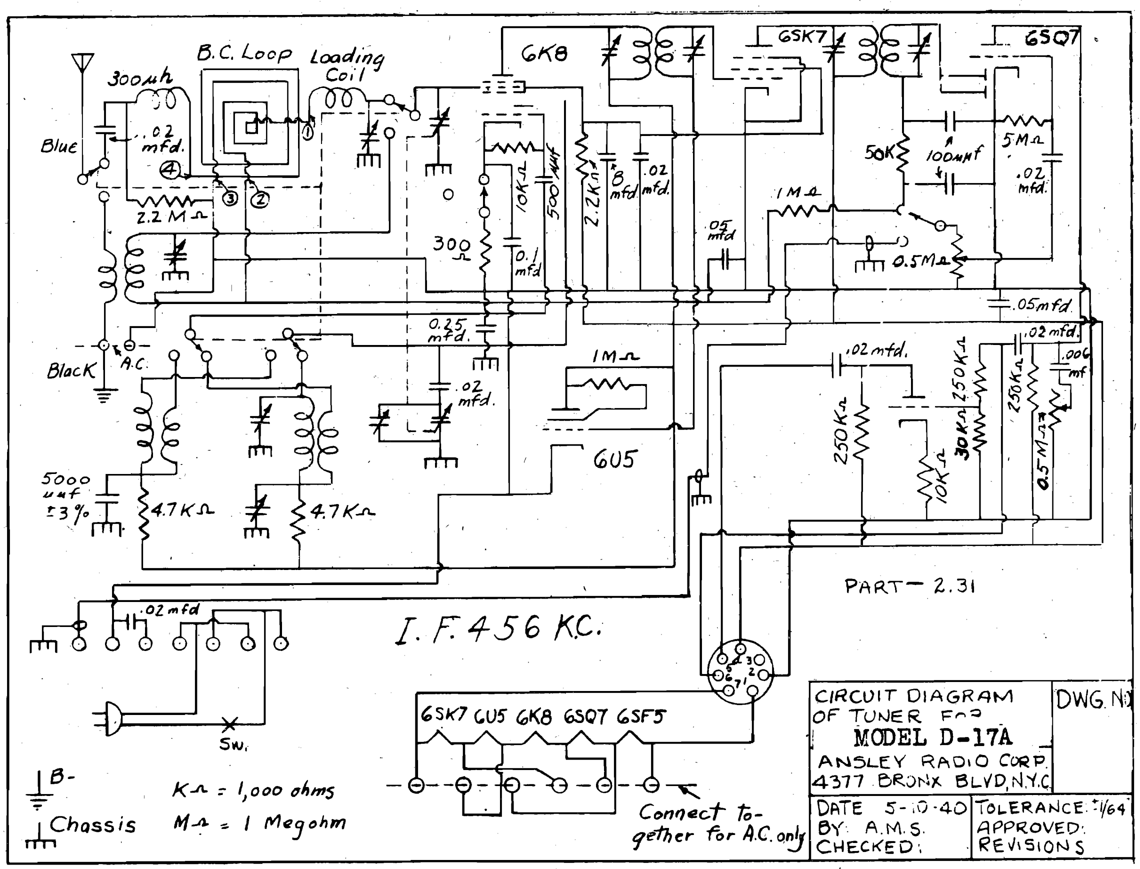
CONTROL UNIT

D-16A, D-20A
PART NO. 1.19

D17A (1940)

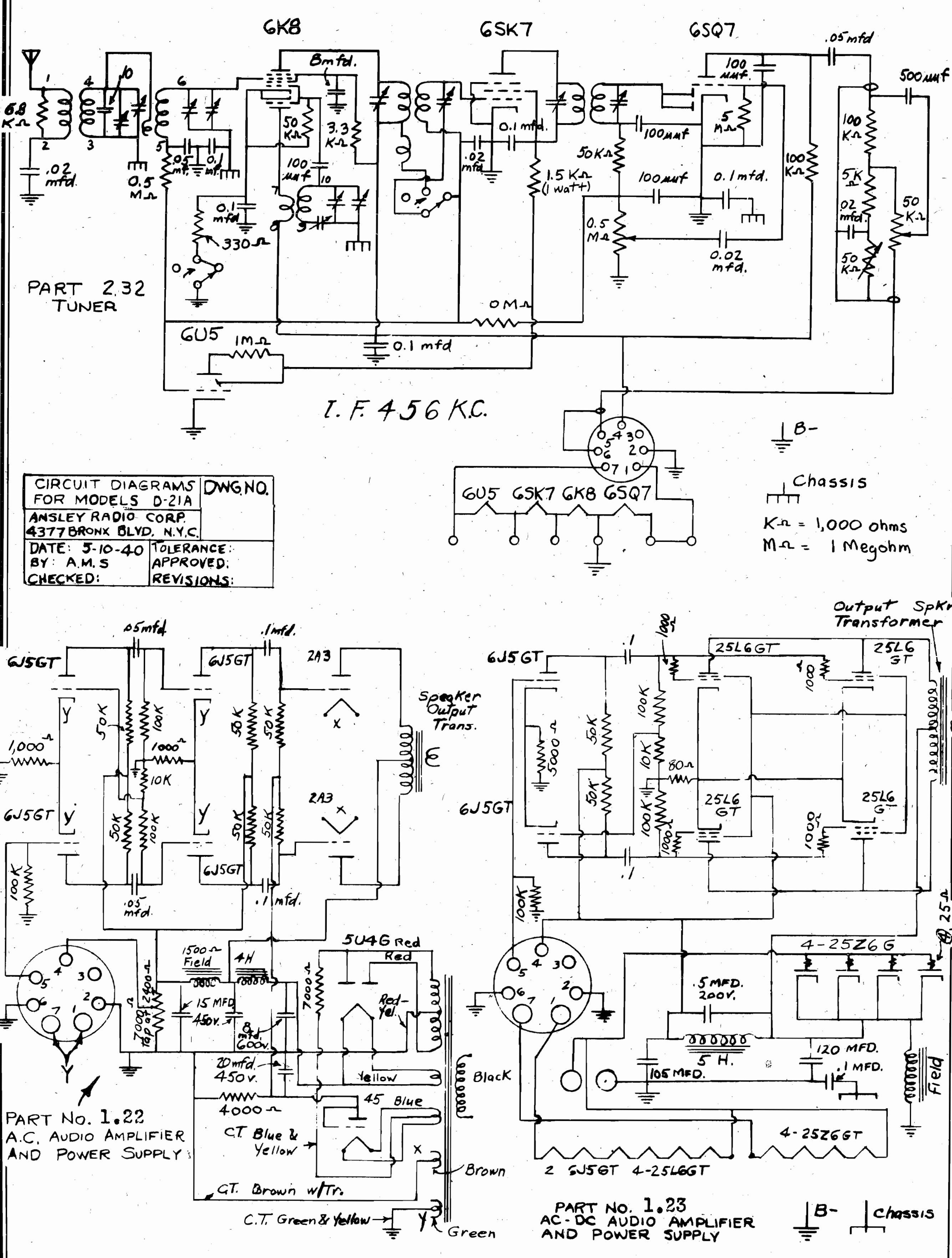
ANSLEY RADIO CORP.



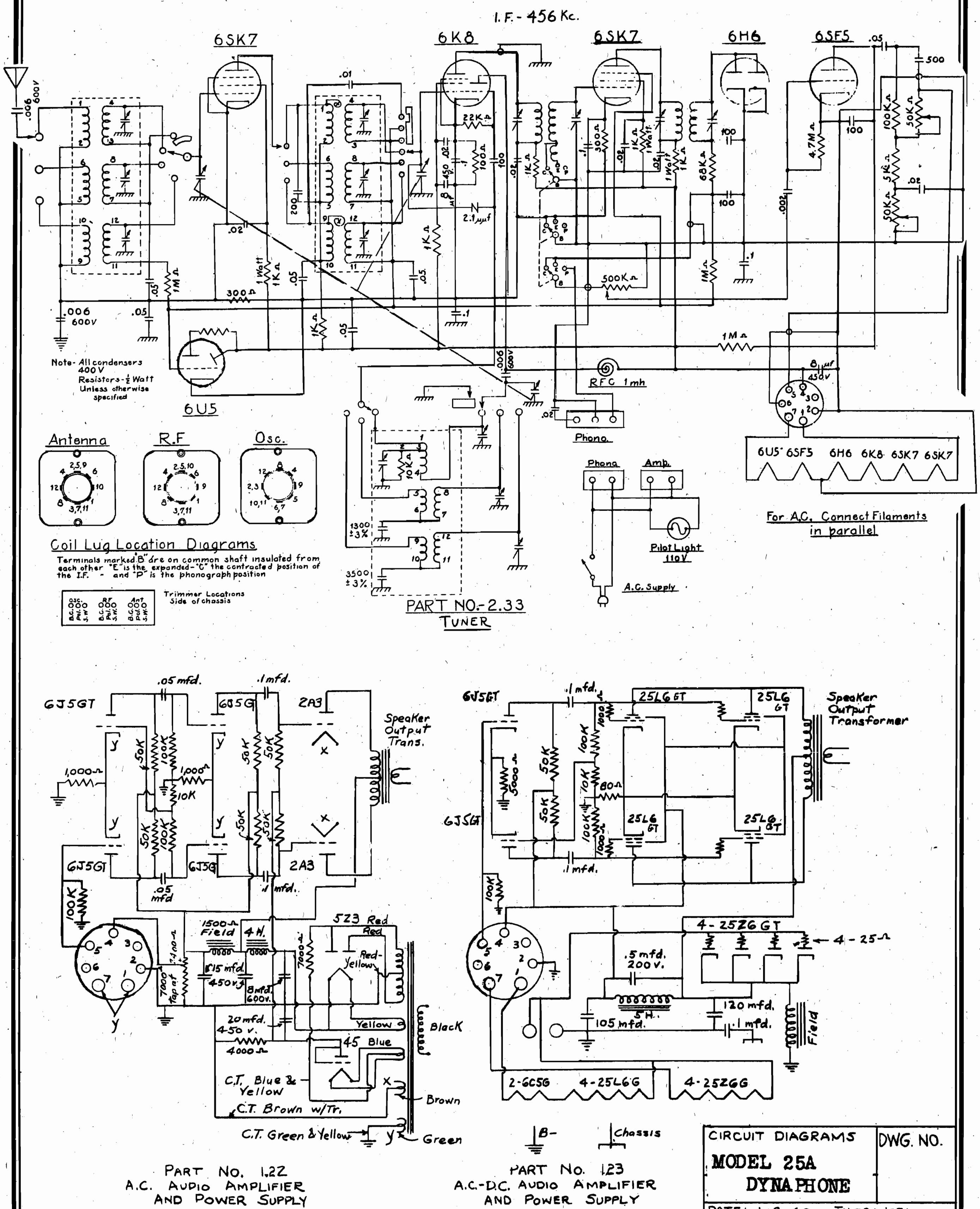


D-21A (1940)

ANSLEY RADIO CORP.



ANSLEY RADIO CORP.

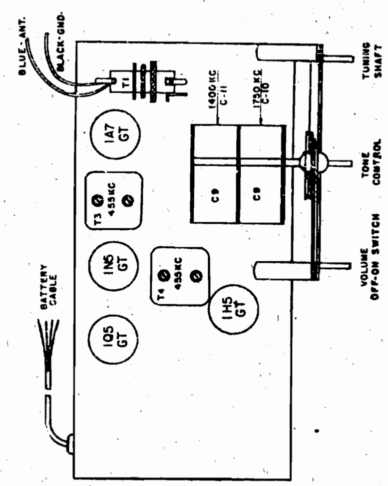


CIRCUIT DIAGRAMS	DWG. NO.
MODEL 25A DYNAPHONE	
DATE: 1-8-40 BY: A.M.S. CHECKED:	TOLERANCE: APPROVED: REVISIONS:

AUTOCRAT RADIO COMPANY

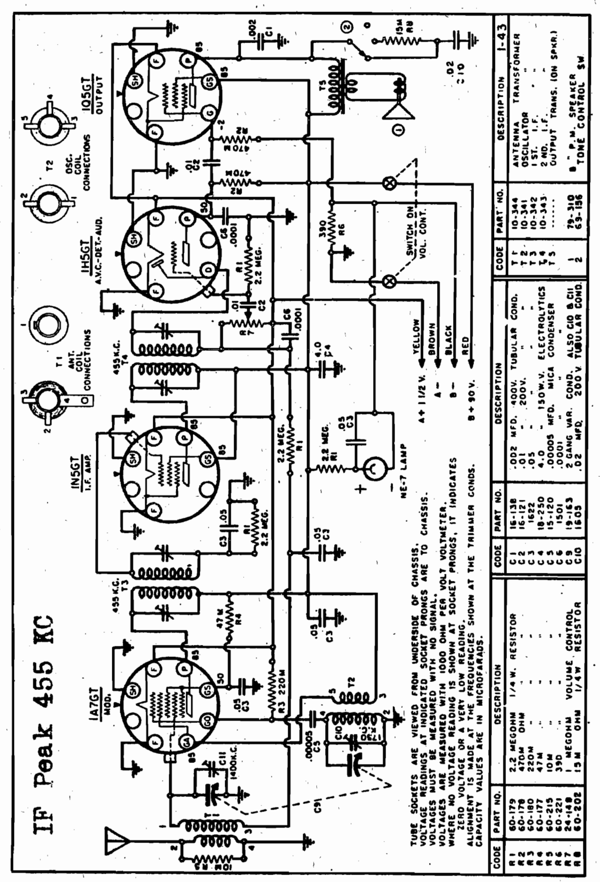
Models 131, 531, 533
Model 431

MODEL 431

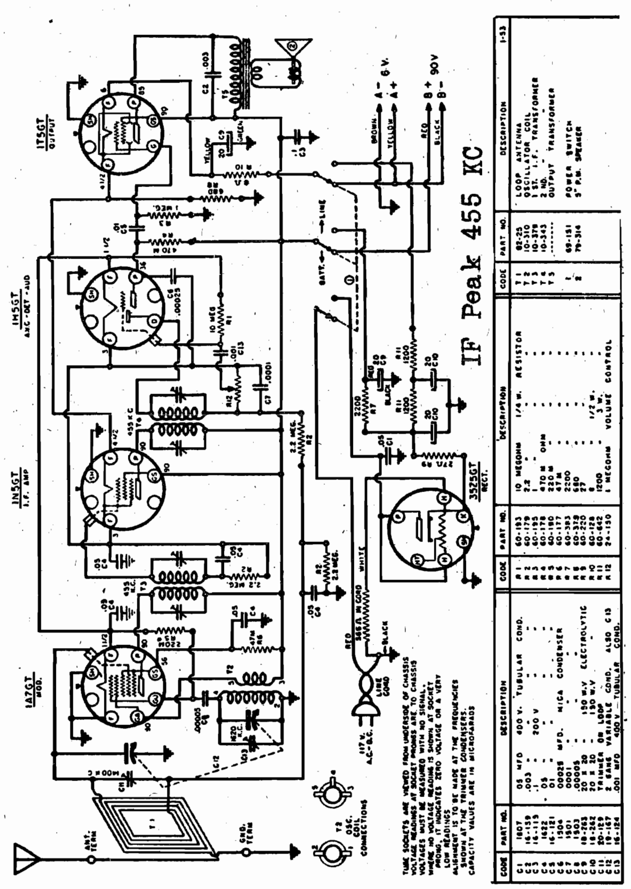


MODEL 431

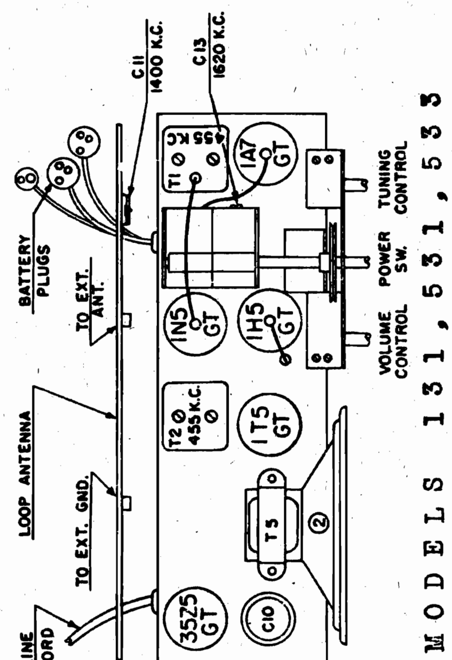
IF Peak 455 KC



IF Peak 455 KC



MODELS 131, 531, 533

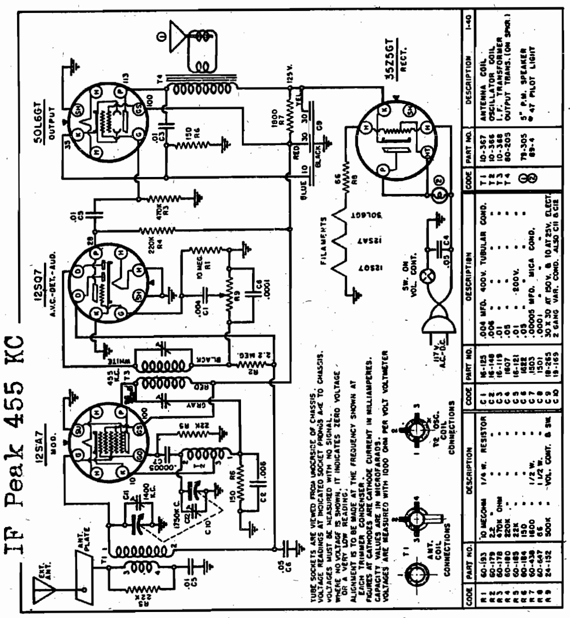


MODELS 131, 531, 533

Models 401, 401V
Model 411
Model 422

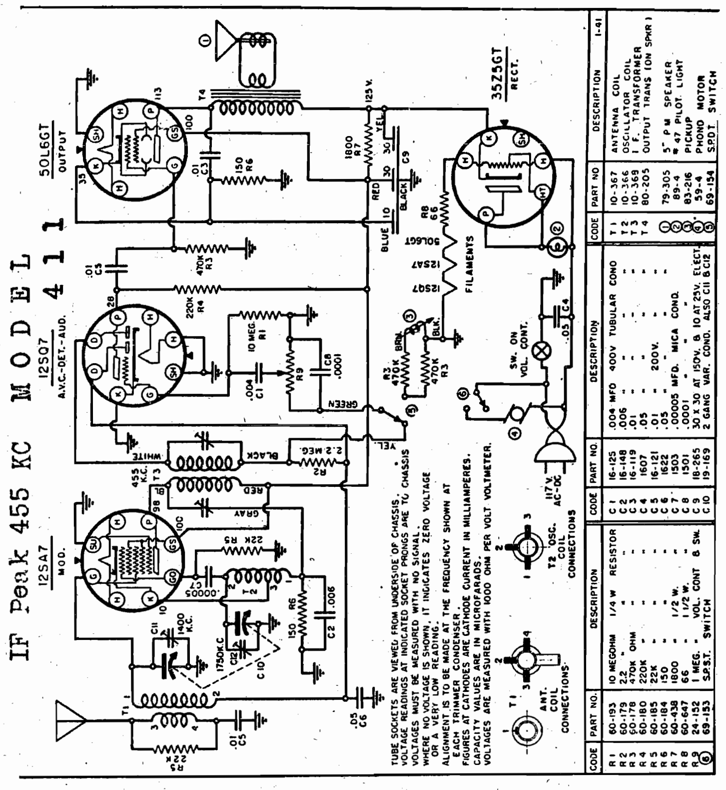
AUTOCRAT RADIO COMPANY

IF Peak 455 KC

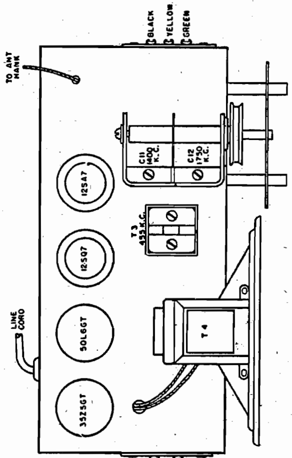


MODELS 401 401V

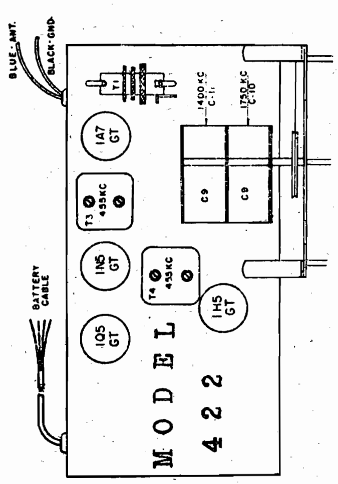
IF Peak 455 KC MODEL 411



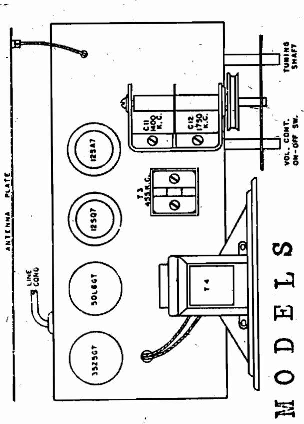
MODEL 411



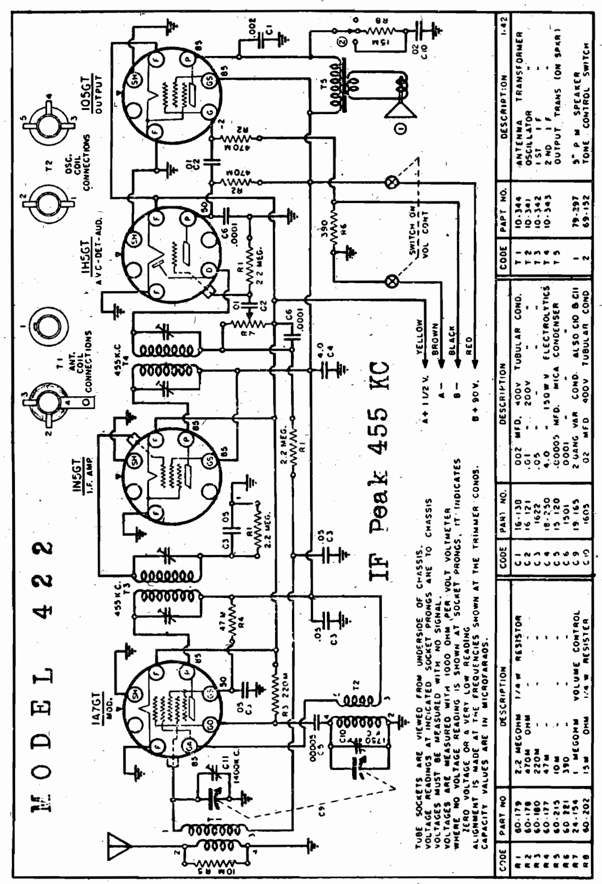
MODEL 422



MODELS 401 401V

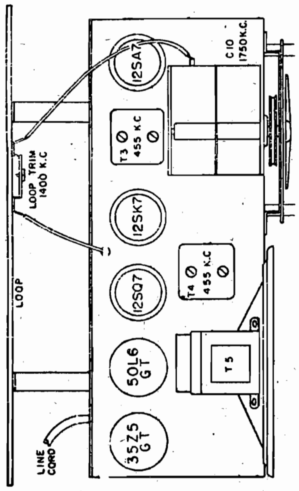


MODEL 422 IF Peak 455 KC

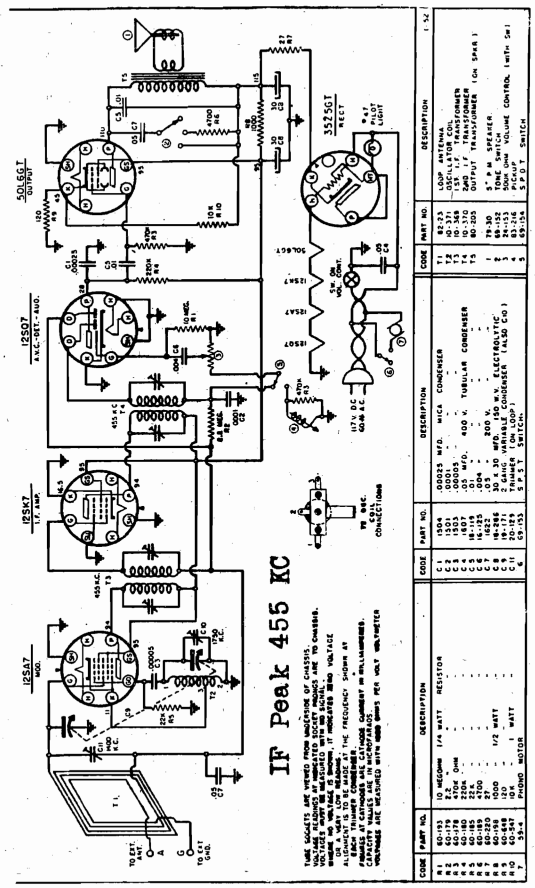


AUTOCRAT RADIO COMPANY

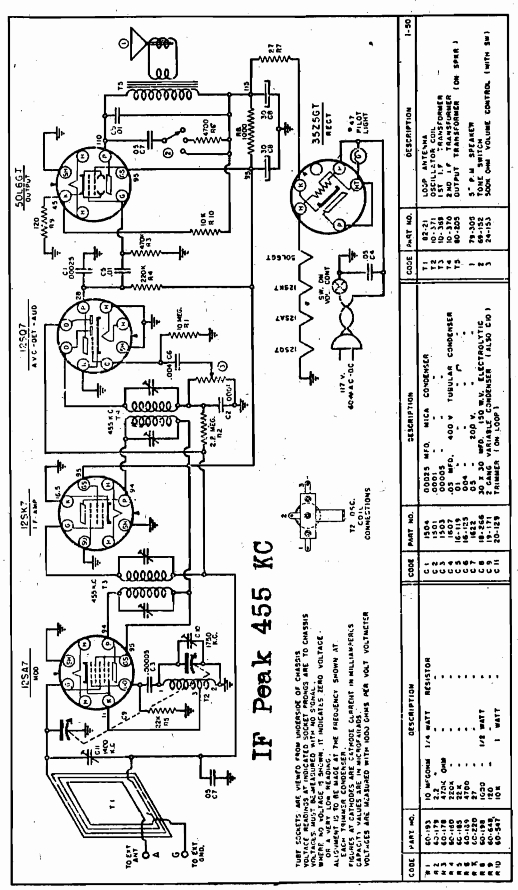
Models 501, 501U, 503
Model 521



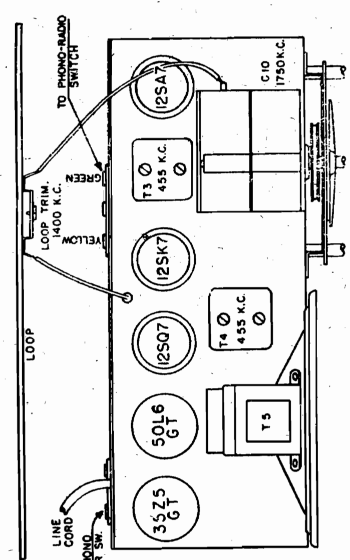
MODELS 501, 501U, 503



MODEL 521



MODELS 501, 501U, 503

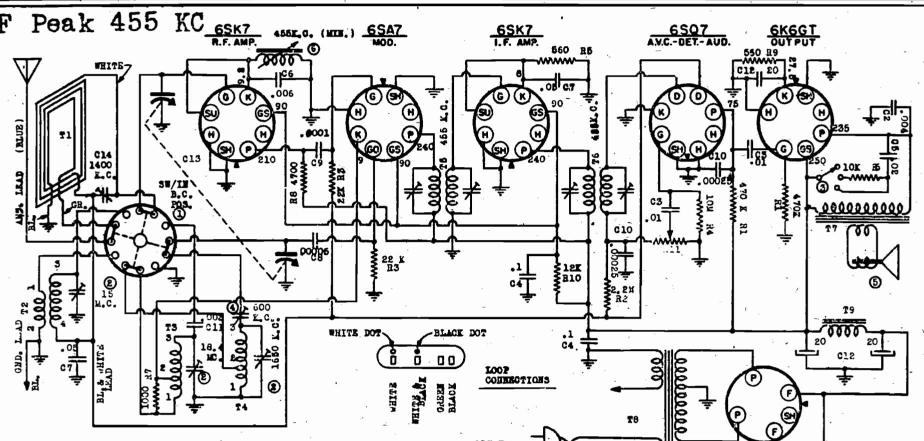


MODEL 521

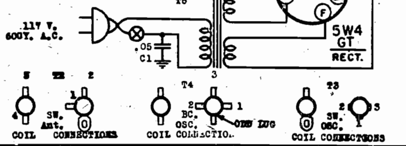
Model 601
Model 611

AUTOCRAT RADIO COMPANY

IF Peak 455 KC



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE
OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT
EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.



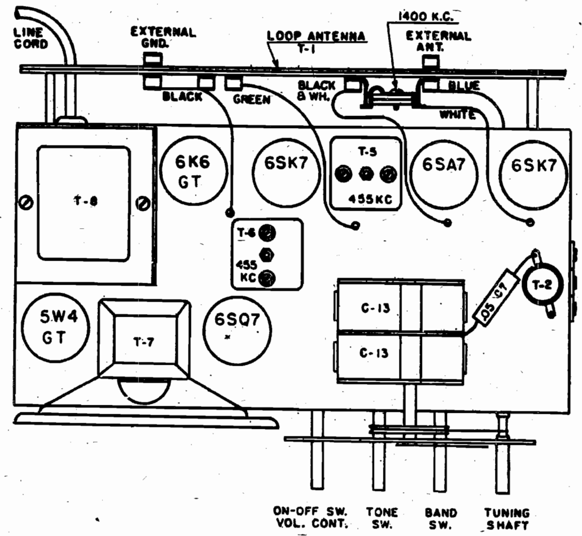
CODE.	PART NO.	DESCRIPTION
R1	60-178	470 K OHM 1/4 WATT RES.
R2	60-179	2.2 MEG OHM 1/4 WATT RES.
R3	60-185	22 K OHM 1/4 WATT RES.
R4	60-193	10 MEG. OHM 1/4 WATT RES.
R5	60-201	560 OHM 1/4 WATT RES.
R6	60-216	10 K OHM 1/4 WATT RES.
R7	60-217	1000 OHM 1/4 WATT RES.
R8	60-282	4700 OHM 1/2 WATT RES.
R9	60-536	560 OHM 1 WATT RES.
R10	60-646	12 K OHM 2 WATT RES.
R11	24-146	VOLUME CONTROL
6	10-374	WAVE TRAP

CODE.	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 WV. TUB. COND.
C2	16-125	.004 " " " " "
C3	16-119	.01 " " " " "
C4	16-116	.1 " " " " "
C5	1605	.02 " " " " "
C6	16-148	.006 " " " " "
C7	1622	.05 " 200 " " "
C8	1503	.00005 MFD. MICA COND.
C9	1501	.0001 " " "
C10	1504	.00025 " " "
C11	15-118	.003 " " "
C12	18-267	ELEC. 20&20 AT 450 & 20 AT 25
C13	19-160	VARIABLE COND.
C14	20-129	TRIMMER (ON LOOP)

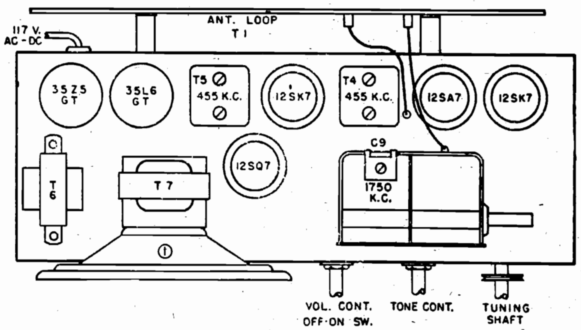
CODE.	PART NO.	DESCRIPTION
T1	82-19	LOOP ANTENNA
T2	10-357	S.W. ANTENNA COIL
T3	10-320	S.W. OSC. COIL
T4	10-326	B.C. OSC. COIL
T5	10-358	1 st. I.F. TRANS.
T6	10-312	2 nd. I.F. TRANS.
T7	------	OUTPUT TRANS.
T8	80-199	POWER TRANS.
T9	------	FIELD COIL
1	69-145	BAND SWITCH
2	20127	TRIMMER BLOCK
3	69-155	TONE CONTROL
4	20-130	PADDING CONDENSER
5	79-300	6" DYNAMIC SPEAKER

1-61

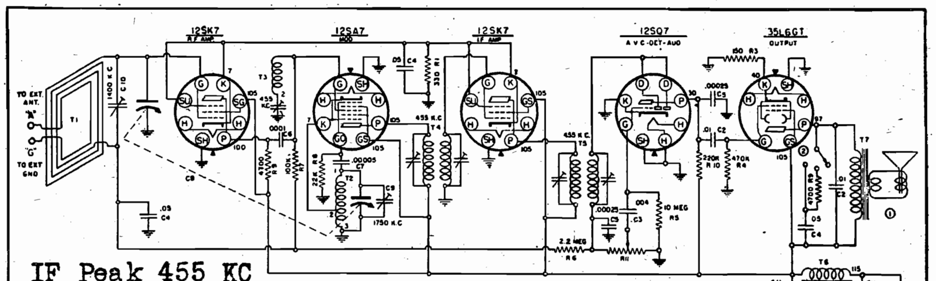
MODEL 611



MODEL 611

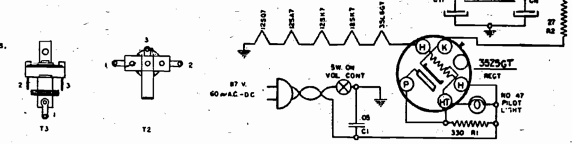


MODEL 601



IF Peak 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKETS PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE
OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT
EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.



CODE	PART NO	DESCRIPTION
R 1	60-282	330 OHM 1/4 WATT RESISTOR
R 2	60-220	27 " " " "
R 3	60-164	150 " " " "
R 4	60-178	470K " " " "
R 5	60-193	10 MEG " " " "
R 6	60-179	2.2 MEG " " " "
R 7	60-196	100 K " " " "
R 8	60-185	22 K " " " "
R 9	60-189	4700 " " " "
R 10	60-160	220 K " " " "
R 11	24-153	500K " VOLUME CONTROL (WITH SWITCH)

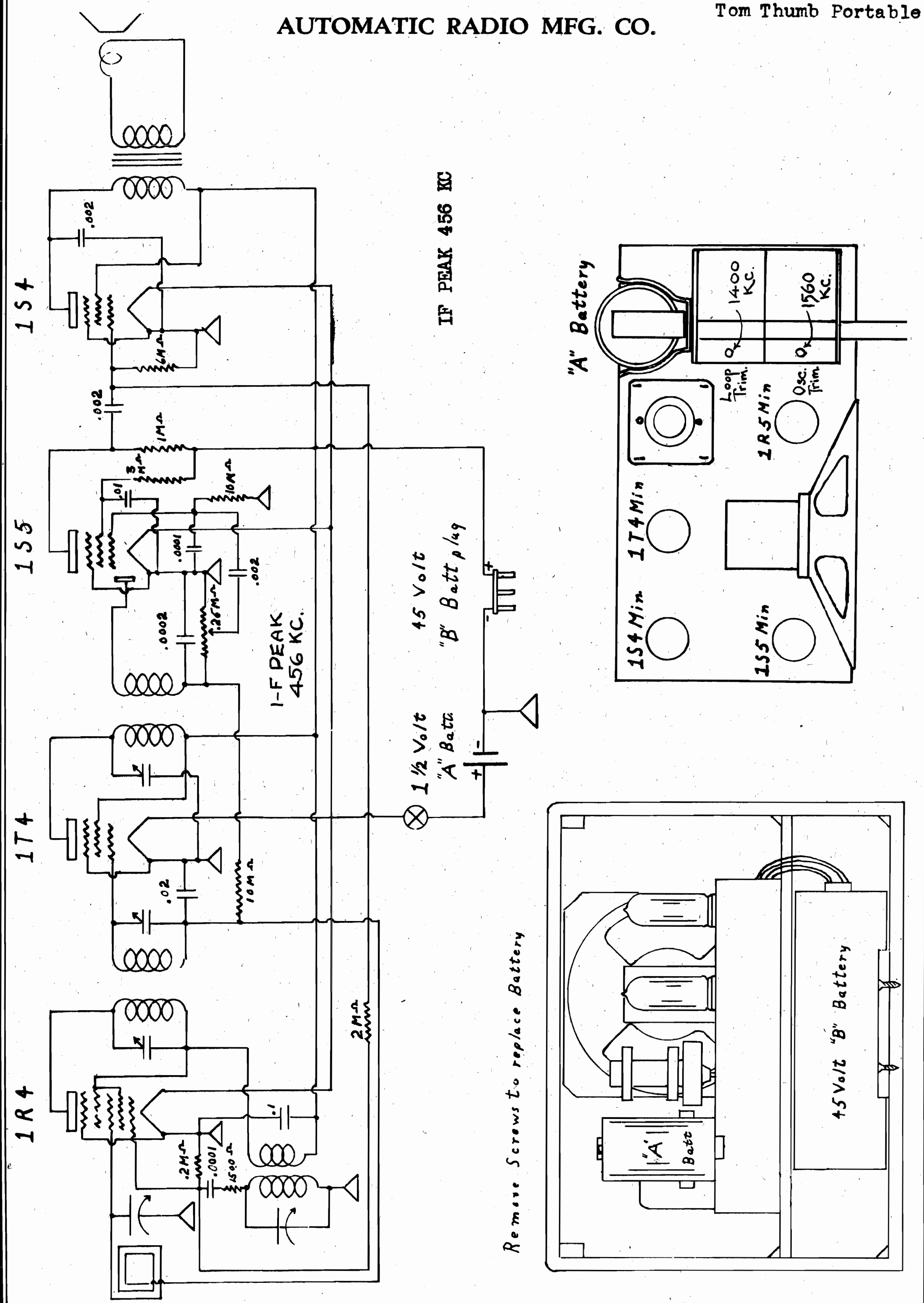
CODE	PART NO.	DESCRIPTION
C 1	1607	.05 MFD 400 V TUBULAR CONDENSER
C 2	16-119	.01 " 400 V " "
C 3	16-125	.004 400 V " "
C 4	1622	.05 " 200 V. " "
C 5	1504	.00025 MFD MICA "
C 6	1501	0.001 " " "
C 7	15-120	.00005 " " "
C 8	95-14	2 GANG VARIABLE CONDENSER & TUNER (ALSO C9)
C 10	20-129	TRIMMER (ON LOOP)
C 11	18-266	30 & 30 MFD ELECTROLYTIC

CODE	PART NO.	1-60
T 1	82-21	LOOP ANTENNA
T 2	10-372	OSC COIL
T 3	10-373	WAVE TRAP
T 4	10-369	1 ST. I F TRANS.
T 5	10-370	2 ND I F TRANS.
T 6	33-222	FILTER CHOKE
T 7	———	OUTPUT TRANS. (ON SPEAKER)
1	79-308	SPEAKER
2	69-152	TONE CONTROL

MODEL 601

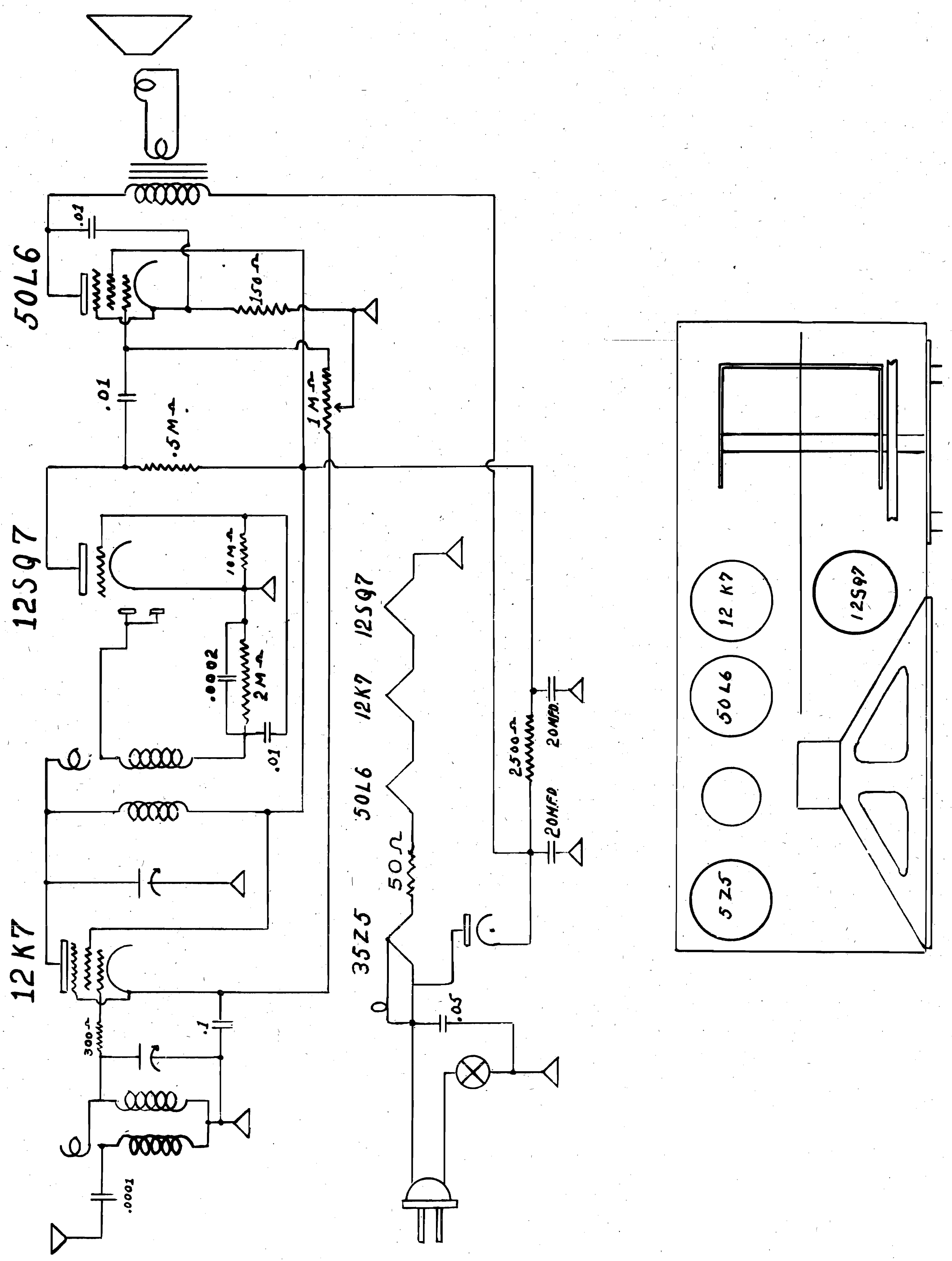
Tom Thumb Portable

AUTOMATIC RADIO MFG. CO.



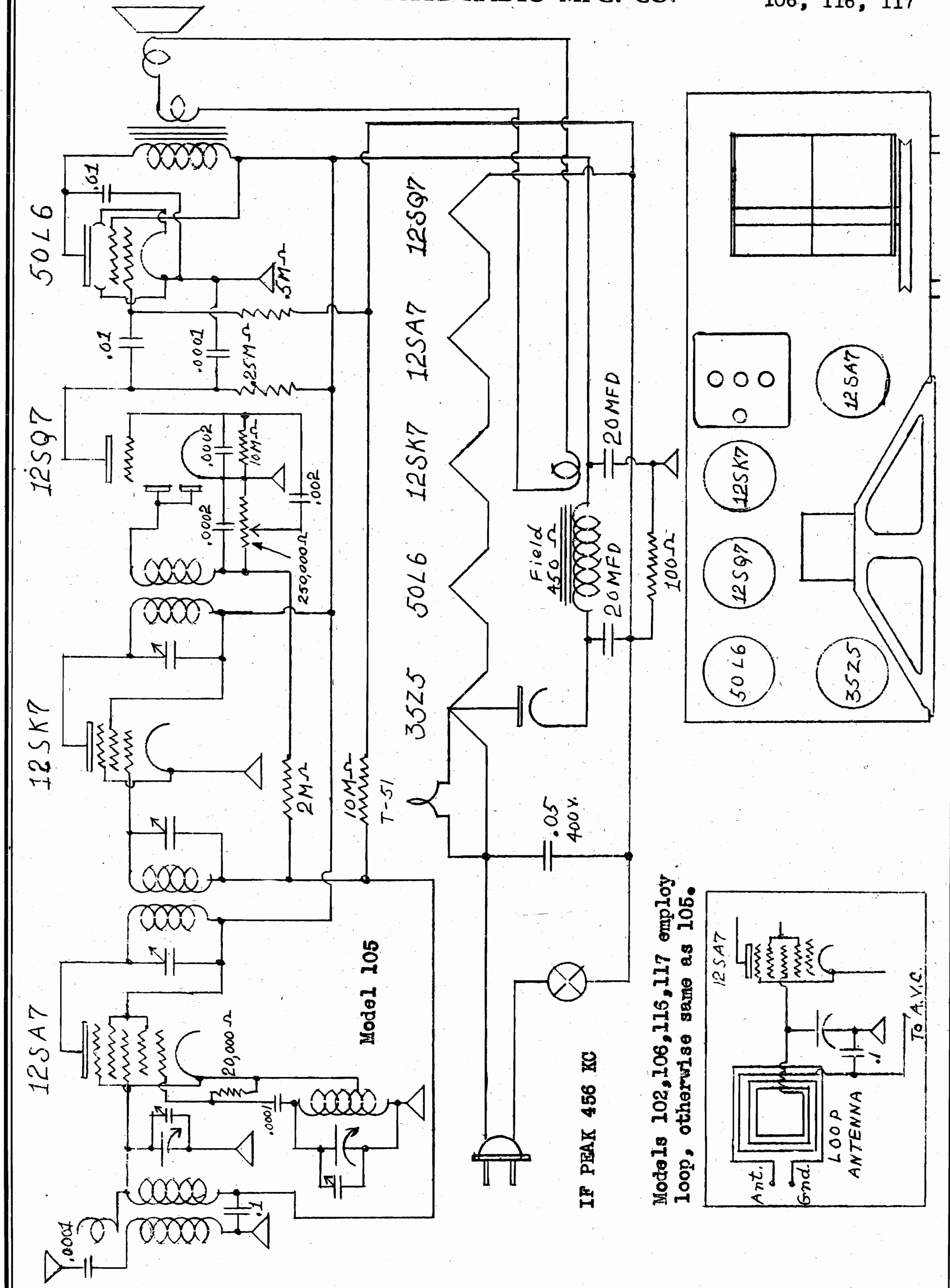
Models 100, 101

AUTOMATIC RADIO MFG. CO.



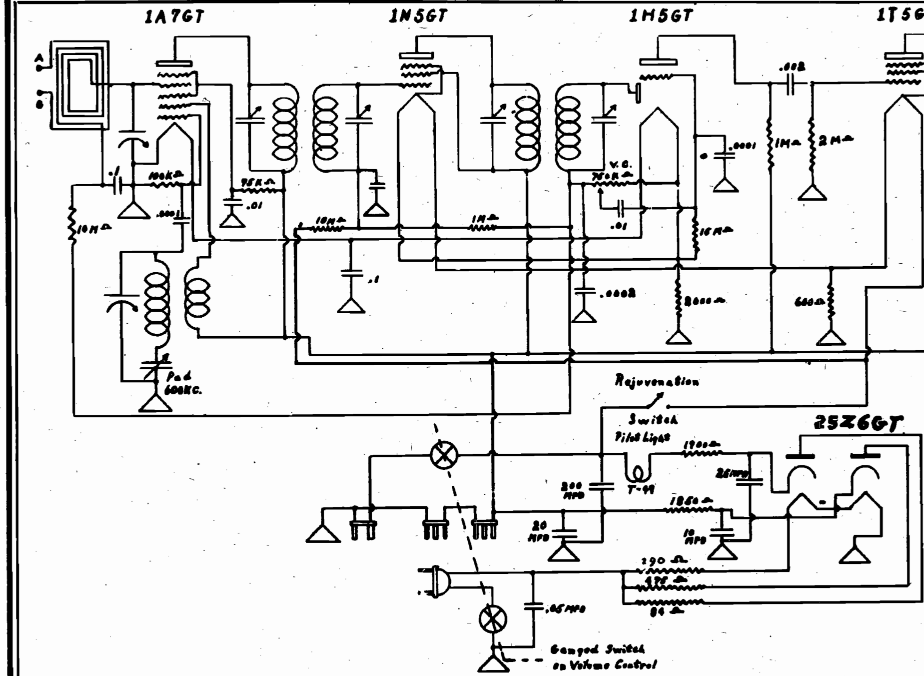
AUTOMATIC RADIO MFG. CO.

Models 102, 105, 106, 116, 117



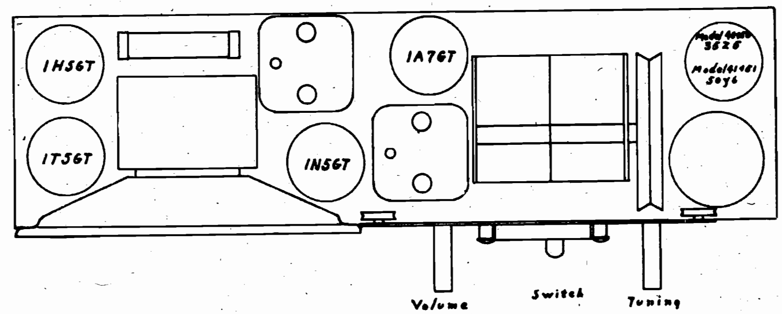
Models P40, P41,
P50, P51

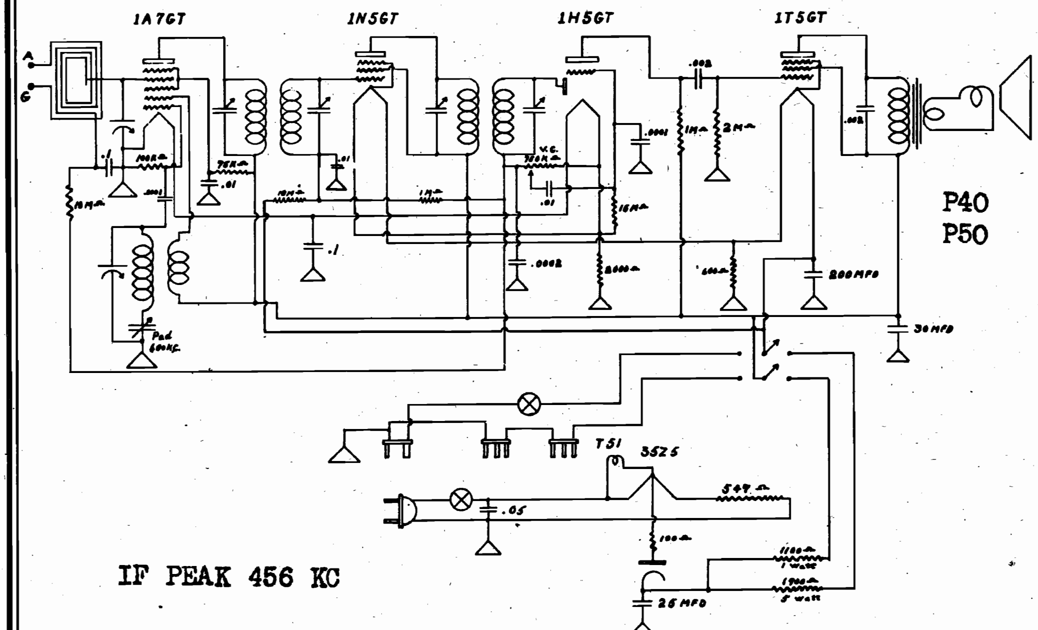
AUTOMATIC RADIO MFG. CO.



P41
P51

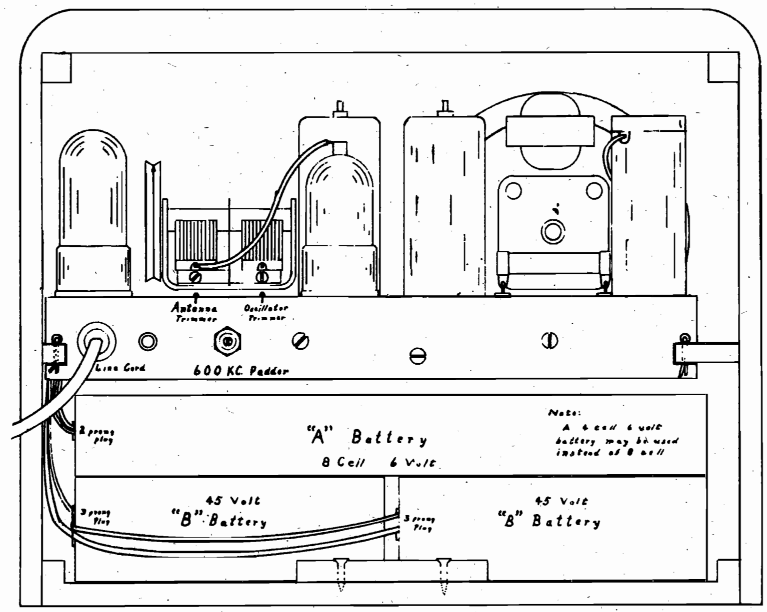
1. IF PEAK 456 KC
2. Osc. (left trimmer on gang) 1560 kc. Variable condenser at minimum capacity.
3. Trimmer loop (right trimmer on gang) - 1400 kc.
4. Pad loop 600 kc.





P40
P50

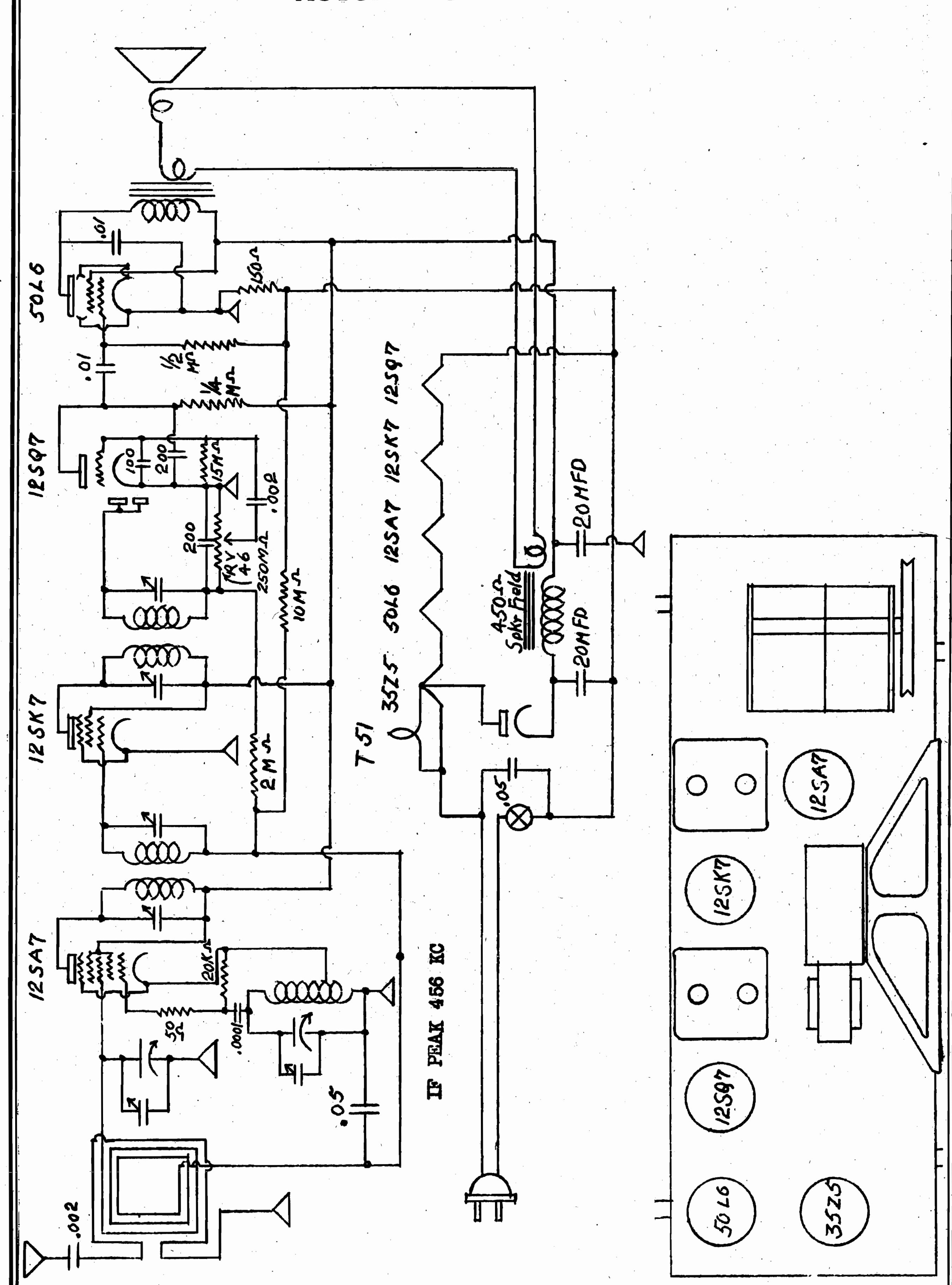
IF PEAK 456 KC



Take out screws and remove block before changing batteries.

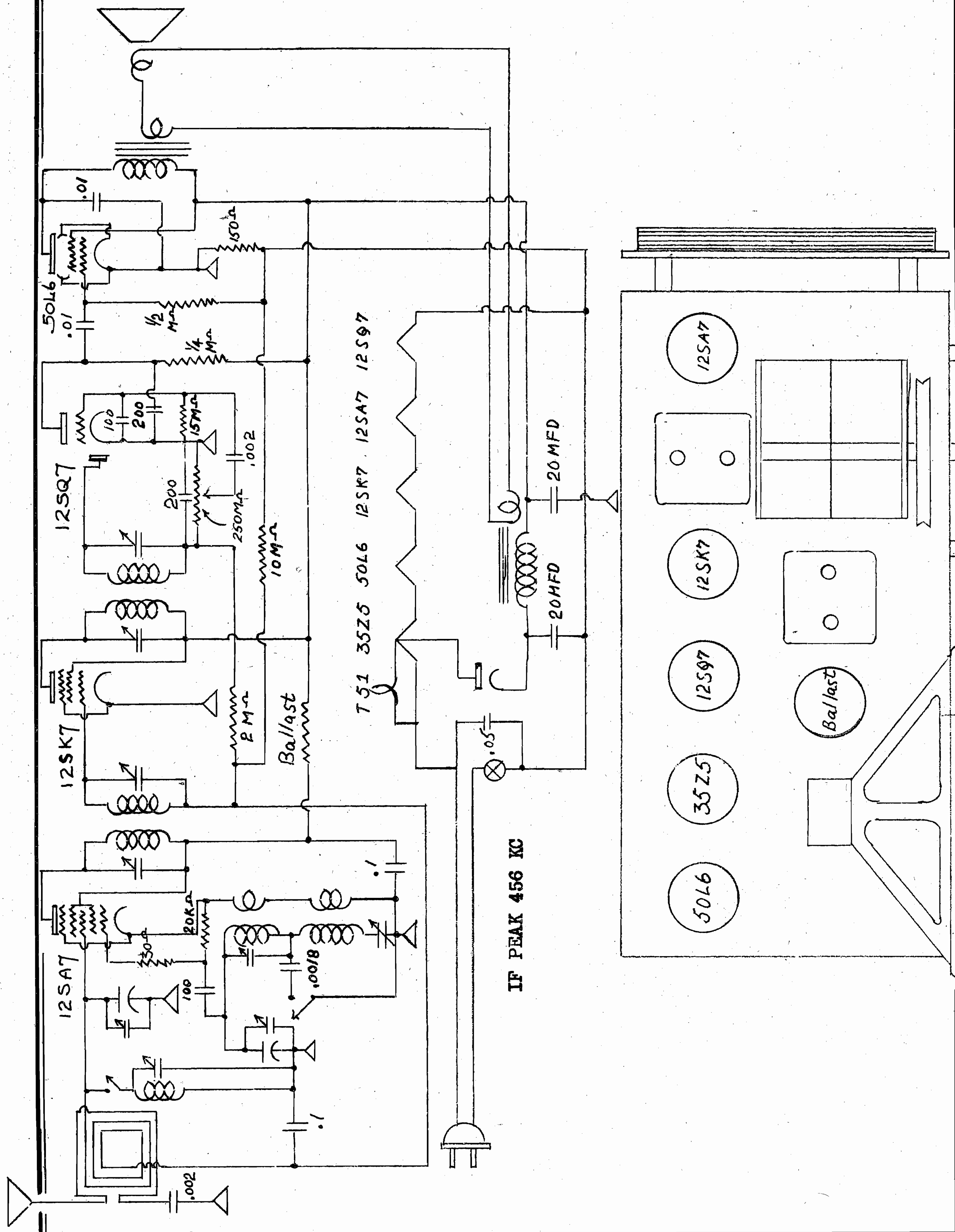
AUTOMATIC RADIO MFG. CO.

Models 110, 111

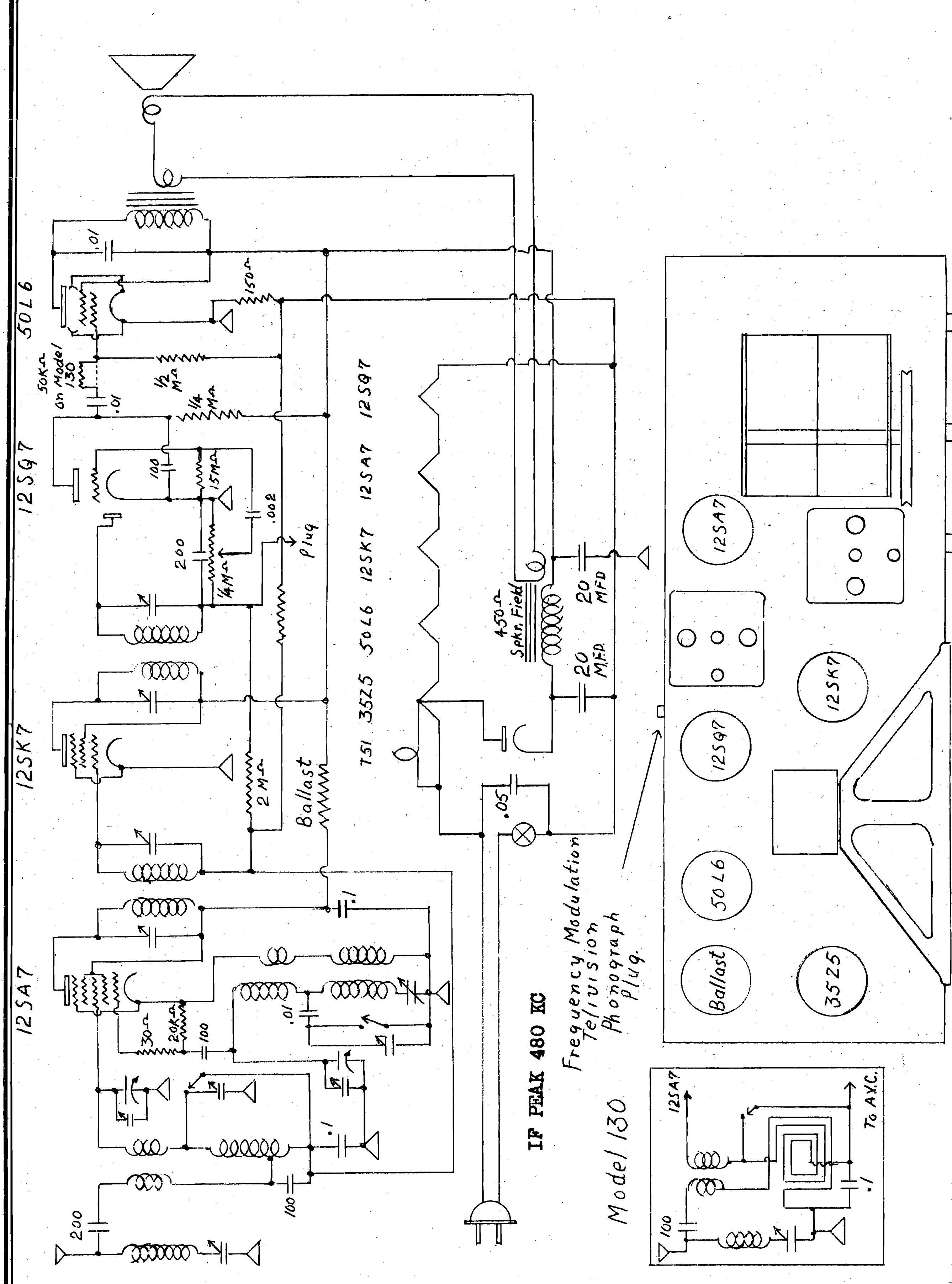


Model 115

AUTOMATIC RADIO MFG. CO.

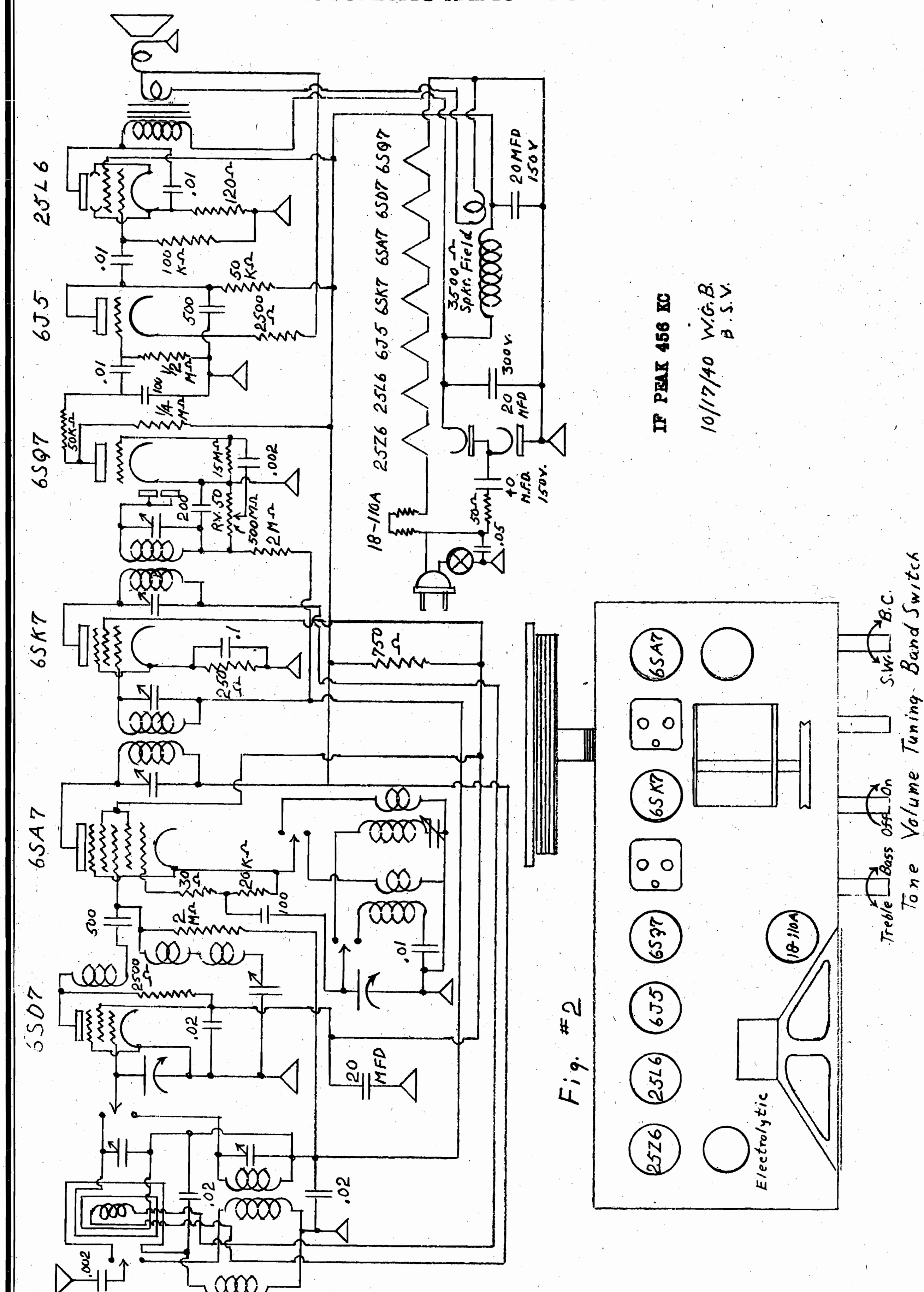


AUTOMATIC RADIO MFG. CO. Models 120, 125, 130



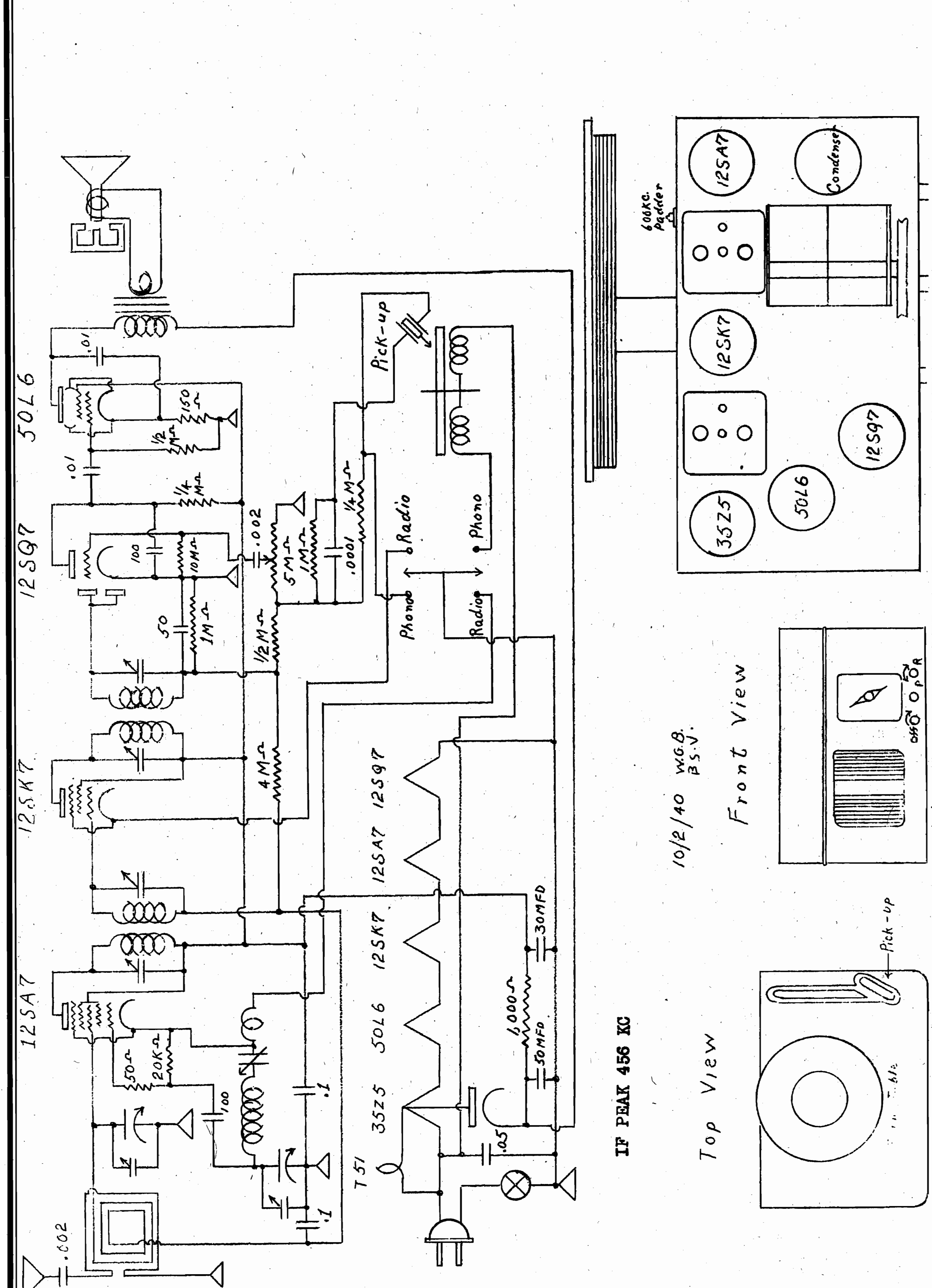
Model 135

AUTOMATIC RADIO MFG. CO.



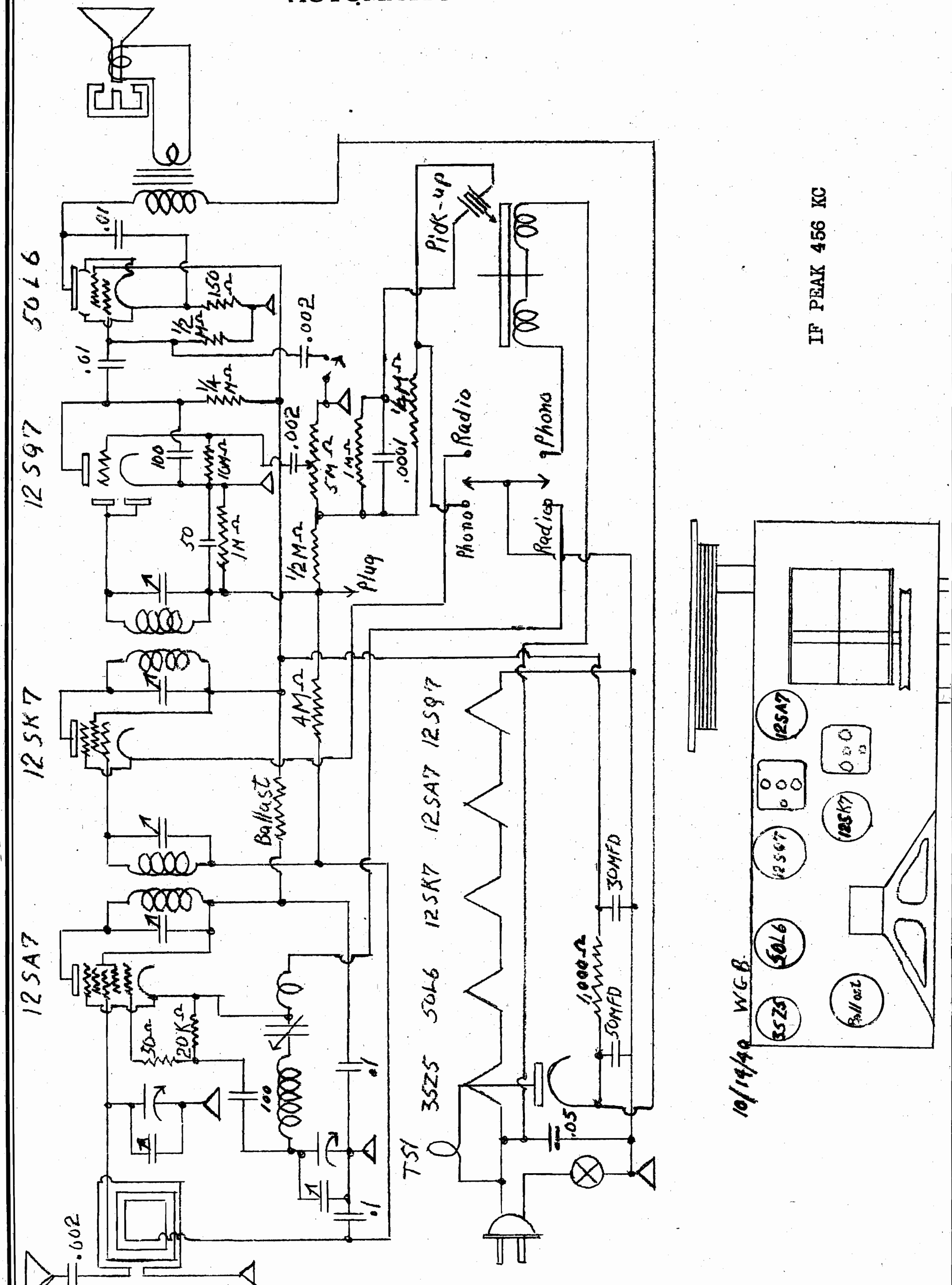
AUTOMATIC RADIO MFG. CO.

Model 140AC



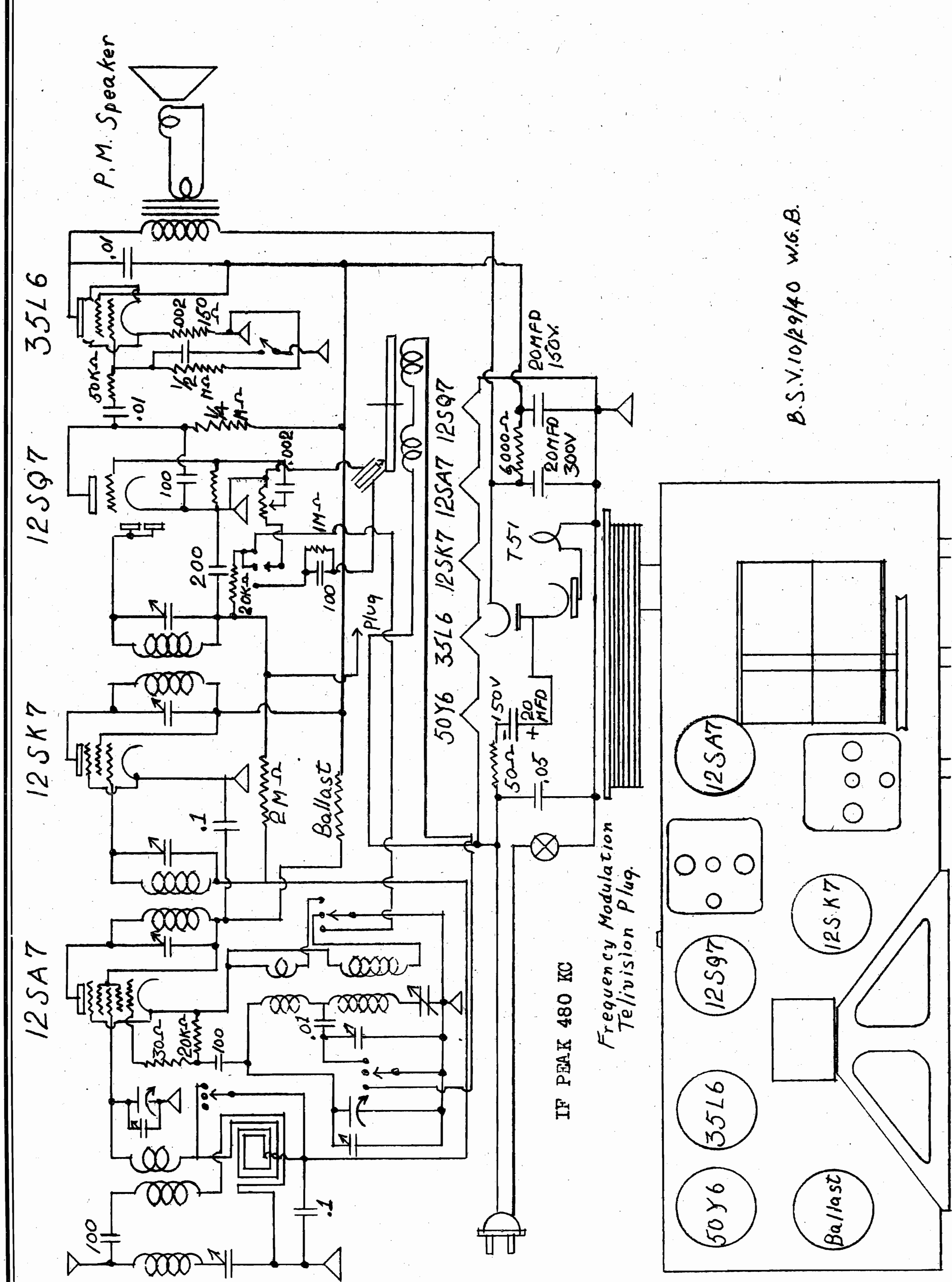
Model 145AC

AUTOMATIC RADIO MFG. CO.



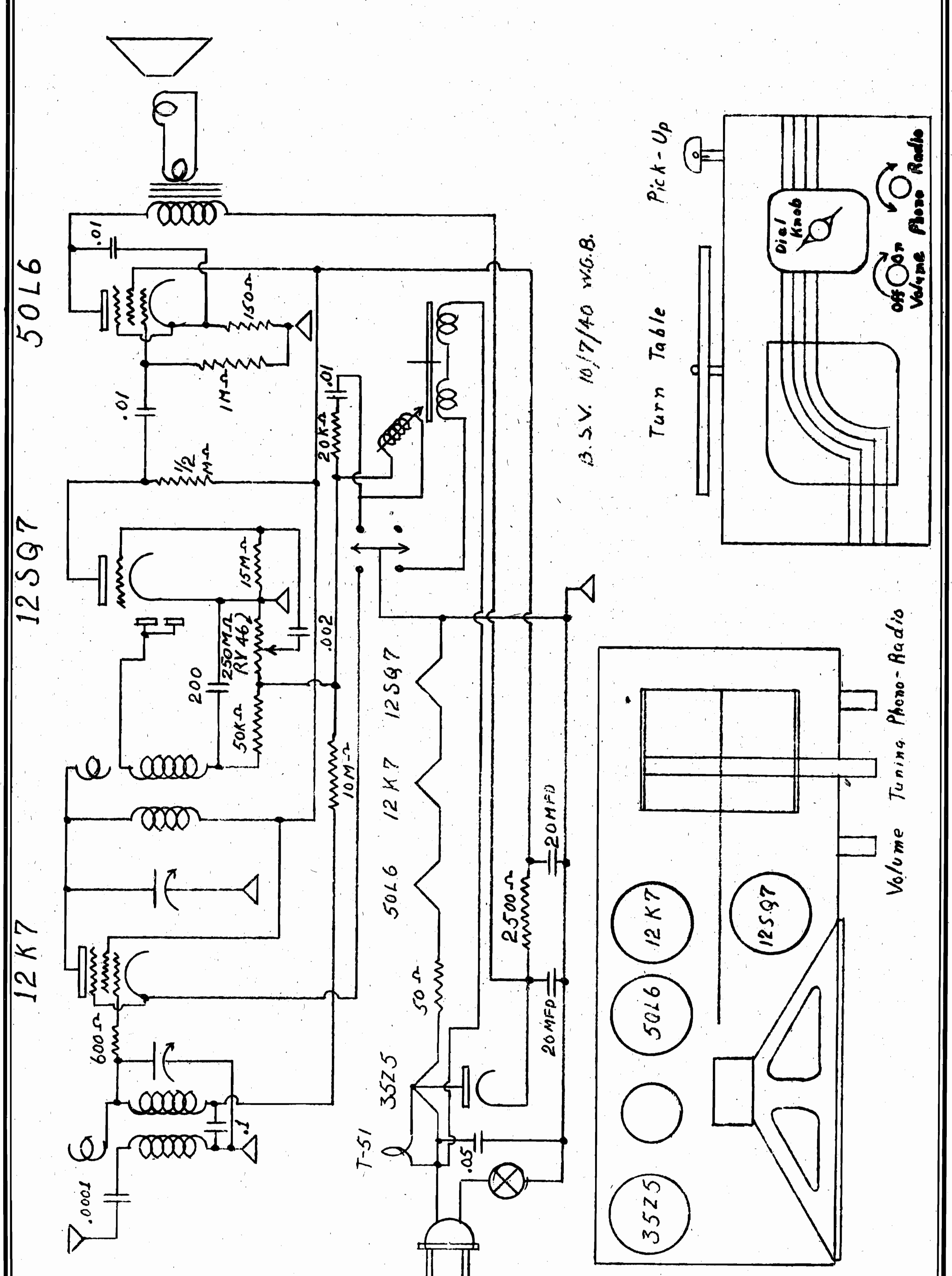
AUTOMATIC RADIO MFG. CO.

Model 148AC



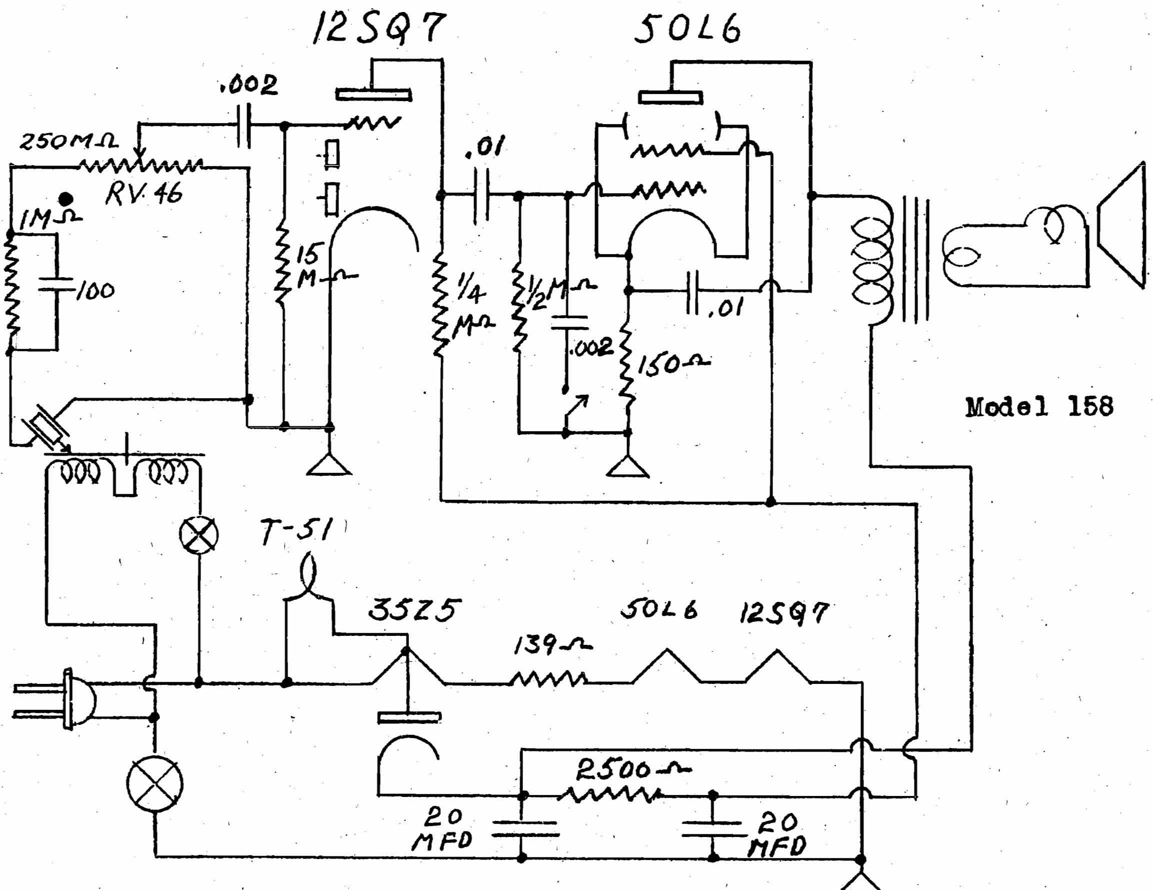
Models 152AC, 155

AUTOMATIC RADIO MFG. CO.

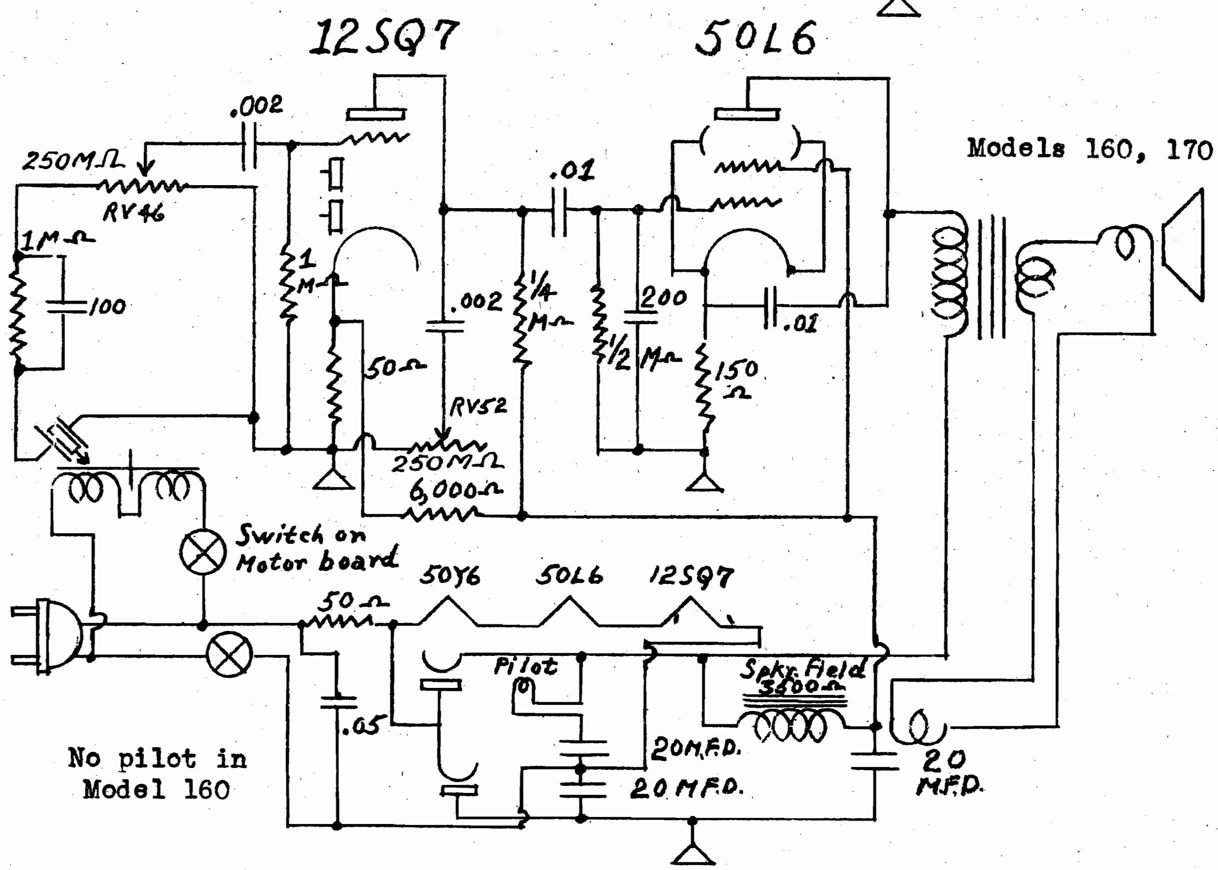


AUTOMATIC RADIO MFG. CO.

Models 158, 160, 170



Model 158

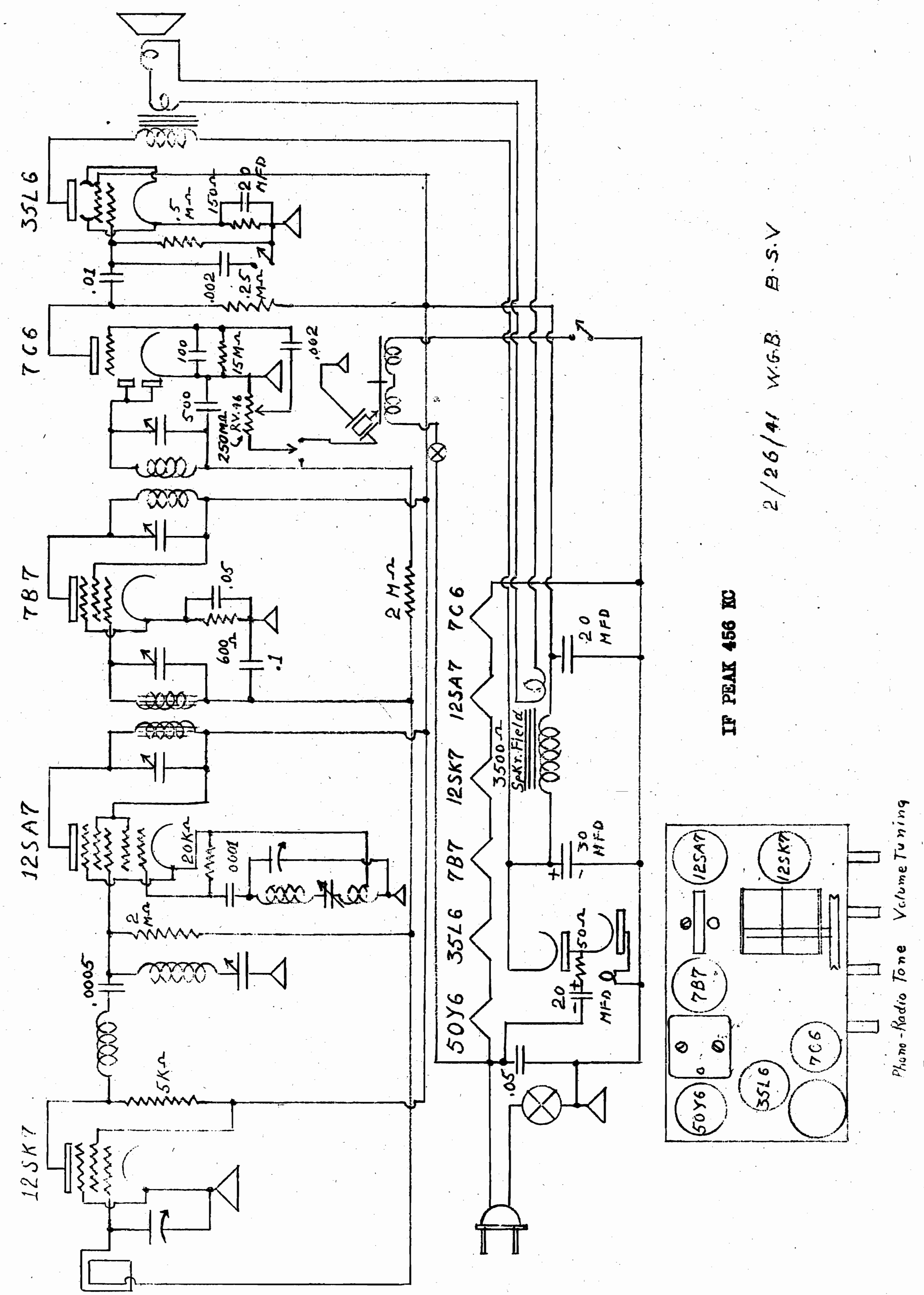


Models 160, 170

No pilot in Model 160

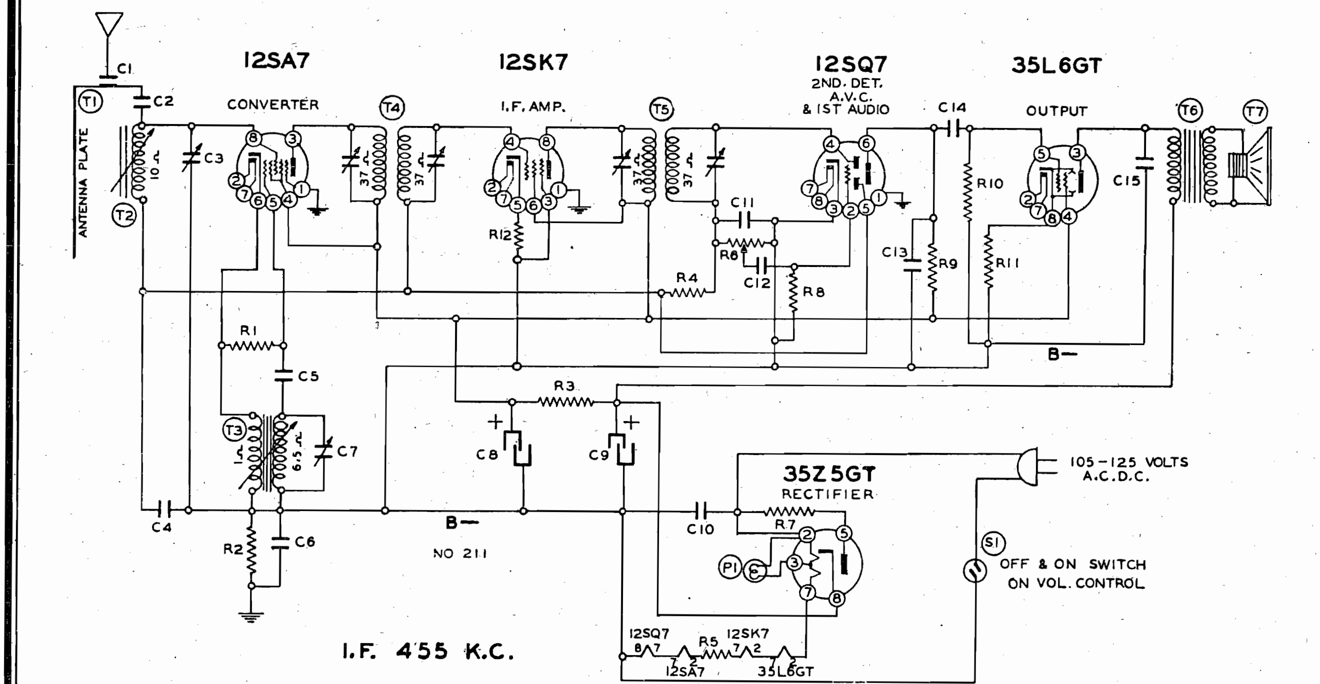
Model 175AC

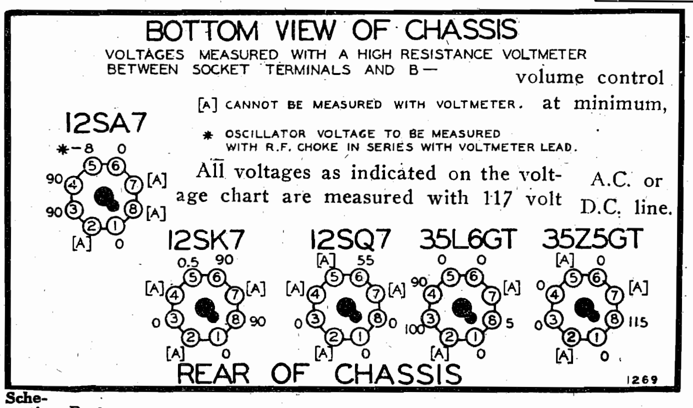
AUTOMATIC RADIO MFG. CO.

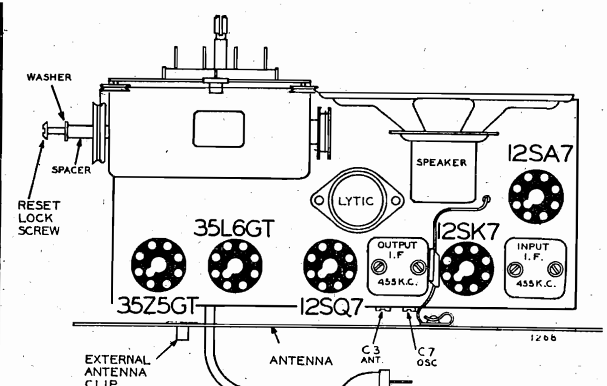


BELMONT RADIO CORP.

MODELS 151, 536

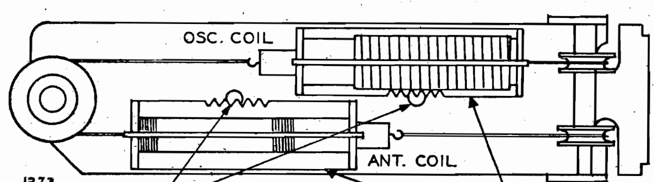






VIEW LOOKING AT BOTTOM OF CHASSIS

Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	130176	20M ohm—⅓ w.
R2	130100	150M ohm—⅓ w.
R3	130279	1M ohm—1 w.
R4	1304	3 megohm—⅓ w.
R5	130288	50 ohm—1.5 w.
R6	101238	500M ohm volume control and switch
R7	130240	30 ohm—⅓ w.
R8	130257	5 megohm—⅓ w.
R9	100100	150M ohm—⅓ w.
R10	13011	250M ohm—⅓ w.
R11	130166	150 ohm—⅓ w.
R12	130233	60 ohm—⅓ w.
		CONDENSERS
C1	131262	.00001 washer condenser (Antenna clip on back plate)
C2	129114	.0003 mica
C3	124151	Trimmer on antenna coil
C4	1009	.05 x 200 v.
C5	12939	.00005 mica
C6	10091	.15 x 400 v.
C7	124151	Trimmer on oscillator coil
C8	11992	20 mfd. lytic x 150 w. v.
C9	11992	40 mfd. lytic x 150 w. v.
C10	10013	.05 x 400 v.
C11	12912	.00025 mica
C12	10025	.002 x 600 v.
C13	1292	.0005 mica
C14	10011	.01 x 400 v.
C15	10011	.01 x 400 v.
		C3 and C7 are in same unit
		C8 and C9 are in same unit
		PARTS
T1	128586B	Back plate (walnut)
	128586	Back plate (ivory)
T2	112877	Antenna coil—Permeability tuning assembly complete
T3	112877	Oscillator coil—Permeability tuning assembly complete
T4	108157L	Input I. F. coil—455 Kc.
T5	108157N	Output I. F. coil—455 Kc.
T6	10595C	Output transformer
T7	114225	5" P. M. speaker
S1		Switch on volume control
P1	107249	Pilot light T47



NOTE "A" THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE THE COIL ASSEMBLY VERY SLOWLY. IT CAN BE MOVED BY HAND OR BY PIVOTING ONE EDGE OF THE BLADE OF A SCREWDRIVER IN THE HOLE AND ENGAGING THE BLADE IN THE GEAR TEETH OF THE COIL FORM.

TO ADJUST COIL ASSEMBLY MOVE LEFT OR RIGHT

For Alignment data see Index

October 1940

Setting the Automatic Pushbuttons

Make a list of your favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the front of each pushbutton.

Press one of the buttons all the way down and hold it FIRMLY. Now tune in the station you want with the tuning knob. Tune back and forth until the station is clear, then release the button. NOTE: **If the tuning knob turns quite hard when the button is held down firmly (loosen the reset lock screw several turns with a screwdriver or coin (quarter).**

Continue, setting each of the remaining pushbuttons in the same way. Now turn the tuning knob all the way to the right and tighten the reset lock screw. This screw prevents the pushbuttons from slipping off the stations you have set. To change stations loosen lock screw and proceed as above.

BRC. Series A—5142—5750—10-40
Pro. 246

MODELS 151, 536, 642

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

MODEL 642

IMPORTANT:—See alignment instructions

- 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 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 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
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer rear section of gang.	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer front section of gang	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
535 to 1600 K.C.

Power Consumption .... 35 Watts
Power Output .... 1 Watt Undistorted, 1.5 Watts Maximum
Intermediate Frequency .... 455 K.C.

MODELS 151 & 536

Power Consumption - - - - - - - - 35 Watts
Power Output - - - - 800 Milliwatts Undistorted
Sensitivity (for .05 Watts Output) - 30 Microvolts Average
Selectivity - 85 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - - 535 to 1720 KC
Intermediate Frequency - - - - - - - - 455 KC
Speaker - - - - - - - - - 5 in. P. M. Dynamic

- 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-metallic screwdriver.
- Dummy antennas—.1 Mfd., and 200 Mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Trimmer (C7) (See chassis view)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Iron Cores All the way out	Trimmer (C3) (See chassis view)	Antenna	Adjust to maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See chassis view)	Antenna	Check for tracking (See Note "B")

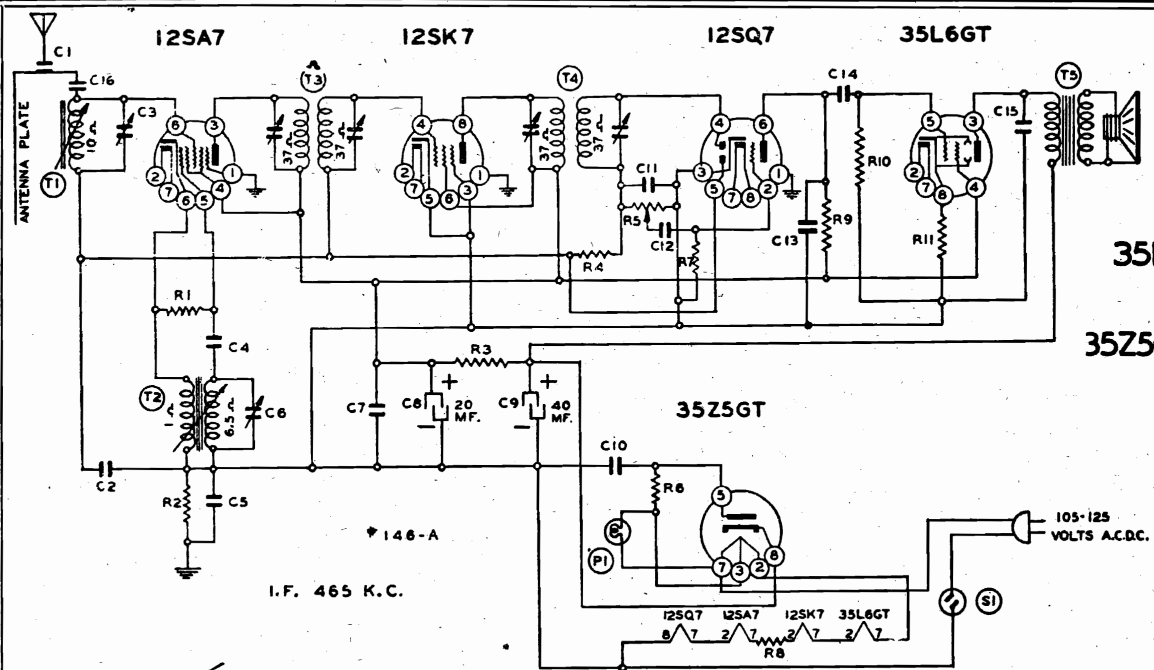
NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

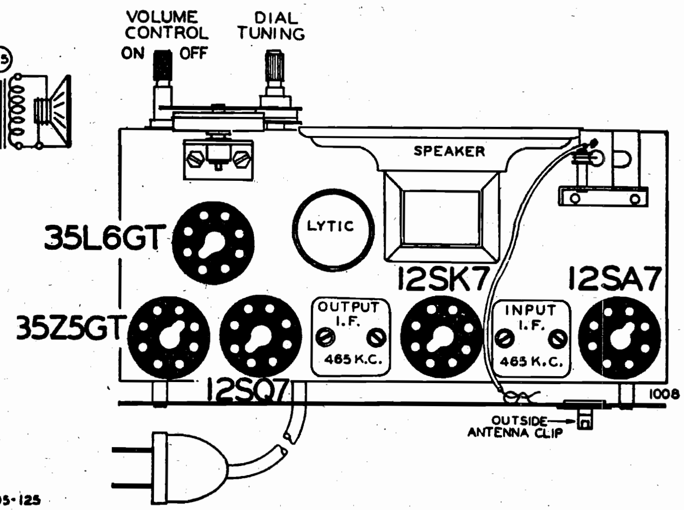
NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

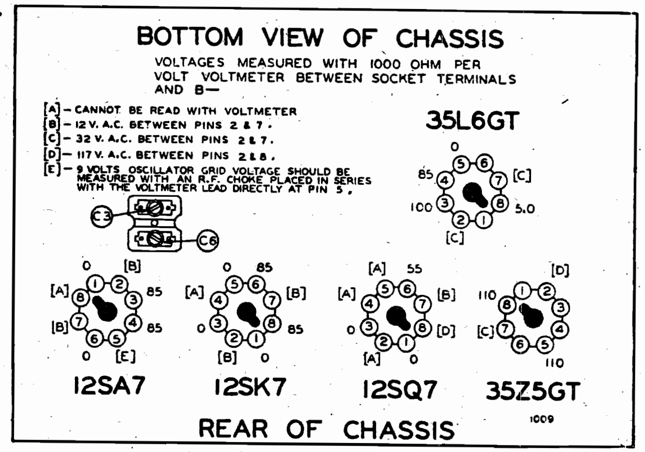
Reduce to 9⅞"

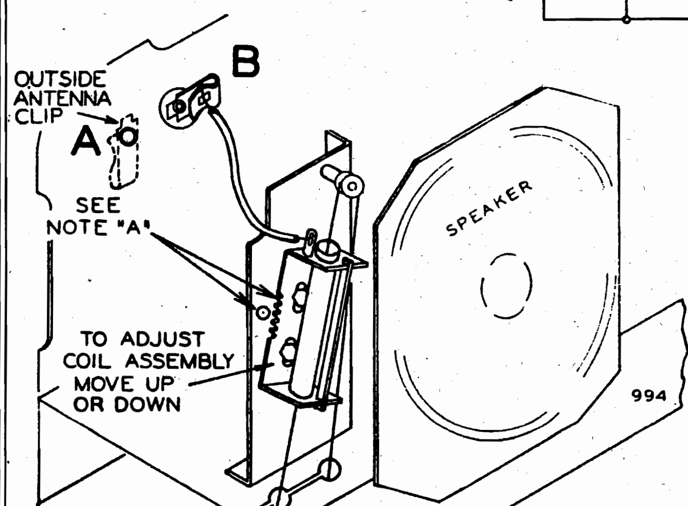
MODEL 518

BELMONT RADIO CORP.









Circuit Diagram Ref.	Part No.	Description
		RESISTORS
R1	130176	20M ohm—⅓ w.
R2	130100	150M ohm—⅓ w.
R3	130279	1M ohm—1 watt
R4	1304	3 megohm—⅓ w.
R5	101196	500M ohm volume control
R6	130293	30 ohm—1 watt
R7	130257	5 megohm—⅓ w.
R8	130288	50 ohm—1.5 watt
R9	1302	75M ohm—⅓ w.
R10	13011	250M ohm—⅓ w.
R11	130166	150 ohm—⅓ w.
		CONDENSERS
C1	131262	.00001 washer condenser (on Antenna plate)
C2	10022	.05 x 200 v.
C3	124100	Antenna Trimmer
C4	12930	.00005 Mica
C5	10091	.15 x 400 v.
C6	124100	Oscillator Trimmer
C7	10022	.05 x 200 v.
C8	11992	20 mfd. x 150 v. lytic
C9	11992	40 mfd. x 150 v. lytic
C10	10013	.05 x 400 v.
C11	12912	.00025 mica
C12	10025	.002 x 600 v.
C13	1292	.0005 mica
C14	10011	.01 x 400 v.
C15	10011	.01 x 400 v.
		C3 and C6 in one unit
		C8 and C9 in one unit
		PARTS
T1	111136B	Antenna Coil Complete
T2	110126B	Oscillator Coil
T3	108157C	Input I. F. Coil—465 kc.
T4	108157C	Output I. F. Coil—465 kc.
T5	114170	4" P. M. Speaker and Transformer
S1	101196	Off-on switch on volume control
P1	107249	6-8 v. pilot light T-47

(BRC. 518) Form No. 5144—3750—9-40
Pro. 235

MODEL 794, Series A,
Ser. No. OA297000 up
MODEL 518

BELMONT RADIO CORP.

Model 518

Power Consumption....35 Watts
Power Output....800 Milliwatts Undistorted, 1.2 Watts Maximum
Intermediate Frequency....465 K.C.

FREQUENCY RANGE
540 to 1720 K.C.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Trimmer (C6) (See bottom of Radio, Fig. 3)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Iron Cores All the way out	Trimmer (C3) (See bottom of Radio, Fig. 3)	Antenna	Adjust to maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1400 Kc.	Adjust position of antenna coil up or down (see Fig. 4)	Antenna Coil Adjustment	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See Fig. 3)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

Model 794 Series A (Serial No. OA297000 and up)

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 12SK7 I. F.	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 12A8GT Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C3 (See Fig. 5)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C10 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1550 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C4 (See Fig. 5)	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 12A8GT	Broadcast	Set Dial at 540 Kc.	Trimmer C8 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 5)	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 12A8GT tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1550 and 540 K.C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal (See Fig. 1).

NOTE "C"—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.

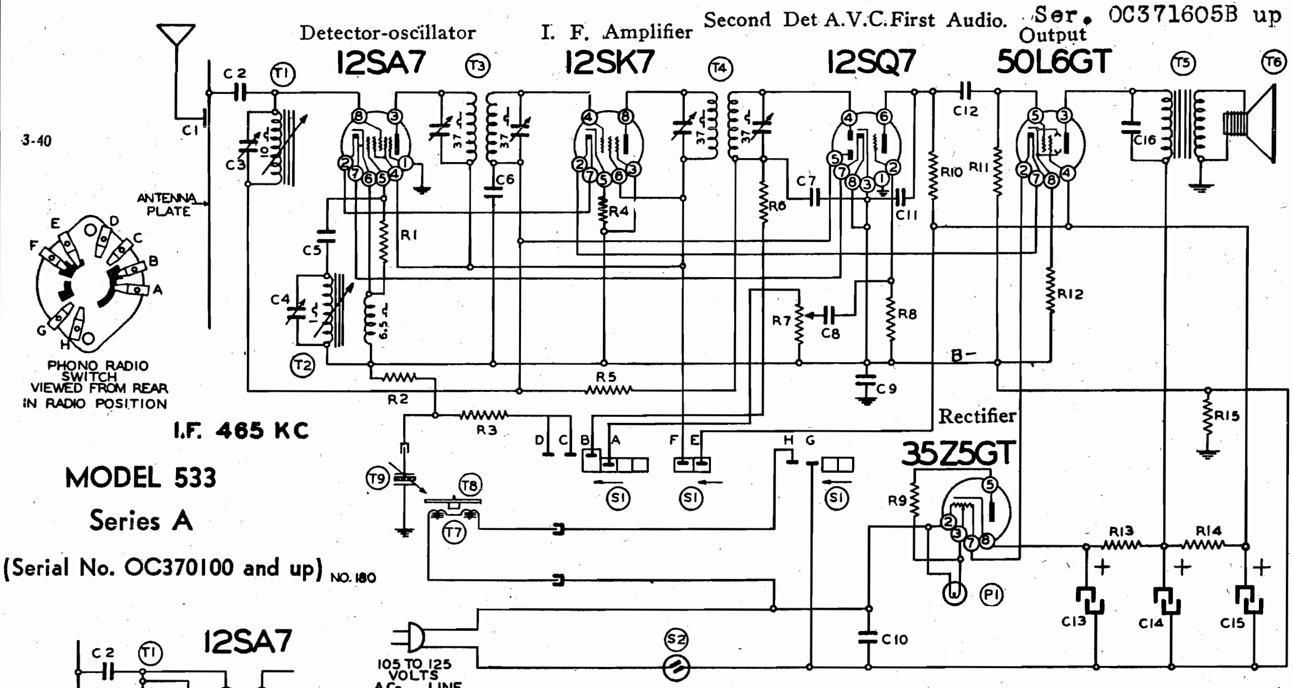
It is important during loop alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

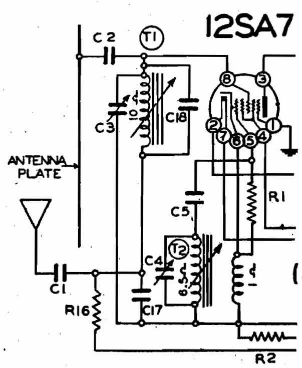
FREQUENCY RANGE
5.7 to 18.3 MC.
540 to 1550 KC.

BELMONT RADIO CORP

MODEL 533, Series A
Ser. OC3710100 up
MODEL 533, Series B
Ser. OC371605B up

3-40





TO LEFT-
PARTIAL
SCHEMATIC FOR
MODEL 533
Series B
(Serial No.
OC371605B and up)
ALL OTHER CONNEC.
ARE AS FOR SERIES
A ABOVE

Power Consumption..Radio Only 30 Watts
Power Output..................900 Milliwatts Undistorted, 1.7 Watts Maximum

FREQUENCY RANGE
535 to 1690 K.C.

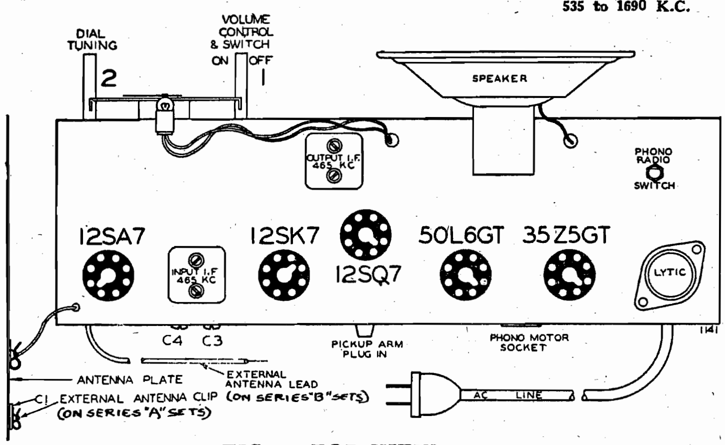
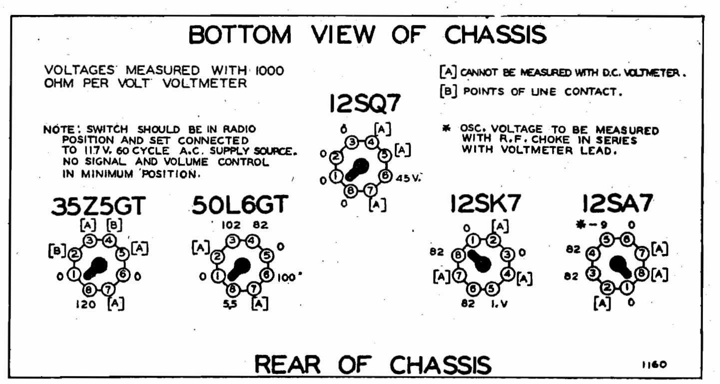


FIG. 1—TOP VIEW



Series A BETWEEN SOCKET TERMINALS AND CHASSIS.
Series B BETWEEN SOCKET TERMINALS AND B−

Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	130176	20M ohm—1/3 w.
R2	130118	600M ohm—1/3 w.
R3	130118	600M ohm—1/3 w.
R4	13056	100 ohm—1/3 w.
R5	130170	3 megohm—1/3 w.
R6	13012	50M ohm—1/3 w.
R7	101217	1/2 megohm—volume control
R8	130257	5 megohm—1/3 w.
R9	130215	25 ohm—1/2 w.
R10	1309	200M ohm—1/3 w.
R11	13037	750M ohm—1/3 w.
R12	130166	150 ohm—1/3 w.
R13	13097	200 ohm—1/3 w.
R14	130287	1200 ohm—1 watt
R15	1309	200M ohm—1/3 w.
R16	1309	200M—1/3 w.
		CONDENSERS
C2	129114	.0003 mfd. mica
C5	1295	.0001 mica
C6	1009	.05 x 200 v.
C7	1295	.0001 mica
C8	10025	.002 x 600 v.
C9	100119	.1 x 400 v.
C10	1001	.1 x 400 v.
C11	12912	.00025 mica
C12	10019	.006 x 600 v.
C13	11994	40 mfd. lytic—150 w. v.
C14	11994	20 mfd. lytic—150 w. v.
C15	11994	20 mfd. lytic—150 w. v.
C16	10011	.01 x 400 v.
C17	129162	.0008 Mica Condenser
C18	129163	.000025 Ceramicon Condenser
		C3 and C4 in same unit
		C13, C14 and C15 are in same unit
		PARTS
T1	112767	Antenna Coil—Permeability tuning assembly complete
T2	112767	Oscillator Coil
T5	105108	Output Transformer
T6	114193	5" P.M. Speaker
T7	104206	Phono Motor
T8	12228	Turntable
T9	114194	Phono pick up arm
S1	125113	Phono Switch
S2		Switch on volume control
P1	107249	Pilot light T47
		T1 and T2 in same unit

Series A Only

C1	131262	.00001 washer condenser (clip on antenna plate)
C3	124135	Antenna Trimmer
C4	124135	Oscillator Trimmer
T3	108157F	Input I. F. Coil—465 kc.
T4	108157G	Output I. F. Coil—465 kc.

Series B Only

C1	1295	.0001 Mica Condenser
C3	121136	Antenna Trimmer
C4	124136	Oscillator Trimmer
T3	108140F	Input I. F. Coil—465 kc.
T4	108145D	Output I. F. Coil—465 kc.

MODEL 533
Series A
Series B

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 which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd., and 200 Mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "A" (See Fig. 1)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "A" (See Fig. 1)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1690 Kc.	.1 MFD.	Connect to Terminal "A" (See Fig. 1)	Iron Cores All the way out	Trimmer (C4) (See Fig. 1)	Oscillator	Adjust to maximum output
	1690 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 1)	Iron Cores All the way out	Trimmer (C3) (See Fig. 1)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 1)	Turn Dial to 1400 Kc.	Adjust position of antenna coil right or left. (See Fig. 3)	Antenna Coil Adjustment	(See Note "A") Adjust to maximum output
	1690 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 1)	Turn Dial to 1690 Kc.	Adjust trimmer (C3) (See Fig. 1)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable right or left. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1690 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1690 Kc.

SERVICE NOTES:

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.

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 radio, the chassis should be removed from the cabinet.

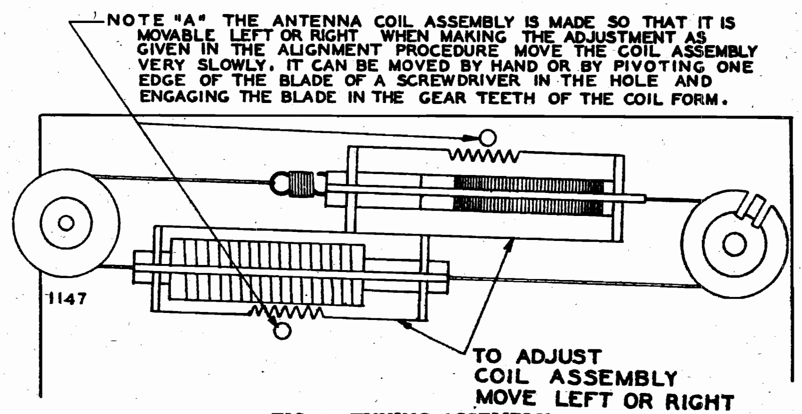
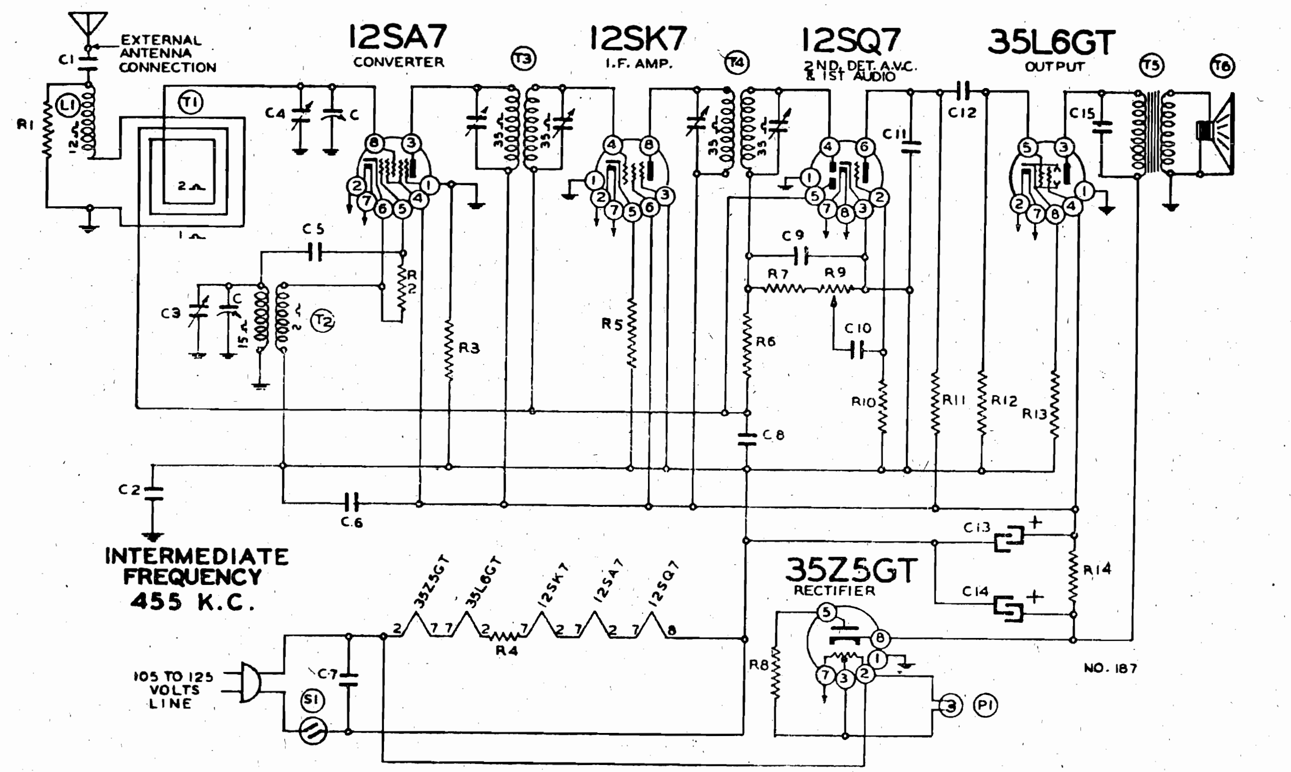
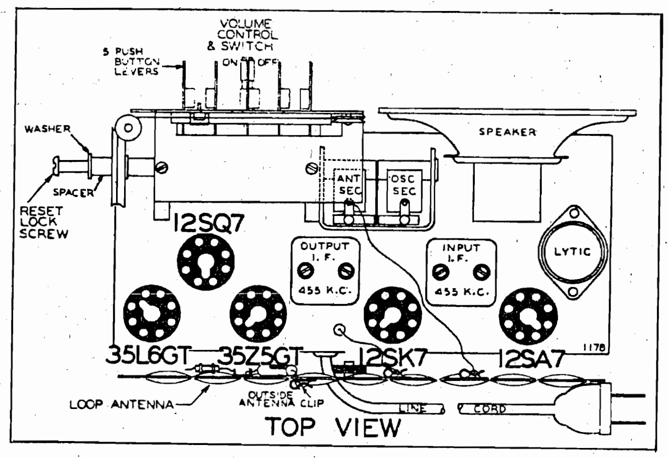


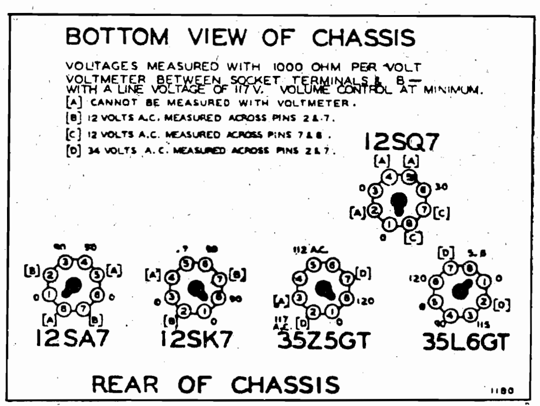
FIG. 3.—TUNING ASSEMBLY

MODEL 534

BELMONT RADIO CORP.







BRC Series A—Form No. 5125—4200-10-40
PRO. 259—1732

Schematic Diagram Ref. No.	Part No.	Description
		CONDENSERS
C	102132	2 gang variable condenser
C1	10011	.01 x 400 v.
C2	10091	.15 x 400 v.
C3		Oscillator trimmer on gang
C4		Antenna trimmer on gang
C5	12921	.0002 mfd. mica
C6	1009	.05 x 200 v.
C7	1001	.1 x 400 v.
C8	1009	.05 x 200 v.
C9	1295	.0001 mfd. mica
C10	10025	.002 x 600 v.
C11	12912	.00025 mfd. mica
C12	100106	.004 x 600 v.
C13	11992	20 mfd. lytic x 150 w. v.
C14	11992	40 mfd. lytic x 150 w. v.
C15	10026	.02 x 400 v.
		C13 and C14 are in same unit
		RESISTORS
R1	130314	2200 ohm—1/3 w.
R2	13094	50M ohm—1/3 w.
R3	1309	200M ohm—1/3 w.
R4	130315	75 ohm—1½ w.
R5	130203	40 ohm—1/3 w.
R6	1304	3 megohm—1/3 w.
R7	1301	25M ohm—1/3 w.
R8	130215	25 ohm—1/3 w.
R9	101198	1 megohm volume control
R10	130257	5 megohm—1/3 w.
R11	1303	500M ohm—1/3 w.
R12	1303	500M ohm—1/3 w.
R13	130166	150 ohm—1/3 w.
R14	130287	1200 ohm—1 w.
T1	111182	Loop antenna—complete assembly
T2	110145	Oscillator coil
T3	108140I	Input I. F.—455 kc.
T4	108141D	Output I. F.—455 kc.
T5	105104	Output Transformer
T6	114201	5" P. M. Speaker
L1	12311	Loading coil
S1		On-off switch on volume control
P1	107249	Pilot light bulb T47

FOR TUNER DATA, SEE INDEX

BELMONT RADIO CORP.

MODEL 534

Power Consumption - - - - - - 35 Watts

Power Output - - - 800 Milliwatts Undistorted

Sensitivity for 50 Milliwatt Output: 20 Microvolts Average

Selectivity - 65 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range - - - - - - 535 to 1650 KC

Intermediate Frequency - - - - - - - - 455 KC

Speaker - - - - - - - - - 5 in. P.M. Dynamic

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Conection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer—Bottom of gang (See Top View)	Oscillator	Adjust to maximum output
	1400 Kc.		(See Note "A" and "B")	Set dial at 1400 Kc.	Trimmer—Bottom of gang (See Top View)	Antenna	(See Note "A") Adjust to maximum output

Loop aerial should be connected when aligning receiver.

NOTE "A"—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 "B"—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 695

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.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 12SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 17 Mc.	Trimmer C8	Short Wave oscillator	Adjust to signal
	17 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 6 Mc.	Trimmer C12	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 12SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C9	Broadcast oscillator	Adjust to signal
	1400 Kc.	200 mmf.	External Antenna and B—	Broadcast	Set Dial at 1400 K. C.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and B—	Broadcast	Set Dial at 600 K. C.	Trimmer C11 (See Top View)	Broadcast Series Pad	Adjust to maximum output (See Note "A")

The loop antenna should be connected to the radio when making all adjustments—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected.

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 - - - - - - 35 Watts

Power Output - - - - 900 Milliwatts Undistorted

Sensitivity for 50 Milliwatt Output - 15 Microvolts Average

Selectivity - 46 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range

Broadcast - - - 540 to 1600 KC

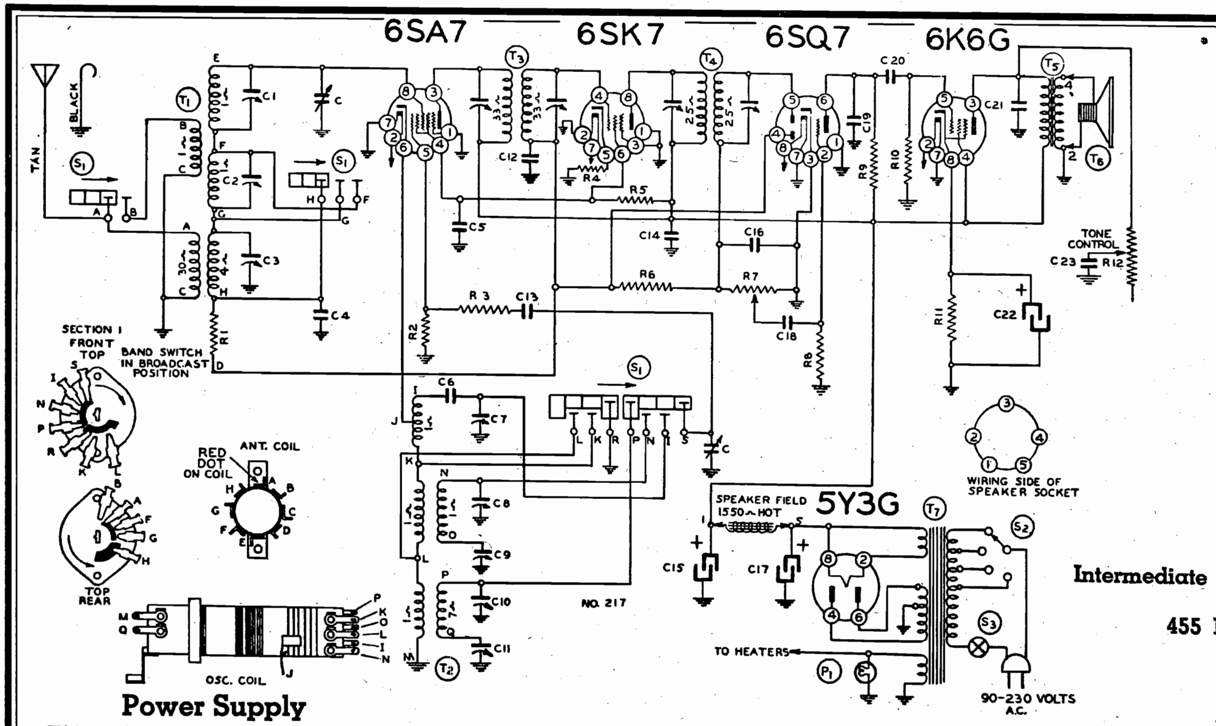
Shortwave - - - 5.6 to 18.3 MC

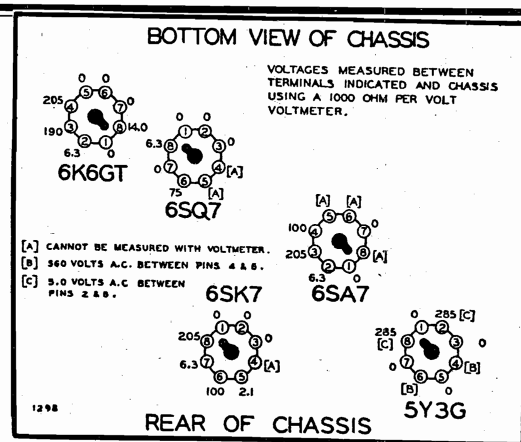
Intermediate Frequency - - - - - - - 455 KC

Speaker - - - - - - - 5 in. P.M. Dynamic

BELMONT RADIO CORP.

MODEL 542
Series A





Intermediate Frequency

455 KC

Power Supply

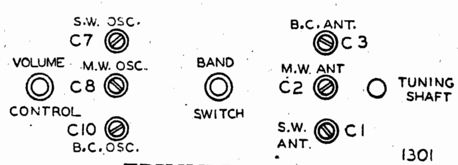
This radio is equipped with a universal transformer, 40 to 60 cycles which has the following taps: 90-110-130-150-230 volts.

A rotary switch mounted on top of the transformer selects the proper voltage tap.

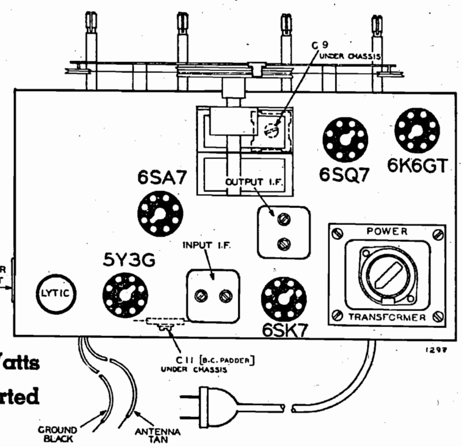
Set the switch for various line voltages to conform with the following table:

90 mark for current of 85 to 105 volts
110 mark for current of 105 to 125 volts
130 mark for current of 125 to 145 volts
150 mark for current of 145 to 165 volts
230 mark for current of 210 to 250 volts

To set the switch, unloosen the set screw on the side of the switch and rotate the knob so that the mark desired shows up in the small framed window on the top of the switch. Tighten the set screw.



TRIMMER VIEW



MODEL 542 SERIES A

Power Consumption - - 55 Watts
Power Output - 1½ Watts Undistorted
Tuning Frequency Range
Broadcast Band - 540 to 1735 KC
Medium Band - - - 2.2 to 7 MC
Short Wave Band - - 6.6 to 23 MC

BRC.—Form No. 5152—1M—12-40
PRO. 280

Circuit Diagram Ref. No.	Part No.	
		RESISTORS
R1	13011	250M ohm—⅓ w.
R2	130194	35M ohm—⅓ w.
R3	130299	10 ohm—⅓ w.
R4	130239	250 ohm—⅓ w.
R5	130242	12M ohm —1 watt
R6	1304	3 megohm—⅓ w.
R7	101208	1 megohm volume control
R8	130223	10 megohm—⅓ w.
R9	13011	250M ohm—⅓ w.
R10	13019	1 megohm—⅓ w.
R11	13070	500 ohm—⅓ w.
R12	101237	Tone control
		CONDENSERS
C	102124	Two Gang Variable Condenser
C1	124124	S. W. Antenna Trimmer
C2	124124	M. W. Antenna Trimmer
C3	124124	B. C. Antenna Trimmer
C4	1009	.05 x 200 v.
C5	1001	.1 x 400 v.
C6	129153	006—S. W. Padder (Set at Factory)
C7	124123	S. W. Oscillator Trimmer
C8	124123	M. W. Oscillator Trimmer
C9	129154	.0025 M. W. Padder
C10	124123	B. C. Oscillator Trimmer
C11	129155	B. C. Padder
C12	10026	.02 x 400 v.
C13	1295	.0001 Mica
C14	1001	.1 x 400 v.
C15	119103	40 mfd. lytic
C16	1295	.0001 Mica
C17	119103	10 mfd. lytic
C18	10025	.002 x 600 v.
C19	1292	.0005 Mica
C20	10026	.02 x 400 v.
C21	10071	.004 x 600 v.
C22	119103	20 mfd. lytic x 25 w.v.
C23	10013	.05 x 400 v.
		C15, C17 and C22 in same unit
		PARTS
T1	111169	Antenna Coil
T2	110143	Oscillator Coil
T3	108169H	Input I. F.
T4	108170C	Output I. F.
T5	10575C	Output Transformer
T6	114176	6" Dynamic Speaker (1550 ohm field) 40-60 cycles
T7	104193B	Power Transformer 90-230 volts
S1	125105	Band Switch
S2		Voltage Switch on Power Transformer
S3		Volume Control—On-Off switch
P1	10794	Pilot Light Bulb T-44
	101237	Tone Control

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., 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.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Chassis View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Chassis View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C7) (See Trimmer View)	Short wave oscillator	See Note "A" Adjust to maximum output
	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C1) (See Trimmer View)	Short wave antenna	Adjust to maximum output
MEDIUM WAVE BAND	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 MC	Trimmers (C8, C2) (See Trimmer View)	Medium wave oscillator and antenna	Adjust to maximum output
	2.3 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 2.3 MC	Trimmer (C9) (See Chassis View)	Medium wave osc. series pad	Adjust to maximum rock dial. (See note "B")
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Trimmer (C10) (See Trimmer View)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer (C3) (See Trimmer View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C11) (See Chassis View)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "B")

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

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

MODEL 542—SERIES A

The loop antenna should be connected to the radio when making all R. F. adjustments.

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

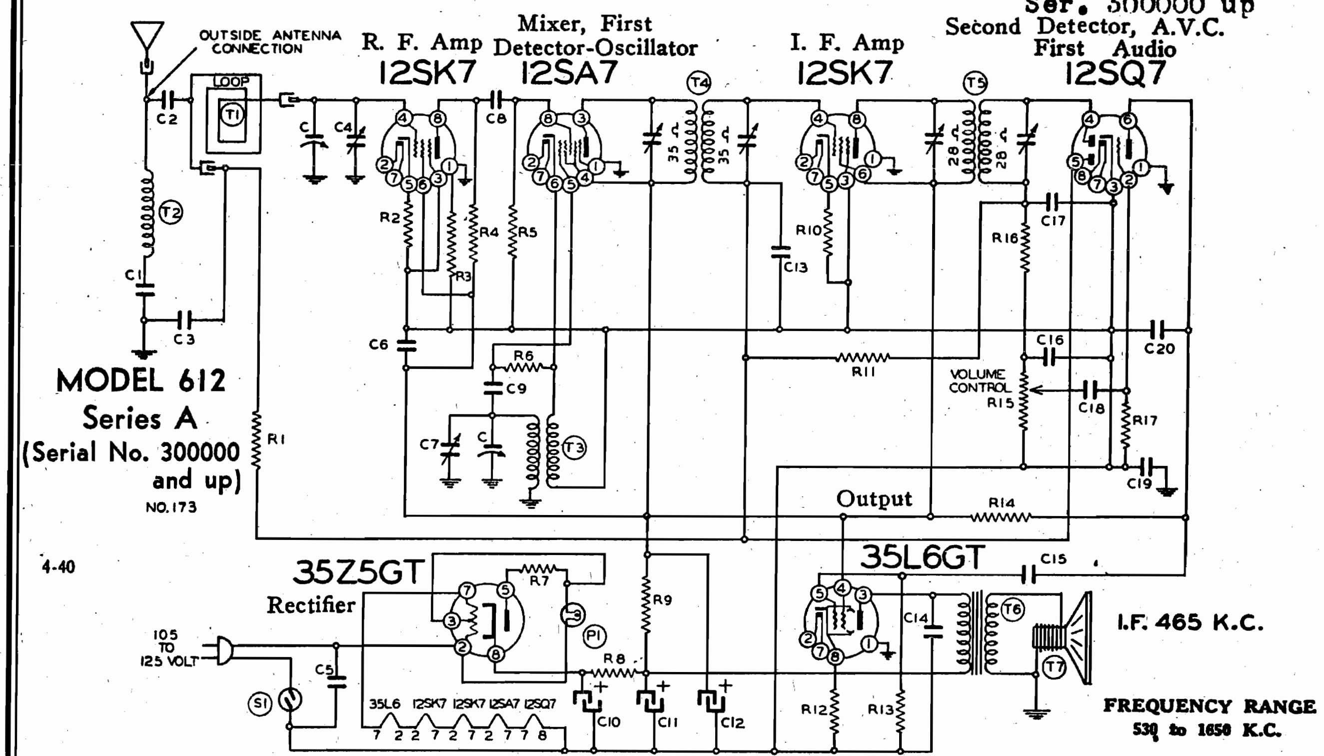
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
After each band is completed, repeat the procedure as a final check.

Model 681—SERIES A

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.	455 Kc.	.1 MFD	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmers on top (See Chassis View)	Input and Output I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Chassis View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C6 (See Chassis View)	Broadcast oscillator series pad	Adjust to maximum output and rock dial (See note "A")

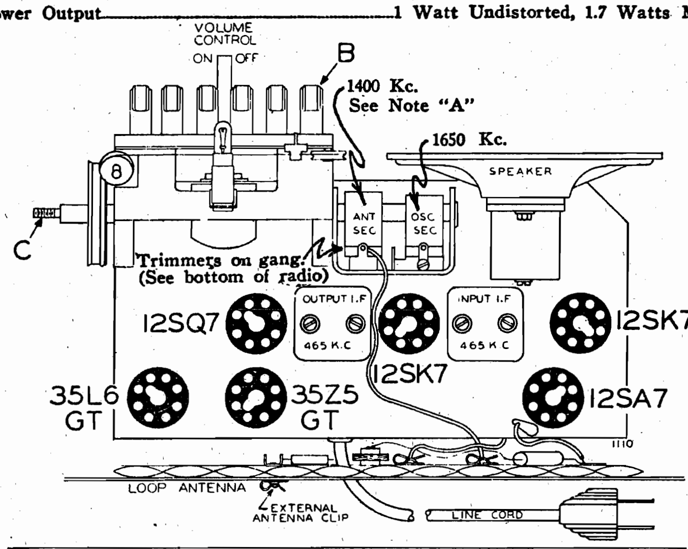
BELMONT RADIO CORP.

MODEL 612, Series A
Ser. 300000 up



Power Consumption..35 Watts

Power Output..1 Watt Undistorted, 1.7 Watts Maximum

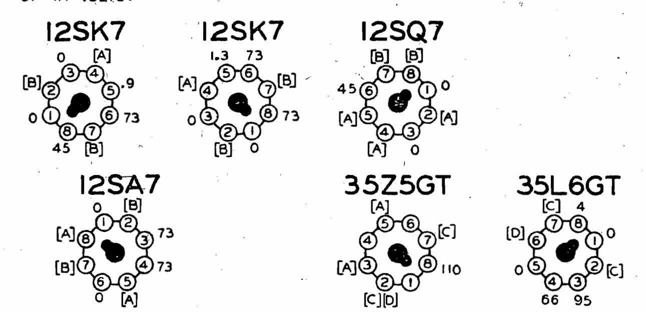


For Tuner Data see Index

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B— WITH A LINE VOLTAGE OF 117 VOLTS.

[A] CANNOT BE READ WITH VOLTMETER.
[B] 12 VOLTS A.C. BETWEEN PINS B & B.
[C] 32 VOLTS A.C. BETWEEN PINS 2 & 7.
[D] 117 VOLTS A.C BETWEEN PINS D & D.



REAR OF CHASSIS

NO 1111

For Conv. Align. see Spec. Sec. Vol. VIII

Diagram Ref.	Part No.	Description
		RESISTORS
R1	130100	150M ohms—⅓ w.
R2	130168	100 ohms—⅓ w.
R3	130100	150M ohms—⅓ w.
R4	130218	5M ohms—⅓ w.
R5	13020	100M ohms—⅓ w.
R6	13094	50M ohms—⅓ w.
R7	130215	25 ohms—½ w.
R8	130296	200 ohms—1 watt
R9	130287	1200 ohms—1 watt
R10	130166	150 ohm—⅓ w.
R11	1304	3 megohm—⅓ w.
R12	130166	150 ohm—⅓ w.
R13	1303	500M ohm—⅓ w.
R14	1309	200M ohm—⅓ w.
R15	101211	1 megohm—volume control and switch
R16	13012	50M ohm—⅓ w.
R17	130257	5 megohm—⅓ w.
		CONDENSERS
C	102116	Two gang variable condenser
C1	10011	.01 x 400 v.
C2	129132	.000125 mica
C3	10026	.02 x 400 v.
C4		B.C. Antenna Trimmer
C5	1001	.1 x 400 v.
C6	1006	.25 x 200 v.
C7		B.C. Oscillator Trimmer
C8	1295	.0001 mica
C9	1295	.0001 mica
C10	11994	40 ufd.—150 w.v. lytic
C11	11994	20 ufd.—150 w.v. lytic
C12	11994	20 ufd.—150 w.v. lytic
C13	1009	.05 x 200 v.
C14	10026	.02 x 400 v.
C15	100106	.004 x 600 v.
C16	12939	.00005 mica
C17	1295	.0001 mica
C18	10025	.002 x 600 v.
C19	100110	.2 x 400 v.
C20	1295	.0001 mica
		C10, C11, C12 are in same unit
		PARTS
T1	111145	Loop Antenna Assembly
T2	1237	Loading Coil
T3	110128	Oscillator Coil
T4	108140G	Input I.F. Coil—465 kc.
T5	108145C	Output I.F. Coil—465 kc.
T6	10595B	Output Transformer
T7	114191	5" P.M. Speaker
S1		On-off switch
P1	107249	T-47 Pilot light

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.

MODELS 534, 612, 638, 642, 678C, 794, 796, 797

BELMONT RADIO CORP.

PROCEDURE FOR SETTING THE AUTOMATIC TUNER PUSH BUTTONS

MODELS 612 ,638,794,796,797,642,534

1. Make a list of six stations you tune in regularly. There are six push buttons on the front of the radio by means of which six stations may be tuned automatically. (See "B," Fig. 2.)

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

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 push buttons.

3. Stations may be set up in any sequence desired. Press any one of the automatic tuner push buttons down all the way.

4. Hold the push button down **firmly**, and tune set **very carefully** to station desired, until station is heard clearly and with maximum volume.

Release the push button.

5. Press down another automatic tuner push button. Hold it down FIRMLY and carefully tune in next station desired. Release this push button.

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

6. Now rotate the tuning knob to the right (clockwise) as far as it will turn, and with a screwdriver tighten the special locking screw ("C")

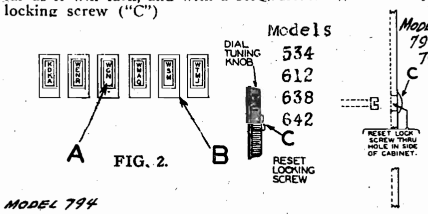


FIG. 2.

MODEL 794

Looking at the back of the cabinet note the **locking screw "C"** on the left hand side of the chassis.

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 push buttons. (Note: Locking screw "C" is loose when radio is shipped from factory.)

CHANGING STATIONS:

If you should desire to change any station you have selected to another, loosen the locking screw "C" one or two turns. Hold in push button on which the station is to be changed and tune in new station desired. Release the push button. (Note: If the dial mechanism works hard when setting up a new station for one of the automatic tuner buttons, it is due to the locking screw being too tight. **Loosen the locking screw "C" until the dial mechanism works freely with the tuner push button pressed in.**

Be sure to retighten the locking screw, otherwise the stations you have previously selected will not stay adjusted **to** the push buttons.

The set is now set up for automatic tuning.

MODEL 678C

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 the **pushbutton release pin** on the bottom of the tuner unit. This will trip the latching mechanism and all the **pushbuttons** will be **released to out position,** (See Fig. 2A).
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 press the pushbutton release pin on the bottom of the tuner unit.**
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.)

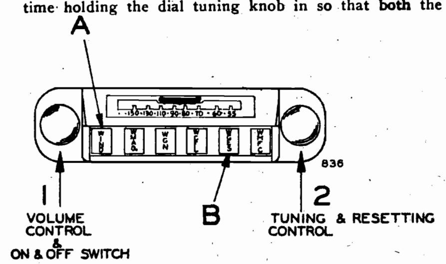


Fig. 2—Front View of Remote Tuner Unit

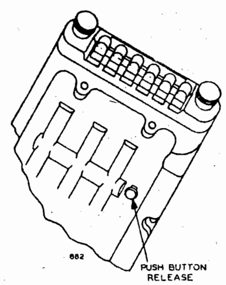
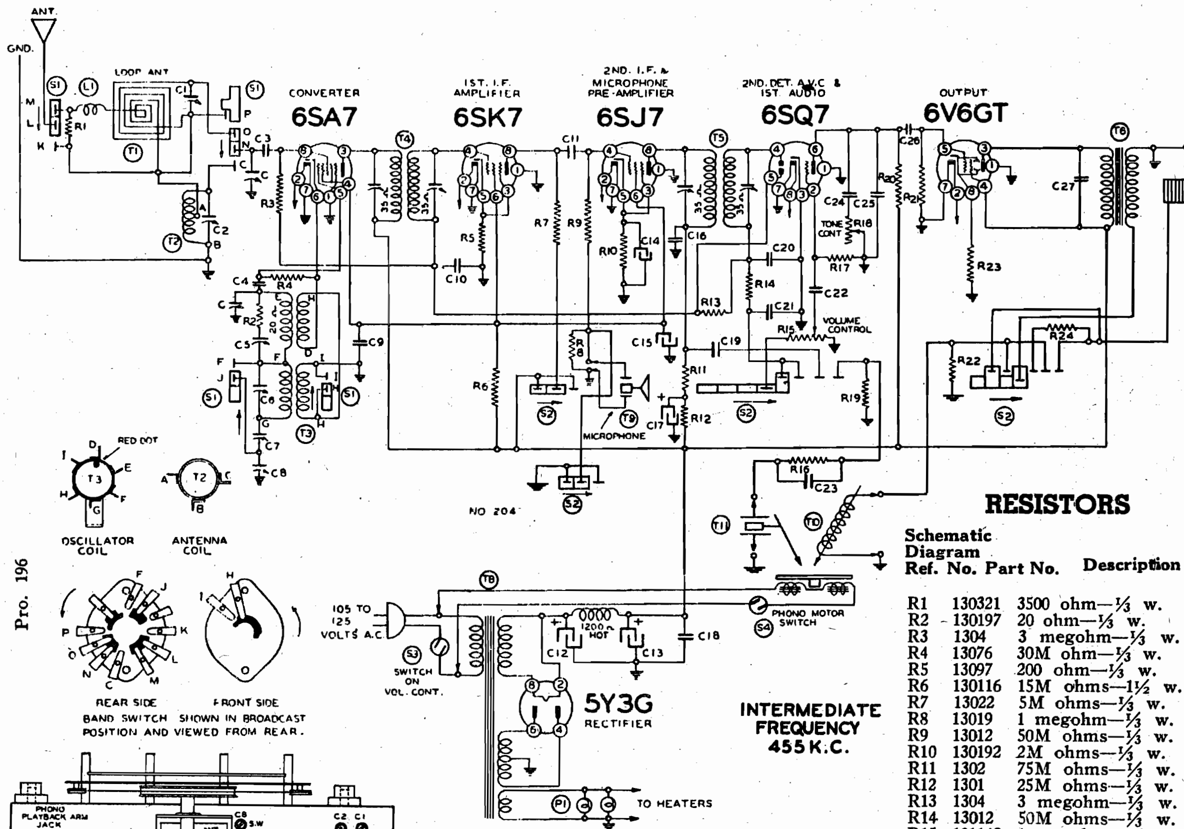


Fig. 2A—

Bottom View of Remote Tuner Unit Showing Push Button Release Pin.

BELMONT RADIO CORP.

MODEL 616
Series A



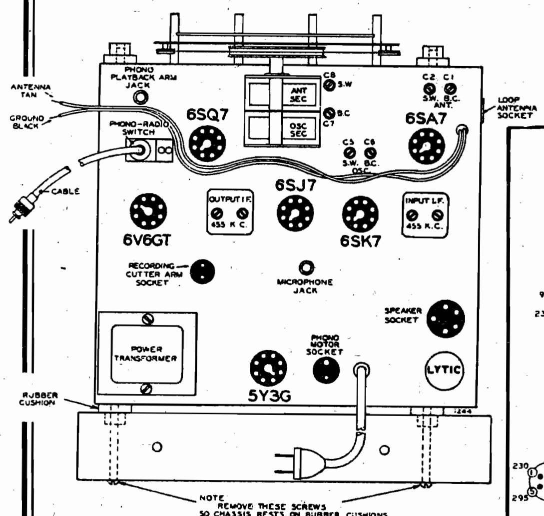
BRC. Series A—Form 6265—1M 8-40

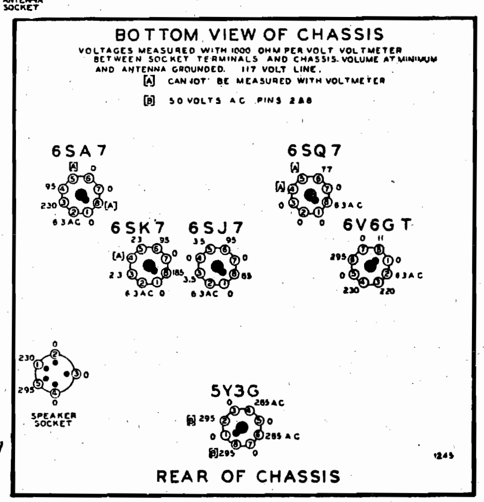
Pro. 196

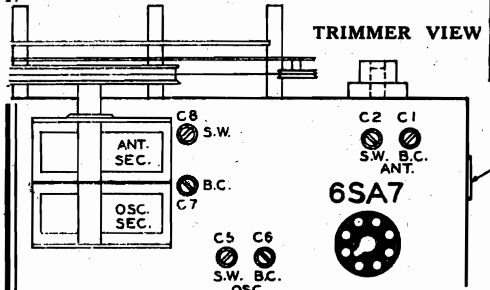
FOR PHONO & RECORDER DATA SEE INDEX

RESISTORS

Schematic Diagram Ref. No.	Part No.	Description
R1	130321	3500 ohm—1/3 w.
R2	130197	20 ohm—1/3 w.
R3	1304	3 megohm—1/3 w.
R4	13076	30M ohm—1/3 w.
R5	13097	200 ohm—1/3 w.
R6	130116	15M ohms—1½ w.
R7	13022	5M ohms—1/3 w.
R8	13019	1 megohm—1/3 w.
R9	13012	50M ohms—1/3 w.
R10	130192	2M ohms—1/3 w.
R11	1302	75M ohms—1/3 w.
R12	1301	25M ohms—1/3 w.
R13	1304	3 megohm—1/3 w.
R14	13012	50M ohms—1/3 w.
R15	101142	1 megohm volume control
R16	13028	750M ohm—1/3 w.
R17	130257	5 megohm—1/3 w.
R18	101143	Tone control
R19	13019	1 megohm—1/3 w.
R20	13011	250M ohm—1/3 w.
R21	1303	500M ohm—1/3 w.
R22	130322	10 ohm—1 w.
R23	130323	270 ohm—1 w.
R24	130203	40 ohm—1/3 w.







C1 and C2 in one unit C5 and C6 in one unit
C7 and C8 in one unit
C12, C13, C14 and C15 in one unit
C20 and C21 in one unit

S1	125126	Band Switch
S2	125134	Phono radio switch
S3		On-off switch on volume control
S4	12577	Phono motor switch
L1	12312	R.F. Choke Coil
P1	10794	2 Pilot light bulbs T44

CONDENSERS

C	102135	2 gang variable condenser
C1	124127	B.C. Antenna trimmer
C2	124127	S.W. Antenna trimmer.
C3	1292	.0005 mica
C4	12960	.00015 mica
C5	124112	S.W. Oscillator trimmer
C6	124112	B.C. Oscillator trimmer
C7	124146	B.C. Oscillator series padder
C8	124146	S.W. Oscillator series padder
C9	10013	.05 x 400 v. condenser
C10	1009	.05 x 200 v. condenser
C11	12921	.0002 mica
C12	119114	15 mfd. x 400 v. lytic
C13	119114	15 mfd. x 400 v. lytic
C14	119114	20 mfd. x 25 volt lytic
C15	119114	10 mfd. x 300 v. lytic
C16	1292	.0005 mica
C17	11967	8 mfd. x 450 v. lytic
C18	1001	.1 x 400 v. condenser
C19	10011	.01 x 400 v. condenser
C20	129161	.0001 mica
C21	129161	.0001 mica
C22	10012	.003 x 600 v. condenser
C23	1292	.0005 mica
C24	10089	.008 x 800 v.
C25	12912	.00025 mica
C26	10026	.02 x 400 v.
C27	10011	.01 x 400 v.

PARTS

T1	111211	Loop Antenna Assembly
T2	111184	S.W. Antenna Coil
T3	110163	B.C. S.W. Oscillator Coil
T4	108169D	Input I.F. Coil complete—455 kc.
T5	108106T	Output I.F. Coil complete—455 kc.
T6	105118	Output Transformer
T7	114218	8 in. dynamic speaker
T8	104225	Power Transformer
T9	114214	Microphone and Cable
T10	104230B	Recording and playback unit complete 60 cycle
T11	104235B	Recording and playback unit complete 50 cycle
		Phono Pickup arm

Power Consumption Radio Only - - - - - 70 Watts
Motor Only - - - - - 40 Watts

Power Output - - - - - - - - 2.1 Watts Undistorted

Sensitivity for 500 Milliwatt Output: 15 Microvolts Average

Selectivity - 51 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range Broadcast Band - 535 to 1600 KC

Shortwave Band - 5.46 to 18.3 MC

Speaker - - - - - - - - - 8 in. Electro Dynamic

MODELS 616, 671

BELMONT RADIO CORP.

- Volume control—Maximum all adjustments.
- Connect radio ground 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., 400 ohms.

MODEL 671

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.	455 Kc.	.1 MFD	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Trimmers on top (See Top View)	Input and Output I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	530 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C6	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C6 (See Top View)	Broadcast oscillator series pad	Adjust to maximum output

SEE NOTES BELOW

MODEL 616

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.	455 Kc.	.1 MFD.	Grid of 6SJ7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Chassis View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Chassis View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External tenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C5	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C8	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C6	Broadcast oscillator	Adjust to maximum output
	535 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C7	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Chassis View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C7 (See Chassis View)	Broadcast oscillator series pad	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND" leads when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the Broadcast Band oscillator end frequencies, (1600 and 535 K. C.). 530 KC ON MODEL 671

The loop antenna should be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." terminals.

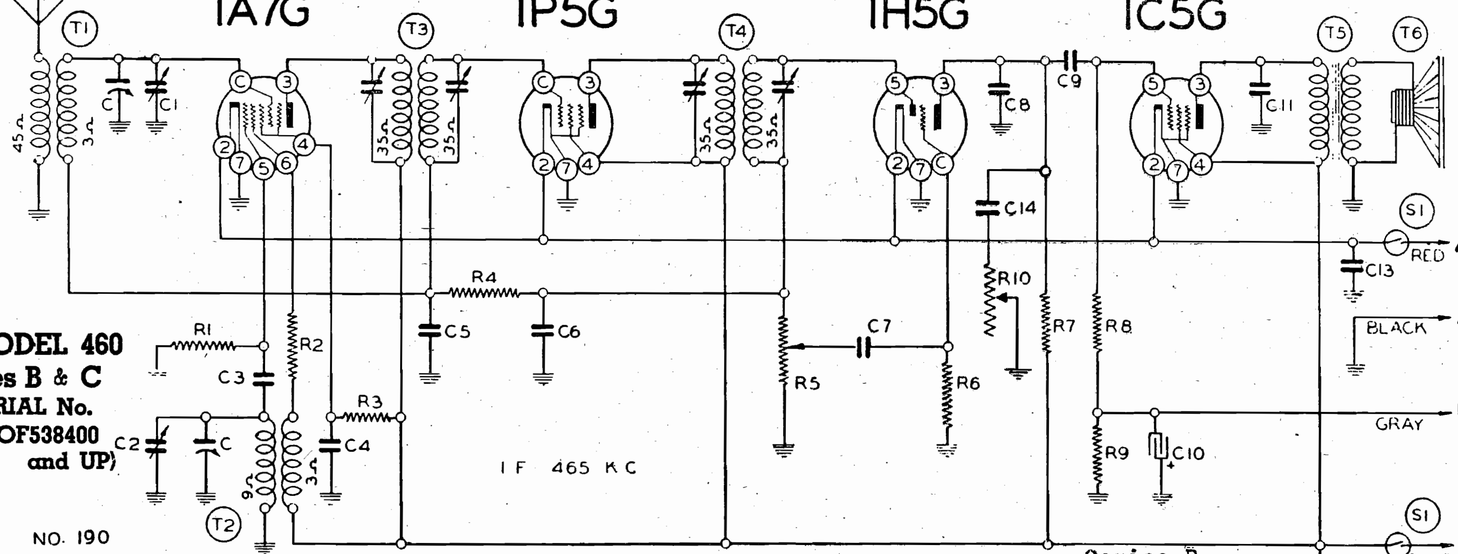
NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

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.

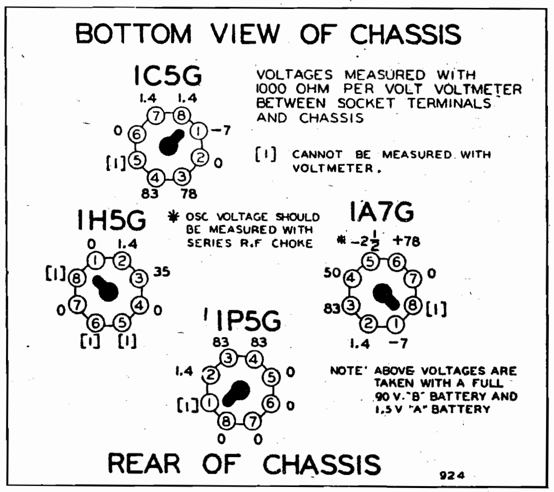
MODEL 460
Series B and C
Ser. No. OF538400

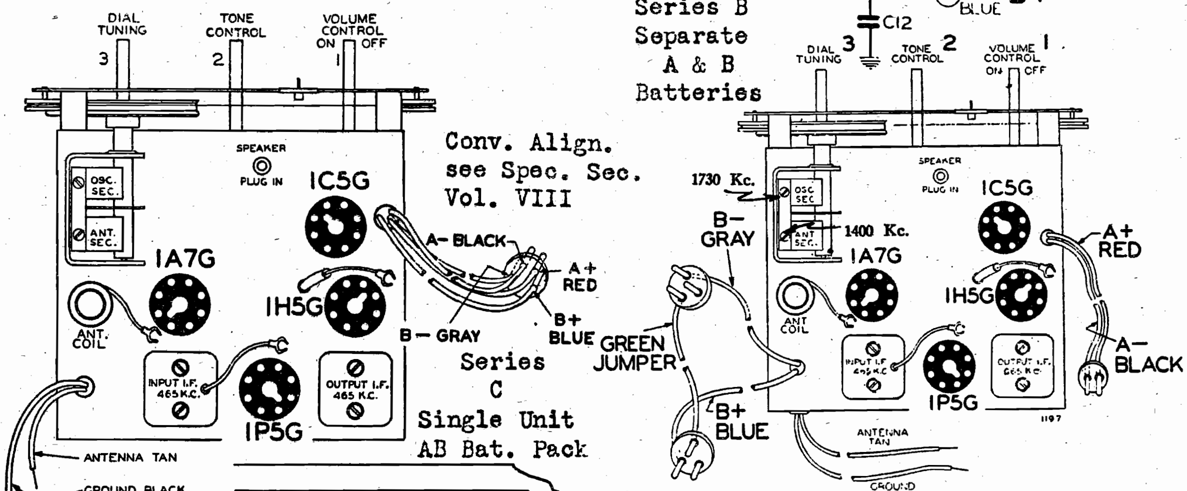
BELMONT RADIO CORP.



MODEL 460
Series B & C
(SERIAL No. OF538400 and UP)

NO. 190

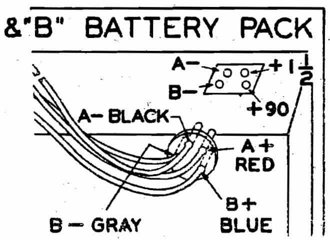




Conv. Align. see Spec. Sec. Vol. VIII

Series C
Single Unit
AB Bat. Pack

Series B
Separate
A & B
Batteries



Ref. No.	Part No.	RESISTORS
R1	130266	200M ohm—⅓ w.
R2	13018	4M ohm—⅓ w.
R3	1307	40M ohm—⅓ w.
R4	1304	3 megohm—⅓ w.
R5	101175	1 megohm volume control
R6	130257	5-megohm—⅓ w.
R7	1303	500M ohm—⅓ w.
R8	13019	1 megohm—⅓ w.
R9	130200	700 ohm—⅓ w.
R10	101119	Tone Control (1 Megohm)

		CONDENSERS
C	102110	2 gang variable condenser
C1		Antenna Trimmer on gang
C2		Oscillator trimmer on gang
C3	12912	.00025 mica
C4	1009	.05 x 200 v.
C5	1009	.05 x 200 v.
C6	1295	.0001 mica
C7	10012	.003 x 600 v.
C8	1295	.0001 mica
C9	10011	.01 x 400 v.

		PARTS
T1	111132	Antenna Coil
T2	110122	Oscillator Coil
T3	108151B	Input I. F. - 465 kc.
T4	108153	Output I. F. - 465 kc.
T5	10591	Output Transformer
T6	114166	5 in. P. M. Speaker
S1		Off-on switch on Volume control
C10	11975	10 mfd. x 25 w. v.
C11	10012	.003 x 600 v.
C12	10064	.25 x 200 v.
C13	10020	.1 x 200 v.
C14	10025	.002 x 600 v.

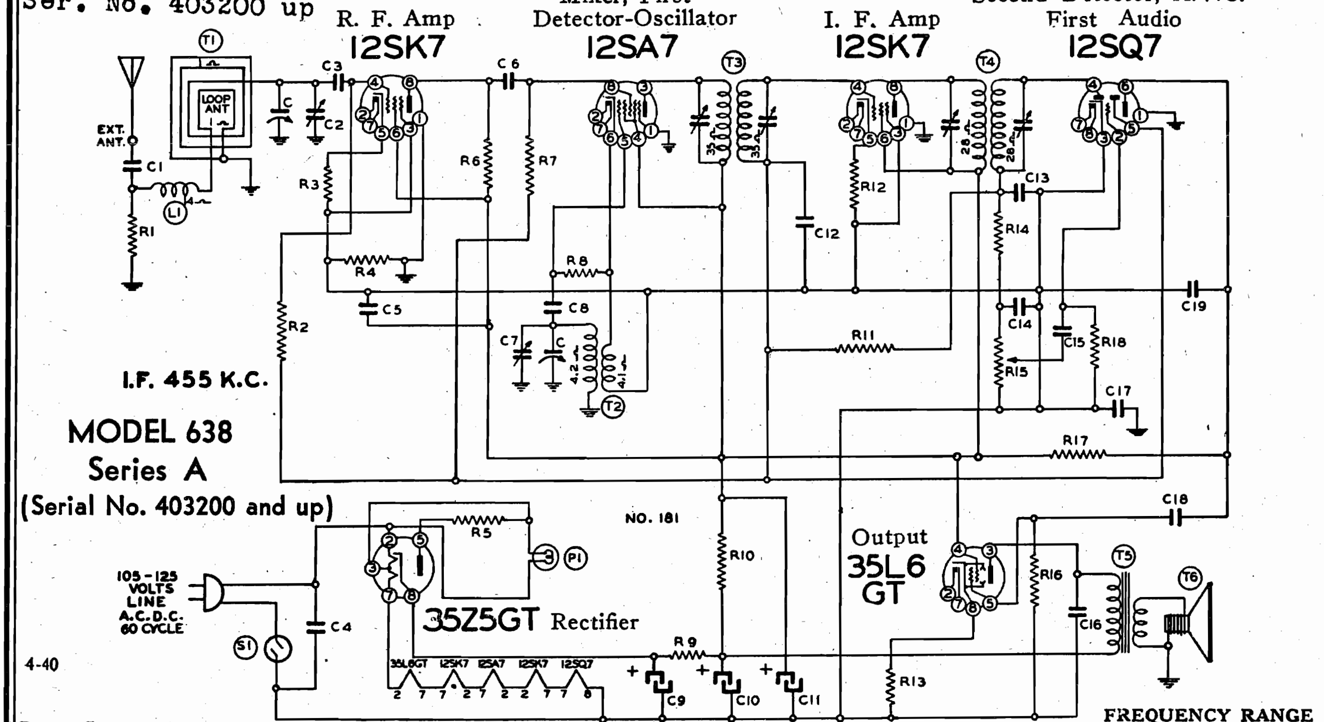
Power Output
150 Milliwatts Undistorted,
270 Milliwatts Maximum

AUGUST 1940

FREQUENCY RANGE
535 to 1730KC.

MODEL 638
Series A
Ser. No. 403200 up

BELMONT RADIO CORP.

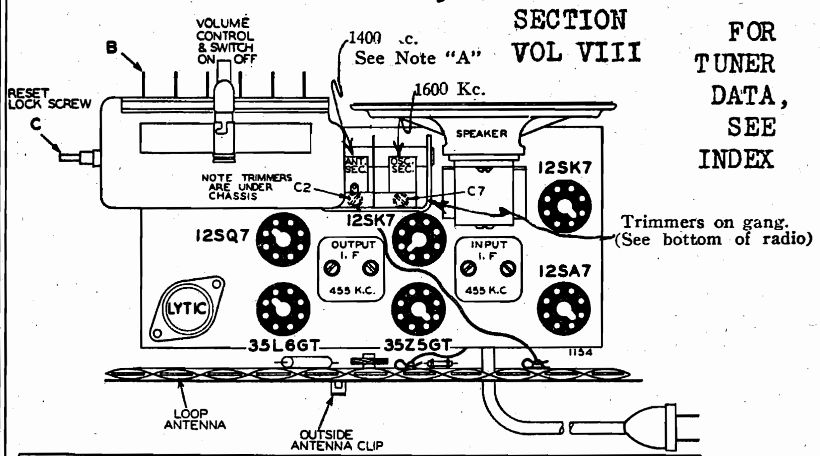


FREQUENCY RANGE
540 to 1600 K.C.

Power Consumption .... 35 Watts

Power Output .... 1 Watt Undistorted, 1.5 Watts Maximum

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOL VIII FOR TUNER DATA, SEE INDEX

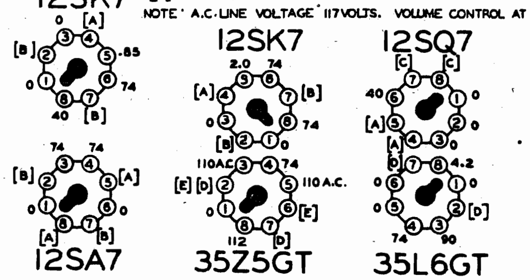


Trimmers on gang. (See bottom of radio)

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—

[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] 12 VOLTS A.C MEASURED ACROSS PINS 2 & 7.
[C] 12 VOLTS A.C MEASURED ACROSS PINS 7 & 8.
[D] 30 VOLTS A.C MEASURED ACROSS PINS 2 & 7.
[E] 117 VOLTS A.C MEASURED ACROSS PINS 2 & 8.
NOTE: A.C. LINE VOLTAGE 117 VOLTS. VOLUME CONTROL AT MINIMUM.



REAR OF CHASSIS

1156

Code No.	Part No.	Description
		RESISTORS
R1	13018	4M ohm—⅓ w.
R2	13019	1 megohm—⅓ w.
R3	130168	100 ohm—⅓ w.
R4	130100	150M ohm—⅓ w.
R5	130215	25 ohm—½ w.
R6	130218	5M ohm—⅓ w.
R7	13020	100M ohm—⅓ w.
R8	13012	50M ohm—⅓ w.
R9	130296	200 ohm—1 w.
R10	130287	1200 ohm—1 w.
R11	130170	3 megohm—⅓ w.
R12	13024	400 ohm—⅓ w.
R13	130166	150 ohm—⅓ w.
R14	13012	50M ohm—⅓ w.
R15	101218	1 megohm volume control
R16	1303	500M ohm—⅓ w.
R17	1309	200M ohm—⅓ w.
R18	130257	5 megohm—⅓ w.
		CONDENSERS
C	102116	2 gang variable condenser
C1	10025	.002 x 600 v.
C2		B. C. Antenna Trimmer on Gang Con.
C3	1292	.0005 Mica
C4	1001	.1 x 400 v.
C5	1006	.25 x 200 v.
C6	1295	.0001 mica
C7		B. C. Oscillator Trimmer on Gang Con.
C8	1295	.0001 mica
C9	11994	40 mfd. lytic x 150 w. v.
C10	11994	20 mfd. lytic x 150 w. v.
C11	11994	20 mfd. lytic x 150 w. v.
C12	1009	.05 x 200 v.
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10025	.002 x 600 v.
C16	10026	.02 x 400 v.
C17	100110	.2 x 400 v.
C18	100106	.004 x 600 v.
C19	1295	.0001 mica

C9, C10, C11 are in same unit
C13, C14 are in same unit

Code No.	Part No.	Description
		PARTS
T1	111180	Loop Antenna complete
T2	110152	Oscillator Coil
T3	108140H	Input I. F. Coil—455 Kc.
T4	108145	Output I. F. Coil—455 Kc.
T5	105104	Output Transformer
T6	114197	5" P. M. Speaker
L1	12310	Loading Coil
S1		On-off switch on volume control
P1	107249	T47 Pilot light bulb

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.

MODEL 642

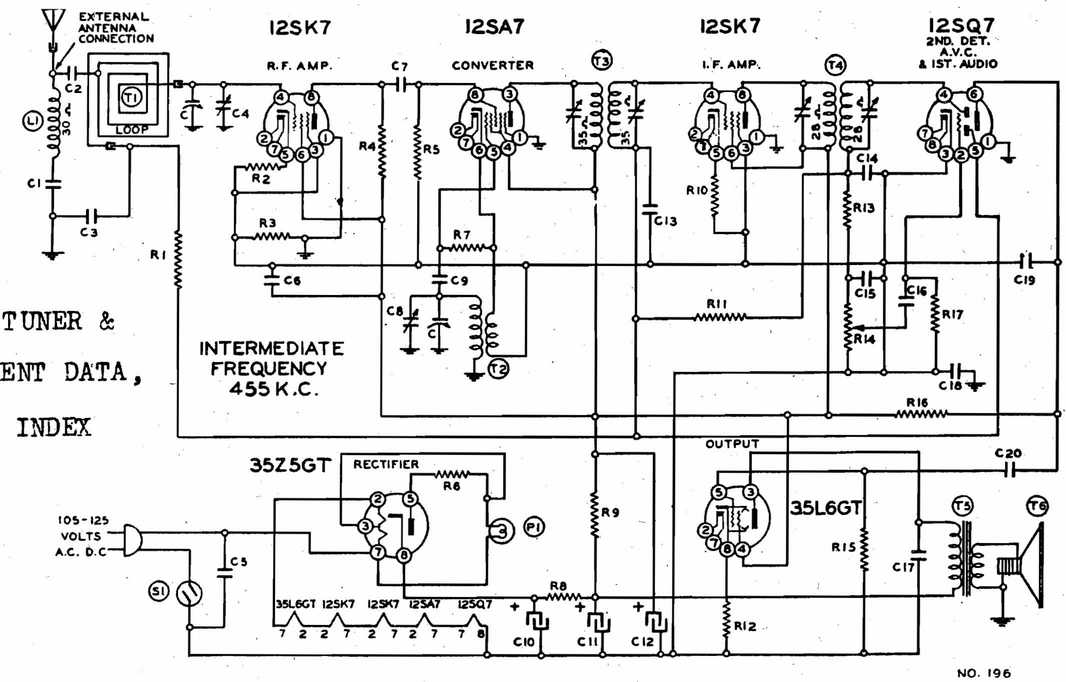
BELMONT RADIO CORP.

Six-Tube A.C.-D.C. Superheterodyne Receiver with Automatic Tuning and Self-Contained Loop Antenna

JUNE 1940

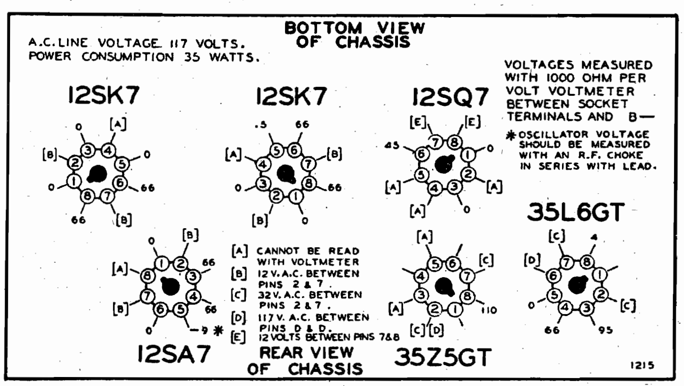
Frequency Range—535 - 1600 Kilocycles

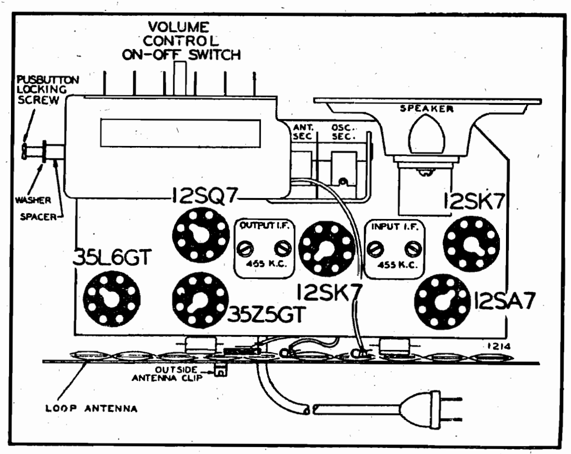
I. F. Frequency 455 Kc.



FOR TUNER & ALIGNMENT DATA, SEE INDEX

Receivers of this model which are to be used on voltages other than 105-125 volts A. C. (50/60 cycle), or 105-125 volts D. C. are so marked. The power consumption of this receiver is 35 watts.





REAR VIEW OF CHASSIS

RESISTORS

Code No.	Part No.	Description
R1	130100	150M ohm—⅓ w.
R2	130168	100 ohm—⅓ w.
R3	130100	150M ohm—⅓ w.
R4	130218	5M ohm—⅓ w.
R5	13020	100M ohm—⅓ w.
R6	130215	25 ohm—½ w.
R7	13094	50M ohm—⅓ w.
R8	130296	200 ohm—1 w.
R9	130287	1200 ohm—1 w.
R10	130248	40 ohm—⅓ w.
R11	1304	3 megohm—⅓ w.
R12	130166	150 ohm—⅓ w.
R13	13012	50M ohm—⅓ w.
R14	101193	1 megohm volume control
R15	1303	500M ohm—⅓ w.
R16	1309	200M ohm—⅓ w.
R17	130257	5 megohm—⅓ w.

CONDENSERS

Code No.	Part No.	Description
C	102116	2 gang variable condenser
C1	10011	.01 x 400 v.
C2	129132	.000125 mica
C3	10026	.02 x 400 v.
C4		B.C. Antenna Trimmer
C5	1001	.1 x 400 v.
C6	1006	.25 x 200 v.
C7	1295	.0001 mica
C8		B.C. Oscillator Trimmer
C9	1295	.0001 mica
C10	11994	40 mfd.—150 w.v. lytic
C11	11994	20 mfd.—150 w.v. lytic
C12	11994	20 mfd.—150 w.v. lytic
C13	1009	.05 x 200 v.
C14	1295	.0001 mica
C15	12939	.00005 mica
C16	10025	.002 x 600 v.
C17	10026	.02 x 400 v.
C18	100110	.2 x 400 v.
C19	1295	.0001 mica
C20	100106	.004 x 600 v.

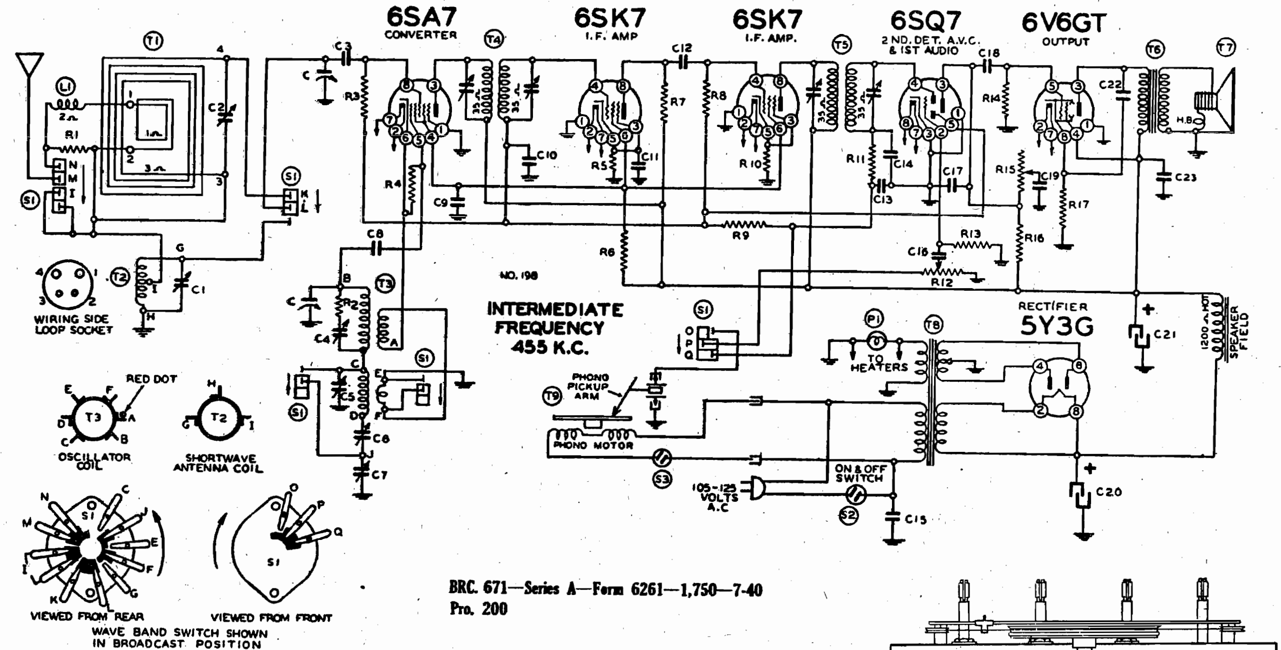
C10, C11 and C12 are in same unit

PARTS

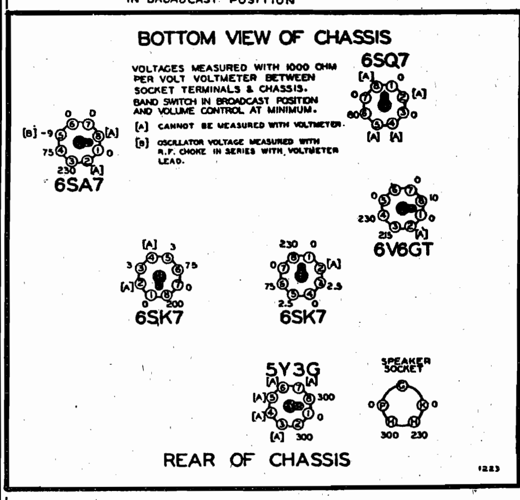
Code No.	Part No.	Description
T1	111145	Loop Antenna Assembly
T2	110128	Oscillator Coil
T3	108140G	Input I.F. Coil—465 kc.
T4	108145C	Output I.F. Coil—465 kc.
T5	10595B	Output Transformer
T6	114174	5" P.M. Speaker
L1	1237	Loading Coil
S1		On-off switch on volume control
P1	107249	Pilot light T47

MODEL 671
Series A

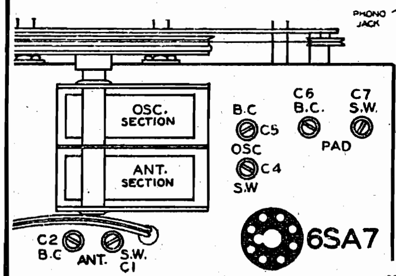
BELMONT RADIO CORP.



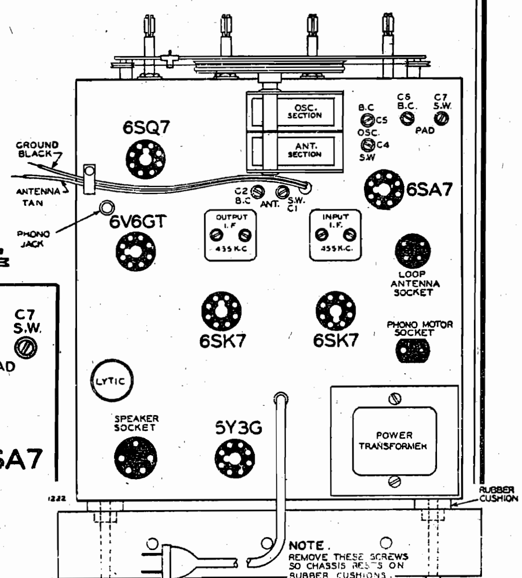
BRC. 671—Series A—Form 6261—1,750—7-40
Pro. 200



FOR AUTOMATIC RECORD-CHANGER DATA, SEE INDEX



TRIMMER VIEW



Power Consumption	
Radio Only	70 Watts
Motor Only	20 Watts

Power Output - - - - - - - - 2.1 Watts Undistorted

Sensitivity for 500 Milliwatt Output: 15 Microvolts Average

Selectivity - 51 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range Broadcast Band - 530 to 1600 KC
Shortwave Band - 5.46 to 18.3 MC

Intermediate Frequency - - - - - - - - - 455 KC

Speaker - - - - - - - - - 8 in. Electro Dynamic

Code No.	Part No.	Description
		RESISTORS
R1	13071	4000 ohm—1/3 w.
R2	130128	20 ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130236	30M ohm—1/3 w.
R5	130283	750 ohm—1/3 w.
R6	130324	18M ohm—1 watt
R7	130218	5M ohm—1/3 w.
R8	13020	100M ohm—1/3 w.
R9	130170	3 megohm—1/3 w.
R10	130222	350 ohm—1/3 w.
R11	13012	50M ohm—1/3 w.
R12	101232	1 megohm volume control
R13	130223	10 megohm—1/3 w.
R14	1303	500M ohm—1/3 w.
R15	101231	1 megohm tone control
R16	130172	250M ohm—1/3 w.
R17	130323	270 ohm—1 watt
		CONDENSERS
C	102137	Two gang variable cond
C1	124149	S. W. Antenna trimmer
C2	124149	B. C. Antenna trimmer
C3	1292	.0005 mica
C4	124142	S. W. Oscillator trimmer
C5	124142	B. C. Oscillator trimmer
C6	124146	B. C. Padding Condenser
C7	124146	S. W. Padding Condenser
C8	12960	150 mmfd. mica
C9	10013	.05 x 400 v.
C10	10022	.05 x 200 v.
C11	1009	.05 x 200 v.
C12	1292	.0005 mica
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10061	.02 x 600 v.
C16	10025	.002 x 600 v.
C17	12912	.00025 mica
C18	10026	.02 x 400 v.
C19	10071	.004 x 600 v.
C20	119115	16 mfd. x 400 w. v. lytic
C21	119115	16 mfd. x 400 w. v. lytic
C22	10019	.006 x 600 v.
C23	1001	.1 x 400 v.

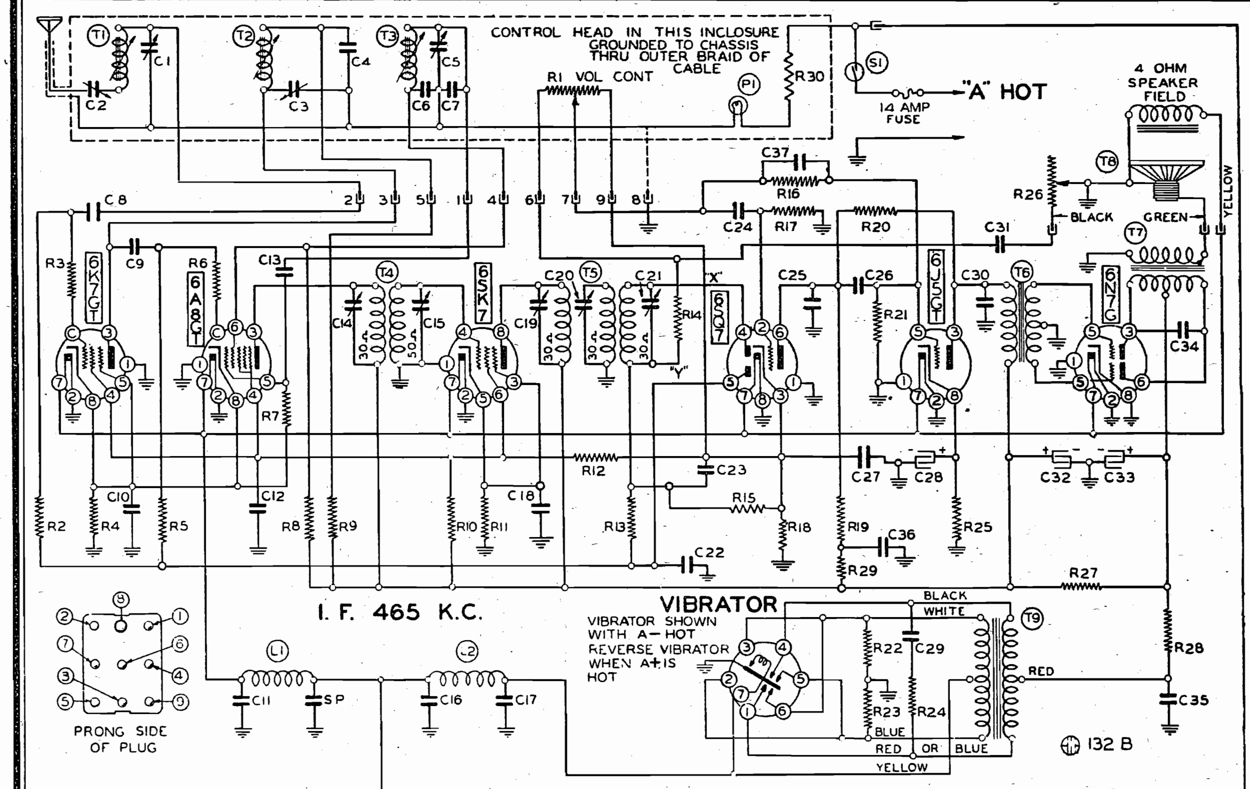
C1 and C2 are in same unit C4 and C5 in same unit
C6 and C7 are in same unit C13 and C14 in same unit
C20 and C21 are in same unit

PARTS

T1	111208	Loop antenna assembly
T2	111184	S. W. Antenna Coil
T3	110154	B. C. and S. W. Oscillator Coil
T4	108169E	Input I. F. Coil—455 kc.
T5	108106U	Output I.F. Coil—455 kc.
T6	105118	Output Transformer
T7	114216	8" Electro Dynamic Speaker
T8	104225B	60 cycle power transformer
and	104238B	25 cycle power transformer
T9	104228	60 cycle Seeburg Record Changer and Phono Assembly
and	104229	25 cycle Seeburg Record Changer and Phono Assembly
S1	125132	Phono-band switch
S2		Switch on volume control
S3		Switch on record changer
L1	12312	R. F. Choke coil
P1	10794	Pilot light bulb No. T-44

BELMONT RADIO CORP.

MODEL 678
Issue C
Ser. No.
14302 up



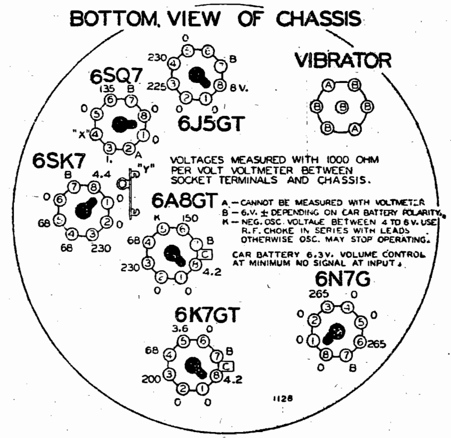


FIG. 5

CONDENSERS

C1	12483	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 Ceramicon—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	10026	.02 x 400 v.
C28	11988	20 mfd.—25 w. v. lytic
C29	100101	.0055 x 1600
C30	129114	.0003 Mica
C31	10047	.002 x 600 v.
C32	11988	15 mfd.—450 w. v. lytic
C33	11988	15 mfd.—450 w. v. lytic
C34	100103	.004 x 800 v.
C35	1001	.1 x 400 volt
C36	10013	.05 x 400 v.
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	10797	6-8 v. Pilot Light T51
S1		Off-on Switch on volume control
	1269	Vibrator (130 cycle synchronous)

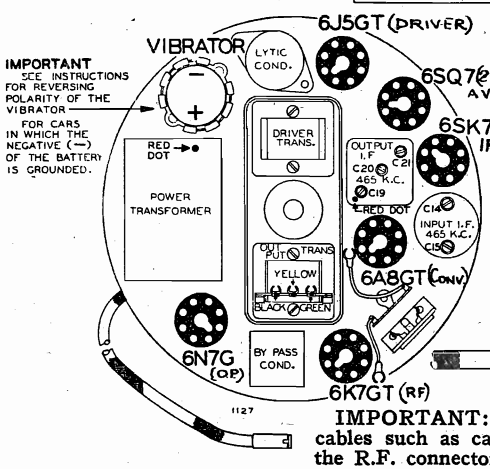


Fig. 3—Top View of Chassis

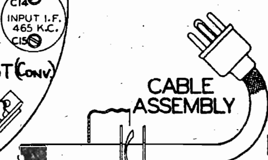
FOR TUNER DATA, SEE INDEX

Power Consumption ....7.7 Amperes at 6.3 Volts
Power Output ....7 Watts Undistorted, 9 Watts Maximum

FREQUENCY RANGE
535 to 1565 Kc.

MARCH 1940

MODEL 678, Issue C
(Serial No. 14302 and up)



IMPORTANT: Keep all battery connecting wires and cables such as cables 107313 and 107315 as far away from the R.F. connector cable (107231) as possible. This will reduce any interference which may be present in these battery wires from being radiated back into the R.F. connector cable 107231.

RESISTORS

R1	101161	1.2 megohm volume control
R2	13019	1 megohm—⅓ w.
R3	130275	500 ohm—⅓ w.
R4	13079	400 ohm—⅓ w.
R5	13019	1 megohm—⅓ w.
R6	130275	500 ohm—⅓ w.
R7	13012	50M ohm—⅓ w.
R8	13012	50M ohm—⅓ w.
R9	13021	20M ohm—⅓ w.
R10	130196	30M ohm—1 watt
R11	130235	1500 ohm—⅓ w.
R12	1307	40M ohm—⅓ w.
R13	13019	1 megohm—⅓ w.
R14	13020	100M ohm—⅓ w.
R15	130118	600M ohm—⅓ w.
R16	130257	5 megohm—⅓ w.
R17	13019	1 megohm—⅓ w.
R18	130101	600 ohm—⅓ w.
R19	13011	250M ohm—⅓ w.
R20	13038	2 megohm—⅓ w.
R21	1303	500M ohm—⅓ w.
R22	130269	100 ohm—⅓ w.
R23	130269	100 ohm—⅓ w.
R24	13071	4M ohm—⅓ w.
R25	13092	1M ohm—⅓ w.
R26	101162	1 megohm tone control
R27	130199	1500 ohm Resistor—1 watt
R28	130231	75 ohm—⅓ w.
R29	13020	100M ohm—⅓ w.
R30	130299	10 ohm—⅓ w.

MODEL 678
Issue C
Ser. No.
14302 up

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., 125 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR 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 6A8GT	Set dial at 1400 Kc.	Trimmers C14, C15 (See Fig. 3)	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"

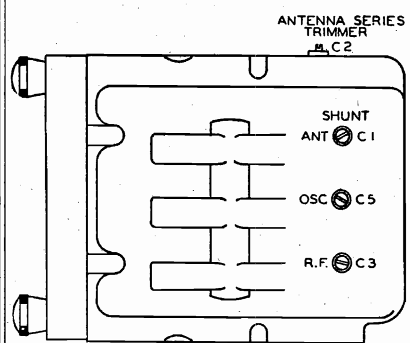


Fig. 4.—Bottom View of Remote Tuner

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:

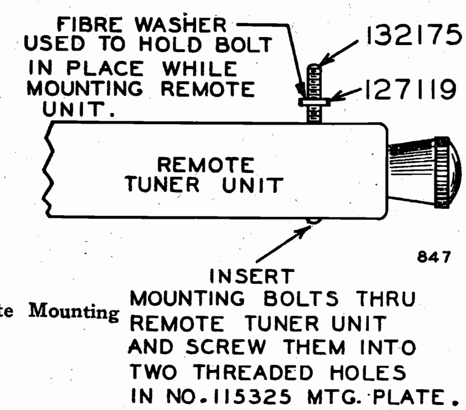
Tune in any weak station between 600 and 800 kc.

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,)

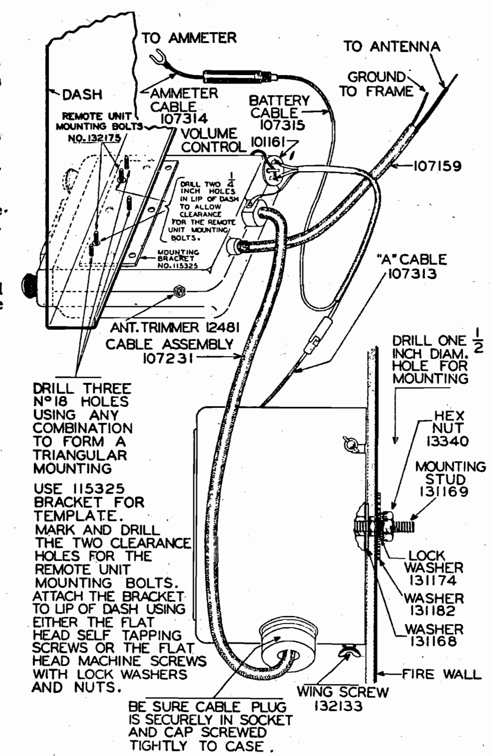
Adjust antenna series trimmer **on the side of the remote Tuner Unit.** For maximum output. (See adjustment "C2," Fig. 4,)

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.



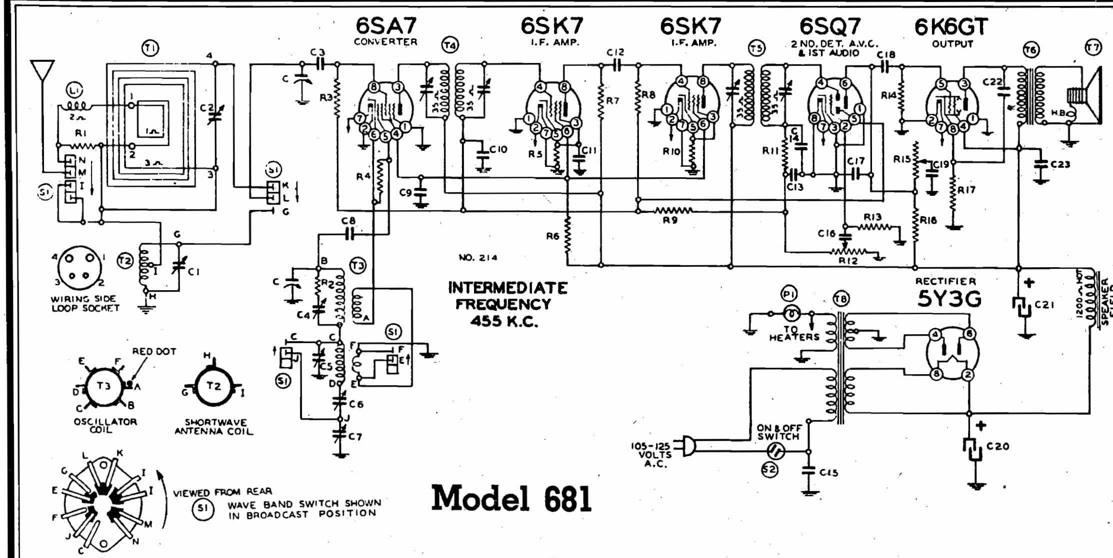
Remote Mounting

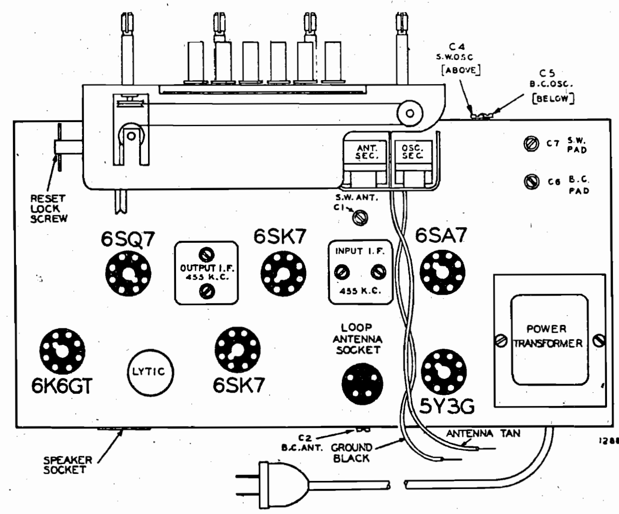


General Installation View

BELMONT RADIO CORP.

MODEL 681
Series A





Model 681

Series A

CONDENSERS

Code No.	Part No.	
C	102128	2 gang variable condenser
C1	124116	S.W. antenna trimmer
C2	124141	B.C. antenna trimmer
C3	1292	.0005 mica
C4	124142	S.W. oscillator trimmer
C5	124142	B.C. oscillator trimmer
C6	124146	B.C. padding condenser
C7	124146	S.W. padding condenser
C8	12960	150 mfd. mica
C9	10013	.05 x 400 v.
C10	1009	.05 x 200 v.
C11	1009	.05 x 200 v.
C12	1292	.0005 mica
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10061	.02 x 600 v.
C16	10025	.002 x 600 v.
C17	12912	.00025 mica
C18	10026	.02 x 400 v.
C19	10071	.004 x 600 v.
C20	119115	16 mfd. x 400 w.v. lytic
C21	119115	16 mfd. x 400 w.v. lytic
C22	10019	.006 x 600 v.
C23	1001	.1 x 400 v.

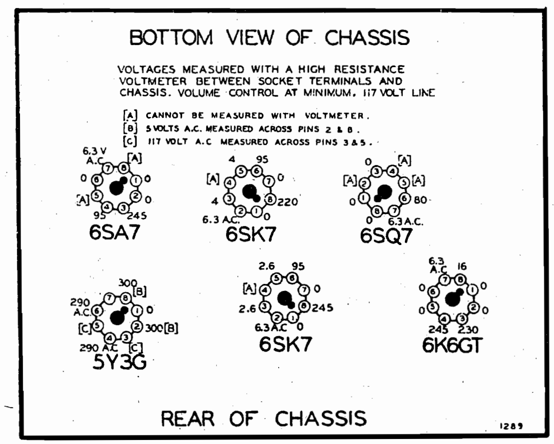
C4 and C5 are in same unit
C13 and C14 are in same unit
C6 and C7 are in same unit
C20 and C21 are in same unit

RESISTORS

R1	13071	4M ohm—1/3 w.
R2	130197	20 ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130236	30M ohm—1/3 w.
R5	130283	750 ohm—1/3 w.
R6	130298	19M ohm—1½ w.
R7	130218	5M ohm—1/3 w.
R8	13020	100M ohm—1/3 w.
R9	1304	3 megohm—1/3 w.
R10	130222	350 ohm—1/3 w.
R11	13012	50M ohm—1/3 w.
R12	101240	1 megohm volume control
R13	130223	10 megohm—1/3 w.
R14	1303	500M ohm—1/3 w.
R15	101241	1 megohm tone control
R16	13011	250M ohm—1/3 w.
R17	130255	500 ohm—1 w.

PARTS

T1	111228	Loop antenna assembly
T2	111184	S.W. antenna coil
T3	110154	B.C. & S.W. oscillator coil
T4	108169G	Input I.F. coil—455 kc.
T5	108106L	Output I.F. coil—455 kc.
T6	10590B	Output Transformer
T7	114229	8" electro dynamic speaker
T8	104225C	60 cycle power transformer
	104238C	25 cycle power transformer
S1	125141	Band switch
S2		Switch on volume control
L1	12312	R.F. choke coil
P1	10794	Pilot light bulb T-44



Power Consumption - - - - - - -	55 Watts
Power Output - - - - - -	2.2 Watts Undistorted

Sensitivity for 500 Milliwatt Output: 15 Microvolts Average

Selectivity - 47 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range Broadcast Band - 535 to 1600 KC

Shortwave Band - 5.43 to 18.3 MC

Intermediate Frequency - - - - - - - 455 KC

Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the front of each pushbutton.

Next push one of the pushbuttons all the way in as far as it will go and hold it there. Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct, then release the button. Continue setting each pushbutton in the same way. Now rotate the tuning knob to the right (clockwise) as far as it will turn.

Looking at the back of the cabinet note the **reset lock screw** on the left hand side of the chassis, (see chassis view).

Rotate the **reset lock screw** to the **right** (clockwise) by means of the pin thru the shaft.

It is **very important** that this locking screw is **turned** until it is **absolutely tight.**

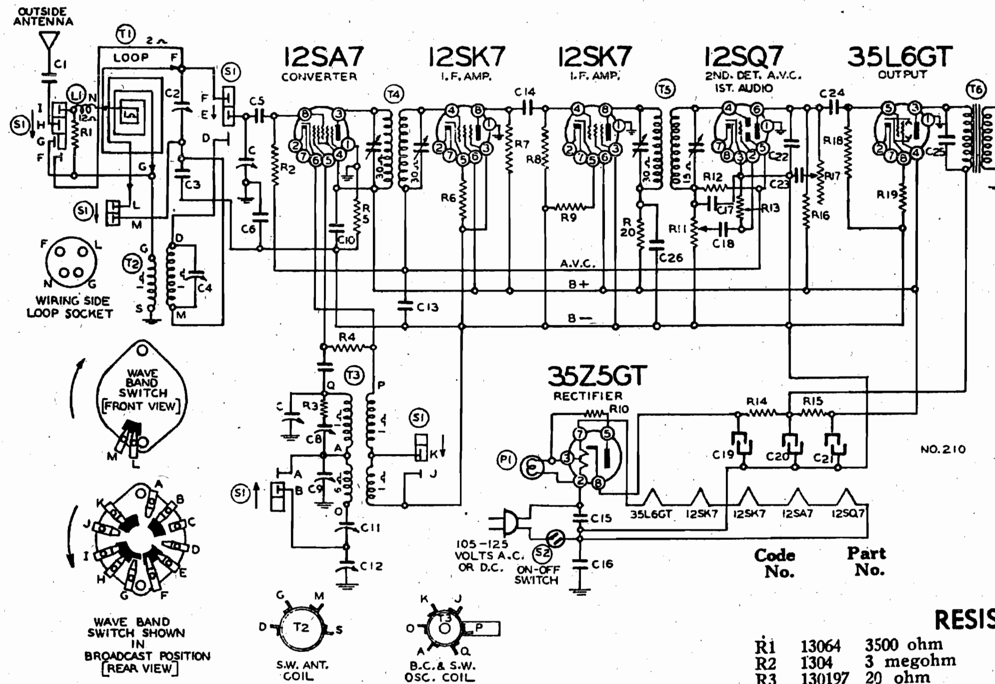
This screw will lock in place all the stations you have selected on the automatic tuner pushbuttons. Pressing the proper button will now tune the station you want. (NOTE: Locking screw is loose when radio is shipped from factory).

To change stations simply loosen the reset lock screw and repeat the procedure above.

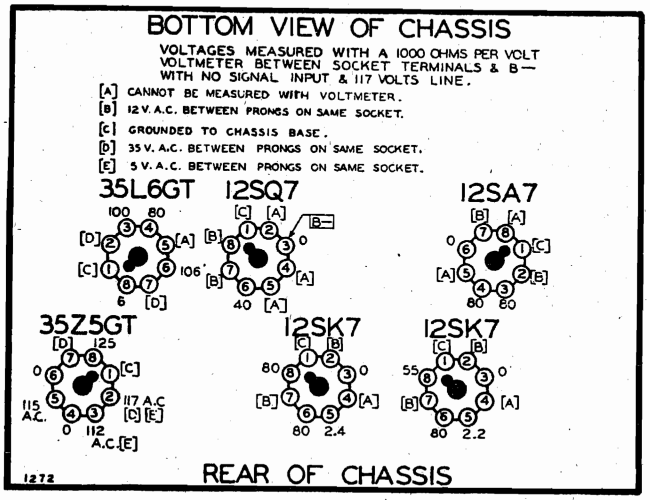
BRC. 681—Series A Form No. 6273—1000—11-40
Pro. 260

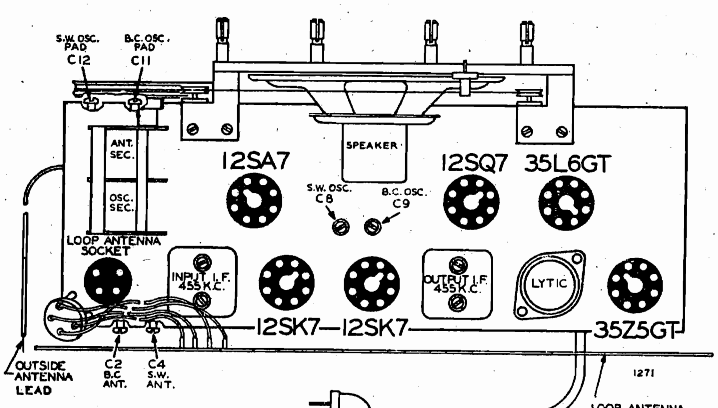
MODEL 695

BELMONT RADIO CORP.



INTERMEDIATE FREQUENCY 455 K.C.





BRC.(695) Form No. 6271—2750—10-40
PRO. 242

RESISTORS

Code No.	Part No.	Description
R1	13064	3500 ohm
R2	1304	3 megohm
R3	130197	20 ohm
R4	13076	30M ohm
R5	130100	150M ohm
R6	13097	200 ohm—⅓ w.
R7	13082	10M ohm—⅓ w.
R8	13019	1 megohm
R9	13083	300 ohm
R10	130215	25 ohm
R11	101215	1 megohm volume control
R12	1304	3 megohm
R13	130257	5 megohm
R14	130296	200 ohm—1 w.
R15	130287	1200 ohm—1 w.
R16	13011	250M ohm
R17	101216	1 megohm tone control
R18	1303	500M ohm
R19	130166	150 ohm
R20	13022	5M ohm—⅓ w.

CONDENSERS

Code No.	Part No.	Description
C	102139	2 gang variable condenser
C1	10092	.001 x 600 v.
C2	124152	B.C. Antenna Trimmer
C3	1009	.05 x 200 v.
C4	124152	S.W. Antenna Trimmer
C5	1292	.0005 mica
C6	1001	.1 x 400 v.
C7	12960	.00015 mica
C8	124142	S.W. Oscillator trimmer
C9	124142	B.C. Oscillator trimmer
C10	1001	.1 x 400 v.
C11	124153	B.C. Oscillator pad
C12	124153	S.W. Oscillator pad
C13	1009	.05 x 200 v.
C14	1292	.0005 mica
C15	1001	.1 x 400 v.
C16	1001	.1 x 400 v.
C17	129158	.0002 mica
C18	10012	.003 x 600 v.
C19	11994	40 mfd. x 150 v. lytic
C20	11994	20 mfd. x 150 v. lytic
C21	11994	20 mfd. x 150 v. lytic
C22	1295	.0001 mica
C23	1007	.005 x 600 v.
C24	10011	.01 x 400 v.
C25	10026	.02 x 400 v.
C26	10013	.05 x 400 v.

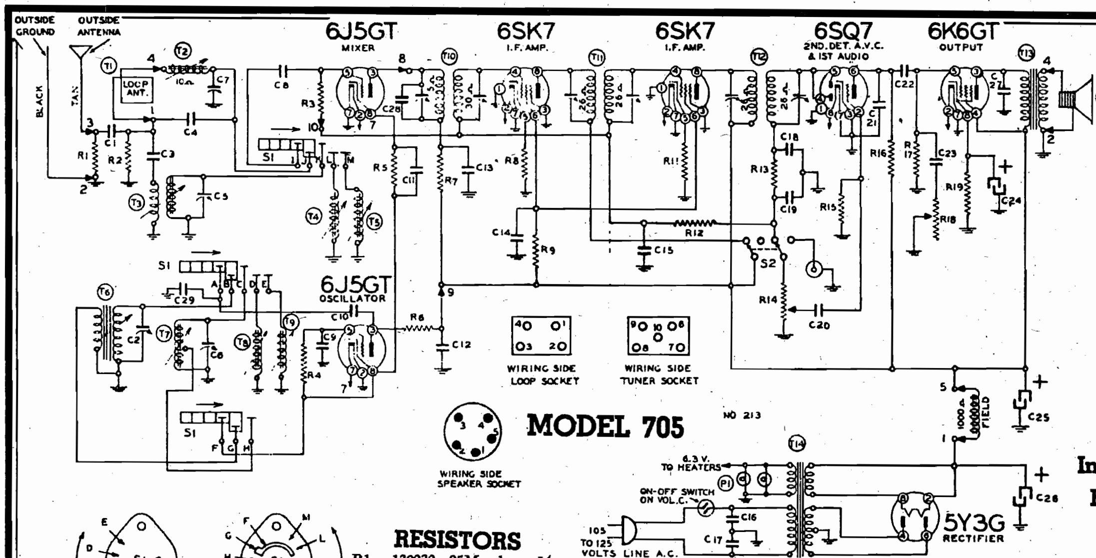
C2 and C4 are in same unit C8 and C9 in same unit
C11 and C12 in same unit
C19, C20 and C21 in same unit

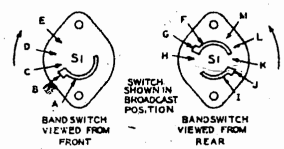
PARTS

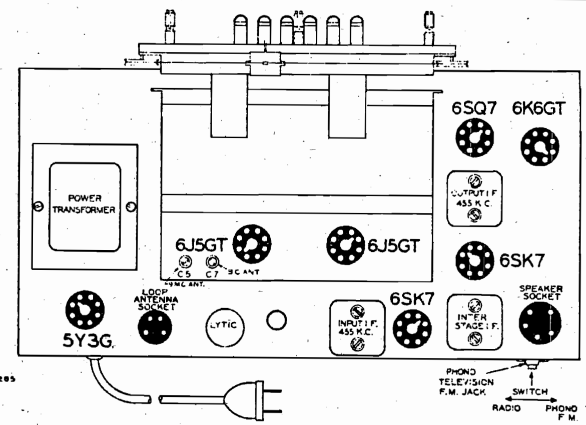
Code No.	Part No.	Description
T1	111217	Loop Antenna Assembly
T2	111219	S.W. Antenna coil
T3	110169	B.C. S.W. Oscillator Coil
T4	108169F	Input I.F. Coil—455 kc.
T5	108130F	Output I.F. Coil—455 kc.
T6	105104C	Output Transformer
T7	114224	5" P.M. Speaker
L1	1239	R.F. Choke coil
S1	125139	Wave band switch
S2		Switch on volume control
P1	107249	Pilot light

BELMONT RADIO CORP.

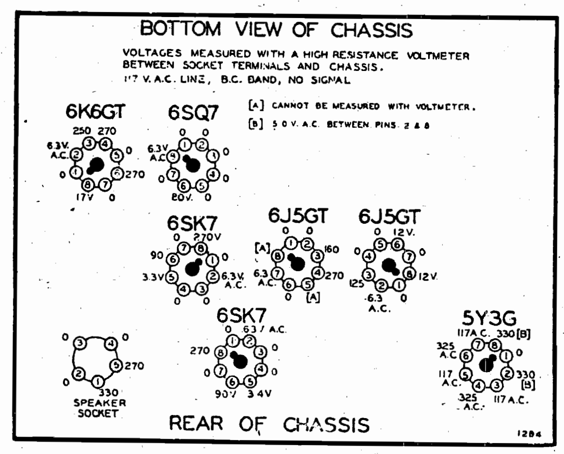
MODEL 705







Intermediate Frequency 455 KC



CONDENSERS

Code No.	Part No.	
C1	1292	.0005 mica
C2	124144	B.C. oscillator trimmer
C3	100112	.001 tubular
C4	129102	.00002 ceramicon
C5	124154	9 mc. ant. trimmer
C6	124145	9 mc. osc. trimmer
C7	124154	B.C. antenna trimmer
C8	1292	.0005 mica
C9	1292	.0005 mica
C10	129158	.0002 mica
C11	10022	.05 x 200 v.
C12	10074	.1 x 400 v.
C13	10026	.02 x 400 v.
C14	10024	.25 x 400 v.
C15	10026	.02 x 400 v.
C16	10061	.02 x 600 v.
C17	10061	.02 x 600 v.
C18	129161	.0001 mica
C19	129161	.0001 mica
C20	10078	.01 x 200 v.
C21	12912	.00025 mica
C22	10026	.02 x 400 v.
C23	10019	.006 x 600 v.
C24	11997	40.0 x 25 w.v. lytic
C25	11997	15.0 x 400 w.v. lytic
C26	11997	15.0 x 450 w.v. lytic
C27	10019	.006 x 600 v.
C28	129171	.0022 mica in coil 108186
C29	129167	.0002 silver mica

RESISTORS

R1	130232	25M ohm—⅓ w.
R2	130232	25M ohm—⅓ w.
R3	13038	2 megohm—⅓ w.
R4	13094	50M ohm—⅓ w.
R5	130157	12M ohm—⅓ w.
R6	130219	20M ohm—1 w.
R7	130103	100M ohm—⅓ w.
R8	13079	400 ohm—⅓ w.
R9	130291	50M ohm—1 w.
R11	13083	300 ohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	13012	50M ohm—⅓ w.
R14	101239	500M ohm volume control
R15	130257	5 megohm—⅓ w.
R16	13011	250M ohm—⅓ w.
R17	13019	1 megohm—⅓ w.
R18	125140	1 megohm tone control
R19	13093	450 ohm—⅓ w.

PARTS

T1	111227	Loop antenna assembly
T2	111222	B.C. antenna coil
T3	111223	9 mc. antenna coil
T4	111224	12 mc. antenna coil
T5	111225	15 mc. antenna coil
T6	110170	B.C. oscillator coil
T7	110171	9 mc. oscillator coil
T8	110158	12 mc. oscillator coil
T9	110172	15 mc. oscillator coil
T10	108186	Input I.F. coil—455 kc.
T11	108187	Interstage I.F. coil—455 kc.
T12	108188	Output I.F coil—455 kc.
T13	105120	Output transformer
T14	104246	Power transformer 50-60 cycle
T14	104247	Power transformer—25 cycle
T15	114228	10" dynamic speaker
S1	125140	Wave band switch
S2	125133	Radio phono switch
P1	10794	(2) Pilot lights—type T44

Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

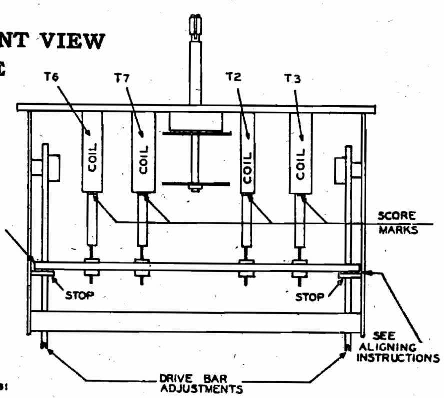
Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place, (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure

Power Consumption - - - - - - - 80 Watts
Power Output - - - - - - 2½ Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 540 to 1600 KC
31M Band - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC

BRC (705) Series A Form No. 7919-
PRO. 247 —1M—10-40

ADJUSTMENT VIEW IRON CORE



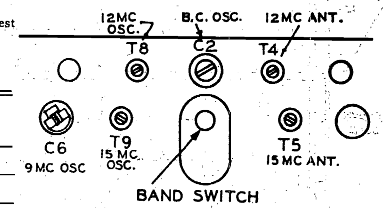
BELMONT RADIO CORP.

MODEL 705

- Tone control—Treble
- 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	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (2nd I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SK7 (1st I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Interstage I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6J5 (Mixer)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C6 (See Trimmer on Top) C5	Osc. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T8 (See Trimmer View) T4	Osc. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T9 (See Trimmer View) T5	Osc. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C2 (See Trimmer on Top) C7	Osc. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T2 (See Iron Core Adjustment View)	Ant.	Adjust to maximum output



TRIMMER VIEW
MODEL 705

Power Consumption - - - - - 100 Watts
Power Output - - - - 5 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 540 to 1600 KC

MODEL 902

49M Band	**5.9 to 6.1 MC**
31M Band	**9.1 to 10 MC**
25M Band	**11.4 to 12.1 MC**
19M Band	**14.9 to 15.4 MC**

Setting the Pushbuttons

MODEL 902

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton. (Except the two end ones).

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place, (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure

MODELS 705 & 902

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a gauge). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

MODEL 902

- Tone control—Treble
- 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	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

MODEL 902

Pushbutton Tone Control

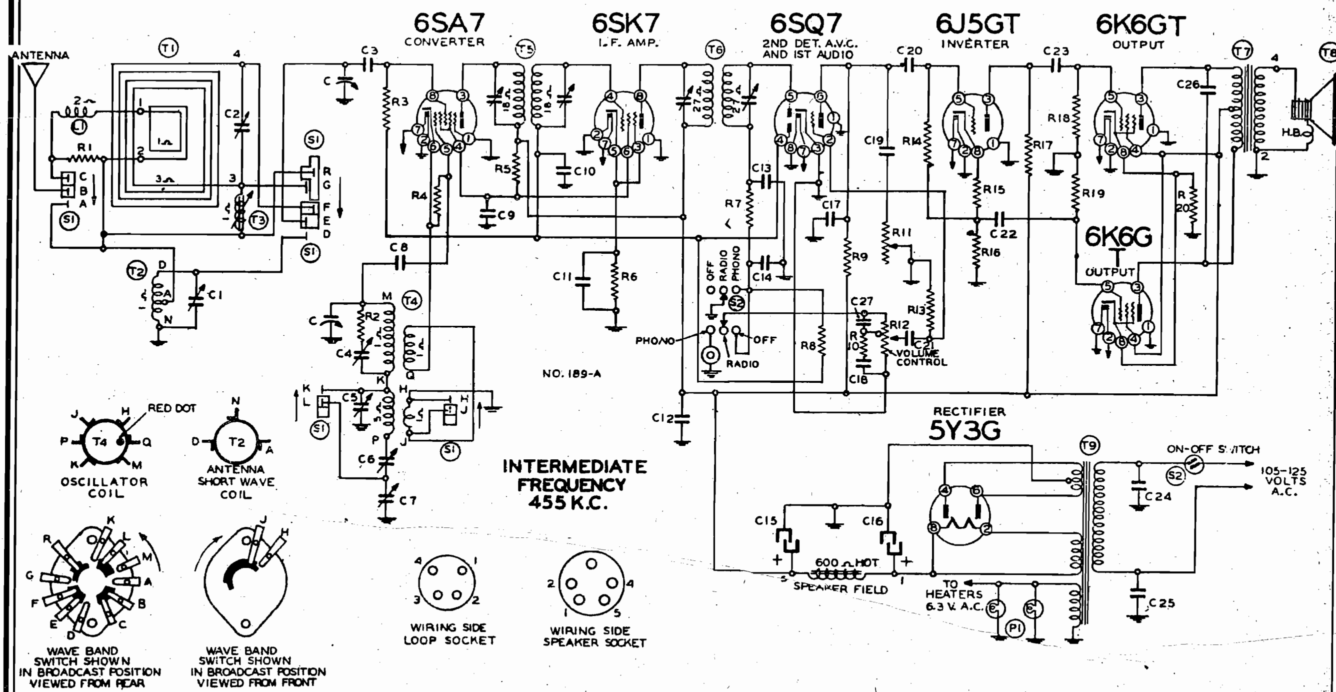
This button has three tone positions Bass—Medium—Treble. Each time you push the button it will change the tone to one of these positions—Change it any time to the tone you like best.

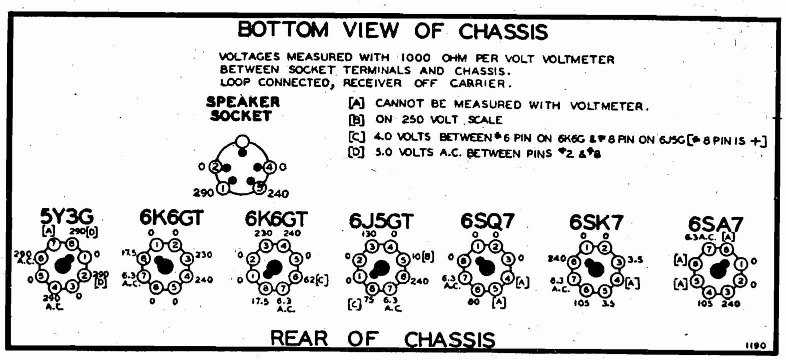
Radio-Phono Pushbutton Switch

This pushbutton switches from the radio to the phono position. It should be level with the other buttons for radio operation—or pulled out to use a phonograph. A phono jack is provided on the chassis should you wish to connect an external Phonograph to your Radio. (Phono jack is shown in the chassis view).

BELMONT RADIO CORP.

MODEL 729
Series A





Schematic Diagram Ref. No.	Part No.	Description

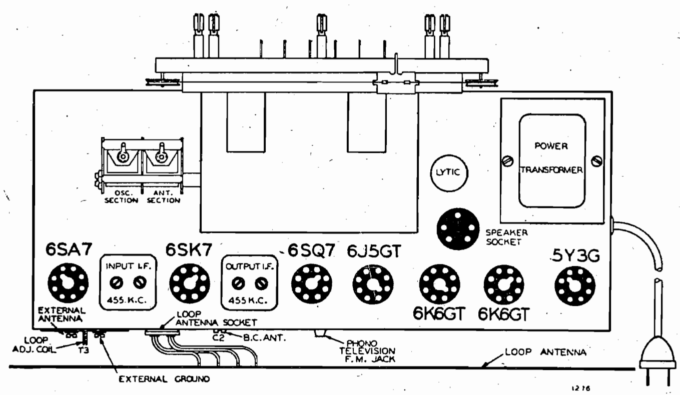
RESISTORS

Ref. No.	Part No.	Description
R1	13064	3500 ohm—1/3 w.
R2	130276	10 ohm—1/3 w.
R3	1304	3 megohm—1/3 w.
R4	130236	30M ohm—1/3 w.
R5	130307	15M ohm—1 w.
R6	13083	300 ohm—1/3 w.
R7	13012	50M ohm—1/3 w.
R8	13038	2 megohm—1/3 w.
R9	13011	250M ohm—1/3 w.
R10	130149	15M ohm—1/3 w.
R11	101223	Tone control—1 megohm
R12	101224	Volume Control—1/2 megohm
R13	130257	5 megohm—1/3 w.
R14	1303	500M ohm—1/3 w.
R15	130218	5M ohm—1/3 w.
R16	130103	100M ohm—1/3 w.
R17	130103	100M ohm—1/3 w.
R18	1303	500M ohm—1/3 w.
R19	1303	500M ohm—1/3 w.
R20	130320	320 ohm—1 watt

CONDENSERS

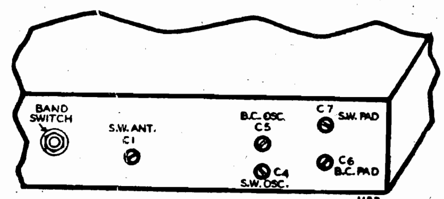
Ref. No.	Part No.	Description
C	102133	2 gang variable condenser
C1	124116	Short wave antenna trimmer
C2	124141	B.C. antenna trimmer
C3	1292	.0005 mica
C4	124142	Dual adj. trimmer—S.W. osc. trimmer
C5	124142	Dual adj. trimmer—B.C. osc. trimmer
C6	124140	Dual adj. condenser—B.C. pad
C7	124140	Dual adj. condenser—S.W. pad
C8	12960	.00015 mica
C9	10013	.05 x 400 v.
C10	1009	.05 x 200 v.
C11	1009	.05 x 200 v.
C12	1001	.1 x 400 v.
C13	129161	Dual—.0001 mica
C14	129161	Dual—.0001 mica
C15	119108	16 mfd. x 450 w.v. lytic condenser
C16	119108	16 mfd. x 450 w.v. lytic condenser
C17	1295	.0001 mica
C18	100120	.035 x 200 v.
C19	10019	.006 x 600 v.
C20	10026	.02 x 400 v.
C21	10019	.006 x 600 v.
C22	10013	.05 x 400 v.
C23	10013	.05 x 400 v.
C24	10061	.02 x 600 v.
C25	10061	.02 x 600 v.
C26	10019	.006 x 600 v.
C27	129169	.00025 mica

C4 and C5, C6 and C7, and C13 and C14 are in the same units



PARTS

Ref. No.	Part No.	Description
T1	111220	Loop antenna assembly
T2	111184	Short wave antenna coil
T3	111183	Loop adjustable coil
T4	110154	B.C.—S.W. oscillator coil
T5	108178	Input I.F. coil—455 kc.
T6	108179	Output I.F. coil—455 kc.
T7	105112	Output transformer
T8	114226	6" Dynamic Speaker
T9	104212	Power transformer
L1	12312	R.F. Choke coil
S1	125119	Wave band switch
S2	125120	Radio-phono On-off switch
P1	10794	(2) Pilot light bulbs T-44



TRIMMER VIEW FRONT CHASSIS FLANGE

BRC. (729) Form No. 7917—1750—10-40
PRO. 254

MODEL 729
Series A

BELMONT RADIO CORP.

Phonograph-Television or FM. Jack

Should you wish to use an external phonograph it should be plugged into the phono-jack shown in the top view—The on-off radio-phono knob on the front panel will then switch from radio to phono operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-television-FM in the top view will accommodate either the Phono or a television or FM converter.

Power Consumption - - - - 75 Watts

Power Output - - - 3 Watts Undistorted

Sensitivity for 500 Milliwatt Output: 20 Microvolts Average

Selectivity - 45 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range Broadcast - - 535 to 1600 KC
Shortwave - 5.4 to 18.4 MC

Intermediate Frequency - - - - - - 455 KC

Speaker - - - - - - - - 6 in. Electro Dynamic

Pushbutton Tuning

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground 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., 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.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROADCAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	535 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Set Dial at 535 Kc.	Trimmer C6	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGNMENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T3 (See Top View)	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the Short Wave Band and to the grid of the 6SA7 tube and ground terminal when setting the Broadcast Band oscillator end frequencies, (1600 and 535 K. C.).

The loop antenna should be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." terminals.

NOTE "C"—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.

BELMONT RADIO CORP.

MODEL 796 Series A
Serial No.
OC362500 up

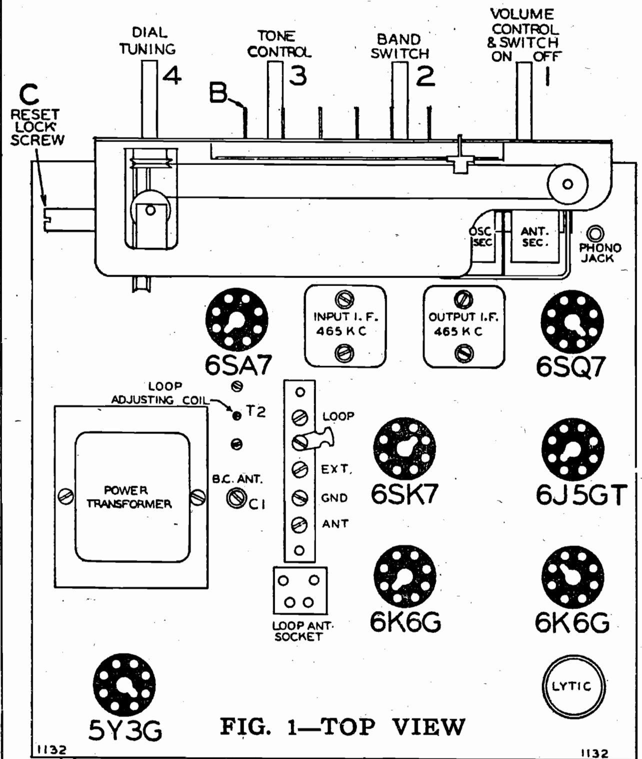
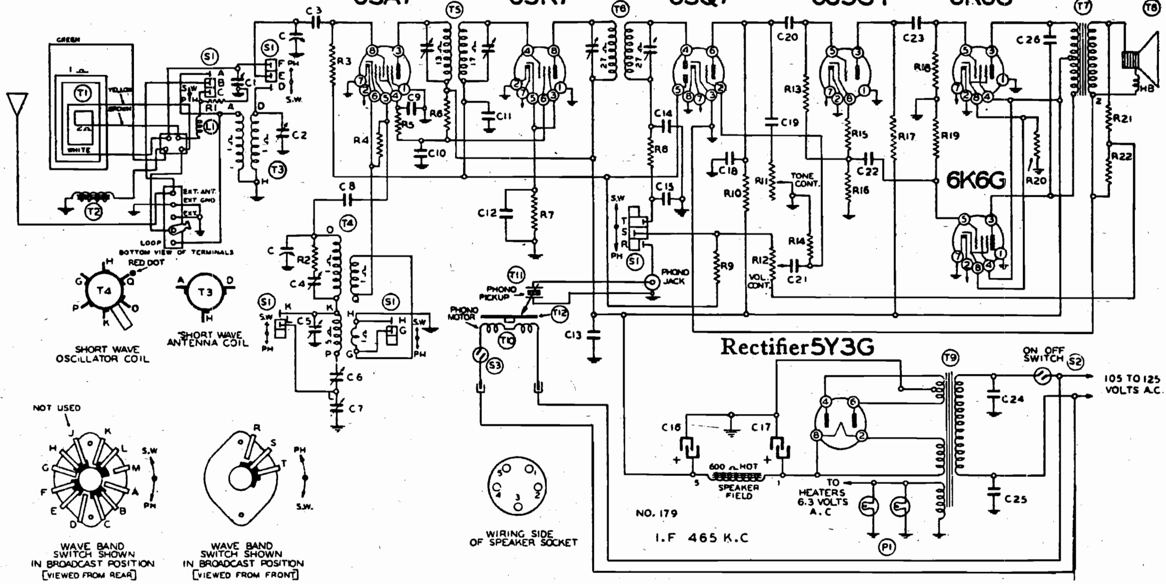


FIG. 1—TOP VIEW



3-40

FOR TUNER DATA, SEE INDEX   I.F. 465 K.C.

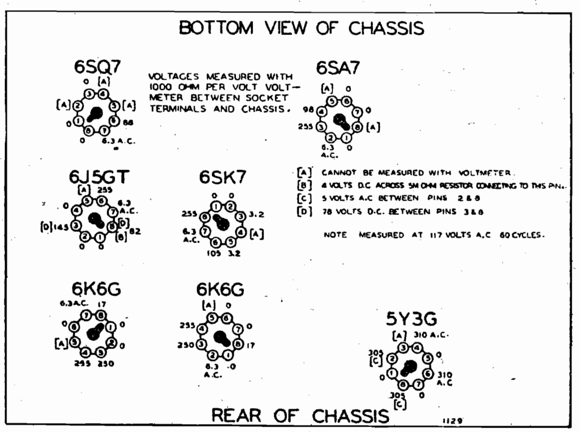
FREQUENCY RANGE
5.4 to 18.3 MC.
532 to 1570 KC.

Power Consumption (Radio Chassis only, less Phono Motor)..........85 Watts
Power Output..........4.5 Watts Undistorted, 6 Watts Maximum

Model 796

Series A

(Serial No. OC362500 and up)



RESISTORS

Circuit Diagram Ref. No.	Part No.	Description
R1	13018	4M ohm—⅓ w.
R2	130197	20 ohm—⅓ w.
R3	1304	3 megohm—⅓ w.
R4	130236	30M ohm—⅓ w.
R5	13092	1000 ohm—⅓ w.
R6	130116	15M ohm—1½ watt
R7	13083	300 ohm—⅓ w.
R8	130103	100M ohm—⅓ w.
R9	1304	3 megohm—⅓ w.
R10	13011	250M ohm—⅓ w.
R11	101216	1 megohm—tone control
R12	101215	1 megohm volume control
R13	1303	500M ohm—⅓ w.
R14	130257	5 megohm—⅓ w.
R15	130218	5M ohm—⅓ w.
R16	130103	100M ohm—⅓ w.
R17	130103	100M ohm—⅓ w.
R18	1303	500M ohm—⅓ w.
R19	1303	500M ohm—⅓ w.
R20	130227	250 ohm—1 watt
R21	130168	100 ohm—⅓ w.
R22	130197	20 ohm—⅓ w.

CONDENSERS

Circuit Diagram Ref. No.	Part No.	Description
C	102131	2 gang variable condenser
C1	124117	B.C. Antenna Trimmer
C2	124116	S.W. Antenna Trimmer
C3	1292	.0005 Mica
C4	124112	S.W. Oscillator Trimmer
C5	124112	B.C. Oscillator Trimmer
C6	124134	B.C. Series Pad
C7	124134	S.W. Series Pad
C8	12991	.00015 Mica
C9	10013	.05 x 400 v.
C10	1001	.1 x 400 v.
C11	1009	.05 x 200 v.
C12	1009	.05 x 200 v.
C13	1001	.1 x 400 v.
C14	129161	.0001 mica
C15	129161	.0001 mica
C16	119108	Lytic—16 mfd. 450 w.v.
C17	119108	Lytic—16 mfd. 450 w.v.
C18	12940	.0001 Mica
C19	100118	.008 x 600 v.
C20	10026	.02 x 400 v.
C21	10025	.002 x 600 v.
C22	10013	.05 x 400 v.
C23	10013	.05 x 400 v.
C24	10061	.02 x 600 v.
C25	10061	.02 x 600 v.
C26	10019	.006 x 600 v.

C4 and C5 are in same unit
C6 and C7 are in same unit
C14 and C15 are in same unit
C16 and C17 are in same unit

PARTS

Ref. No.	Part No.	Description
T1	111165E	Loop Antenna Assembly
T2	111153	Loop Adjustable Coil
T3	111163	Short Wave Antenna Coil
T4	110150	B.C. S.W. Oscillator Coil
T5	108162B	Input I.F. Coil—465 kc.
T6	108132D	Output I.F. Coil—465 kc.
T7	10554E	Output Transformer
T8	114192	10" Electrodynamic speaker
T9	104170B	Power Transformer
S1	125112	Band Switch
S2		On-off Switch on Volume Control
P1	10794	(2) Pilot light Bulbs T44
L1	1239	R. F. Choke Coil
S3		Phono Motor Switch
T10, T11	104174	Phono Motor; Phono Pickup Arm; Record Changer Complete
T12		Phono Turntable

MODEL 796, Series A
Ser. No. 0C32500 up
MODEL 797, Series A
Ser. No. 0D428100 up

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions.

- Volume control—Maximum all adjustments.
- Connect radio ground 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., 400 ohms.

BAND	SIGNAL GENERATOR MODEL 796 Frequency Setting	SIGNAL GENERATOR MODEL 797 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.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Output I. F.	Adjust to maximum output
	465 Kc.	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROADCAST BAND (See Note A)	1570 Kc.	1570 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	532 Kc.	532 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Set Dial at 532 K. C.	Trimmer C6 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGNMENT (See Note B)	1400 Kc.	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 5)	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1570 and 532 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal.

NOTE "C"—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.

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.

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.

It is important during loop alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

To remove the chassis from the cabinet, pull off the knobs and take out the 4 bolts holding the chassis flange to the control panel.

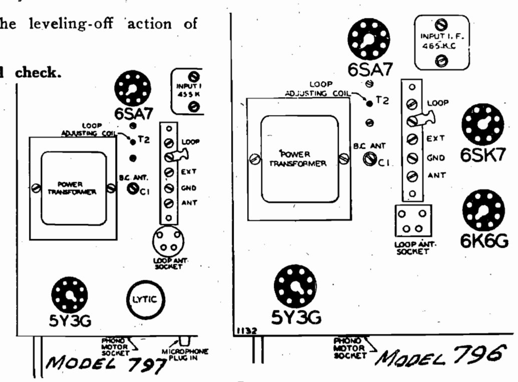


FIG. 5—TOP VIEW

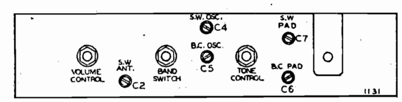
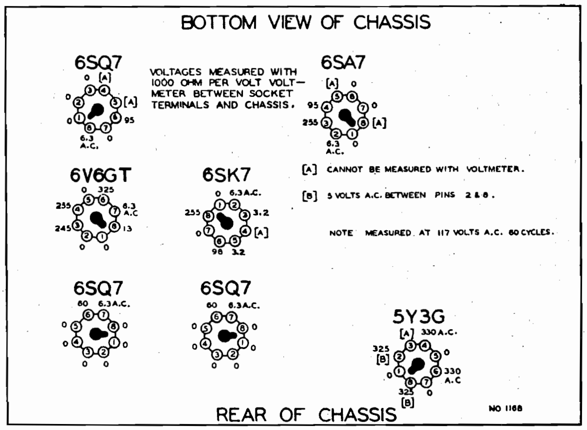


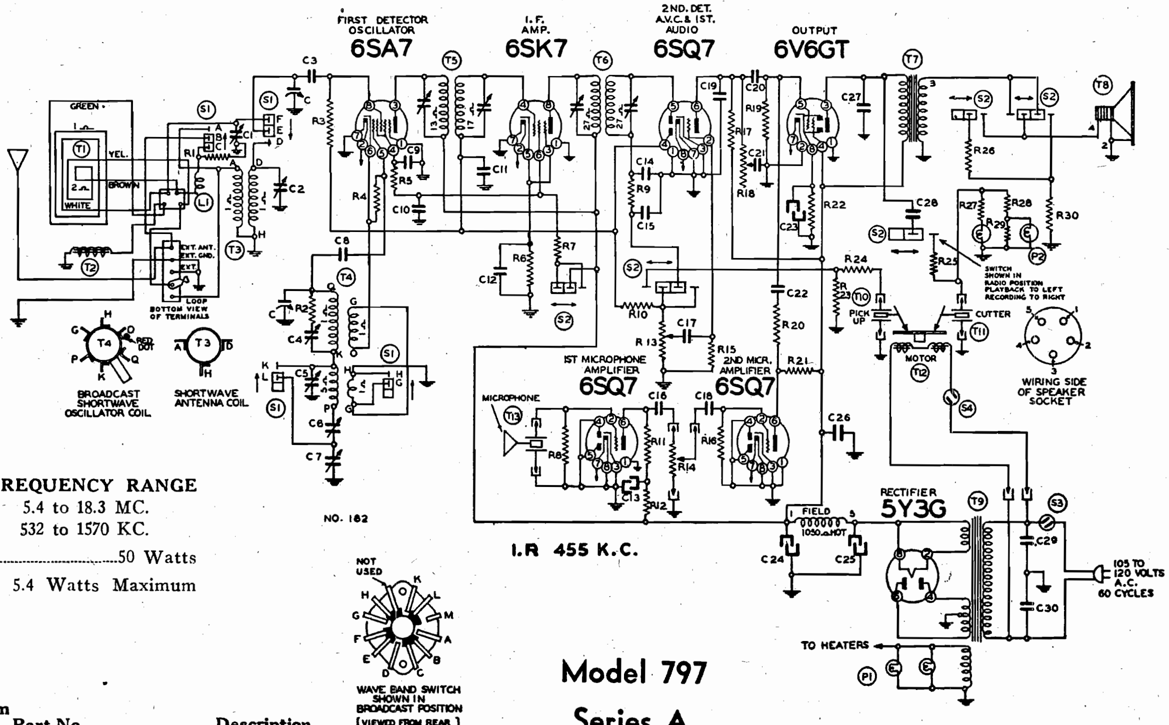
FIG. 4

MODEL 797, Series A
Ser. No. OD428100 up

BELMONT RADIO CORP.



MODEL 797



I.R 455 K.C.

Model 797
Series A
(Serial No. OD428100 and up)

FOR TUNER DATA
SEE INDEX

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.4 to 18.3 MC.
Center Position	Broadcast	532 to 1570 KC.

Power Consumption (Radio Chassis only, less Phono Motor)......50 Watts

Power Output......3.6 Watts Undistorted, 5.4 Watts Maximum

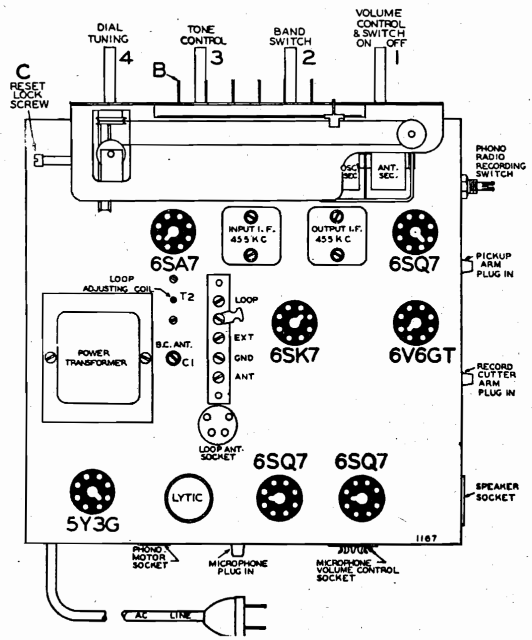


FIG. 3—TOP VIEW

RESISTORS

Circuit Diagram Ref. No.	Part No.	Description
R1	13018	4M ohm—1/3 w.
R2	130197	20 ohm—1/3 w.
R3	1304	3 megohm—1/3 w.
R4	130236	30M ohm—1/3 w.
R5	13092	1M ohm—1/3 w.
R6	13083	300 ohm—1/3 w.
R7	130313	20M ohm—1½ watt
R8	130257	5 megohm—1/3 w.
R9	13012	50M ohm—1/3 w.
R10	1304	3 megohm—1/3 w.
R11	1303	500M ohm—1/3 w.
R12	13012	50M ohm—1/3 w.
R13	101215	1 megohm volume control
R14	101219	1 megohm microphone control
R15	130223	10 megohm—1/3 w.
R16	130223	10 megohm—1/3 w.
R17	13011	250M ohm—1/3 w.
R18	101216	1 megohm tone control
R19	1303	500M ohm—1/3 w.
R20	13020	100M ohm—1/3 w.
R21	1303	500M ohm—1/3 w.
R22	130227	250 ohm—1 watt
R23	13019	1 megohm—1/3 w.
R24	1303	500M ohm—1/3 w.
R25	130194	35M ohm—1/3 w.
R26	130166	150 ohm—1/3 w.
R27	1309	200M ohm—1/3 w.
R28	1309	200M ohm—1/3 w.
R29	1309	200M ohm—1/3 w.
R30	10661	6 ohm—5 watt

CONDENSERS

C	102131	2 gang variable condenser
C1	124117	B.C. Antenna Trimmer
C2	124116	S.W. Antenna Trimmer
C3	1292	.0005 mica
C4	124112	S.W. Oscillator Trimmer
C5	124112	B.C. Oscillator Trimmer
C6	124134	B.C. Series Pad
C7	124134	S.W. Series Pad
C8	12991	.00015 mica
C9	10013	.05 x 400 v.
C10	1001	.1 x 400 v.
C11	1009	.05 x 200 v.
C12	1009	.05 x 200 v.
C13	11967	8 mfd. lytic
C14	129161	.0001 mica
C15	129161	.0001 mica
C16	10026	.02 x 400 volts
C17	10071	.004 x 600 v.
C18	10025	.002 x 600 v.
C19	1292	.0005 mica
C20	10013	.05 x 400 v.
C21	10019	.006 x 600 v.
C22	10013	.05 x 400 v.
C23	119110	40 mfd. lytic
C24	119110	20 mfd. lytic
C25	119110	20 mfd. lytic
C26	1001	.1 x 400 v.
C27	10019	.006 x 600 v.
C28	10024	.25 x 400 v.
C29	10061	.02 x 600 v.
C30	10061	.02 x 600 v.

C4 and C5 in same unit—C6 and C7 in same unit
C14 and C15 are in same unit
C23, C24 and C25 are in same unit

PARTS

T1	111165E	Loop Antenna Assembly
T2	111153	Loop Adjustable Coil
T3	111163	S.W. Antenna Coil
T4	110150	B.C. & S.W. Oscillator Coil
T5	108162B	Input I.F. Coil—455 kc.
T6	108132D	Output I.F. Coil—455 kc.
T7	105109	Output Transformer
T8	114195	10" Dynamic Speaker
T9	104209	Power Transformer
T10	104210	Pickup arm
T11	104210	Record cutter arm
T12	104210	Phono Motor
T13	114196	Microphone Complete
L1	1239	R.F. Choke coil
S1	125114	Wave Band Switch
S2	125115	Radio Recording Switch
S3		On-off switch on Volume Control
S4		Phono Motor Switch
P1	10794	(2) Pilot light bulbs T44
P2	107326	(2) Neon Light Bulbs Type (T2)

MODEL 797, Series A
Ser. No. OD428100 up

BELMONT RADIO CORP.

THE RECORDER AND PHONOGRAPH
Model 797 Series A

Unpack the microphone and plug it into the chassis. The microphone socket is shown in Fig. 3.

Insert a playback needle in the phone playback arm.

Insert a special cutting stylus (needle) in the cutter arm as shown in Fig. 2. Handle this needle with care.

Be sure the needle is tight after each recording. Should it loosen during the recording, it will chatter and ruin your record.

The cutting stylus is razor sharp and must not be dropped on the record or allowed to rest on the turntable.

For best operation, the instrument should be level in all directions. To check this, place a small level, if you have one, on the turntable. If you do not have a level, a marble will do. If the marble rolls off the turntable, it is low in the direction in which it rolls. Place something under the console until the machine is reasonably level.

HOWLING:

If the microphone is held too close to the loud speaker, it will feed back and start a loud "howl". Keep the microphone well away from the recording cabinet with its back toward the cabinet.

If the recording switch is in **radio** position and the microphone volume control is turned on, feedback will occur and a very loud howl will start. Be sure to turn the microphone volume control to zero when playing radio.

SHAVINGS:

The cutting stylus cuts out a fine shaving that is just a little thicker than a human hair. These shavings should not be allowed to gather under the cutting stylus.

Just before lowering the cutting arm on the record, hold one finger on the center of the record for a moment. This will create a static charge that will pull the shavings toward the center pin.

While cutting, gently brush the shavings from the left side of the record in, toward the center pin, allowing them to collect there until the recording is completed.

CUTTING ARM ADJUSTMENTS:

The cutting arm is adjusted at the factory for proper operation, however,, with various types of blanks this adjustment may sometimes have to be altered. With a blank record on the table, the height adjustment shown in Fig. 2. should be adjusted so that the bottom of the cutting arm is ¼" from the top of the record blank. Make this measurement carefully at the front end beside the stylus screw.

The screw adjustment can be turned to raise or lower the arm.

Several blank grooves should now be cut to see if the groove is the proper depth. The depth adjustment screw shown in **Fig. 2** will increase the depth of the groove if turned to the right and will decrease the groove if turned to the left.

If the groove is too shallow, the playback needle will not stay in the groove. If it is too deep, not enough wall will be left between grooves and the playback needle will break through from one track to the next after a few playings.

The proper depth of groove will leave about the same space between the groove as the groove is wide. Hold a finished record toward the light and you can usually see if the grooves are spaced correctly.

A **properly** cut groove will leave a shaving just a little heavier than a human hair.

RECORDING RADIO PROGRAMS:

Turn the radio on and tune in the pogram you wish to record. Turn microphone volume control to zero (left). Put recording switch in **record** position. The volume will drop. Start motor and then gently lower cutting needle onto blank record, about ¼" from outer edge.

OPERATING THE PHONOGRAPH:

Turn **microphone volume control** left, to zero. Turn recording switch to **Phono Playback** position.

Put your record on turntable and start motor. Place playback arm on record and contol tone and volume with radio volume and tone control knobs.

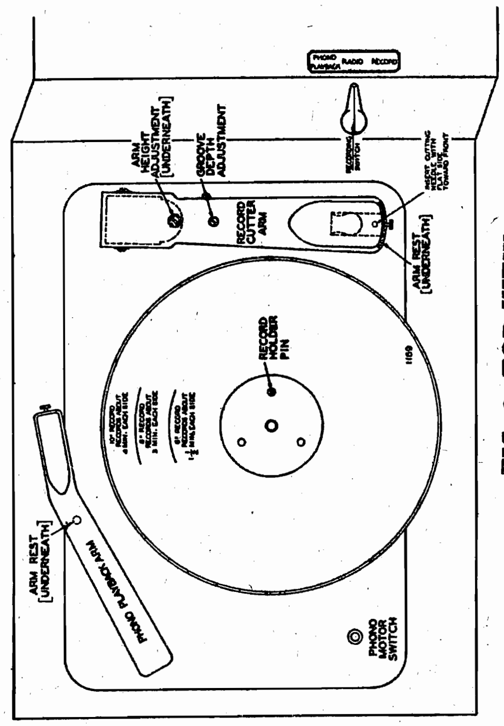


FIG. 2—TOP VIEW

RECORDING VOICE:

Turn the radio volume control to zero volume but do not turn the radio completely off. Turn microphone volume control to the right, full on. Recording switch should be in **record** position. Talk into the microphone. Watch the lights and, if volume is too great, reduce it by turning microphone volume control to the left. Start motor, and set cutting needle gently on start of record.

RECORDING VOICE WITH RADIO MUSIC BACKGROUND:

Proceed the same as for recording voice, after having first tuned in the radio music you want as a background.

By tuning the radio volume control up or down you can make the radio background music as loud or soft as you wish.

VOLUME OVERLOAD LIGHTS:

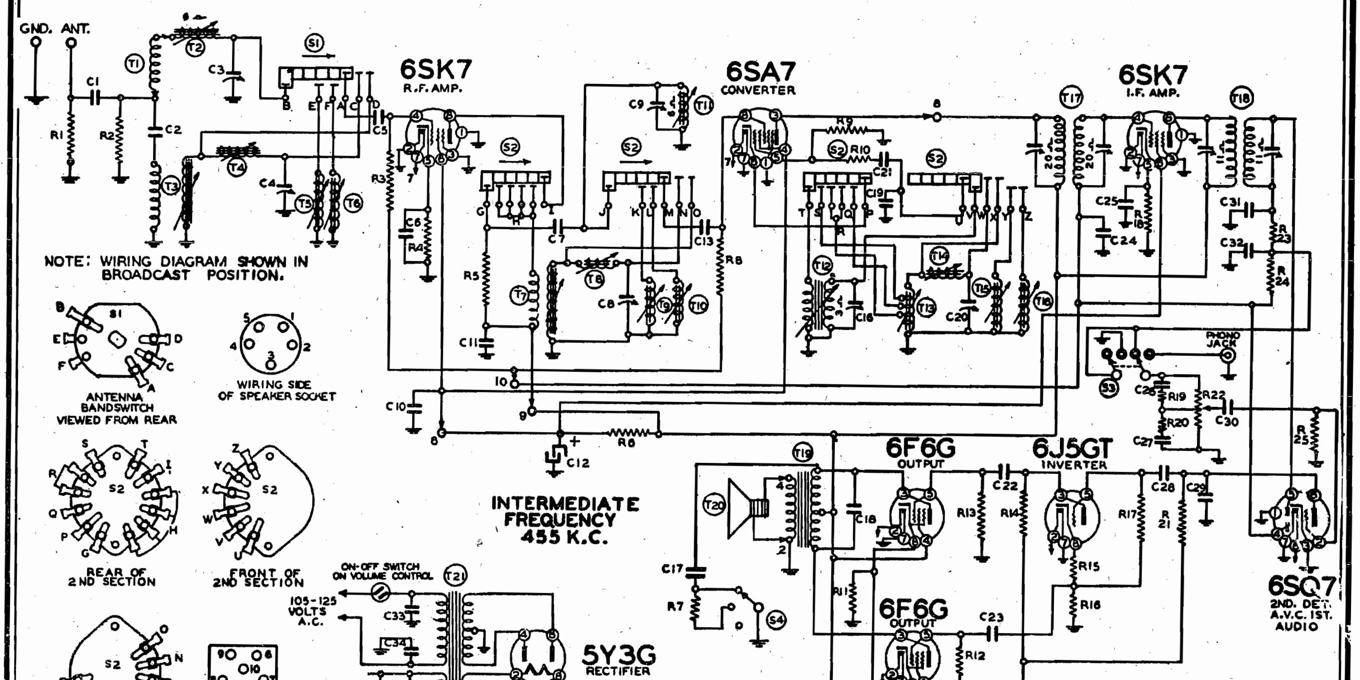
There are two small lights set into the dial marked "Normal Level" and "Overload Level".

If you do not use enough volume on either radio or voice for a satisfactory recording, both lights will remain out. If you use too much volume, both lights will glow.

Before cutting a record, speak into the microphone and set the microphone volume control so that the "Normal Level" light is on and the "Overload Level" is out. This is the proper recording level for all types of recordings.

BELMONT RADIO CORP.

MODEL 800



NO. 199 **CONDENSERS**

C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. Antenna Trimmer
C4	124143	9 mc. Ant. Trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v.
C7	129168	.00001 mica
C8	124138	9 mc. R.F. Trimmer
C9	124139	B.C. R.F. Trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	119109	10.0 mfd. x 350 w.v. lytic
C13	1292	.0005 mica
C14	119109	15.0 mfd. x 450 w.v. lytic
C15	119109	15.0 mfd. x 450 w.v. lytic
C16	124144	B.C. Oscillator Trimmer
C17	10013	.05 x 400 v.
C18	10071	.004 x 600 v.
C19	129167	.0002 silver mica
C20	124145	9 mc. Oscillator Trimmer
C21	12938	.00005 mica
C22	10013	.05 x 400 v.
C23	1009	.05 x 200 v.
C24	10026	.02 x 400 v.
C25	10020	.1 x 200 v.
C26	129114	.0003 mica
C27	100122	.03 x 200 v.
C28	10026	.02 x 400 v.
C29	12921	.0002 mica
C30	10019	.006 x 600 v.
C31	129165	.00005 mica
C32	129165	.00005 mica
C33	10061	.02 x 600 v.
C34	10061	.02 x 600 v.

C12 and C14 and C15 in same unit
C31 and C32 in same unit

PARTS

T1	111206	Loop antenna assembly
T2	111195	B.C. Antenna Coil
T3	111190	9 mc. Antenna Coil
T4	111189	6 mc. Antenna Coil
T5	111191	12 mc. Antenna Coil
T6	111192	15 mc. Antenna Coil
T7	10959	9 mc. R.F. Coil
T8	10958	6 mc. R.F. Coil
T9	10960	12 mc. R.F. Coil
T10	10961	15 mc. R.F. Coil
T11	10962	B.C. R.F. Coil
T12	110161	B.C. Oscillator Coil
T13	110157	9 mc. Oscillator Coil
T14	110156	6 mc. Oscillator Coil
T15	110158	12 mc. Oscillator Coil
T16	110159	15 mc. Oscillator Coil
T17	108177	Input I.F. Coil—455 kc.
T18	108176	Output I.F. Coil—455 kc.
T19	105111	Output Transformer
T20	114221	12" Dynamic Speaker
T21	104202B	Power Transformer—For 50-60 Cycle
or	104203B	Power Transformer—For 25 Cycle
S1	125118	Antenna Bandswitch
S2	125117	R.F. & Osc. Bandswitch
S3	125129	Radio-Phono Switch
S4	125130	Tone Control Switch
P1	10794	(2) 6-8 Volt Pilot Lights—T44

RESISTORS

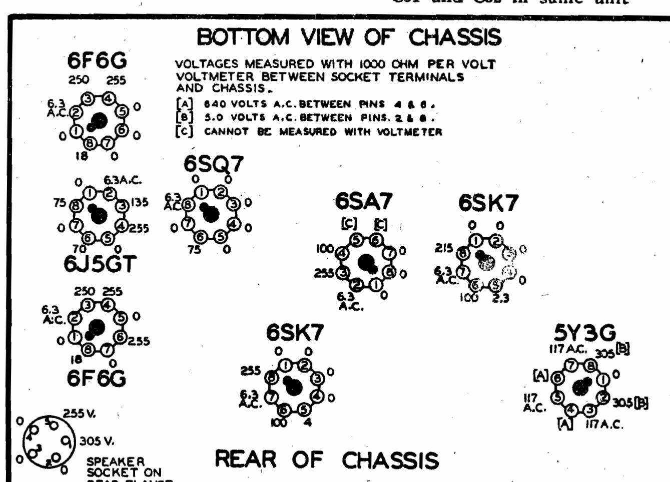
Code No.	Part No.	
R1	1301	25M ohm—1/3 w.
R2	1301	25M ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130239	250 ohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	10662	12,500 ohm—3 w.
R7	13064	3500 ohm—1/3 w.
R8	13019	1 megohm—1/3 w.
R9	130232	25M ohm—1/3 w.
R10	130174	50 ohm—1/3 w.
R11	130220	300 ohm—1 w.
R12	1303	500M ohm—1/3 w.
R13	1303	500M ohm—1/3 w.
R14	130103	100M ohm—1/3 w.
R15	130218	5M ohm—1/3 w.
R16	130103	100M ohm—1/3 w.
R17	13019	1 megohm—1/3 w.
R18	13070	500 ohm—1/3 w.
R19	13011	250M ohm—1/3 w.
R20	130149	15M ohm—1/3 w.
R21	13011	250M ohm—1/3 w.
R22	101233	Volume Control & On-off switch
R23	13012	50M ohm—1/3 w.
R24	1304	3 megohm—1/3 w.
R25	130257	5 megohm—1/3 w.

Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton. (Except the two end ones).

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button **hard** all the way in to lock the station in place, (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

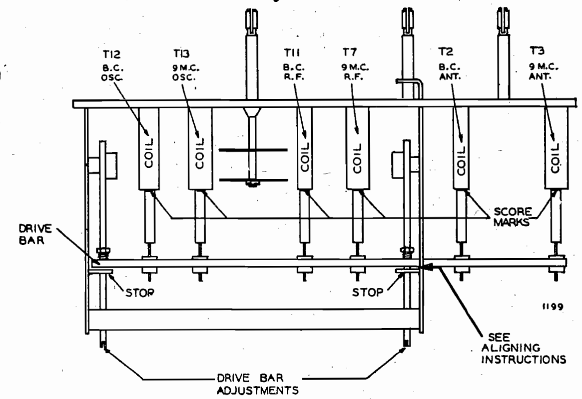
To change stations simply repeat the procedure above.

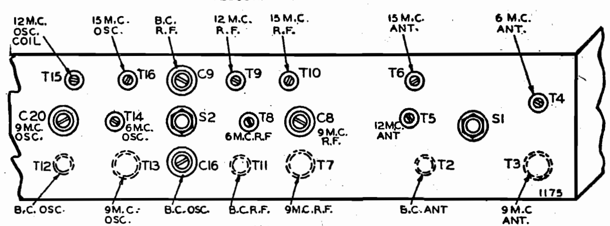


MODEL 800

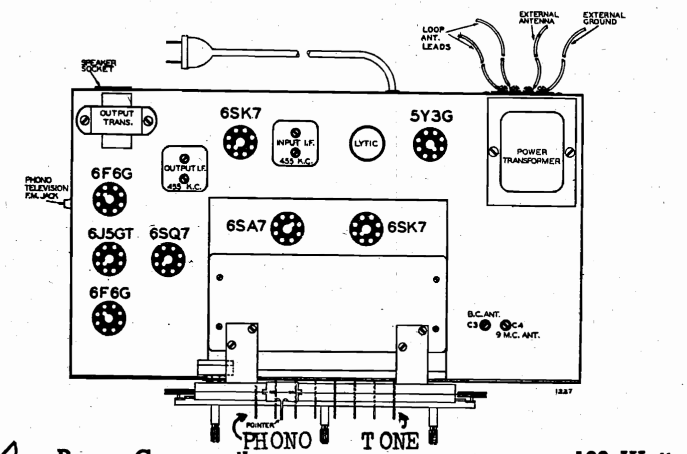
BELMONT RADIO CORP.

IRON CORE ADJUSTMENT VIEW





FRONT VIEW CHASSIS



Power Consumption - - - - - - 100 Watts
Power Output - - - - - 5 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC

- Tone control—Treble
- 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.

Tuning Frequency Range
Broadcast Band - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency 455 KC
Speaker 12 in. Electro Dynamic

Phonograph-Television and Fm. Jack

Should you wish to use an external phonograph it should be plugged into the phono jack shown in the chassis view—The radio-phono button on the front panel will then switch from radio to phono operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-television-FM in the top view will accommodate either the Phono or a television or FM converter.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a guage). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

Pro. 236
Pro. 229
BRC(800) Series A Form No. 8079—1M—9-40

BELMONT RADIO CORP.

MODEL 794, Series A
Ser. No. 0A297000 up

Power Consumption ....55 Watts
Power Output..........................3 Watts Undistorted, 3.6 Watts Maximum

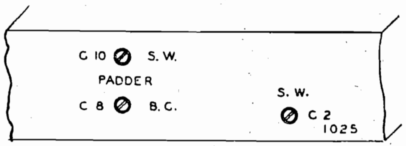


FIG. 4.—FRONT OF CHASSIS

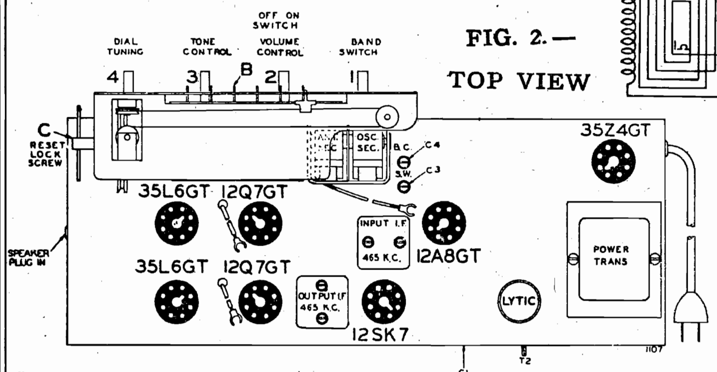
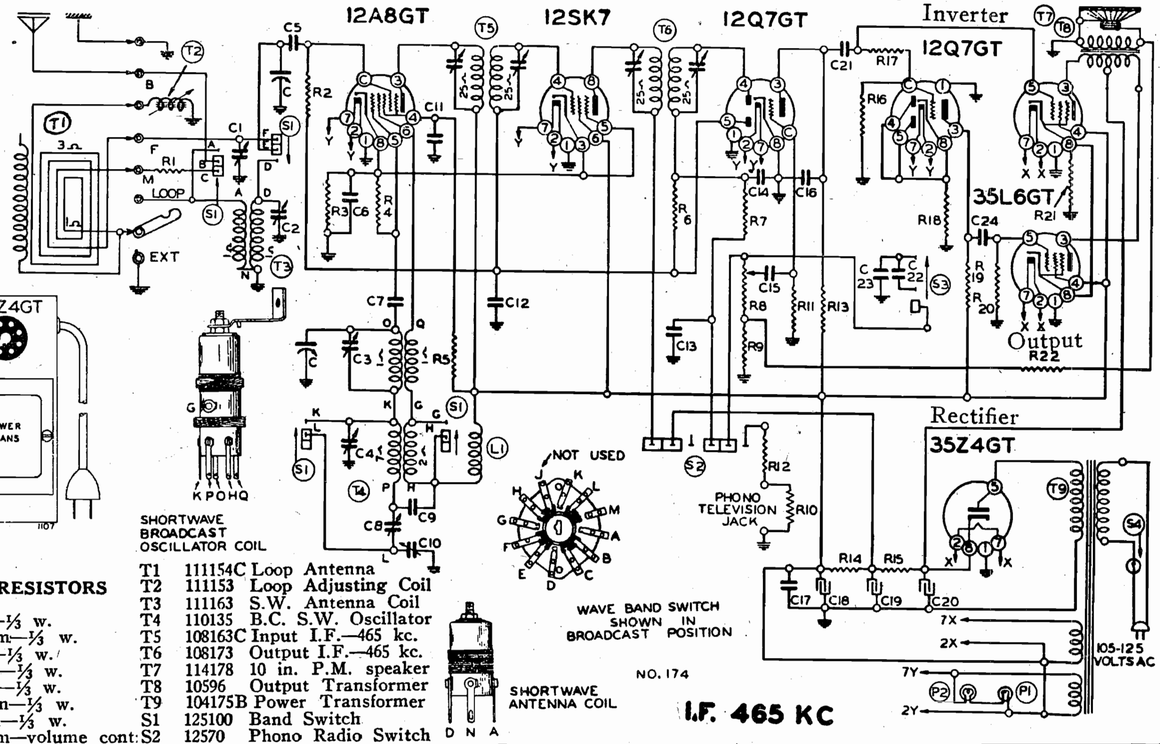


FIG. 2.— TOP VIEW



C	102128	2 gang variable condenser
C1	124117	B.C. Adj. Trimmer (Antenna)
C2	124116	S.W. Adj. Trimmer (Antenna)
C3	124112	S.W. Adj. Trimmer (Oscillator)
C4	124112	B.C. Adj. Trimmer (Oscillator)
C5	1292	.0005 mica
C6	100104	.5 x 100 v.
C7	12939	.00005 mica
C8	124113	B.C. Series pad
C9	1009	.05 x 200 v.
C10	124113	S.W. Series pad
C11	10020	.1 x 200 v.
C12	1009	.05 x 200 v.
C13	1295	.0001 mica
C14	1295	.0001 mica
C15	10025	.002 x 600 v.
C16	1292	.0005 mica
C17	10020	.1 x 200 v.
C18	119101	20 mfd. lytic
C19	119101	20 mfd. lytic
C20	119101	40 mfd. lytic
C21	10026	.02 x 400 v.
C22	1298	.0006 mica
C23	100112	.001 x 200 v.
C24	10026	.02 x 400 v.

C3 and C4 in same unit
C8 and C10 in same unit
C18, C19, C20 in same unit

FOR TUNER & ALIGNMENT DATA, SEE INDEX

RESISTORS

R1	13079	400 ohm—1/3 w.
R2	13019	1 megohm—1/3 w.
R3	130168	100 ohm—1/3 w.
R4	13012	50M ohm—1/3 w.
R5	130149	15M ohm—1/3 w.
R6	130170	3 megohm—1/3 w.
R7	13012	50M ohm—1/3 w.
R8	101195	1 megohm—volume cont.
R9	130276	10 ohm—1/3 w.
R10	1305	300M ohm—1/3 w.
R11	130257	5 megohm—1/3 w.
R12	1304	3 megohm—1/3 w.
R13	1309	200M ohm—1/3 w.
R14	130294	1200 ohm—1/2 w.
R15	130294	1200 ohm 1/2 w.
R16	130236	30M ohm—1/3 w.
R17	130102	500M ohm—1/3 w.
R18	13022	5M ohm—1/3 w.
R19	1309	200M ohm—1/3 w.
R20	130102	500M ohm—1/3 w.
R21	130296	200 ohm—1 w.
R22	130168	100 ohm—1/3 w.

T1	111154C	Loop Antenna
T2	111153	Loop Adjusting Coil
T3	111163	S.W. Antenna Coil
T4	110135	B.C. S.W. Oscillator
T5	108163C	Input I.F.—465 kc.
T6	108173	Output I.F.—465 kc.
T7	114178	10 in. P.M. speaker
T8	10596	Output Transformer
T9	104175B	Power Transformer
S1	125100	Band Switch
S2	12570	Phono Radio Switch
S3	12599	Tone Switch
S4		Off-on Switch on volume control
L1	1233	R.F. Choke
P1 & 2	10794	6-8 v. pilot light

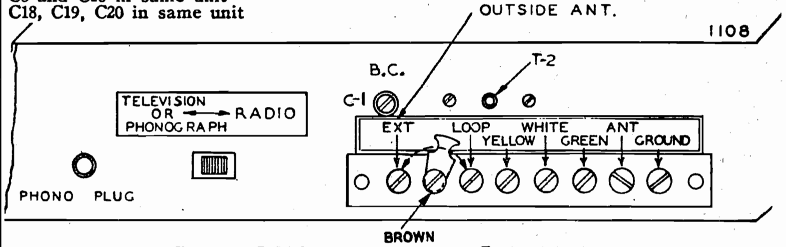


FIG. 1.— REAR VIEW OF CHASSIS

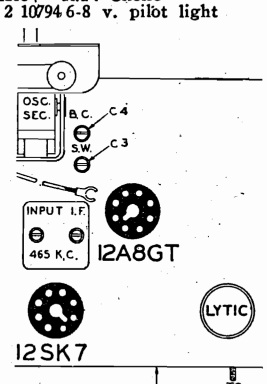
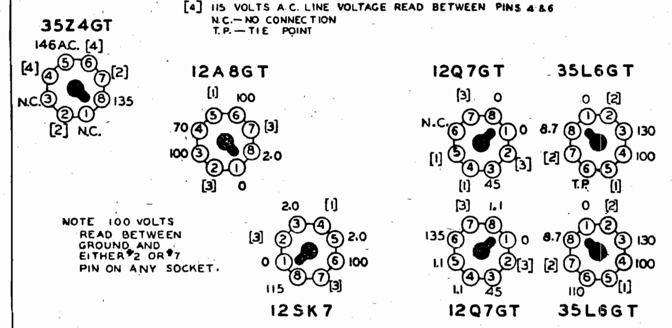


FIG. 5.—TOP VIEW

BOTTOM VIEW OF CHASSIS

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

[1] CANNOT BE MEASURED WITH VOLTMETER
[2] 30 VOLTS A.C. READ ACROSS PINS 2 & 7
[3] 11.6 VOLTS A.C. READ ACROSS PINS 2 & 7
[4] 115 VOLTS A.C. LINE VOLTAGE READ BETWEEN PINS 4 & 6
N.C.—NO CONNECTION
T.P.—TIE POINT



NOTE 100 VOLTS READ BETWEEN GROUND AND EITHER #2 OR #7 PIN ON ANY SOCKET.

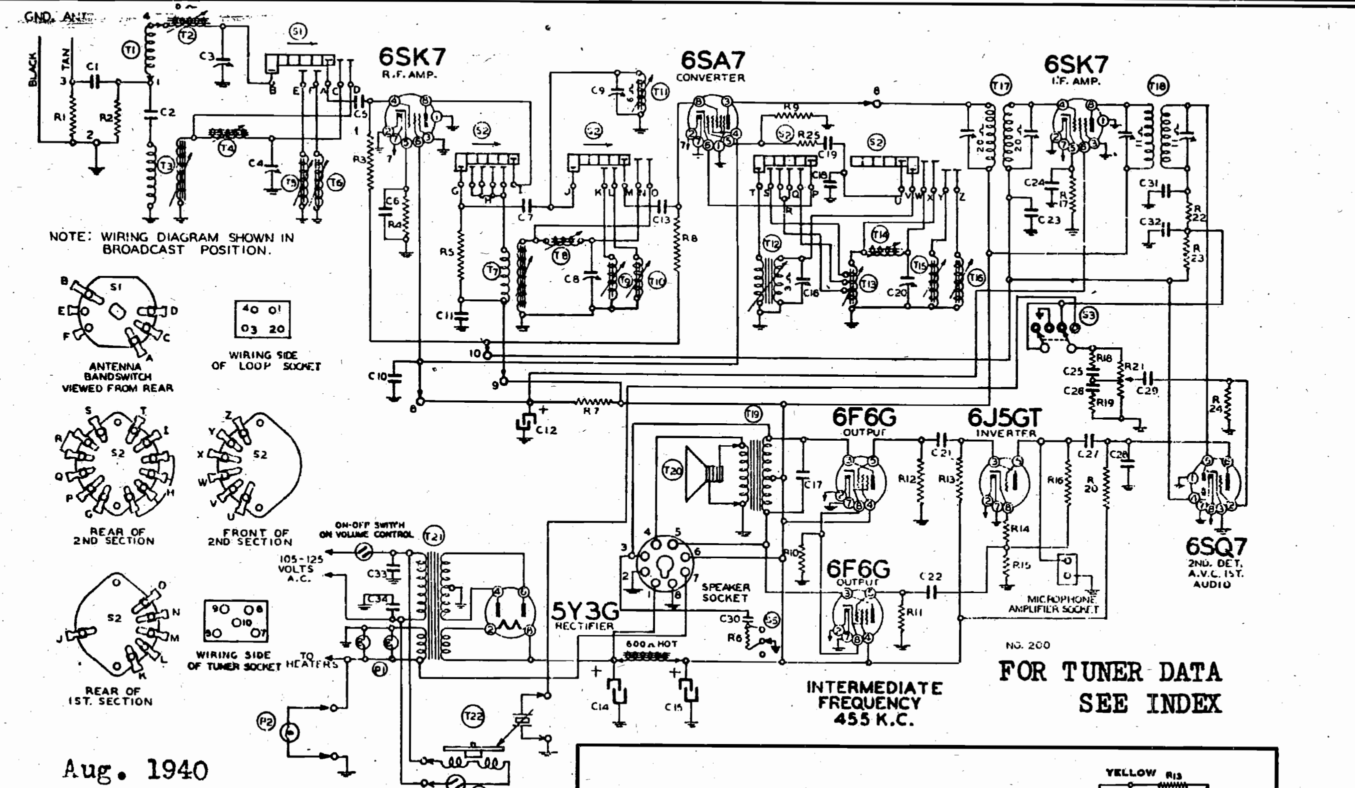
REAR OF CHASSIS

1-40

MODEL 801

BELMONT RADIO CORP.

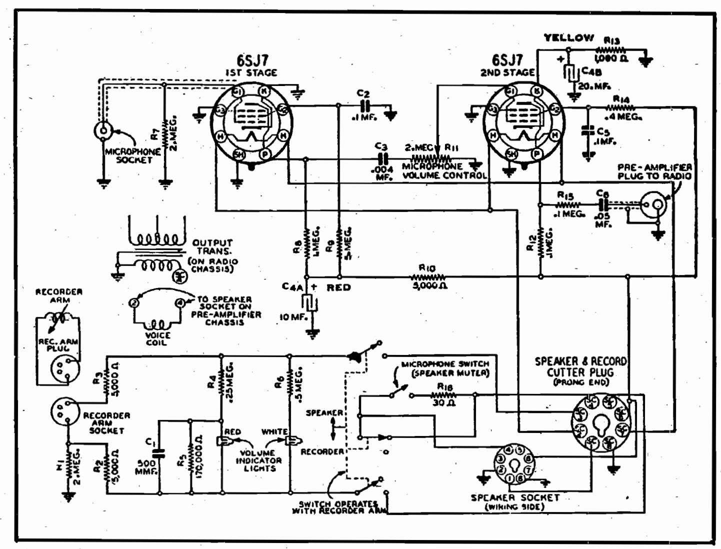
Radio Set Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	1301	25M ohm—1/3 w.
R2	1301	25M ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130239	250 ohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	13064	3500 ohm—1/3 w.
R7	10662	12,500 ohm—3 watts
R8	13019	1 megohm—1/3 w.
R9	130232	25M ohm—1/3 w.
R10	130220	300 ohm—1 watt
R11	1303	500M ohm—1/3 w.
R12	1303	500M ohm—1/3 w.
R13	130103	100M ohm—1/3 w.
R14	130218	5M ohm—1/3 w.
R15	130103	100M ohm—1/3 w.
R16	13019	1 megohm—1/3 w.
R17	13070	500 ohm—1/3 w.
R18	13011	250M ohm—1/3 w.
R19	130149	15M ohm—1/3 w.
R20	13011	250M ohm—1/3 w.
R21	101233	1/2 megohm volume control and on-off switch
R22	13012	50M ohm—1/3 w.
R23	1304	3 megohm—1/3 w.
R24	130257	5 megohm—1/3 w.
R25	130174	50 ohm—1/3 w.
		CONDENSERS
C1	1292	.0005 mica
C2	10047	.002 x 600 v. -10%
C3	124143	B.C. Antenna Trimmer
C4	124143	9 mc. antenna trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v. tubular
C7	129168	.00001 mica
C8	124138	9 mc. R.F. Trimmer
C9	124139	B.C. R.F. Trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	119109	10.0 x 350 w.v.
C13	1292	.0005 mica
C14	119109	15.0 x 450 w.v.
C15	119109	15.0 x 450 w.v.
C16	124144	B.C. Oscillator trimmer
C17	10071	.004 x 600 v.
C18	129167	.0002 silver mica
C19	12938	.00005 mica
C20	124145	9 mc. osc. trimmer
C21	10013	.05 x 400 v.
C22	1009	.05 x 200 v.
C23	10026	.02 x 400 v.
C24	10020	.1 x 200 v.
C25	129114	.0003 mica
C26	100122	.03 x 200 v.
C27	10026	.02 x 400 v.
C28	12921	.0002 mica
C29	10019	.006 x 600 v.
C30	10013	.05 x 400 v.
C31	129165	.00005 mica
C32	129165	.00005 mica
C33	10061	.02 x 600 v. bakelite
C34	10061	.02 x 600 v. bakelite
		C12, C14 and C15 in same unit
		C31 and C32 in same unit
T1	111209	Loop antenna assembly
T2	111195	B.C. Antenna Coil
T3	111190	9 mc. Antenna Coil
T4	111189	6 mc. Antenna Coil
T5	111191	12 mc. Antenna Coil
T6	111192	15 mc. Antenna Coil
T7	10959	9 mc. R.F. Coil
T8	10958	6 mc. R.F. Coil
T9	10960	12 mc. R.F. Coil
T10	10961	15 mc. R.F. Coil
T11	10962	B.C. R.F. Coil
T12	110161	B.C. Osc. Coil
T13	110157	9 mc. Osc. Coil
T14	110156	6 mc. Osc. Coil
T15	110158	12 mc. Osc. Coil
T16	110159	15 mc. Osc. Coil
T17	108177	Input I.F. Coil—455 kc.
T18	108176	Output I.F. Coil—455 kc.
T19	105111	Output Transformer
T20	114217	12 in. speaker—dynamic
T21	104202B	Power Transformer—50-60 cycle
	104203B	Power Transformer—25 cycle
T22	104234	Automatic Record Changer—Complete Seeburg 60 cycle
	104232	Automatic Record Changer—Complete Seeburg 25 cycle
	104233	Automatic Record Changer—Complete Seeburg 50 cycle
S1	125118	Antenna Bandswitch
S2	125117	R.F. & Osc. Bandswitch
S3	125129	Radio-phono switch
S4	—	Switch on record changer
S5	125130	Tone control switch
P1	10794	(2) 6-8 Volt Pilot Lights T44
P2	10794	Indicator Light T44



INTERMEDIATE FREQUENCY 455 K.C.

FOR TUNER DATA SEE INDEX

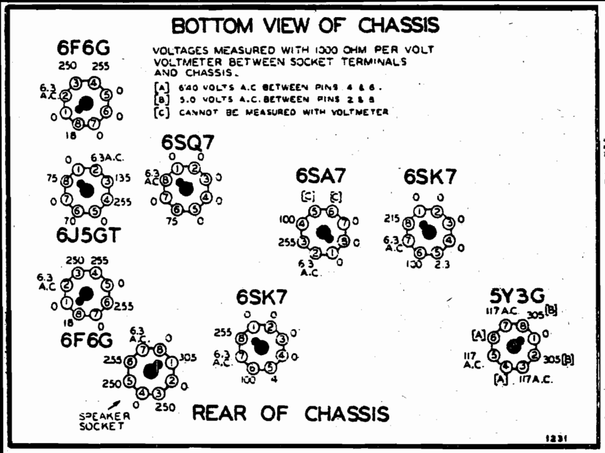
Aug. 1940

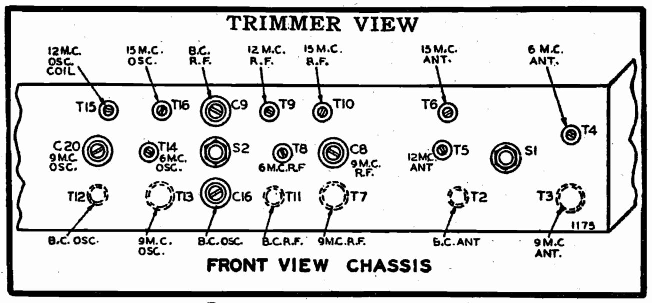


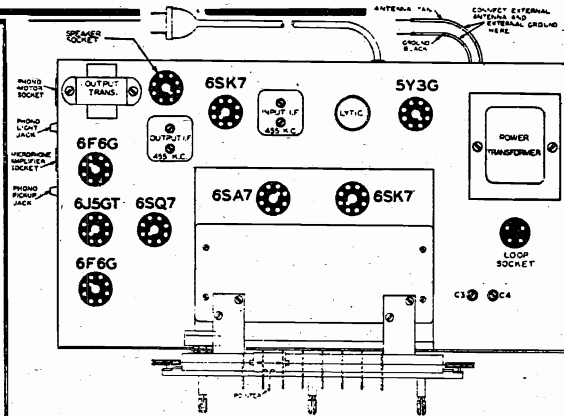
CIRCUIT DIAGRAM OF MICROPHONE AMPLIFIER

MODEL 801

BELMONT RADIO CORP.



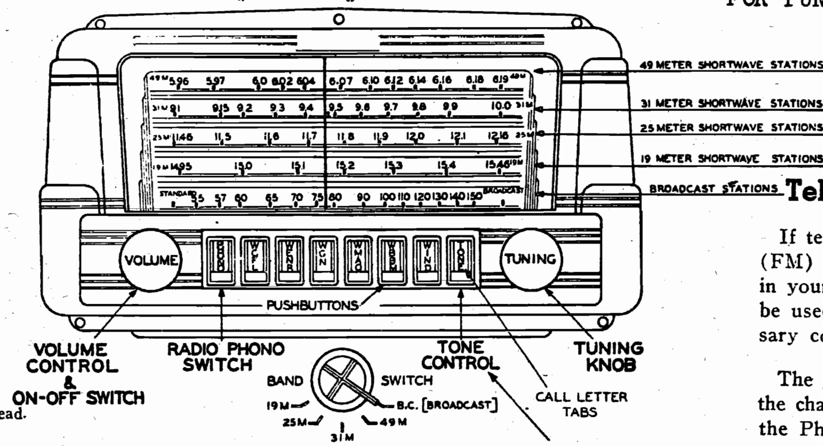




- Tone control—Treble.
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms

Power Consumption, Radio only - - - 100 Watts
Power Output - - - - - 5 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - 12 in. Electro Dynamic

FOR TUNER DATA, SEE INDEX



FOR IRON-CORE ADJUSTMENT DATA (SW BAND SPREAD) SEE INDEX

Television and Fm. Jack

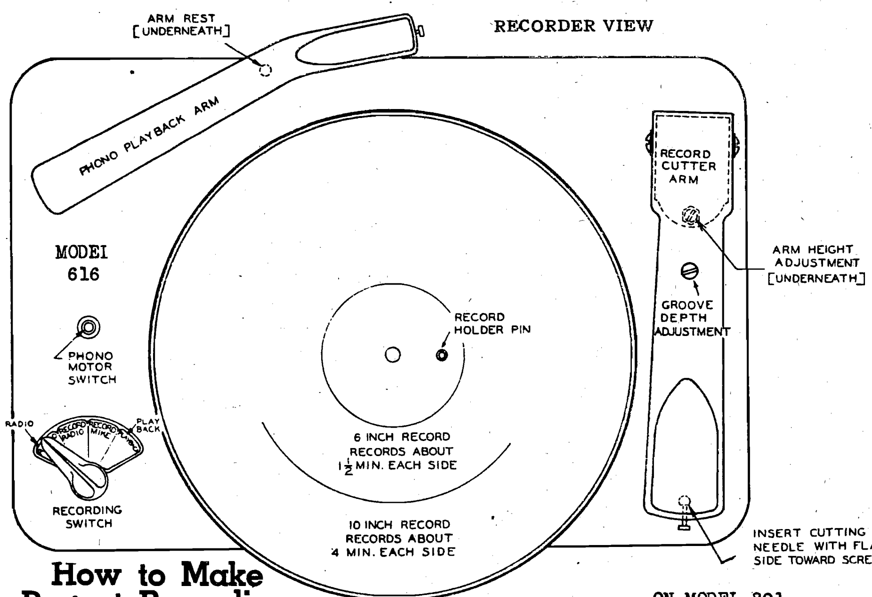
If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

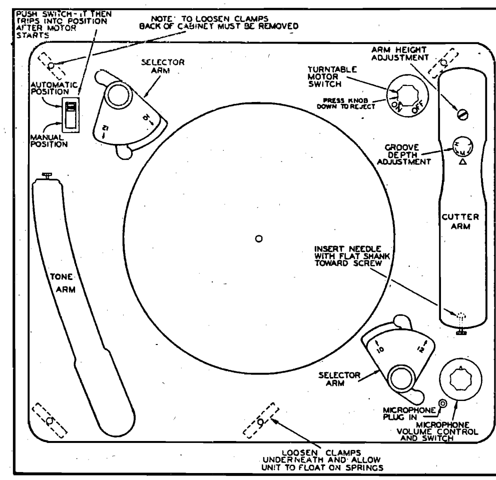
The jack marked phono-pickup jack in the chassis view will accommodate either the Phono or a television or FM converter.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted in Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

MODELS 801, 616

BELMONT RADIO CORP.





How to Make Perfect Recordings

The microphone must be connected to the chassis at all times.

Insert a playback needle in the playback arm.

Insert a special cutting stylus (needle) in the cutter arm. Handle this needle with care.

Be sure the needle is tight after each recording. Should it loosen during the recording, it will chatter and ruin your record.

Cutting Needle

The cutting stylus is razor sharp and must not be dropped on the record or allowed to rest on the turntable.

For best operation, the instrument should be level in all directions. To check this, place a small level, if you have one, on the turntable. If you do not have a level, a marble will do. If the marble rolls off the turntable, it is low in the direction in which it rolls. Place something under the cabinet until the machine is reasonably level.

Shavings

The cutting stylus cuts out a fine shaving that is just a little thicker than a human hair. These shavings should not be allowed to gather under the cutting stylus.

While cutting, gently brush the shavings from the left side of the record in, toward the center pin, allowing them to collect there until the recording is completed.

Do Not Use Too Much Volume

The most frequent cause of poor recordings is too much volume or overloading. If some passages of your recording are smooth and clear while others are raspy, rough and distorted, you are probably using too much volume. Overloading occurs most often on strong passages. The remedy is to reduce the volume slightly and watch the volume indicator lights—and study the different effects of microphone technique.

Too little volume will show up when you play the record back. The volume control on playbacks will have to be turned up quite high and needle scratch will be excessive.

Cutting Arm Adjustments

The cutting arm is adjusted at the factory for proper operation, however, with various types of blanks this adjustment may sometimes have to be altered.

ON MODEL 801

With a blank record on the table, the height adjustment on the cutter arm should be adjusted so that the needle screw is centered in the slot when the needle rests on a blank record.

on Model 616

With a blank record on the table, the height adjustment under the cutter arm should be adjusted so that the bottom of the cutting arm is ¼" from the top of the record blank. Make this measurement carefully at the front end beside the stylus screw.

The screw adjustment can be turned to raise or lower the arm.

Several blank grooves should now be cut to see if the groove is the proper depth.

on Model 616

The depth adjustment screw on the cutter arm will increase the depth of the groove if turned to the right and will decrease the groove if turned to the left.

on Model 801

The depth adjustment screw on the cutter arm will increase the depth of the groove if turned to the letter "H" and will decrease the groove if turned to the letter "L"—For a medium groove turn to "M".

If the groove is too shallow, the playback needle will not stay in the groove. If it is too deep, not enough wall will be left between grooves and the playback needle will break through from one track to the next after a few playings.

A **properly** cut groove will leave a shaving just a little heavier than a human hair.

The proper depth of groove will leave about the same space between the groove as the groove is wide. Hold a finished record toward the light and you can usually see if the grooves are spaced correctly.

Recording Radio Programs — MODEL 616

Turn the radio on and tune in the program you wish to record. Put recording switch in "Record Radio" position. The volume will drop. Start motor and then gently lower cutting needle onto blank record, about ¼" from outer edge.

Recording Radio Programs — MODEL 801

Turn the radio on and tune in the program you wish to record. Put manual switch in manual position. Start motor and then gently lower cutting needle onto blank record, about ¼" from outer edge. Radio Volume will drop—Adjust volume control so red volume indicator light is off and white indicator light continues to flicker.

MODEL 801

NOTE—Some radios of this model are equipped with a recording arm on the record changer with which you can make your own records. If your radio has the recording unit follow the instructions below for making records.

The Mike volume control must be turned off (all the way left) except when recording with the microphone.

The two volume indicator lights along side the microphone volume control are used for setting the proper recording level. When recording radio programs the radio volume control should be adjusted so that the red indicator light remains off while the white continues to flicker. When recording with the microphone the lights should be adjusted in the same manner but using the microphone volume control.

Recording Voice — MODEL 616

Turn the radio volume control nearly full on. Recording switch should be in Record "Mike" position. Start motor, and set cutting needle gently on start of record. Turn mike switch on and talk.

Microphone Recording — MODEL 801

Turn the mike volume control well up. Phono pushbutton should be in "Phono" position. Put manual switch in manual position. Start motor, and set cutting needle gently on start of record. Adjust volume indicator lights the same as in recording radio programs.

NOTE: The cutting arm must be raised about three inches to move it freely across the record.

Operating the Phonograph

Turn radio on. Put phono switch in "Phono" position. on 801

Turn recording switch to Playback position. on 616

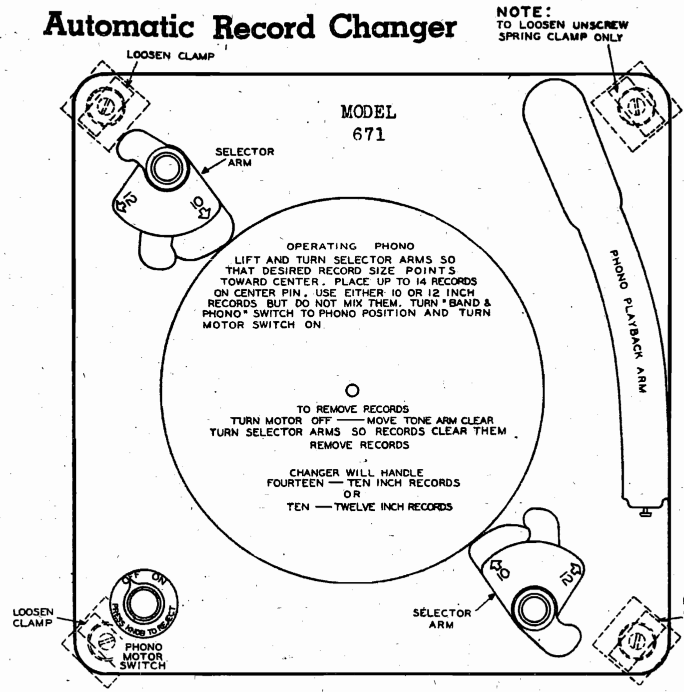
Push manual switch toward manual side to play home recordings. on 801

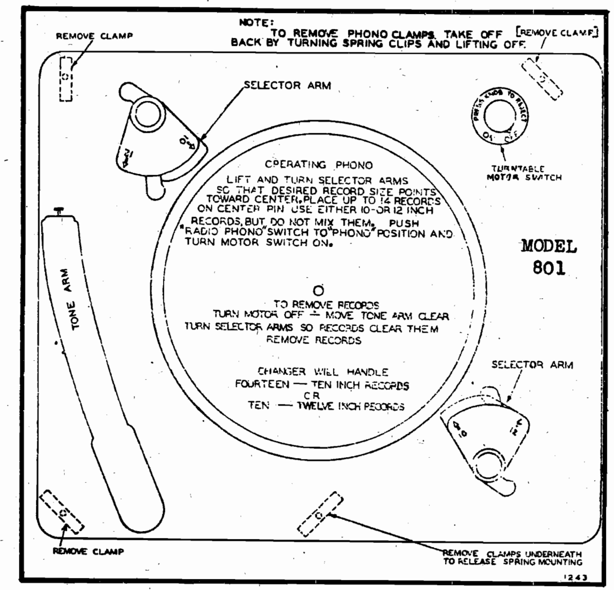
Put your record on turntable and start motor. Place playback arm on record and control tone and volume with the radio volume and tone control knobs.

Be sure mike control is turned off when playing records.

BELMONT RADIO CORP.

Automatic Record Changer





Setting for Size of Record

The Changer plays up to fourteen 10" or ten 12" records at one loading. **All records must be the same size for each loading.**

On each post you will see selecting arms. The position of these arms determines the setting for different size records. To set for 10 or 12 inch records, it is merely necessary to grasp the posts by the knobs at the top, lift, and turn until the 10" or 12" arrows are pointing toward the center of the turntable. When in either the 10" or 12" position, the posts will snap into place except when they are lifted by hand. Be sure to set both posts for the same size record.

Loading

See that the selecting arms of both posts are turned toward the center of the turntable as indicated by the engraved arrows, and that both sets of arms are set for the same size (10" or 12") records as described in the preceding paragraph.

Place the stack of records (up to fourteen 10" or ten 12") over the center pin so that they will rest on the selecting arms.

Starting the Changer

1. Turn on the radio (allowing approximately 30 seconds for the tubes to warm up) and turn the phonograph-radio knob, to the phonograph position.
2. Turn the switch knob on the Record Changer panel to "ON". The motor will then start and the record changer will go into automatic operation of its own accord.

How to Reject a Record

Merely press the switch knob on the Changer panel. You can do it any time after the needle has come into contact with that record.

Playing Individual Records

Should it be desired to play an individual record merely set up the machine as described above for the proper size (10" or 12" as indicated on the selecting arms), place the record on top of the arms as described under "Loading", and set the machine in operation by means of the switch knob described under "Starting the Changer." In other words, play an individual record in the same manner as you would play a stack of that size.

Unloading

First switch off the motor. Grasp each post by its knob at the top and turn them out of the way.

Lift the played records from the turntable. Then return the posts to the proper playing position as indicated by the arrows on the selecting arms.

The Changer may then be loaded with a new stack of records according to the size shown on the selecting arms.

Turning Off Changer

Throw Changer switch knob to "OFF" position.

Lift tone arm and place it in the rest position. (If you happen to turn off the Changer switch while the mechanism is going through a "change cycle," you will notice that it does not stop until the cycle has been completed, and the tone arm is again in playing position, at which point it is ready to be lifted to the rest position. If you prefer to turn off your Changer with the radio switch, be sure to turn it off while needle is resting upon a record; otherwise, the selecting arms cannot be correctly reset.

To avoid warping of records, never leave records resting on posts.

If Changer is Left Running

No damage will be done if you forget to turn off Changer after it has played its entire load of records. It will simply repeat the last record until stopped or reloaded.

Phonograph Needles

Various types and kinds of needles are available for use in phonograph tone arms. All have their virtues, as well as their faults, **for use in ordinary** phonographs, where needles can be changed after each record. For playing ten or more records at one set-up, as with this Changer, no attempt should be made to use ordinary steel or fibre points, since continued use of worn points will be likely to ruin both quality of reproduction and the records as well. Any kind of needle can be used which has a point durable enough to play ten records or more without damaging them.

It should be remembered that, no matter what the quality of the tone arm, amplifying system and speaker, all of the recorded music must pass through the needle. For this reason, it is absolutely essential that particular care be taken to use good needles, and to see that they are changed often enough so that the records are not damaged and the quality of the music is not impaired.

In general there are two types of needles which can be satisfactorily used on an Automatic Record Changer: those which require changing after approximately 12 records, and the so-called permanent type needles which are rated in terms of "hours of service." In no case should the manufacturers' claims for these needles be exceeded, since in all probability the needles are rated in terms of their maximum life. If at any time short of the rated life, particularly in the case of the semi-permanent type needles, there is any reason to suspect that the needle has become unduly worn, it would probably be advisable to replace it with a new one. **Never under any conditions should a needle be removed from the tone arm head and then replaced—needle manufacturers' claims notwithstanding.**

For convenience, the tone arm on your changer may be raised to a nearly vertical position, so that the needle may be easily inserted; the needle screw should be tightened firmly.

Radio-Phono Pushbutton Switch MODEL 801

This pushbutton switches from the radio to the phono position. It should be level with the other buttons for radio operation—or pulled out to use the phonograph.

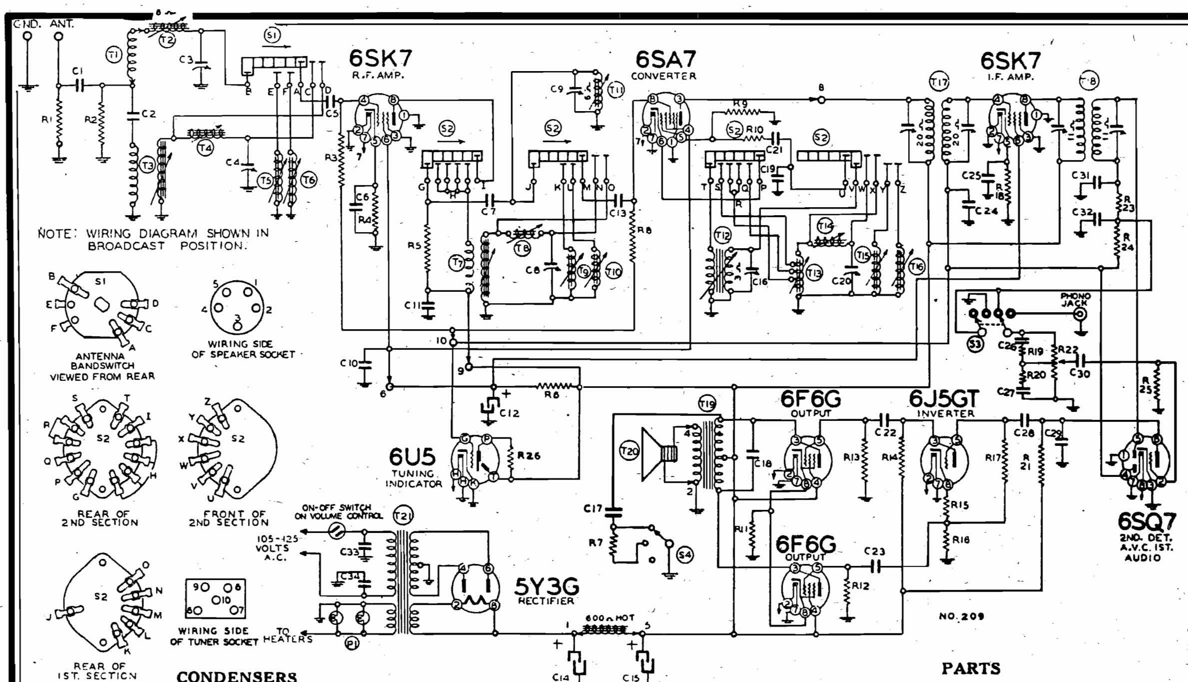
The volume and tone controls also operate when playing records.

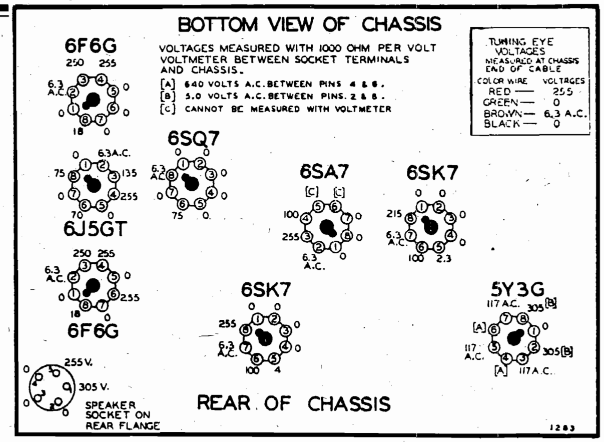
Pushbutton Tone Control

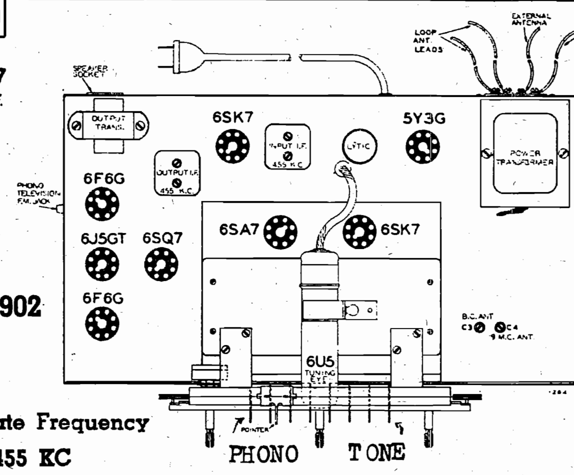
This button has three tone positions Bass—Medium—Treble. Each time you push the button it will change the tone to one of these positions—Change it any time to the tone you like best.

MODEL 902

BELMONT RADIO CORP.







Model 902

Intermediate Frequency 455 KC

CONDENSERS

C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. Antenna Trimmer
C4	124143	9 mc. Ant. Trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v.
C7	129168	.00001 mica
C8	124138	9 mc. R.F. Trimmer
C9	124139	B.C. R.F. Trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	119109	10.0 mfd. x 350 w.v. lytic
C13	1292	.0005 mica
C14	119109	15.0 mfd. x 450 w.v. lytic
C15	119109	15.0 mfd. x 450 w.v. lytic
C16	124144	B.C. Oscillator Trimmer
C17	10013	.05 x 400 v.
C18	10071	.004 x 600 v.
C19	129167	.0002 silver mica
C20	124145	9 mc. Oscillator Trimmer
C21	12938	.00005 mica
C22	10013	.05 x 400 v.
C23	1009	.05 x 200 v.
C24	10026	.02 x 400 v.
C25	10020	.1 x 200 v.
C26	129114	.0003 mica
C27	100122	.03 x 200 v.
C28	10026	.02 x 400 v.
C29	12921	.0002 mica
C30	10019	.006 x 600 v.
C31	129165	.00005 mica
C32	129165	.00005 mica
C33	10061	.02 x 600 v.
C34	10061	.02 x 600 v.

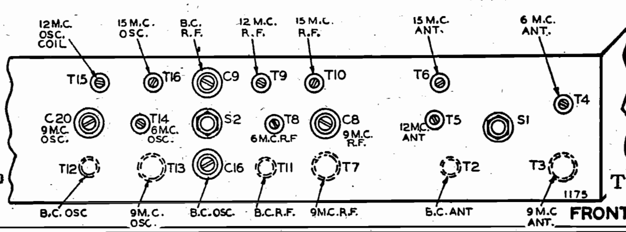
C12 and C14 and C15 in same unit
C31 and C32 in same unit

RESISTORS

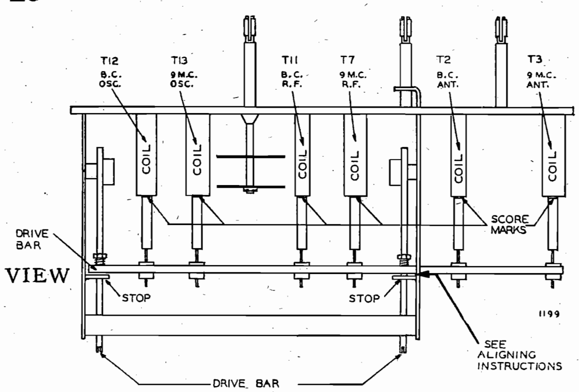
R1	1301	25M ohm—1/3 w.
R2	1301	25M ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130239	250 ohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	10662	12,500 ohm—3 w.
R7	13064	3500 ohm—1/3 w.
R8	13019	1 megohm—1/3 w.
R9	130232	25M ohm—1/3 w.
R10	130174	50 ohm—1/3 w.
R11	130220	300 ohm—1 w.
R12	1303	500M ohm—1/3 w.
R13	1303	500M ohm—1/3 w.
R14	130103	100M ohm—1/3 w.
R15	130218	5M ohm—1/3 w.
R16	130103	100M ohm—1/3 w.
R17	13019	1 megohm—1/3 w.
R18	13070	500 ohm—1/3 w.
R19	13011	250M ohm—1/3 w.
R20	130149	15M ohm—1/3 w.
R21	13011	250M ohm—1/3 w.
R22	101233	Volume Control & On-off switch
R23	13012	50M ohm—1/3 w.
R24	1304	3 megohm—1/3 w.
R25	130257	5 megohm—1/3 w.
R26		1 megohm tuning indicator cable

PARTS

T1	111206	Loop antenna assembly
T2	111195	B.C. Antenna Coil
T3	111190	9 mc. Antenna Coil
T4	111189	6 mc. Antenna Coil
T5	111191	12 mc. Antenna Coil
T6	111192	15 mc. Antenna Coil
T7	10959	9 mc. R.F. Coil
T8	10958	6 mc. R.F. Coil
T9	10960	12 mc. R.F. Coil
T10	10961	15 mc. R.F. Coil
T11	10962	B.C. R.F. Coil
T12	110161	B.C. Oscillator Coil
T13	110157	9 mc. Oscillator Coil
T14	110156	6 mc. Oscillator Coil
T15	110158	12 mc. Oscillator Coil
T16	110159	15 mc. Oscillator Coil
T17	108177	Input I.F. Coil—455 kc.
T18	108176	Output I.F. Coil—455 kc.
T19	105111	Output Transformer
T20	114221	12" Dynamic Speaker
T21	104202B	Power Transformer—For 50-60 Cycle
or	104203B	Power Transformer—For 25 Cycle
S1	125118	Antenna Bandswitch
S2	125117	R.F. & Osc. Bandswitch
S3	125129	Radio-Phono Switch
S4	125130	Tone Control Switch
P1	10794	(2) 6-8 Volt Pilot Lights—T44



TRIMMER VIEW
FRONT VIEW CHASSIS



IRON CORE ADJUSTMENT VIEW

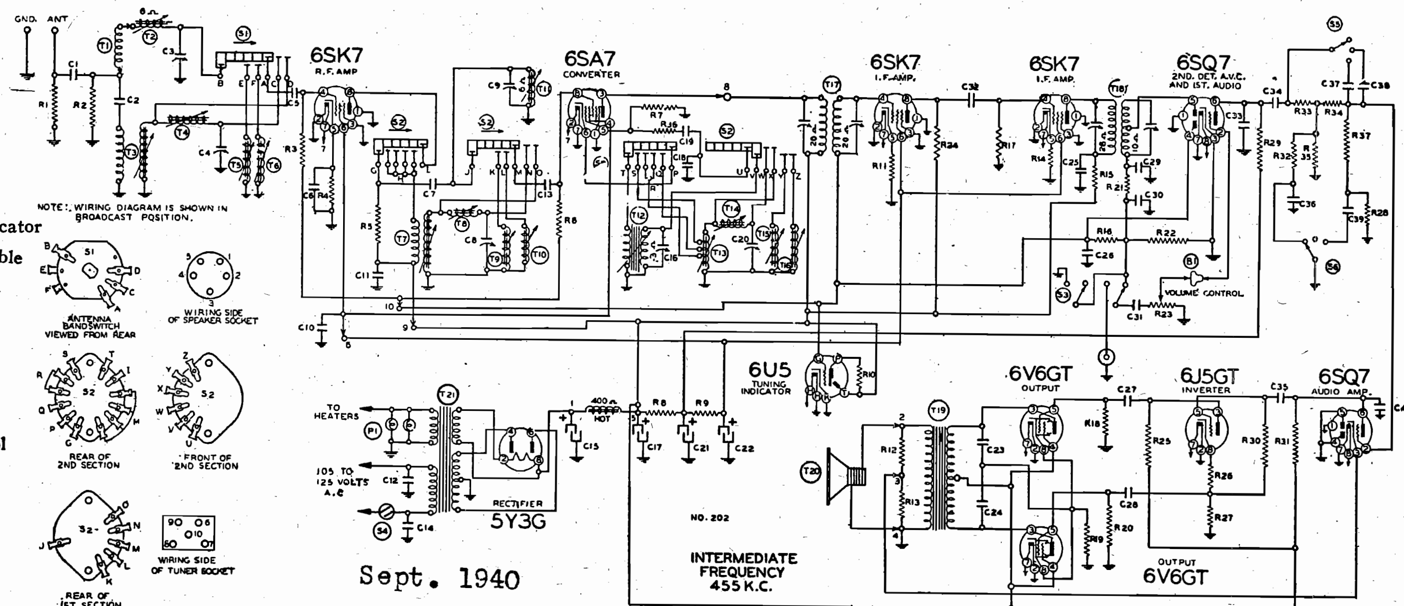
BRC(C800) Series A Form No. 9030—1M—9-40

PRO. 236

BELMONT RADIO CORP.

MODEL 1100
Series A

FOR TUNER DATA, SEE INDEX



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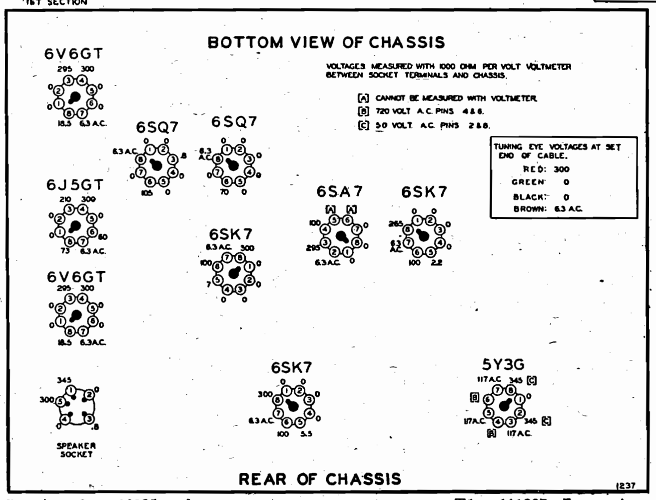
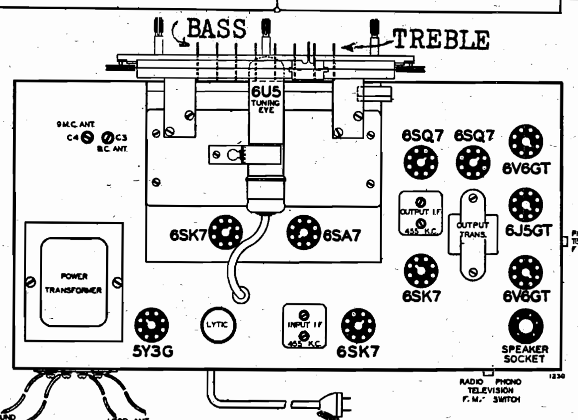




RESISTORS

Code No.	Part No.	Description
R1	130232	25M ohm—⅓ w.
R2	130232	25M ohm—⅓ w.
R3	13019	1 megohm—⅓ w.
R4	130239	250 ohm—⅓ w.
R5	130218	5M ohm—⅓ w.
R6	13019	1 megohm—⅓ w.
R7	130232	25M ohm—⅓ w.
R8	130318	6M ohm—2 watt
R9	130319	10M—2 watt
R10		1 megohm in tuning indicator cable
R11	130200	700 ohm—⅓ w.
R12	13082	10M ohm—⅓ w.
R13	130235	1500 ohm—⅓ w.
R14	130235	1500 ohm—⅓ w.
R15	130192	2M ohm—⅓ w.
R16	13019	1 megohm—⅓ w.
R17	13020	100M ohm—⅓ w.
R18	1303	500M ohm—⅓ w.
R19	130317	250 ohm—2 watt
R20	1303	500M ohm—⅓ w.
R21	13020	100M ohm—⅓ w.
R22	130238	400M ohm—⅓ w.
R23	101234	500M ohm volume control and line switch (S4)
R24	13073	15M ohm—⅓ w.
R25	13094	50M ohm—⅓ w.
R26	130218	5M ohm—⅓ w.
R27	13094	50M ohm—⅓ w.
R28	1303	500M ohm—⅓ w.
R29	130172	250M ohm—⅓ w.
R30	1303	500M ohm—⅓ w.
R31	130172	250M ohm—⅓ w.
R32	1307	40M ohm—⅓ w.
R33	13080	150M ohm—⅓ w.
R34	130309	350M ohm—⅓ w.
R35	130172	250M ohm—⅓ w.
R36	130174	50 ohm—⅓ w.
R37	13080	150M ohm—⅓ w.

CONDENSERS

Code No.	Part No.	Description
C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. Antenna Trimmer
C4	124143	9 mc. Antenna Trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v. Tubular
C7	129168	.00001 mica
C8	124138	9 mc. R.F. Trimmer
C9	124139	B.C. R.F. Trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	10061	.02 x 600 v.
C13	1292	.0005 mica
C14	10061	.02 x 600 v.
C15	119112	30.0 mfd. lytic
C16	124144	B.C. Oscillator Trimmer
C17	119112	30.0 mfd. lytic x 450 w.v.
C18	129167	.0002 silver mica
C19	12938	.00005 mica
C20	124145	9 mc. Oscillator Trimmer
C21	119112	10.0 mfd. lytic
C22	11969	16 mfd. x 350 w.v.
C23	10065	.015 x 600 v.
C24	10065	.015 x 600 v.
C25	1001	.1 x 400 v.
C26	10022	.05 x 200 v.
C27	10013	.05 x 400 v.
C28	1009	.05 x 200 v.
C29	129161	.0001 mica
C30	129161	.0001 mica
C31	10020	.1 x 200 v.
C32	1292	.0005 mica
C33	12912	.00025 mica
C34	1001	.1 x 400 v.
C35	10013	.05 x 400 v.
C36	100118	.008 x 600 v.
C37	12936	.0003 mica
C38	129166	.000125 mica
C39	10037	.003 x 600 v.
C40	12912	.00025 mica

C3 and C4 in same unit
C15, C17 and C21 in same unit
C29 and C30 in same unit

Code No.	Part No.	Description
T1	111207	Loop Antenna Assembly
T2	111195	B.C. Antenna Coil
T3	111190	9 mc. Antenna Coil
T4	111189	6 mc. Antenna Coil
T5	111191	12 mc. Antenna Coil
T6	111192	15 mc. Antenna Coil
T7	10959	9 mc. R.F. Coil
T8	10958	6 mc. R.F. Coil
T9	10960	12 mc. R.F. Coil
T10	10961	15 mc. R.F. Coil
T11	10962	B.C. R.F. Coil
T12	110161	B.C. Oscillator Coil
T13	110157	9 mc. Oscillator Coil
T14	110156	6 mc. Oscillator Coil
T15	110158	12 mc. Oscillator Coil
T16	110159	15 mc. Oscillator Coil
T17	108177B	Input I.F. Coil—455 Kc.
T18	108130E	Output I.F. Coil—455 Kc.
T19	105115	Output Transformer
T20	114207	12" Dynamic Speaker
T21	104217	Power Transformer—50-60 cycles
S1	125118	Antenna Bandswitch
S2	125117	R.F. Oscillator Bandswitch
S3	125133	Radio-phono Switch
S4		On-off Switch on volume control
S5	125130	Treble Switch
S6	125131	Bass Switch
P1	10794	2 6-8 Volts Pilot Lights T44
B1	11622	1.25 Volt Bias Cell

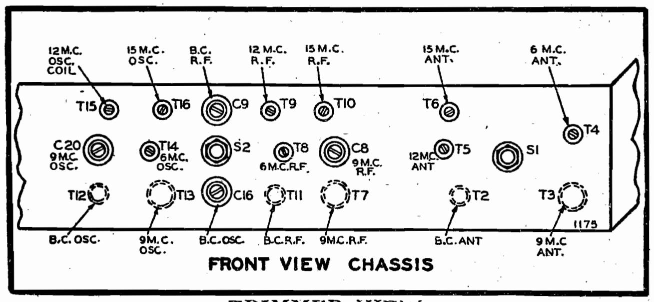
MODEL 1100

BELMONT RADIO CORP.

- Tone control—Treble
- 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	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output



TRIMMER VIEW

Power Consumption - - - - - - 120 Watts
Power Output - - - - - 10 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 27 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - 12 in. Electro Dynamic

Phonograph-Television and Fm. Jack

Should you wish to use an external phonograph it should be plugged into the phono jack shown in the chassis view—The radio-phono switch on the chassis will then switch from radio to phono operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-television-FM in the chassis view will accommodate either the Phono or a television or FM converter.

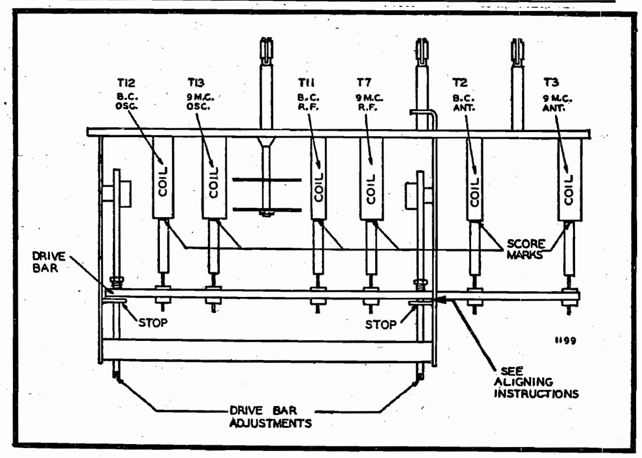
Service Notes

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a guage). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

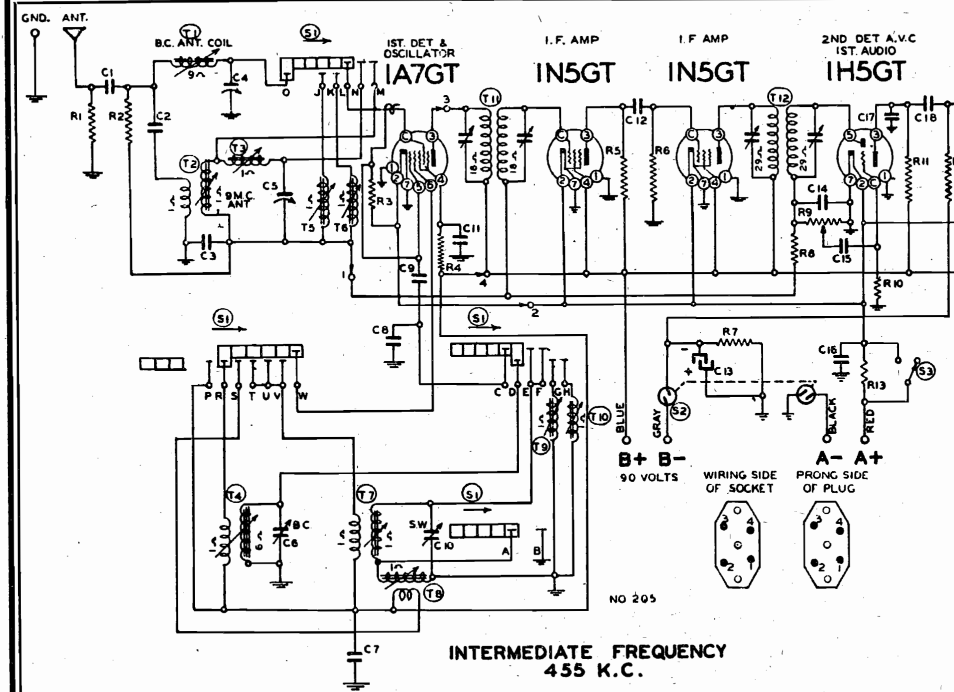
You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

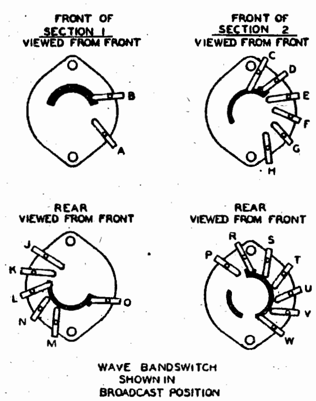


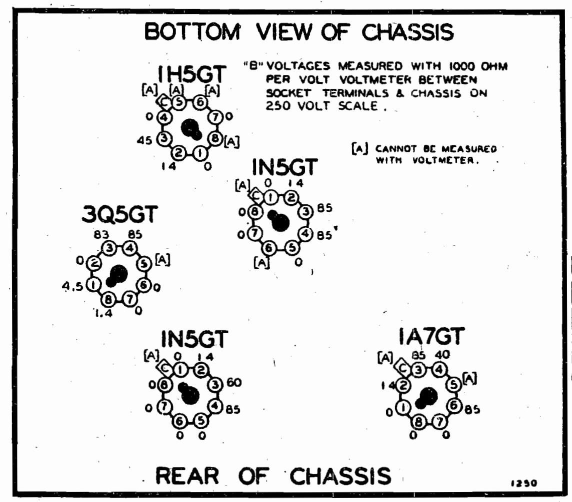
IRON CORE ADJUSTMENT VIEW

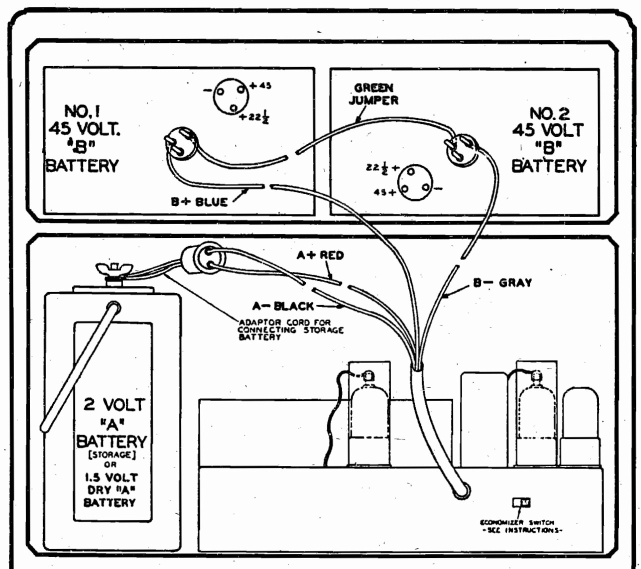
BELMONT RADIO CORP.

BRC(509) Series A Form No. 5129—1,500—9-40
PRO. 220





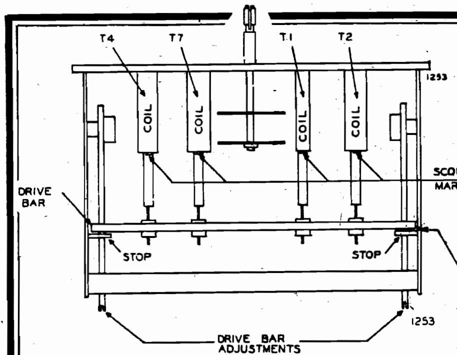




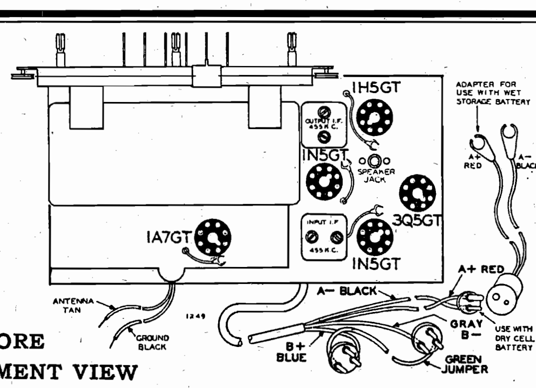
Code No.	Part No.	Description
		RESISTORS
R1	13012	50M ohm—1/3 w. 20%
R2	13020	100M ohm—1/3 w. 20%
R3	1309	200M ohm—1/3 w. 20%
R4	13094	50M ohm—1/3 w. 10%
R5	130176	20M ohm—1/3 w. 10%
R6	13019	1 megohm—1/3 w. 20%
R7	13079	400 ohm—1/3 w. 10%
R8	13038	2 megohm—1/3 w. 20%
R9	101236	Volume Control
R10	130223	10 megohm—1/3 w. 20%
R11	13011	250M ohm—1/3 w. 20%
R12	13019	1 megohm—1/3 w. 20%
R13	130325	1 ohm—1/3 w. 10%
	130326	2.3 ohm—1½ Watt 10% in "A" Cable Adapter
		CONDENSERS
C1	129158	.0002 mica 10%
C2	100112	.001 x 200 volt
C3	1009	.05 x 200 volt
C4	124138	B.C. ant. trimmer
C5	124138	9 mc. ant. trimmer
C6	124139	B.C. osc. trimmer
C7	10064	.25 x 200 volt
C8	129170	.00009 mica 3%
C9	1295	.0001 mica 20%
C10	124145	9 mc. osc. trimmer
C11	100124	.1 x 200 volt
C12	100112	.001 x 200 volt
C13	119116	20 mfd. x 25 volt lytic
C14	12912	.00025 mica 20%
C15	10025	.002 x 600 volt
C16	100104	.5 x 100 volt
C17	1295	.0001 mica 20%
C18	10026	.02 x 400 volt
C19	10012	.003 x 600 volt
		MISCELLANEOUS
T1	111216	B.C. ant. coil
T2	111213	9 mc. ant. coil
T3	111212	6 mc. ant. coil
T4	110168	B.C. osc. coil
T5	111214	12 mc. ant. coil
T6	111215	15 mc. ant. coil
T7	110165	9 mc. osc. coil
T8	110164	6 mc. osc. coil
T9	110166	12 mc. osc. coil
T10	110167	15 mc. osc. coil
T11	108177C	Input I.F. complete
T12	108185B	Output I.F. complete
T13	105119	Output transformer
T14	114220	P.M. speaker
S1	125138	Band switch
S2		On-off switch on volume control
S3	12588B	Battery switch

MODEL 509

BELMONT RADIO CORP.



IRON CORE ADJUSTMENT VIEW



Power Consumption

A Battery	- - -	**300 MA**
B Battery	- - -	**13.5 MA**

Power Output - - - - - 210 MW Undistorted
Sensitivity for 50 Milliwatt Output: 10 Microvolts Average
Selectivity - 38 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 535 to 1730 KC

49M Band	- - -	**5.9 to 6.1 MC**
31M Band	- - -	**9.1 to 10 MC**
25M Band	- -	**11.4 to 12.1 MC**
19M Band	- -	**14.9 to 15.4 MC**

Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - - 6 in. PM Dynamic

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a gauge). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

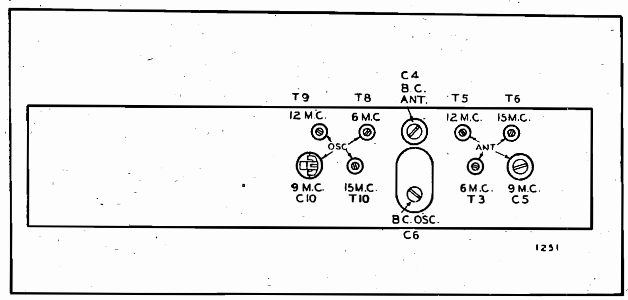
Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button **hard** all the way in to lock the station in place, (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.



TRIMMER VIEW

- Tone control—Treble
- 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	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 1N5 (I.F.)	Broadcast	Set Dial at 1730 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 1A7	Broadcast	Set Dial at 1730 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C10 (See Trimmer on Top) C5	Osc. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T8 (See Trimmer View) T3	Osc. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T9 (See Trimmer View) T5	Osc. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T10 (See Trimmer View) T6	Osc. Ant.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1730 Kc.	(See Trimmer View) C6 ((See Trimmer View) C4	Osc. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Tune to Generator Sig.	Rotate Core T1 (See Iron Core Adjustment View)	Ant.	Adjust to maximum output

MODEL 1308221

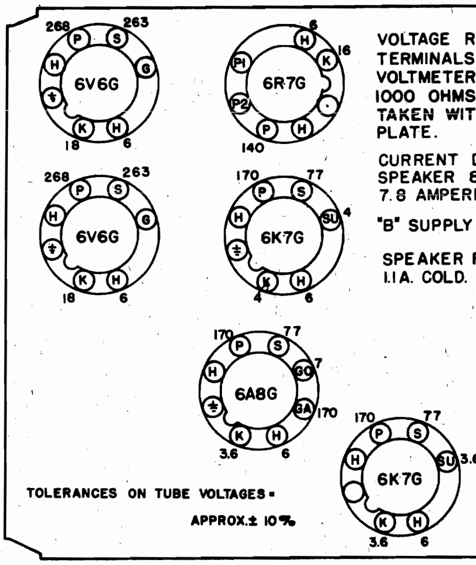
BUICK MOTOR

The 1939 Buick Sonomatic radio is a six tube single unit, superheterodyne receiver with an 8" dynamic speaker.

BUICK MODEL 1308221
(980598) AUTO RADIO

6 D-916

Date: 10-17-38



VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 1000 OHMS PER VOLT. ALL READINGS TAKEN WITH 5.9 VOLTS AT SPARK PLATE.

CURRENT DRAIN WITH SPEAKER & DIAL LIGHT 7.8 AMPERES.

"B" SUPPLY DRAIN 70 M.A.

SPEAKER FIELD DRAIN 1.1A. COLD.

FIG. 1
TUBE SOCKET VOLTAGES

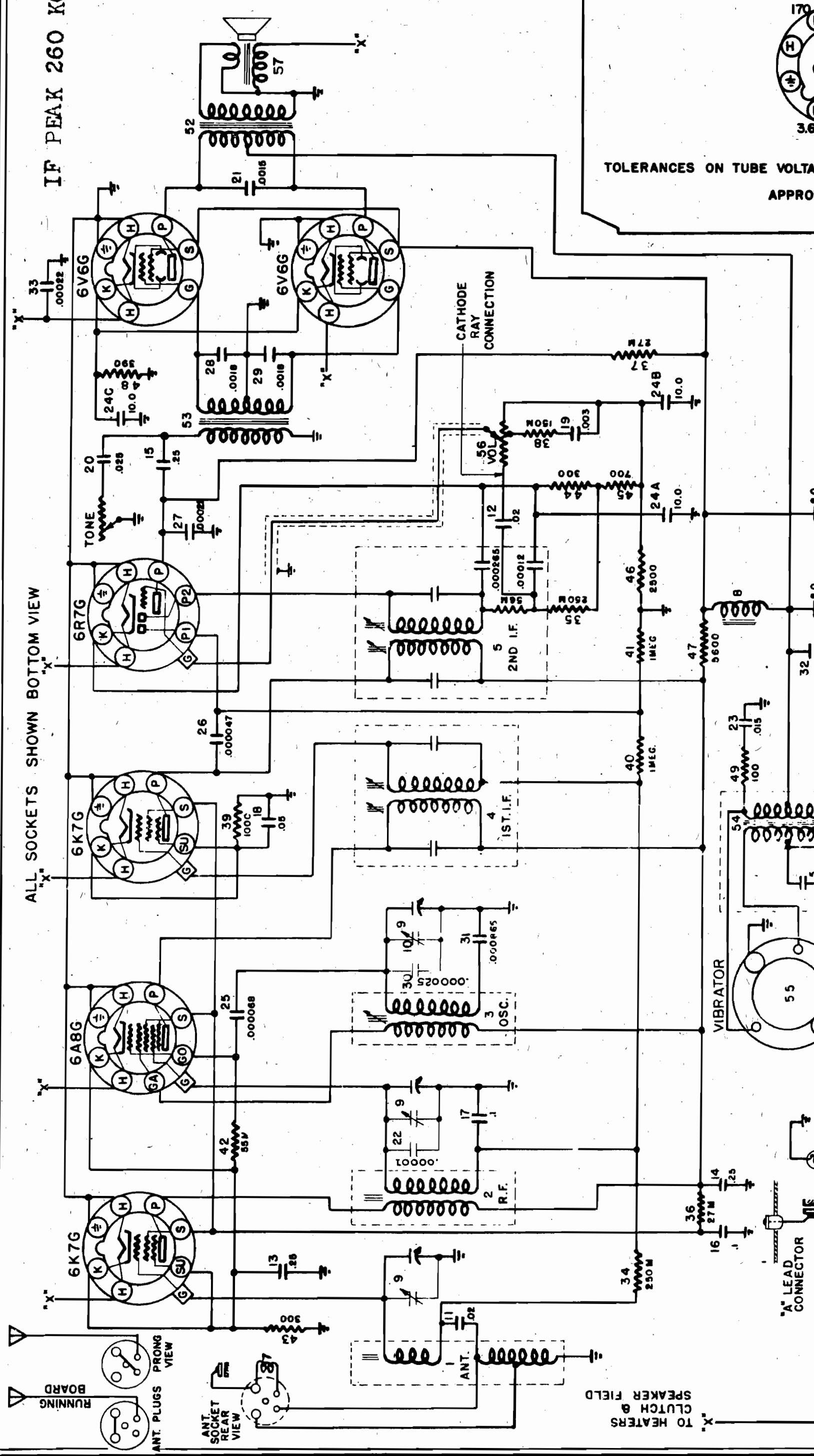


FIG. 2

BUICK MODEL 1308221 CIRCUIT DIAGRAM

TUNING CONTROLS: Tuning is accomplished by means of the conventional manual tuning control, or by means of five push buttons which mechanically rotate the variable condenser gang to preselected frequencies. An electric clutch is provided which automatically disconnects the manual tuning mechanism when a button is pressed.

NOTE: Do not attempt to operate the push button tuning unless the set is connected to a 6 volt battery and the switch turned "on".

Setting up the push buttons for any desired station may be done as follows:

1. Remove the button by depressing the spring located on the bottom of each button, and pulling straight out.
2. Loosen the screw with a coin or a screw driver.
3. Carefully tune in the desired station by means of the manual control.
4. Push the loosened screw in as far as possible and tighten.

BUICK MOTOR

1. Aligning I-F Stages at 260 Kilocycles

   (a) Connect the ground lead of the signal generator to the chassis frame.

   (b) Connect the signal lead of the signal generator to the grid cap of the 6A8G tube through a .25 mfd. condenser, leaving the grid clip in place.

   (c) Connect the output meter across the speaker voice coil.

   (d) Set the signal generator accurately to 260 kilocycles and turn volume control on full.

   (e) Set the condenser gang to a point at about 600 kilocycles where no station is received.

   (f) Adjust the four screws of the two I-F transformers, one on top and one on the bottom of each transformer in the following order ABA and CDC (Illus. 4 & 5 of Figs. 3 & 4) until maximum output is obtained. Repeat these adjustments the second time for greater accuracy using the minimum output from the signal generator which will give a readable indication on the output meter.

   (g) CHECKING SELECTIVITY CURVE

   The cathode ray oscillograph should be used to check the shape of the I-F curve after completing the "Alignment Procedure". The best tone quality is obtained when both sides of the I-F curve are alike. Slight readjustment of the I-F transformers may be necessary to accomplish this.

2. Aligning at 1560 Kilocycles

   The antenna and R-F coils contain iron cores which have been very carefully adjusted at the factory. These cores are sealed, and no further adjustments in service are necessary. The Service Replacement coils are also adjusted and sealed at the factory.

   (a) Turn tuning condenser plates all the way out and against the high frequency stop.

   (b) Set signal generator accurately to 1560 kilocycles and adjust oscillator trimmer (Illus. E, Fig. 3) for maximum output. This trimmer is made accessible by removing plug button at side of case. Using trimmer alignment wrench, Part No. 7236513, loosen the hex nut with one end and adjust for maximum output by sliding plunger either in or out with the "hook" end of the wrench.

3. Aligning at 1400 Kilocycles

   (a) Remove the .25 mfd. condenser and connect the signal lead of the signal generator through a .0005 mfd. condenser to the Test Plug Part No. 7236514 which is then inserted into the receiver antenna receptacle.

   (b) Set the signal generator to approximately 1400 kilocycles.

   (c) Rotate the variable plates of the condenser gang until the signal is tuned in with maximum output.

   (d) Adjust the R-F and antenna parallel trimmers (Illus. F & G, Fig. 3) for maximum output.

4. Aligning at 600 Kilocycles

   (a) Set the signal generator to approximately 600 kilocycles.

   (b) Rotate the variable plates of the condenser gang until the signal is tuned in.

   (c) Adjust the oscillator coil iron core aligning screw (Illus. H, Fig. 3) while rocking the condenser gang back and forth through the signal until maximum output is obtained. This screw is made accessible by removing plug button at side of case.

   (d) Repeat adjustments made under "Aligning at 1400 Kilocycles".

SERVICING AUTOMATIC TUNER

1. LUBRICATION

The mechanical parts of the push button tuner should be carefully lubricated as a part of every service job, using a special lubricant which is supplied under Part No. 7236515.
NOTE: Do not use ordinary oils or greases on the automatic tuner.
Grease the following points:
(a) Dial pulleys and pins.
(b) Plunger guides and pinions.
(c) Pinion rack.
(d) Manual tuning shaft bearing.
(e) All gears and worms.
(f) Pointer guide.
(g) Clutch shaft bearings.

Do not grease the parkerized cam or brake shoe.

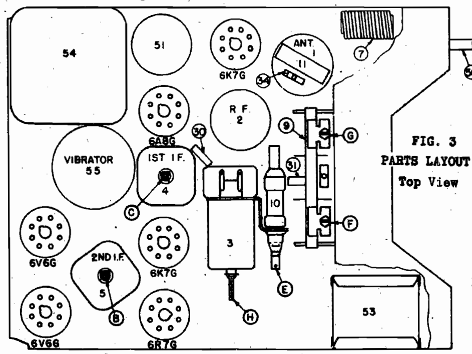


FIG. 3
PARTS LAYOUT
Top View

The capacity of the running board antenna is approximately 550 micro-microfarads or .00055 microfarads.

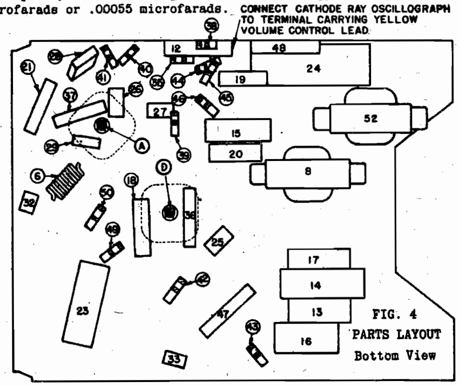


FIG. 4
PARTS LAYOUT
Bottom View

2. SERVICE HINTS

(a) Improper operation--single button.
Sticking cams. Remove knob; loosen screw, force in and rotate the manual tuner knob to grind in. Do not lubricate.

(b) Improper operation--all buttons.
Back lash between condenser drive gears.
Remove automatic tuner assembly by removing the three fastening screws on the under side of case. Loosen the four tuner mechanism to condenser gang mounting screws and adjust the mesh between the two large drive gears, to be as tight as possible without binding.

(c) Replacing button re-set screw hold-on spring.
In cases where it does not seem advisable to replace the complete tuner mechanism, the hold-on spring may be replaced as follows:
The spring can be removed from the pusher arm by prying off with a screw driver. This operation straightens out the staking, and does not destroy the metal of the pin. Carefully file the burrs off the stake end of the pin. New springs (Part No. 7235845) can be placed over the pins and restaked in place.

(d) Clutch.
Do not attempt to disassemble the clutch. If trouble is encountered with this unit, replace with Part No. 7236984.

The antenna circuit in the receiver is designed to operate either with the running board antenna or with a low capacity antenna such as the side cowl type, the selection being controlled by the internal wiring of the antenna lead plug.

6 D-916
Buick 1308221
Date: 10-17-38

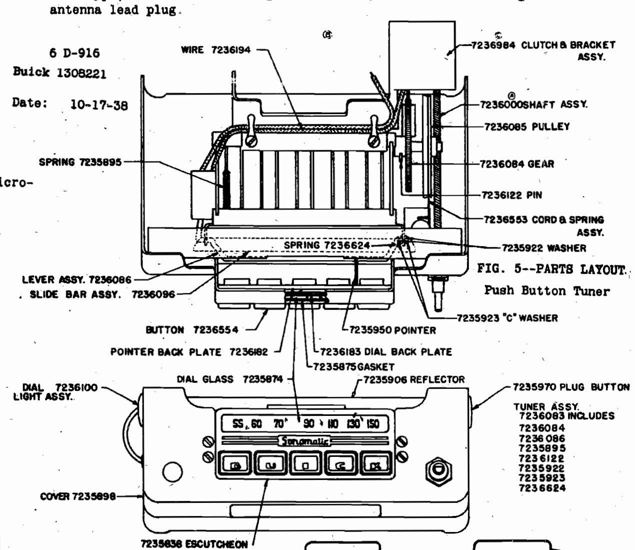


FIG. 5--PARTS LAYOUT
Push Button Tuner

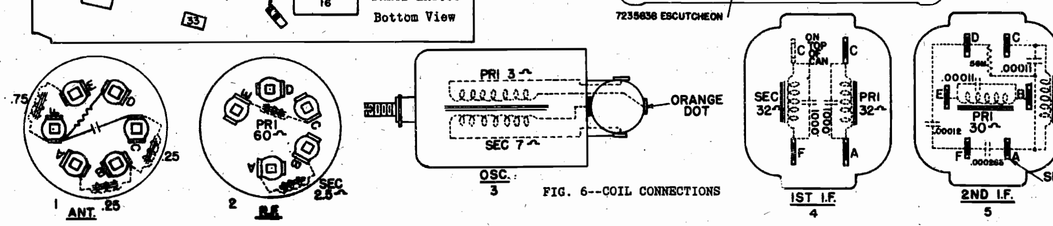
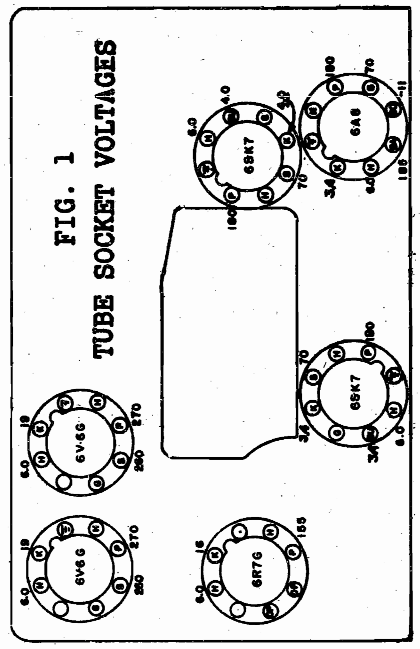
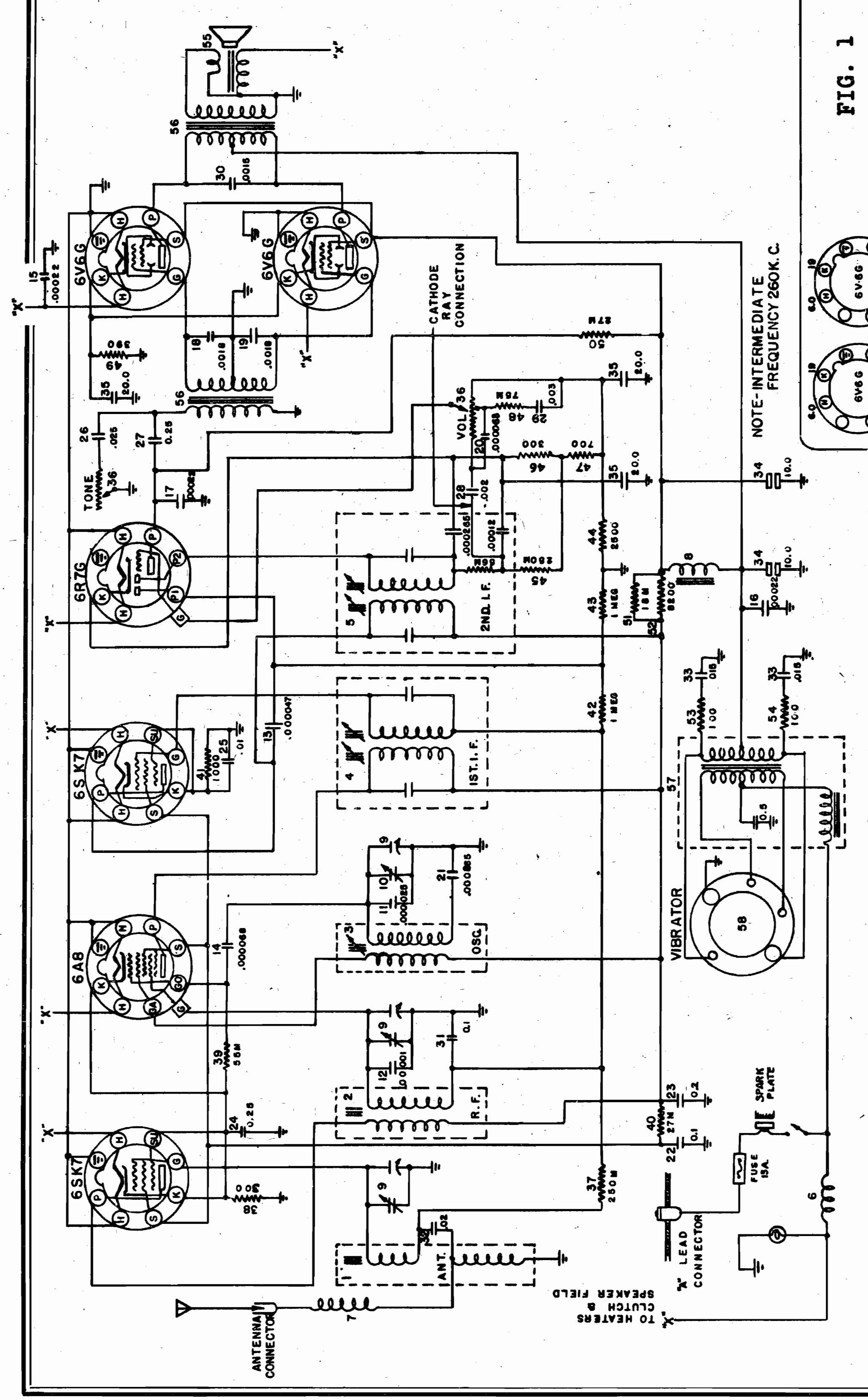


FIG. 6--COIL CONNECTIONS

BUICK MOTOR

MODEL 1314523





CIRCUIT DIAGRAM

FIG. 2--BUICK MODEL 1314523 (980620)

VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 1000 OHMS PER VOLT.
ALL READINGS TAKEN WITH 6.0 VOLTS ACROSS HEATERS.
CURRENT DRAIN WITH SPEAKER AND DIAL LIGHT 8.0 AMPERES.
"B" SUPPLY DRAIN 70 M.A. TOLERANCES ON VOLTAGES ±10%.

IF PEAK 260 KC

Date: 10-12-39

BUICK MOTOR

1. Aligning I.F. Stages at 260 Kilocycles

(a) Connect the ground lead of the signal generator to the chassis.

(b) Connect the signal lead of the signal generator to the grid cap of the 6A8 tube through a .25 mfd. condenser leaving the grid cap in place.

(c) Connect the output meter from the plate prong of one 6V6G tube to the plate prong of the other 6V6G tube.

(d) Set the signal generator to 260 kilocycles and turn volume control on full.

(e) Set the condenser gang to a point around 600 kilocycles where no station is received.

(f) Adjust the four screws of the two I.F. transformers, one on top and one on the bottom of each transformer, in the order ABA and CDC (Illus. 4 & 5, Figs. 3 & 4) until maximum output is obtained. Repeat these adjustments with as low an output from the signal generator as possible for a readable indication on the output meter.

(g) Checking Selectivity Curves: The Cathode Ray Oscillograph should be used to check the shape of the I.F. curve after completing the alignment procedure. Slight readjustments of the I.F. transformers may be necessary to obtain a symmetrical curve. Connect the Cathode Ray Oscillograph from the point as shown on the schematic circuit diagram or from "D" lug on the second I.F. Coil (Fig. 7).

2. Aligning at 1560 Kilocycles

(a) Turn tuning condenser plates all the way out and against the high frequency stop.

(b) Set the signal generator to 1560 kilocycles and adjust the oscillator trimmer (Illus. E, Fig. 3) for maximum output.

3. Aligning at 1400 Kilocycles

(a) Remove the .25 mfd. condenser and connect the signal lead of the signal generator to the antenna connection of the set through a .00005 condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Rotate the variable plates of the gang condenser until the signal is tuned for maximum output.

(d) Adjust the R.F. and antenna parallel trimmers (Illus. F & G, Fig. 6) for maximum output.

4. Alignment at 600 Kilocycles

(a) Set the signal generator to 600 kilocycles.

(b) Tune this signal in on the set.

(c) Adjust the oscillator coil iron core aligning screw (Illus. H, Fig. 3) while rocking the condenser gang back and forth through the signal until maximum output is obtained.

(d) Repeat adjustment made under "Alignment at 1400 Kilocycles."

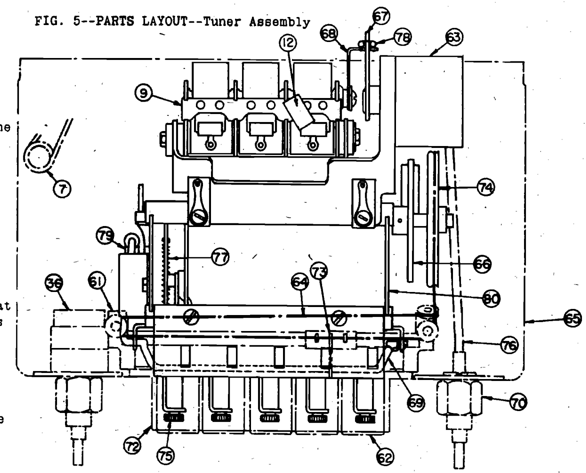
5. Adjustment of Radio to Car Antenna

The radio should be adjusted to the car antenna after mounting in the car. The following adjustment should be made:

(a) Tune in a weak station near the high frequency end of the dial (approximately 1400 K.C.).

(b) Adjust the Antenna Trimmer (Illus. G, Fig. 6) for maximum volume. DO NOT DISTURB THE OSCILLATOR OR R.F. TRIMMERS WHILE MAKING THIS ADJUSTMENT.

FIG. 5--PARTS LAYOUT--Tuner Assembly



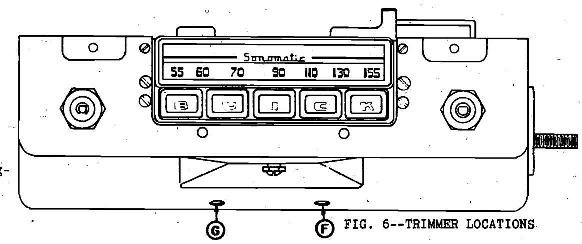


FIG. 6--TRIMMER LOCATIONS

61	7238400	Bar	Pointer slide bar assy.
62	7239107	Button	Push button assy.
63	7238712	Clutch assy.	Includes bracket
64	7239108	Cord	Drive cord and spring assy.
65	7238420	Cover	Bottom cover assy.
66	7236084	Gear	Tuner gear assy.
67	7238493	Leaf	Female joint leaf assy.
68	7236018	Leaf	Male joint leaf assy.
69	7238885	Lever	Switch lever assy.
70	7238510	Nut	Spacer nut
71	7238647	Pin	Taper pin for tuner gear
72	7238349	Plate	Escutcheon
73	7233348	Pointer	Dial
74	7239038	Pulley	Pointer drive pulley assy.
75	7238213	Screw	Reset screw
76	7238516	Shaft	Manual tuning shaft assy.
77	7235895	Spring	Plunger return
78	7237174	Spring	Universal joint spring
79	1213511	Switch	Declutching switch assy.
80	7238706	Tuner	Tuner assy.--Includes racks, pinions, plungers, reset screws and tuner gear

ANTENNA SYSTEM: The 1940 Buick uses a roof peak antenna as standard equipment. Optional equipment is a vacuum operated whip antenna. The roof peak antenna has a capacity of .000055 mfd. and the vacuum operated of .000067 mfd. The 1940 Buick Sonomatic Radio is designed to operate satisfactorily with either type of antenna.

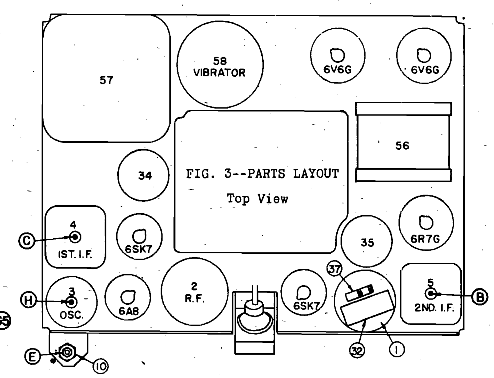


FIG. 3--PARTS LAYOUT
Top View

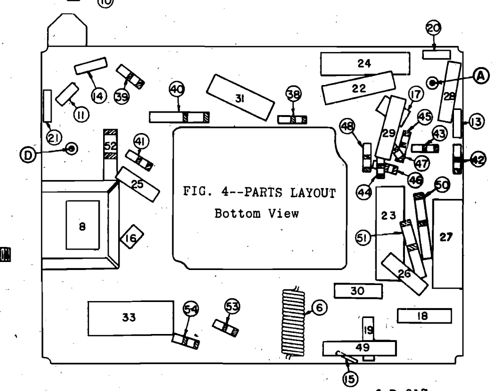
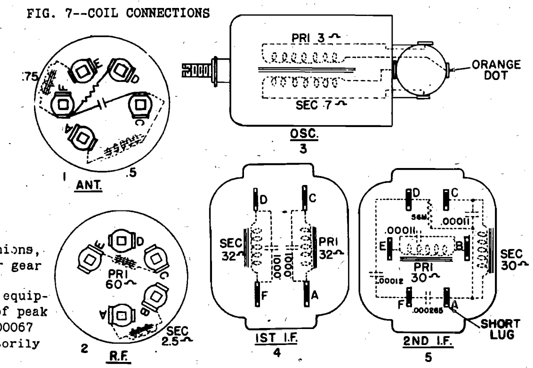


FIG. 4--PARTS LAYOUT
Bottom View

Date: 10-12-39

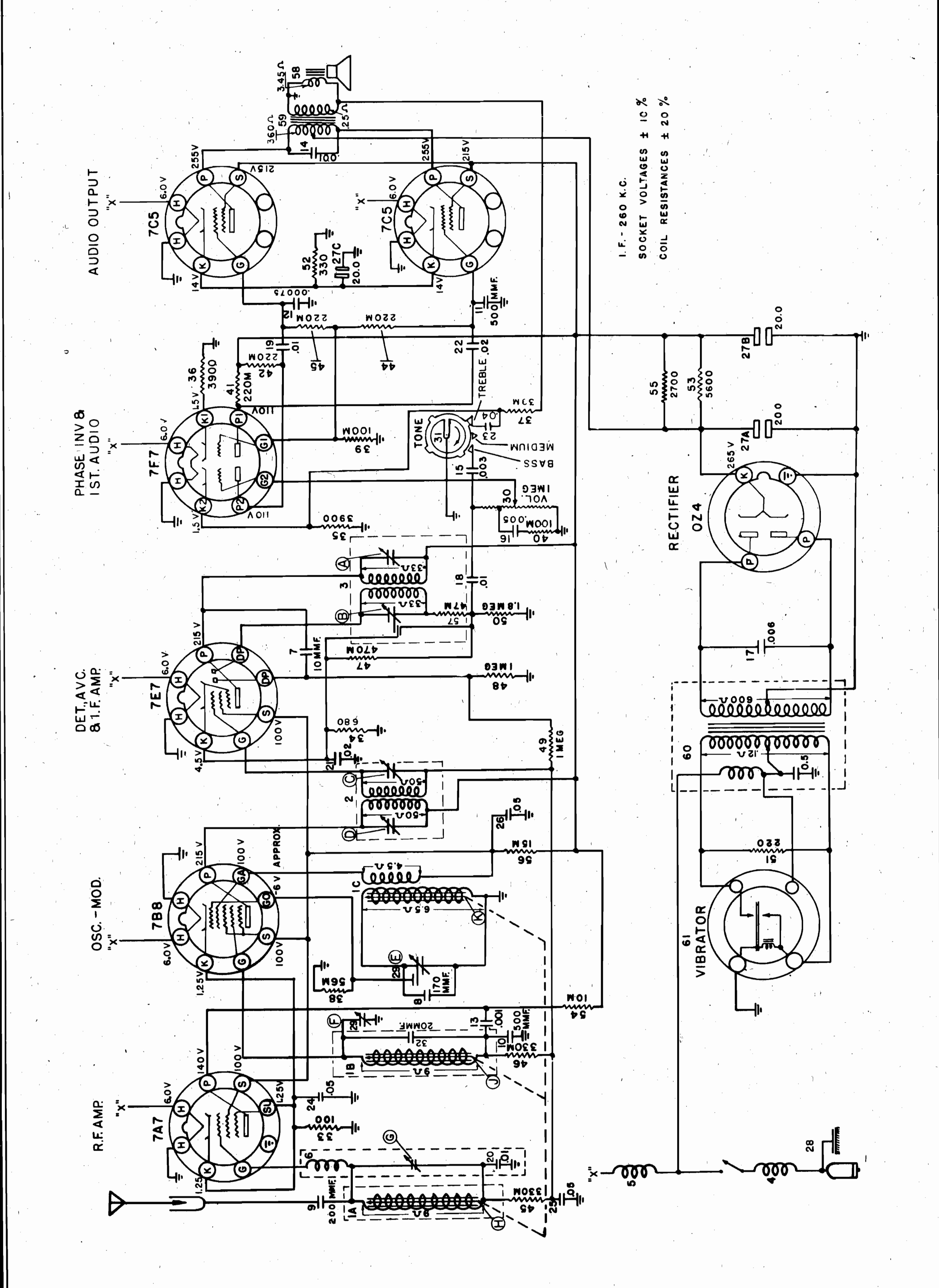
6 D-917
Buick 1314523 (980620)

FIG. 7--COIL CONNECTIONS



CADILLAC DIV.—GEN. MOTORS

MODEL 7240371



CADILLAC DIV.—GEN. MOTORS

Due to the fact that the iron cores have been sealed in place at the factory, only the trimmer adjustments as outlined under capacity alignment should be made unless the coils of the iron cored tuning unit are changed.

CAPACITY ALIGNMENT

1. I.F. Alignment at 260 K.C.
   (a) Connect an output meter across the test terminals on the left side of speaker cover, leaving the speaker connected.
   (b) Connect the ground lead of the signal generator to the chassis frame.
   (c) Connect the signal lead of the signal generator to the grid of the 7B8 tube through the 0.1 mfd condenser.
   (d) Turn set volume control on full and tone control to the extreme treble end. Set the signal generator at 260 KC. Tune the receiver to a frequency where no squeals or beat notes may be heard and so that when the tuning control is moved in narrow limits no appreciable change in output may be noted.
   (e) Adjust the I.F. trimmers A, B, C, & D for maximum output, beginning with trimmer A.
2. Alignment at 1560 KC.
   (a) Connect the signal lead of the signal generator to the receiver antenna connection through a 70 mmfd. condenser or 7241619 alignment dummy.
   (b) Turn the manual tuning control of the receiver to the stop at the extreme high frequency end of the dial.
   (c) Set the signal generator to 1560 KC.
   (d) Adjust the oscillator trimmer E for maximum output.
3. Alignment at 1400 KC.
   (a) Set the signal generator to 1400 KC.
   (b) Tune the receiver to the signal and adjust the trimmers F and G for maximum output. Signal generator signal should be as low as possible and still give a satisfactory meter reading.

   This type of tuning circuit does not require alignment at 600 KC.
4. Alignment with Car Antenna

   Antenna trimmer G must be adjusted to match car antenna when receiver is installed; use a weak station signal between 1000 and 1500 KC. The antenna should be fully extended when making this adjustment.

CAPACITY AND INDUCTANCE ALIGNMENT

To be used only when there is definite evidence of iron cores being out of adjustment.

1. I.F. Alignment at 260 KC.

   Follow the procedure as outlined under I.F. Alignment at 260 KC Capacity Alignment.
2. Alignment at 1560 KC.
   (a) Connect the signal lead of the signal generator to the antenna connection of the set through a 70 mmfd condenser.
   (b) Set signal generator to 1560 Kilocycles.
   (c) Rotate the manual tuning mechanism until the high frequency stop is reached. Mechanically align the iron cores K, H, & J by setting the oscillator core K so that its front edge projects out 1 - 1/16" from the end of the coil form and the antenna and R.F. cores H & J project 1 - 13/32" from the end of the respective coil windings. Note that one of the above measurements is from the coil form while the others are from the windings.
   (d) Adjust the oscillator trimmer E, R.F. trimmer F, and antenna trimmer G for maximum output.
3. Alignment at 1400 KC
   (a) Set signal generator to 1400 K.C. and tune set to this signal.
   (b) Adjust the R.F. core J for maximum output.
   (c) Adjust the antenna core H for maximum output.
4. Realignment at 1560 and 1400 KC
   (a) Repeat alignment of trimmer E and trimmers F and G at 1560 KC.
   (b) Repeat alignment of cores H and J at 1400 KC. Apply shellac to the core screws to seal the adjustment.
5. Alignment with car antenna

   Antenna trimmer G must be adjusted to match car antenna when receiver is installed; use a weak station signal between 1000 and 1500 KC. The antenna should be fully extended when making this adjustment.

AUTOMATIC PERMEABILITY TUNING

The automatic push button tuning unit has been made compact by combining the manual and automatic tuning units so that they both use the same three iron cores which are "ganged" together in one reciprocating unit actuated by a small mechanical motor. This highly efficient three-circuit tuning system pushes the iron cores back and forth like pistons in the tuning coils, which varies the inductance of the coils by changing the permeability of the magnetic circuit.

For manual tuning, this is accomplished by first depressing and then rotating the manual station selector knob. For automatic tuning, pressing an automatic tuning button causes the cores to be moved to a pre-set position and locked in place by the button latch mechanism, which prevents the cores from shifting position until released by the use of another of the automatic push buttons or by use of the manual control.

Changing the stations selected by the buttons is a simple operation. The button to be set to a new station is depressed until it locks in. Then the button is rotated exactly like a manual tuning knob until the desired station is tuned in. Pressing any tuning button will release the depressed button.

The call letters of the stations to which the automatic tuner is pre-set are inserted above the chrome plated selector buttons. Whenever the instrument panel lights are turned on, the call letters are illuminated. Identification of the station to which the radio is tuned is facilitated by three indications: the selector button is latched into its depressed position, the corresponding call letters are more brightly illuminated than the call letters of the other four stations, and, finally, the dial pointer indicates the station frequency.

Note: Do not turn any button at any time unless a new station setting is desired, as the tuning position of a button is changed whenever it is turned regardless of whether it is depressed or not.

CADILLAC 1941 AUTOMATIC RADIO (Front Compt.) PART NO. 7240371

Power Output	5 Watts Undistorted at 6.0 volts.
Power Consumption	7.0 Amperes at 6.0 volts.
Sensitivity	2.5 Microvolts at 1 Watt output
Selectivity at 1000 times signal	35 KC
Tuning Range	
Manual Tuning	545 to 1560 KC
Automatic Tuning (All buttons)	545 to 1560 KC
Speaker	8" Permanent Magnet Dynamic
Intermediate Frequency Peak	260 KC
Antenna Trimmer Range	45 to 90 mfd

CADILLAC DIV.—GEN. MOTORS

MODEL 7240371

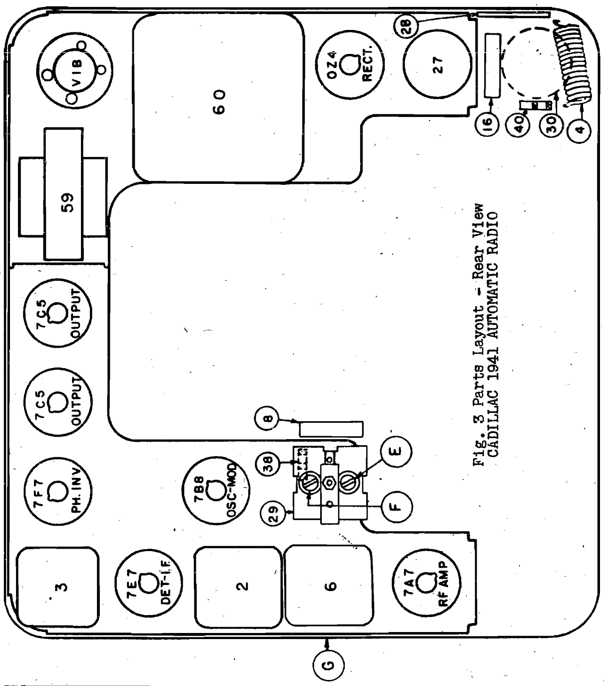


Fig. 3 Parts Layout - Rear View CADILLAC 1941 AUTOMATIC RADIO

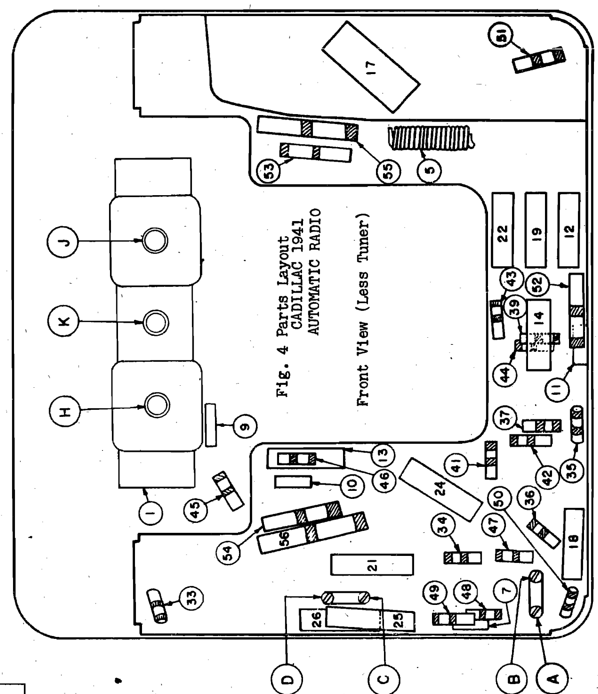


Fig. 4 Parts Layout CADILLAC 1941 AUTOMATIC RADIO Front View (Less Tuner)

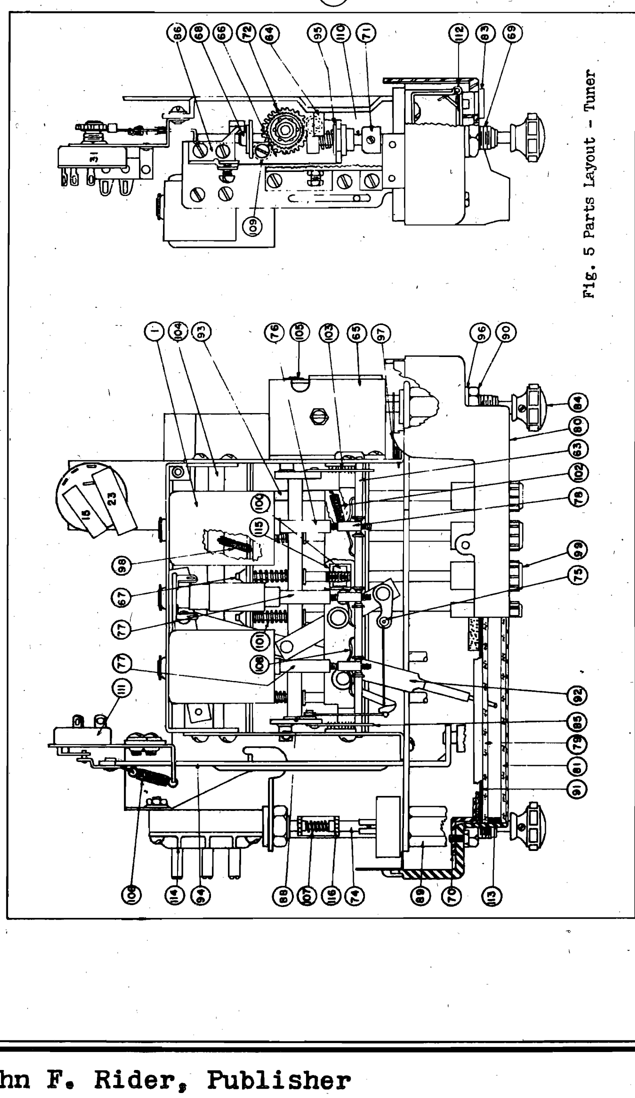
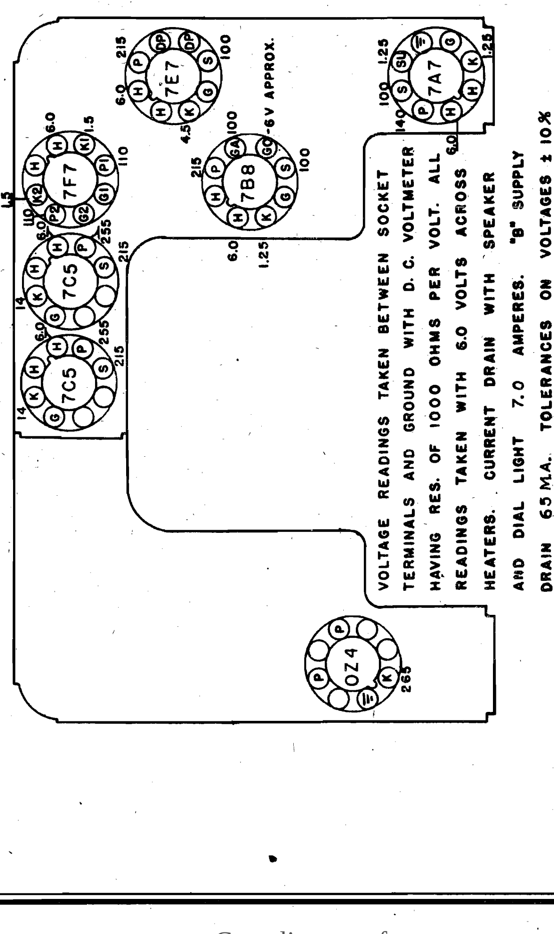


Fig. 5 Parts Layout - Tuner



VOLTAGE READINGS TAKEN BETWEEN SOCKET TERMINALS AND GROUND WITH D. C. VOLTMETER HAVING RES. OF 1000 OHMS PER VOLT. ALL READINGS TAKEN WITH 6.0 VOLTS ACROSS HEATERS. CURRENT DRAIN WITH SPEAKER AND DIAL LIGHT 7.0 AMPERES. "B" SUPPLY DRAIN 65 MA. TOLERANCES ON VOLTAGES ± 10%

MODEL 7240427

CADILLAC DIV.—GEN. MOTORS

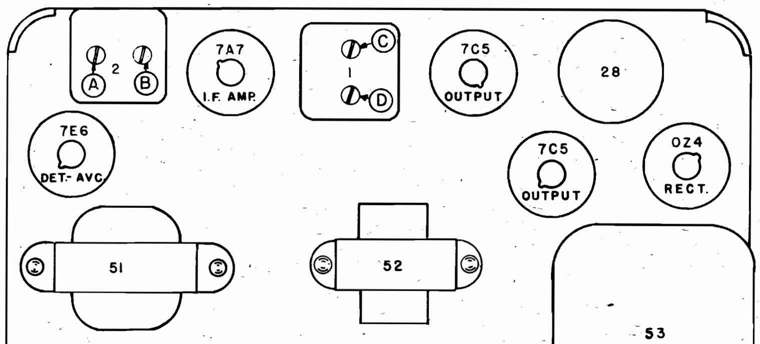


Fig. 1 Parts Layout - Top View
CADILLAC 1941 REAR COMPARTMENT RADIO

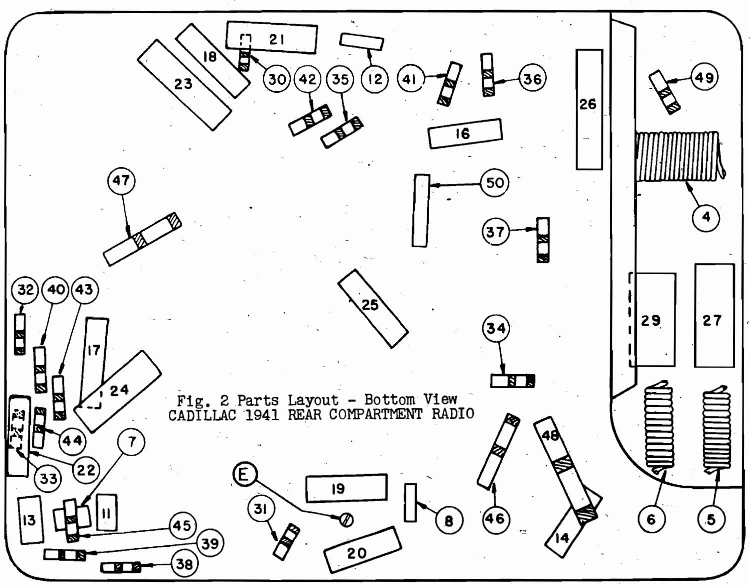


Fig. 2 Parts Layout - Bottom View
CADILLAC 1941 REAR COMPARTMENT RADIO

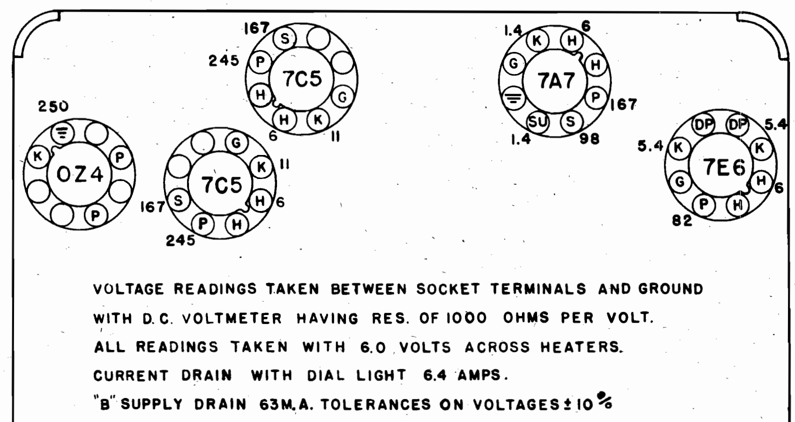


Fig. 4 Voltage Chart
CADILLAC 1941 REAR RADIO COMPARTMENT

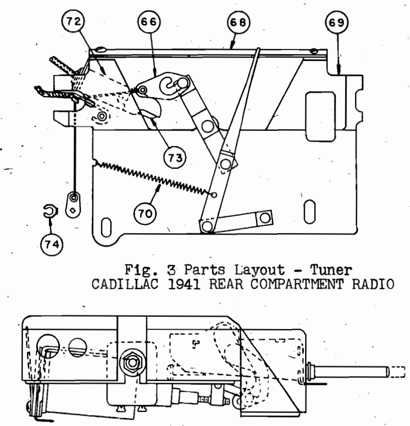
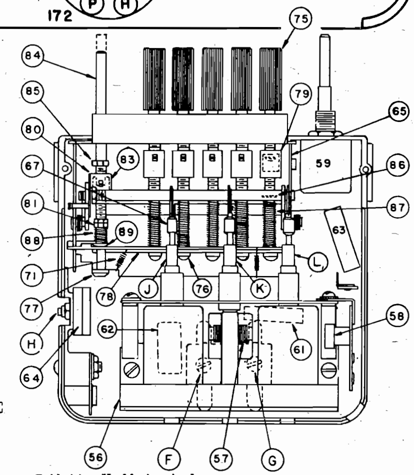


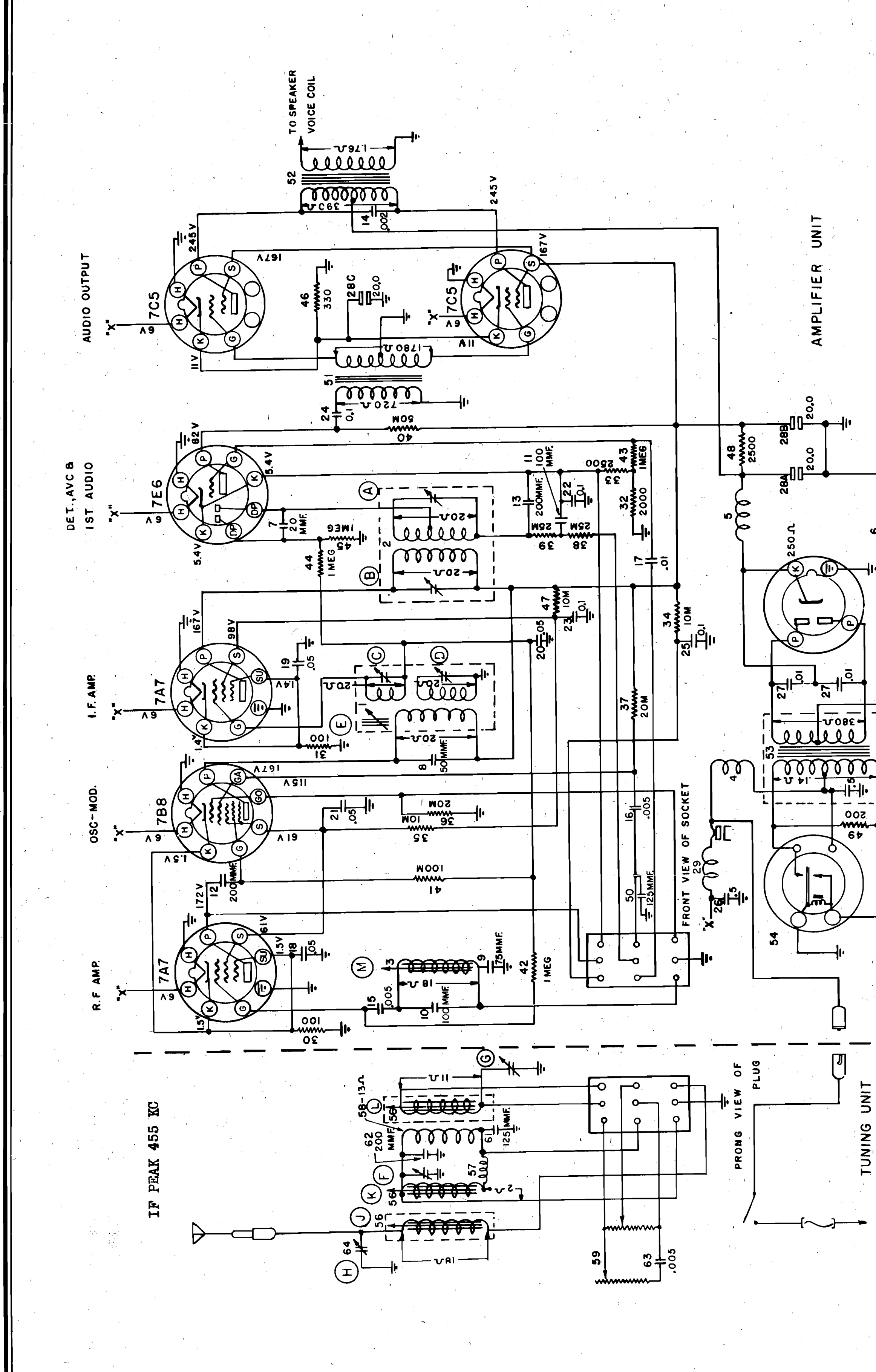
Fig. 3 Parts Layout - Tuner
CADILLAC 1941 REAR COMPARTMENT RADIO



Power Output	5 Watts Undistorted
Power Consumption	7.5 Amperes at 6 volts
Sensitivity	4 Microvolts at 1 Watt output
Selectivity at 1000 times signal	35 KC
Tuning Range	545 to 1560 KC
Manual Tuning	545 to 1560 KC
Automatic Tuning (all 5 buttons)	545 to 1560 KC
Speaker	21 oz. Permanent Magnet, Elliptical Cone
Intermediate Frequency Peak	455
Antenna Trimmer - Designed for 80 mmf. vacuum trunk Antenna	

CADILLAC DIV.—GEN. MOTORS

MODEL 7240427



TO CONTROL THE VACUUM AERIAL

To the left of the volume control rod is the knob which controls the vacuum aerial. Pulling this button upward will raise the aerial and pushing it downward will lower the aerial. The vacuum aerial has two rods, one sliding within the other. For maximum reception both rods should be extended to their full height, the inner rod being extended manually.

MODEL 7240427

CADILLAC DIV.—GEN. MOTORS

TO CHANGE STATION SETTING OF PUSH BUTTONS

The five push buttons should be set up for five stations which are received favorably in your vicinity. The procedure for setting up the push buttons is as follows:

1. Turn on the radio and allow it to warm up from ten to fifteen minutes.
2. Depress button to be set up until it latches and remains depressed.
3. Without pressing or holding the button down, turn it, as in manual tuning, until the desired station is tuned in. This should be done very carefully until the station comes in sharp and clear, free from background noise.
4. Repeat this process for any other buttons which you wish to change.

The setting of any button may be changed at any time by following this procedure.

CAUTION: TURNING ANY OF THE PUSH BUTTONS CHANGES ITS STATION SETTING. DO NOT TURN ANY BUTTON UNLESS YOU WISH TO CHANGE THE SETTING.

CAPACITY ALIGNMENT

1. Aligning I.F. stages at 455 KC.
   - (a) Connect the ground lead of the signal generator to the chassis frame.
   - (b) Connect the signal lead of the signal generator to the grid of the 7B8. (Grid side of condenser 12) through a 0.1 mfd. condenser.
   - (c) Connect an output meter across the speaker voice coil. (If speaker is disconnected a 4 ohm load may be used instead).
   - (d) Set signal generator to 455 KC.
   - (e) Turn the set volume control on full and tune the set to a position where no squeals or beat notes may be heard, and so that when the tuning control knob is rotated within narrow limits there is no appreciable change in output. The tone control should be rotated to its extreme high position (clockwise).
   - (f) Adjust the I.F. trimmers A, B, C, and D, and the I.F. core adjustment E until maximum output is obtained.
   - (g) Repeat these adjustments with as low an output from the signal generator as possible for more accurate alignment.
   - (h) Connect the signal generator to the antenna connection of the set through a 70 mmfd. condenser.
   - (i) Adjust the I.F. trap adjustment M for minimum output.
2. Alignment at 1560 KC.
   - (a) Leave signal generator connected the same as for the I.F. trap adjustment.
   - (b) Tune the set to the extreme high frequency position against the stop.
   - (c) Set the signal generator to 1560 KC.
   - (d) Adjust the oscillator trimmer F for maximum output.
3. Alignment at 600 K.C.
   - (a) Set the signal generator to 600 KC and tune the set to this signal.
   - (b) Adjust the R.F. trimmer G and the antenna trimmer H for maximum output.

CAPACITY AND INDUCTANCE ALIGNMENT

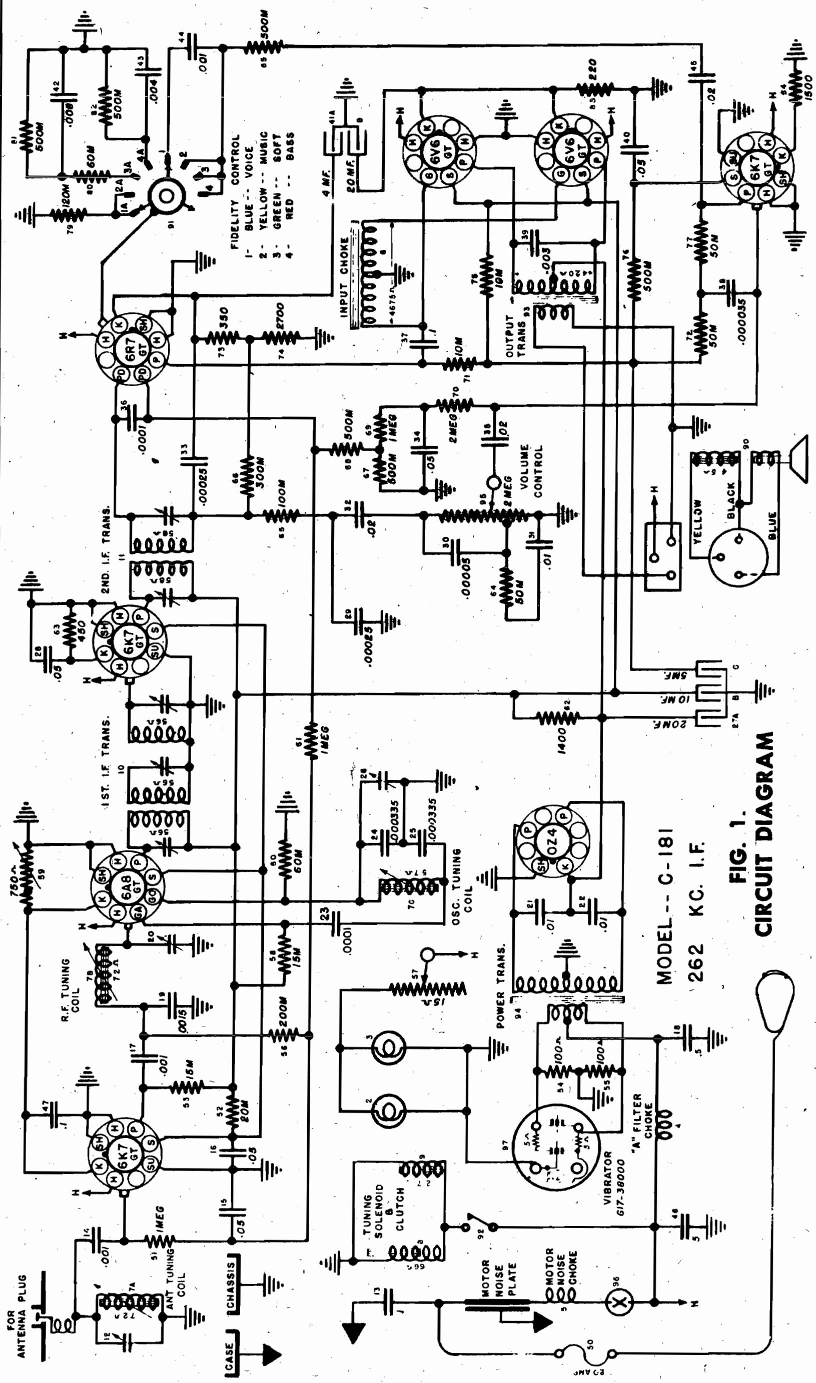
1. Aligning I.F. stages at 455 K.C.

   Align the I.F. stages as outlined under paragraph 1 under "Capacity Alignment".
2. Mechanical Alignment of cores
   - (a) Turn the manual control of the set to the high frequency end, against stop.
   - (b) Remove the pointer plate (note insulating washers under mounting screws) without disturbing the tuning mechanism.
   - (c) Using a spare core as a gauge, adjust the oscillator core K so that its rear surface is exactly flush with the front end of the oscillator coil winding.
   - (d) Manually tune the set to a point where the front surface of the oscillator core is flush with the front end of the oscillator coil fiber mounting bushing.
   - (e) Adjust the antenna and R.F. cores J and L so that the front surfaces of these cores are flush with the front ends of the coil fiber mounting bushing. Mechanically align the cores so that all three are just at the point of entering their respective windings when the tuning mechanism is against the high frequency stop.
   - (f) Replace the pointer plate assembly.
3. Aligning at 1560 KC.
   - (a) Connect the signal lead of the signal generator to the antenna connection of the receiver through a 70 mmfd. condenser.
   - (b) Turn the manual control of the set to the high frequency end against stop.
   - (c) Set signal generator to 1560 KC.
   - (d) Adjust the oscillator trimmer "F" for maximum output.
4. Aligning at 600 KC.
   - (a) Leave the signal generator connected the same as before and set frequency to 600 KC.
   - (b) Tune in this frequency on the set.
   - (c) Adjust the R.F. trimmer G for maximum output.
   - (d) Adjust the antenna trimmer H for maximum output.
5. Aligning at 1400 KC.
   - (a) Set the signal generator to 1400 KC and tune set to this signal.
   - (b) Adjust the antenna core J and the R.F. core L for maximum output.
6. Realigning at 600 and 1400 KC.
   - (a) Repeat the alignment outlined under paragraphs 4 and 5 with as low an output from the signal generator as possible.
   - (b) Apply cement to the core screws to prevent their changing alignment.
7. Adjusting receiver to car antenna

   After the receiver is installed in the car, readjust the antenna trimmer H on a weak station near 1400 KC.

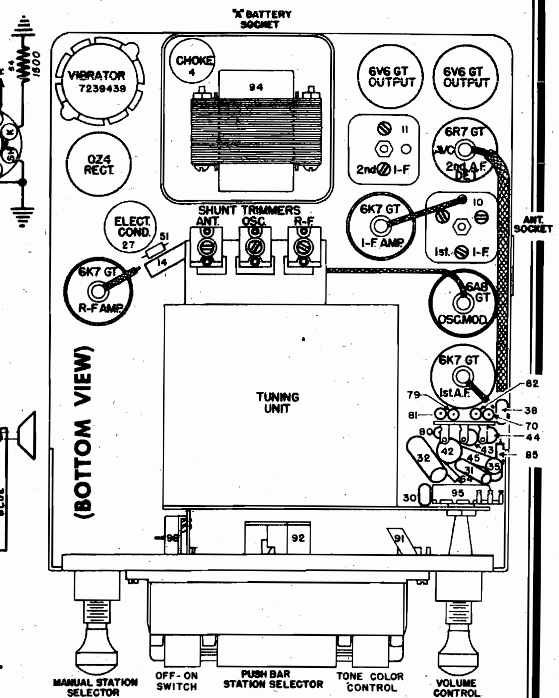
MODEL 985694

CHEVROLET DIV.—GEN. MOTORS



MODEL -- C-181
262 KC. I.F.

FIG. 1.
CIRCUIT DIAGRAM



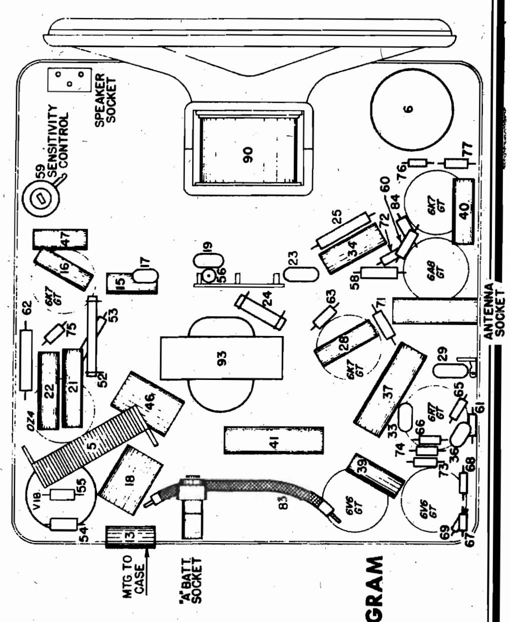


FIG. 2.
PARTS LOCATING DIAGRAM
(TOP VIEW)

This auto radio is an eight-tube self contained receiver, built expressly for installation in 1941 Chevrolet automobiles. Special features incorporated are: Automatic station selection; permeability tuning; sensitivity control; automatic noise control; temperature control condenser; four-position tone control; A.V.C. applied to R.F., I.F., and A.F. circuits; a dimmer control for dial lights; automatic bass compensation; push-pull beam power output; elliptical low resonance speaker; OZ4 rectifier; and a special full-wave primary type vibrator.

ANTENNA SYSTEM:

There are two antenna systems available for use with this receiver; the telescopic cowl antenna, and the telescopic reel-type antenna. Either of these antennas will operate very efficiently when used with this Chevrolet radio. A motor noise filter is built into the set end of the antenna system.

3-33 . 985694
Date 10-1-40

MODEL 985694

CHEVROLET DIV.—GEN. MOTORS

Solenoid Relief Valve

This valve is of the ball type and will operate only when the receiver is setting in normal operating position.

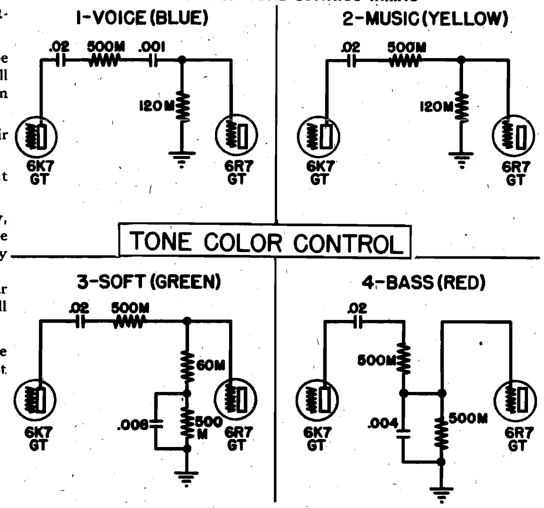
The automatic station selection tuning system is operated by a single bar. The system can be pre-set for five stations, each station having a corresponding number which is visible in small window to the right of tuning dial as that station is tuned in. To set the automatic tuning system to the five stations, proceed as follows:

1. Turn the receiver on and allow a sufficient length of time to permit the tubes to reach their normal operating condition.
2. Depress the automatic station selector until No. 5 is visible in the small window to the right of the dial.
3. Depress the large push-bar and hold in depressed position while carefully tuning in manually, the station which is to be represented by the figure 1 in the small window. Release bar and the first station has been set. Depress the push-bar and hold in that position then tune in manually the second station, and so on, until the five station positions have been set.

To tune the receiver with the automatic station selector bar, merely keep depressing the bar until the program you wish to hear is tuned in. The numbers 1 to 5 which appear in the small window to the right of the dial, will indicate the station.

NOTE: The accuracy of the automatic station selector depends upon how accurately the station is tuned in manually when setting it up. Always tune to a point where the clearest reception is obtained.

FIG. 5. TONE CONTROL WIRING



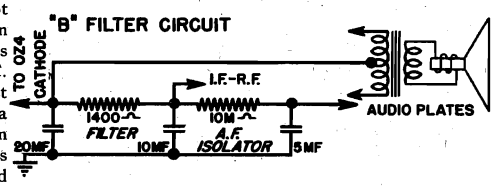
Tube Complement

Type	Function	Type	Function
6K7GT	R.F. Amplifier	6K7GT	1st Audio (A.V.C. Control)
6A8GT	Osc.-Modl.	6V6GT	Output (Push-pull)
6K7GT	I.F. Amplifier	OZ4	Rectifier
6R7GT	2nd Det. A.V.C. Driver		

Circuit Description

The circuit used in this receiver is the conventional superheterodyne type and does not use any regeneration. The eight tubes employed are an R.F. amplifier; combination oscillator-modulator tube; 262.5 k.c. I.F. amplifier, the first transformer of which is triple tuned; push-pull output, and power supply. The 6R7GT tube supplies A.V.C. voltage to the grids of the 6K7GT R.F. amplifier; the 6A8GT and the 6K7GT 1st A.F. tube. Bias for the 6K7GT R.F. amplifier and the 6A8GT is developed across a 750 ohm variable resistor (sensitivity control, item 59) which has a fixed minimum of approximately 140 ohms. The bias for the 6K7GT I.F. amplifier is developed across a 450 ohm resistor (item 63). The bias for the 6K7GT 1st audio tube is developed across a 1500 ohm resistor (item 84). The bias for the 6R7GT tube is developed across two resistors, one of 350 ohms (item 73), the other of 2400 ohms (item 74). These two resistors form a voltage divider, feeding a portion of the bias voltage through the 300,000 ohm R.F.-A.V.C. load resistor (item 66) to the grid of the 6R7GT providing approximately one volt (q). Bias for the 6V6GT output tubes is developed across a 220 ohm resistor (item 83), between the 6K7GT 1st audio plate and the 6R7GT (driver) grid for the resistor capacity network comprising the tone color control. The 6R7GT plate is coupled through a .1 mfd. condenser to one side of the center tapped audio input choke.

"B" FILTER CIRCUIT



MODEL 985694

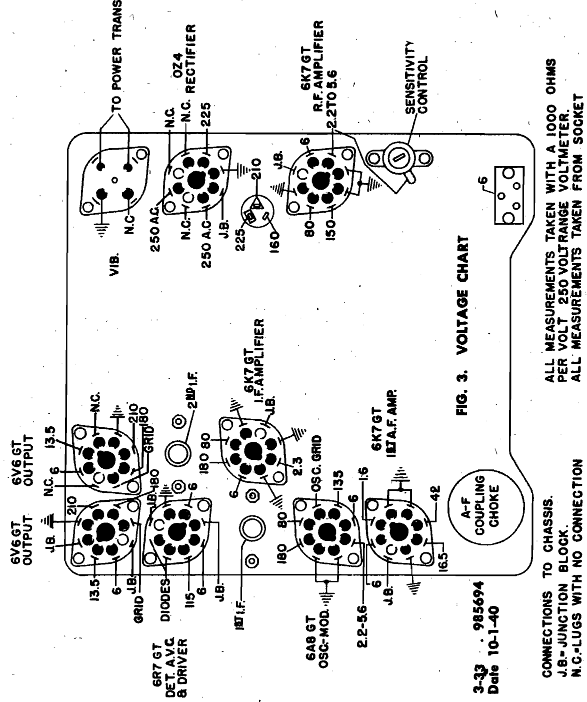


FIG. 3. VOLTAGE CHART

ALL MEASUREMENTS TAKEN WITH A 1000 OHMS PER VOLT 250 VOLTRANGE VOLTMETER. ALL MEASUREMENTS TAKEN FROM SOCKET

CONNECTIONS TO CHASSIS. J.B.= JUNCTION BLOCK. N.C.=LUGS WITH NO CONNECTION

3-33 . 985694
Date 10-1-40

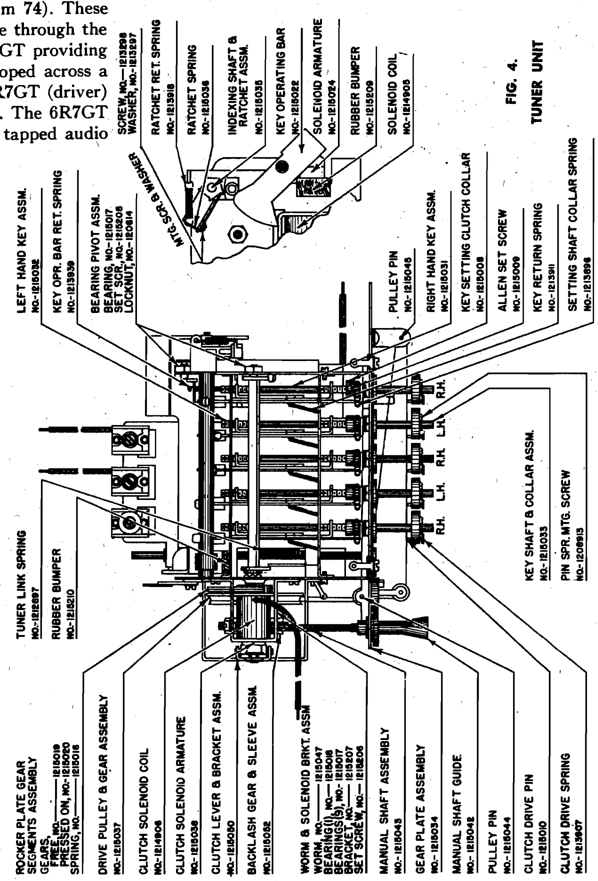


FIG. 4. TUNER UNIT

CHEVROLET DIV.—GEN. MOTORS

MODEL 985694

Circuit Alignment

The adjustable condensers in this receiver have been very carefully adjusted at the factory and will require no further adjustment (excepting antenna trimmer) unless tampered with or a defective I.F. coil has been replaced. If realignment is found necessary the circuits can be adjusted only with the use of a signal generator and an output meter.

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 modulated signal generator and oscillograph. The accuracy of the automatic 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 6V6GT output tubes, and connect the other terminal through a .1 mfd. condenser (not electrolytic) to the plate of the other 6V6GT output tube.

(b) Connect the ground lead from the signal generator to the frame of the receiver chassis. Connect the output of the signal generator through a .02 mfd. condenser to the grid of the 6K7GT I.F. amplifier tube leaving the tube's grid clip in place.

(c) Turn the volume control on full. Adjust station selector to low frequency (55) end of dial and press the tone control button to the "music" position.

(d) Adjust the signal generator to 262.5 kilocycles.

(e) Adjust the trimmer condensers located on the 2nd I.F. transformer for maximum reading on the output meter. NOTE: 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 6A8GT tube leaving the tube's grid clip in place.

(g) Open the middle trimmer (front) on the 1st I.F. transformer two or three turns of the adjusting screw. Care should be taken that the adjustment screw does not become dislodged from the nut.

(h) Adjust the other two trimmers (rear) on the 1st I.F. transformer for maximum reading on the output meter.

(i) Adjust the middle trimmer (front) on the I.F. transformer for maximum reading on the output meter. NOTE: 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 visual alignment. It will also 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 6K7GT audio amplifier tube, leaving the tube's grid clip in place. 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 6A8GT 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 260.5 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 the 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 oscillator 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 condenser 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 numbers of the curve when maximum symmetry is reached.

3. Aligning the R.F. Amplifier

NOTE: The tuning of this receiver is not accomplished in the conventional manner. Tuning is accomplished by specially designed iron cores which are moved in and out of the coils to vary the inductance. There are three matched cores mounted to a carriage and which move as a single unit. The adjustment (tracking alignment) of the iron cores is very critical, therefore they should not be tampered with. The permeability tuning unit is precision tested and aligned, then sealed at the factory, and should need no further adjustment.

NOTE: Do not touch iron core adjustments. See instructions under permeability tuning unit replacement procedure.

TO ALIGN THE R.F. AMPLIFIER

(a) Connect the output of the signal generator through a 40 mmfd. condenser and use the regular Chevrolet shielded lead-in to the antenna connection of the receiver.

(b) Connect the generator ground lead to the frame of the receiver chassis.

(c) Adjust the signal generator to 1610 kilocycles.

(d) Adjust the station selector knob until the high frequency (1610) stop is reached. The dial pointer should be at the indexing mark on dial (below 155).

(e) Adjust the shunt trimmer condensers for maximum output. The adjustment should be made in the following order: Oscillator—Antenna—R.F. NOTE: After the radio is installed in the car the antenna trimmer should again be adjusted. Using a very weak signal around 1550 kilocycles, which is just audible with volume control on full, the antenna trimmer should be peaked for maximum output.

4. Permeability Unit Replacement Procedure

Each unit is made of matched parts. The iron cores in any one unit must be of the same group. There are four groups or classifications graded according to permeability and coded with a dot of paint on the screw end of the core. The code and value is as follows:

Code	Value
Red	2% to minus 1%
Blue	Minus 1% to mean value
Yellow	Mean value to plus 1%
Purple	Plus 1% to plus 2%

A. To Replace Iron Core Only:

(a) Remove speaker from case. This will give access to permeability tuning unit mounted to key assembly.

(b) Remove the two screws holding the bakelite core support strip to the carriage. Carefully remove assembly from carriage.

(c) Note the physical location of core to be replaced, then carefully remove defective core.

(d) Clean the cement from core fastener and then insert the new core (be sure new core is coded similar to cores used in set) in fastener so it is approximately in the same position as the one removed. Replace core assembly on carriage being very careful to insert cores in coil forms so as not to damage either.

(e) If either or both the antenna or R.F. cores have been changed, align them as follows:

1. Set the signal generator to 1610 kilocycles.
2. Turn control until carriage is all the way out. Pointer on dial should be at indexing mark (below 155).
3. Adjust the antenna and R.F. cores for maximum output.
4. Adjust the signal generator to 1400 kilocycles.
5. Readjust the antenna and R.F. cores to peak at 1400 kilocycles.
6. Adjust the signal generator to 1610 kilocycles.
7. Adjust the shunt trimmer condensers for maximum output.

(f) The alignment procedure after changing the oscillator iron core, is as follows:

1. Insert core (same code) into core retainer to approximately the same physical position as one removed.
2. Adjust the signal generator to exactly 1610 kilocycles.
3. Move carriage (with manual tuning knob) to minimum position (pointer at 1610 kilocycles).
4. Adjust the oscillator trimmer condenser for maximum output, then adjust antenna and R.F. trimmer for maximum output.
5. Move carriage in approximately 3/16 of an inch.
6. Adjust the signal generator to 1400 kilocycles.
7. Adjust the oscillator core, the antenna and R.F. cores for maximum output.
8. Adjust the signal generator to exactly 1610 kilocycles and touch up the shunt trimmer condenser.

B. Replacing Complete Permeability Unit:

To facilitate this work, remove chassis from case.

(a) Remove the top and bottom covers from the case, then remove the speaker.

(b) Unsolder the "a" connection and motor noise choke from log on spark plate (mounted to case).

(c) Remove p.k. screws holding chassis in case and remove the chassis and front panel from case.

(d) To remove tuning unit (key assembly, etc.):

1. Remove the dial pointer from drive string.
2. Unsolder the two ground bonds, antenna connection, its shield, the blue, green, and black leads of the tuning unit, and also the A.V.C. resistor attached to the junction block.
3. Unsolder the clutch coil and the solenoid coil leads from the push-bar switch.
4. Loosen the set screw in the indexing shaft and remove long flexible shaft.
5. Loosen the unit on the volume control.
6. Remove the four screws which attach the whole tuning unit to the chassis.
7. Unsolder the .001 mfd. grid coupling condenser from antenna trimmer on unit. Unhook the spring and connecting link connecting the rocker arm and tuning carriage.
8. Remove permeability assembly by removing three screws accessible through keys on tuning unit and replace with new assembly.
9. The adjustments necessary on new units are the same as outlined under paragraph headed "Aligning the R.F. Amplifier".

IMPORTANT: The permeability unit must not present any load or drag to the rest of the tuning unit. The method of determining whether or not there is too much friction is to hold the unit (permeability only) so that the iron cores will move in and out of the coils of their own weight. If they do not, too much friction is present. The total linear motion of the iron cores rack is 1.375 inches. Always seal iron core screws after an adjustment.

5. Automatic Tuning Unit

When the push-button bar is depressed, the following action takes place. The lower rear side of the bar pushes in lever on the solenoid. When the solenoid switch makes contact it closes the "A" circuit to both the magnetic clutch solenoid coil and the key operating bar solenoid. The clutch solenoid disconnects the manual drive mechanism. While this is occurring the large solenoid is pulling down the key operating bar. This bar has an arm on the right side which is cam shaped on the end which moves lever on indexing shaft ratchet. This movement causes the indexing shaft to pull on key back far enough to permit the key operating bar to engage lower hook of key. The key is then drawn back by the key operating bar until the key rocker bar is lined up by the key toggle fingers. The movement of the key rocker bar is transmitted through a link which moves the permeability tuning rack (iron core assembly) tuning in station for which that position was set. The indexing shaft has five studs so spaced that while one stud is pushing a key back so the key operating bar will engage the lower hook on the key, the next stud on the shaft is indexed ready to push the next key back. This follows in sequence. In the end of the indexing shaft is a flexible drive cable which operates the station indicator drum. This entire action takes place instantaneously when the push button is depressed.

Adjustments

The solenoid clutch face gap should be approximately .026 inches. This is adjusted by bending the clutch operating bar just above the pivot. The backlash gears on both the clutch and the rocker bar are adjusted on tooth.

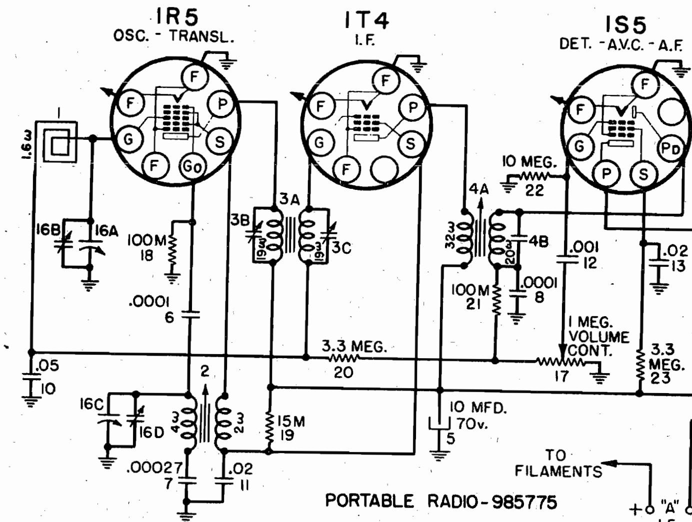
Key Adjustment

To adjust a key the two fingers should be parallel (straight up and down). Turn the rocker bar until it is exactly vertical. Push key in until both fingers are against the rocker bar. With the key in this position the key setting clutch shaft (1215033) should have its "C" washer bearing against the end of key and the clutch shaft locking collar should also be bearing against key. The shaft must turn freely and not bind or be rough. With the key in the above position adjust the gap against the key setting clutch to approximately .010 clearance between the clutch and gear face. With the setup as stated above, the correct distance between the inside edge of the hook on key (which engages the key operating bar) and the outside face of the rear key guide bar, should be 5/64 of an inch. Adjust and tighten set screw in key clutch shaft locking collar.

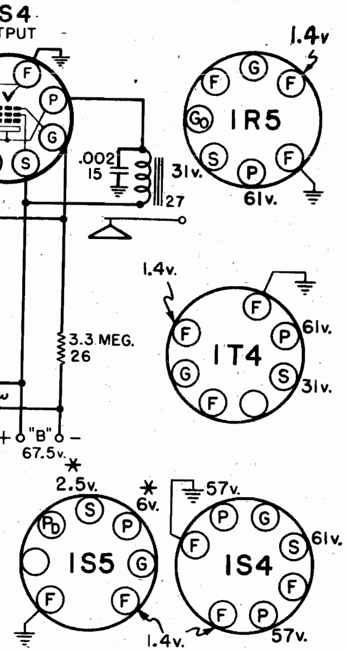
IMPORTANT: Do not put oil on solenoid armature or on the clutch solenoid armature.

MODEL 985775

CHEVROLET DIV.—GEN. MOTORS



PORTABLE RADIO-985775



READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; ALL VOLTAGES EXCEPT THE HEATER VOLTAGES MEASURED ON THE 0-250 VOLT SCALE.

"A" BATTERY 1.4 VOLTS. CURRENT DRAIN 250 M.A.

"B" SUPPLY DRAIN APPROXIMATELY 10 M.A.

✱ READINGS MUCH LOWER THAN ACTUAL VOLTAGE BECAUSE OF HIGH SERIES RESISTANCE.

3-P2 . 985775
Date 1-1-41

BOTTOM VIEW OF TUBE SOCKETS LOOKING FROM BACK OF SET

"A" BATTERY CURRENT - 250 M.A.
"B" BATTERY CURRENT - 10 M.A.
B+ TO B- - 67.5 VOLTS
I.F. K.C. - 455
R.F. K.C. - 1600 TO 540

IMPORTANT: Batteries must be in their proper positions before making any adjustments.

ALIGNING I-F STAGES AT 455 KILOCYCLES

Connect the signal lead of the test oscillator through a .1 mfd. condenser, to terminal "X" on variable condenser 16A (see Parts Layout), which is the grid lead of the 1R5 tube.
Connect the ground lead of the test oscillator to the chassis frame.
Connect the output meter through a .5 mfd. condenser from the plate prong of the 1S4 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, and to prevent short circuit of "B" battery
Turn volume control to maximum.
Adjust the trimmers 3B, 3C and 4A 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.

ALIGNING AT 1600 KILOCYCLES

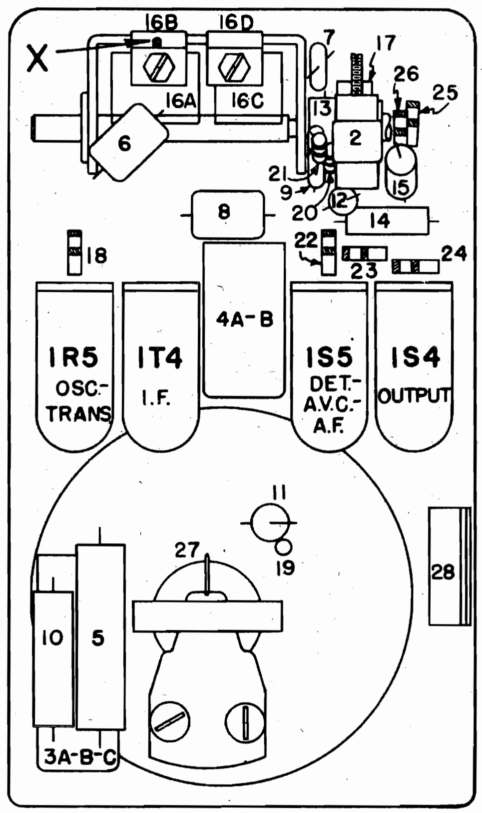
Leave the test oscillator leads connected the same as for aligning the I-F circuits.
Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.
Adjust the condenser 16D (see Parts Layout) for maximum output. (It is very important that this frequency be set accurately as a slight missetting will cause the receiver to be out of track over the entire high frequency end of the dial.)

ALIGNING THE ANTENNA STAGE 1400 K.C.

Remove the signal lead of the test oscillator from the grid of the 1R5 tube. Run a wire from the output terminal of the test oscillator, having it come near the receiver. NOTE: No metallic connection is made between the test oscillator and the receiver.
Turn the condenser rotor plates until this frequency is tuned in with maximum output.
Adjust the Antenna Trimmer "16B" (see Parts Layout) for maximum output.

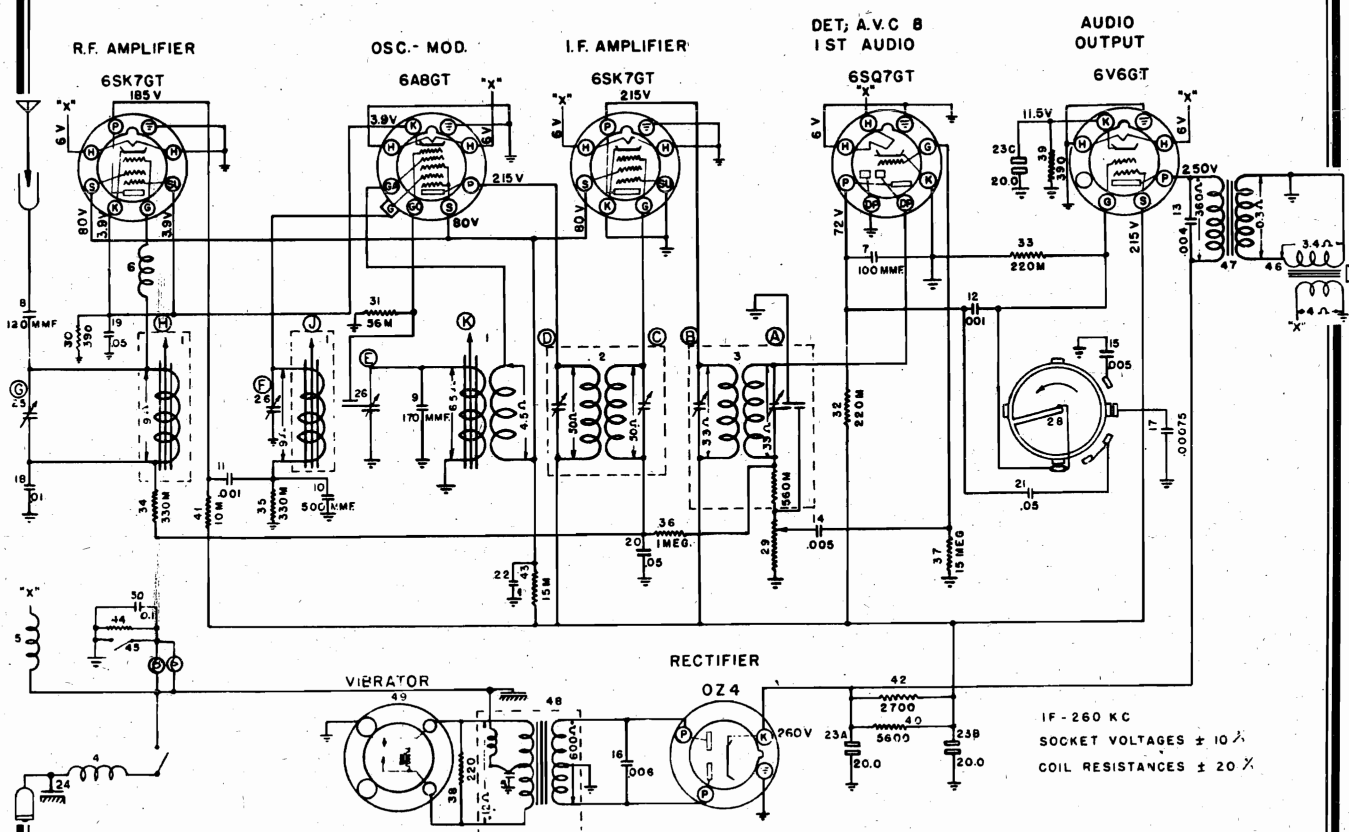
ALIGNING AT 600 KILOCYCLES

Turn the condenser rotor plates until the radiated signal from the test oscillator is tuned in with maximum output.
Maintain a low output signal from the test oscillator and adjust the oscillator padding adjustment on item 2 (see Parts Layout) 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.
After the above operation turn the condenser rotor plates to the high frequency stop position. Check the 1600 K.C. setting and if necessary readjust trimmer "16D". Then return to 1400 K.C. for final antenna trimmer adjustment.
If the entire alignment procedure has been accomplished correctly, the receiver should be uniformly sensitive over the entire frequency range.



MODEL 985695

CHEVROLET DIV.—GEN. MOTORS



3-34 . 985695
Date 10-1-40

FIG. 1. CIRCUIT DIAGRAM

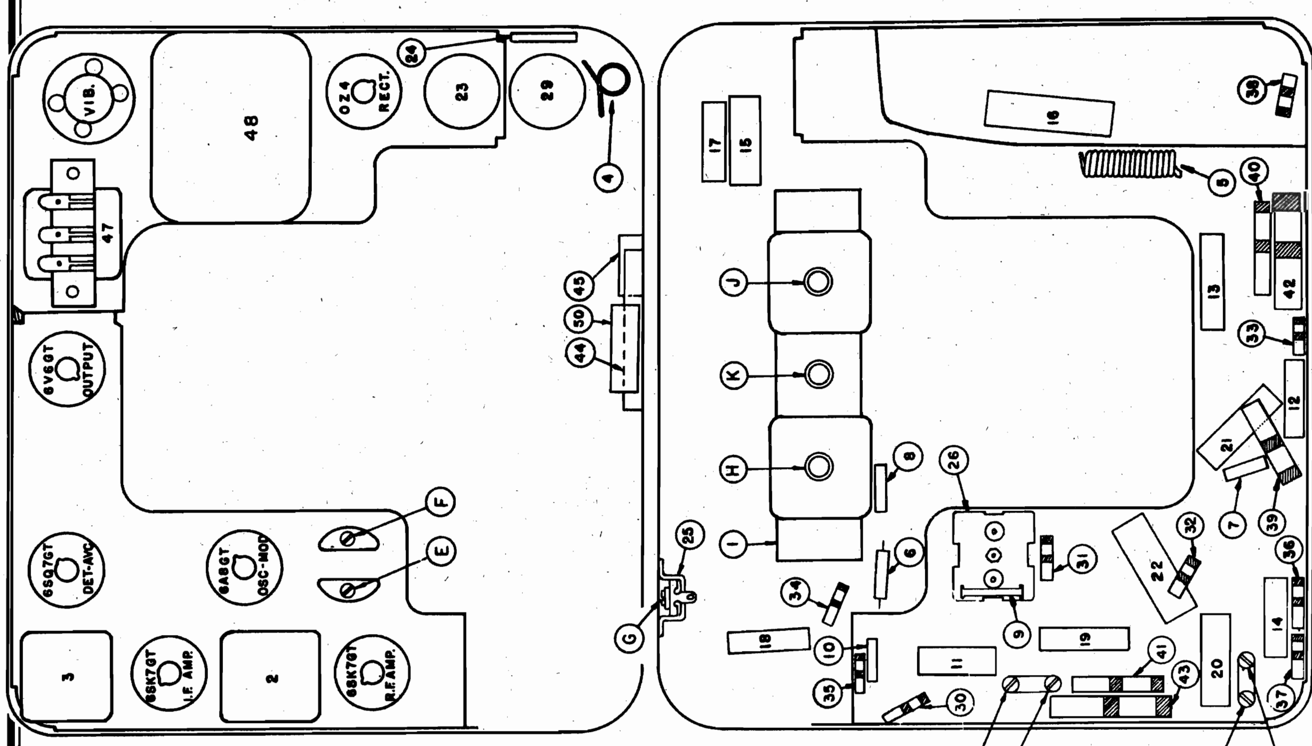


FIG. 2. PARTS LOCATING DIAGRAMS (TOP AND BOTTOM VIEWS)

MODEL 985695

CHEVROLET DIV.—GEN. MOTORS

Circuit Description

The circuit used in this receiver is the conventional superheterodyne type and does not use any regeneration. A special tone control circuit is employed to give the desired tone without distortion. The tuning circuits are tuned by varying the inductance of the antenna, R.F. and oscillator coils by means of iron cores which slide in and out of the coils like pistons. The alignment of the cores has been sealed at the factory and they should not require readjustment unless the coils have been changed.

Circuit Alignment

The trimmer condensers in this receiver have been carefully adjusted at the factory and should require no further adjustment (except the antenna trimmer) unless tampered with or a coil has been replaced. It is advisable not to attempt any adjustment unless it is definitely known that alignment is necessary. Due to the fact that the iron cores are sealed in place at the factory, only the trimmer adjustment as outlined under "Capacity Alignment" should be made, unless the coils of the iron core tuning unit are changed. A signal generator and an output meter must be used to align the receiver circuit correctly. To make all alignment adjustments the front and back covers must be removed. All trimmer condensers are readily accessible.

Capacity Alignment

1. I.F. Alignment at 260 Kilocycles

(a) Connect a .1 mfd. condenser between the plate prong of the 6V6GT output tube and one terminal of the output meter. Connect the second terminal of the output meter to ground. This will protect the meter from DC voltages.

(b) Connect the ground lead of the signal generator to the chassis frame.

(c) Connect the signal lead of the signal generator to the grid cap of the 6A8GT tube through a .1 mfd. condenser. Leave the grid connection on the tube in place.

(d) Turn the set volume control on full and put tone control on "music" position. Adjust the signal generator to 260 kilocycles. Tune the receiver to a frequency where no squeals or beat notes may be heard and so that when the tuning control is moved through narrow limits no appreciable change in output may be noted.

(e) Adjust the I.F. trimmers (a), (b), (c), and (d) for maximum output.

2. Aligning at 1560 Kilocycles

Set the signal generator to 1560 kilocycles.

(a) Connect the signal lead of the signal generator to the receiver antenna connection through a 70 mmfd. condenser.

(b) Turn the manual tuning control of the receiver to the stop at the extreme high frequency end of the dial.

(c) Adjust the signal generator to 1560 kilocycles.

(d) Adjust the oscillator trimmer (e) for maximum output.

(e) Adjust the R.F. trimmer (f) for maximum output.

(f) Adjust the antenna trimmer (g) for maximum output.

3. Aligning at 1400 Kilocycles

(a) Adjust the signal generator to 1400 kilocycles.

(b) Tune the receiver to the signal and readjust the trimmers (f) and (g) for maximum output. The signal generator output should be as low as possible and still give a satisfactory meter reading. NOTE: This type of tuning does not require alignment at 600 k.c.

4. Alignment with Car Antenna

Antenna trimmer (g) must be adjusted to match car antenna when the receiver is installed. Use a weak station signal near 1400 kilocycles. When a weak signal has been tuned in turn volume control on full and adjust antenna trimmer for maximum output. NOTE: When making this adjustment the antenna should be fully extended.

Capacity and Inductance Alignment

This should be used only when there is definite evidence of the iron cores being out of adjustment.

1. I.F. Alignment at 260 Kilocycles

The same procedure as previously outlined should be followed.

2. Aligning at 1560 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna connection of the set through a 70 mmfd. condenser.

(b) Adjust the signal generator to 1560 kilocycles.

(c) Rotate the manual tuning mechanism until the high frequency stop is reached. Mechanically align the iron cores (k), (h) and (j), by setting the oscillator core (k) so that its front edge sticks out 1 1/16" from the end of the coil form, and the antenna and R.F. cores (h) and (j) stick out 1 13/32" from the end of the respective coil windings.

(d) Adjust the oscillator trimmer (e), the R.F. trimmer (f) and the antenna trimmer (g) for maximum output.

3. Aligning at 1400 Kilocycles

(a) Adjust the signal generator to 1400 kilocycles and tune the set to this signal.

(b) Adjust the R.F. core (j) for maximum output.

(c) Adjust the antenna core (h) for maximum output. NOTE: When checking maximum output remove hand from vicinity of the cores as body capacity will affect readings.

4. Realignment at 1560 and 1400 Kilocycles

(a) Repeat alignment of trimmer (e) and trimmers (f) and (g) at 1560 kilocycles.

(b) Repeat alignment of cores (k) and (j) at 1400 kilocycles. When this adjustment has been made seal the core screws with cement.

5. Alignment with Car Antenna

Antenna trimmer (g) must be adjusted to match car antenna when receiver is installed. Use a weak station signal near 1400 kilocycles that is audible with volume control on full. Adjust antenna trimmer for maximum output. NOTE: The antenna should be fully extended when making this adjustment.

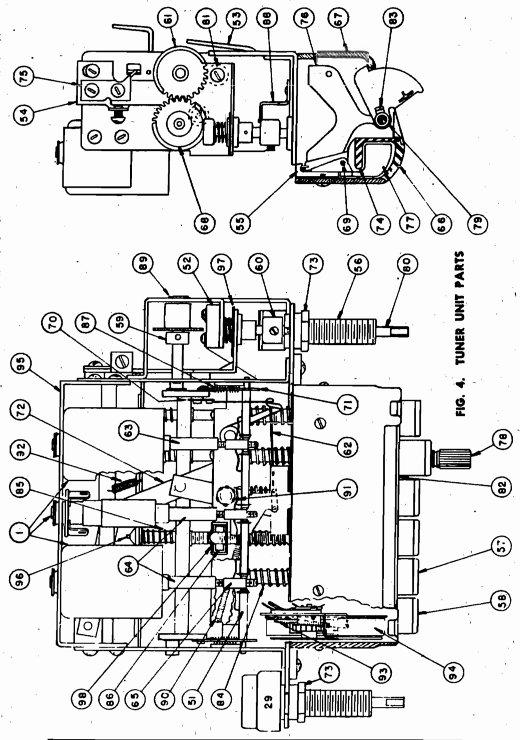


FIG. 4. TUNER UNIT PARTS

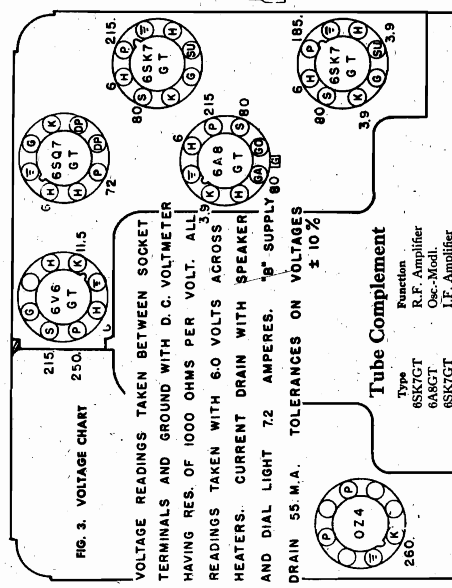


FIG. 3. VOLTAGE CHART

VOLTAGE READINGS TAKEN BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RES. OF 1000 OHMS PER VOLT. ALL READINGS TAKEN WITH 6.0 VOLTS ACROSS HEATERS. CURRENT DRAIN WITH SPEAKER AND DIAL LIGHT 7.2 AMPERES. "B" SUPPLY DRAIN 55 M.A. TOLERANCES ON VOLTAGES ± 10%

Tube Complement

Type	Function
6SK7GT	R.F. Amplifier
6A8GT	Osc.-Modl.
6SK7GT	I.F. Amplifier
6SQ7GT	2nd Det. A.V.C. and 1st Audio
6V6GT	Audio Output
OZ4	Rectifier

This auto radio is a six-tube single unit radio designed especially for 1941 Chevrolet automobiles. The complete radio mounts behind the instrument panel, and has six push-buttons (five for tuning and one for tone control). The manual tuning control, volume control knob and the dial extend through the instrument panel, blending with the design of the car interior. An elliptical speaker is used and is mounted in front of the receiver and projects its tone through the ornamental grille of the 1941 Chevrolet instrument panel. The tuning is accomplished by a mechanical unit of rugged construction assuring accuracy. A special compensating condenser is employed in the oscillator circuit to minimize tuning circuit changes due to normal variations in car voltages and temperature ranges. The power supply consists of an OZ4 rectifier tube used in conjunction with a full wave primary type vibrator.

ANTENNA CIRCUIT

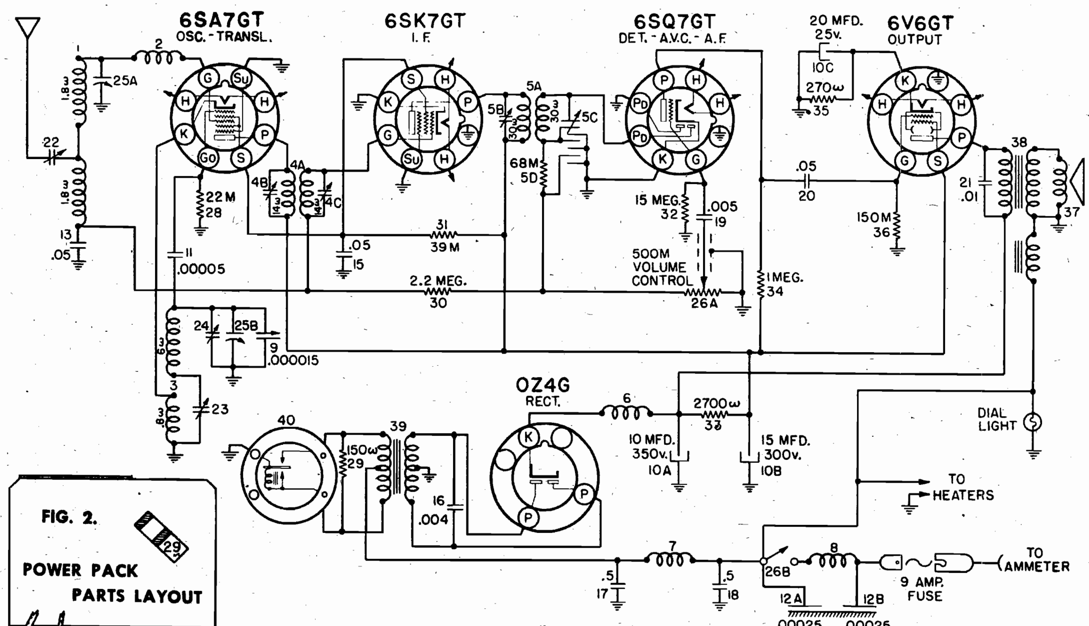
The antenna circuit is directly coupled to the antenna. The antenna coil is tuned by means of an iron core and the circuit is adjusted for slight variations in antenna capacity by means of an antenna trimmer located on the bottom of the receiver case.

ANTENNA SYSTEM

There are two antenna systems available for use with this receiver: the telescopic cowl antenna, and the telescopic reel-type antenna. Either of these antennas will operate very efficiently when used with this Chevrolet radio.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985696



I.F. = 455 K.C.

FIG. 1. CIRCUIT DIAGRAM

3-35 . 985696
Date 10-1-40

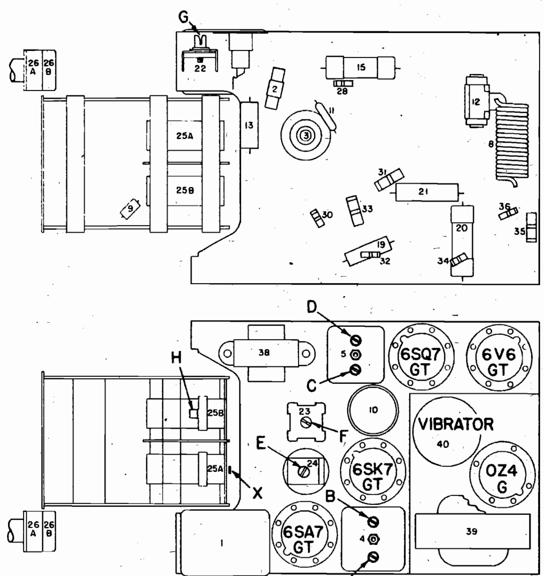
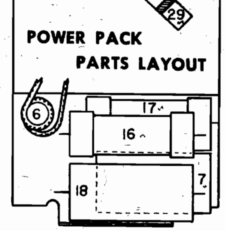


FIG. 2. PARTS LOCATING DIAGRAM (TOP AND BOTTOM VIEWS)

FIG. 2.

POWER PACK PARTS LAYOUT



MODEL NUMBER -- 985696

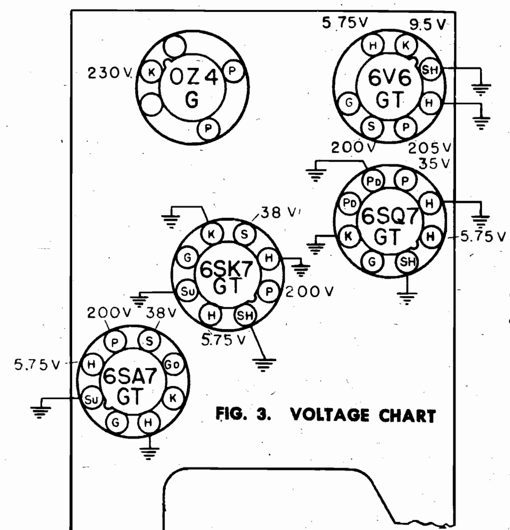


FIG. 3. VOLTAGE CHART

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, ALL VOLTAGES EXCEPT THE HEATER VOLTAGES MEASURED ON THE 0-250 VOLT SCALE.
"A" BATTERY 6.0 VOLTS. CURRENT DRAIN 6.0 AMPERES.
"B" SUPPLY DRAIN APPROXIMATELY 45 M A.

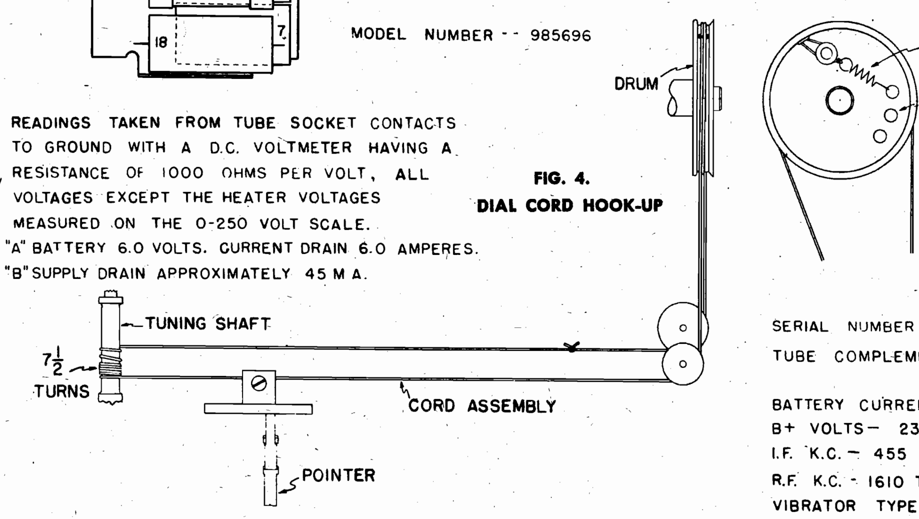


FIG. 4.
DIAL CORD HOOK-UP

POSITION OF DRUM ASSEMBLY WITH COIL CORES FULLY IN.

SERIAL NUMBER -- B41-085001 & UP
TUBE COMPLEMENT — 6SA7GT, 6SK7GT, 6SQ7GT, 6V6GT, OZ4G
BATTERY CURRENT — 6.0 AMPERES
B+ VOLTS— 230 VOLTS
I.F. K.C. — 455
R.F. K.C. - 1610 TO 540
VIBRATOR TYPE - NON SYNCHRONOUS

MODEL 985696

CHEVROLET DIV.—GEN. MOTORS

1. Aligning I.F. Stages at 455 Kilocycles

(a) Connect the signal lead of the test oscillator to terminal "X" on variable condenser 25A (see parts layout) which is the grid lead of the 6SA7GT tube through a .1 mfd. condenser.

(b) Connect the ground lead of the test oscillator to the chassis frame.

(c) Connect a .1 mfd. condenser between the plate prong of the 6V6GT output tube and one terminal of the output meter. Connect the second terminal of the output meter to ground. This will protect the meter from d.c. voltages.

(d) Set the signal generator at 455 kilocycles.

(e) Turn volume control on full.

(f) Adjust the trimmer condensers (a), (b), (c), and (d), on the I.F. transformers for maximum output.

These adjustments should be repeated several times, and during alignment the signal generator 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 signal generator leads connected the same as for aligning the I.F. circuit.

(b) Turn the rotor plates of the gang condenser all the way out and against the high frequency stop (h).

(c) Set the signal generator at 1560 kilocycles.

(d) Adjust condenser (e), (see parts layout) for maximum output.

NOTE: 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 the Antenna Stage

(a) Remove the signal lead of the signal generator from the grid of the 6SA7GT tube and connect to the antenna terminal of the receiver through a .000075 mfd. mica condenser connected in place of the .1 mfd. condenser previously used. NOTE: It is very important that a .000075 mfd. mica condenser be used when aligning the antenna stage of the receiver in order that this circuit can be made to track properly.

(b) Adjust the signal generator to 1400 kilocycles.

(c) Turn the condenser rotor plates until the 1400 k.c. signal is tuned in with maximum output.

(d) Adjust antenna trimmer (g), (see parts layout) for maximum output.

4. Aligning at 600 Kilocycles

(a) Adjust the signal generator to 600 kilocycles.

(b) Turn the condenser rotor plates until the signal from the generator is tuned in with maximum output.

(c) Maintain a low output signal from the signal generator and adjust the oscillator padding condenser (f), (see parts layout) 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.

(e) After the above operation, turn the condenser rotor plates to the high frequency stop position. Check the 1560 k.c. setting and if necessary readjust trimmer (e) then return to 1400 k.c. for final antenna trimmer adjustment.

NOTE: If the entire alignment procedure has been accomplished correctly the receiver should be uniformly sensitive over the entire frequency range.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985697

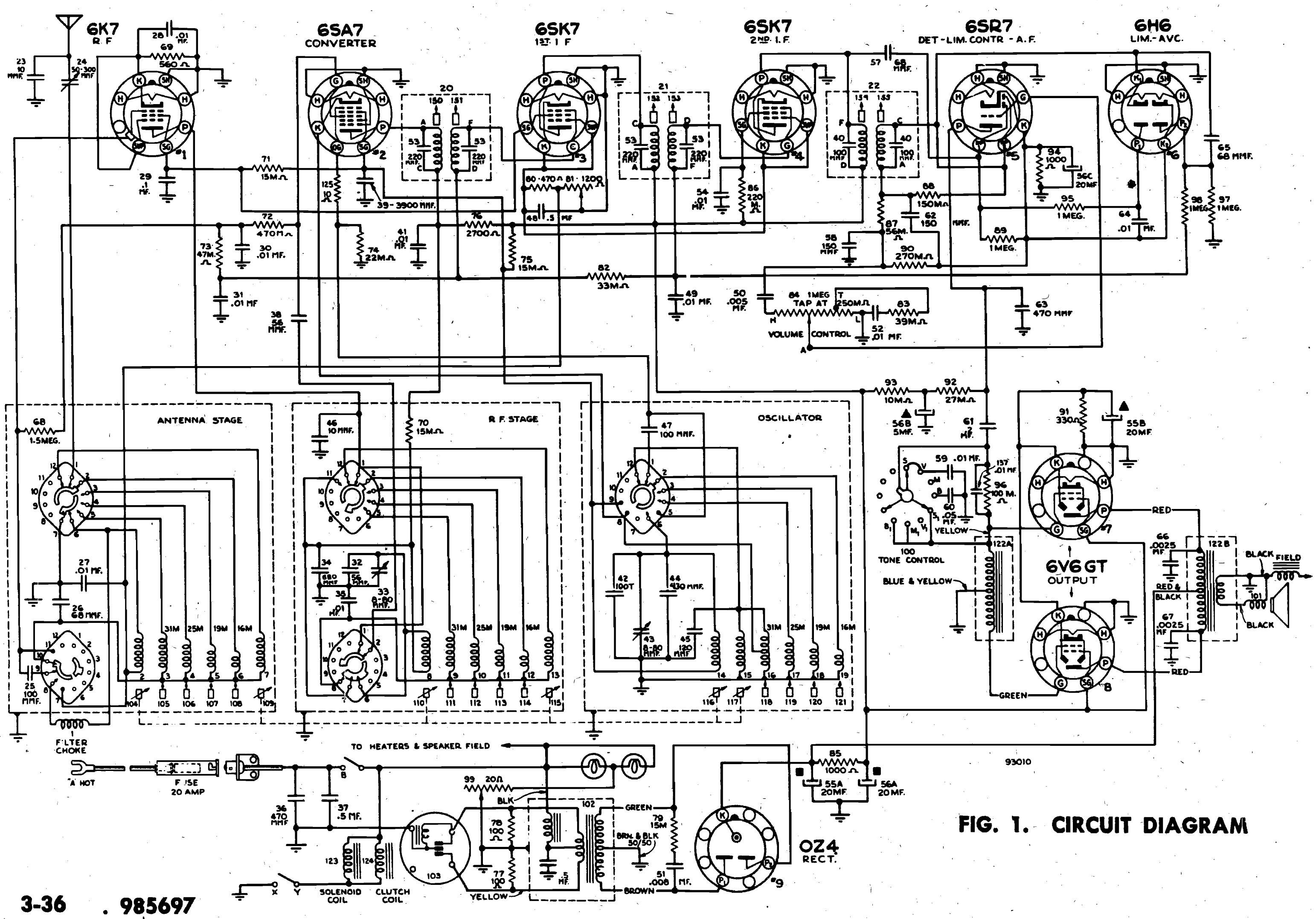


FIG. 1. CIRCUIT DIAGRAM

3-36 . 985697
Date 10-1-40

I.F. = 455 K.C.

ANTENNA SYSTEM: There are two antenna systems available for use with this receiver; the telescopic cowl antenna, and the telescopic reel-type antenna. Either of these antennas will operate very efficiently when used with this Chevrolet radio. A motor noise filter is built into the set end of the antenna system.

MODEL 985697

CHEVROLET DIV.—GEN. MOTORS

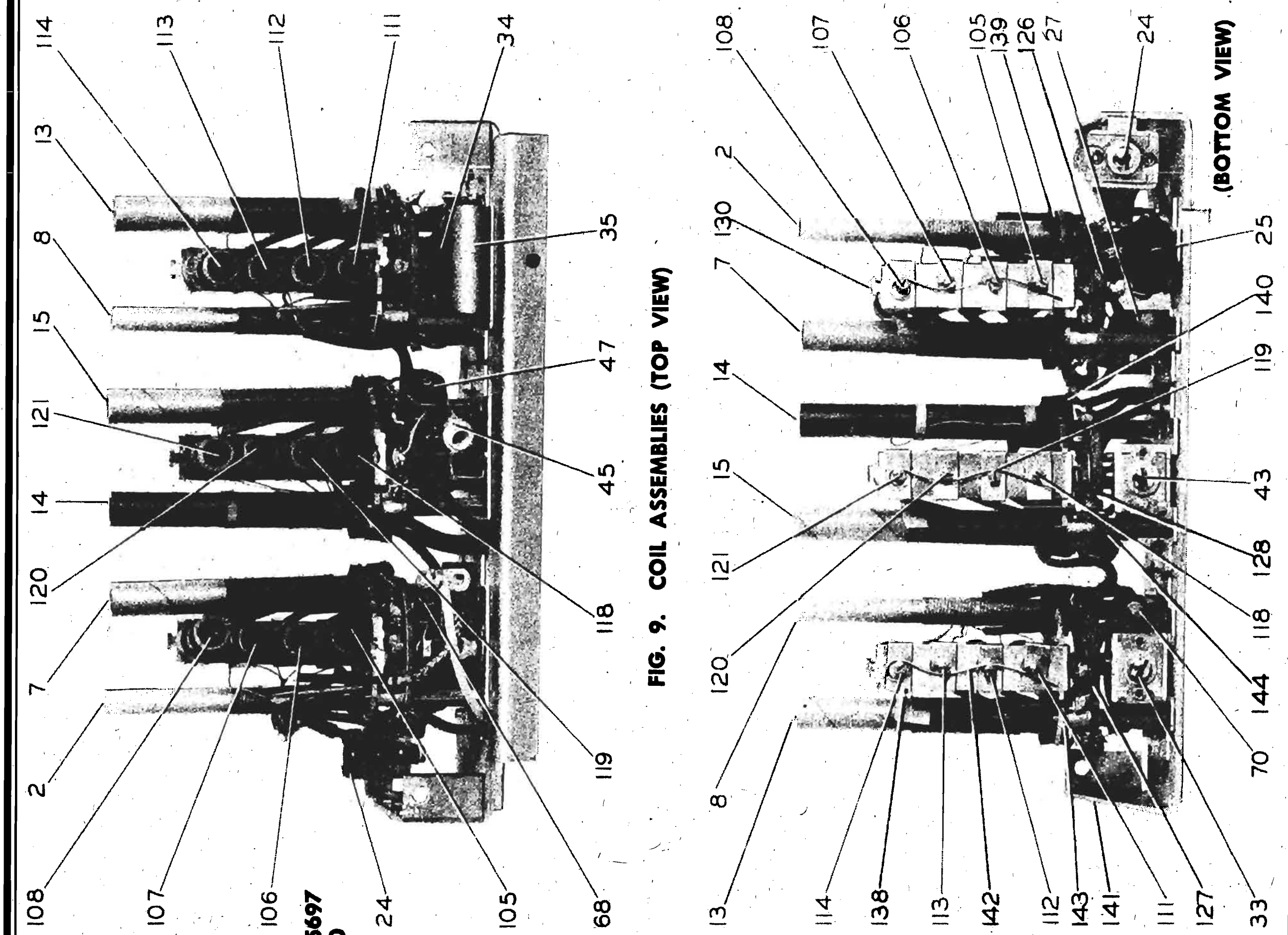


FIG. 9. COIL ASSEMBLIES (TOP VIEW)

3-36 . 985697
Date 10-1-40

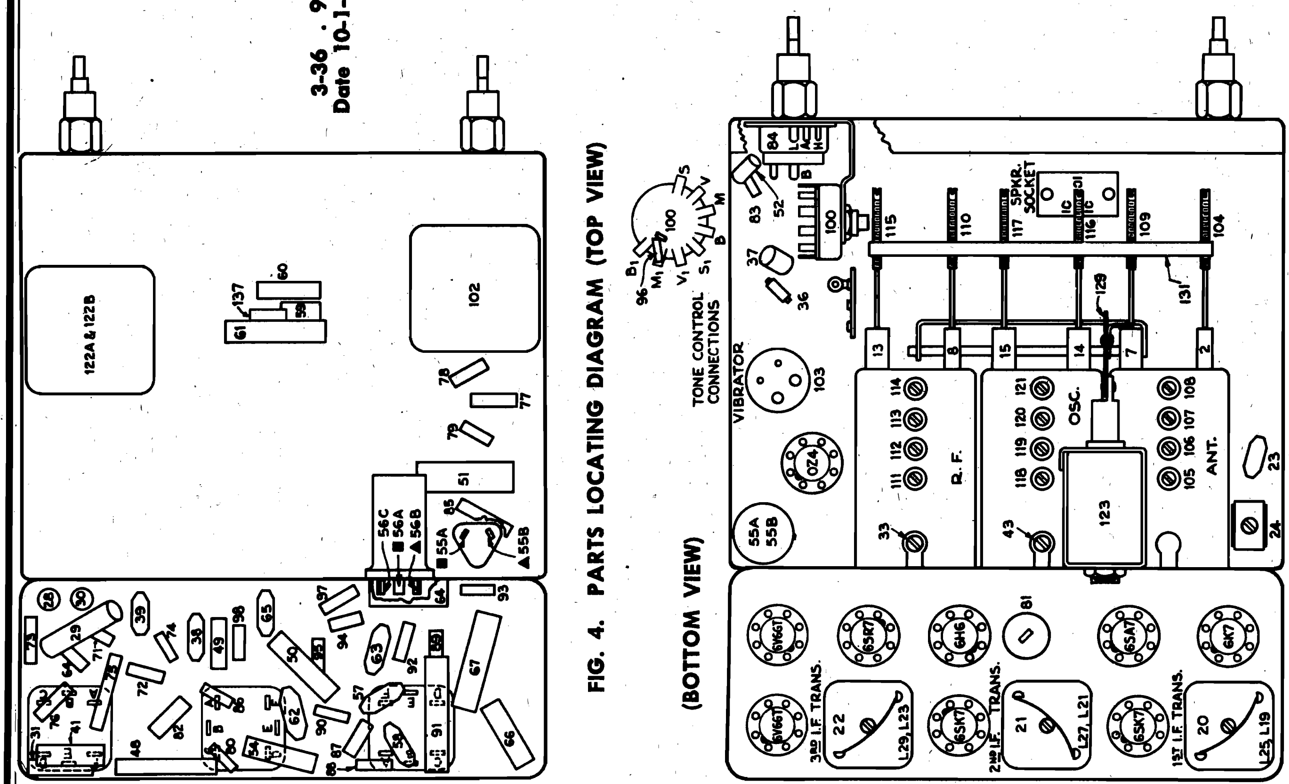
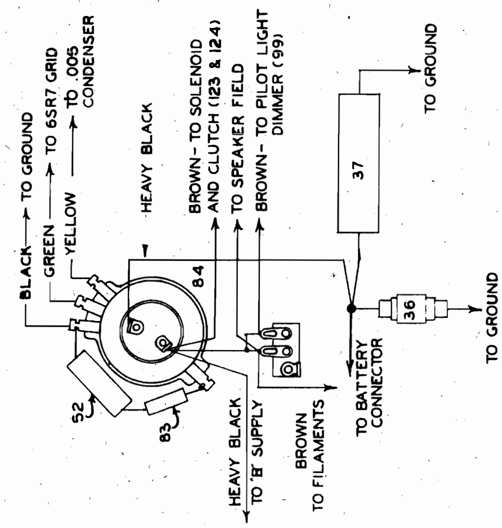


FIG. 4. PARTS LOCATING DIAGRAM (TOP VIEW)

(BOTTOM VIEW)

CHEVROLET DIV.—GEN. MOTORS

MODEL 985697



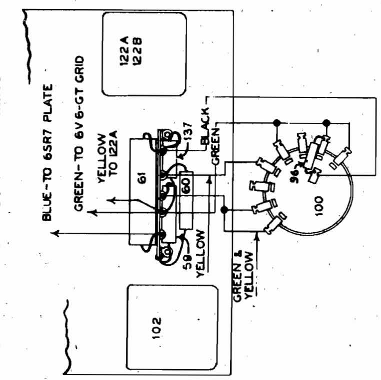


FIG. 7. VOLUME CONTROL WIRING

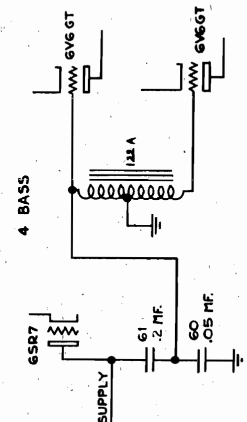


FIG. 7. TONE CONTROL WIRING

4 BASS

3-36 . 985697
Date 10-1-40

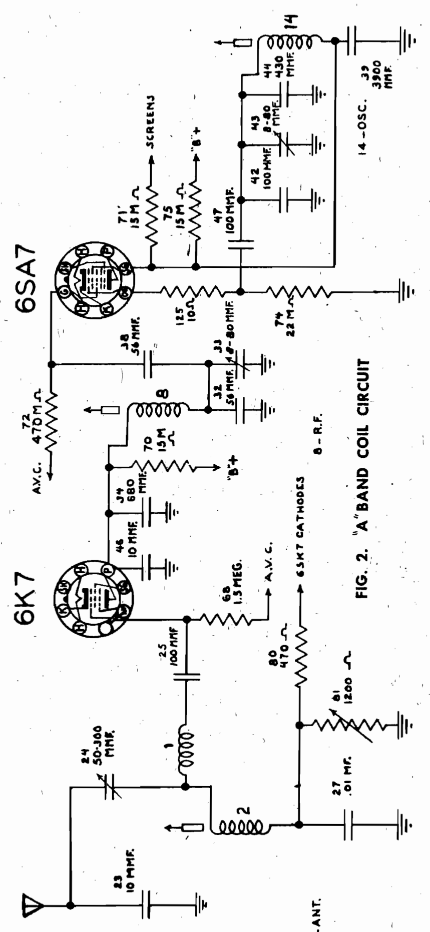


FIG. 2. "A" BAND COIL CIRCUIT

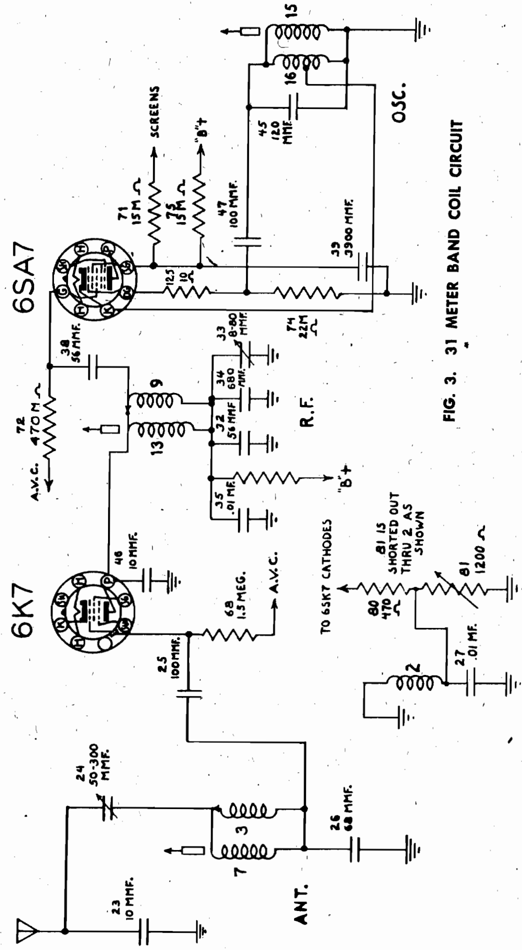


FIG. 3. 31 METER BAND COIL CIRCUIT

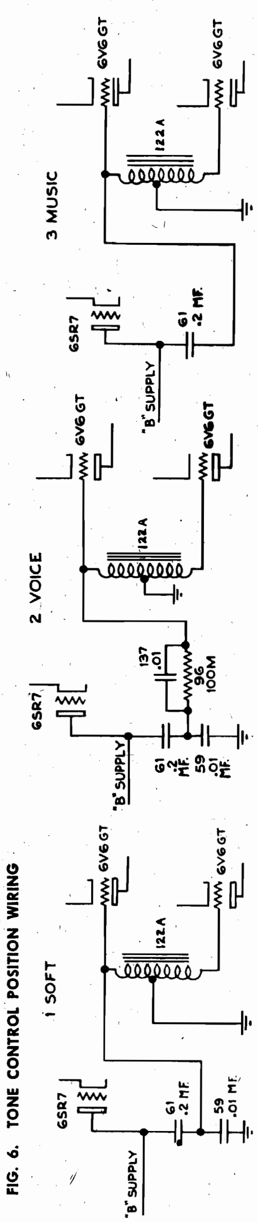


FIG. 6. TONE CONTROL POSITION WIRING

MODEL 985697

CHEVROLET DIV.—GEN. MOTORS

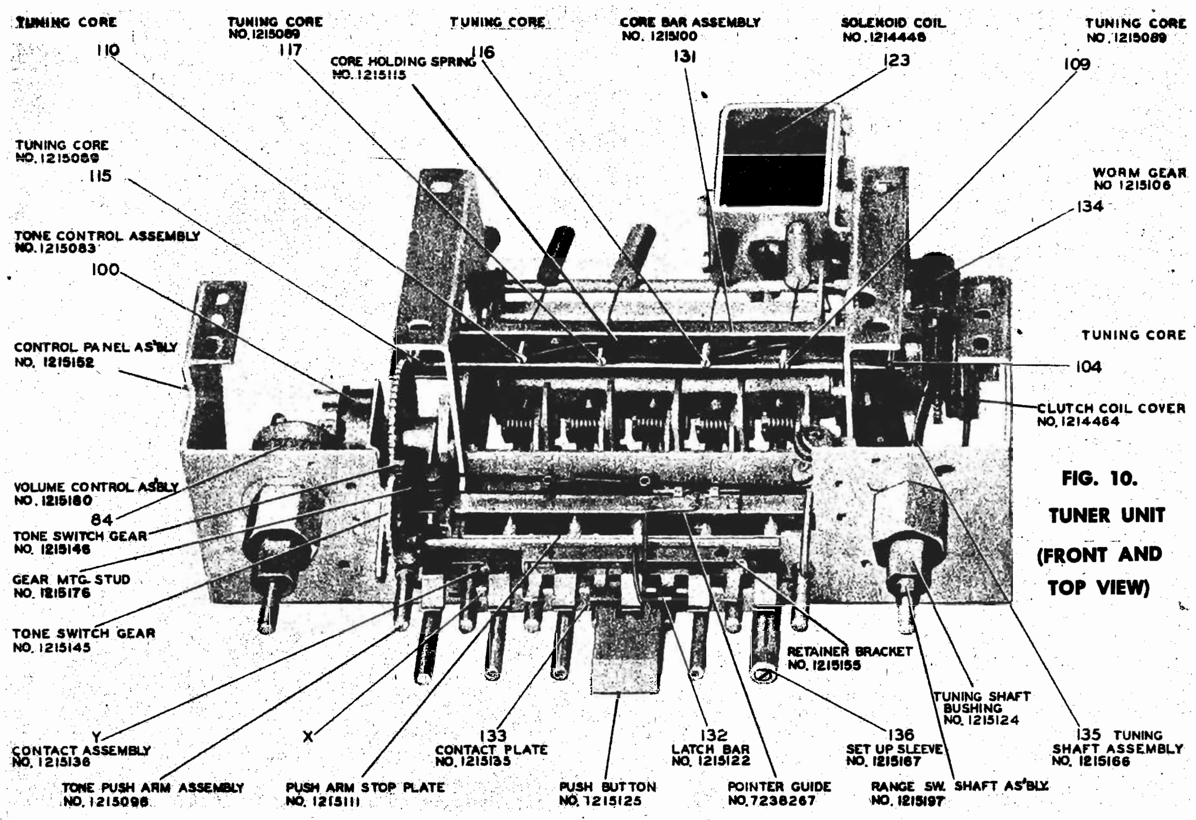


FIG. 10. TUNER UNIT (FRONT AND TOP VIEW)

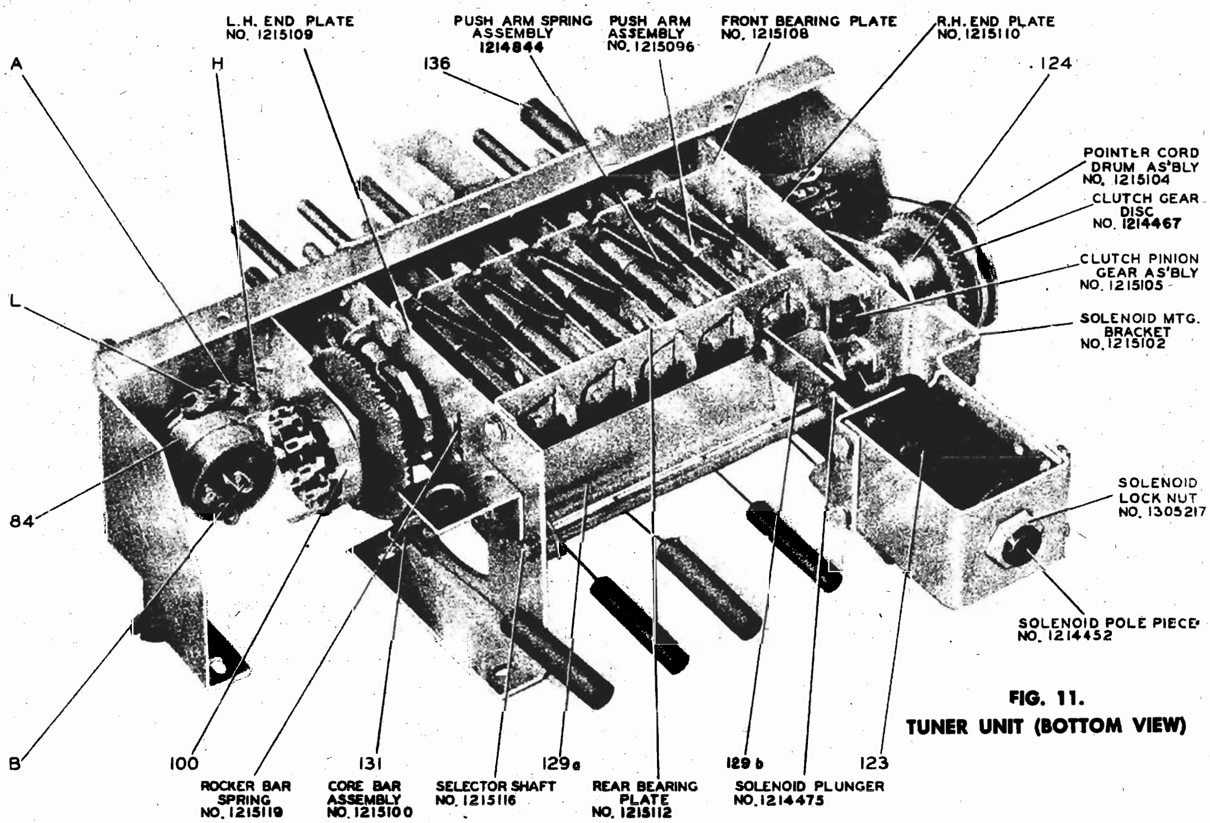


FIG. 11. TUNER UNIT (BOTTOM VIEW)

MODEL 985697

CHEVROLET DIV.—GEN. MOTORS

Circuit Alignment

The adjustable condensers and magnetite cores in this receiver have been very carefully adjusted at the factory and should require no further adjustment (except antenna trimmer, item 24) unless tampered with or a defective unit has been replaced. It is advisable not to attempt any adjustment unless it is definitely known that an adjustment is necessary.

To align the circuits of this receiver correctly a signal generator and an output meter must be used. In aligning the receiver it is very important that the correct frequencies be used and that all alignment adjustments be made in sequence, starting with the I.F. amplifier, then aligning the broadcast band, and finally the short wave band. Slight misadjusting of either the I.F. or R.F. circuits will result in a weak set over most of the dial. All R.F. and I.F. adjustments are accessible after removing the speaker cover, top cover and rear bottom cover. The I.F. primary windings are adjusted by magnetite core screws Nos. 150, 152 and 154, located on top of the I.F. transformers (Fig. 1); and the secondary windings are adjusted by core screws Nos. 151, 153 and 155, located at the bottom of each I.F. transformer (Fig. 1).

1. Aligning I.F. Stages at 455 Kilocycles

(a) Connect one terminal of the output meter to the plate of one of the 6V6GT output tubes and connect the other terminal through a .1 mfd. condenser to the plate of the other 6V6GT output tube.

(b) Connect the output of the signal generator through a .01 mfd. condenser to the grid of the 2nd I.F. tube, 6SK7 (Pin No. 4). Connect the ground lead from the signal generator to the frame of the receiver chassis.

(c) Turn the volume control on full.

(d) Adjust the signal generator to 455 kilocycles.

(e) Adjust core screws (154 and 155) on the 3rd I.F. transformer for maximum reading on the output meter. NOTE: Always use the lowest signal generator output that will give a reasonable deflection on the output meter.

(f) Connect the signal generator lead through the .01 condenser to the grid of the 1st I.F. tube. 6SK7 (Pin No. 4), and adjust core screws (152 and 153) in the 2nd I.F. transformer for maximum output.

(g) Connect the signal generator lead through the .01 condenser to the grid of the 6SA7 tube (Pin No. 8) and adjust core screws (150 and 151) in the 1st I.F. transformer for maximum output.

2. Aligning the R.F. Amplifier

The main tuning cores should never be touched unless a coil or core is replaced. Where one of these parts has been replaced the complete broadcast band alignment procedure (No. 3) should be followed. Generally when checking the R.F. circuits for proper peaking the following procedure and sequence must be used. There are fifteen trimmer screws properly labeled "Antenna", "Oscillator", and "R.F." The broadcast band is designated by the letter "A" and the four short wave bands are designated by the numbers indicating the bands—31, 25, 19 and 16. The labels all appear on the coil assembly shields.

(a) **"A" Band, or Broadcast:**

If the dial pointer is right on calibration, merely trim the "A" band, antenna and R.F. trimmers at 600 kilocycles. If the pointer is slightly off calibration it can be corrected by resetting the oscillator trimmer slightly and then trim the antenna and R.F. circuits for maximum output. (NOTE: When the radio is installed in the car the antenna trimmer should be aligned on the "A" band between 1000 and 1200 kilocycles.)

(b) **31 Meter Band:**

Using a signal of 9.6 megacycles, tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim antenna and R.F. trimmers for maximum output at 9.6 megacycles.

(c) **25 Meter Band:**

Using a signal of 11.8 megacycles tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim the antenna and R.F. trimmer for maximum output at 11.8 megacycles.

(d) **19 Meter Band:**

Using a signal of 15.2 megacycles tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim the antenna and R.F. trimmers for maximum output at 15.2 megacycles.

(e) **16 Meter Band:**

Using a signal of 17.8 megacycles tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim the antenna and R.F. trimmers for maximum output at 17.8 megacycles.

NOTE: The 31-meter band affects the tuning of the other short wave bands, therefore it must always be aligned first. It is equally important that the antenna trimmer (item 24) be aligned first on the broadcast band for proper tracking.

3. Broadcast Band Alignment

Six adjustments are provided which include trimmers Nos. 24, 33 and 43, associated with circuits Nos. 2, 8, 14 and the three iron cores Nos. 104, 110 and 116, which are mounted in front of the coil assemblies in conjunction with the core draw-bar No. 131. If complete realignment is found necessary the R.F. circuits should be adjusted in the following sequence.

(a) Tune the receiver to the extreme high frequency end of the band.

(b) Turn each of the three core screws (104, 110 and 116) in a counterclockwise direction ten turns. NOTE. This is done in order to separate the cores from the coil windings far enough so that the cores will have no effect on the frequency of the circuits.

(c) Connect the signal generator through a 35 mmf. condenser to the standard Chevrolet shielded antenna lead-in. Connect the ground lead from the signal generator to the shield of the antenna lead-in cable.

(d) Connect one terminal of the output meter to the plate of one of the 6V6GT output tubes, and connect the other terminal through a .1 mfd. condenser to the plate of the other 6V6GT output tube.

(e) Adjust the frequency of the signal generator to 1590 kilocycles and peak trimmers Nos. 24, 33 and 43 for maximum signal output, at the same time reducing the signal generator output to as low a value as is consistent with a reliable indication on the output meter.

(f) Change the frequency of the signal generator to 1560 kilocycles and turn the oscillator core screw (116) clockwise until maximum output is obtained.

(g) Change the frequency of the signal generator to 1200 kilocycles and tune the receiver for maximum signal at 1200 kilocycles.

(h) Adjust core screws (104 and 110) for maximum signal output.

(i) Change the frequency of the signal generator to 600 kilocycles.

(j) Tune the receiver for maximum signal output at 600 kilocycles.

(k) Adjust the antenna and R.F. trimmers (24 and 33) for maximum output.

(l) Reset the signal generator to 1200 kilocycles and tune the receiver for maximum output at 1200 kilocycles.

(m) Adjust the antenna and R.F. cores (104 and 110) for maximum output.

4. Complete Short Wave Alignment

Because of the extensive range of this receiver, it is necessary that the short wave bands be completely aligned in exact accordance with the following procedure. Be sure to make all adjustments in the order specified.

(a) Check broadcast band antenna trimmer (item 24) for maximum peaking. This is very important.

(b) Tune the receiver so that the dial pointer is at the extreme high frequency end of the 31-meter band, and adjust the magnetite core screws (109, 115 and 117) so that each core end is flush with the coil forms (items No. 7, No. 13 and No. 15) which extend beyond the shield.

(c) Turn the magnetite trimmer core screws (105, 106, 107, 108, 111, 112, 113, 114, 118, 119, 120 and 121) in a counterclockwise direction, as far as they will go. NOTE: Do not force the cores against their stops as too much force may fracture the core.

(d) Connect the signal generator through a 35 mmf. condenser and the Chevrolet shielded antenna lead-in, to the antenna connection of the receiver. Connect the ground lead from the signal generator to the shield of the lead-in.

(e) Turn the band indicator to 31 meters and turn the volume control to the maximum position.

(f) Adjust the signal generator frequency to 9.6 megacycles and move the pointer to 9.6 megacycles on the dial scale.

(g) Turn the core screw (118) in a clockwise direction until the first peak is obtained, and then adjust carefully for maximum reading on the output meter.

(h) Turn the core screw (111) in a clockwise direction until the 2nd peak is obtained, if more than one peak can be found, and adjust for maximum reading on the output meter at the same time reducing the signal generator output to as low a value as is consistent with a reliable indication on the output meter.

(i) Turn the core screw (105) in a clockwise direction or until 2nd peak is obtained, and adjust for maximum reading on the output meter.

(j) Change the signal generator frequency to 11.8 megacycles, the band indicator to 25 meters, and move the pointer meter to 11.8 megacycles on the dial scale.

(k) Turn the core screw (119) in a clockwise direction, until 1st peak is obtained, and adjust for maximum reading on the output meter.

(l) Turn core screws (112 and 106) in a clockwise direction until 2nd peak is obtained, and adjust for maximum reading on output meter.

(m) Change the signal generator frequency to 15.2 megacycles, the band indicator to 19 meters, and move the dial pointer to 15.2 megacycles on the dial scale.

(n) Turn core screw (120) in a clockwise direction until the 1st peak is obtained and adjust for maximum reading on the output meter.

(o) Turn core screws (113 and 107) in a clockwise direction until 2nd peak is obtained, and adjust for maximum reading on output meter.

(p) Change the signal generator frequency to 17.8 megacycles, the band indicator to 16 meters, and move the pointer to 17.8 megacycles on the dial scale.

(q) Adjust core screw (121) by turning in a clockwise direction until 2nd peak is obtained and adjust for maximum output.

(r) Adjust core screws (114 and 108) by turning in a clockwise direction until 1st peak is obtained and adjust for maximum reading on output meter.

(s) Repeat all operations starting with (e) until no further improvement can be obtained.

5. General Alignment Information

Alignment of the short wave bands should never be attempted without first peaking trimmer condenser No. 24 in accordance with the procedure outlined under "Broadcast Band Alignment" (3.). A slight misalignment of this trimmer condenser will result in unsatisfactory short wave operation, the reason being that trimmer condenser No. 24, is in the circuit on all bands but it should be peaked on the broadcast band only.

The most satisfactory method of aligning or checking the spread band ranges is on actual reception of short wave stations of known frequency by adjusting the magnetite core oscillator coil for each band, so that the short wave stations come in at the correct points on the dial. In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short wave stations a signal generator should be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the signal generator as a slight error will produce considerable inaccuracy on the spread band dial.

When adjusting the magnetite core trimmer in the auxiliary short wave coils, if more than one peak is found, select the peak specified in the alignment procedure for each band.

6. Adjusting Antenna Compensating Condenser

This adjustment should be made after the receiver has been properly installed in the car. Tune the receiver to a weak signal at the high frequency end of the broadcast band at about 1200 kilocycles. This signal should be just audible with volume control on full. Adjust the antenna compensating condenser for maximum signal strength. NOTE: When aligning the antenna trimmer condenser, be sure that the antenna is fully extended.

7. Instructions for Removal of Coil Unit

(a) Remove the top, rear bottom, and speaker cover from the receiver.

(b) Remove the row of tubes immediately behind coil unit assembly.

(c) Remove the two No. 8 self-tapping screws that hold the antenna connector to the side of the case, then unsolder the antenna cable shielding from the two grounding lances which will leave this part entirely free. Pry up the clips which hold the leads from the R.F. coils to the chassis. Free these leads. Unsolder the leads from the antenna, R.F. and oscillator coil assembly which is to be removed.

(d) Remove the two No. 8 screws which hold the solenoid mounting bracket to the main tuner frame. Place the solenoid out of the way, taking care that the armature does not get damaged. Unsolder the small condenser (item 23) from the case.

(e) Remove the 5/32 hex. head screw from the end of the switch shaft to be found at the center of the coil unit base. Remove the two nuts from the end of the band indicator shaft. The short link arm which is retained by these nuts is to be removed after the main assembly is

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CHEVROLET DIV.—GEN. MOTORS

free. Remove the two 5/16 hex. head screws that hold the coil unit base to the main coil assembly bracket.

(f) Turn the tuning indicator to the high frequency end of the band, then remove the three No. 8 self-tapping screws and the two No. 8 machine screws that hold the coil unit mounting bracket to the chassis. Remove the sleeve covered tension wire on the core bar, part No. 1215115, and back out the threaded portion of the two cores. This will leave the wire only passing through the threaded holes in the core bar. Carefully pull the cores from the coil forms by drawing the whole assembly towards the I.F. transformers. With the coil unit assembly in this position the affected coil can be removed by first moving it away from the coil unit assembly bracket until the projections at its base just clear the bracket, then raising the base end and withdrawing the unit over the I.F. transformer. CAUTION: When performing this operation take care that the band indicator shaft is not withdrawn with the coil unit assembly bracket.

8. To Disassemble Coil Units

(a) Turn all trimmer screws until they are within the coil unit cover.

(b) Remove the small spring steel clip, part No. 1215134, which anchors the coil bracket to the end of the cover. Two corners of this clip dig into the aluminum of the cover and care must be exercised when removing it so that no damage is done to the protruding coil tubes.

(c) Remove the two 5/16 nuts holding the shield can in place and slide the cover off.

9. Reassembling Coil Units

(a) Replace the cable clamp which holds the coil leads located between the 6K7 and the 6SR7.

(b) In replacing the cores into the coil tubes, grasp the threaded stud end, raise the core and work it into the coil tube.

(c) When the oscillator coil is removed be sure that the two detent balls at the switch shaft do not get lost.

(d) The two nuts which hold the short link arm to the band indicator shaft must be taken up tight.

(e) While replacing the coil unit mounting bracket be sure that the three bronze clips enter their slots in the shield cans properly.

10. Stiff Manual Tuning

Excessive stress on the worm bearing caused by tension or compression in the flexible manual tuning shaft (item 135) may cause stiff manual tuning. Such stress can readily be eliminated by loosening and retightening the set screw in the worm (item 134).

11. Tone Control

The four positions of the tone control are: Soft, Voice, Music and Bass. The tone control and its tone compensating network in the circuit is between the audio amplifier and the output stage. When the switch is in the "soft" position, the 100,000 ohm resistor (item 96) and the .01 mfd. condenser (item 137) are shorted out resulting in maximum lows. Some of the high audio frequencies are bypassed to ground through the .01 condenser (item 59). In the "voice" position the high audio frequency response remains the same as in the soft position but the 100,000 ohm resistor and the .01 condenser are in series with the primary of the driver stage transformer (item 122A) resulting in a reduced low frequency response. With the tone control switch in the "music" position, none of the high frequencies are bypassed and maximum lows are available because the 100,000 ohm resistor (item 96) and the .01 mfd. condenser (item 137) are shorted out. When the switch is in the "bass" position the high frequencies are bypassed to ground through the .05 condenser (item 60). The low frequency response remains the same as when the switch is in the music position.

12. Band Switching Circuits

The two switch sections as shown on the schematic diagram in the antenna stage and in the R.F. stage are actually one switch wafer in each case. The top section on the diagram is that set of contacts toward the coils as viewed from the coils. The lower set of contacts is that set of contacts away from the coils. The switch sections are all shown in the 16-meter band position. Referring to the top wafer sections, when the upper rotor fingers touch terminals No. 2, the 16-meter band is in the circuit. Terminals No. 3 are the 19-meter band contacts. Terminals No. 4 are the 25-meter band contacts. Terminals No. 5 are the 31-meter band contacts. Terminals No. 6 are the "A" band or broadcast band contacts.

The "A" band coil circuit shows the actual simplified circuit diagram for the "A" band without the switch contacts being shown. The same applies to the 31-meter band coil circuit. Coils 7, 13, 15 and 16 remain in the circuit at all times for short wave operation. When switching to the 25-meter band; coil No. 3 is replaced by coil No. 4. Coil No. 9 is replaced by coil No. 10. Coil No. 17 is switched across coils Nos. 15 and 16, thus on each of the 25, 19 and 16-meter bands there are three oscillator coils in parallel at the same time. The sensitivity control is removed from the circuit for short wave operation thereby giving full sensitivity on short waves.

In order to provide good tracking sensitivity only perfectly matched main tuning cores are used in the receivers on the "A" band (No. 104, 110 and 116). The cores are color coded with a spot of red, yellow or green paint on the stud-end of the core. Only one particular color will be used in each receiver. When servicing one of these cores always replace the defective core assembly with a replacement core bearing the exact color coding, or replace all three cores with a new set of cores of another color code.

Circuit Description

The circuit used in this receiver is the conventional superheterodyne type with two stages of I.F. and six tuned I.F. circuits. In the short wave position the band switch operates by shunting respective coils (with their magnetite trimmer cores) across the main variable tuning inductances in the antenna, R.F. and oscillator circuits. When tuning either of the four short wave bands the signal is fed through the 100 mmf. condenser (item 25) to the grid of the R.F. amplifier tube 6K7 which also receives its A.V.C. bias through the 1.5 megohm resistor (item 68).

In the broadcast band position the filter choke (item 1) is included in the circuit and in conjunction with the input capacity of the tube constitutes a low-pass filter which effectively prevents unwanted disturbances from reaching the R.F. tube. The variable trimmer (item 24) is used for compensating the slight variations in the effective capacities of the antenna and the shielded lead-in cable. Bias for the 6K7 tube is developed across the 560 ohm resistor (item 69).

The 6SA7 tube serves the combined functions of 1st detector and oscillator. In the short wave position the oscillator section of 6SA7 uses the conventional Hartley circuit, however the band switching arrangement of this section differs slightly from that of the antenna and RF sections, in that a 31-meter auxiliary oscillator coil (item 16) is permanently shunted across the main tuning coil (item 15) and a tap is brought out for return to the cathode. In changing to the 25, 19 and 16 meter bands, the respective auxiliary oscillator coils (items 17, 18 and 19) are shunted in parallel to the previous combination. The negative coefficient 120 mmf. condenser (item 45) in parallel to the main tuning coil (item 15) constitutes the temperature compensating arrangement for the short wave bands. In the broadcast band the oscillator uses a modified Colpitts circuit arrangement formed by the main tuning inductance (item 14) 3900 mmf. condenser (item 39) and condensers consisting of items 42, 43 and 44 in which item 42 is the negative temperature coefficient condenser.

The two 6SK7 tubes are used in the two stage I.F. amplifier. In the short wave position, both tubes get their bias from the 470 ohm resistor (item 80), but in the broadcast position a 1200 ohm variable resistor (item 81) is connected in series with the 470 ohm resistor and is adjusted in the factory for uniform sensitivity. The variable resistor (item 81) increases the bias on the 6SK7 tubes, therefore the I.F. stage gain in the broadcast position is less than that in the short wave position so that the desired sensitivity is obtained on all bands.

The 6SR7 tube serves three distinct functions. The diode plate No. 2 is used for signal detection. Diode No. 1 is used for supplying bias for the noise limiter circuit, while the triode part is used for the audio amplifier. Diode plate No. 1 gets its signal from the primary of the 3rd I.F. transformer through the 68 mmf. condenser (item 57) and inasmuch as the secondary of the transformer is loaded with a 150,000 ohm resistor (item 88) the bias for the noise-limiter circuit is more than twice the DC voltage of the rectified signal. The bias for the tube is developed across the 1000 ohm resistor (item 94).

The 6H6 tube performs two functions: Plate No. 1 is used in the noise-limiter circuit, and plate No. 2 is used for supplying A.V.C. after the 2nd cathode of the 6H6 tube is connected to the cathode of the 6R7. The voltage developed across the 1000 ohm resistor (item 94) also acts as a delayed bias for the A.V.C. system.

The two 6V6GT tubes are used in the push-pull output circuit and both get their bias from the 330 ohm resistor (item 91). The OZ4 tube is used as the cold cathode rectifier with a conventional nonsynchronous type vibrator.

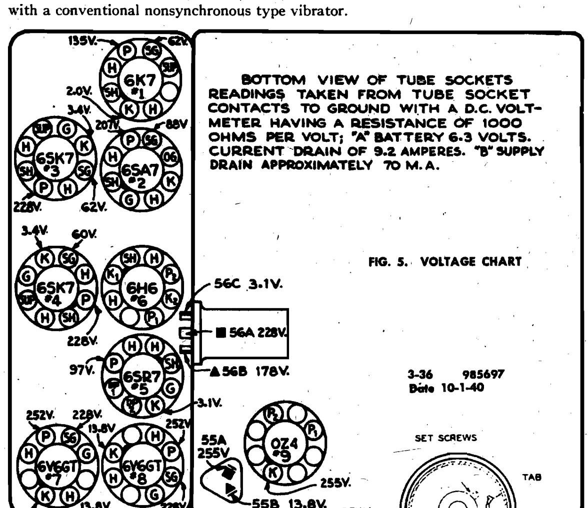

FIG. 5. VOLTAGE CHART

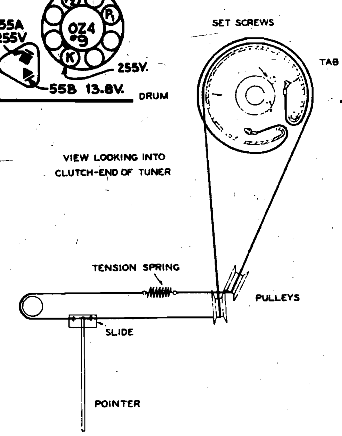

FIG. 8. DIAL POINTER CORD DRIVE

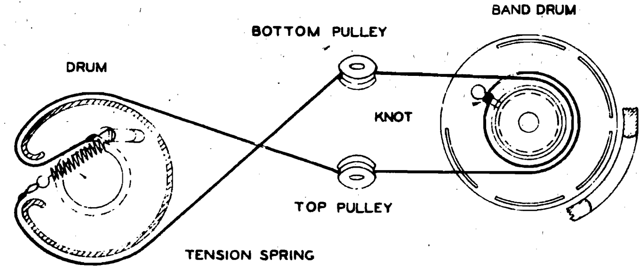

FIG. 8. CORD DRIVE FOR BAND INDICATOR DRUM

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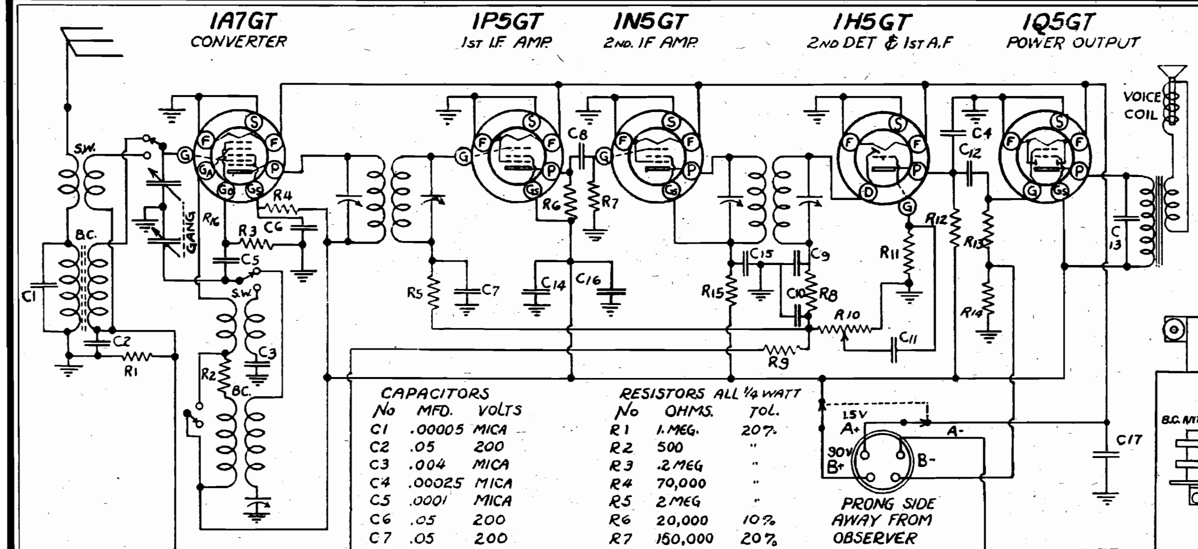
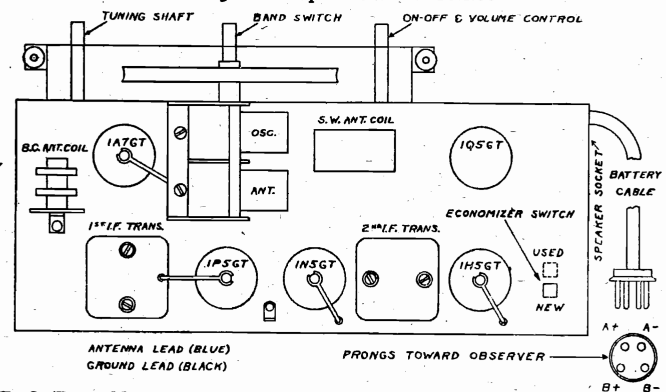
MODEL A5



BROADCAST BAND
535-1,730 KILOCYCLES
SHORT WAVE BAND
5,750-18,100 KILOCYCLES

I.F. 455 K.C.

Fig. 1—Top View of Chassis



ISSUE B
MAY 1940

CAPACITORS No	MFD.	VOLTS
C1	.00005	MICA
C2	.05	200
C3	.004	MICA
C4	.00025	MICA
C5	.0001	MICA
C6	.05	200
C7	.05	200
C8	.00025	MICA
C9	.00005	MICA
C10	.00005	MICA
C11	.01	400
C12	.01	400
C13	.002	400
C14	.05	200
C15	.05	200
C16	4.0	150 ELECTRO.
C17	.25	200

RESISTORS ALL ¼ WATT No	OHMS.	TOL.
R1	1. MEG.	20%
R2	500	"
R3	.2 MEG	"
R4	70,000	"
R5	2 MEG	"
R6	20,000	10%
R7	150,000	20%
R8	100,000	"
R9	2 MEG	"
R10	1 MEG	"
R11	5 MEG	"
R12	.25 MEG	"
R13	.5 MEG	"
R14	300	10%
R15	5000	20%
R16	½	"

Speaker (Part No. P-4045) 6" PM Type.
D.C. voice coil resistance....2.6 ohms
Voice coil impedance at 400 cycles....2.9 ohms

Broadcast Antenna Coil (Part No. G6096)
Looking at the connection end starting at the chassis in a clockwise direction the terminals are: No. 1, AVC; No. 2, grid; No. 3, Ant.; No. 4, ground. No. 4 is grounded to the mounting bracket.
Primary—No. 3 and No. 4—Resistance 25.3 ohms.
Secondary—No. 1 and No. 2—Resistance 2.1 ohms.
A gimmik coil of 5.5 mmfd. connects to terminals No. 2 and No. 3.

Short Wave Antenna Coil (Part No. P3722)
Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, AVC; No. 2, Ant.; No. 3, Grid; No. 4, Ground.
Primary—No. 2 and No. 4—Resistance .3 ohm.
Secondary—No. 1 and No. 3—Resistance .07 ohm.

Broadcast Oscillator Coil (Part No. P3723)
Looking at the connection end (with dot) in a clockwise direction starting at the chassis the terminals are; No. 1, grid; No. 2, plate; No. 3, B+; No. 4, ground.
Primary—No. 2 and No. 3—Resistance 2.8 ohms.
Secondary—No. 4 and No. 1—Resistance 4.9 ohms.

Short Wave Oscillator Coil (Part No. 3721)
Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, Plate; No. 2, B+; No. 3, Grid; No. 4, Pad.
Primary—No. 1 and No. 2—Resistance .8 ohm.
Secondary—No. 3 and No. 4—Resistance .07 ohm.

First I.F. Transformer (Part No. P3048)
Primary—Blue white, plate; red white B+—Resistance 12.1 ohms.
Secondary—White, grid; black white, AVC—Resistance 24.9 ohms.

Second I.F. Transformer (Part No. P3736)
Primary—Blue white, plate; red white B+—Resistance 15.1 ohms.
Secondary—White, grid; black white, AVC—Resistance 11.8 ohms.

VOLTAGE CHART

All voltages measured with a 1,000 ohm per volt meter on 150 volt scale. For the following voltages the "B" battery section of the power pack should read 94½ volts under load.

1A7GT TUBE Volts
Plate—P—to ground....86½
Screen—Gs—to ground....31
Grid—G2—to ground....86½

1P5GT
Plate—P—to ground....85
Screen—Gs—to ground....86½

1N5GT
Plate—P—to ground....86½
Screen—Gs—to ground....86½

1H5GT
Plate—P—to ground....24

1Q5GT
Plate—P—to ground....84
Screen—Gs—to ground....86½
Grid—G—to ground....—2¼

MODELS A5, J6, XJ6, A7, B7, J55, XJ55, XJ55-PH, 62-B7, A77

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ALIGNMENT DATA

MODELS A5,A7,B7,62-B7

I.F. ALIGNMENT

Adjust the signal generator to 455 K.C. and connect the output to the grid of the first detector tube (6SA7) through a .05 or .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT **

Adjust the signal generator to 1630 K.C. and connect the output to a shielded loop radiator and place this loop about two feet from the rotary loop antenna. If no loop radiator is available the output of the signal generator should be connected to the antenna clip of the rotary loop antenna* thru a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the B.C. oscillator trimmer (upper left, front of chassis) to receive this signal. After this has been carefully done, the next step is to set the signal generator to 1400 K.C. and after tuning in the signal adjust the B.C. antenna trimmer (on rotary loop antenna) to peak. Set the signal generator to 600 K.C., tune the signal and then slowly increase or decrease the B.C. oscillator padding condenser (top of chassis, center) and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.

Return to 1400 K.C. 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 K.C.

* or to ANT. lead on models without loop

** 1730kc on Model A5

SHORT WAVE BAND ALIGNMENT

Adjust the signal generator to 18,100 K.C. and connect the output to the antenna clip, through a 400 ohm resistor. Set the gang condenser to minimum capacity and adjust the S.W. oscillator trimmer (lower left, front of chassis) to receive this signal. Set the signal generator to 16,000 K.C., tune signal and adjust the S.W. antenna trimmer (upper right, front of chassis) to peak. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 K.C. to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 K.C., the antenna and oscillator coils, as well as the padding condenser should be tested.

MODELS XJ5,XJ55,XJ55-PH

I.F. ALIGNMENT

Adjust the signal generator to 455 K.C. and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. Connect ground of signal generator to chassis ground through a .1 mfd. condenser. On XJ55 only connect ground of signal generator to common ground thru a .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Adjust the signal generator to 1630 K.C. and connect the output to the antenna lead, through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the oscillator trimmer to receive this signal. After this has been carefully done, the next step is to set the signal generator to 1400 K.C. and after tuning in the signal adjust the B.C. antenna trimmer to peak. In case of bent plates, set the signal generator and the receiver to 600 KC and bend the plates into the position for maximum output.

SHORT WAVE BAND ALIGNMENT

Set the signal generator to 6000 K.C., tune the signal and adjust the short wave antenna trimmer to give maximum output. Set the signal generator to 3000 K.C., tune the signal and then slowly increase or decrease the short wave antenna padding condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.

MODELS J6,XJ6,A7,B7,A77,62-B7

PROCEDURE FOR SETTING UP PUSH BUTTONS

Loosen one of the push buttons by inserting a screw driver thru the center hole in the push button to the locking screw and turn the locking screw counter-clockwise one full turn and push in, while holding this screw in tune in the desired station by means of the station selector. Turn the selector very slowly back and forth until the signal is clearest. Now while still holding the above screw in, tighten it by turning clockwise. Release and turn the station selector to one end of the dial; then check the button by pushing it down and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

Release the push button and repeat the above procedure for the remaining buttons.

If it is desired to change a button to a different station simply re-set by repeating the above procedure.

Punch the correct station call letter tabs from the set of sheets supplied and insert them from the side into the grooves in the front of the push buttons. Punch celluloid squares from the sheet supplied and insert them in the afore mentioned grooves over the station call letter tabs.

The dial is now set up for quick tuning and all that is necessary is to push the button of the desired station down and then release.

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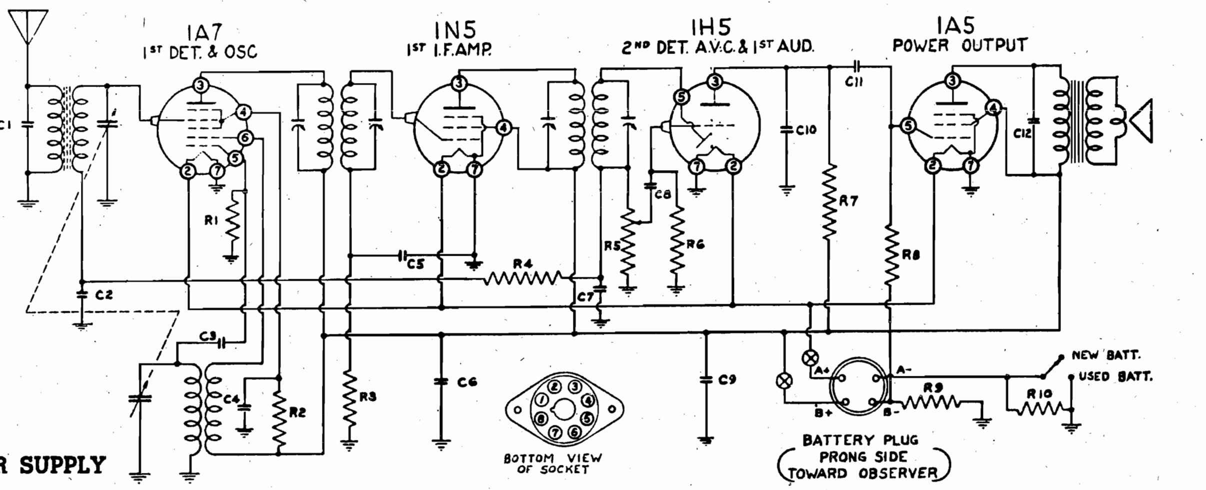
MODEL D4



I.F. FREQUENCY = 455 K.C.

POWER SUPPLY

This receiver is designed to operate on a single unit General 60B-6L or Burgess 6TA-60. The battery will fit inside the cabinet in back of the chassis.

A large single unit battery may also be used with this model such as the Burgess 17G-D60, Eveready 748, Ray-O-Vac No. AB-82, Bond 0528 or General 60DL-11L and will provide the most economical operation.

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Speaker (Part No. P4311) 5" PM Type

D.C. voice coil resistance .... 3.1 ohms

Voice coil impedance at 400 cycles .... 3.5 ohms

Antenna Coil (Part No. G-6274)

Looking at the connection end starting at the chassis in a clockwise direction the terminals are: No. 1, AVC; No. 2, grid; No. 3, Ant.; No. 4, ground. No. 4 is grounded to the mounting bracket.

Primary—No. 3 and No. 4—Resistance 24.6 ohms.

Secondary—No. 1 and No. 2—Resistance 2.2 ohms.

A gimmik coil of 5.5 mmfd. connects to terminals No. 2 and No. 3.

RESISTORS

No.	Ohms	Watts
R1	200,000	½
R2	30,000	½
R3	5,000,000	¼
R4	2,000,000	¼
R5	1,000,000	V.C.
R6	5,000,000	¼
R7	500,000	¼
R8	1,000,000	¼
R9	600—10%	¼
R10	1	½

No.	Capacity (Mfd.)	Volts
C1	.00005	Mica
C2	.05	200
C3	.00005	Mica
C4	.05	200
C5	.05	200
C6	.1	200
C7	.0001	Mica
C8	.01	400
C9	6. (Elect.)	150
C10	.0001	Mica
C11	.01	400
C12	.001	600

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION -- VOL.VIII

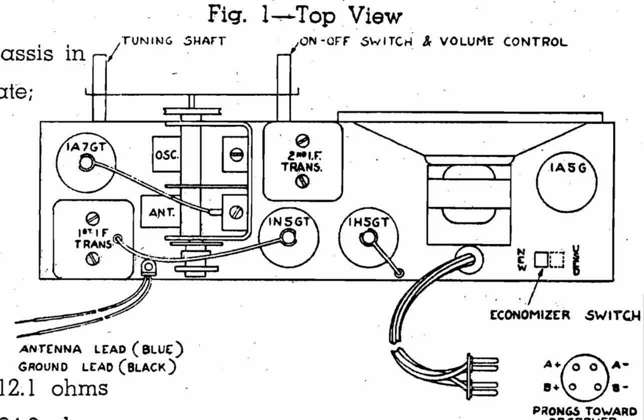
Oscillator Coil (Part No. P4308) (Red & Brown Dots)

Looking at the connection end (with dots) starting at the chassis in clockwise direction the terminals are: No. 1, grid; No. 2, plate; No. 3, B+; No. 4, ground.

Primary—No. 2 and No. 3—Resistance 2.2 ohms.

Secondary—No. 4 and No. 1—Resistance 5.7 ohms.

Fig. 1—Top View



First I.F. Transformer (Part No. P4323)

Primary—Blue white, plate; red white, B+ — Resistance 12.1 ohms

Secondary—White, grid; black white, AVC — Resistance 24.9 ohms

Second I.F. Transformer (Part No. P3980)

Primary—Blue white, plate; red white, B+ — Resistance 15.1 ohms

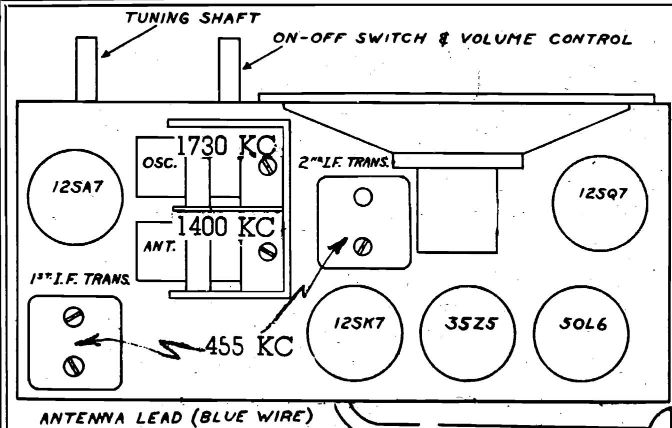
Secondary—White, grid; black white, AVC — Resistance 11.8 ohms

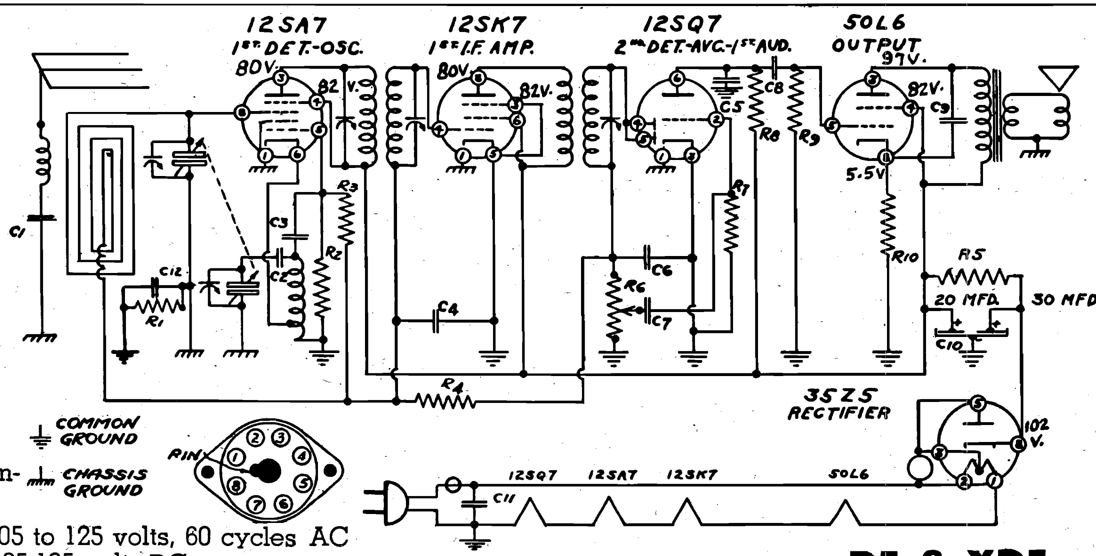
ALIGNMENT:

IF - 455kc thru .05 or .1mf cond.
BC - With 1730kc sig. thru .0002mf cond., gang at minimum, adj. osc. trim. If gang cond. plates are bent, adj. with 600kc sig.

MODELS D5, XD5

CONTINENTAL RADIO & TELEV. CORP.





On XD5 only connect ground of signal generator to common ground thru a .1 mfd. condenser.

Speaker (Part No. P3553) 5" PM Type

D.C. voice coil resistance........................3.4 ohms
Voice coil impedance at 400 cycles........3.8 ohms

105 to 125 volts, 60 cycles AC
105-125 volts DC

For CONVENTIONAL ALIGNMENT see Spec. Section Vol. VIII

D5 & XD5

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Oscillator Coil (Part No. P3748) (D5 only)

Looking at the connection end in a clockwise direction starting at the chassis the terminals are No. 1, end of winding; No. 2, start of winding; No. 3, tap.

No. 2 and No. 1—Resistance 4.9 ohms.
No. 3 and No. 1—Resistance 4.3 ohms.

Oscillator Coil (Part No. P3917) (XD5 only)

Looking at the connection end in a clockwise direction starting at the chassis the terminals are No. 1, tap; No. 2, start of winding; No. 3, end of winding.

No. 3 and No. 1—Resistance 4.9 ohms.
No. 2 and No. 1—Resistance 4.3 ohms.

First I.F. Transformer (Part No. P3923)

Primary—Blue, plate; red, B+—Resistance 21.8 ohms.
Secondary—White, grid; black, AVC—Resistance 20.9 ohms.

Secondary I.F. Transformer (Part No. P3924)

Primary—Blue, plate; red B+—Resistance 23.8 ohms.
Secondary—White, grid; black, AVC—Resistance 23.7 ohms.

Electrolytic Condenser (Part No. P3355)

Red, 30 mfd., 150 volt; green, 20 mfd., 150 volt; black, negative for both sections.

C2, C12 and R1 are used in Model XD5 only.

In D5 Model only, all common grounds are connected to chassis ground.

CONDENSERS

No.	Capacity	Volts
C1	.001	600
C2	.02	400
C3	.00005	Mica
C4	.05	200
C5	.0005	Mica
C6	.00025	Mica
C7	.01	400
C8	.002	600
C9	.01	400
C10	20.0	150
	30.0	150
C11	.05	400
C12	.2	200

RESISTORS

No.	Ohms	
R1	150,000	½ Watt
R2	20,000	½ Watt
R3	15,000,000	½ Watt
R4	2,000,000	½ Watt
R5	1,000	1 Watt
R6	500,000	Vol. Cont.
R7	5,000,000	½ Watt
R8	250,000	½ Watt
R9	500,000	½ Watt
R10	150	½ Watt 10%

Models D5 and XD5 are the same except for a few parts and that the XD5 is approved by the Underwriters Laboratories. A condenser is used in the XD5 model to provide a floating ground.

Voltages—Line 115 Volts AC—Power Consumption 30 Watts.

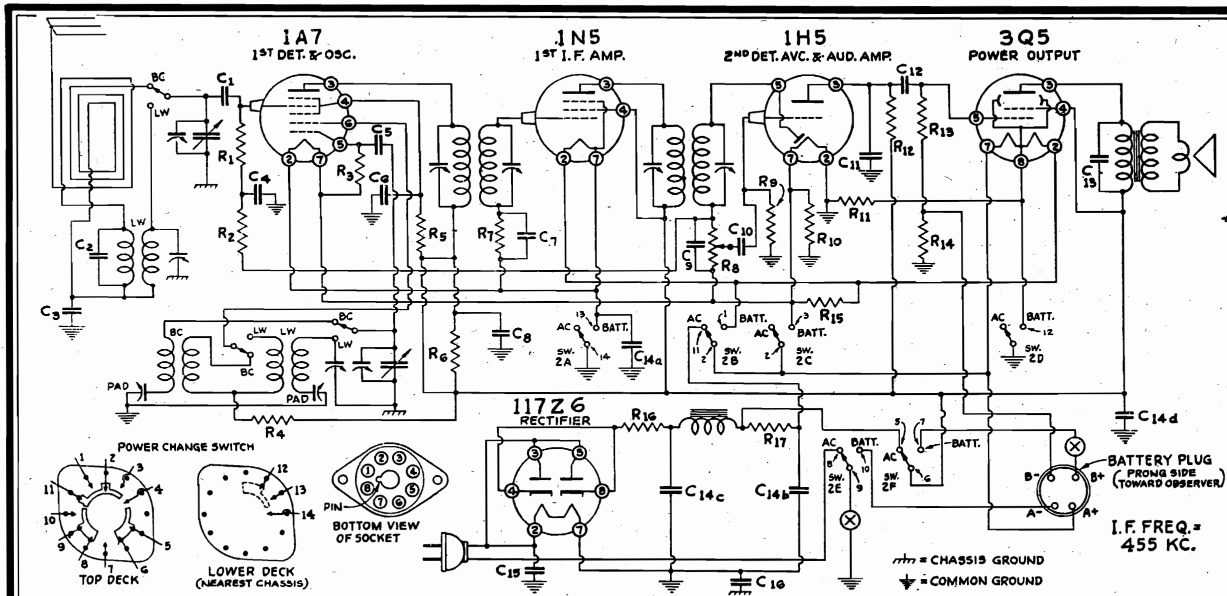
Volume Control maximum. Meter 1000 ohms per volt, 150 volt scale.

Plate (3) of 12SA7 tube to common ground........80 volts
Screen (4) of 12SA7 tube to common ground........82 volts
Plate (8) of 12SK7 tube to common ground........80 volts
Screen (3) of 12SK7 tube to common ground........82 volts
Plate (3) of 50L6 tube to common ground........97 volts
Screen (4) of 50L6 tube to common ground........82 volts
Cathode (2) of 50L6 tube to common ground........5.5 volts
Cathode (8) of 35Z5 tube to common ground........102 volts

CONTINENTAL RADIO & TELEV. CORP.

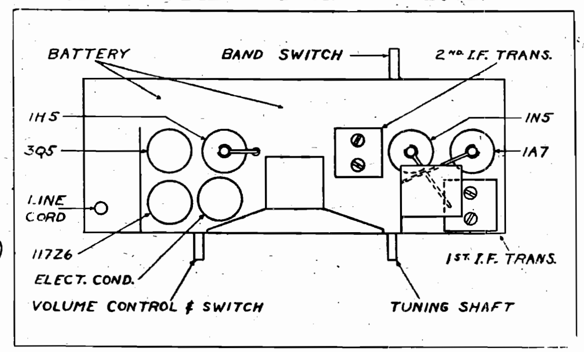
MODEL H5

ISSUE A
FEB. 1940



ALIGNING FREQUENCIES:
IF trims. - 455KC; BC-OSC. - 1550KC; BC-PAD (nearest tuning shaft on front of chassis) - 540KC; Re-check BC-OSC. - Finally BC-ANT. at 1400 KC.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION -- VOL.VIII



NOTE:– POWER CHANGE SWITCH 2A THRU 2F, AND THE PICTORIAL VIEW SHOWN IN THE "AC-DC" POSITION. SWITCH POINT 4 IS NOT USED.

Fig. 1—Top View

RESISTORS

NO.	OHMS	WATTS	NO.	OHMS	WATTS
R_1	1,000,000	1/2	R_{13}	1,000,000	1/2
R_2	1,000,000	1/2	R_{14}	400	1/2 10%
R_3	200,000	1/2	R_{15}	400	1/2
R_4	5,000	1/2	R_{16}	30	1/2
R_5	30,000	1/2	R_{17}	2,100 (CANDOHM)	5
R_6	2,000	1/2			
R_7	5,000,000	1/2			
R_8	1,000,000 (VOL. CONT)				
R_9	5,000,000	1/2			
R_{10}	110	1/2			
R_{11}	750	1/2 10%			
R_{12}	250,000	1/2			

CONDENSERS

NO.	CAPACITY	VOLT	NO.	CAPACITY	VOLTS
C_1	.00025	MICA	C_{13}	002	400
C_2	.0001	MICA	C_{14a}	40.0 ELECTROLYTIC	25
C_3	.1	200	C_{14b}	40.0 ELECTROLYTIC	25
C_4	.01	200	C_{14c}	30.0 ELECTROLYTIC	150
C_5	.00005	MICA	C_{14d}	30.0 ELECTROLYTIC	150
C_6	.05	200	C_{15}	.05	400
C_7	.01	200	C_{16}	.25	200
C_8	05	200			
C_9	.00025	MICA			
C_{10}	.01	400			
C_{11}	.00025	MICA			
C_{12}	.01	400			

Voltages—Line 117.5 Volts AC—Power Consumption 25 Watts. Volume control maximum and no signal tuned in. Meter 1000 ohms per volt, 150 volt scale.

Plate (3) of 1A7 tube to common ground	100	volts
Screen (4) of 1A7 tube to common ground	62	volts
Anode grid (6) of 1A7 tube to common ground	100	volts
Filament (2) to (7) of 1A7 tube	1.35	volts
Plate (3) of 1N5 tube to common ground	100	volts
Screen (4) of 1N5 tube to common ground	102	volts
Filament (2) to (7) of 1N5 tube	1.3	volts
Plate (3) of 1H5 tube to common ground	38	volts
Filament (2) to (7) of 1H5 tube	1.35	volts
Plate (3) of 3Q5 tube to common ground	98	volts
Screen (4) of 3Q5 to common ground	102	volts
Filament (7) to (8) of 3Q5 tube	1.3	volts
Filament (2) to (8) of 3Q5 tube	1.35	volts
Plate (3) or (5) of 117Z6 tube to common ground	117.5v.	(AC)
Cathode (4) or (8) of 117Z6 tube to common ground	128	volts
Filament (2) to (7) of 117Z6 tube	117.5v.	(AC)

Speaker (Part No. P4004) 5" PM Type
D.C. voice coil resistance........3.2 ohms
Voice coil impedance at 400 cycles........3.5 ohms

L. W. Antenna Coil (Part No. P4019)
Looking at the connection end (with dot) in a clockwise direction starting at the mounting lug the terminals are: No. 1, grid; No. 2, ant.; No. 3, sec. ground; No. 4, pri. ground.
Primary—No. 2 and No. 4—Resistance........139.7 ohms
Secondary—No. 3 and No. 1—Resistance........29.4 ohms

B. C. Oscillator Coil (Part No. P4018)
Looking at the connection end (with dot) in a clockwise direction starting at the chassis the terminals are No. 1, grid; No. 2, plate; No. 3, B+; No. 4, pad.
Primary—No. 2 and No. 3—Resistance........2.9 ohms
Secondary—No. 4 and No. 1—Resistance........9.1 ohms

L. W. Oscillator Coil (Part No. P4017)
Looking at the connection end (with dot) in a clockwise direction starting at the chassis the terminals are: No. 1, pad; No. 2, B+; No. 3, plate; No. 4, grid.
Primary—No. 3 and No. 2—Resistance........4.8 ohms
Secondary—No. 1 and No. 4—Resistance........11.9 ohms

First I.F. Transformer (Part No. P3962)
Primary—Red white, B+; blue white, plate—Resistance........11.8 ohms
Secondary—White, grid; black white, AVC—Resistance........23.9 ohms

Second I.F. Transformer (Part No. P3980)
Primary—Blue white, plate; red white B+—Resistance........15.1 ohms
Secondary—White, grid; black white, AVC—Resistance........11.8 ohms

Power Change Switch
The power change switch connects the tube filaments in series (7½ volt) on AC-DC operation and parallel (1½ volt) on battery operation.

MODELS J5, XJ5
J55, XJ55, XJ55PH

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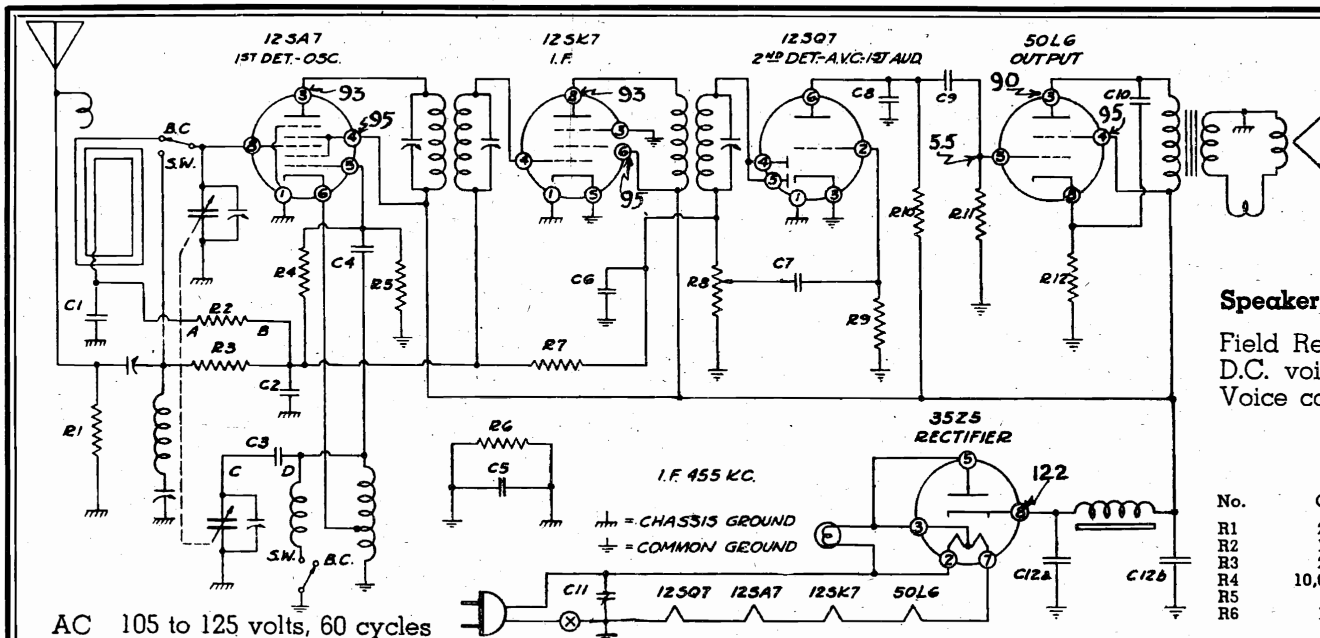
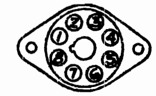


AC 105 to 125 volts, 60 cycles
or DC 105-125 volts

Band Switch

right (535 to 1630 kilocycles)
left (2.8 to 6.58 megacycles)

MODEL J5 & XJ5



BOTTOM VIEW OF SOCKET

Speaker (Part No. P4169) 5" Dynamic.

Field Resistance ....400 ohms
D.C. voice coil resistance.................. 3.6 ohms
Voice coil impedance at 400 cycles.... 4.0 ohms

For CONVENTIONAL ALIGNMENT see Spec. Section Vol. VIII.

In model J5 all common grounds become chassis grounds. C1, C3, C5, R2, and R6 are omitted. Point "A" is connected to point "B" and point "C" to point "D."

Voltages—(tube to common ground) Line 117 Volts AC—

Volume Control maximum. Meter 1000 ohms per volt, 150 volt scale.

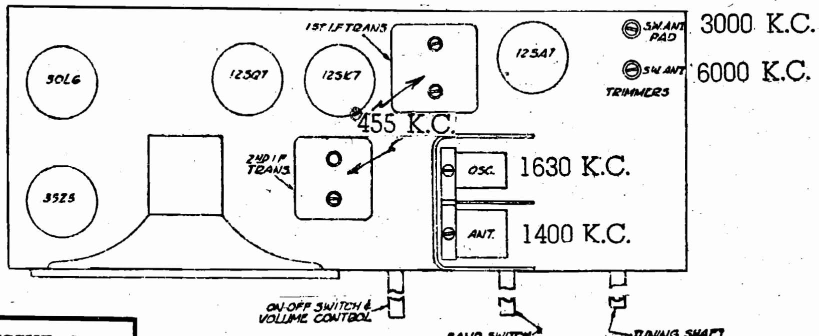
RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	250,000	1/4	R7	2,000,000	1/4
R2	100,000	1/4	R8	500,000	V.C.
R3	250,000	1/4	R9	5,000,000	1/4
R4	10,000,000	1/4	R10	250,000	1/4
R5	25,000	1/4	R11	500,000	1/4
R6	150,000	1/4	R12	150—10%	1/4

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C8	.0005	Mica
C2	.05	200	C9	.01	400
C3	.02	200	C10	.02	400
C4	.0001	Mica	C11	.05	400
C5	.2	200	C12a	30. Elec.	150
C6	.00025	Mica	C12b	20. Elec.	150
C7	.005	400			

Models J5 and XJ5 are the same except for a few parts and that the XJ5 is approved by the Underwriters Laboratories. A condenser is used in the XJ5 model to provide a floating ground.



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On XJ5 only connect ground of signal generator to common ground thru a .1 mfd. condenser.

Oscillator and Short Wave Antenna Coil (Part No. G6187) J5 & XJ5
(PART NO. G6201) XJ55-PH

Looking at the five terminal connection end in a clockwise direction starting at the mounting bracket, the connections are: No. 1, ground; No. 2, grid; No. 3, B.C. osc. tap; No. 4, open; No. 5, open. Looking at the other end in a clockwise direction starting at the mounting bracket, the connections are: No. 6, pad; No. 7, open; No. 8, switch; No. 9, ant.

No. 1 and No. 2—Resistance...6.9 ohms
No. 1 and No. 3—Resistance... .4 ohm
No. 3 and No. 2—....6.5 ohms
No. 6 and No. 9—.... .3 ohm
No. 8 and No. 2—.... .3 ohm

First I.F. Transformer (Part No. P3923)

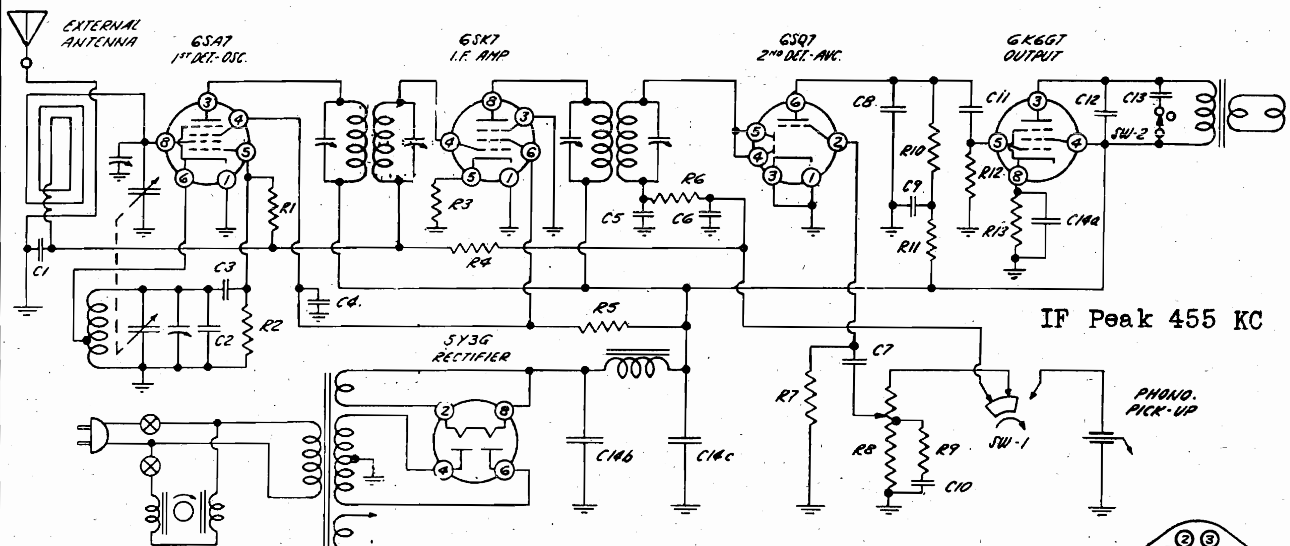
Primary—Blue, plate; red, B+—Resistance 20.4 ohms.
Secondary—White, grid; Black, AVC—Resistance 20.3 ohms.

Second I.F. Transformer (Part No. P3924)

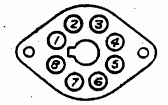
Primary—Blue, plate; red B+—Resistance 22.2 ohms.
Secondary—White, diode; black, AVC—Resistance 22.1 ohms.

MODEL K5

CONTINENTAL RADIO & TELEV. CORP.



This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (A.C.) **Never plug in a D.C. outlet.**



RESISTORS

No.	Ohms	Watts
R1	10,000,000	½
R2	20,000	½
R3	100—10%	½
R4	2,000,000	½
R5	15,000—10%	2
R6	50,000	½
R7	5,000,000	½
R8	500,000	V.C.
R9	20,000	½
R10	250,000	½
R11	50,000	½
R12	500,000	½
R13	600—10%	½

CONDENSERS

No.	Capacity (Mfd.)	Volts
C1	.05	200
C2	.000025	Mica
C3	.00005	Mica
C4	.05	400
C5	.0001	Mica
C6	.0001	Mica
C7	.01	400
C8	.00025	Mica
C9	.1	400
C10	.02	200
C11	.01	400
C12	.002	600
C13	.02	400
C14a	20.	25
C14b	20.	350
C14c	20.	350

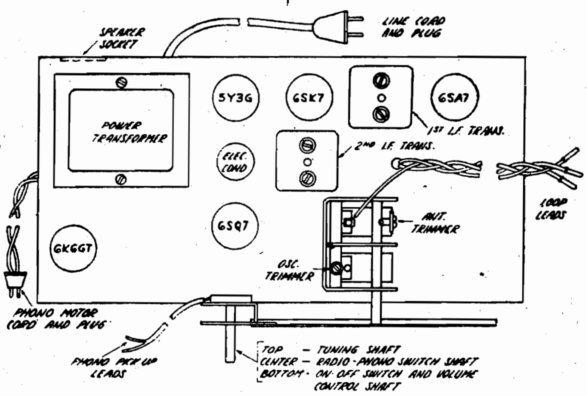


Fig. 3—Top View of Chassis

ALIGNMENT: IF - 455kc thru .05 or .1mf cond. BC - With 1630kc thru shielded loop radiator, 2 ft. from loop antenna; OR to blue lead of loop antenna thru .0002mf cond., gang at minimum, adjust osc. trim.
With 1400kc adj. Ant. trim. - If gang plates are bent adj. with 600kc.

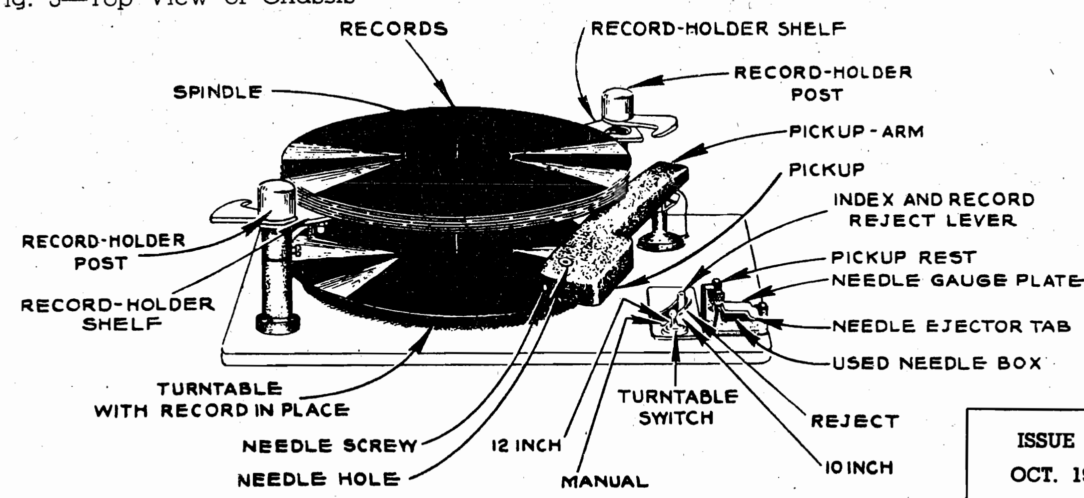


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Fig. 2—Top View of Automatic Record Changer

MODEL K5

CONTINENTAL RADIO & TELEV. CORP.

AUTOMATIC RECORD CHANGER

This **Record Changer** will automatically play a series of eight 10" or seven 12" records of the standard 78 R.P.M. type. Records of the last few years with the standard eccentric or spiral stopping groove on the inside and an eccentric on the outside will operate the automatic mechanism. However, records of any size up to 12" may be played manually.

OPERATION

Before operating the phonograph, either automatically or manually, be sure that the pickup is down and can be moved by hand. If not, a "cycle" must be completed to bring it down. To do this, throw **Turntable Switch** "On." The turntable will begin to revolve and the cycle of motion on the pickup arm will be resumed. When the pickup arm comes down, turn off the **Turntable Switch.**

CAUTIONS

1. Never use force to start or stop the motor or any part of the record-changing mechanism or pickup arm.

2. The use of records which have become warped or damaged through improper care, may cause the mechanism to jam and damage the instrument. Records which have become warped, will slide on one another when playing, resulting in unsatisfactory reproduction.

3. This instrument is not recommended for playing 10" and 12" records in mixed sequence. If this service is desired, all records must be perfectly flat and free from warp. The **index** and **record reject lever** must be set at 10" and after playing the last selection, the pickup will come down in position for a 10" record and repeat the playing of the record on a 10" 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.

4. Do not leave records on the record holder posts, as they are liable to warp, particularly so in warmer climates. Keep your records in a record file (album or cabinet) when not in use.

5. The needle must be installed according to directions under "Pickup and Top-Loading Needle Socket" for proper operation of this instrument.

6. The two red mounting bolts which hold the Automatic Record Player solid for shipping must be removed before using the Automatic Record Player so it can "float" on the spring mountings.

7. LEVELING—When a record has been played the pickup moves out, another record is dropped down, and the needle is fed automatically into the starting groove of this record. If the needle fails to enter the starting groove, raise the right-hand side of the cabinet by inserting thin spacers under the feet on that side. If the needle slides over a few grooves, raise the left-hand side of the cabinet in a similar manner.

8. LUBRICATION—A few drops of good quality light machine oil should be applied about once every six months at the base of the spindle below the metal washer under the turntable.

CONTROLS AND 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 it is desired 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" records automatically. To play either a series of 10" records or 10" and 12" 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 pickup will rise and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If a series of 12" records is to be played, 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 Slide Switch located just in front of the **Index** and **Record Reject Lever** controls the current to the turntable motor. To start the turntable, push the switch to the "On" position. To stop the turntable, push the switch to the "Off" position.

NEEDLES

The use of high grade long playing needles is absolutely essential for the proper operation of this instrument, as the regular needles are only good for one or at the most two records. If any needle is used too long, distortion and poor quality will be obtained and also the records will be damaged.

PICKUP AND TOP-LOADING NEEDLE SOCKET

The pickup is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pickup arm should be moved out to the right beyond the turntable and placed at rest on the support with the edge of the pickup arm in the groove and the pickup over the needle gauge plate. The pickup must be in this position to change needles.

To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle plate and then tighten 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 pickup 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 pickup 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 the outer edge of record. Also push back vertical lever adjacent to the rear record holder post. The turntable is now accessible. Before loading the magazine for **automatic operation**, swing the record holder shelves back into position.

AUTOMATIC OPERATION

1. See that the pickup is over the needle gauge plate with the needle properly in place. If not, complete a "cycle" as explained in the first paragraph under "Operation."

2. With the **Index** and **Record Reject Lever** at **"Manual"**, place the first of the series of records on the turntable and the remainder of the series (up to seven 10" or six 12" records) on the record holder posts (as shown in Fig. 2). The records should be arranged in the desired order with the desired selection face up and the last selection on top.

3. Set the **Index** and **Record Reject Lever** to the proper position. (See **Controls: Index and Record Reject Lever.**)

4. Push the turntable switch to the left—**"On"** —turntable should commence to revolve.

5. When the turntable has attained speed, lift pickup and lower gently on to the record so that the needle point enters the outside groove.

6. Adjust volume control to the desired intensity and tone control to the preferred setting.

7. Close the lid of the cabinet to eliminate mechanical reproduction of sound by the needle.

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 pickup, swing the arm to the right beyond the edge of the record and lower it onto the pickup rest with the pickup over the needle gauge plate. The record player is then ready for reloading, or for manual operation.

TO PLAY RECORDS MANUALLY: MANUAL OPERATION

1. Proceed as in step 1, under **"Automatic Operation."**

2. Place a record on the turntable with the desired selection upwards.

3. Set the **Index** and **Record Reject Lever** to **"Manual"** position.

4. Proceed as in steps 4, 5, 6, and 7 under **"Automatic Operation."**

When the playing is finished, be sure that the turntable has stopped and the pickup is in the rest position over the needle gauge plate. Never leave the pickup with the needle resting on a record or the turntable.

Speaker (Part No. P-4515) 6½" P.M. Type.

D.C. voice coil resistance....2.8 ohms
Voice coil impedance at 400 cycles....3.1 ohms

Oscillator Coil (Part No. P-4495)

Looking at the connection end in a clockwise direction starting at the chassis the terminals are No. 1, end of winding; No. 2, start of winding; No. 3, tap.

No. 1 and No. 2—Resistance.... 4.5 ohms
No. 1 and No. 3—Resistance.... 4.05 ohms
No. 2 and No. 3—Resistance.... .45 ohm

First I.F. Transformer (Part No. P-4108)

Primary—Blue, plate; red, B+
Resistance ....18.2 ohms

Secondary—White, grid; black, AVC
Resistance ....15.1 ohms

Second I.F. Transformer (Part No. P-4109)

Primary—Blue, plate; red, B+
Resistance ....20.8 ohms

Secondary—White, diode; black, AVC
Resistance ....17.4 ohms

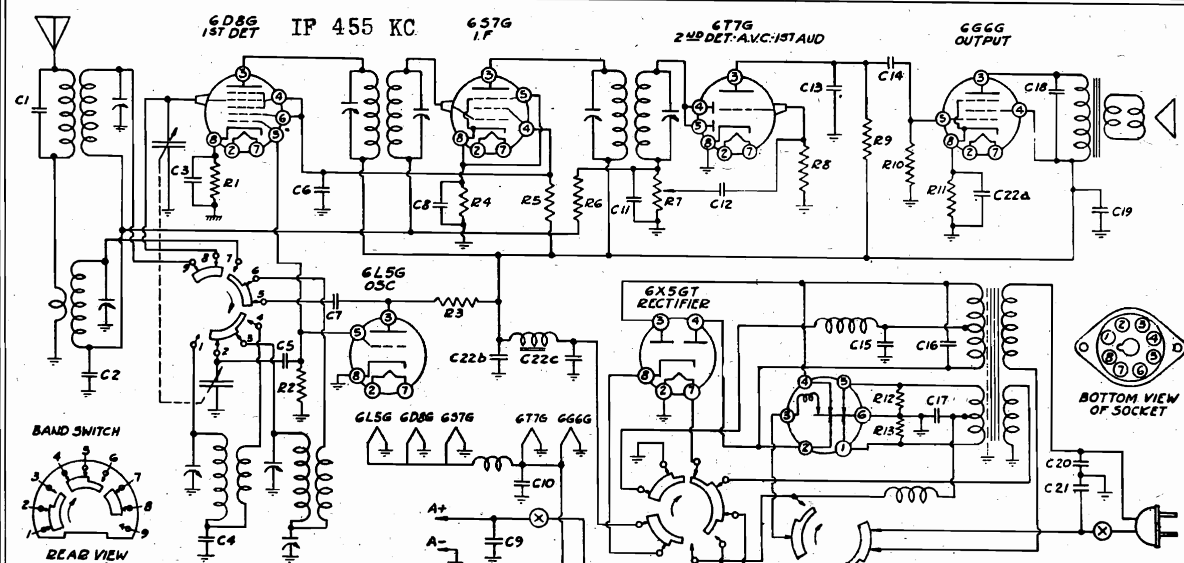
VOLTAGE CHART

All voltages measured with a 1,000 ohm per volt meter on the 300 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 75 watts.

	Volts
6SA7 TUBE	
Plate (3) to ground	255
Screen (4) to ground	93
6SK7 TUBE	
Plate (8) to ground	255
Screen (6) to ground	93
6K6G TUBE	
Plate (3) to ground	240
Screen (4) to ground	258
Cathode (8) to ground	18
5Y3G TUBE	
Filament (8) to ground	266

CONTINENTAL RADIO & TELEV. CORP.

MODEL E6



BOTTOM VIEW OF SOCKET

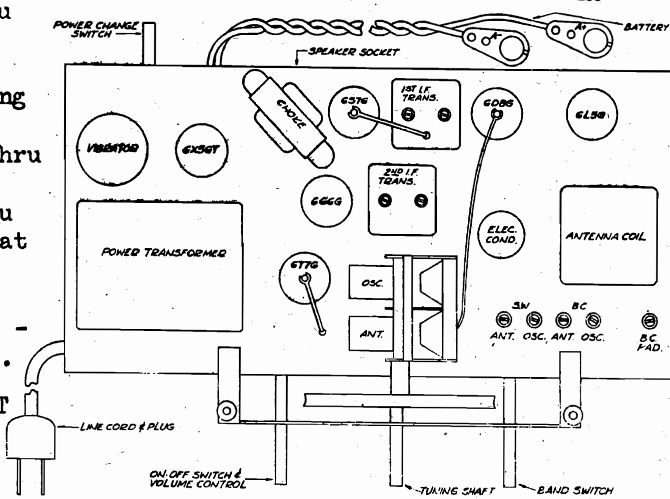
6D8G TUBE	VOLTAGE 117 V.A.C.	6.2 V. Bat.
Plate (3) to ground	160	146
Screen (4) to ground	82	76
Cathode (8) to ground	4.3	3.3
6S7G TUBE		
Plate (3) to ground	160	146
Screen (4) to ground	82	76
Cathode (8) to ground	4.1	3.2
6G6G TUBE		
Plate (3) to ground	152	139
Screen (4) to ground	163	148
Cathode (8) to ground	7.5	6.9
6X5GT TUBE		
Cathode (8) to ground	169	154

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	800	½	R8	15,000,000	½
R2	60,000	½	R9	250,000	½
R3	15,000	½	R10	500,000	½
R4	1,000	½	R11	500	½
R5	20,000	½	R12	100	½
R6	1,000,000	½	R13	100	½
R7	500,000	V.C.			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C13	.00025	Mica
C2	.05	200	C14	.01	400
C3	.05	200	C15	.1	400
C4	.004—5%	Mica	C16	.015	1000
C5	.0001	Mica	C17	.5	120
C6	.1	400	C18	.005	600
C7	.0005	Mica	C19	.1	400
C8	.05	200	C20	.05	400
C9	.5	10	C21	.05	400
C10	.0005	Mica	C22a	20.	25
C11	.0001	Mica	C22b	20.	250
C12	.01	400	C22c	20.	250



Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.

ISSUE A
SEPT. 1940

Speaker (Part No. P-4243) 6" PM Type.
D.C. voice coil resistance......5.1 ohms
Voice coil impedance at 400 cycles......5.5 ohms

B.C. and S.W. Oscillator Coil (Part No. P-4226)
Looking at the mounting bracket end in a clockwise direction starting at the chassis, the connections are: No. 1, pad; No. 2, open. Looking at the other end in a clockwise direction starting at the chassis the connections are: No. 3, plate; No. 4, plate; No. 5, pad; No. 6, grid; No. 7, grid.
S.W. Primary—No. 4 and No. 5—Resistance.......44 ohm
B.C. Primary—No. 1 and No. 3—Resistance......1.3 ohms
S.W. Secondary—No. 5 and No. 6—Resistance......09 ohm
B.C. Secondary—No. 1 and No. 7—Resistance......5.8 ohms

B.C. and S.W. Antenna Coil (Part No. P-4225)
Starting with the lug that is connected direct to ground in a clockwise direction, the terminals are: No. 1, ground; No. 2, open; No. 3, pad; No. 4, grid; No. 5, grid; No. 6 ant.
S.W. Primary—No. 6 and No. 2—Resistance......35 ohm
B.C. Primary—No. 1 and No. 2—Resistance......24.1 ohms
S.W. Secondary—No. 3 and No. 4—Resistance......07 ohm
B.C. Secondary—No. 3 and No. 5—Resistance...... 2.9 ohms

First I.F. Transformer (Part No. P-4245)
Primary—Blue, plate; red, B+—Resistance......26.2 ohms
Secondary—White, grid; black, AVC—Resistance......26.6 ohms

Second I.F. Transformer (Part No. P-4244)
Primary—Blue, plate; red, B+—Resistance......15.1 ohms
Secondary—White, grid; black, AVC—Resistance......11.8 ohms

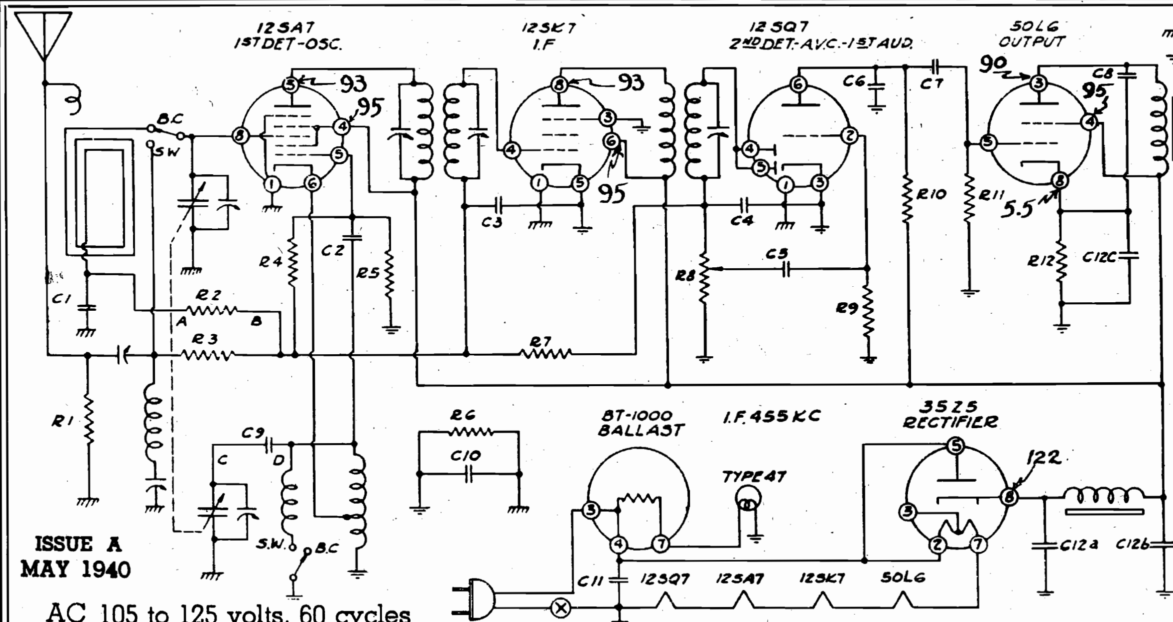
ALIGNING FREQUENCIES:
IF trims - 455kc thru .05 or .1mf.
SW-OSC. - 18,100kc thru 400 ohm res., gang cond. at minimum.
SW-ANT. - 16,000kc thru 400 ohm res.
BC-OSC. - 1730kc thru .0002mf, gang cond. at minimum.
BC-ANT. - 1400kc.
BC-OSC. PAD - 600 kc - Recheck BC at 1400kc.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL.VIII

POWER SUPPLY
This receiver is designed to operate on either a 6 volt storage battery or a power supply main of 110-120 volts, 60 cycle alternating current (A.C.) **Never plug in to a D.C. outlet.**

MODELS J6, XJ6

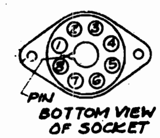
CONTINENTAL RADIO & TELEV. CORP.



ISSUE A
MAY 1940

Band Switch
right (535 to 1630 kilocycles)
left (2.8 to 6.58 megacycles)

MODEL J6 & XJ6



Speaker (Part No. P4169) 5" Dynamic.

Field Resistance ....400 ohms
D.C. voice coil resistance....................... 3.6 ohms
Voice coil impedance at 400 cycles.. 4.0 ohms

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	250,000	¼	R7	2,000,000	¼
R2	100,000	¼	R8	500,000	V.C.
R3	250,000	¼	R9	5,000,000	¼
R4	10,000,000	¼	R10	250,000	¼
R5	25,000	¼	R11	500,000	¼
R6	150,000	¼	R12	150—10%	¼

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C8	.02	400
C2	.0001	Mica	C9	.02	200
C3	.05	200	C10	.2	200
C4	.00025	Mica	C11	.05	400
C5	.005	400	C12a	30.	150
C6	.0005	Mica	C12b	20.	150
C7	.01	400	C12c	20.	25

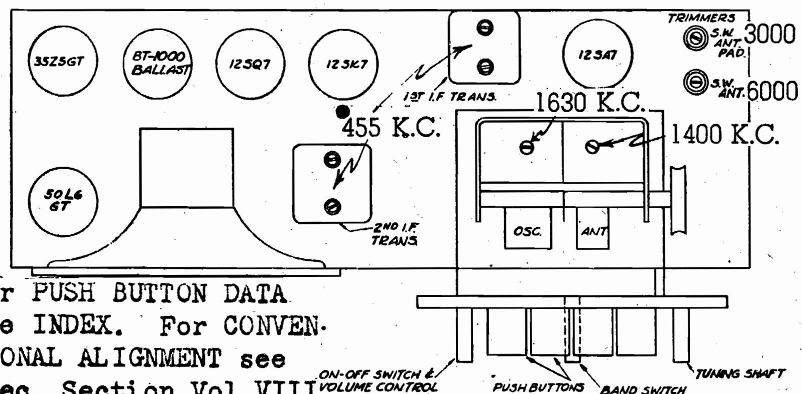
AC 105 to 125 volts, 60 cycles
or DC 105-125 volts. **In model J6 all common grounds become chassis grounds, C1, C9, C10, R2 and R6 are omitted. Point "A" is connected to point "B" and point "C" to point "D."**

Voltages— tube to common ground Line 117 Volts AC—Power Consumption 50 Watts.

Volume Control maximum. Meter 1000 ohms per volt, 150 volt scale.

Models J6 and XJ6 are the same except for a few parts and that the XJ6 is approved by the Underwriters Laboratories. A condenser is used in the XJ6 model to provide a floating ground.

•On XJ6 only connect ground of signal generator to common ground thru a .1 mfd. condenser.



For PUSH BUTTON DATA see INDEX. For CONVENTIONAL ALIGNMENT see Spec. Section Vol. VIII

Oscillator and Short Wave Antenna Coil (Part No. G6187)

Looking at the five terminal connection end in a clockwise direction starting at the mounting bracket, the connections are: No. 1, ground; No. 2, grid; No. 3, B.C. osc. tap; No. 4, open; No. 5, open. Looking at the other end in a clockwise direction starting at the mounting bracket, the connections are: No. 6, pad; No. 7, open; No. 8, switch; No. 9, ant.

No. 1 and No. 2—Resistance...6.9 ohms
No. 1 and No. 3—Resistance... .4 ohm
No. 3 and No. 2-6.5 ohms
No. 6 and No. 9- .3 ohm
No. 8 and No. 2— .3 ohm

First I.F. Transformer (Part No. P3794)

Primary—Blue, plate; red, B+—Resistance..............................19.9 ohms
Secondary—White, grid; black, AVC—Resistance....................19.8 ohms

Second I.F. Transformer (Part No. P3924)

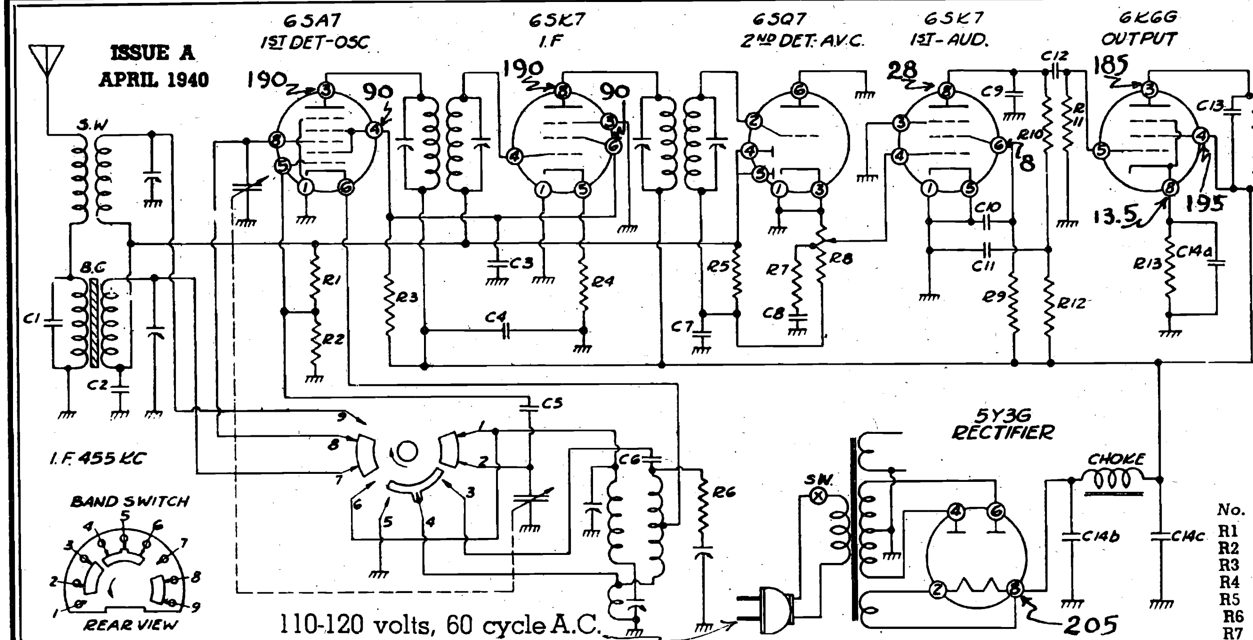
Primary—Blue, plate; red B+—Resistance 22.2 ohms.
Secondary—White, diode; black, AVC—Resistance 22.1 ohms.

Electrolytic Condenser (Part No. P3531)

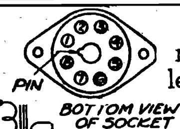
Red, 20 mfd., 150 volt; green, 20 mfd., 150 volt; yellow, 20 mfd, 25 volt; black, negative for all three sections.

CONTINENTAL RADIO & TELEV. CORP.

ISSUE A
APRIL 1940



110-120 volts, 60 cycle A.C.



Band Switch
right 535 to 1730 kilocycles
left 16.57 to 53.10 meters

MODEL K6

Speaker (Part No. P-4140) 5" PM Type
D.C. voice coil resistance ....3.1 ohms
Voice coil impedance at 400 cycles 3.5 ohms

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C9	.00025	Mica
C2	.05	200	C10	.05	200
C3	.05	400	C11	.1	200
C4	.05	400	C12	.01	400
C5	.00005	Mica	C13	.005	600
C6	.004 —5%	Mica	C14a	20.	25
C7	.00025	Mica	C14b	20.	350
C8	.05	200	C14c	20.	350

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	10,000,000	1/4	R9	1,000,000	1/4
R2	20,000	1/4	R10	200,000	1/4
R3	10,000	1	R11	500,000	1/4
R4	100—10%	1/4	R12	50,000	1/4
R5	2,000,000	1/4	R13	500—10%	1/2
R6	30	1/4			
R7	8,000	1/4			
R8	500,000	V.C.			

All voltages to ground with a 1,000 ohm per volt meter on the 250 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 45 watts.

Short Wave Antenna Coil (Part No. P3378)
Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, AVC; No. 2, Ant; No. 3, Grid; No. 4, Ground.
Primary—No. 2 and No. 4—Resistance.............................. .3 ohm
Secondary—No. 1 and No. 3—Resistance.............................. .07 ohm

Broadcast Antenna Coil (Part No. G6031)
Looking at the connection end in a clockwise direction starting at the mounting strip the terminals are: No. 1, AVC; No. 2, grid; No. 3, Ant; No. 4, ground. No. 4 is grounded to the mounting strip.
Primary—No. 3 and No. 4—Resistance..............................27.1 ohms
Secondary—No. 1 and No. 2—Resistance.............................. 1.9 ohms

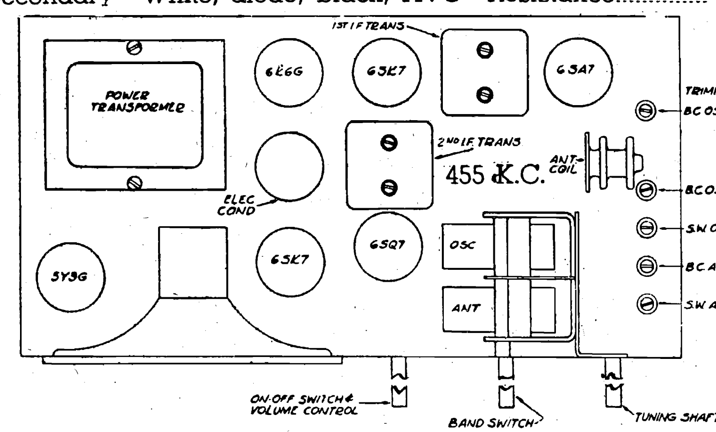
Oscillator Coil (Part No. P4185)
Looking at the mounting bracket end in a clockwise direction starting at the chassis the connections are: No. 1, pad; No. 2, B.C. grid; looking at the other end in a clockwise direction starting at the chassis the connections are: No. 3, ground; No. 4, sec. tap; No. 5, open; No. 6, S.W. grid; No. 7, tickler.
Tickler—No. 3 and No. 7—Resistance.................. .8 ohm
S.W. Secondary—No. 6 and No. 7—Resistance... .07 ohm
B.C. Secondary—No. 2 and No. 1—Resistance...5.1 ohms

Band switch shown in broadcast position in schematic and in short wave position in pictorial view

For CONVENTIONAL ALIGNMENT see Spec. Section Vol. VIII

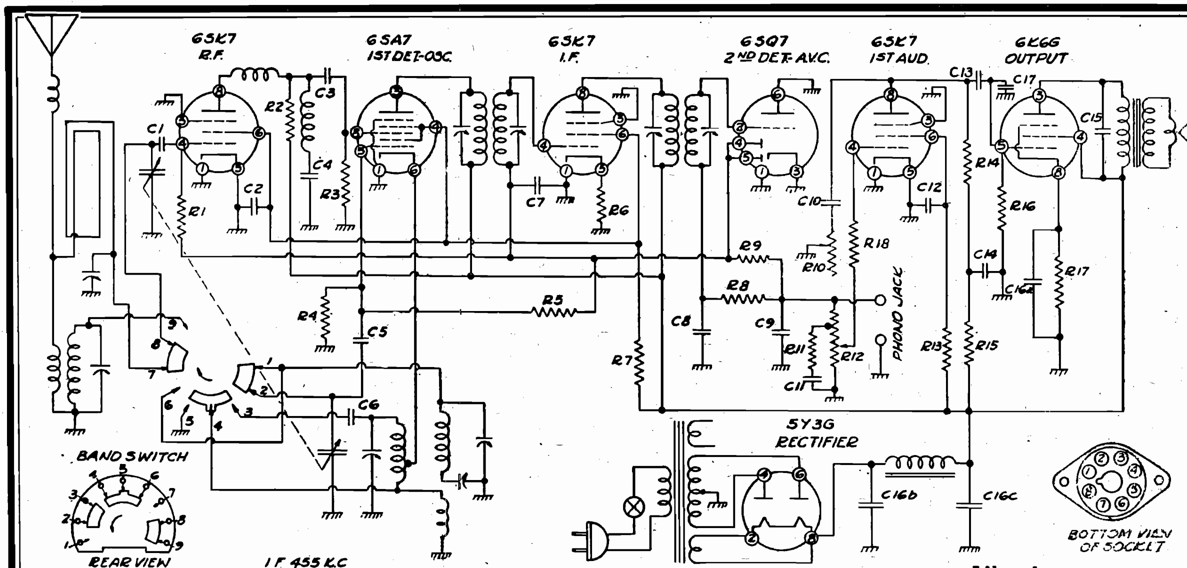
First I.F. Transformer (Part No. P4108)
Primary—Blue, plate; red, B+—Resistance.............................. 18.2 ohms
Secondary—White, grid; black, AVC—Resistance.............................. 15.1 ohms

Second I.F. Transformer (Part No. P4109)
Primary—Blue, plate; red B+—Resistance.............................. 20.8 ohms
Secondary—White, diode; black, AVC—Resistance.............................. 17.4 ohms



MODEL A7

CONTINENTAL RADIO & TELEV. CORP.



Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.

6SK7 (RF) TUBE

	Volts
Plate (8) to ground	208
Screen (6) to ground	93

6SA7 TUBE

Plate (3) to ground	255
Screen (4) to ground	93

6SK7 (IF) TUBE

Plate (8) to ground	255
Screen (6) to ground	93

6SK7 (AF) TUBE

Plate (8) to ground	20
Screen (6) to ground	10

6K6G TUBE

Plate (3) to ground	240
Screen (4) to ground	258
Cathode (8) to ground	18

5Y3G TUBE

Filament (8) to ground	266

All voltages measured with a 1,000 ohm per volt meter on the 300 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 60 watts.

Speaker (Part No. P4206) 6½" PM.

D. C. voice coil resistance	3.6 ohms
Voice coil impedance at 400 cycles	4.0 ohms

S. W. Antenna Coil (Part No. P3198)

Looking at the connection end starting at the chassis in a clockwise direction the terminals are: No. 1, ground; No. 2, antenna; No. 3, switch; No. 4, ground.

Primary—No. 1 and No. 2—Resistance	.37 ohm
Secondary—No. 3 and No. 4—Resistance	.08 ohm

Oscillator Coil (Part No. P4194)

Looking at the mounting strip end in a clockwise direction starting at the chassis, the terminals are: No. 1, ground; No. 2, cathode; No. 3, open; No. 4, pad; No. 5, switch; No. 6, grid; No. 7, grid; No. 8, open.

B.C. Primary—No. 1 and No. 5—Resistance	.29 ohm
S.W. Primary—No. 5 and No. 2—Resistance	.06 ohm
B.C. Secondary—No. 4 and No. 6—Resistance	5.7 ohms
S.W. Secondary—No. 2 and No. 7—Resistance	.08 ohm

First I.F. Transformer (Part No. P4108)

Primary—Blue, plate; red, B+—Resistance	18.2 ohms
Secondary—White, grid; black, AVC—Resistance	15.1 ohms

Second I.F. Transformer (Part No. P4109)

Primary—Blue, plate; red B+—Resistance	20.8 ohms
Secondary—White, diode; black, AVC—Resistance	17.4 ohms

RESISTORS

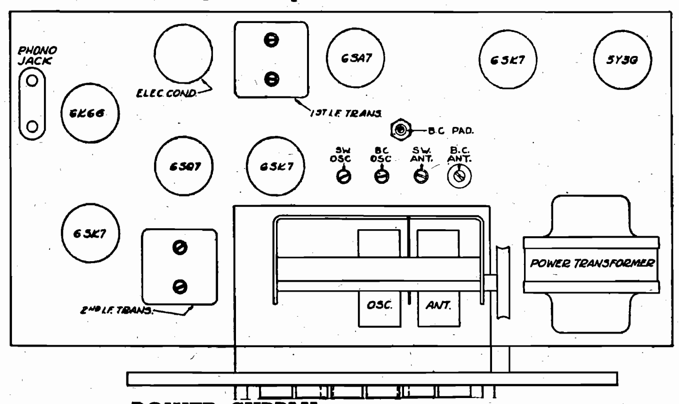
No.	Ohms	Watts	No.	Ohms	Watts
R1	500,000	¼	R10	500,000	T.C.
R2	4,000	½	R11	10,000	¼
R3	100,000	½	R12	500,000	V.C.
R4	25,000	½	R13	2,000,000	¼
R5	5,000,000	¼	R14	250,000	¼
R6	100	¼	R15	50,000	¼
R7	15,000	2	R16	500,000	¼
R8	50,000	¼	R17	600—10%	½
R9	1,000,000	¼	R18	150,000	½

CONDENSERS

No.	Capacity (Mfd.)	Volts
C1	.0001	Mica
C2	.05	400
C3	.0001	Mica
C4	.00006—5%	Mica
C5	.0001	Mica
C6	.003—5%	Mica
C7	.05	200
C8	.0001	Mica
C9	.00025	Mica
C10	.002	600

No.	Capacity (Mfd.)	Volts
C11	.05	200
C12	.25	400
C13	.01	400
C14	.25	400
C15	.005	600
C16a	20.	25
C16b	20.	350
C16c	20.	350
C17	.0001	Mica

Fig. 1—Top View of Chassis



ISSUE C
OCT. 1940

FOR ALIGNMENT & PUSH-BUTTON TUNER DATA,-- SEE INDEX

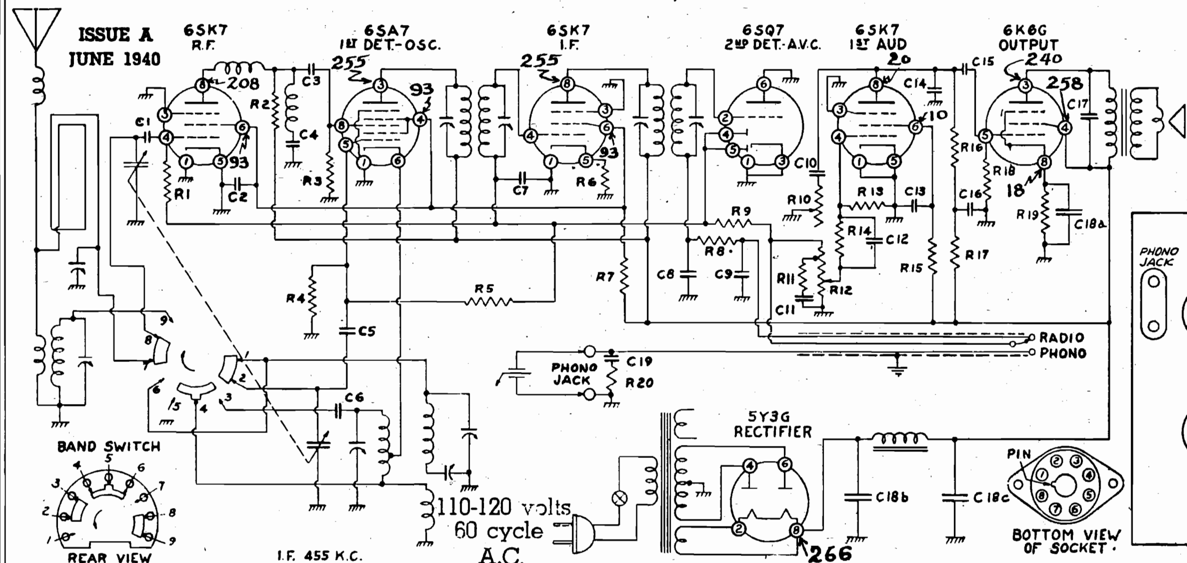
POWER SUPPLY

This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (A.C.). **Never plug in a D.C.**

MODEL B7
Issues A and B
MODEL 62-B7

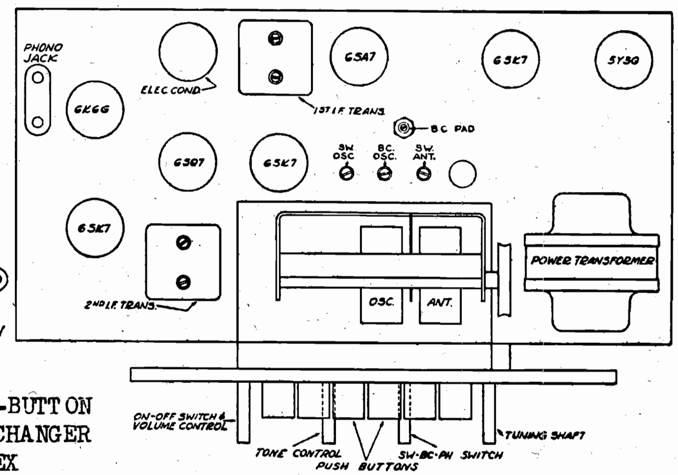
CONTINENTAL RADIO & TELEV. CORP.

ISSUE A
JUNE 1940



Band Switch
left 535 to 1630 kilocycles
right 5,800 to 18,100 kilocycles

MODEL B7



Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.

All voltages to ground with a 1,000 ohm per volt meter on the 300 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 60 watts.

FOR ALIGNMENT, PUSH-BUTTON TUNER, PHONO RECORD-CHANGER DATA----SEE INDEX

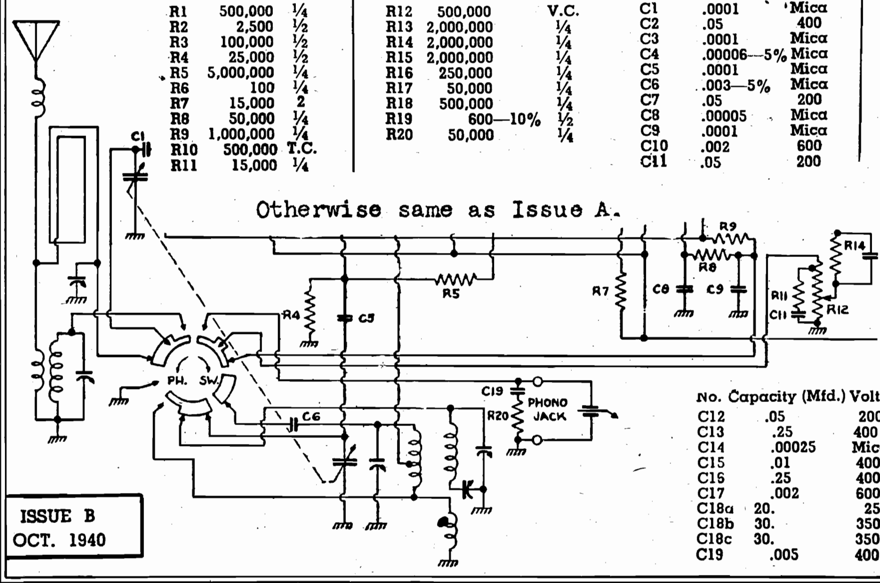
RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	500,000	1/4	R12	500,000	V.C.
R2	2,500	1/2	R13	2,000,000	1/4
R3	100,000	1/2	R14	2,000,000	1/4
R4	25,000	1/2	R15	2,000,000	1/4
R5	5,000,000	1/4	R16	250,000	1/4
R6	100	1/4	R17	50,000	1/4
R7	15,000	2	R18	500,000	1/4
R8	50,000	1/4	R19	600—10%	1/2
R9	1,000,000	1/4	R20	50,000	1/4
R10	500,000	T.C.			
R11	15,000	1/4			

CONDENSERS

No.	Capacity (Mfd.)	Volts
C1	.0001	Mica
C2	.05	400
C3	.0001	Mica
C4	.00006—5%	Mica
C5	.0001	Mica
C6	.003—5%	Mica
C7	.05	200
C8	.00005	Mica
C9	.0001	Mica
C10	.002	600
C11	.05	200
C12	.05	200
C13	.25	400
C14	.00025	Mica
C15	.01	400
C16	.25	400
C17	.002	600
C18a	20.	25
C18b	30.	350
C18c	30.	350
C19	.005	400

ISSUE B
OCT. 1940



Speaker (Part No. P4283) 10" PM.
D. C. voice coil resistance .... 3.7 ohms
Voice coil impedance at 400 cycles .... 4.1 ohms

S. W. Antenna Coil (Part No. P3198)
Looking at the connection end starting at the chassis in a clockwise direction the terminals are: No. 1, ground; No. 2, antenna; No. 3, switch; No. 4, ground.

Primary—No. 1 and No. 2—Resistance .... .37 ohm
Secondary—No. 3 and No. 4—Resistance .... .08 ohm

Oscillator Coil (Part No. P4194)
Looking at the mounting strip end in a clockwise direction starting at the chassis, the terminals are: No. 1, ground; No. 2, cathode; No. 3, open; No. 4, pad; No. 5, switch; No. 6, grid; No. 7, grid; No. 8, open.
B.C. Primary—No. 1 and No. 5—Resistance .... .29 ohm
S.W. Primary—No. 5 and No. 2—Resistance .... .06 ohm
B.C. Secondary—No. 4 and No. 6—Resistance .... 5.7 ohms
S.W. Secondary—No. 2 and No. 7—Resistance .... .08 ohm

First I.F. Transformer (Part No. P4108)
Primary—Blue, plate; red, B+—Resistance .... 18.2 ohms
Secondary—White, grid; black, AVC—Resistance .... 15.1 ohms

Second I.F. Transformer (Part No. P4109)
Primary—Blue, plate; red, B+—Resistance .... 20.8 ohms
Secondary—White, diode; black, AVC—Resistance .... 17.4 ohms

MODEL K7

CONTINENTAL RADIO & TELEV. CORP.

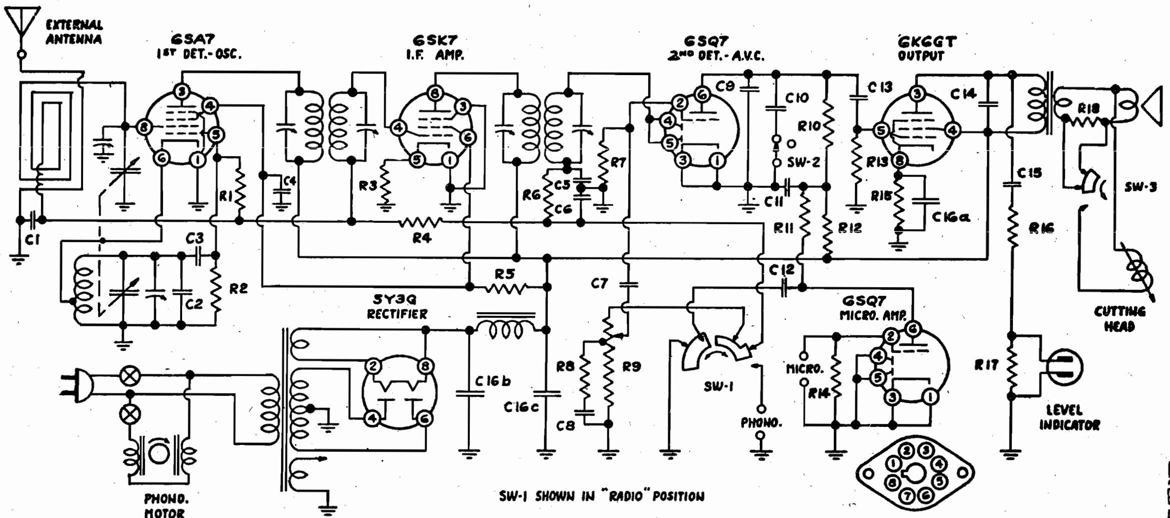
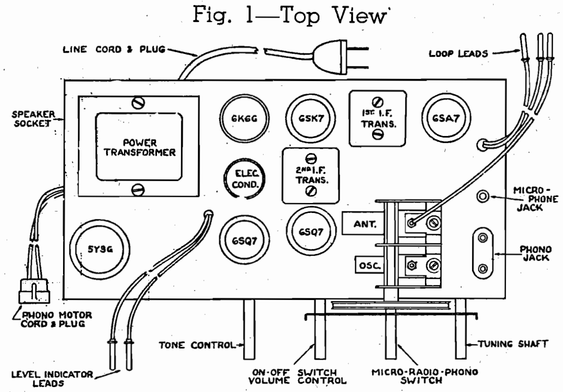


Fig. 1—Top View



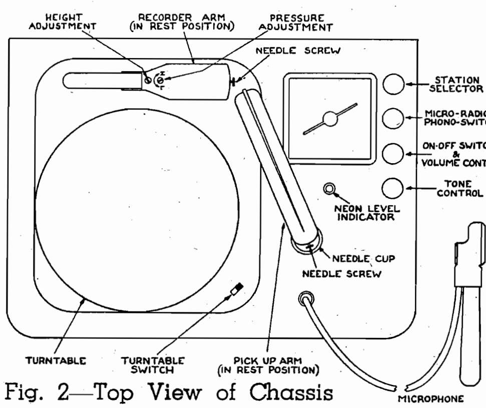


Fig. 2—Top View of Chassis

FOR PHONO RECORDER DATA SEE INDEX

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION--VOL. III

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	10,000,000	½	R10	250,000	½
R2	20,000	½	R11	250,000	½
R3	100—10%	½	R12	50,000	½
R4	2,000,000	½	R13	500,000	½
R5	15,000—10%	2	R14	5,000,000	½
R6	50,000	½	R15	600—10%	½
R7	5,000,000	½	R16	250,000—10%	½
R8	20,000	½	R17	500,000—10%	½
R9	500,000	V.C.	R18	50	½

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C10	.002	400
C2	.000025	Mica	C11	.1	400
C3	.00005	Mica	C12	.005	600
C4	.05	400	C13	.01	400
C5	.0001	Mica	C14	.002	600
C6	.0001	Mica	C15	.002	400
C7	.01	400	C16a	20.	25
C8	.02	200	C16b	20.	350
C9	.00025	Mica	C16c	20.	350

Speaker (Part No. P-4490) 6½" P.M. Type.
D.C. voice coil resistance....2.8 ohms
Voice coil impedance at 400 cycles....3.1 ohms

Oscillator Coil (Part No. P-4495)

Looking at the connection end in a clockwise direction starting at the chassis the terminals are No. 1, end of winding; No. 2, start of winding; No. 3, tap.
No. 1 and No. 2—Resistance.... 4.5 ohms
No. 1 and No. 3—Resistance.... 4.05 ohms
No. 2 and No. 3—Resistance.... .45 ohm

First I.F. Transformer (Part No. P-4108)

Primary—Blue, plate; red, B+
Resistance ....18.2 ohms
Secondary—White, grid; black, AVC
Resistance ....15.1 ohms

Second I.F. Transformer (Part No. P-4109)

Primary—Blue, plate; red, B+
Resistance .... 20.8 ohms
Secondary—White, diode; black, AVC
Resistance ....17.4 ohms

ALIGNING FREQUENCIES:
IF - 455kc. BC-OSC. - 1730kc thru .0002mf; cond. gang at minimum.
BC-ANT. - 1400kc; check gang cond. plates at 600kc.

VOLTAGE CHART

Never plug in a D.C. outlet.

All voltages measured with a 1,000 ohm per volt meter on the 300 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 90 watts.

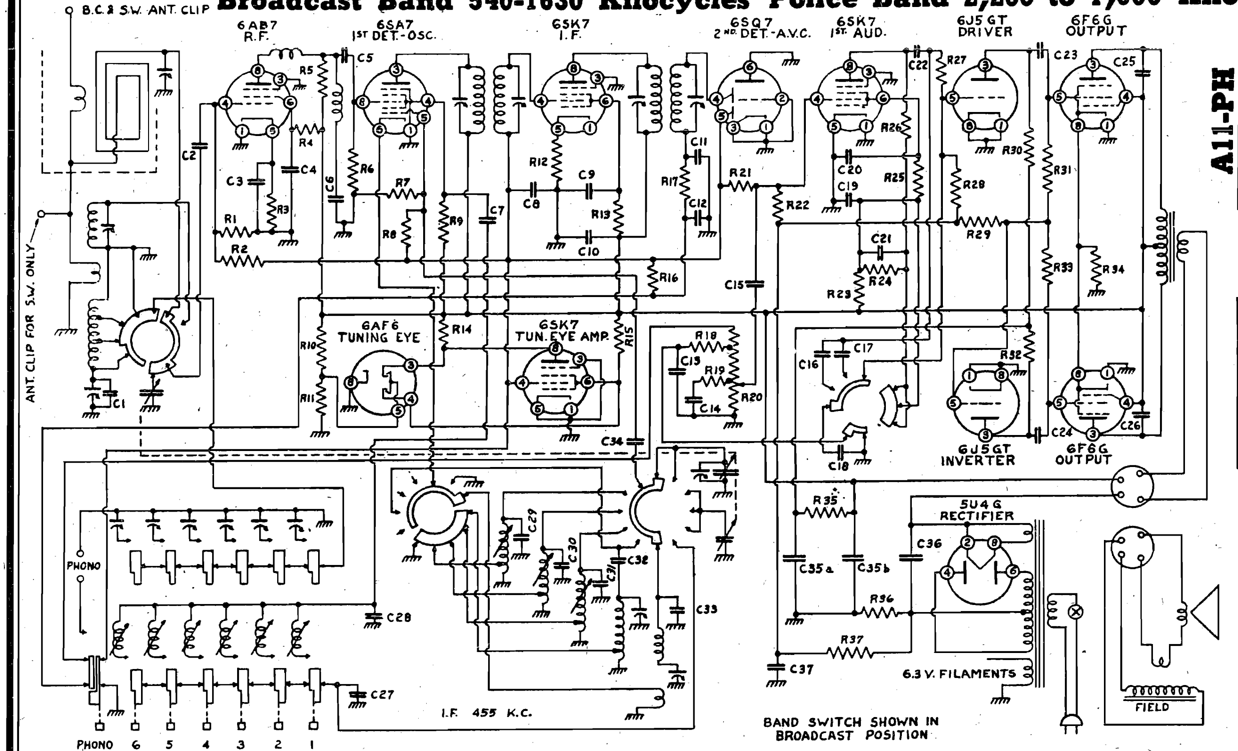
ISSUE A OCT. 1940

	Volts
6SA7 TUBE	
Plate (3) to ground	255
Screen (4) to ground	93
6SK7 TUBE	
Plate (8) to ground	255
Screen (6) to ground	93
6K6G TUBE	
Plate (3) to ground	240
Screen (4) to ground	258
Cathode (8) to ground	18
5Y3G TUBE	
Filament (8) to ground	266

MODELS A11, A11-PH

CONTINENTAL RADIO & TELEV. CORP.

Short Wave Bands 9.45 to 9.77, 11.65 to 11.96 and 15.05 to 15.35 Megacycles
Broadcast Band 540-1630 Kilocycles Police Band 2,200 to 7,000 Kilocycles



A11-PH ISSUE A AUGUST 1940

A11 ISSUE A MAY 1940

RESISTORS		
No.	Ohms	Watts
R 1	1,000,000 ohm	½ watt
R 2	2,000,000 ohm	½ watt
R 3	250 ohm	½ watt
R 4	50,000 ohm	½ watt
R 5	5,000 ohm	½ watt
R 6	100,000 ohm	½ watt
R 7	25,000 ohm	½ watt
R 8	5,000,000 ohm	½ watt
R 9	15,000 ohm	2 watt
R10	25,000 ohm	1 watt
R11	30,000 ohm	½ watt
R12	100 ohm	½ watt
R13	50,000 ohm	½ watt
R14	200,000 ohm	½ watt
R15	200,000 ohm	½ watt
R16	1,000,000 ohm	½ watt
R17	50,000 ohm	½ watt
R18	30,000 ohm	½ watt
R19	30,000 ohm	½ watt

RESISTORS		
No.	Capacity	Volts
R20	500,000 ohm	V.C.
R21	1,000,000 ohm	½ watt
R22	2,000,000 ohm	½ watt
R23	50,000 ohm	½ watt
R24	100,000 ohm	½ watt
R25	500,000 ohm	½ watt
R26	15,000 ohm	½ watt
R27	500,000 ohm	½ watt
R28	100,000 ohm	½ watt
R29	250,000 ohm	½ watt
R30	50,000 ohm	½ watt
R31	250,000 ohm	½ watt
R32	50,000 ohm	½ watt
R33	300,000 ohm	½ watt
R34	220 ohm	1 watt
R35	20,000 ohm	½ watt
R36	25 ohm 10%	1 watt
R37	250,000 ohm	½ watt

CONDENSERS		
No.	Capacity	Volts
C1	.00002	10% Mica
C2	.0001	Mica
C3	.05	200 V.
C4	.05	400 V.
C5	.0001	Mica
C6	.00006	5% Mica
C7	.05	400 V.
C8	.05	200 V.
C9	.05	400 V.
C10	.1	400 V.
C11	.0001	Mica
C12	.0001	Mica
C13	.02	200 V.
C14	.02	200 V.
C15	.05	400 V.
C16	.0001	Mica
C17	.00025	Mica
C18	.001	600 V.
C19	.25	400 V.

CONDENSERS		
No.	Ohms	Watts
C20	.05	400 V.
C21	.05	400 V.
C22	.01	400 V.
C23	.02	400 V.
C24	.02	400 V.
C25	.005	600 V.
C26	.005	600 V.
C27	.0005	2½% Mica
C28	.003	5% Mica
C29	.0003	2½% Mica
C30	.00025	2½% Mica
C31	.0002	2½% Mica
C32	.003	5% Mica
C33	.00003	10% Mica
C34	.0001	Mica
C35a	16 Mfd.	450 V.
C35b	20 Mfd.	450 V.
C36	25 Mfd.	450 V.
C37	.25	200 V.

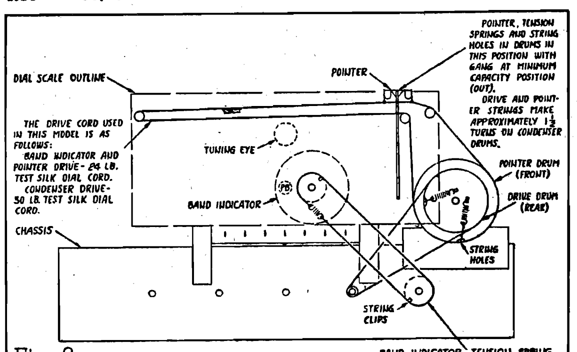


Fig. 2—
Dial and Drive Cord System

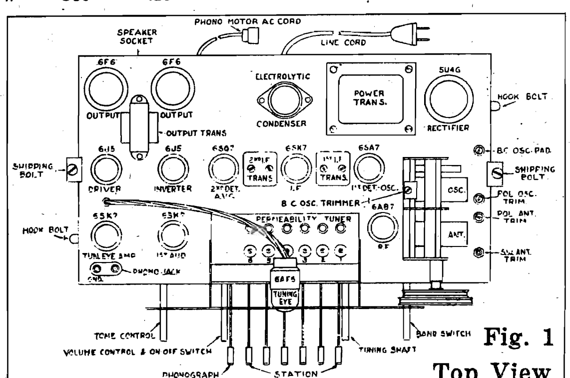


Fig. 1
Top View

PHONOGRAPH CONNECTIONS MODEL A11

connection may be made direct from the phonograph to this jack by means of phone tips, if the phonograph pickup is of the high impedance type. If the pickup is of the low impedance type, a coupling transformer must be used.

TELEVISION CONNECTIONS

The sound channel output from the second detector of a Television Receiver may be plugged directly into the Phono-Jack, thus using the speaker and audio system of this receiver.

MICROPHONE CONNECTIONS

A high impedance, high output microphone may be plugged directly into the phono jack with fair results. A low output microphone giving fairly good results. The results obtained will be mainly determined by phone such as the crystal, velocity, etc., will not the microphone used; the Quam Permanic Micro- operate properly.

MODELS A11-PH,
62-B7

CONTINENTAL RADIO & TELEV. CORP.

This Record Changer will automatically play a **series of up** to twelve 10", ten 12" or ten mixed 10" **and 12" records** of the standard 78 R. P. M. type. Records of the last few years with the standard eccentric or spiral stopping groove on the inside and an eccentric on the outside will operate the automatic mechanism. However, records of any size up to 12" may be played manually.

SHIPPING BOLTS

The automatic record changer is held solid for shipping by four bolts and before placing unit in operation the four channel shaped nuts must be loosened. The aforementioned four channel shaped nuts are located underneath the record changer and should be turned counter-clockwise until they are free from the wood rail of the cabinet.

DO NOT REMOVE THE BOLTS.

If it is necessary to later ship this radio the four channel shaped nuts must be tightened to the shipping position.

CAUTIONS

1. Never use force to start or stop the motor or any part of the record changing mechanism or pickup arm.
2. The use of records which have become warped or damaged thru improper care may cause the mechanism to jam and damage the instrument. Records which have become warped will slide on one another when playing, resulting in unsatisfactory reproduction.
3. Do not leave records on the selector arms, as they are liable to warp, particularly so in warmer climates. Keep your records in a record file (album or cabinet) when not in use. This will protect them from warping and dust.
4. The Changing Cycle consists of the time interval beginning when the pickup arm automatically lifts at the end or center section of the record and moves out to its extreme position; the new record drops and the pickup arm resets itself on the outer edge of this new record. During this cycle, the pickup arm should not be handled. WHEN IT IS DESIRED TO STOP THE MECHANISM CARE SHOULD BE TAKEN TO SEE THAT THIS CHANGING CYCLE IS COMPLETE.
5. No damage will be done if you forget to turn off changer after it has played its entire load of records. It will simply repeat the last record until stopped.
6. LEVELING—For proper operation of the record changer the unit must be level.

PHONOGRAPH NEEDLES

Various types and kinds of needles are available for use in phonograph pickup arms. All have their virtues, as well as their faults, for use in ordinary phonographs, where needles can be changed after each record. For playing up to twelve records at one set-up, as with this Changer, no attempt should be made to use ordinary steel or fibre points, since continued use of worn points will be likely to ruin both quality of reproduction and the records as well. Any kind of needle can be used which has a point durable enough to play ten records or more without damaging them.

It should be remembered that, no matter what the quality of the pickup arm, amplifying system and speaker, all of the recorded music must pass through the needle. For this reason, it is absolutely essential that particular care be taken to use good needles, and to see that they are changed often enough so the records are not damaged and the quality of the music is not impaired.

It is recommended that a sapphire point needle be used as it is the only needle that can be satisfactorily used on both commercial records and home recordings. If any other type of needle is used it is necessary to change the needle every time it is desired to play home recordings after playing commercial records. If the same needle is used on both kinds of records (except sapphire types) the home recordings will be quickly damaged. A sapphire needle will play several thousand records before requiring replacement. Never under any condition should a needle be removed from the pickup arm and then re-installed.

To install a needle raise the pickup arm to a nearly **vertical** position, loosen needle screw and insert needle. The needle screw should now be firmly **tightened.**

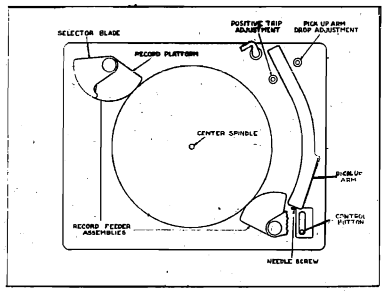


Fig. 1

LOADING

Turn the record feeder assemblies until they snap into place and then place the selected records (up to twelve 10", ten 12" or a mixed stack of 10" and 12" records, not exceeding ten) over the center spindle so they will rest on the record platforms of the record feeder assemblies.

The Record Feeder Assemblies consist of a top plate or Selector Blade which is tapered at the edge for the purpose of selecting the bottom record on the stack and to drop it during the changing cycle. The lower plate is called the Record Platform and it is upon this plate that the records are placed. Place the record desired last on top.

STARTING THE CHANGER

1. Turn on the radio and set the "Phono-Band Switch" to the "Phono" position.
2. Push the control button (see Fig. 1) to the "Rej." (Reject) position and release. The motor will start and the record changer will go into automatic operation.
3. Adjust volume control to the desired intensity and tone control to the preferred setting.
4. Close cabinet to eliminate mechanical reproduction of sound by the needle.
5. When the playing is finished, be sure turntable is stopped and tone arm is in the rest position. Never leave the tone arm with the needle resting on a record or the turntable.

REJECTING A RECORD

To reject a record it is only necessary to push the control button on the record changer panel to the "Rej." (Reject) position for a few seconds and then release. A record can be rejected any time the needle is in contact with the record.

UNLOADING

1. Switch off the motor while the needle is in contact with a record.
2. Return the pickup arm to the rest position.
3. Lift the record feeder assemblies upward and turn them out of the way.
4. Lift the played records from the turntable.
5. Turn the record feeder assemblies until they snap back into position.

The changer may now be loaded with a new stack of records.

MANUAL OPERATION

Manual operation is used for all home recordings and records without spiral grooves.

1. Lift the record feeder assemblies upward and turn them out of the way.
2. Place record on turntable with the desired selection upward.
3. Push the control button to the first or "Man." (Manual) position.
4. When the turntable has attained speed, lift pickup arm and lower gently on to the record so the needle point enters the outside groove.
5. Adjust volume control to the desired intensity and tone control to the preferred setting.
6. Close cabinet to eliminate mechanical reproduction of sound by the needle.
7. When the playing is finished, be sure turntable is stopped and pickup arm is in the rest position. Never leave the pickup arm with the needle resting on a record or the turntable.

This record changer is provided with two trip mechanisms so that automatic changing can be secured from records with the conventional Eccentric Center Groove or with records lacking the Eccentric Center Groove, but which are recorded sufficiently near the center so that the Positive Trip comes into operation.

THE RATCHET TRIP

The Ratchet Trip requires no adjustment as its range of operation is greater than that of any standard records.

THE POSITIVE TRIP

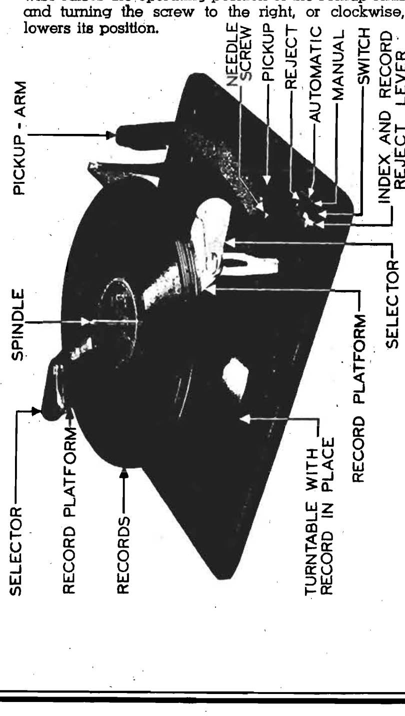
The Positive Trip can be adjusted to operate at a definite point from the center spindle in the following manner. Remove the button covering the hole on the left side of the pickup arm. Using a small screw driver rotate the screw-head appearing thru this hole. (Caution: This screw can be rotated only one half turn or 180 degrees. Therefore, slight adjustments are all that should be required.) A slight turn to the right or in a clockwise direction makes the trip operative earlier in the playing cycle or farther from the center of the record. Turning this screw slightly to the left or in a counter-clockwise direction causes the positive trip to set later in the playing cycle or nearer to the center of the record. The exact adjustment can be determined only by playing a record with its last groove located at the desired distance from its center.

PICKUP ARM DROP POINT

This Record Changer is provided with an adjustment controlling the position at which the Pickup arm is dropped on the outer edge of the record. This adjustment has a constant relationship for 10 or 12 inch records. Therefore, one adjustment on either diameter of record is sufficient. To make this adjustment, remove the button on the right side of the pickup arm and with a small screw driver, rotate the exposed screw head slightly. (Caution: This screw also can be rotated only one half turn or 180 degrees. Therefore, slight adjustments are all that should be required.) Turning to the right or in a clockwise direction causes the needle to drop farther from the edge of the record. Turning to the left or counter-clockwise direction causes the needle to drop nearer the edge of the record. The proper position for the needle to drop is approximately ⅛" from the edge of the record and in the blank space at this point, that is, in the space at the edge of the record where there are no grooves.

PICKUP ARM LIFT

This Record Changer is designed so that the pickup will start at the proper position on the top record of 12 ten inch records on the turntable. This is based upon the use of a needle which is inserted with approximately 5/16" protruding from the underside of the pickup arm. Adjustment for this is readily available by lifting the pickup arm to its maximum position. Turning the hexagon headed screw thus exposed on the underside of the Pickup Arm makes the adjustment. Turning the screw to the left or counter-clockwise raises the operating position of the Pickup Arm and turning the screw to the right, or clockwise, lowers its position.



CONTINENTAL RADIO & TELEV. CORP.

MODELS A11, A11-PH, B11

MODELS A11,A11-PH,B11

All alignments should be made with the **volume** control in the maximum position, to prevent the AVC from operating and giving false readings.

I.F. ALIGNMENT

Remove the chassis from the cabinet, disconnect loop and adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (6SA7) through a .05 or .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT
(Band No. 1, 1st Part)

Adjust the signal generator to 1630 KC and connect the output to the green antenna loop lead through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the B.C. oscillator trimmer (See Fig. 1) to receive this signal. The other broadcast band adjustments are made later.

POLICE BAND ALIGNMENT
(Band No. 2)

Adjust the signal generator to 7000 KC and connect the output to the black antenna loop lead through a 400 ohm resistor. With the gang condenser at minimum capacity adjust the police oscillator trimmer (See Fig. 1) to receive this signal. Set the signal generator to 6000 KC and adjust the police antenna trimmer to peak.

31 METER BAND ALIGNMENT
(Band No. 3)

Set the signal generator to exactly 9,450 KC and **connect** the output to the black antenna loop lead **through** a 400 ohm resistor. With the gang con**denser** at maximum capacity adjust the iron slug **(lower** screw on right side of chassis) to receive **signal.** The antenna air trimmer is now adjusted by first loosening the large nut and then moving the plunger in or out until the point of maximum output **is** reached. This air trimmer should now be locked **in** place by means of the large nut and not changed **during** the rest of the alignment. If a **signal genera-tor of** sufficient accuracy is not available adjust **approximately,** then tune in a station of known fre**quency** and readjust until the station comes in at the correct dial setting.

25 METER BAND ALIGNMENT
(Band No. 4)

Set the signal generator to exactly 11,650 KC and connect the output to the black antenna loop lead through a 400 ohm resistor. With the gang condenser at maximum capacity adjust the iron slug (center screw on right side of chassis) to receive signal. This is the only adjustment on this band.

19 METER BAND ALIGNMENT
(Band No. 5)

Set the signal generator to exactly 15,050 KC and connect the output to the black antenna loop lead through a 400 ohm resistor. With the gang condenser at maximum capacity adjust the iron slug (upper screw on right side of chassis) to receive signal. This is the only adjustment on this band.

BROADCAST BAND ALIGNMENT
(Band No. 1, 2nd Part)

Re-install the receiver completely in its cabinet. Adjust the signal generator to 1400 KC and connect the output to a shielded loop radiator and place this loop about two feet from the rotary loop antenna. If no loop radiator is available the output of the signal generator should be connected to the antenna clip of the rotary loop antenna through a .0002 mfd. mica **condenser.** Tune signal and adjust the B.C. antenna trimmer (on rotary loop antenna) to peak. Set the signal generator to 600 KC, tune the signal and then slowly increase or decrease the B.C. oscillator padding condenser (See Fig. 1) and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.

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.

Speaker (Part No. P4382) 12" Dynamic

Field Resistance .... 600 ohms
D.C. Voice Coil Resistance........ 5.4 ohms
Voice Coil Impedance at 400 cycles.... 6.0 ohms

Short Wave Antenna Coil (Part No. G6282)

Looking at the five lug connection end starting at the chassis in a clockwise direction the terminals are: No. 1, switch; No. 2, sec. tap; No. 3, sec. tap; No. 4, ground; No. 5, antenna; other end, No. 6, trimmer.

Primary—No. 4 and No. 5—Resistance.... .3 ohm
Secondary (Police)—No. 1 and No. 4—
Resistance .... .5 ohm
Secondary (S.W.)—No. 4 and No. 6—
Resistance .... .5 ohm

B.C. Oscillator Coil (Part No. G6283)

Starting at the mounting bracket in a clockwise direction the connections are: No. 1, pad; No. 2, ground; No. 3, grid; No. 4, cathode.

Primary—No. 2 and No. 4—Resistance.... .14 ohm
Secondary—No. 1 and No. 3—
Resistance .... 4.1 ohms

First I.F. Transformer (Part No. P4360)

Primary—Blue, plate; red, B+—
Resistance .... 19.6 ohms
Secondary—White, grid; black, AVC—
Resistance .... 16.9 ohms

Second I.F. Transformer (Part No. P4361)

Primary—Blue, plate; red B+—
Resistance .... 19.3 ohms
Secondary—White, diode; black, AVC—
Resistance .... 16.6 ohms

Power Transformer (Part No. P3476)

Primary—115 volt, 60 cycle; black leads;
Resistance .... 2.5 ohms
Secondary—6.3 volt filament; green leads.
Resistance .... .12 ohm
Secondary—5 volt rectifier filament;
yellow leads. Resistance........ .11 ohm
Secondary—High voltage; red leads.
Resistance .... 123.7 ohms
High voltage center tap; red and white lead.
Resistance to one side........ 59.8 ohms
Resistance to other side........ 64.3 ohms

PROCEDURE FOR SETTING UP PUSH BUTTONS

The push buttons under the dial will provide instant tuning to any one of six stations. Make a list of the desired stations; two between 540 and 1080 kilocycles, two between 670 and 1270 kilocycles, and the last two between 1000 and 1630 kilocycles.

The adjustments of the push buttons are reached from the rear and are located above the chassis in the center. The top of the plate is numbered from 1 to 6 inclusive and there are two adjustments under each number. Numbers 1 and 2 cover the two stations between 1000 and 1630 kilocycles, numbers 3 and 4 cover the two stations between 670 and 1270 kilocycles and numbers 5 and 6 cover the two stations between 540 and 1080 kilocycles.

To set the aforementioned adjustments proceed as follows:

1. Turn band switch to band (1) (band indicator located in lower center of dial).
2. Tune in, by means of the station selector knob, the station selected above for number 1.
3. Turn band switch to (P.B.) position.
4. Loosen wing nut and remove the tuning eye located directly above the permeability tuner.
5. Turn the adjustment screw directly under number 1 until the station tuned in step number 2 is again received and then carefully adjust it until the tuning eye is the nearest to closed.
6. Turn the adjustment directly below the aforementioned adjustment until the tuning eye is the nearest to closed and the station is received the clearest.

The above procedure is repeated for each of the five remaining stations. The tuning eye should then be carefully replaced.

MODEL B11

Voltages—Line 117 volts A.C. Power consumption 165 watts. Volume control maximum. Loop antenna not connected and set tuned off station. Meter 20,000 ohms per volt. Meter scales used are as follows: Scale "A," 10 volts; Scale "B," 50 volts; Scale "C," 250 volts; Scale "D," 1,000 volts.

	Meter Scale	Voltage
6AB7 RF Tube		
Plate (8) to ground	"C"	225 volts
Screen (6) to ground	"C"	180 volts
Cathode (5) to ground	"A"	2.6 volts
6SA7 1st Det.-Osc. Tube		
Plate (3) to ground	"D"	260 volts
Screen (4) to ground	"C"	130 volts
Cathode (6) to ground	"A"	0.0 volts
6SK7 I.F. Amp. Tube		
Plate (8) to ground	"D"	230 volts
Screen (6) to ground	"C"	125 volts
Cathode (5) to ground	"A"	1.7 volts
6SQ7 2nd Det., AVC Tube		
Plate (6) to ground	"A"	0.0 volts
6U5 Tuning Eye and Volume Level Indicator Tube		
Target Plate (4) to ground	"D"	260 volts
6SQ7 Microphone Amp. Tube		
Plate (6) to ground	"B"	25 volts
Grid (2) to ground	"A"	0.0 volts
6SK7 1st Audio Tube		
Plate (8) to ground	"C"	70 volts
Screen (6) to ground	"B"	30 volts
6J5GT Driver Tube		
Plate (3) to ground	"C"	85 volts
Cathode (8) to ground	"A"	0.0 volts
6SR7 Inverter Tube		
Plate (6) to ground	"C"	75 volts
Diode Plate (4) to ground	"A"	—3 volts
Diode Plate (5) to ground	"A"	—3 volts
6F6G Output Tubes		
Plate (3) to ground	"D"	260 volts
Screen (4) to ground	"D"	260 volts
Cathode (8) to ground	"B"	15 volts
5U4G Rectifier Tube		
Filament (8) to ground	"D"	340 volts

MODELS A11,A11-PH

Voltages—Line 117 volts A.C. Power consumption 150 watts. Volume control maximum. Loop antenna not connected and set tuned off station. Meter 20,000 ohms per volt. Meter scales used are as follows: Scale "A," 10 volts; Scale "B," 50 volts; Scale "C," 250 volts; Scale "D," 1,000 volts.

	Meter Scale	Voltage
6AB7 R.F. Tube		
Plate (8) to ground	"C"	170 volts
Screen (6) to ground	"C"	155 volts
Cathode (5) to ground	"A"	2.9 volts
6SA7 1st Det.-Osc. Tube		
Plate (3) to ground	"C"	175 volts
Screen (4) to ground	"C"	105 volts
6AF6 Tuning Eye Tube		
Target (5) to ground	"C"	115 volts
6SK7 I.F. Tube		
Plate (8) to ground	"C"	175 volts
Screen (6) to ground	"C"	108 volts
6SK7 1st Aud. Tube		
Plate (8) to ground	"B"	38 volts
6J5GT Driver Tube		
Plate (3) to ground	"C"	86 volts
6J5GT Inverter Tube		
Plate (3) to ground	"C"	86 volts
6F6G Output Tube		
Plate (3) to ground	"C"	168 volts
Screen (4) to ground	"C"	175 volts
Cathode (8) to ground	"B"	15.5 volts
5U4G Rectifier Tube		
Filament (2) to ground	"D"	270 volts

MODEL B11

CONTINENTAL RADIO & TELEV. CORP.

AUTOMATIC RECORD CHANGER

This Record Changer will automatically play a series of fourteen 10" or ten 12" records of the standard 78 R.P.M. type. The records must all be one size when loading and may consist of less records than listed above. Records of the last few years with the standard eccentric or spiral stopping groove on the inside and an eccentric on the outside will operate the automatic mechanism. However, records of any size up to 12" may be played manually.

CAUTIONS

1. Never use force to start or stop the motor or any part of the record changing mechanism or pickup arm. The turntable is weighted for recording and will require about one minute to come to rest after the motor is turned off.
2. The use of records which have become warped or damaged thru improper care may cause the mechanism to jam and damage the instrument. Records which have become warped will slide on one another when playing, resulting in unsatisfactory reproduction.
3. Do not leave records on the selector arms, as they are liable to warp, particularly so in warmer climates. Keep your records in a record file (album or cabinet) when not in use. This will protect them from warping and dust.
4. If the automatic record changer is turned off by the motor switch knob while the mechanism is going thru a "change cycle" the motor will not stop until the cycle is completed and the tone arm is again in playing position. The tone arm may now be lifted to the rest position. If it is desired to turn the record changer off by the use of any other switch than the one on the changer itself, be sure to turn it off while needle is resting upon record; otherwise the selecting arms cannot be correctly reset.
5. No damage will be done if you forget to turn off changer after it has played its entire load of records. It will simply repeat the last record until stopped.
6. LEVELING—For proper operation of the record changer and recorder the unit must be level.

PHONOGRAPH NEEDLES

Various types and kinds of needles are available for use in phonograph tone arms. All have their virtues, as well as their faults, for use in ordinary phonographs, where needles can be changed after each record. For playing ten or more records at one set-up, as with this Changer, no attempt should be made to use ordinary steel or fibre points, since continued use of worn points will be likely to ruin both quality of reproduction and the records as well. Any kind of needle can be used which has a point durable enough to play ten records or more without damaging them.

It should be remembered that, no matter what the quality of the tone arm, amplifying system and speaker, all of the recorded music must pass through the needle. For this reason, it is absolutely essential that particular care be taken to use good needles, and to see that they are changed often enough so the records are not damaged and the quality of the music is not impaired.

It is recommended that a sapphire point needle be used as it is the only needle that can be satisfactorily used on both commercial records and home recordings. If any other type of needle is used it is necessary to change the needle every time it is desired to play home recordings after playing commercial records. If the same needle is used on both kinds of records (except sapphire types) the home recordings will be quickly damaged. A sapphire needle will play several thousand records before requiring replacement. Never under any condition should a needle be removed from the tone-arm head and then re-installed.

To install a needle raise the tone arm to a nearly vertical position, loosen needle screw and insert needle. The needle screw should now be firmly tightened.

SETTING FOR SIZE OF RECORD

On each post there are selecting arms (See Fig. 2 and Fig. 3) and their position determines the setting for different size records. To set for 10 or 12 inch records, it is merely necessary to grasp the posts by the knobs at the top, lift, and turn until the 10" or 12" arrows are pointing toward the center of the turntable. When in either the 10" or 12" position, the posts will snap into place except when they are lifted by hand. Figure 2 shows the Record changer with the selecting arms set for 10" records and ready to be loaded; the tone arm in the rest position. Figure 3 shows the setting for 12" records.

LOADING

After both selecting arms are adjusted so the arrows marked with the desired record size point to the center, the selected records (up to fourteen 10" or ten 12") are placed over the center pin so they will rest on the selecting arms. Place the record desired last on top.

STARTING THE CHANGER

1. Move the manual control button (See Figure 2) to the "AUTOMATIC" position.
2. Turn on the radio and push in the "PHONOGRAPH" push button.
3. Turn the switch knob on the Record Changer panel to "ON." The motor will then start and the record changer will go into automatic operation.
4. Adjust volume control to the desired intensity and tone control to the preferred setting.
5. Close lid of the cabinet to eliminate mechanical reproduction of sound by the needle.
6. When the playing is finished, be sure turntable is stopped and tone arm is in the rest position. Never leave the tone arm with the needle resting on a record or the turntable.

REJECTING A RECORD

To reject a record it is only necessary to press the switch knob on the record changer panel for a few seconds and then release. A record can be rejected any time the needle is in contact with the record.

UNLOADING

First switch off the motor. Grasp each post by its knob at the top and turn them out of the way. Return the tone arm to the rest position.

Lift the played records from the turntable. Then return the posts to the proper playing position as indicated by the arrows on the selecting arms. (See Fig. 2 and 3). The Changer may then be loaded with a new stack of records according to the size shown on the selecting arms.

MANUAL OPERATION

Manual operation is used for all home recordings and records without spiral grooves.

1. Move the manual control button as far as possible toward the needle screw and then move the tone arm to its extreme outside position. The combination of movements will result in the manual control button snapping into position at the end of the escutcheon plate and will completely free the tone arm from all locked or automatic positions.
2. Place record on turntable with the desired selection upward.
3. Turn the switch knob on the record changer panel to "On."
4. When the turntable has attained speed, lift tone arm and lower gently on to the record so the needle point enters the outside groove.
5. Adjust volume control to the desired intensity and tone control to the preferred setting.
6. Close lid of the cabinet to eliminate mechanical reproduction of sound by the needle.
7. When the playing is finished, be sure turntable is stopped and tone arm is in the rest position. Never leave the tone arm with the needle resting on a record or the turntable.

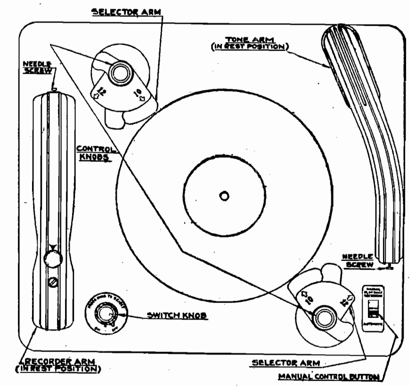


Fig. 2

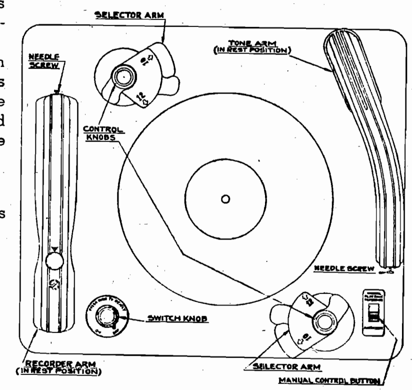


Fig. 3

ANTENNA CONTROL

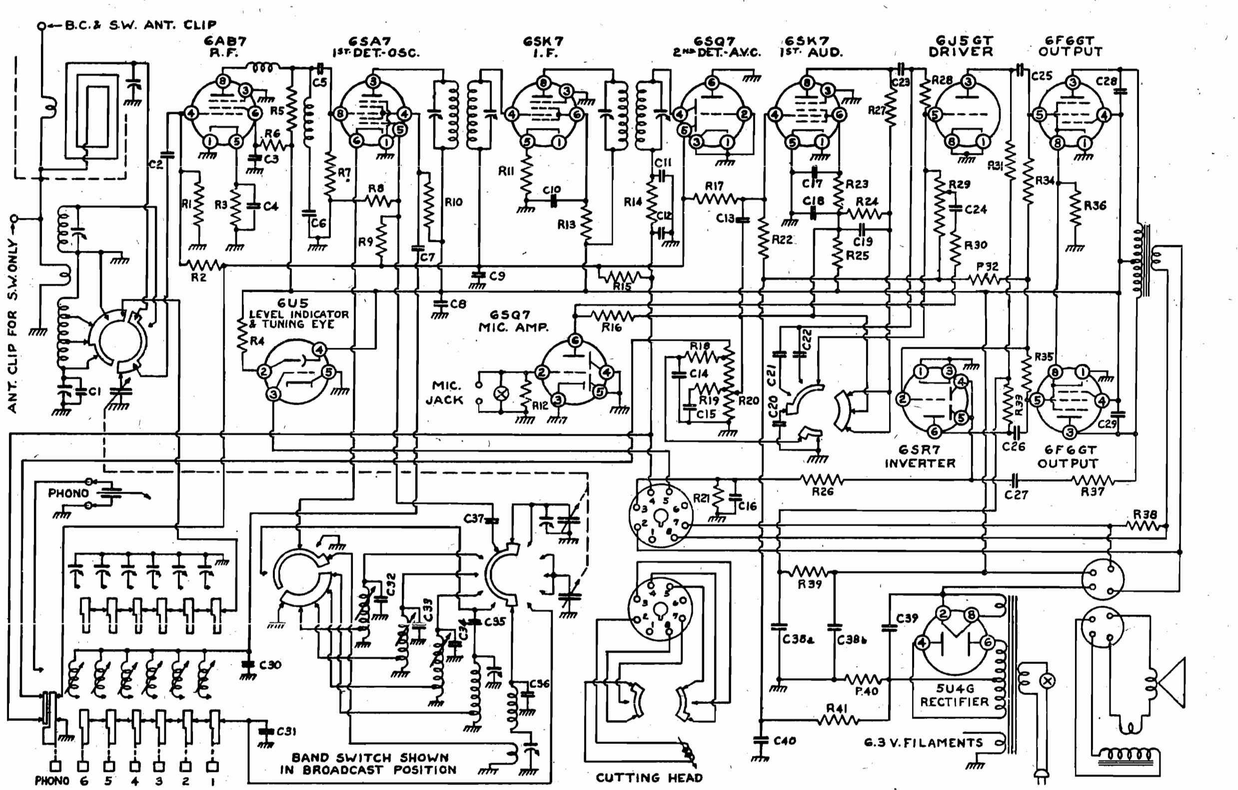
The antenna control knob is located above the dial scale and controls the position of the rotary loop antenna. On weak stations this knob should be turned right or left to the position of maximum output. In extremely noisy locations the knob should be turned to the point of minimum noise.

TELEVISION CONNECTIONS

The sound channel output from the second detector of a Television Receiver may be plugged directly into the Phono Jack, thus using the speaker and audio system of this receiver. The above connections will greatly reduce the cost of Television Receiving Equipment, because it eliminates the need for a speaker and audio system in the above equipment.

MODEL B11

CONTINENTAL RADIO & TELEV. CORP.



RESISTORS

R1	1,000,000 ohm ½ watt		R22	2,000,000 ohm ½ watt	
R2	2,000,000 ohm ½ watt		R23	500,000 ohm ½ watt	
R3	250 ohm ½ watt 10%		R24	100,000 ohm ½ watt	
			R25	50,000 ohm ½ watt	
R4	1,000,000 ohm ½ watt		R26	1,000,000 ohm ½ watt	
R5	5,000 ohm ½ watt		R27	15,000 ohm ½ watt	
R6	50,000 ohm ½ watt		R28	500,000 ohm ½ watt	
R7	100,000 ohm ½ watt		R29	100,000 ohm M.V.C.	
R8	25,000 ohm ½ watt		R30	50,000 ohm ½ watt	
R9	5,000,000 ohm ½ watt		R31	50,000 ohm ½ watt	
R10	15,000 ohm 2 watt		R32	250,000 ohm ½ watt	
R11	100 ohm ½ watt		R33	50,000 ohm ½ watt	
R12	5,000,000 ohm ½ watt		R34	250,000 ohm ½ watt	
R13	50,000 ohm ½ watt		R35	300,000 ohm ½ watt	
R14	50,000 ohm ½ watt		R36	220 ohm 1 watt	
R15	1,000,000 ohm ½ watt		R37	25,000 ohm 1 watt 10%	
R16	500,000 ohm ½ watt				
R17	1,000,000 ohm ½ watt		R38	50 ohm ½ watt	
R18	30,000 ohm ½ watt		R39	20,000 ohm ½ watt	
R19	30,000 ohm ½ watt		R40	25 ohm 1 watt (10% wire wound)	
R20	500,000 ohm V.C.				
R21	400,000 ohm ½ watt		R41	250,000 ohm ½ watt	

CONDENSERS

C1	.00002	10%—Mica	C22	.00025	Mica
C2	.0001	Mica	C23	.01	400
C3	.05	400	C24	.02	400
C4	.05	200	C25	.02	400
C5	.0001	Mica	C26	.02	400
C6	.00006	5%—Mica	C27	.05	400
C7	.05	400	C28	.005	600
C8	.1	400	C29	.005	600
C9	.05	200	C30	.003	5%—Mica
C10	.05	400	C31	.0005	2½%—Mica
C11	.0001	Mica	C32	.0003	2½%—Mica
C12	.0001	Mica	C33	.00025	2½%—Mica
C13	.05	400	C34	.0002	2½%—Mica
C14	.02	200	C35	.003	5%—Mica
C15	.02	200	C36	.00003	10%—Mica
C16	.1	200	C37	.0001	Mica
C17	.05	400	C38a	16.	450
C18	.25	400	C38b	20.	450
C19	.05	400	C39	25.	450
C20	.001	600	C40	.25	200
C21	.0001	Mica			

POWER
110-120 V.
60 cycles
AC.

DO NOT PLUG INTO A DC OUTLET.

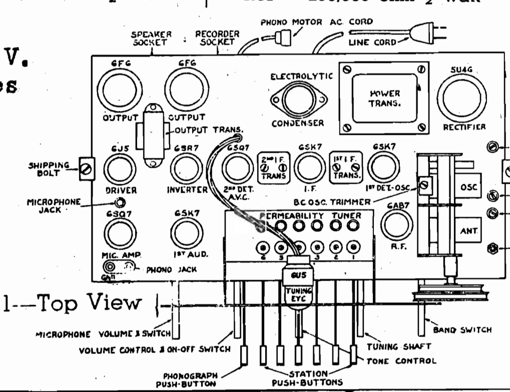


Fig. 1—Top View

Issue A — August 1940

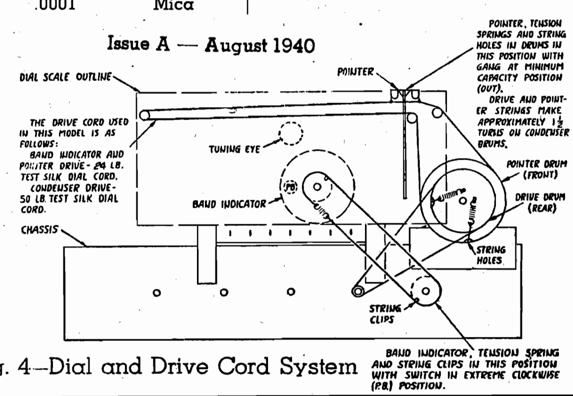


Fig. 4—Dial and Drive Cord System

MODELS K7, B11

CONTINENTAL RADIO & TELEV. CORP.

RECORDER

This recorder will make up to 12 inch recordings. The recordings may be made from the microphone or radio; also the microphone and radio may be blended together in one recording.

CAUTIONS

1. Never try to record on a blank that is warped even though it be just slight.

2. When recording the recording needle will cut a fine thread, just a little thicker than a human hair, from the record blank and this thread should pile up toward the center of the blank. After the recording is completed, this thread may be gathered up and removed. Although it is possible to remove this thread continually with a soft brush while the record is being cut, considerable care must be taken so that the thread is not tangled around the recording needle or the turntable slowed up by touching it; since either will cause poor recordings.

3. If the shavings cut from the record gather under the recording needle the needle screw should be loosened and then retightened, being sure to keep the needle all the way in. The resulting minute change in the angular position of the needle will probably correct the trouble.

4. The recorder arm must be in the rest position when playing back recordings or using the automatic record changer.

5. Never try to remove or replace a recorded or plain blank with the motor running.

6. Be sure the recording needle is tight after each recording. Should it loosen during a recording, it will chatter and ruin the record.

7. The recording needle is razor sharp and must not be dropped or allowed to rest on the turntable. The recording needle should only be in contact with the record while actually recording or adjusting the Recorder Arm Height.

8. If the microphone is held too close to the speaker it will feed back and start a loud "howl." When recording from the microphone it should be kept well away from the cabinet and with the back toward the cabinet. When not recording the microphone volume control should be turned to the off position to prevent feedback or "howl."

9. Never record nearer than one and one-half inches from the center of the record. With some recording discs it is not possible to record this close to the center because of a large label; do not record closer than one-fourth inch from label.

TO RECORD A RADIO PROGRAM

1. Place a blank recording disc on the turntable with the driving pin, located in the top of the turntable about one inch from the center, in one of the three holes provided.

2. Set "Phono-Radio-Micro" Switch to Radio Position. (Model K7)

2. Move the manual control button as far as possible toward the needle screw and then move the tone arm to its extreme outside position. The combination of movements will result in the manual control button snapping into position at the end of the escutcheon plate and will completely free the tone arm from all locked or automatic positions. (Model B11)

3. Turn radio on and tune desired station.

4. Turn phonograph motor on.

5. Lift recorder arm about three inches and move it to the edge of the blank. This will switch from playback to record and decreases the volume. While holding the recorder arm adjust the volume control until the volume level indicator (tuning eye) almost closes and lower the recorder arm gently on to the record so the recording needle starts about one-fourth inch in from the edge of the blank disc. On loud music passages the volume level indicator should completely close.

6. After the recording is complete (never record closer than one and one-half inches from the center) the recorder arm should be returned to its rest position. Never leave the recorder arm resting on record or turntable.

TO RECORD FROM THE MICROPHONE

The procedure is the same as recording a radio program except (the volume control is set to minimum and the microphone volume control is used Mod.B11) (Mod.K7, Phono-Radio-Micro Sw. turned to Mike Position)

TO RECORD MICROPHONE AND RADIO PROGRAM AT THE SAME TIME

The procedure is the same as recording a radio program except the microphone volume control is also used. The two may be blended as desired or only one used part of the time and by changing the volume controls slowly, fading from one to the other is obtained. Model B11 only.

PLAYBACK

As soon as a recording is completed it may be instantly played back after the recorder arm is returned to its rest position and the "Phono" button is pushed in. (See Manual Playback)

RECORDER ARM PRESSURE ADJUSTMENT

The pressure on the recording needle which determines the groove depth is controlled by the chrome-plated knob on the top of the recorder arm. This knob has engraved upon it the letters "L, M and H" indicating Light, Medium and Heavy pressures and provides an easy means of compensating for different types of recording needles, blanks or for the wearing of the recording needle after it is used. In general, the machine is properly set at the factory so that it will cut the average record correctly when this knob is in the "M" position. No "M" Pos. for Mod.K7.

If the groove is too shallow, the playback needle will not stay in the groove. If it is too deep, not enough wall will be left between grooves and the playback needle will break through from one track to the next after a few playings.

The proper depth of groove will leave about the same space between the groove as the groove is wide. Hold a finished record toward the light and you can usually see if the grooves are spaced correctly.

A properly cut groove will leave a shaving just a little heavier than a human hair.

RECORDER ARM HEIGHT ADJUSTMENT

The height of the recorder arm can be varied by means of the slotted screw head which is on the top of the arm and toward the back, approximately flush with the surface. In order to make this adjustment, it is necessary to insert a recording needle and, with the motor turned OFF and a record blank on the turntable, place the recorder arm VERY CAREFULLY in the cutting position. Now raise or lower the recorder arm by means of the above mentioned adjustment until the needle screw is approximately centered in the slot at the front end of the recorder arm.

RECORDING NEEDLE

The recording needle or cutting stylus supplied with this recorder is a "Permo* Point" and will make about *350 six-inch recordings. The condition of the recording needle may be determined by comparing the color of the newly recorded portion of the record with the unrecorded portion. A good recording needle will result in grooves having a higher brilliance than the unrecorded portion; as the needle wears or if the needle is poor to begin with the cut portion will have less lustre and will eventually appear gray.

*25 Recordings for Mod.K7(no Permo Point)

In case the recording needle tends to chatter as it is recording, it is advisable to replace it with a new needle.

The recording needle may be removed and replaced as desired, provided the adjustments are checked before recording. In all events, every precaution must be taken to protect the cutting point at all times; in cutting it should be lowered GENTLY on the blank with the turntable running.

INSTALLING NEW RECORDING NEEDLE

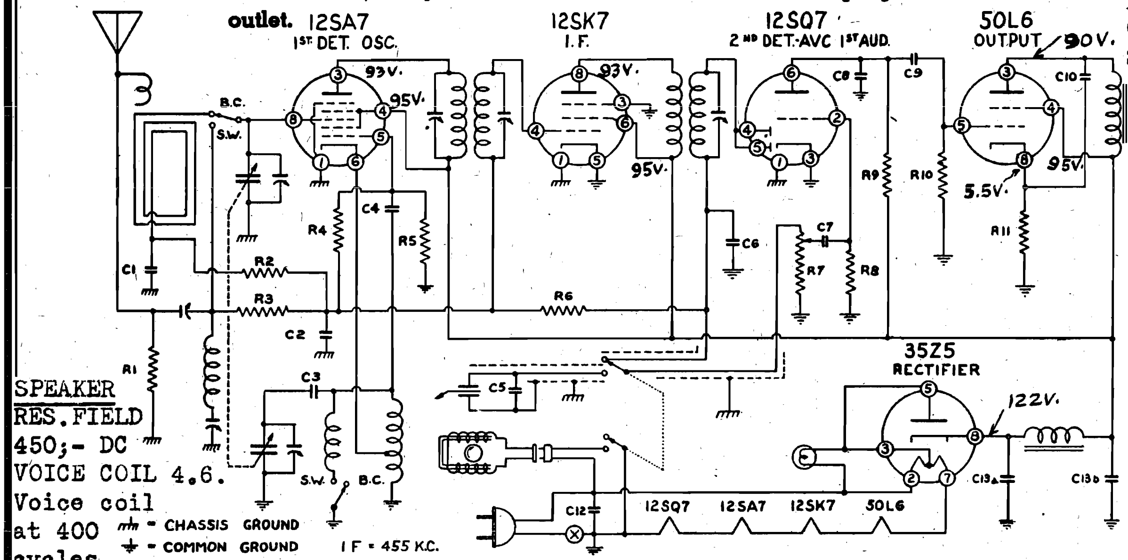
The recording needle is provided with a flat on one side and should be inserted in the needle hole so this flat is toward the needle screw, now with the needle all the way in tighten it by means of the needle screw. The recorder arm adjustments must now be checked. See "Recorder Arm Height Adjustment" and "Recorder Arm Pressure Adjustment."

CONTINENTAL RADIO & TELEV. CORP.

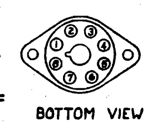
MODELS J55, XJ55, XJ55-PH

This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (A.C.). **Never plug in a D.C. outlet.**

For ALIGN. & COIL DATA - SEE INDEX.



SPEAKER RES. FIELD 450;- DC VOICE COIL 4.6. Voice coil at 400 cycles.



XJ55

RESISTORS

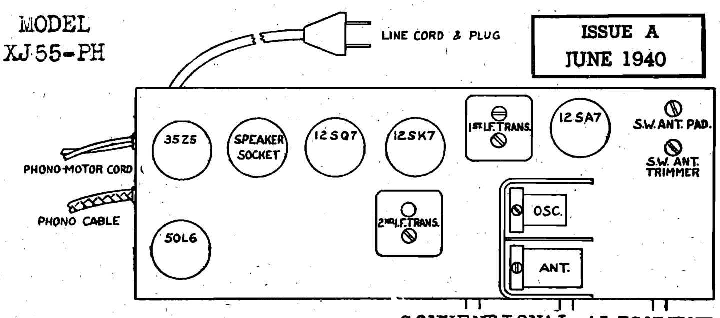
No.	Ohms	Watts
R1	250,000	1/4
R2	100,000	1/4
R3	250,000	1/4
R4	10,000,000	1/4
R5	25,000	1/4
R6	2,000,000	1/4
R7	500,000	V.C.
R8	5,000,000	1/4
R9	250,000	1/4
R10	500,000	1/4
R11	150—10%	1/4
R12	150,000	1/4

CONDENSERS

No.	Capacity (Mfd.)	Volts
C1	.05	200
C2	.05	200
C3	.02	200
C4	.0001	Mica
C5	.005	400
C6	.00025	Mica
C7	.005	400
C8	.0005	Mica
C9	.01	400
C10	.02	400
C11	.2	200
C12	.05	400
C13a	30.	150
C13b	20.	150

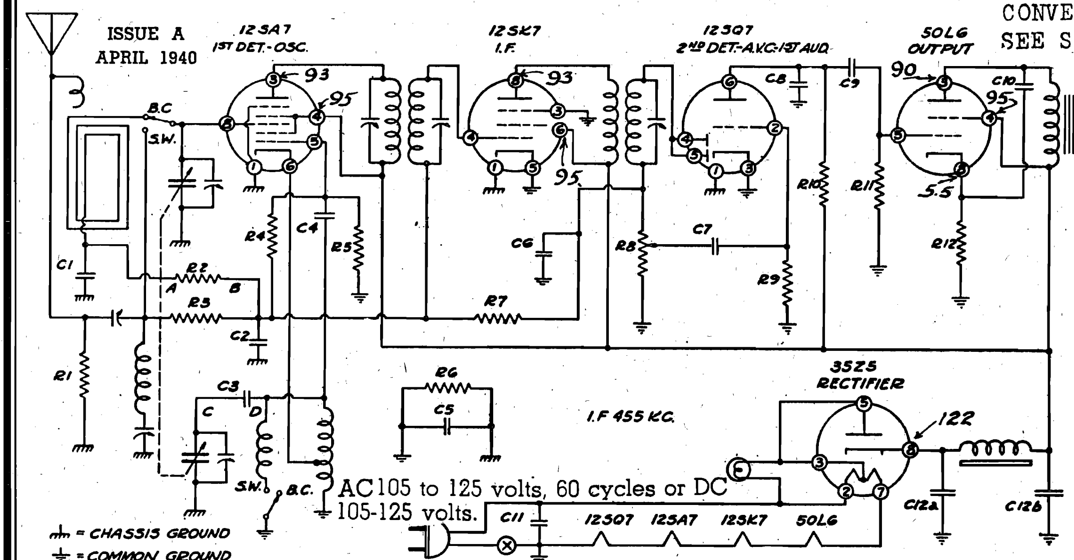
MODEL XJ55-PH

ISSUE A JUNE 1940



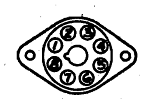
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

ISSUE A APRIL 1940



AC 105 to 125 volts, 60 cycles or DC 105-125 volts.

MODEL J55 & XJ55



For SPEAKER & COIL DATA - SEE INDEX.

(Band Switch)
right 535 to 1630 kilocycles
left 2.8 to 6.58 megacycles

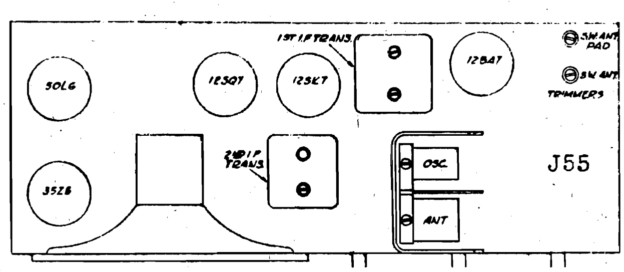
In model J55 all common grounds become chassis grounds. C1, C3, C5, R2, and R6 are omitted Point "A" is connected to point "B" and point "C" to point "D."

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C8	.0005	Mica
C2	.05	200	C9	.01	450
C3	.02	200	C10	.02	400
C4	.0001	Mica	C11	.05	400
C5	.2	200	C12a	30. Elec.	150
C6	.00025	Mica	C12b	20. Elec.	150
C7	.005	400			

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	250,000	1/4	R7	2,000,000	1/4
R2	100,000	1/4	R8	500,000	V.C.
R3	250,000	1/4	R9	5,000,000	1/4
R4	10,000,000	1/4	R10	250,000	1/4
R5	25,000	1/4	R11	500,000	1/4
R6	150,000	1/4	R12	150—10%	1/4

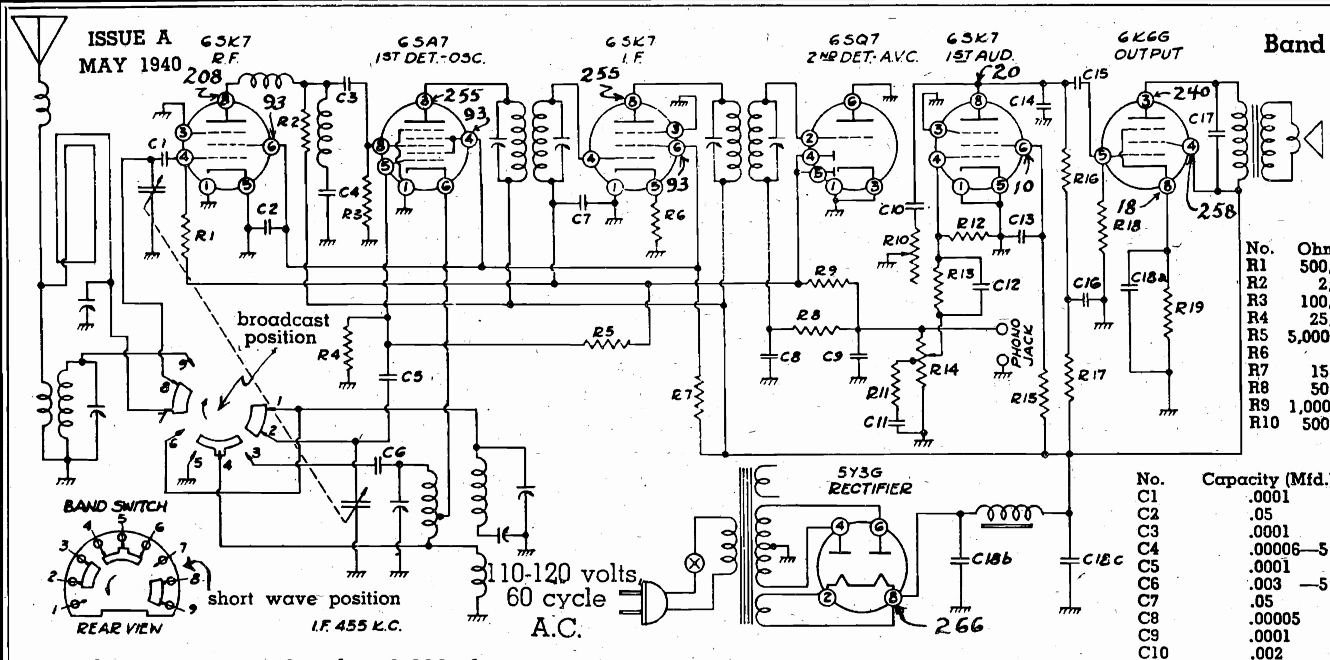


J55

MODEL A77

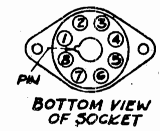
CONTINENTAL RADIO & TELEV. CORP.

ISSUE A
MAY 1940



Band Switch 535 to 1630 kilocycles
1582 to 1630 kilocycles.

MODEL A77



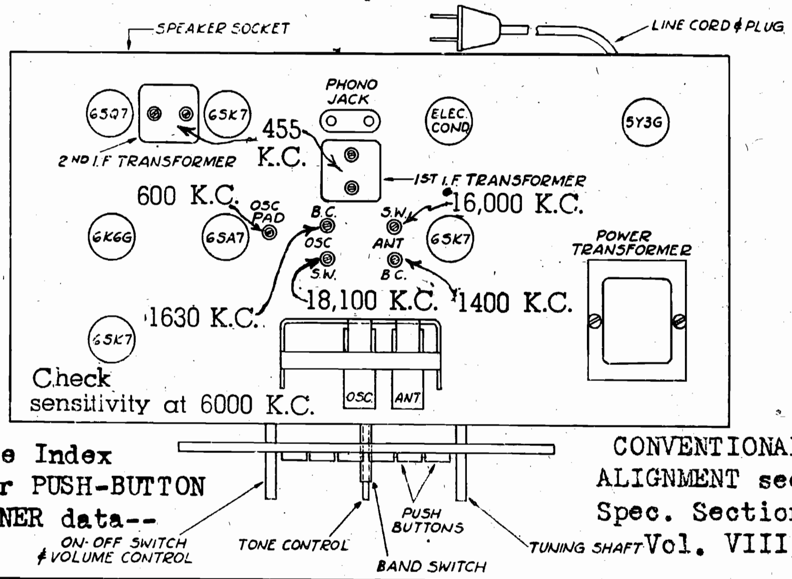
RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	500,000	¼	R11	15,000	¼
R2	2,500	½	R12	2,000,000	¼
R3	100,000	½	R13	2,000,000	¼
R4	25,000	½	R14	500,000	V.C.
R5	5,000,000	¼	R15	2,000,000	¼
R6	100	¼	R16	250,000	¼
R7	15,000	2	R17	50,000	¼
R8	50,000	¼	R18	500,000	¼
R9	1,000,000	¼	R19	600—10%	½
R10	500,000	T.C.			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C11	.05	200
C2	.05	400	C12	.05	200
C3	.0001	Mica	C13	.25	400
C4	.00006—5%	Mica	C14	.00025	Mica
C5	.0001	Mica	C15	.01	400
C6	.003 —5%	Mica	C16	.25	400
C7	.05	200	C17	.002	600
C8	.00005	Mica	C18a	20.	25
C9	.0001	Mica	C18b	30.	350
C10	.002	600	C18c	30.	350

All voltages measured with a 1,000 ohm per volt meter on the 300 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 60 watts.



See Index for PUSH-BUTTON TUNER data--

CONVENTIONAL ALIGNMENT see Spec. Section Vol. VIII.

Speaker (Part No. P4283) 10" PM.
D. C. voice coil resistance........................3.7 ohms
Voice coil impedance at 400 cycles........................4.1 ohms

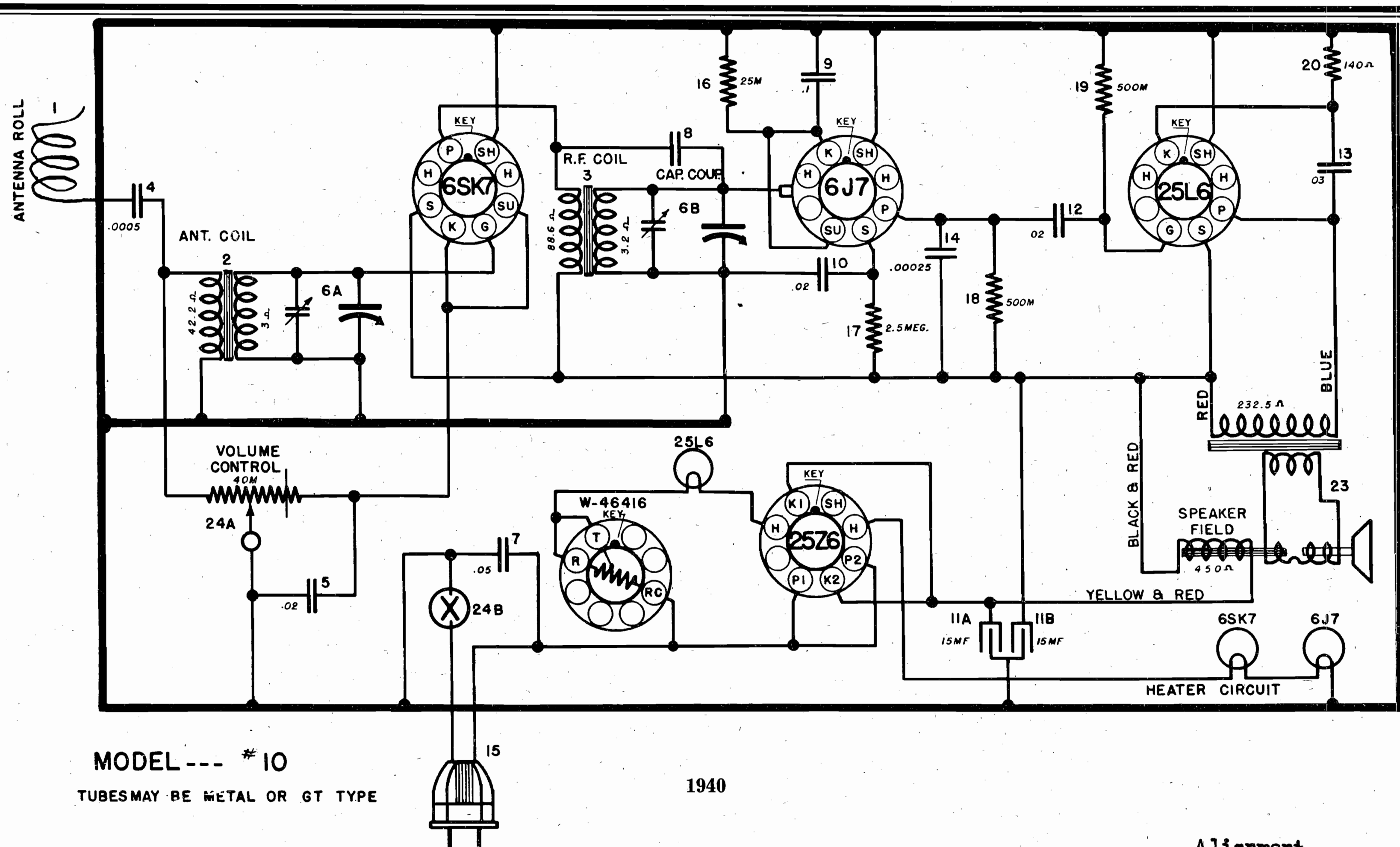
S. W. Antenna Coil (Part No. P3198)
Looking at the connection end starting at the chassis in a clockwise direction the terminals are: No. 1, plate; No. 2, B+; No. 3, grid; No. 4, pad.
Primary—No. 3 and No. 4—Resistance........................ .08 ohm
Secondary—No. 1 and No. 2—Resistance........................ .37 ohm

Oscillator Coil (Part No. P4194)
Looking at the mounting strip end in a clockwise direction starting at the chassis, the terminals are: No. 1, ground; No. 2, cathode; No. 3, open; No. 4, pad; No. 5, switch; No. 6, grid; No. 7, grid; No. 8, open.
B.C. Primary—No. 1 and No. 5—Resistance........................ .29 ohm
S.W. Primary—No. 5 and No. 2—Resistance........................ .06 ohm
B.C. Secondary—No. 4 and No. 6—Resistance........................ 5.7 ohms
S.W. Secondary—No. 2 and No. 7—Resistance........................ .08 ohm

First I.F. Transformer (Part No. P4108)
Primary—Blue, plate; red, B+—Resistance........................ 18.2 ohms
Secondary—White, grid; black, AVC—Resistance........................ 15.1 ohms

Second I.F. Transformer (Part No. P4109)
Primary—Blue, plate; red, B+—Resistance........................ 20.8 ohms
Secondary—White, diode; black, AVC—Resistance........................ 17.4 ohms

THE CROSLEY CORP.



MODEL --- #10

TUBES MAY BE METAL OR GT TYPE

1940

SOCKET VOLTAGES TAKEN @ 117.5 VOLT LINE (A. C.)

		SOCKET PIN NUMBER							
Tube	Function	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SK7	R. F. Amplifier	GND.	H	3.0	GRID	3.0	92	H	91
6J7	Detector	GND.	H	20	8	2.0	—	H	2.0
25L6	Output	GND.	H	82	91	GRID	N.C.	H	5.8
25Z6	Rectifier		H	A.C.	120	A.C.		H	120
W-46416	Ballast Resistor—165 Ohms (Cold) Between No. 3 and No. 7 Pins with No. 7 and No. 8 Pins Tied Together.								

Power Consumption @ 117.5 Volts Line—Approximately 43 Watts.
D. C. Drop Across Speaker Field—29 Volts.
Maximum Power Output Approximately 2.0 Watts.

Alignment

(a) Connect the output lead of the signal generator through a .0001 mf. condenser to the antenna lead on the receiver.
(b) Open the gang condenser all the way.
(c) Set the generator to 1712 kilocycles.
(d) Adjust the trimmer condensers on the gang until the 1712 kc. signal is heard. The gang should just 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.

MODEL 10
MODELS 11, J11
MODELS 12, J12,
13, J13, 14, J14

THE CROSLEY CORP.

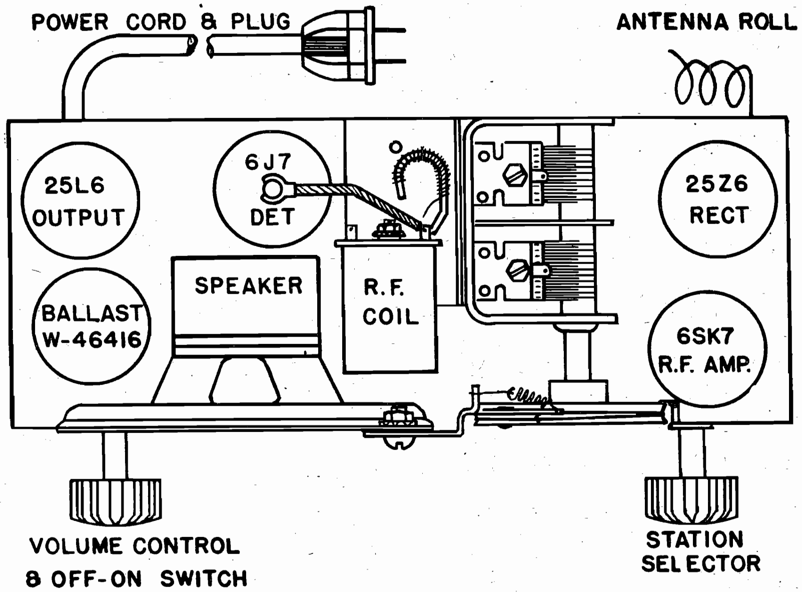


Fig. 2—Top View Chassis Model 10

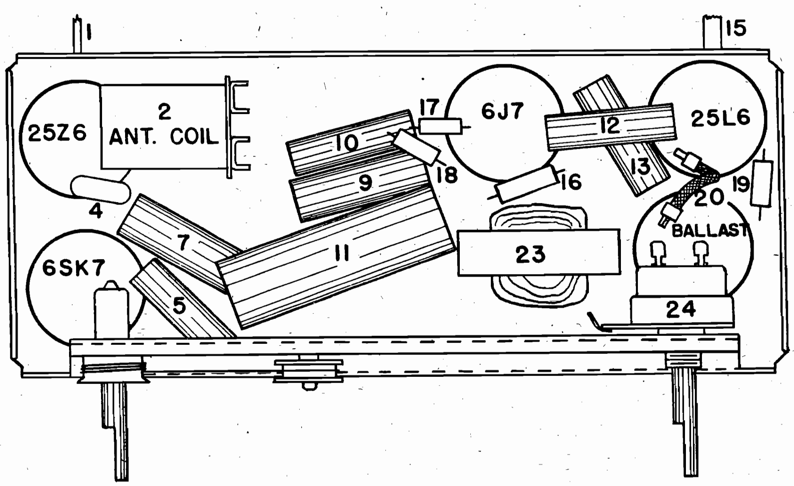
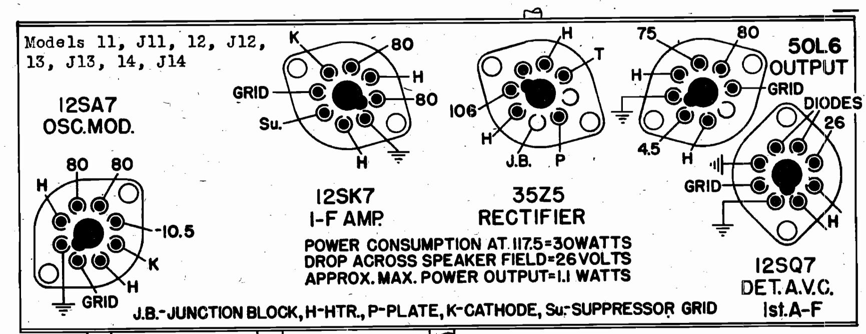


Fig. 3—Bottom View Chassis Model 10



VOLTAGES MEASURED BETWEEN SOCKET PIN & GND. SIDE OF VOL. CONT. WITH 250VOLT, 1000 OHMS. PER. VOLT METER. READINGS MAY VARY 10%

Fig 4—Socket Voltage Chart

ALIGNMENT PROCEDURE

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.

This does not apply to the models J-11 as the power supply is isolated from the chassis by a .25 mf. condenser.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 50L6GT 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 100 mmf. condenser to the antenna connection (Blue or Red lead extending from rear of loop) 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 7, located in top of 2nd I-F assy., (Fig. 2) for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers, item 6, located on top of 1st I-F assy., (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.

Models 11, J11

Aligning the R-F Amplifier.

(a) Set the signal generator to 1650 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser (Fig. 3) B. C. "OSC" so that the 1650 kilocycle signal is heard. It is not necessary that the receiver tunes 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 condensers B. C. "ANT" for maximum output. (Fig. 3).

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

WAVE TRAP

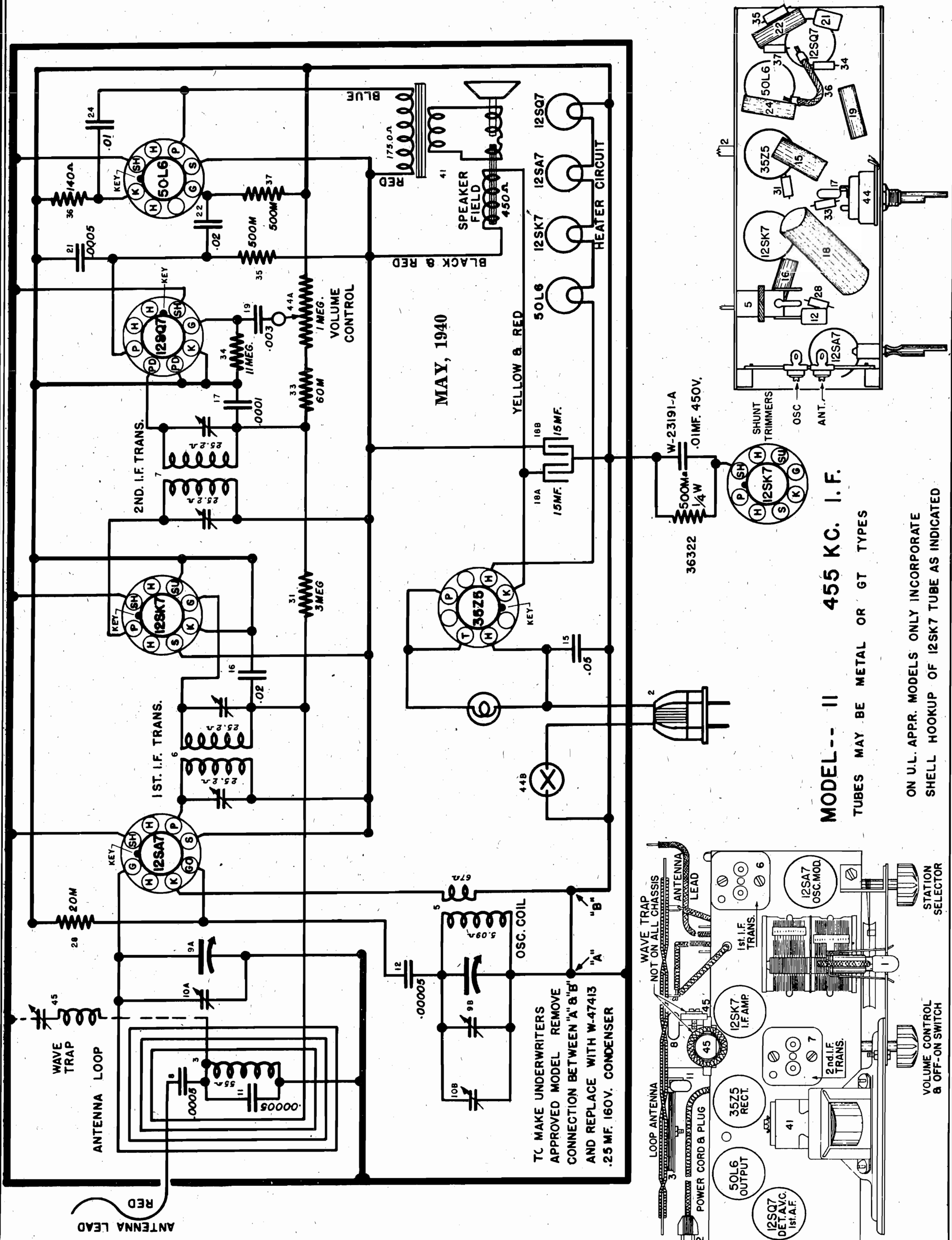
Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the loop mounting bracket (Fig. 2) and consists of a coil, and a trimmer condenser as illustrated by the dotted lines in the Wiring Diagram (item 45).

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 50 mmf. condenser into the antenna terminal of the receiver. With the gang condenser set at approximately 60 on the dial 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.

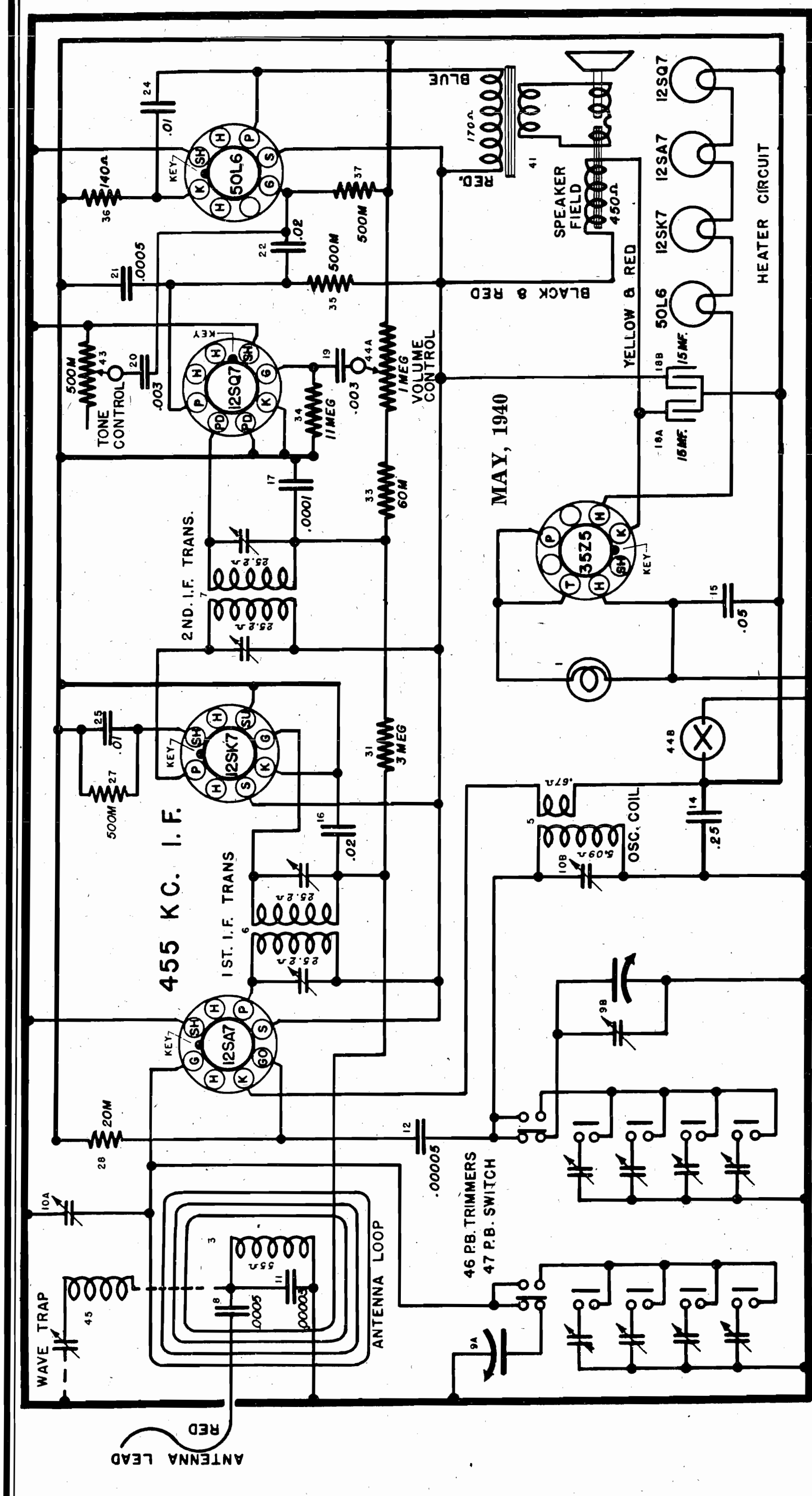
THE CROSLEY CORP.

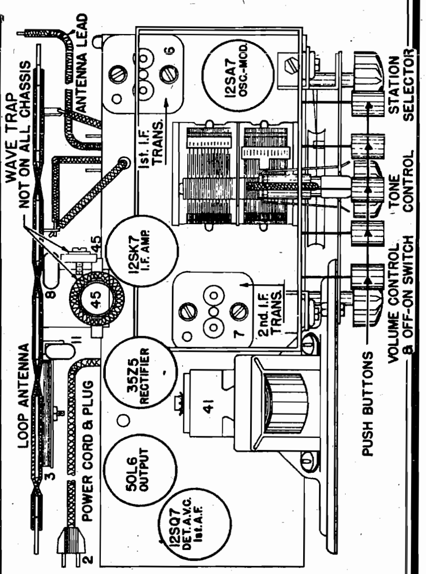
MODELS 11, J11

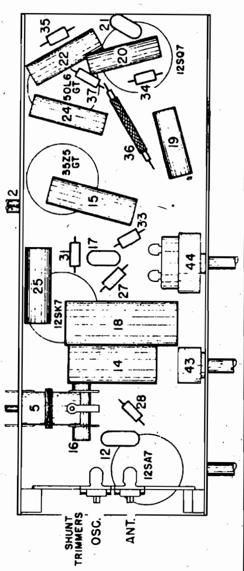


MODELS 12, J12

THE CROSLEY CORP.

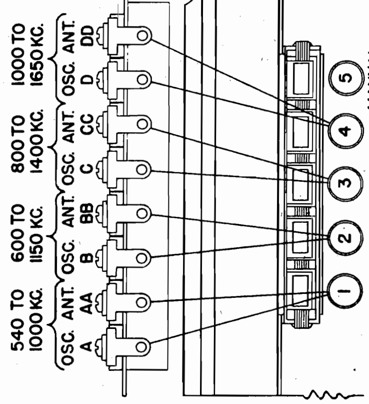






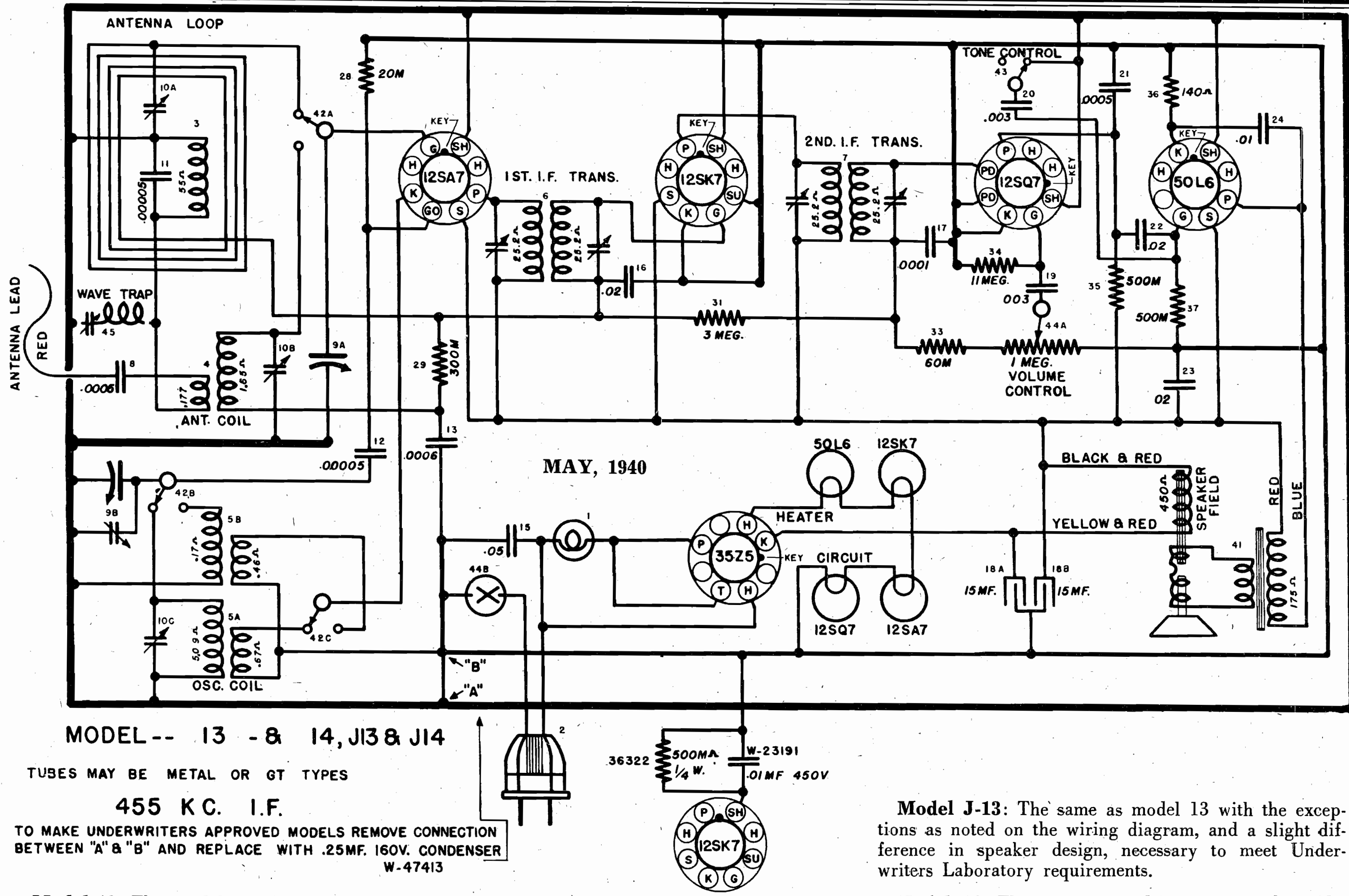
For voltage and wave trap adjustment, See Model 11

Trim OSC at 1650 KC
Trim ANT at 1400 KC



THE CROSLEY CORP.

MODELS 13, J13, 14, J14



MAY, 1940

MODEL-- 13 -& 14, J13 & J14

TUBES MAY BE METAL OR GT TYPES

455 KC. I.F.

TO MAKE UNDERWRITERS APPROVED MODELS REMOVE CONNECTION BETWEEN "A" & "B" AND REPLACE WITH .25MF. 160V. CONDENSER W-47413

ON ALL U.L APPR. MODELS ONLY INCORPORATE SHELL HOOKUP ON 12SK7 TUBE AS INDICATED

Model 13: This model is a five-tube, two band superheterodyne receiver. It is designed for operation on 117 volt power circuits either D. C. or A. C. (50-60 cycles).

The tuning range is divided into two bands as follows:

540 to 1,600 Kilocycles (American Broadcast)
6.0 to 15.0 Megacycles (High Frequency or Foreign Band)

Model J-13: The same as model 13 with the exceptions as noted on the wiring diagram, and a slight difference in speaker design, necessary to meet Underwriters Laboratory requirements.

Model 14: The same as model 13 except the addition of a two position tone control connected as shown by items 43, a two position switch and 20, a .003 mf. condenser.

Model J-14: The same as model 14 with the exceptions as noted on the wiring diagram, and a slight difference in speaker design, necessary to meet Underwriters Laboratory requirements.

MODELS 13, J13,
14, J14

THE CROSLEY CORP.

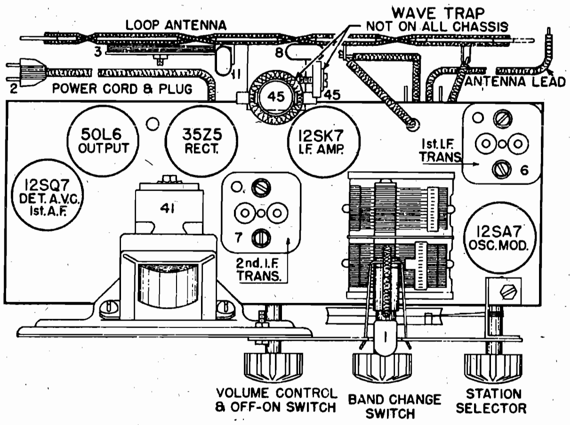


FIG. 2—Top View Model 13

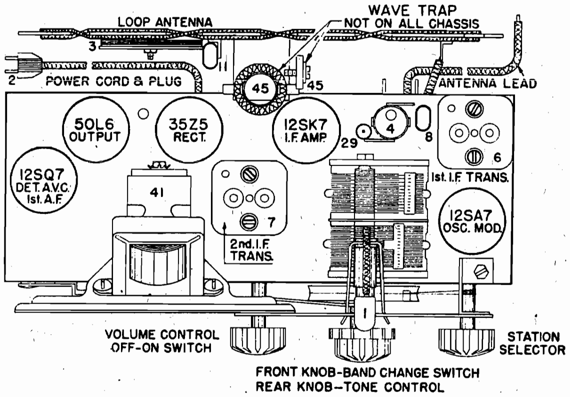


Fig. 3—Top View Model 14

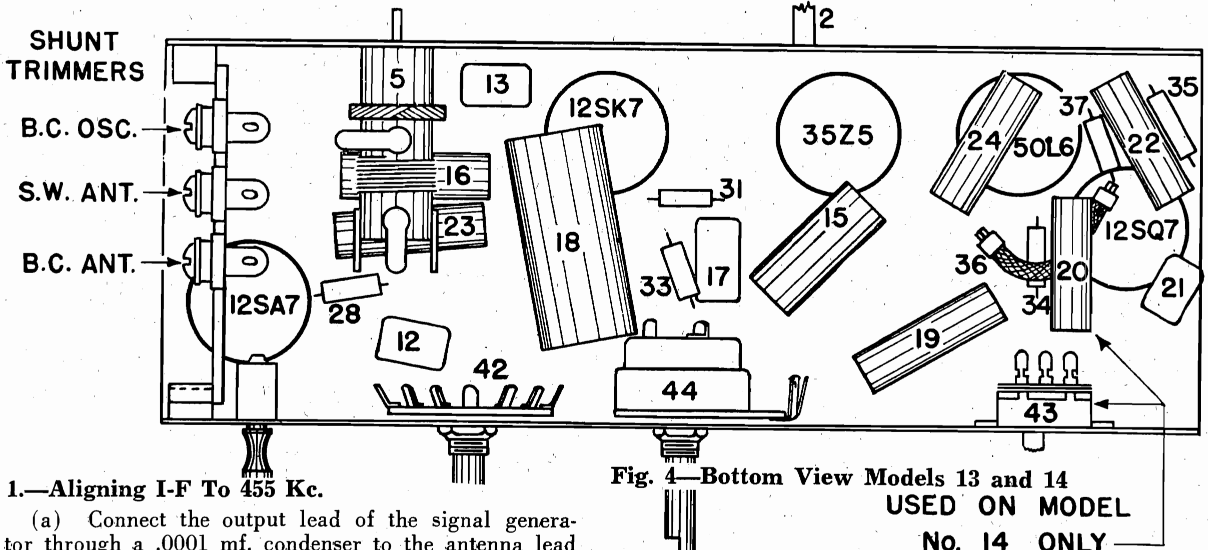


Fig. 4—Bottom View Models 13 and 14

1.—Aligning I-F To 455 Kc.

(a) Connect the output lead of the signal generator through a .0001 mf. condenser to the antenna lead extending from the rear of the chassis. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If necessary a small condenser (.001 mf.) should be connected in series with the ground lead of the signal generator and the chassis.

(b) Open tuning gang condenser all the way (plates completely out of mesh). Turn volume control to maximum. On models 14 and J-14 turn tone control switch to right (treble). Turn band switch to the B. C. (left) position.

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the two trimmer condensers on top of 2nd I-F assembly (Fig. 3) for maximum output.

(e) Adjust the two trimmer condensers on top of the 1st I-F assembly (Fig. 3) for maximum output.

(f) Repeat (d) and (e) for more accurate adjustments.

2.—Aligning R-F Amplifier.

The short wave band 6-15 mc., must be aligned before the Broadcast Band 540-1600 kc.

(a) Connect the signal generator output lead through a dummy antenna (400 ohm carbon resistor) to lead (Blue or Red) extending from rear of chassis. Turn the band switch to S. W. (right) and open tuning condenser all the way.

(b) Set signal generator to 15.0 megacycles.

(c). Adjust the S. W. "OSC" trimmer condenser (Fig. 2) (on rear section of gang) for maximum output. The gang should just tune through this signal.

(d) Tune in 15.0 mc. signal with gang and while slowly rocking gang through signal, adjust the S. W. "ANT" trimmer condenser for maximum output. (Center trimmer on right end of chassis).

NOTE: When aligning the Short Wave band care should be exercised so that the circuits are aligned on the fundamental rather than on the image frequency which is approximately 910 kilocycles more than the fundamental. To check this increase the output of the signal generator approximately 10 times and try to tune in both, the fundamental, at the signal generator frequency as indicated on the dial and the image which should be approximately 910 kilocycles lower (approximately 14) on the dial.

(e) Repeat (c) and (d) for more accurate adjustments.

(f) Replace 400 ohm carbon antenna dummy with a .0001 mf. condenser. Turn band switch to the Broadcast band, open gang condenser all the way, etc.

(g) Set the signal generator to 1650 kilocycles.

(h) Adjust B. C. "OSC" trimmer (rear trimmer right end of chassis) Fig. 3, for maximum output.

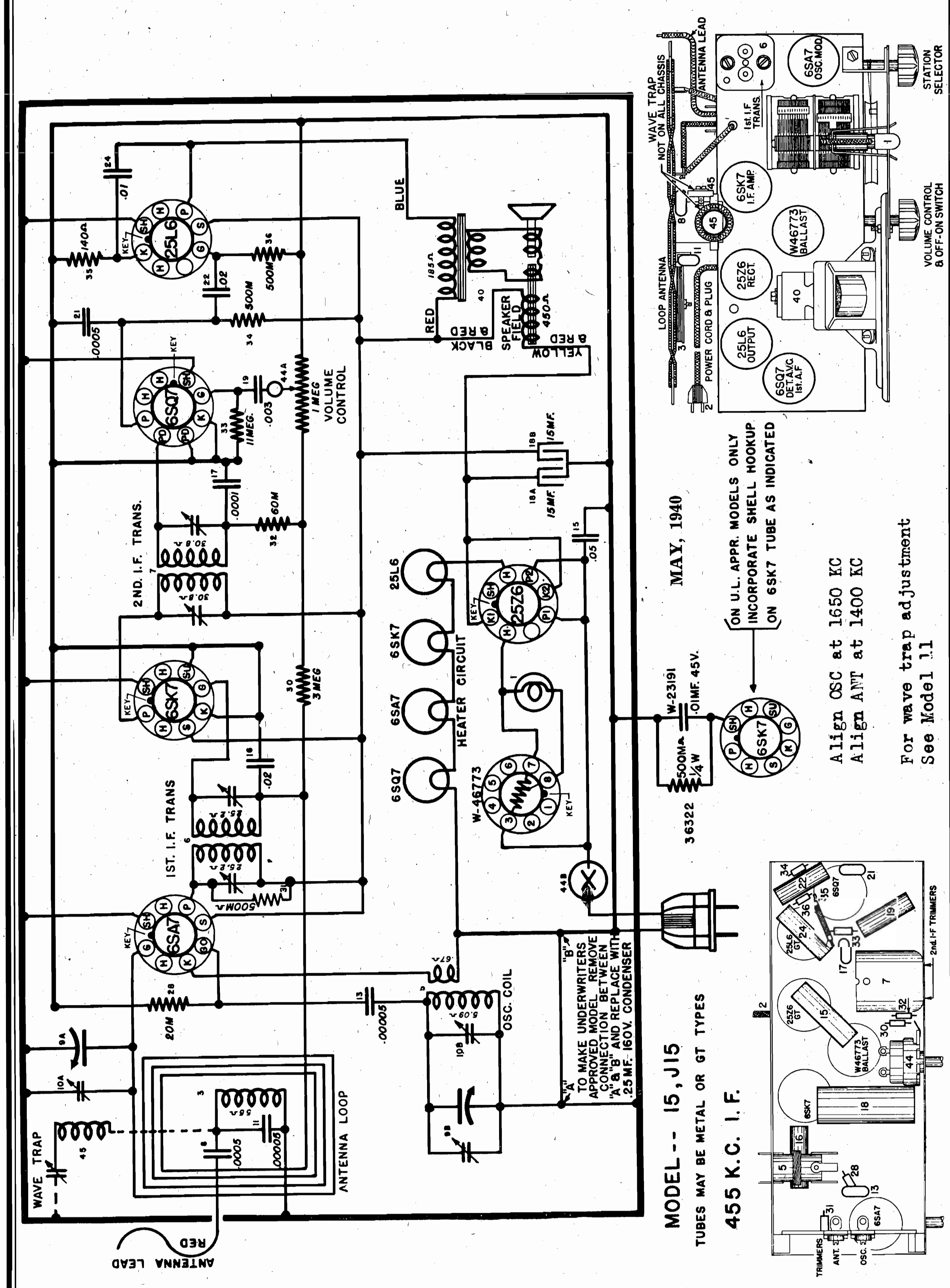
(i) Set signal generator to 1400 kilocycles.

(j) Tune in generator signal for maximum output then adjust B. C. "ANT" trimmer (front trimmer right end of chassis) Fig. 3, for maximum output.

(k) Repeat (h) and (j) for more accurate adjustments.

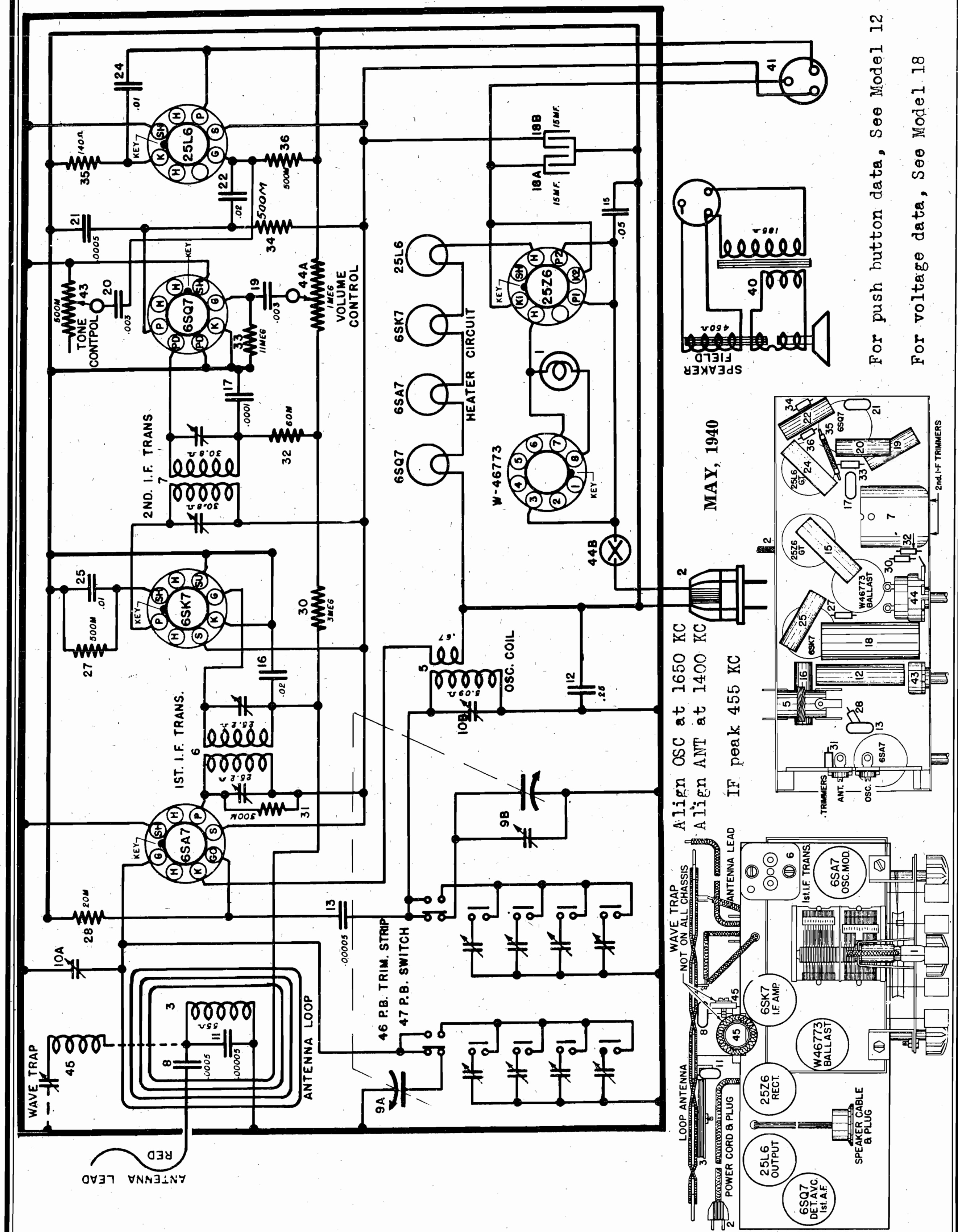
For voltage and wave trap data, See Model 11

THE CROSLEY CORP.



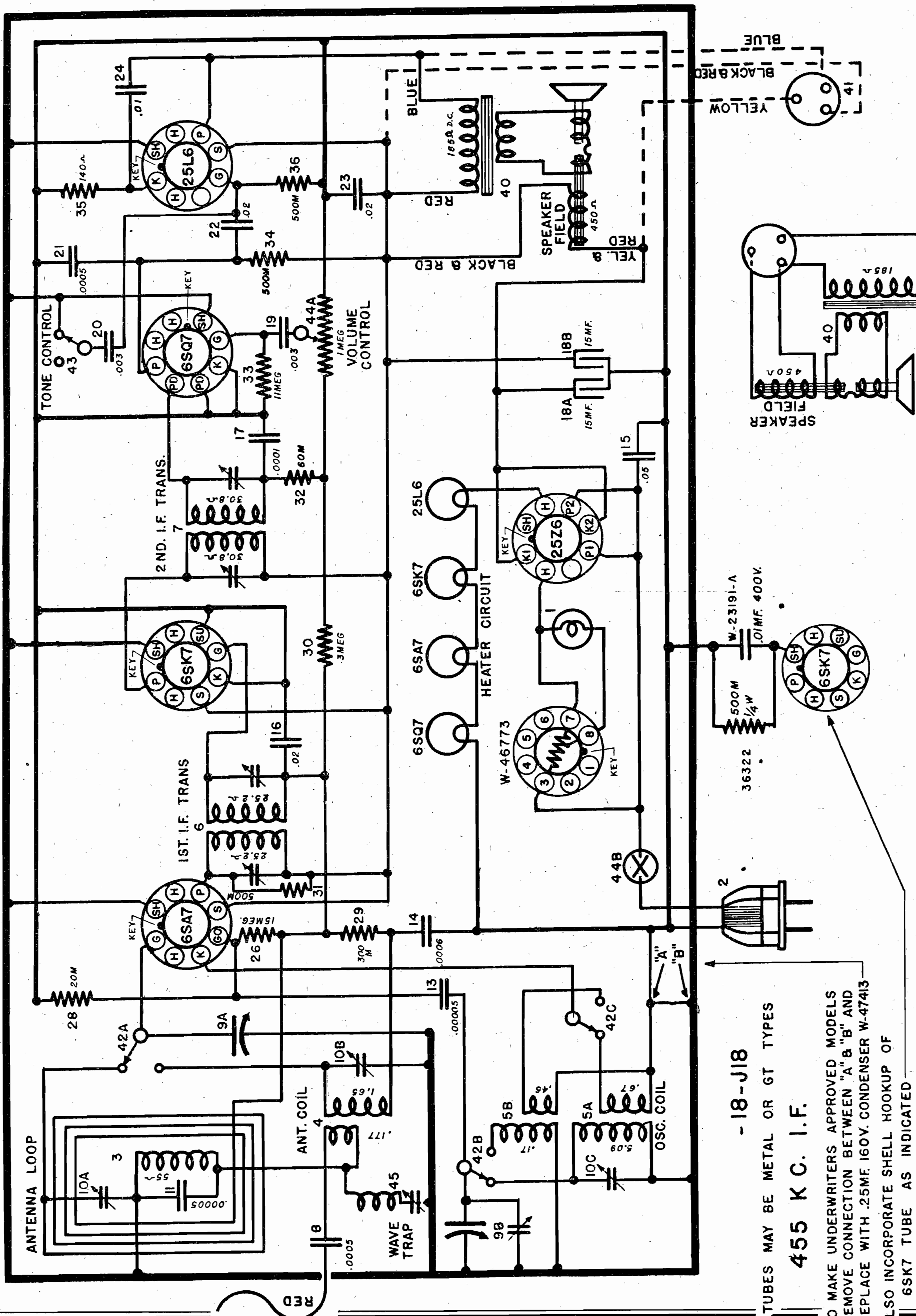
MODELS 16, J16

THE CROSLEY CORP.



THE CROSLEY CORP.

MODELS 18, J18



-18-J18

TUBES MAY BE METAL OR GT TYPES

455 K C. I.F.

TO MAKE UNDERWRITERS APPROVED MODELS
REMOVE CONNECTION BETWEEN "A" & "B" AND
REPLACE WITH .25MF. 160V. CONDENSER W-47413

ALSO INCORPORATE SHELL HOOKUP OF
6SK7 TUBE AS INDICATED

MODELS 18, J18
MODELS 15, J15, 16, J16

THE CROSLEY CORP.

1.—Aligning I-F To 455 Kc.

(a) Connect the output lead of the signal generator through a .0001 mf. condenser to the antenna lead extending from the rear of the chassis. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If necessary a small condenser (.001 mf.) should be connected in series with the ground lead of the signal generator and the chassis.

(b) Open tuning gang condenser all the way (plates completely out of mesh). Turn volume control to maximum, turn tone control switch to right (treble). Turn band switch to the B. C. (left) position.

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the two 2nd I-F trimmer condensers located through front chassis flange, below speaker (Fig. 3) for maximum output.

(e) Adjust the two trimmer condensers on top of the first I-F assembly (Fig. 2) for maximum output.

(f) Repeat (d) and (e) for more accurate adjustments.

2.—Aligning R-F Amplifier.

The short wave band 6-15 mc., MUST be aligned before the Broadcast Band 540-1600 kc.

(a) Connect the signal generator output lead through a dummy antenna (400 ohm carbon resistor) to lead (Blue or Red) extending from rear of chassis. Turn the band switch to S. W. (right) and open tuning condenser all the way.

(b) Set signal generator to 15.0 megacycles.

(c) Adjust the S. W. "OSC" trimmer condenser (Fig. 2) (on rear section of gang) for maximum output. The gang should just tune through this signal.

(d) Tune in 15.0 mc. signal with gang and while slowly rocking gang through signal, adjust the S. W. "ANT" trimmer condenser for maximum output. (Center trimmer on right end of chassis).

NOTE: When aligning the Short Wave band care should be exercised so that the circuits are aligned on the fundamental rather than on the image frequency which is approximately 910 kilocycles more than the fundamental. To check this increase the output of the signal generator approximately 10 times and try to tune in both, the fundamental, at the signal generator frequency as indicated on the dial and the image which should be approximately 910 kilocycles lower (approximately 14) on the dial.

(e) Repeat (c) and (d) for more accurate adjustments.

(f) Replace 400 ohm carbon antenna dummy with a .0001 mf. condenser. Turn band switch to the Broadcast band, open gang condenser all the way, etc.

(g) Set the signal generator to 1650 kilocycles.

(h) Adjust B. C. "OSC" trimmer (rear trimmer right end of chassis) Fig. 3, for maximum output.

(i) Set signal generator to 1400 kilocycles.

(j) Tune-in generator signal for maximum output then adjust B. C. "ANT" trimmer (front trimmer right end of chassis) Fig. 3, for maximum output.

(k) Repeat (h) and (j) for more accurate adjustments.

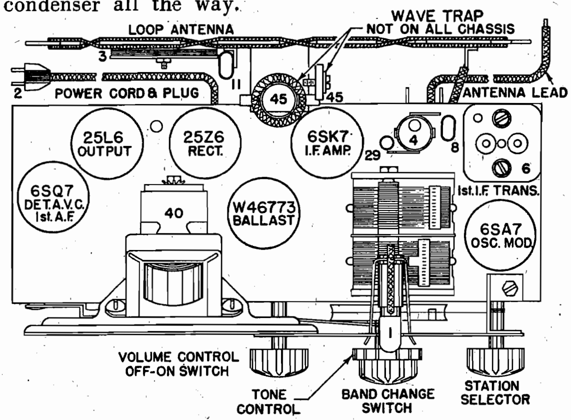


Fig. 2—Top View Model 18, J-18

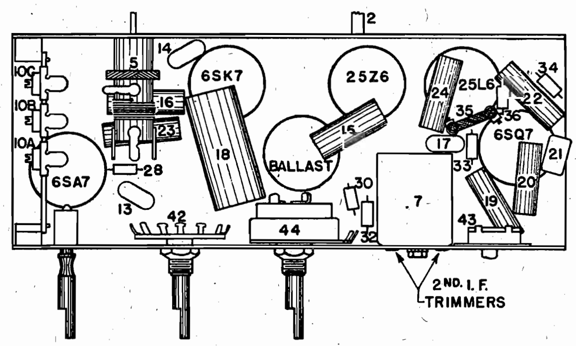
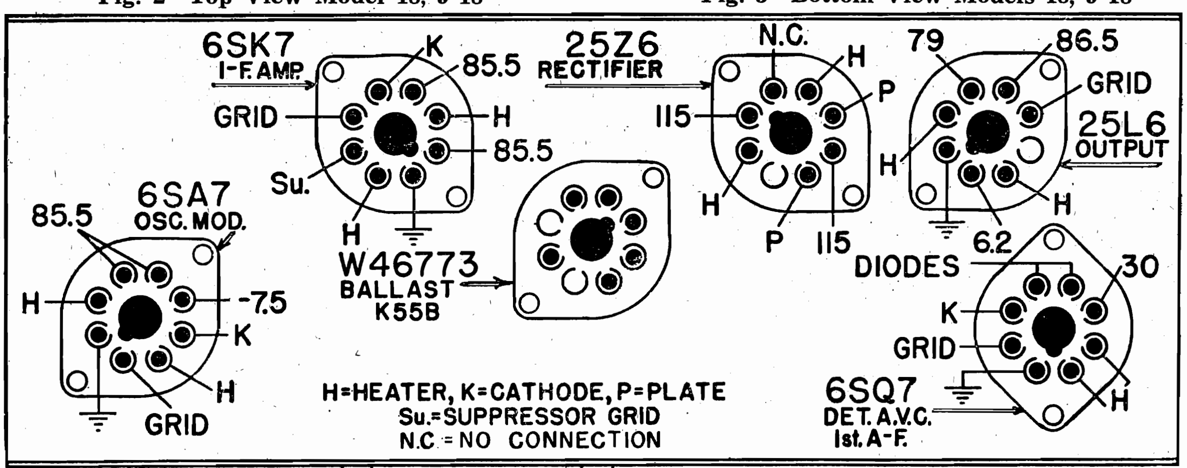


Fig. 3—Bottom View Models 18, J-18

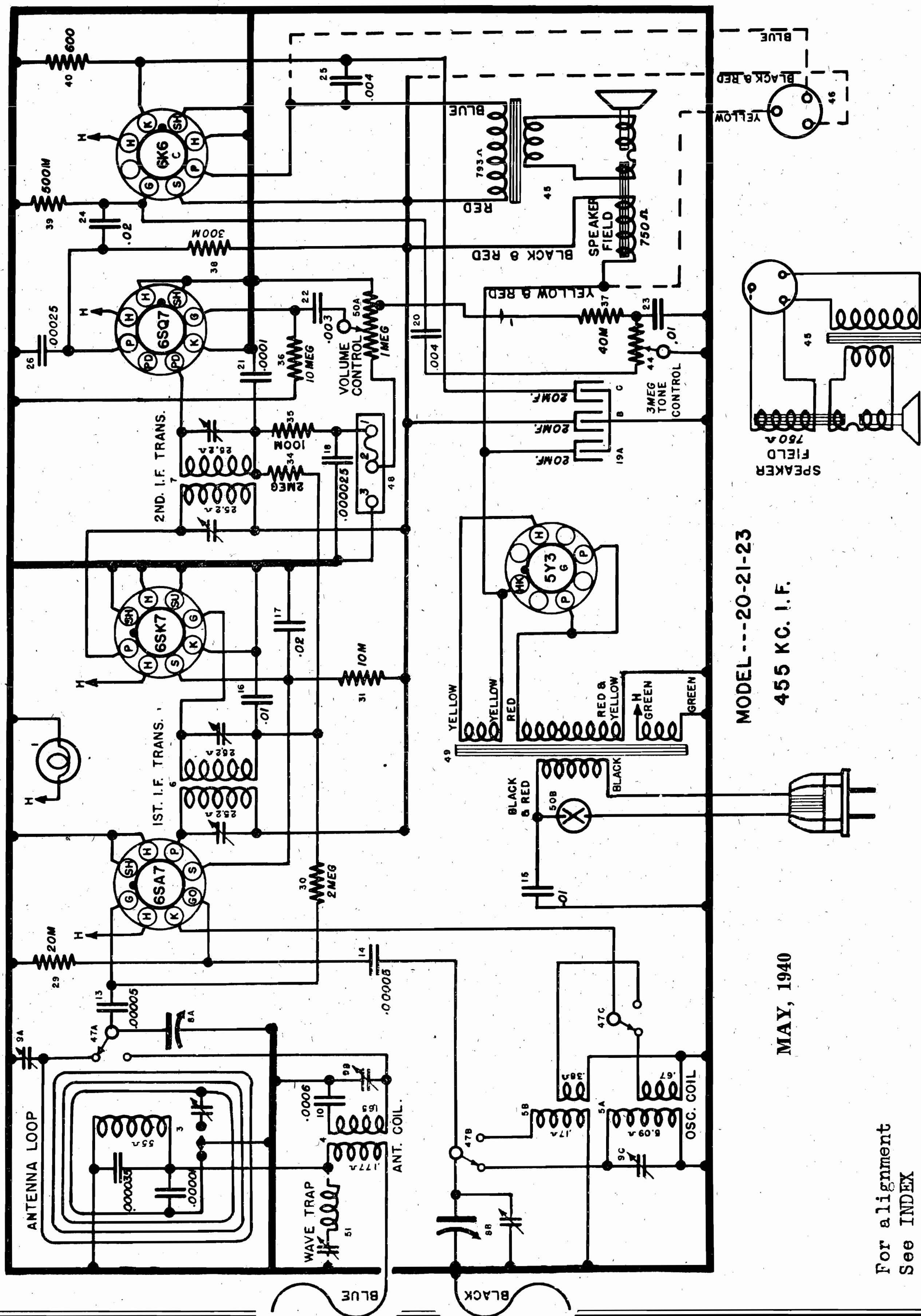


POWER CONSUMPTION AT 117.5 LINE = 50 WATTS
MAXIMUM POWER OUTPUT ---------- = 1.2 WATTS
DROP ACROSS SPEAKER FIELD ------ = 28.5 VOLTS

For wave trap data, see Model 11

THE CROSLEY CORP.

MODELS 20, 21, 23



MODEL---20-21-23

455 KC. I.F.

MAY, 1940

For alignment
See INDEX

MODELS 20, 21, 23, 24, 25

THE CROSLEY CORP.

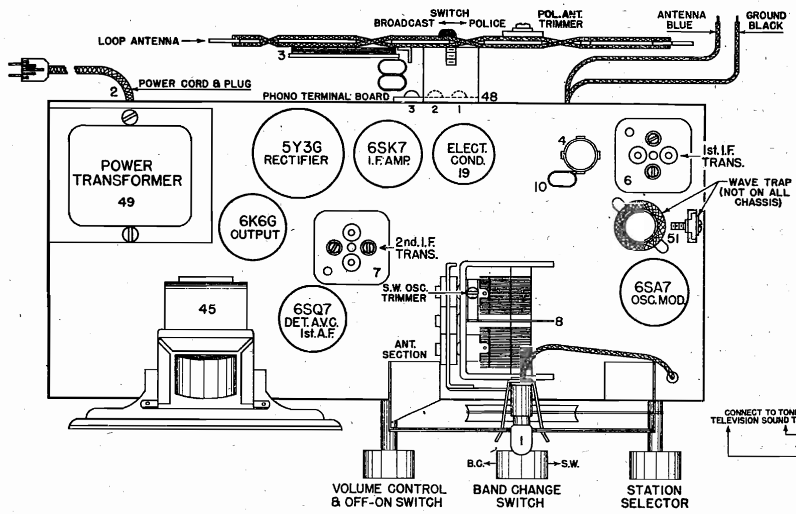
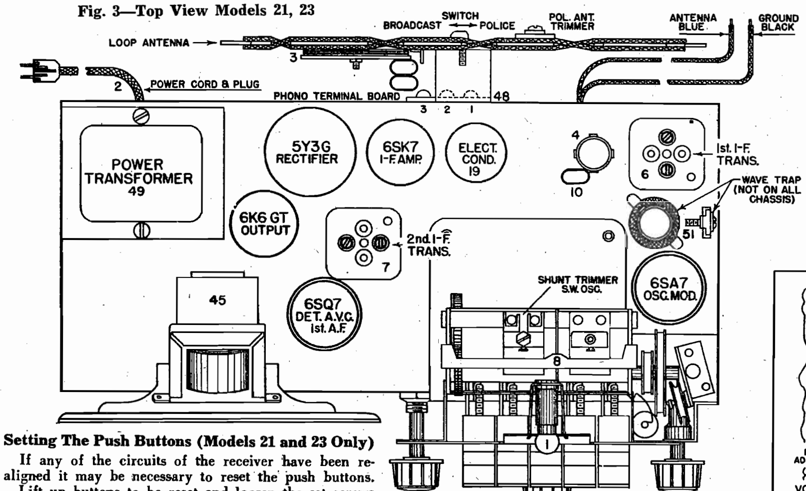
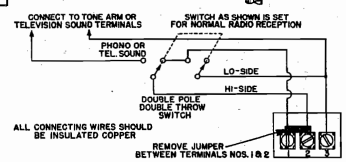


Fig. 2—Top View Model 20

Fig. 3—Top View Models 21, 23




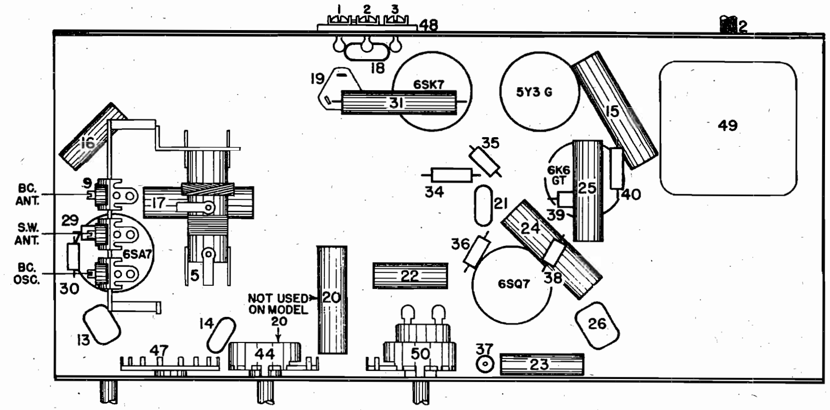
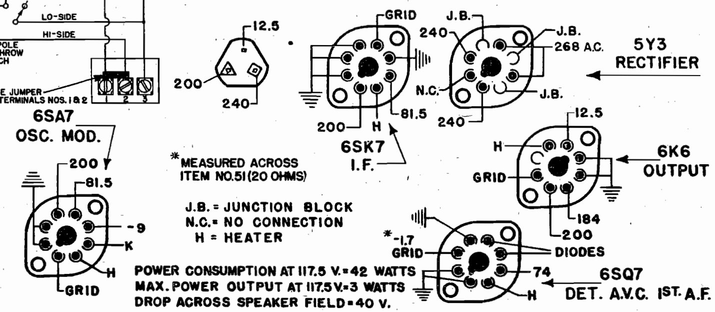


Fig. 4—Bottom View Models 20, 21 and 23



POWER CONSUMPTION AT 117.5 V. = 42 WATTS
MAX. POWER OUTPUT AT 117.5 V. = 3 WATTS
DROP ACROSS SPEAKER FIELD = 40 V.

VOLTAGES MEASURED BETWEEN SOCKET PIN & GROUND WITH A 250 VOLT, 1000 OHMS PER VOLT, VOLT METER. READINGS MAY VARY 10%

Fig. 5—Socket Voltage Chart

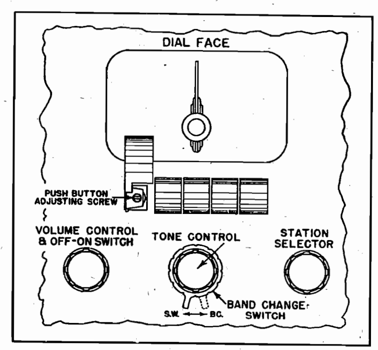


Fig. 6—Controls Models 21 and 23

Setting The Push Buttons (Models 21 and 23 Only)

If any of the circuits of the receiver have been re-aligned it may be necessary to reset the push buttons. Lift up buttons to be reset and loosen the set screws two or three turns. Tune-in accurately the station to which the first button is to be set, with a small screw driver inserted in the adjusting screw, push the adjusting screw ALL THE WAY IN and while holding in that position, securely tighten the screw. It is essential that you apply a steady pressure while tightening the setting screw in order to keep the mechanism lined up with the station tuned-in.

Models 24, 25

The double pole double throw switch for changing from Radio to Phono or television sound, should be connected as shown in the diagram

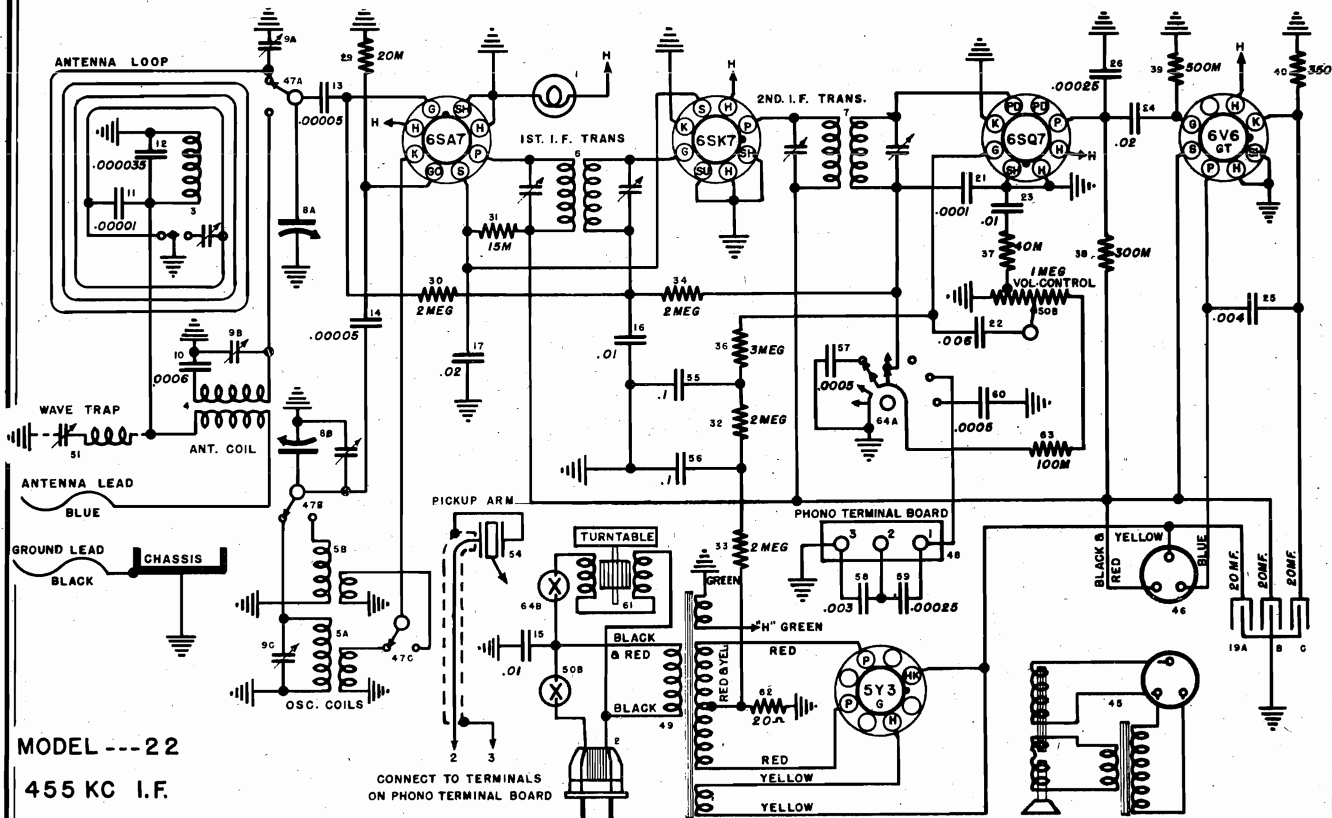
The terminals are coded as follows: 1, 2, 3, respectively. The No. 2 terminal connects to the high side of the phono pickup or television A-F connection.

NOTE: The jumper between No. 1 and No. 2 terminals must be removed when phono-radio switch is connected. If phono switch is removed, it is absolutely essential that the jumper wire between No. 1 and No. 2 terminals be replaced. Be sure all connections are tight.

The No. 3 terminal is the ground or low side connection. The No. 1 terminal should be connected to the No. 3 terminal by some means (as indicated in the above diagram). This prevents any radio signals from the receiver proper interfering with the Phono or Television sound reproduction.

THE CROSLEY CORP.

MODEL 22AS



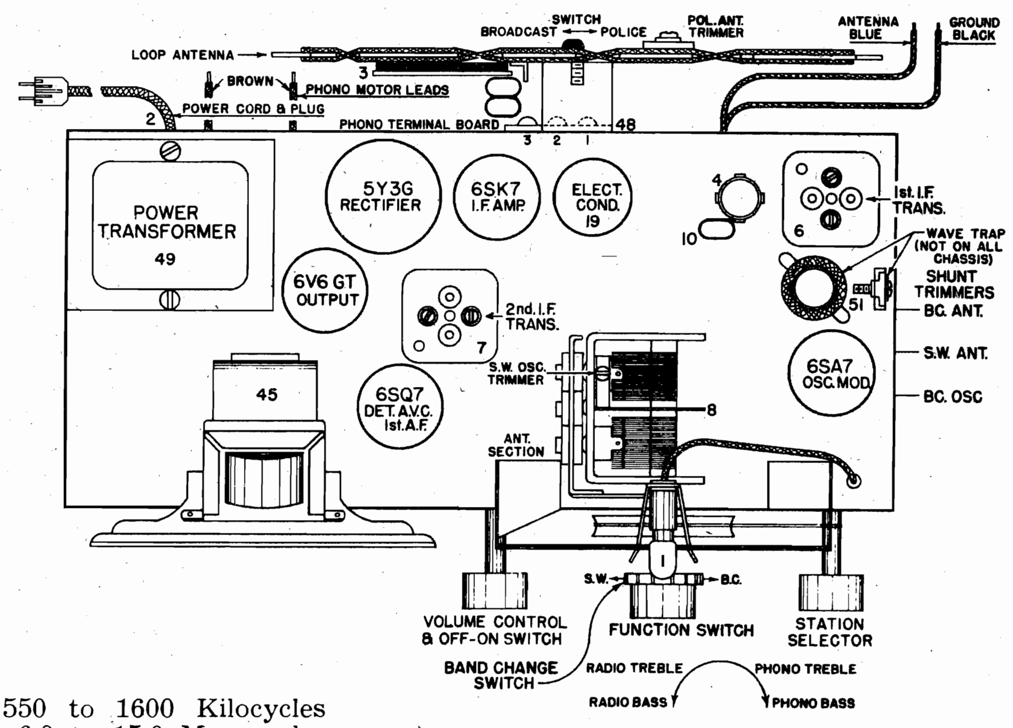


FIG. 2

Broadcast Band—550 to 1600 Kilocycles
Short Wave Band—6.0 to 15.0 Megacycles
Special Police Band—2.3 to 2.5 Megacycles

MODEL 22AS
MODEL 20, 21, 23

THE CROSLEY CORP.

CHASSIS NO. 20, 21 AND 23

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 I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the antenna lead (Blue). Connect the ground lead from the signal generator to the ground lead (Black) of the receiver.

(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 Broadcast Band. (Left). Push switch on loop ant. to B. C. position.

(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 adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning The R.-F Circuits.

(1) Connect the signal generator output through a 400 ohm carbon resistor to the antenna lead (Blue) of the receiver and the generator return to the ground lead (Black).

(a) Set signal generator to 15.4 megacycles.

(b) Open tuning condenser all the way (rotor completely out of mesh) turn band switch to the right, (short wave) and volume on full. On models 21 and 23 turn tone control to treble position.

(c) Adjust the S. W. "OSC" trimmer, located on gang condenser, for maximum output.

(d) Set signal generator to 15.0 megacycles.

(e) Tune-in signal generator frequency with the station selector knob (approximately 15 on the dial) and while slowly rocking the station selector knob adjust the S. W. "ANT." trimmer condenser, center trimmer on right end of chassis, for maximum output.

NOTE: Check the image frequency by increasing the signal generator output. Tune-in 15 mc. signal and then the image which should come in around 14 on the dial. If image is not heard the oscillator is aligned on the wrong peak and S. W. "OSC" trimmer should be further opened until correct peak is found.

(f) Repeat (a) to (e) for more accurate adjustments.

(2) Change the 400 ohm dummy antenna to a .0002 mf. (200 mmf.) condenser. Turn band switch to B. C. position (left), open gang condenser all the way, etc.

(a) Set signal generator to 1650 kilocycles.

(b) Adjust the B. C. "OSC" trimmer for maximum output (front trimmer, right end of chassis).

(c) Set signal generator to 1400 kilocycles.

(d) Tune-in 1400 kc. signal with tuning condenser, (should be approximately 14 on the dial), then adjust the B. C. "ANT" trimmer (rear trimmer, right end of chassis) for maximum output.

(e) Repeat (a) to (d) for more accurate adjustments.

(3.) Using same dummy antenna (.0001 mf.) align the Special Police Band antenna trimmer (there is no oscillator adjustment for this band).

(a) Set signal generator to 2.5 kilocycles.

(b) Push switch on loop antenna to Pol. position and then tune-in the generator signal with gang, approx. 2.5 on the dial.

(c) Adjust trimmer on loop antenna for maximum output.

CAUTION: Be sure to push the switch on the loop antenna back to B. C. position if receiver is to be used for broadcast reception.

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 consists of a coil and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram.

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 .0002 mfd. condenser into the antenna lead of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser set to approximately 60 in the dial, and the volume control full on, adjust the wave trap trimmer condenser 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 an 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.

PRELIMINARY

Output Meter Connections....Plate to Screen of 6V6GT
Generator Ground Connection....To chassis or Ground Lead
Dummy Antenna to be in series with generator output....See Chart Below
Position of Volume Control....Fully On
Position of Tone Control....Treble or Speech

ALIGNMENT PROCEDURE CHART

Alignment Sequence	Dummy Antenna	Frequency Setting	Input to Receiver	Band Switch	Tuning Cond. Setting	Trimmers Adjusted	Remarks
1.	.02MF.	455 Kc.	Ant. Lead (Blue)	B. C.	Fully Open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum output. Adjust for Maximum output.
2.	400 ohm (carbon)	15.3 Mc.	Ant. Lead (Blue)	S. W.	Fully Open	S. W. "OSC" (on gang)	Adjust for Peak. See foot note.
3.	400 ohm (carbon)	15.0 Mc.	Ant. Lead (Blue)	S. W.	Approx. 15 on dial	S. W. "ANT" center trimmer on right end	Adjust for Maximum while rocking gang back and forth.
4.	.0002 MF.	1650 Kc.	Ant. Lead (Blue)	B. C.	Fully Open	B. C. "OSC" front trimmer on right end	Adjust for peak. Make sure the switch on loop is in B. C. position.
5.	.0002 MF.	1400 Kc.	Ant. Lead (Blue)	B. C.	Approx. 140 on dial	B. C. "ANT" rear trimmer on right end	Adjust for Maximum output.
6.	.0002 MF.	2.5 Mc.	Ant. Lead (Blue)	B. C. and switch on loop to Pol.	Approx. 2.5 on dial lower right corner	Pol. Ant on loop	Adjust for Maximum output.

IMPORTANT ALIGNMENT NOTES

When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency which is approximately 910 kilocycles less as **indicated on the dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

Repeat the original alignment procedure for more accurate adjustments.

Always keep signal generator output as low as possible to prevent action of the A.V.C. circuit.

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 consists of a coil and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram. 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 .0002 mfd. condenser into the antenna lead of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser set to approximately 60 on the dial, and the volume control full on, adjust the wave trap trimmer condenser 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 interferring signal should be used. If it is not possible to determine the exact frequency of the interfering signal an 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.

VOLTAGE CHART

ALL VOLTAGES MEASURED FROM SOCKET PIN TO CHASSIS @ 117.5 VOLT LINE

TUBE SECTION	SOCKET PIN NUMBER 1	2	3	4	5	6	7	8
6SA7—Osc.-Mod.	0	0	225	74	0	0	6.3 A.C.	0
6SK7—I. F. Amp.	0	0	0	0	0	74	6.3 A.C.	225
6SQ7—Det. A.V.C.—1st A.F.	0	0	0	0	0	100	6.3 A.C.	0
6V6GT—Output	0	0	209	225	0	0	6.3 A.C.	10.5
5Y3G—Rectifier	0	5.0 A.C.	0	316 A.C.	0	316 A.C.	0	283

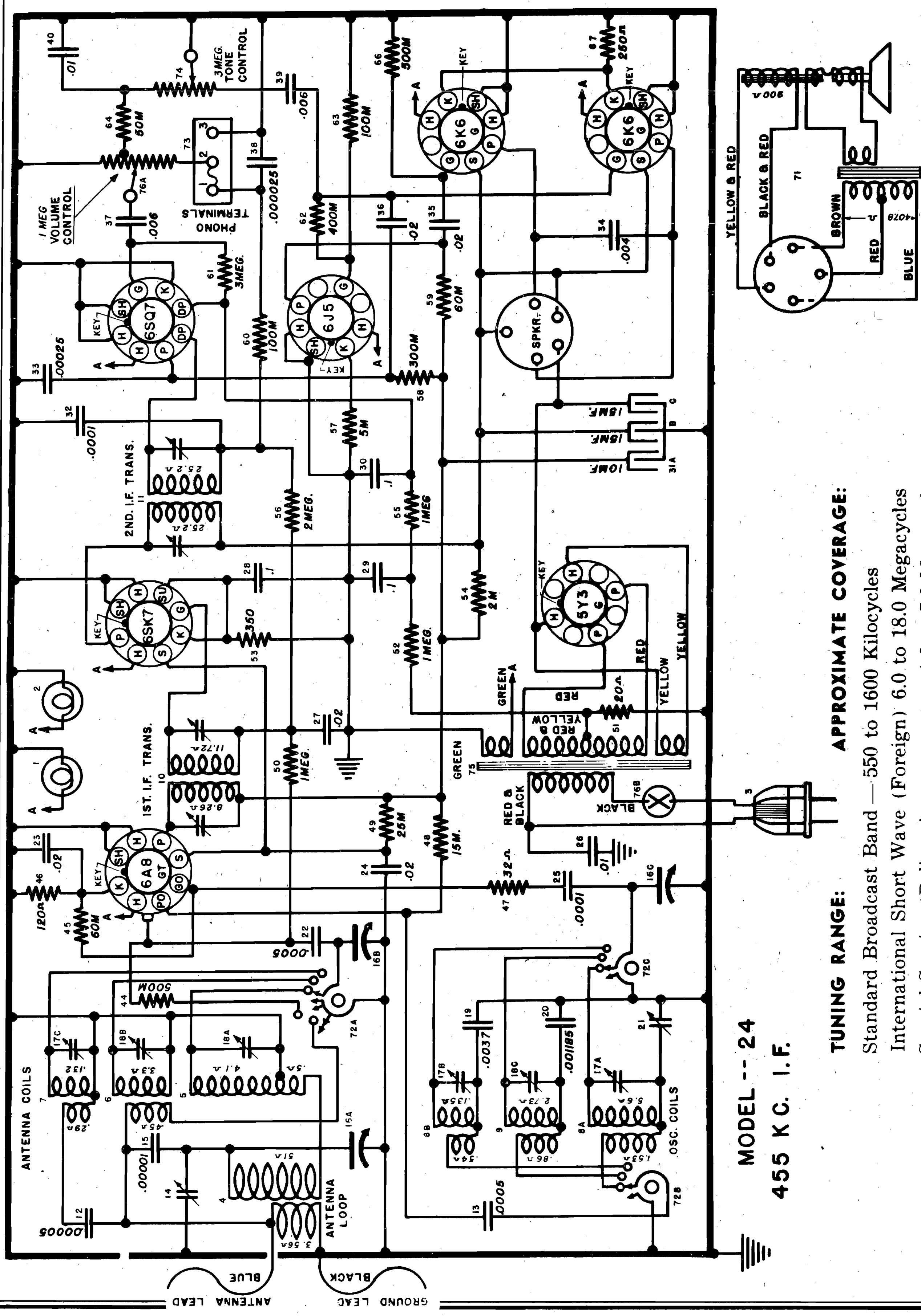
All voltages measured with 1000 OHM/Volt Voltmeter except heaters. Voltages may vary 10% of values given.

DROP ACROSS SPEAKER FIELD.... 58 Volts
MAXIMUM POWER OUTPUT @ 130 V. LINE.... 6.5 Watts
MAXIMUM POWER CONSUMPTION @ 130 V. LINE....*60 Watts

*Phono Motor 40 Watts additional.

THE CROSLEY CORP.

MODEL 24



TUNING RANGE:

Standard Broadcast Band —550 to 1600 Kilocycles

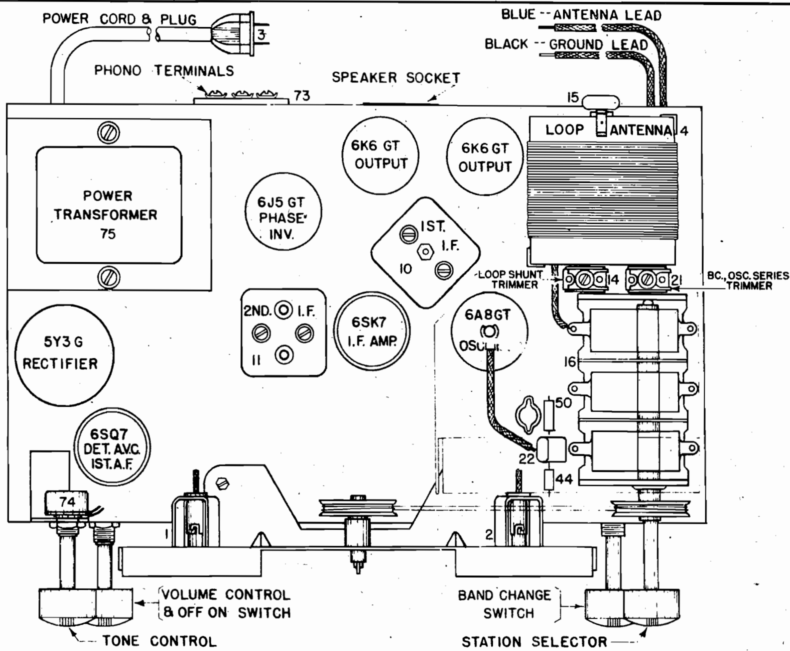
International Short Wave (Foreign) 6.0 to 18.0 Megacycles

Special Service (Police, Amateurs, etc.) 1.6 to 5.0 Megacycles

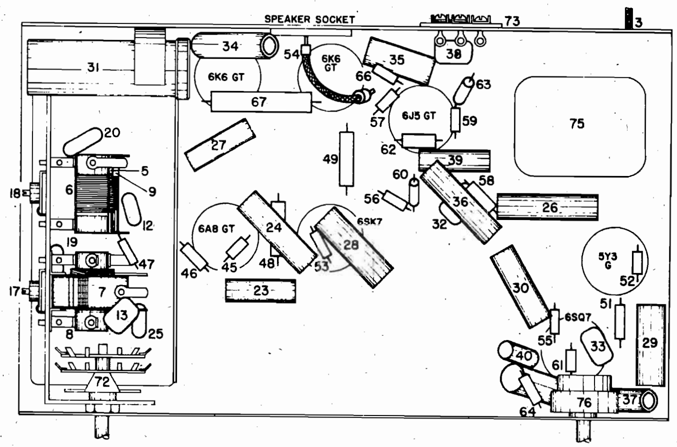
APPROXIMATE COVERAGE:

MODEL 24
MODEL 25

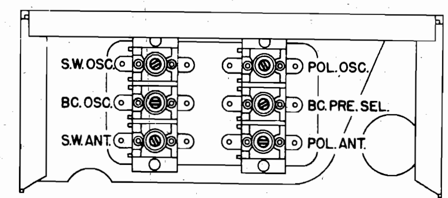
THE CROSLEY CORP.



BOTTOM VIEW OF CHASSIS



TRIMMER LOCATIONS



Signal Generator

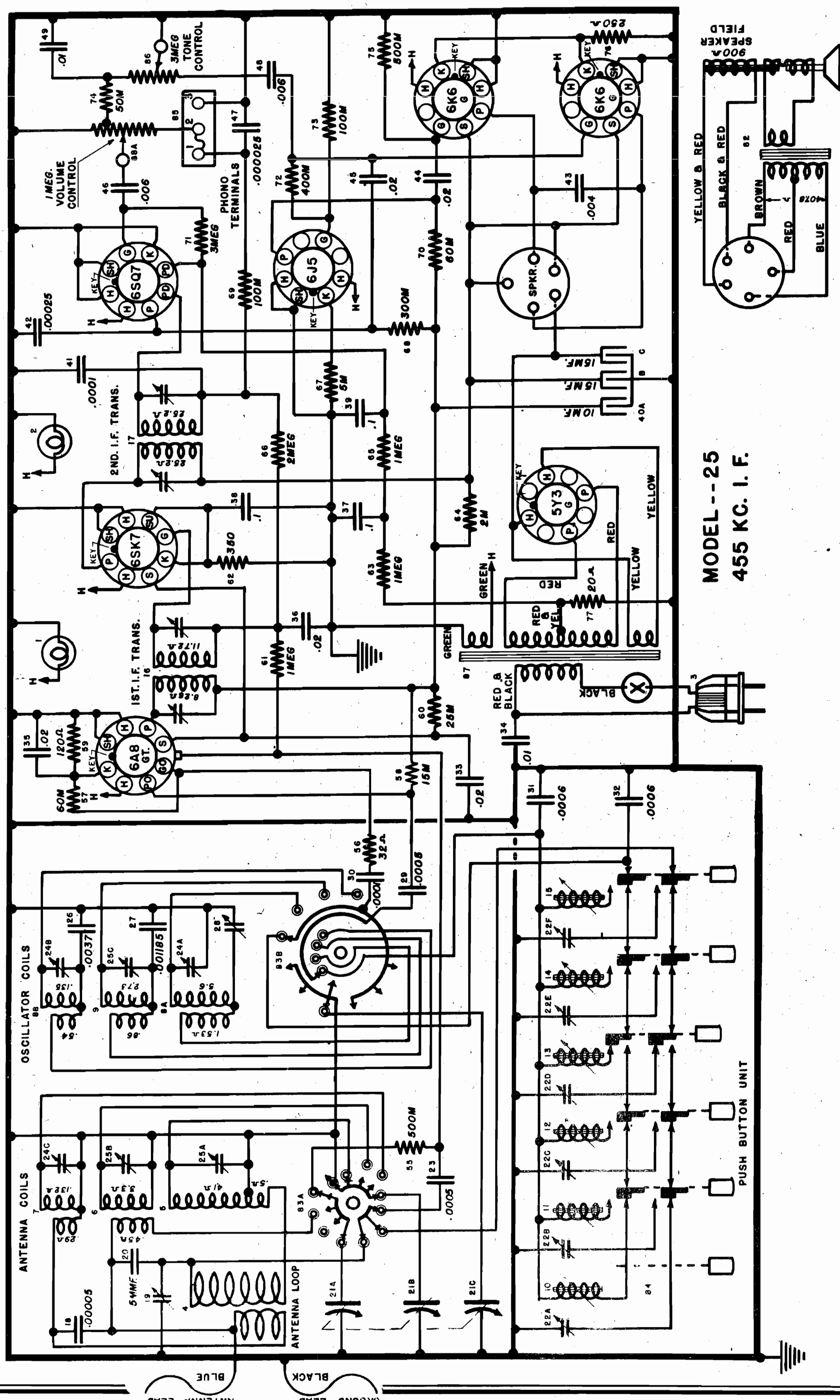
Align-ment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Grid of 6A8GT	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1650 Kc.	Ant. Lead (Blue)	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal.
3.	.0002 MF.	600 Kc.	Ant. Lead (Blue)	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment						
5.	.0002 MF.	1400 Kc.	Ant. Lead (Blue)	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "PRE" Trimmer	Adjust for maximum output to not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Lead (Blue)	Police	Fully open	Pol "OSC"	Adjust for peak gang; does not have to tune thru signal.
7.	400 ohm (carbon)	5.0 Mc.	Ant. Lead (Blue)	Police	Approx. 5.0	Pol "ANT"	Adjust for maximum output while rocking gang thru signal.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Lead (Blue)	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Lead (Blue)	S. W.	Approx. 18	S. W. "ANT"	Adjust for maximum output while rocking gang thru signal.

For Phonograph connections
See Model 20

For Voltage data
See Index

THE CROSLEY CORP.

MODEL 25



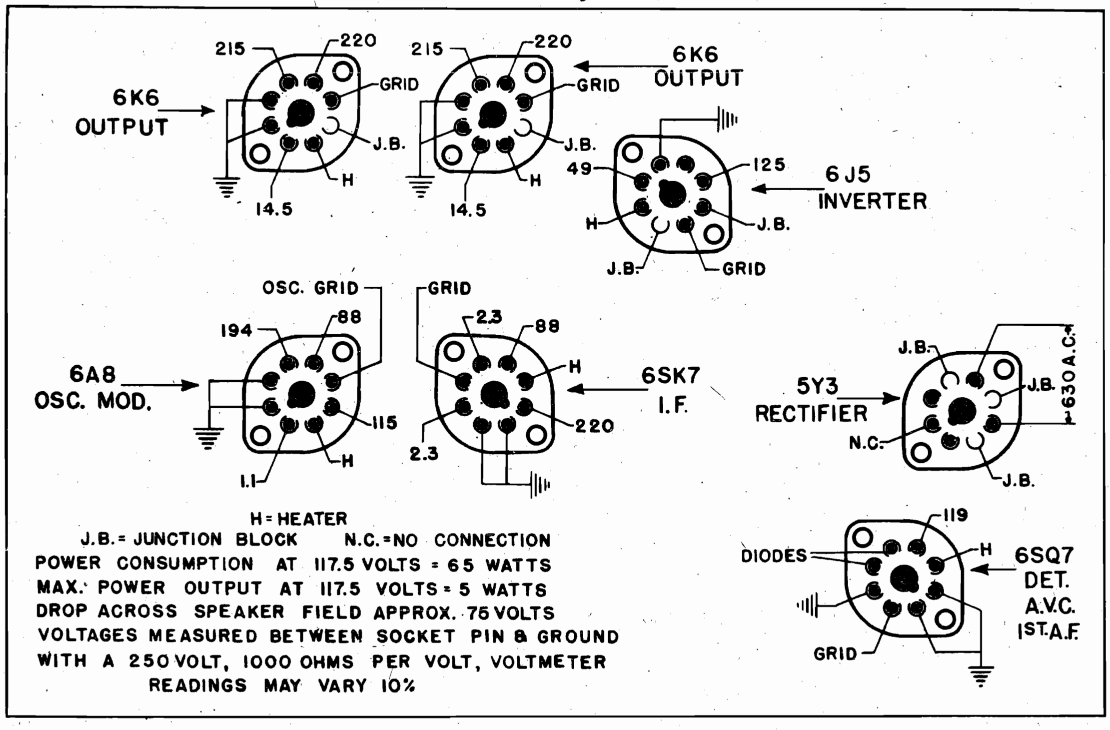
Standard Broadcast Band — 550 to 1600 Kilocycles
International Short Wave (Foreign)—6.0 to 18.0 Megacycles
Special Service (Police, Amateurs, etc.) 1.6 to 5.0 Megacycles

MODEL 24
MODEL 25

THE CROSLEY CORP.

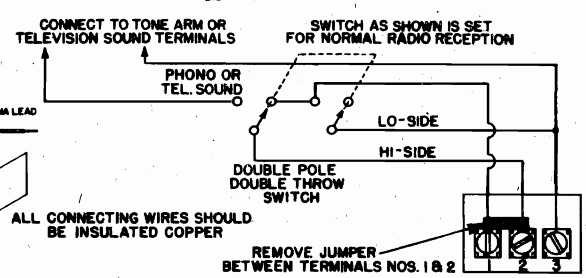
SOCKET VOLTAGE CHART

Models 24, 25

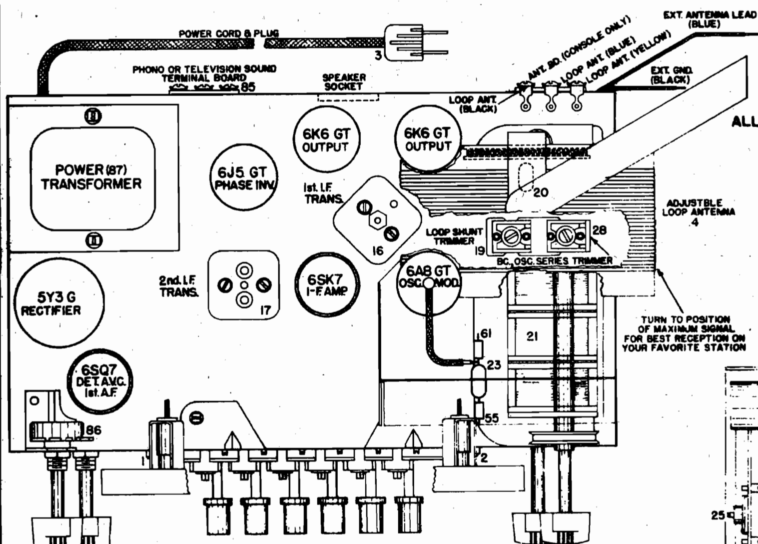


PHONO CONNECTIONS

Model 25

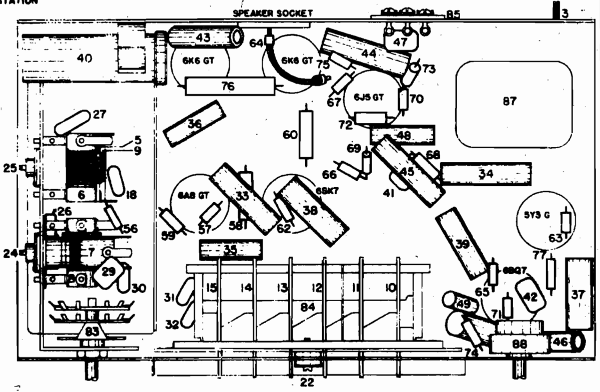


Model 25



Model 25

BOTTOM VIEW OF CHASSIS



THE CROSLEY CORP.

MODELS 25, 26, 26 (Revised), 29, 31BF

SET UP PROCEDURE

Remove push button escutcheon. Turn the set on and leave operate a sufficient length of time to permit the tubes to reach their normal operating conditions.

NOTE: To simplify the set up and insure accurate adjustments the following pre-adjustments should be made.

Tighten all the "ANT" Trimmer screws just moderately tight. See Fig. 1.

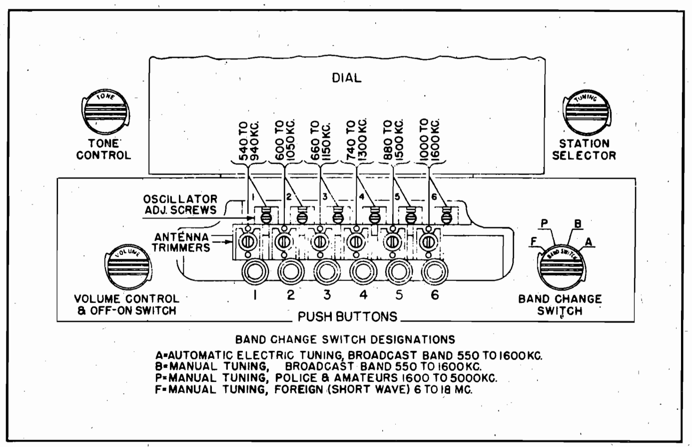


FIG. 1

Turn the "OSC" screws to the left (counter-clockwise) until the end of the screw is about flush (even) with the top of the "ANT" padded condenser. Note: Care should be exercised when adjusting the "OSC" screws so that the selected station is not passed over, turn screws slowly.

It is essential that the frequency (kilocycles) of the station selected is **within** the range of the push button to be set for that station, see Fig. 1.

1. Turn the band switch to "B" position, first notch from left end. Using the station selector knob (upper right) carefully tune in the station to which the No. 1 push button is to be set. Note program.

2. Turn the band switch to the left ("A") and using a small screw driver, carefully turn the "OSC" screw to the right (clockwise) for the No. 1 push button (first screw on left in the upper row), until the station you tuned in (Manually) is heard again. Adjust for maximum output in speaker.

3. Adjust the No. 1 push button "ANT" adjusting screw for maximum volume in speaker. NOTE: If this adjustment does not seem to have much effect adjust loop antenna for miuimum signal from that station, then adjust the "ANT" screw for maximum signal.

4: Turn band switch one notch to right "B" then back to "A" to check if push button is correctly adjusted. There should be no change in tone quality when switched from one to the other.

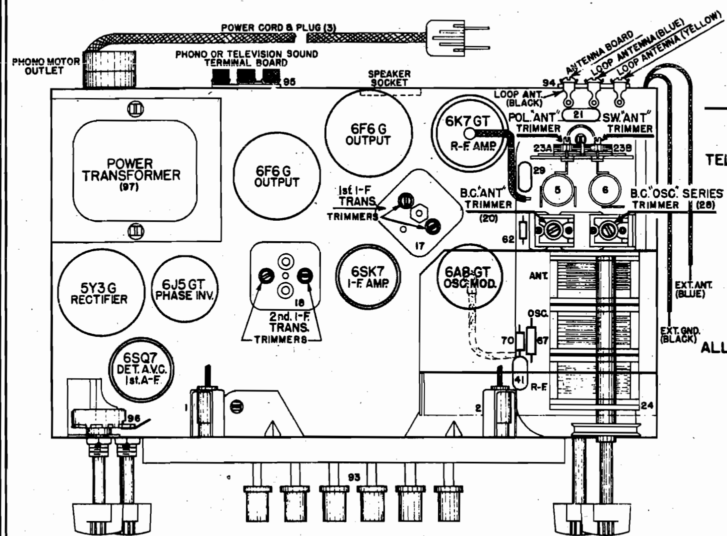
5. The set-up for No. 1 push button is now complete. Set up remaining buttons to be set, following the same procedure, adjusting the "OSC" screw first, then the "ANT" padder screw.

6. After all the buttons have been set, they should be rechecked, turning the loop antenna for minimum pickup on each station to insure accurate adjustments.

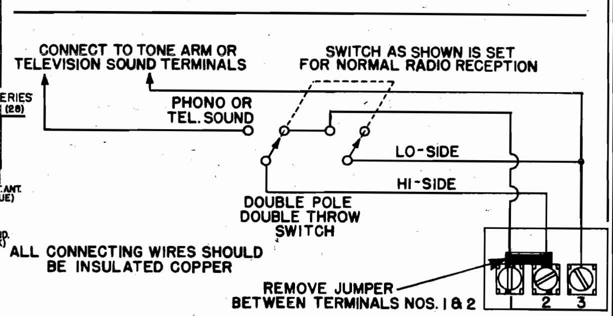
To tune the receiver with the push buttons the Band Switch must be turned all the way to the left "A" then completely depress the button which represents the station you wish to hear.

MODELS 26,
26 (Revised)

THE CROSLEY CORP.



PHONO CONNECTIONS



For tuner data
See INDEX

Preliminary
Output Meter Connections....................Plate to Plate of 6F6's
Generator Ground Connection....................To chassis or Ground Lead
Dummy Antenna to be in series with generator output....................See Chart Below
Position of Volume Control....................Fully On
Position of Tone Control....................Treble or Speech

ALIGNMENT PROCEDURE CHART

	Signal Generator						
Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Grid of 6A8GT	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1650 Kc.	Ant. Lead (Blue)	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal.
3.	.0002 MF.	600 Kc.	Ant. Lead (Blue)	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment						
5.	.0002 MF.	1400 Kc.	Ant. Lead (Blue)	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "R-F" Trimmer	Adjust for maximum output to not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Lead (Blue)	Police	Fully open	Pol "OSC"	Adjust for peak; gang does not have to tune thru signal.
7.	400 ohm (carbon)	5.0 Mc.	Ant. Lead (Blue)	Police	Approx. 5.0	Pol "ANT" and "R-F" Trimmers	Adjust for maximum output while rocking gang thru signal.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Lead (Blue)	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Lead (Blue)	S. W.	Approx. 18	S. W. "ANT" and "R-F" Trimmers	Adjust for maximum output while rocking gang thru signal.

SOCKET VOLTAGES MEASURED @ 117.5 VOLTS LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 VOLT RANGE VOLTMETER (D. C.)

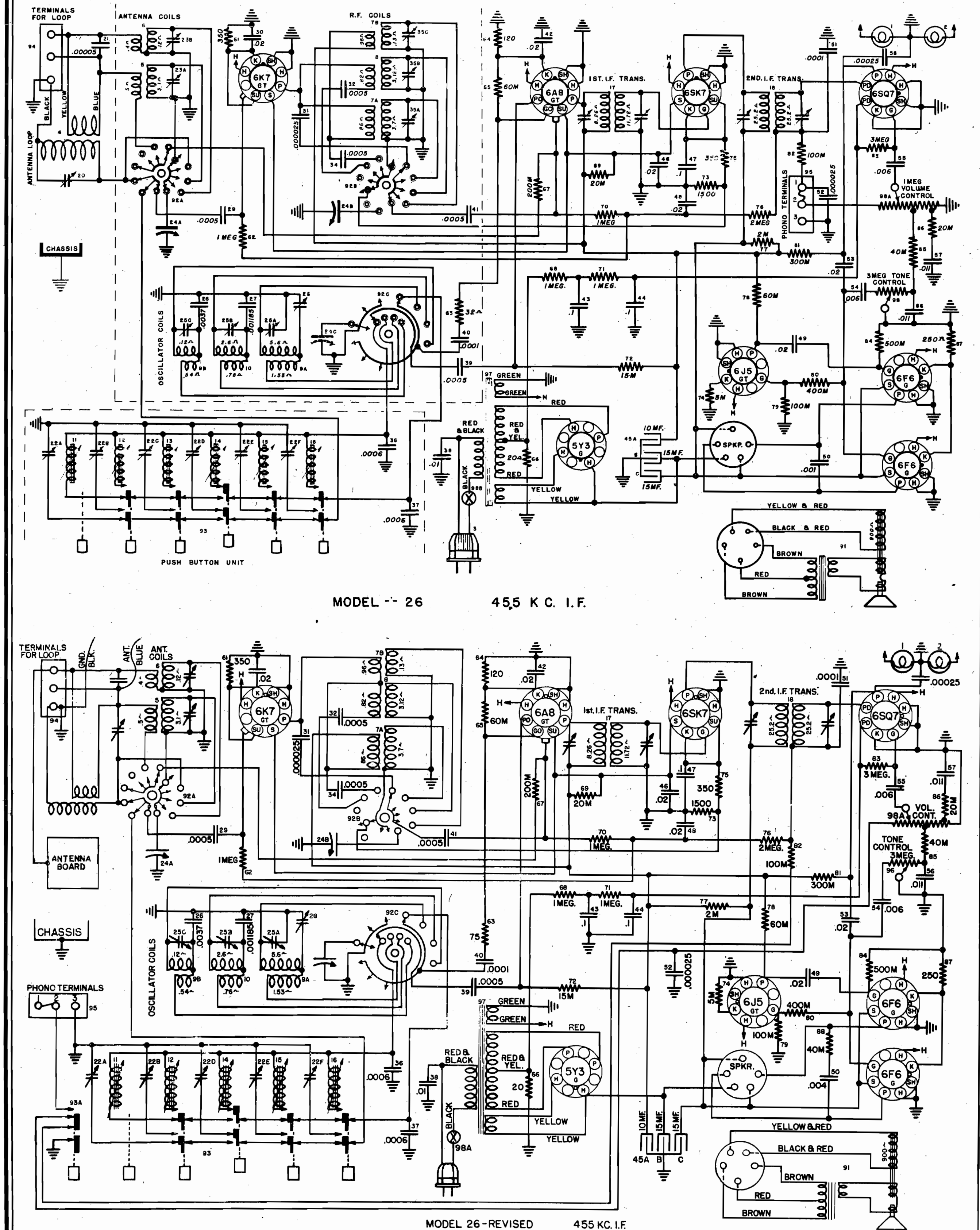
	PIN NUMBER							
TUBE FUNCTION	1	2	3	4	5	6	7	8
6K7GT—R. F. Amp.	0	0	187	75	0	J.B.	*6.3	2
6A8GT—Osc.-Mod.	0	0	187	75	0	130	*6.3	1
6SK7—I. F. Amp.	0	0	2.3	0	2.3	78	*6.3	228
6SQ7—Det. A.V.C.-A. F.	0	0	0	0	0	110	*6.3	0
6J5GT—Phase Invert.	0	0	120	0	0	J.B.	*6.3	5.5
6F6G—Output	0	0	220	230	0	J.B.	*6.3	14.5
6F6G—Output	0	0	220	230	0	J.B.	*6.3	14.5
5Y3G—Rectifier	NC	329.0	J.B.	*358.0	J.B.	*358	J.B.	329.0

*Measure with A. C. Voltmeter.

Max. POWER OUTPUT @ 117.5 V. LINE.................... 8.0 Watts
POWER CONSUMPTION @ 117.5 V. LINE....................85 Watts
DROP ACROSS SPEAKER FIELD....................95.0 Volts

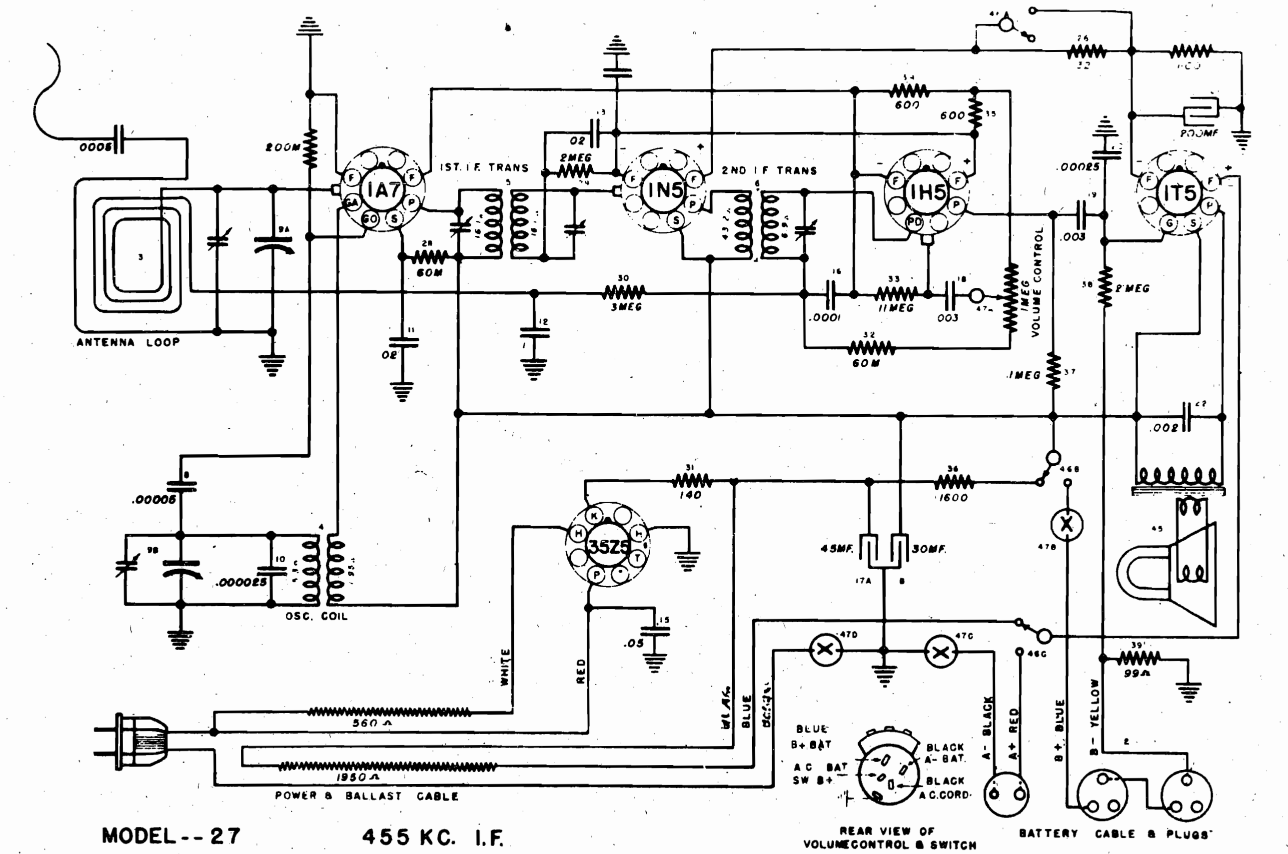
THE CROSLEY CORP.

MODEL 26
MODEL 26 Revised



MODELS 27BD, 27BE

THE CROSLEY CORP.



MODEL--27 455 KC. I.F.

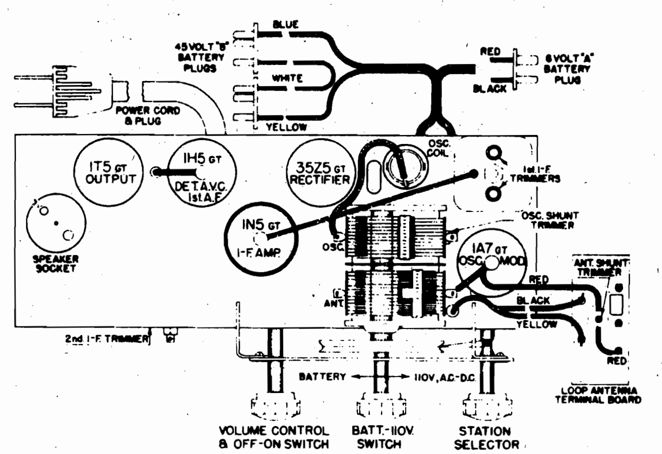
ALIGNMENT PROCEDURE

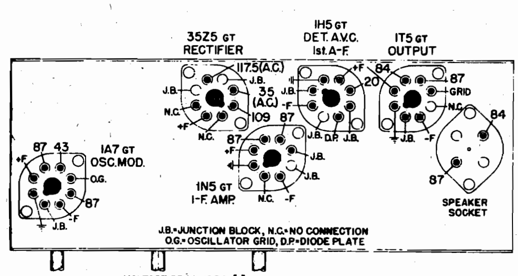
Volume Control on full   Output meter connected to Plate and Screen of 1T5GT

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION TO RADIO	DUMMY ANTENNA	TUNING COND SETTING	TRIMMERS TO ADJUST (See Fig. 1)	REMARKS
455 Kc	Grid 1A7GT	.02 MF	Fully open	2nd 1-F (1) located on front	Adjust for maximum signal.
455 Kc	Grid 1A7GT	.02 MF	Fully open	chassis flange 1st 1-F (2)	Adjust for maximum signal. Located top of 1st 1-F ass'y.
1650	Ant. Lead	.0001 MF	Approx. 140	"OSC" Shunt on gang	Adjust for maximum output. Gang does not have to tune through signal.
1400	Ant. Lead	.0001 MF	on dial	"ANT" shunt on loop ant. through hole in right side of cabinet	Adjust for maximum output.

Repeat above for more accurate adjustments.
Maximum power output @ 75 V. "B" — approx. 200 M. W.
Maximum power output @ 90 V. "B" — approx. 340 M. W.
Maximum power output @ 90 V. "B" — approx. 200 M. W. undistorted

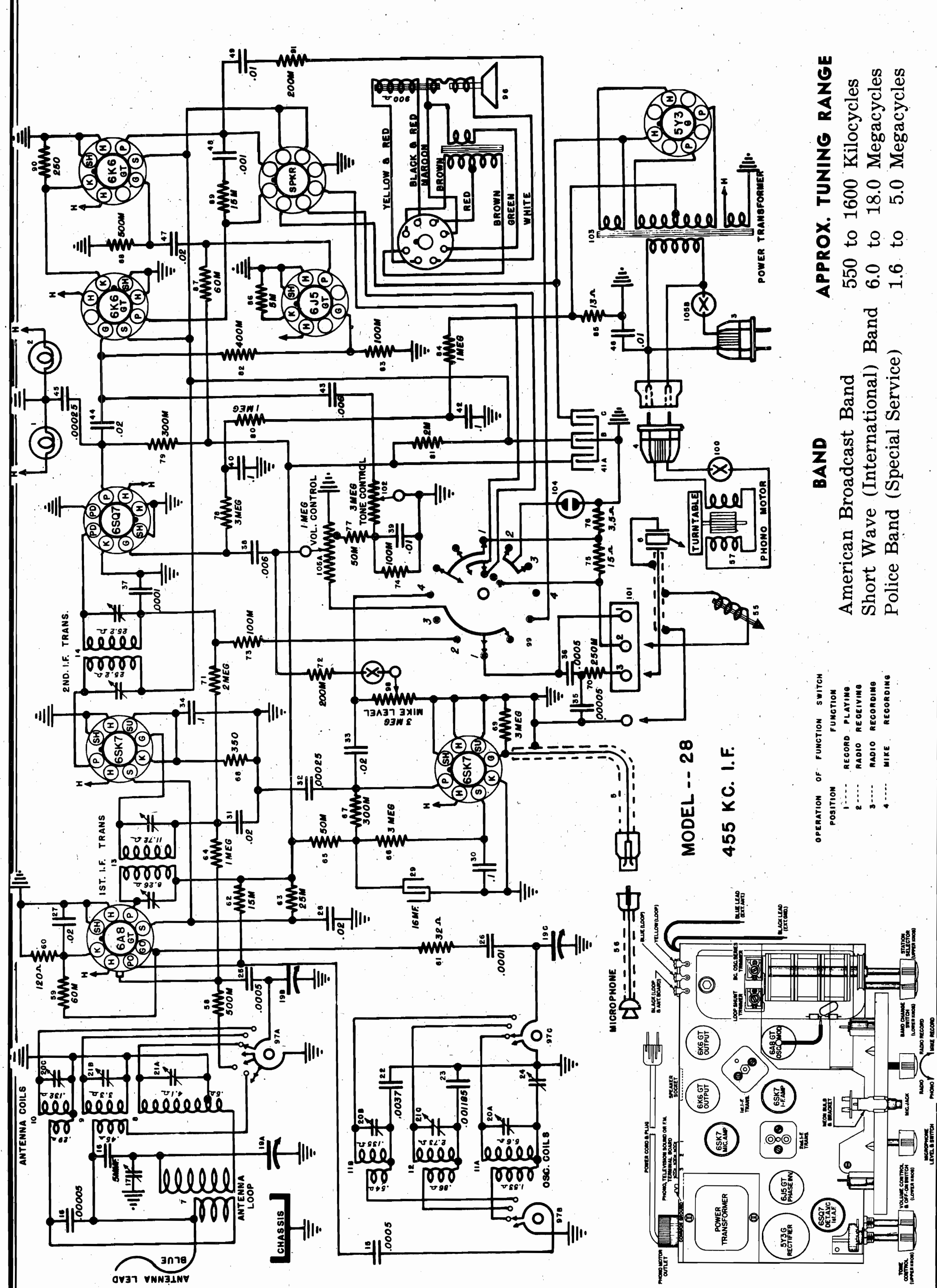
A Battery drain @ 6 volts, .05 Amp.; "B" Battery drain @ 75 V., 9 M. A.; @ 90 V., 12 M. A.
Power consumption @ 117.5 volts line—30 Watts





VOLTAGE DROP-1950="A" BALLAST RESISTOR=79V.
VOLTAGE DROP-1600="B" FILTER RESISTOR=13V.
ALL VOLTAGES MEAS. TO CHASSIS WITH 250V. 1000=/V. VOLTMETER (D.C.)
(EXCEPT A.C. VOLTAGES) AT 117.5 VOLTS LINE A.C.

THE CROSLEY CORP. MODEL 28



MODELS 28, 29,
J30, 31BF, 34BH

THE CROSLEY CORP.

Position of Volume Control........................Fully On
Position of Tone Control........................Treble or Speech
Position of Function Switch........................Radio
Position of Mike Level Control........................All the Way to Left (Off)

ALIGNMENT PROCEDURE CHART Models 28, 30

Alignment Sequence	Signal Generator Dummy Antenna	Signal Generator Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Grid of 6A8GT	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1650 Kc.	Ant. Lead (Blue)	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal.
3.	.0002 MF.	600 Kc.	Ant. Lead (Blue)	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment						
5.	.0002 MF.	1400 Kc.	Ant. Lead (Blue)	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "PRE" Trimmer	Adjust for maximum output to not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Lead (Blue)	Police	Fully open	Pol "OSC"	Adjust for peak gang; does not have to tune thru signal.
7.	400 ohm (carbon)	5.0 Mc.	Ant. Lead (Blue)	Police	Approx. 5.0	Pol "ANT"	Adjust for maximum output while rocking gang thru signal.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Lead (Blue)	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Lead (Blue)	S. W.	Approx. 18	S. W. "ANT"	Adjust for maximum output while rocking gang thru signal.

Model 28

SOCKET VOLTAGES MEASURED @ 117.5 VOLTS LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 VOLT RANGE VOLTMETER (D. C.)

PIN NUMBER

TUBE FUNCTION	1	2	3	4	5	6	7	8
6SK7—Pre-Amp.	0	0	......	....	0	J. B.	*6.3	52
6A8GT—Osc.-Mod.	0	0	198	76.5	0	132	*6.3	1
6SK7—I. F. Amp.	0	0	2.4	0	2.3	76.5	*6.3	226
6SQ7—Det. A. V.C.-A. F.	0	0	0	0	0	98	*6.3	0
6J5GT—Phase Invert.	0	0	118.5	0	0	J. B.	*6.3	6.0
6K6G—Output	0	0	226	236	0	J. B.	*6.3	15.5
6K6G—Output	0	0	226	236	0	J. B.	*6.3	15.5
5Y3G—Rectifier	NC	310	J. B.	*300	J. B.	*300	J. B.	310

*Measure with A. C. Voltmeter.

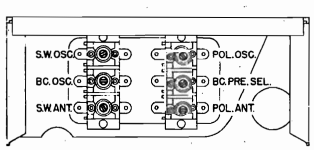
MAX. POWER OUTPUT @ 117.5 V. LINE........................5.0 Watts
POWER CONSUMPTION @ 117.5 V. LINE........................66 Watts (Radio Only)
TOTAL POWER CONSUMPTION @ 117.5 V. LINE......110 Watts (Including Phono Motor)
DROP ACROSS SPEAKER FIELD........................74 Volts

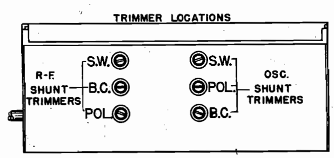
Voltages may vary 10% of values given.

J. B.—JUNCTION BLOCK N. C.—NO CONNECTION

Models 28, 30

TRIMMER LOCATIONS





Models 29, 31, 34

Position of Volume Control........................Fully On
Position of Tone Control........................Treble or Speech

ALIGNMENT PROCEDURE CHART Models 29, 31, 34

Alignment Sequence	Signal Generator Dummy Antenna	Signal Generator Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Grid of 6A8GT	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1650 Kc.	Ant. Lead (Blue)	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal.
3.	.0002 MF.	600 Kc.	Ant. Lead (Blue)	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment						
5.	.0002 MF.	1400 Kc.	Ant. Lead (Blue)	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. R-F Trimmer	Adjust for maximum output to not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Lead (Blue)	Police	Fully open	Pol "OSC"	Adjust for peak gang; does not have to tune thru signal.
7.	400 ohm (carbon)	5.0 Mc.	Ant. Lead (Blue)	Police	Approx. 5.0	Pol "ANT" and R-F Trimmers	Adjust for maximum output while rocking gang thru signal.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Lead (Blue)	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Lead (Blue)	S. W.	Approx. 18	S. W. "ANT" and R-F Trimmers	Adjust for maximum output while rocking gang thru signal.

Models 28, 29, J30, 31BF, 34BH

IMPORTANT ALIGNMENT NOTES

When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less **as indicated on the dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

Repeat the original alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A.V.C. circuit.

Model 29

SOCKET VOLTAGES MEASURED @ 117.5 VOLTS LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 VOLT RANGE VOLTMETER (D. C.)

PIN NUMBER

TUBE FUNCTION	1	2	3	4	5	6	7	8
6K7GT—R. F. Amp.	0	0	187	75	0	J.B.	*6.3	2
6A8GT—Osc.-Mod.	0	0	187	75	0	130	*6.3	1
6SK7—I. F. Amp.	0	0	2.3	0	2.3	78	*6.3	228
6SQ7—Det. A.V.C.-A. F.	0	0	0	0	0	110	*6.3	0
6J5GT—Phase Invert.	0	0	120	0	0	J.B.	*6.3	5.5
6F6G—Output	0	0	220	230	0	J.B.	*6.3	14.5
6F6G—Output	0	0	220	230	0	J.B.	*6.3	14.5
5Y3G—Rectifier	NC	329.0	J.B.	*358.0	J.B.	*358	J.B.	329.0

*Measure with A. C. Voltmeter.

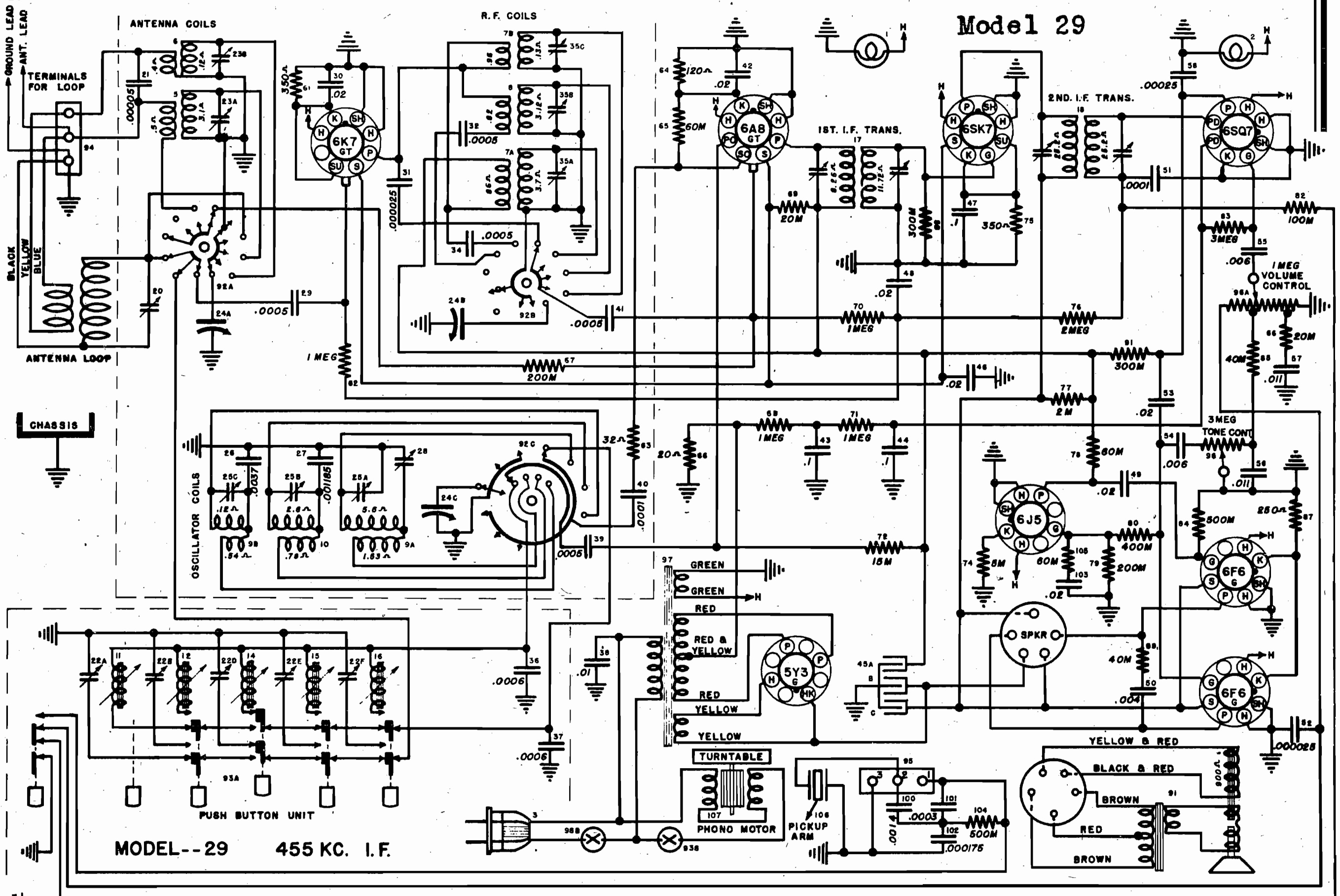
MAX. POWER OUTPUT @ 117.5 V. LINE........................8.0 Watts
POWER CONSUMPTION @ 117.5 V. LINE........................85 Watts
DROP ACROSS SPEAKER FIELD........................95.0 Volts

Voltages may vary 10% of values given.

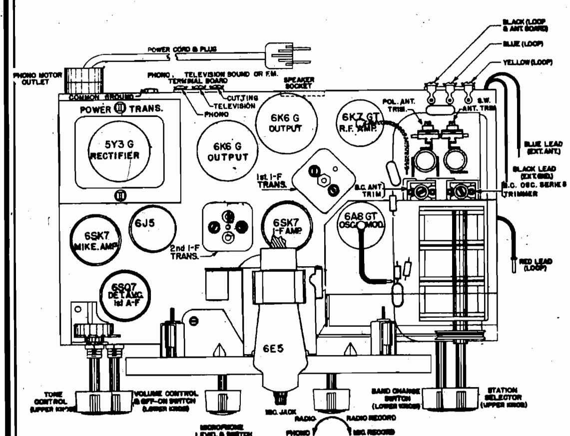
J. B.—JUNCTION BLOCK N. C.—NO CONNECTION

THE CROSLEY CORP.

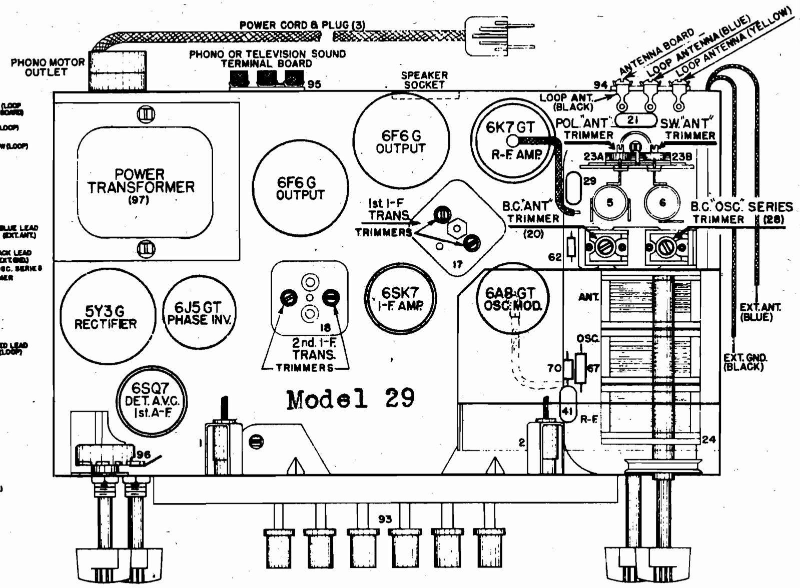
MODEL 29
MODEL 34BH



For tuner, alignment voltage, See INDEX



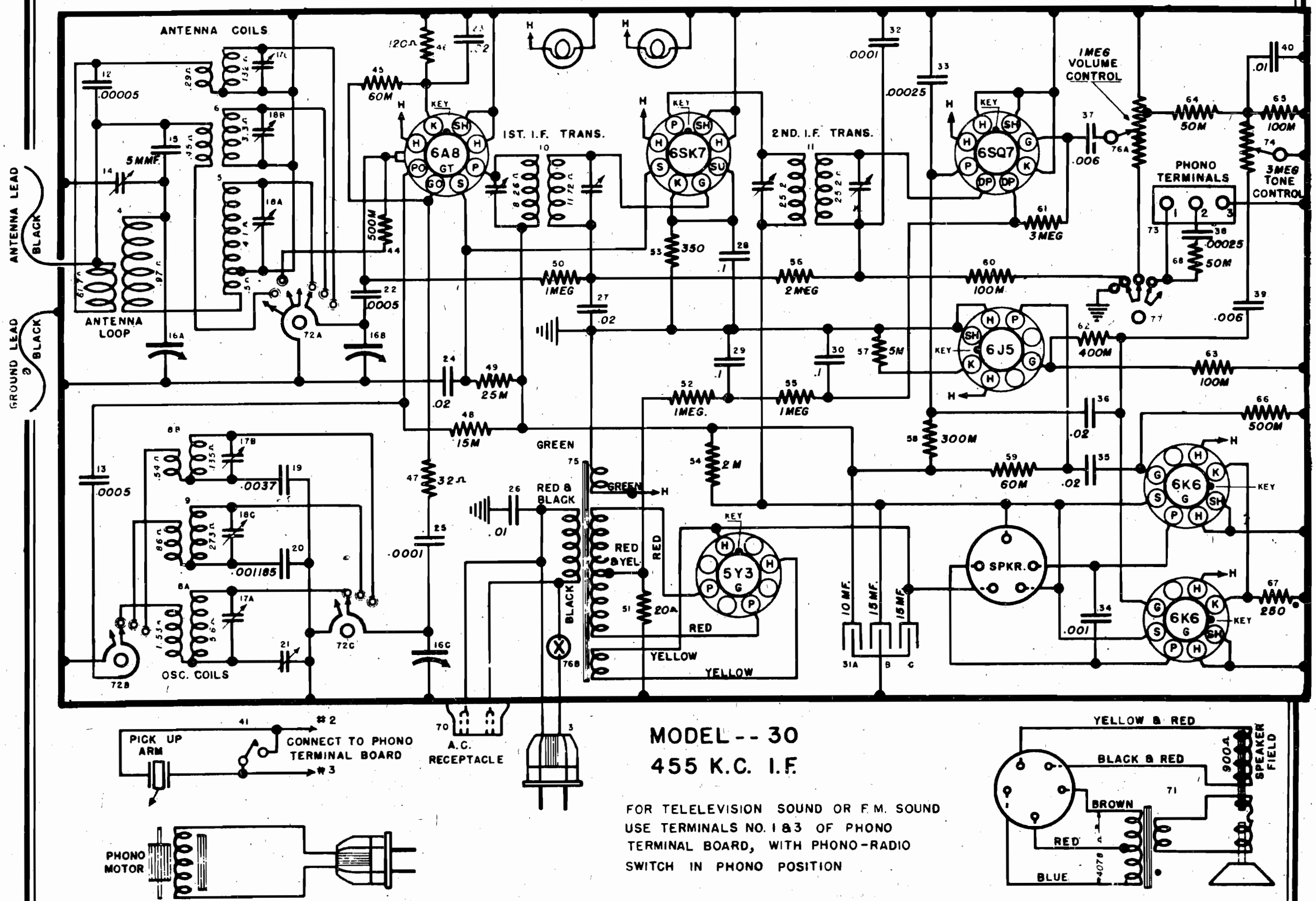
Model 34BH



American Broadcast—550 to 1600 Kc. (545-187 Meters)
Police, Amateur, etc.—1600 to 5000 Kc. (187-60 Meters)
Short Wave (Foreign)—6.0 to 18.0 Mc. (50-16.6 Meters)

MODEL J30BC

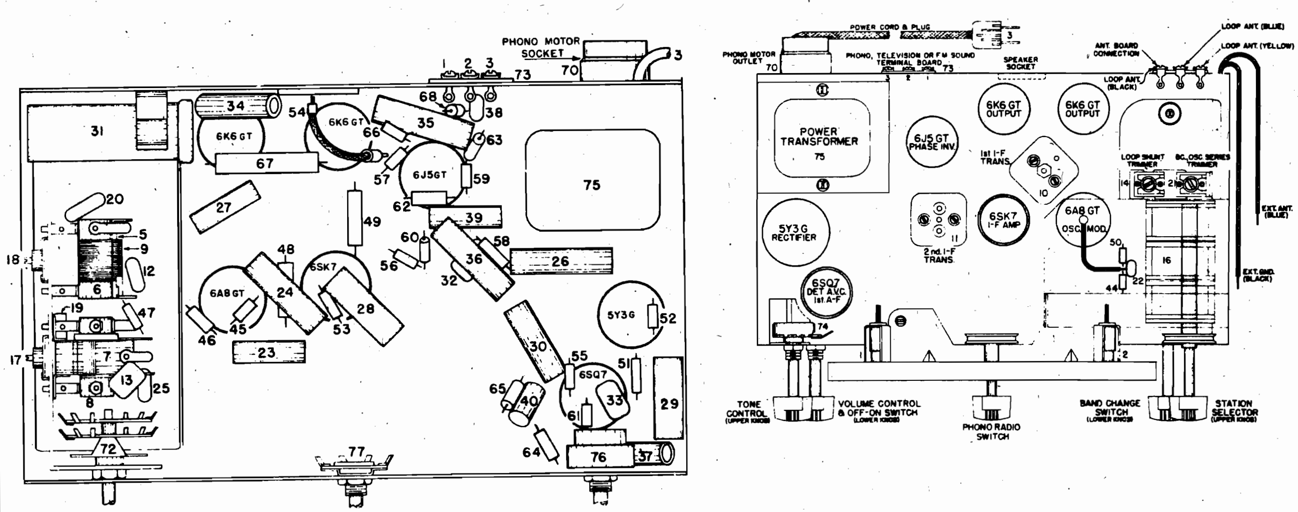
THE CROSLEY CORP.



MODEL -- 30
455 K.C. I.F.

FOR TELELEVISION SOUND OR F.M. SOUND USE TERMINALS NO. 1 & 3 OF PHONO TERMINAL BOARD, WITH PHONO-RADIO SWITCH IN PHONO POSITION

BOTTOM VIEW OF CHASSIS

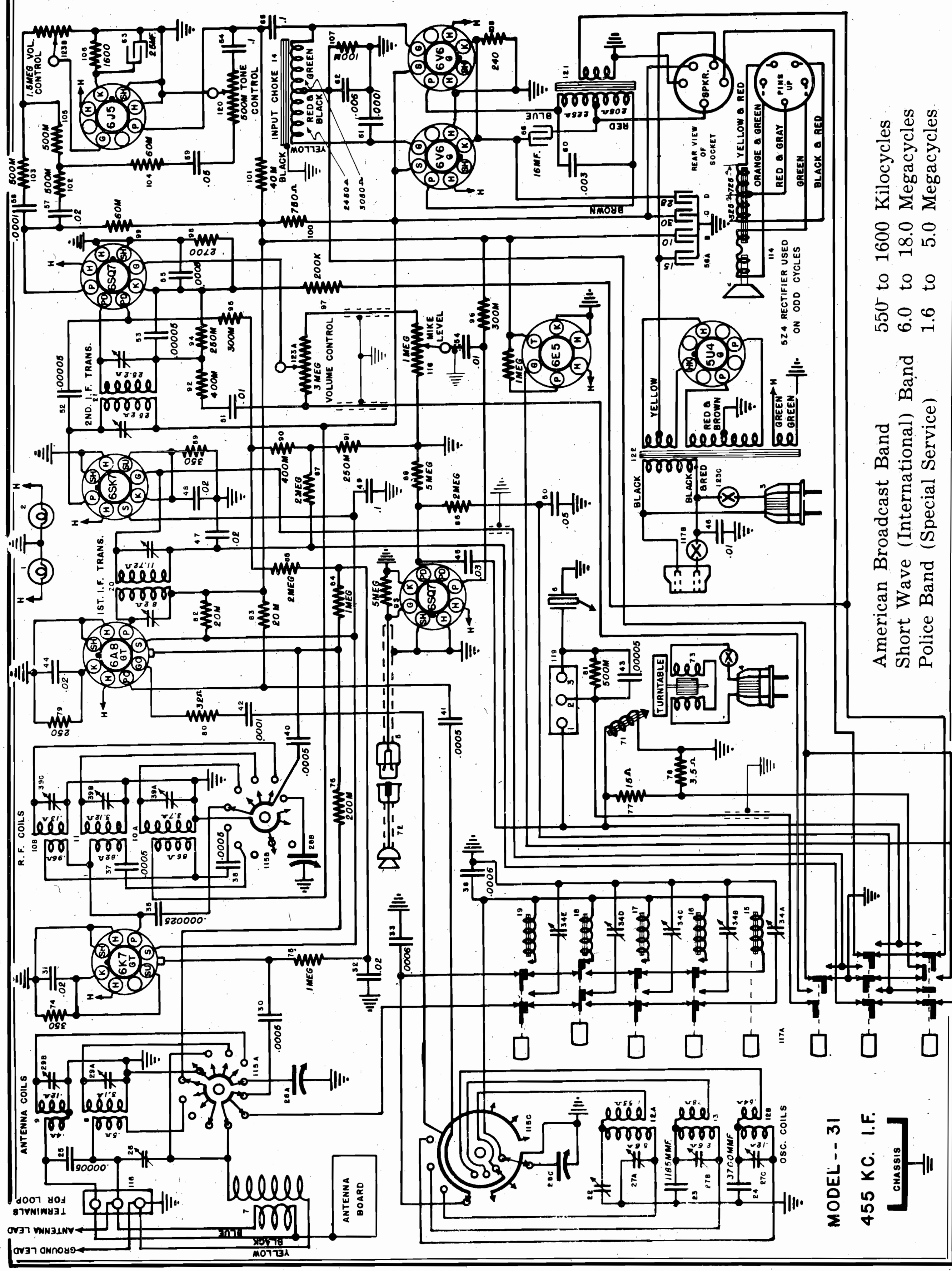


American Broadcast—550 to 1600 Kc. (545-187 Meters)
Police, Amateur, etc.—1600 to 5000 Kc. (187-60 Meters)
Short Wave (Foreign)—6.0 to 18.0 Mc. (50-16.6 Meters

For alignment and voltage See INDEX

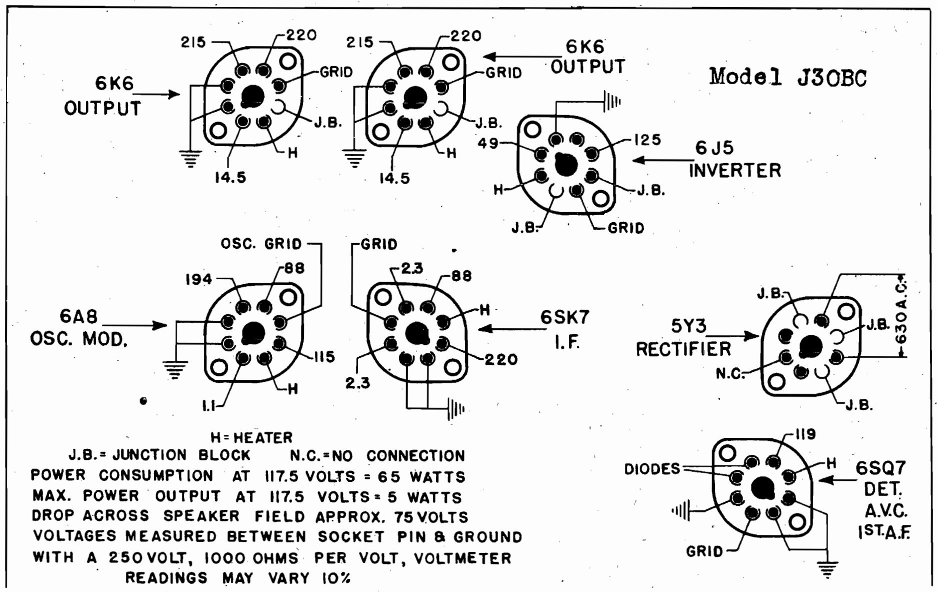
THE CROSLEY CORP.

MODEL 31BF



MODELS 33BG, J30BC, 31BF

THE CROSLEY CORP.



SOCKET VOLTAGES MEASURED @ 117.5 VOLTS LINE (BETWEEN SOCKET PIN AND CHASSIS)
WITH 1000 OHM PER VOLT, 500 VOLT RANGE VOLTMETER (D. C.)
VOLTAGES MAY VARY 10% OF VALUES GIVEN

Model 31BF

SOCKET PIN NUMBER

TUBE	FUNCTION	1	2	3	4	5	6	7	8
6K7GT	R.F. Amplifier	GND.	GND.	280	110	3.25	J.B.	*6.5	3.25
6A8GT	Osc.-Mod	GND.	GND.	260	110	—NEG.	135	*6.5	3.00
6SK7	I-F Amplifier	GND.	GND.	GND.	GRID	3.6	110	*6.5	280
6SQ7	Det.-A.V.C.-1st A-F	GND.	GND.	1.75	A.V.C. DIODE	AUDIO DIODE	220	*6.5	GND.
6J5	Driver	GND.	6.5	145	J.B. 265	GRID	J.B. A.V.C.	GND.	4.85
6V6G	Output	GND.	GND.	300	280	GRID	J.B.	*6.5	18.5
6V6G	Output	GND.	GND.	300	280	GRID	J.B.	*6.5	18.5
6SQ7	Mic. Amp. & Ind. Rect.	GND.	GND.	GND.	LEVEL DIODE	N.C.	85	*6.5	GND.
6E5	Indicator—(Tun.-Level)								
5U4G	Rectifier								

*Measured with A.C. Voltmeter. N.C.=No Connection. GND.=Ground. J.B.=Junction Block.
MAXIMUM POWER OUTPUT @ 117.5 V. Line=20 Watts @ Voice Coil.
POWER CONSUMPTION @ 117.5 V. Line = Radio 115 Watts + Phono Motor 35 Watts = 150 Watts, Total.
DROP ACROSS SPEAKER FIELD: Red/Black to Red/Gray = 25 Volts.
Red/Gray to Red/Yellow = 45 Volts.

Position of Volume Control........Fully On
Position of Tone Control........Treble or Speech

Model 33

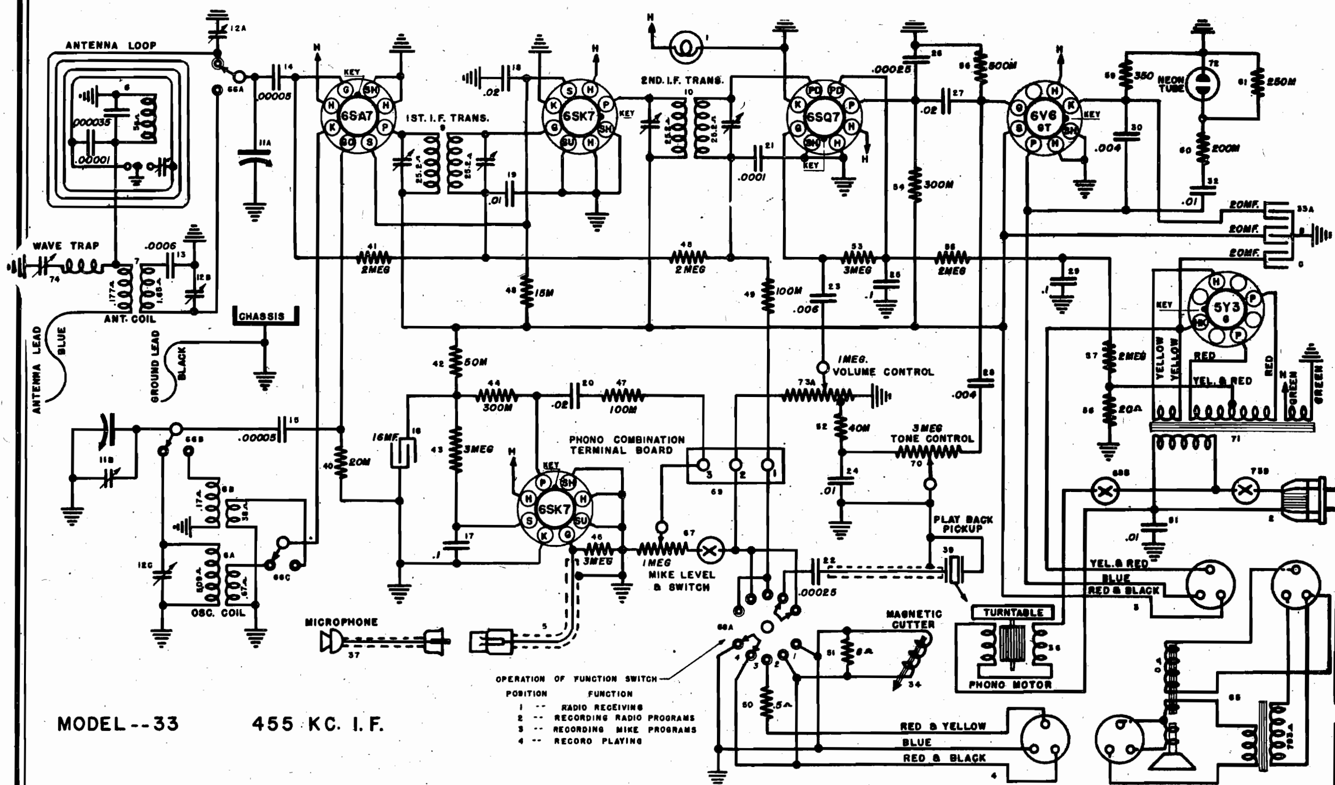
ALIGNMENT PROCEDURE CHART

Alignment Sequence	Dummy Antenna	Frequency Setting	Input to Receiver	Band Switch	Tuning Cond. Setting	Trimmers Adjusted	Remarks
1.	.02MF.	455 Kc.	Ant. Lead (Blue)	B. C.	Fully Open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum output. Adjust for Maximum output.
2.	400 ohm (carbon)	15.3 Mc.	Ant. Lead (Blue)	S. W.	Fully Open	S. W. "OSC" (on gang)	Adjust for Peak. See foot note.
3.	400 ohm (carbon)	15.0 Mc.	Ant. Lead (Blue)	S. W.	Approx. 15 on dial	S. W. "ANT" center trimmer on right end	Adjust for Maximum while rocking gang back and forth.
4.	.0002 MF.	1650 Kc.	Ant. Lead (Blue)	B. C.	Fully Open	B. C. "OSC" front trimmer on right end	Adjust for peak. Make sure the switch on loop is in B. C. position.
5.	.0002 MF.	1400 Kc.	Ant. Lead (Blue)	B. C.	Approx. 140 on dial	B. C. "ANT" rear trimmer on right end	Adjust for Maximum output.
6.	.0002 MF.	2.5 Mc.	Ant. Lead (Blue)	B. C. and switch on loop to Pol	Approx. 2.5 on dial lower right corner	Pol. Ant on loop	Adjust for Maximum output.

When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency which is approximately 910 kilocycles less **as indicated on the dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

THE CROSLEY CORP.

MODEL 33BG
MODEL 31BF



Model 33BG **VOLTAGE CHART**

ALL VOLTAGES MEASURED FROM SOCKET PIN TO CHASSIS @ 117.5 VOLT LINE

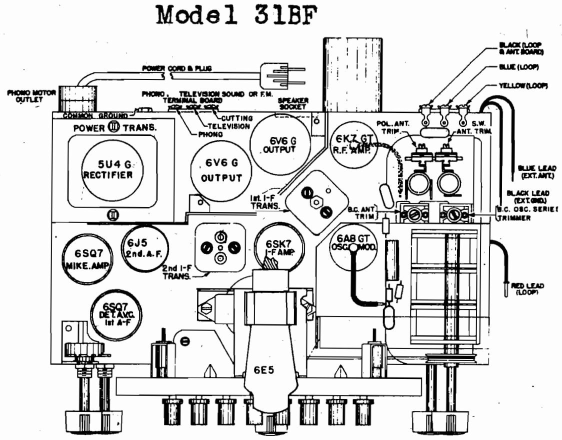
TUBE SECTION	SOCKET PIN NUMBER 1	2	3	4	5	6	7	8
6SA7—Osc.-Mod.	0	0	225	74	0	0	6.3	0
6SK7—I. F. Amp.	0	0	0	0	0	74	6.3	225
6SQ7—Det. A.V.C.—1st A.F.	0	0	0	0	0	100	6.3	0
6V6GT—Output	0	0	209	225	0	0	6.3	10.5
6SK7—Mike Amp.	0	0	0	0	0	+	6.3	+
5Y3G—Rectifier	0	5.0	0	316 A.C.	0	316 A.C.	0	283

All voltages measured with 1000 OHM/Volt Voltmeter except heaters. Voltages may vary 10% of values given.

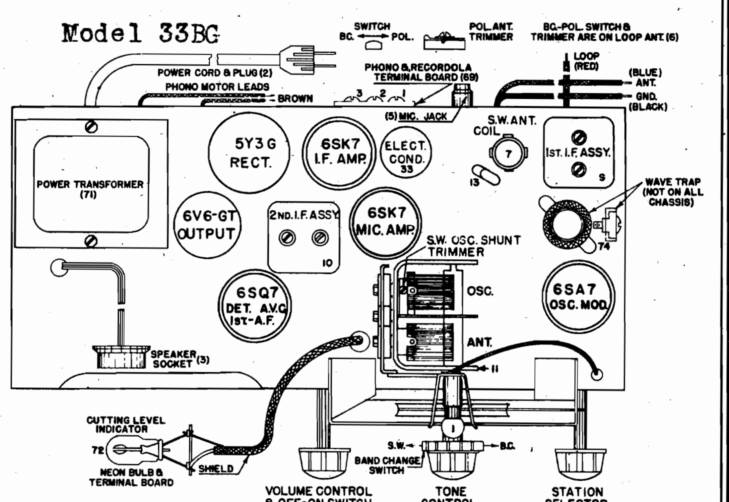
DROP ACROSS SPEAKER FIELD .... 58 Volts
MAXIMUM POWER OUTPUT @ 130 V. LINE .... 6.5 Watts
MAXIMUM POWER CONSUMPTION @ 130 V. LINE .... *60 Watts

*Phono Motor 40 Watts additional.

Model 31BF

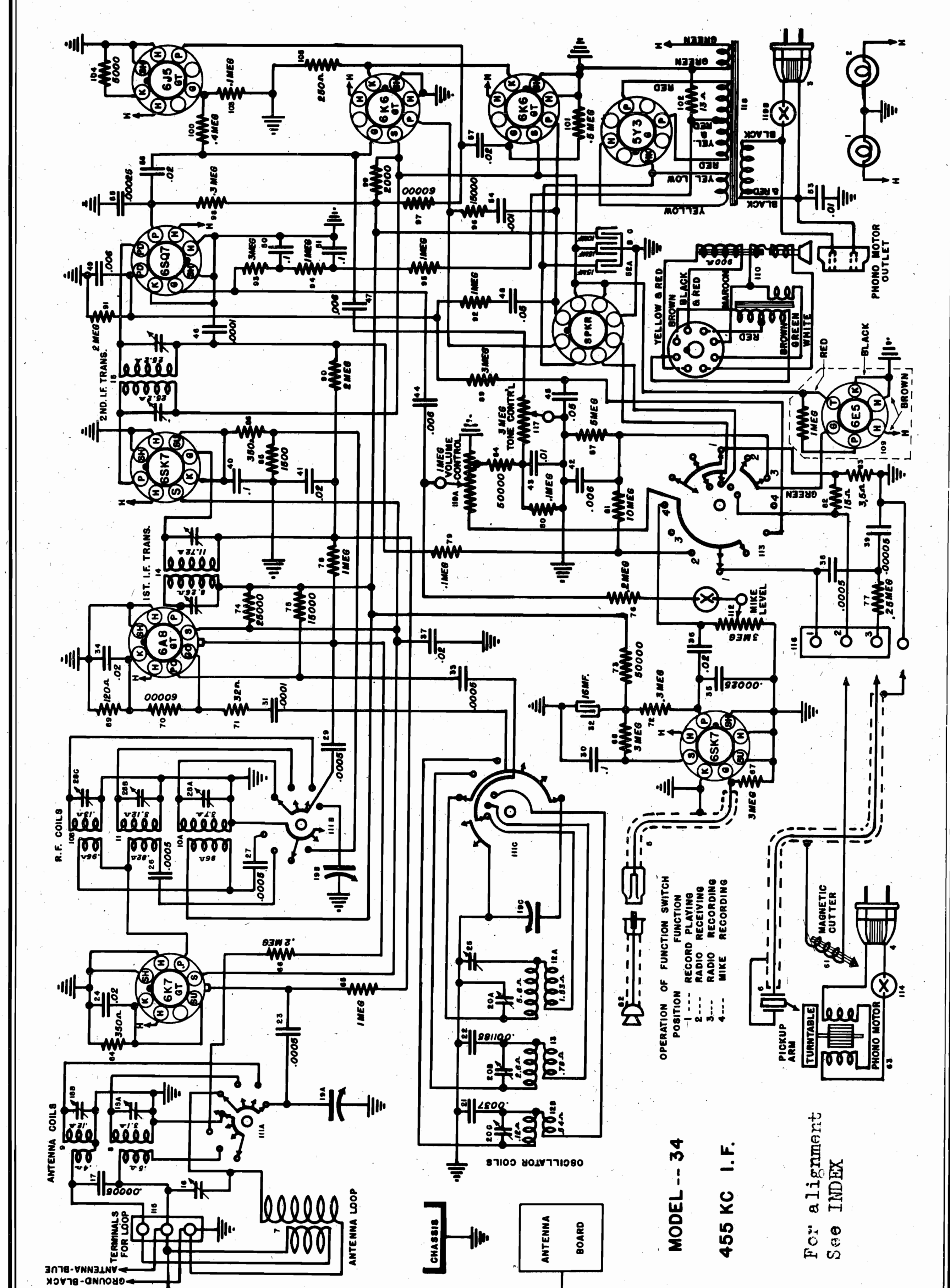


Model 33BG



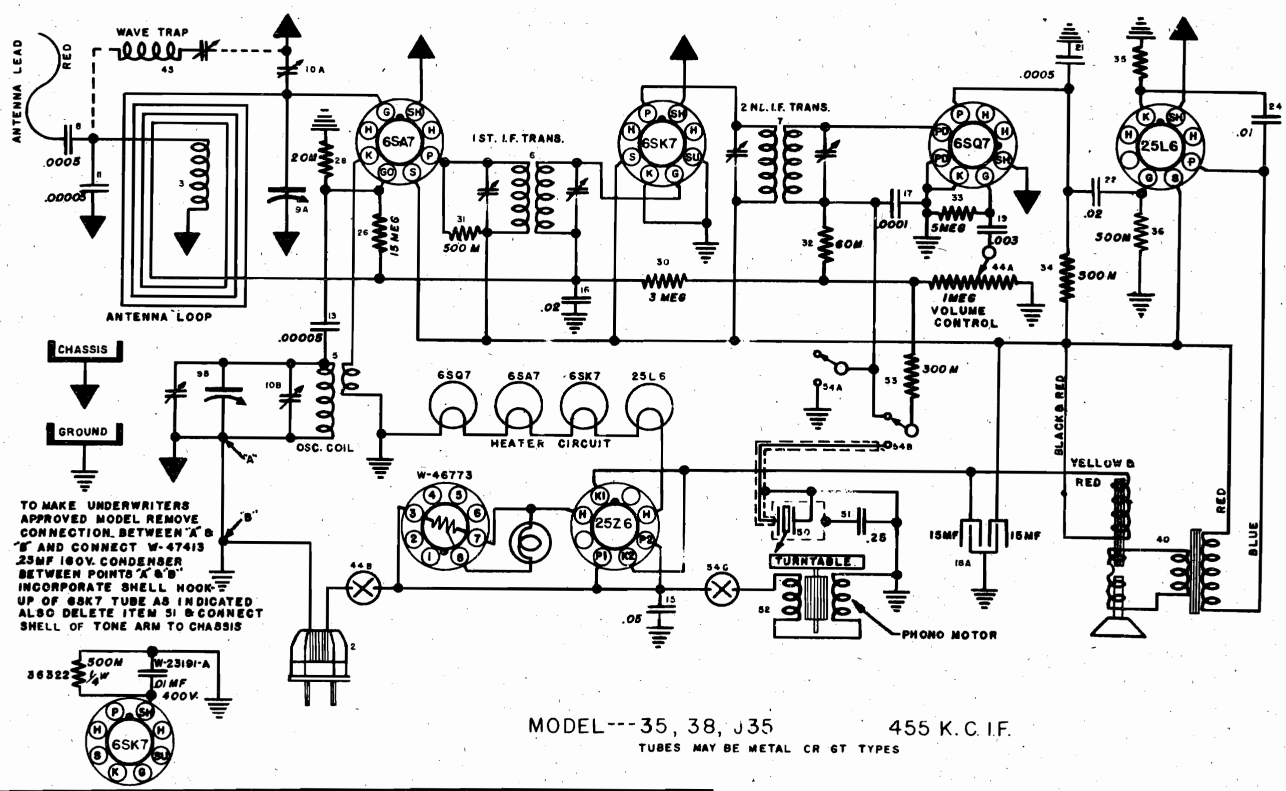
MODEL 34BH

THE CROSLEY CORP.



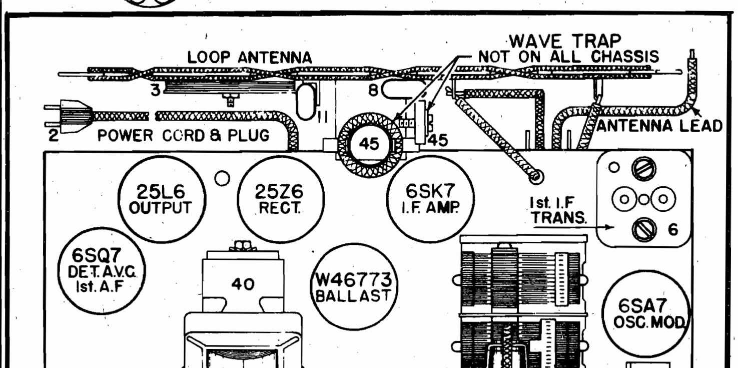
THE CROSLEY CORP.

MODELS 35AK, 38BM



MODEL---35, 38, J35 455 K.C. I.F.

TUBES MAY BE METAL OR GT TYPES

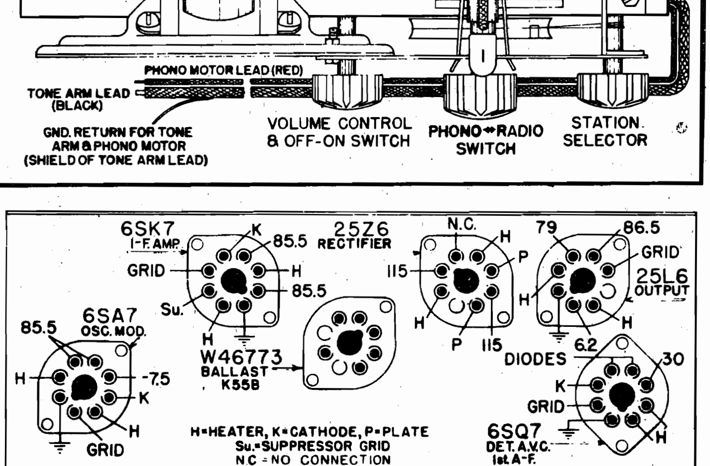


ALIGNMENT:

I.F. -- Set signal generator to 455 kc and connect to Red or Blue antenna lead through a 100 mmf dummy. Adjust 2nd i-f trimmers located through front chassis flange below speaker. Adjust 1st i-f trimmers for maximum output. See layout at left.

R.F. -- Set signal generator to 1650 kc. Condenser gang to minimum. Adjust B.C. OSC. trimmer so that signal is heard. Set signal generator to 1400 kc. Adjust tuning dial to 140 and adjust BC ANT. trimmer for maximum output.

NOTE: Do not readjust the OSC trimmer.

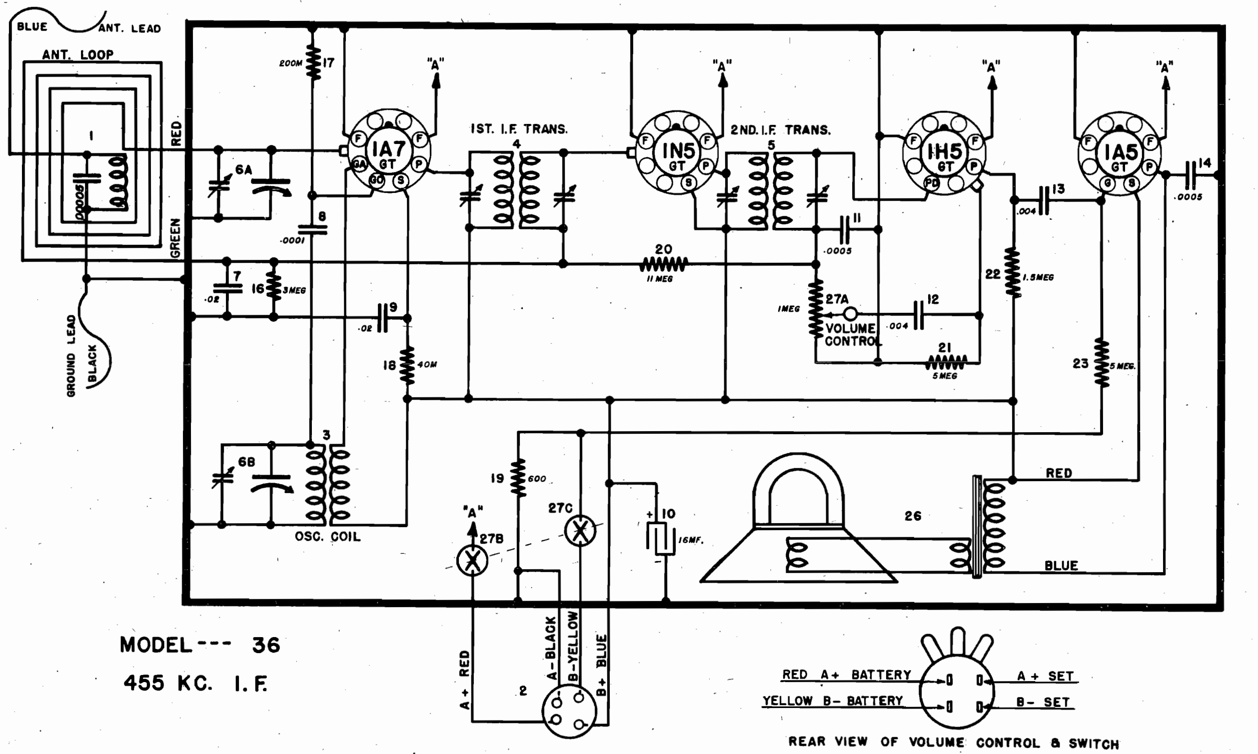


POWER CONSUMPTION AT 117.5 LINE = 50 WATTS
MAXIMUM POWER OUTPUT----------=1.2 WATTS
DROP ACROSS SPEAKER FIELD-------=28.5 VOLTS

Socket Voltage Chart

MODEL 36AM

THE CROSLEY CORP.



TUBE SOCKET VOLTAGE READINGS (MEASURED FROM SOCKET PIN TO CHASSIS)

		PIN NUMBER							
Tube	Function	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1A7-GT	Oscilator-Modulator	—	1.5	86	46	Neg.	86	—	—
1N5-GT	I-F Amplifier	—	1.5	86	86	—	J.B.	—	—
1H5-GT	Detector & 1st A-F Amp.	—	1.5	12	—	—	—	—	—
1A5-GT	Output	—	1.5	84	86	4.3*	—	—	J.B.

Power Output approximately 200 milliwatts. "A" Battery Drain approximately .20 Ampere at 1.5 Volts.
"B" Battery Drain approximately 9.0 Milliamperes at 90 Volts. *Measured across item 19. J.B.=Junction Block.

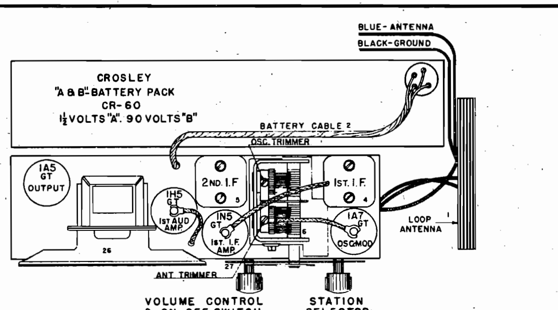


Fig. 1

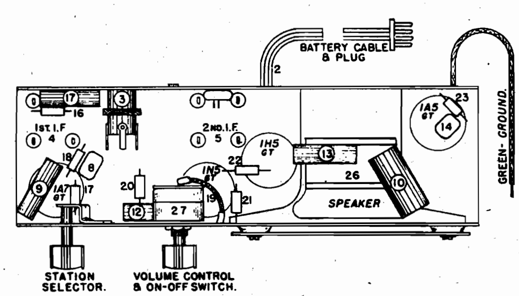


Fig. 2

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 1A5GT 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.

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 1A7GT tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" lead or 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 tuning condenser plates are completely in mesh and turn the volume control knob on the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I-F trimmers for maximum reading on the output meter.

(e) Adjust both trimmers on the 1st I-F transformer for maximum output.

(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 .0001 mfd. condenser to the "ANT" lead (Blue). (Check dial pointer to see that it covers complete range.)

(a) Set the signal generator to 1500 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.

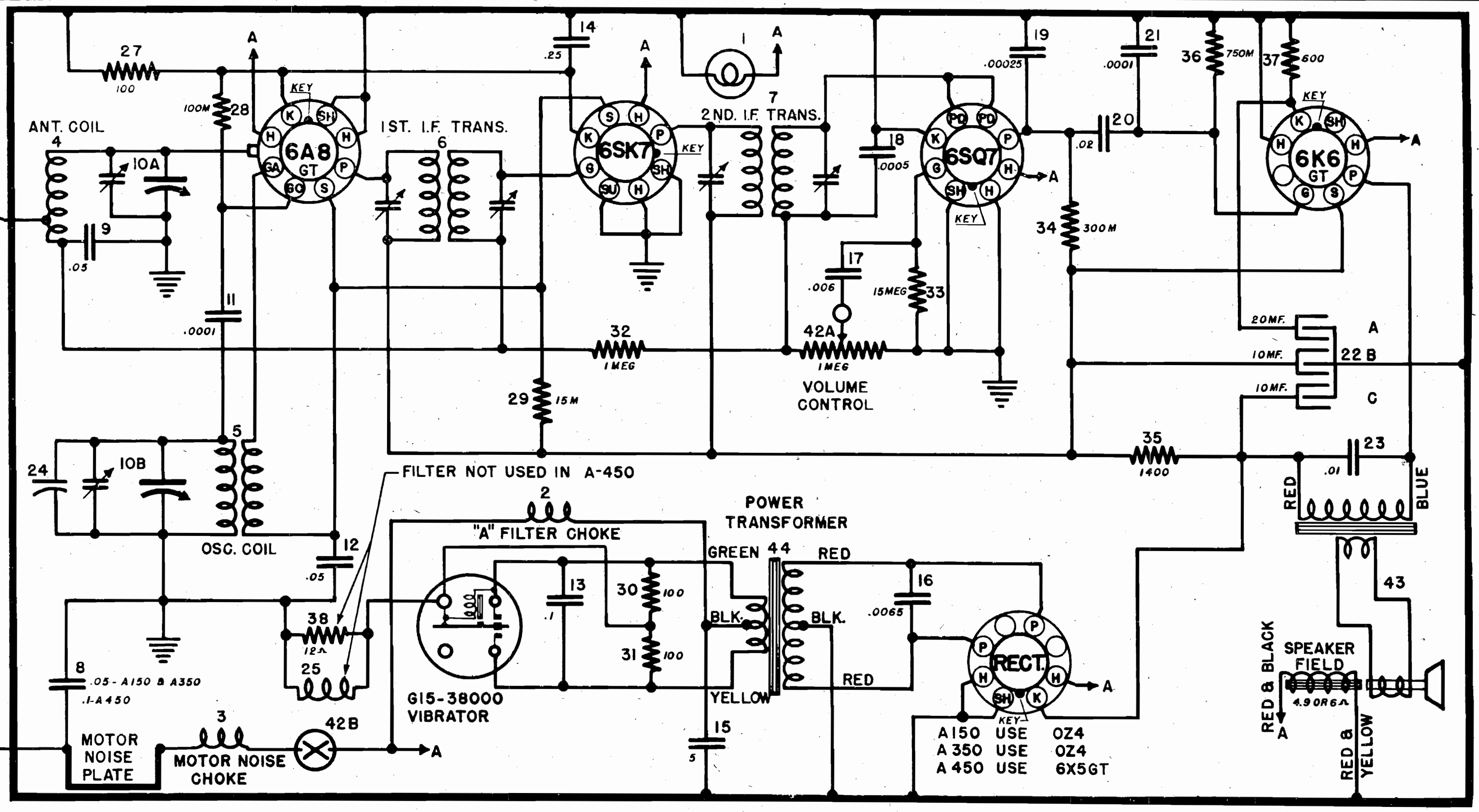
(e) Tune the receiver to the generator signal for maximum output (approximately 140 on the dial).

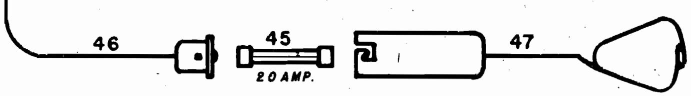
(f) Adjust the "ANT" trimmer condenser on gang for maximum output. DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.

(g) Repeat operations (e) and (f) alternately until no further improvement in output can be obtained.

MODELS A150, A350, A450 Roamio

THE CROSLEY CORP.





MODELS --- A150 - A350 - A450

455 KC. I. F.

MARCH 1940

The vibrator is a 150 cycle full wave primary type. Bias for the 6A8GT and the 6SK7 is obtained from the voltage drop across item 27, a 100 ohm resistor. The 6SQ7 is operated at zero bias. Bias for the 6K6GT is obtained from the voltage drop across item 37, a 600 ohm resistor. A resistive "B" filter is used and consists of item 35, a 1400 ohm resistor and sections B and C of item 22, a three section electrolytic condenser (section A used as by-pass for output cathode).

Models A-150 and A-450 are manually tuned receivers while model A-350 has a five station mechanical push button tuning system.

MODEL A-150
MODEL A-350
MODEL A-450

THE CROSLEY CORP.

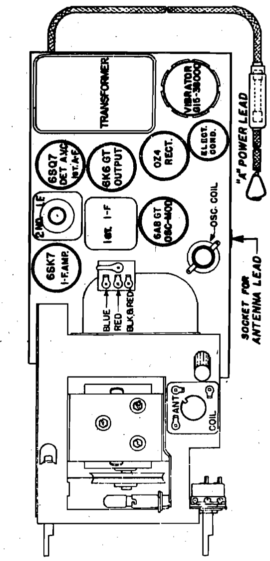


Fig. 2-C—Top View Model A-150

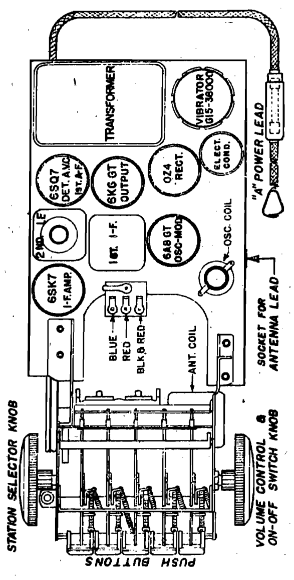


Fig. 2-B—Top View Model A-350

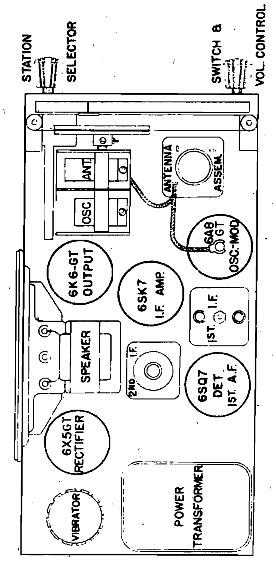


Fig. 2-A—Top View Model A-450

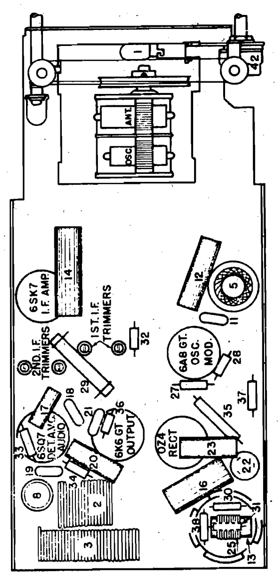


Fig. 3-C—Bottom View Model A-150

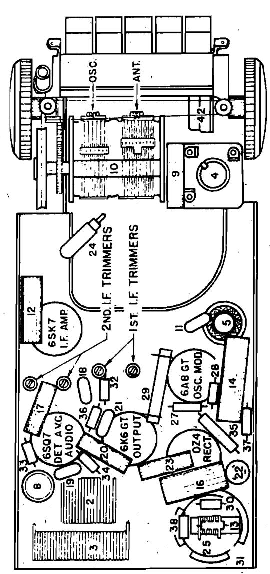


Fig. 3-B—Bottom View Model A-350

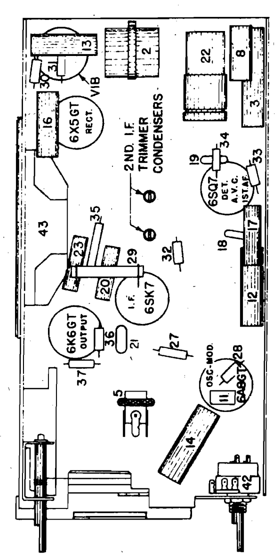


Fig. 3-A—Bottom View Model A-450

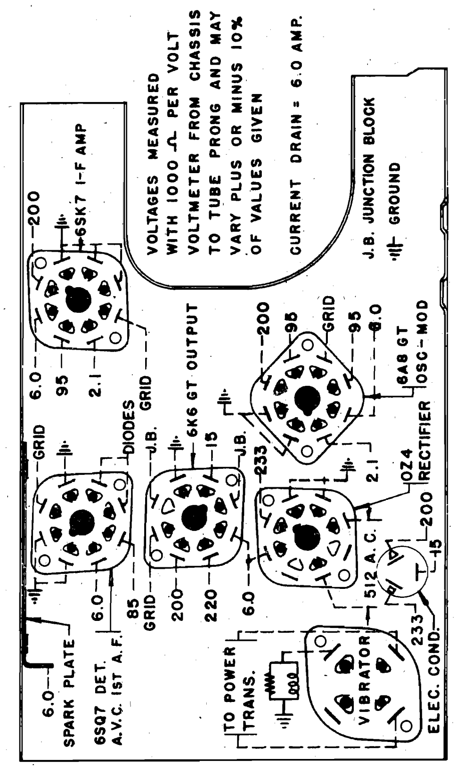


Fig. 4-B—Socket Voltage Chart Models A-150 and A-350

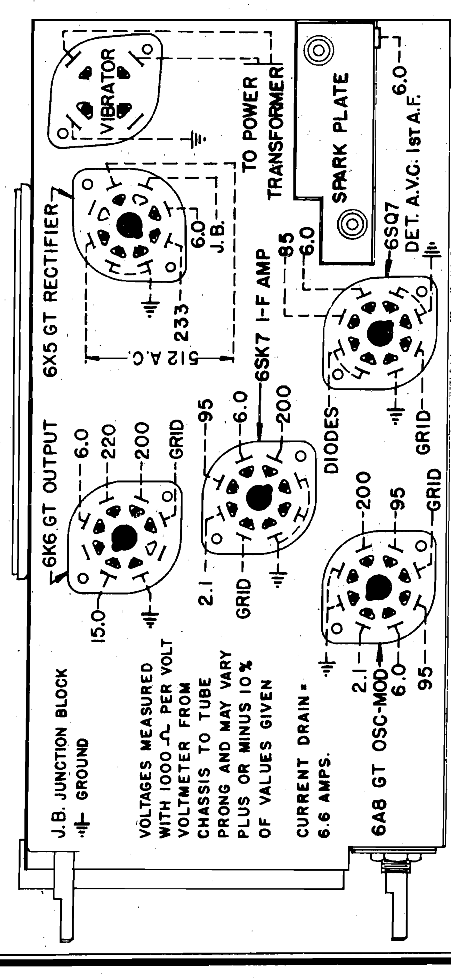
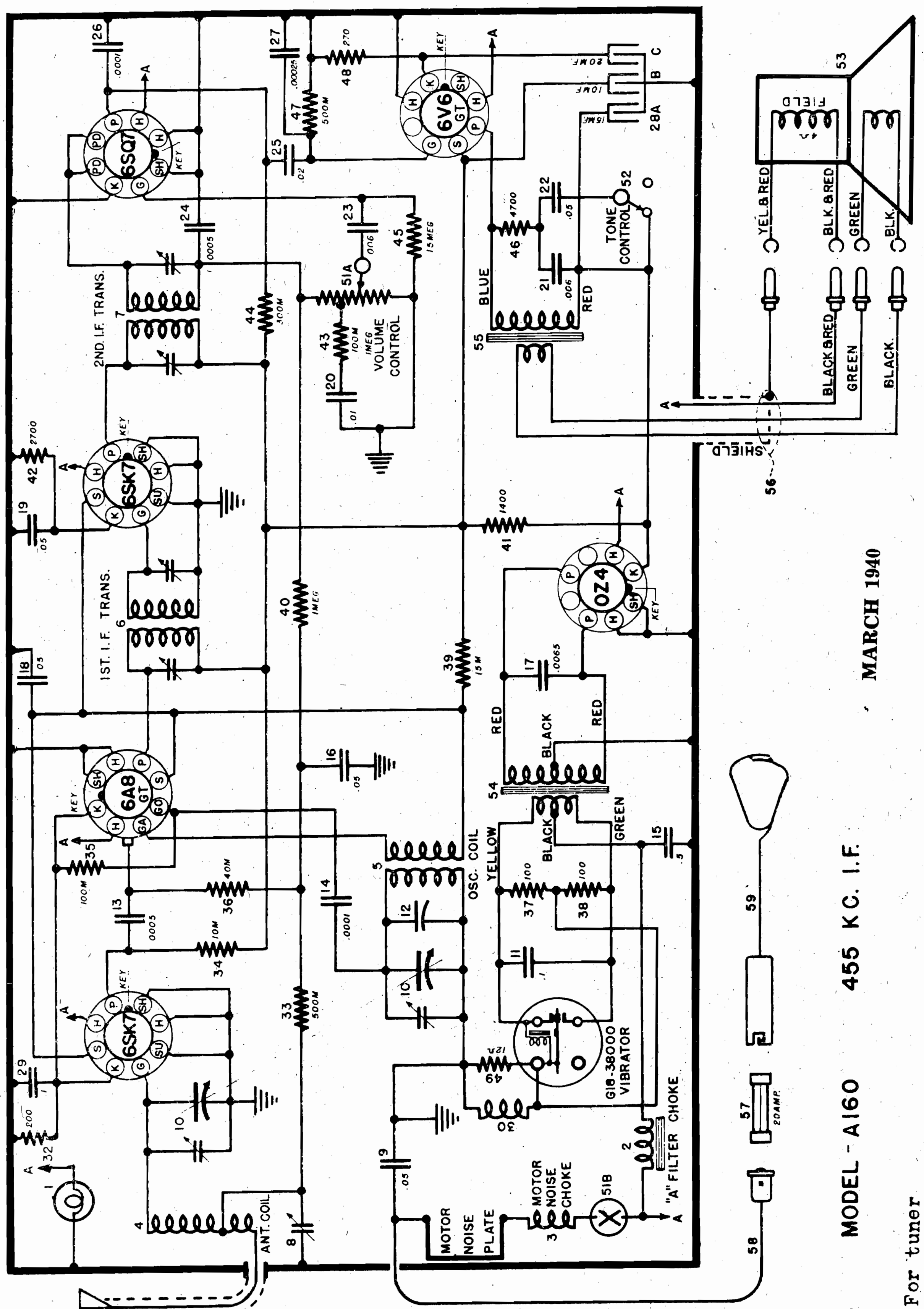


Fig. 4-A—Socket Voltage Chart Model A-450

Conventional alignment; See Special Section Vol. VIII

THE CROSLEY CORP.

MODEL A-160



MARCH 1940

455 KC. I.F.

MODEL - A160

For tuner
See Model A250

MODEL A160

THE CROSLEY CORP.

SPEAKER INSTALLATION

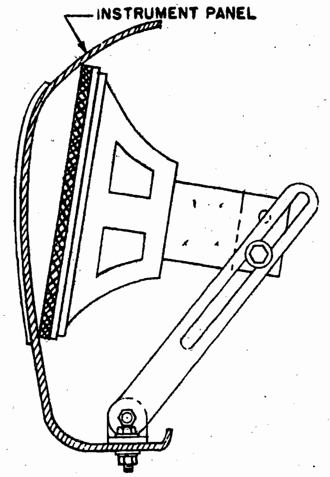


Fig. 5—Instr. Panel Mtg.

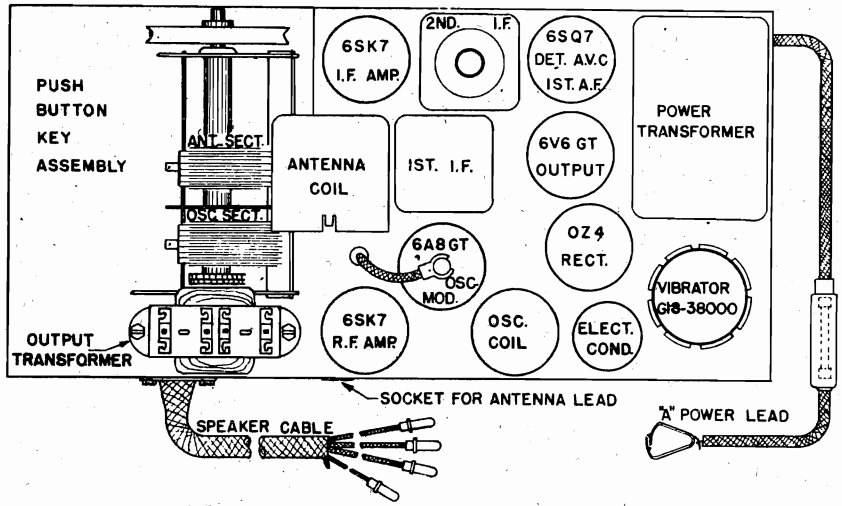


Fig. 2—Top View Model A-160

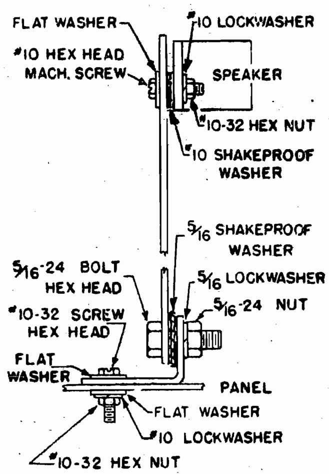


Fig. 6—Bracket Assembly

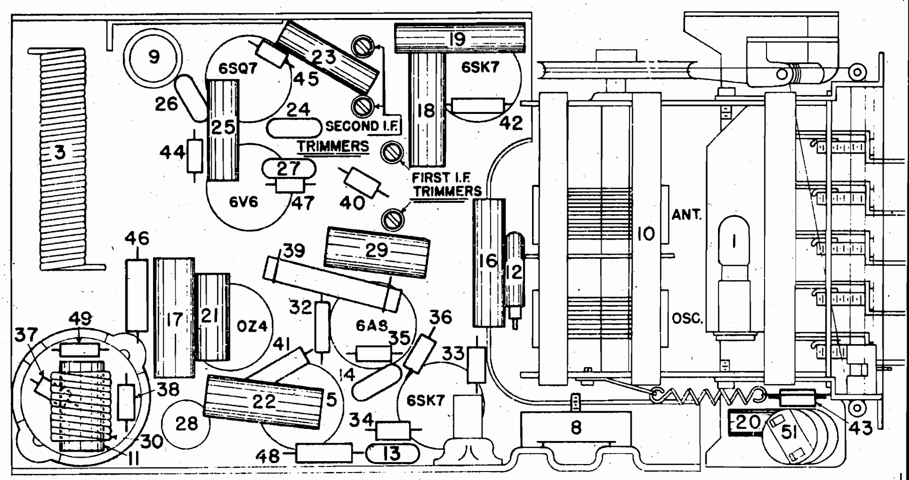


Fig. 3—Bottom View Model A-160

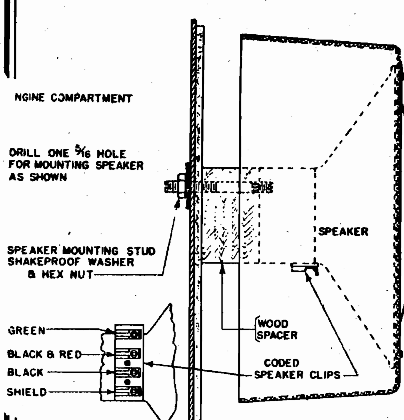


Fig. 7—Cowl Speaker Mtg.

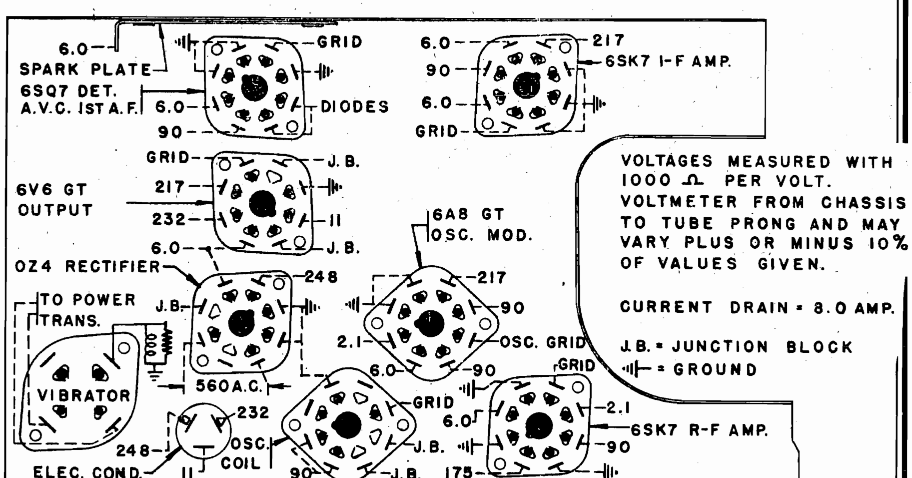


Fig. 4—Socket Voltage Chart Model A-160

THE CROSLEY CORP.

MODEL A160
MODEL A250
MODEL 34BH

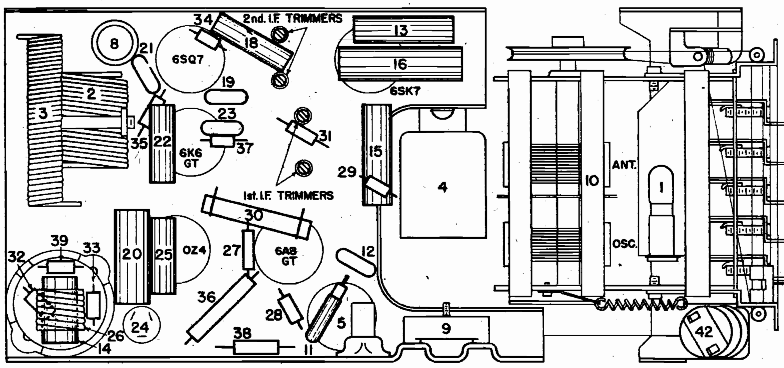


Fig. 3—Bottom View Model A-250

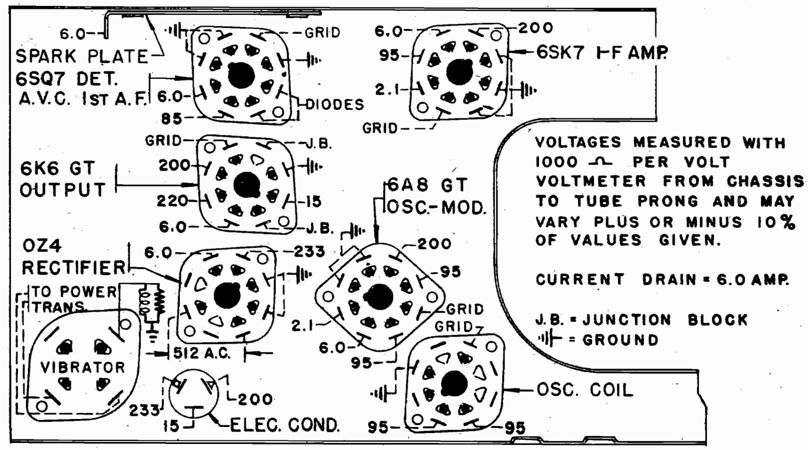


Fig. 5—Socket Voltage Layout

1. Aligning The I-F Amplifier (455 Kc.)

(a) Connect the output of the signal generator through a .02 mf., or larger, condenser to the top cap of the 6A8GT oscillator-modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the chassis.

(b) Set the signal generator to 455 kilocycles.

(c) Open the tuning condenser all the way, turn the volume control on full.

(d) Adjust both trimmers on the 2nd. I-F transformer for maximum output. (See figure 3).

(e) Adjust both trimmers on the 1st I-F transformer for maximum output. (See figure 3).

(f) Repeat (d) and (e) for more accurate adjustments. ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING TO PREVENT A. V. C. ACTION.

2. Aligning R-F Amplifier

To obtain the greatest gain from the R. F. amplifier, the capacity of the dummy antenna should be equal to the capacity of the antenna with which the receiver is to be used. The capacities of auto radio antennas range from 65 mmf. (.000065 mf.) to 250 mmf. (.00025 mf.), 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 and vice versa.

(a) If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "Ant" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Check the pointer travel on the dial to see that it makes a complete trip, reset if necessary. Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output. DO NOT READUST THE OSC. TRIMMER.

(g) Repeat operation (e) for more accurate adjustment.

3. 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, located to the right of antenna receptacle, 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 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.

SOCKET VOLTAGES MEASURED @ 117.5 VOLTS LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 VOLT RANGE VOLTMETER (D. C.)

Model 34BH

SOCKET PIN NUMBER

TUBE FUNCTION	1	2	3	4	5	6	7	8
6K7GT—R-F Amp.	......	......	195	78.6	......	2.0	*6.3	2.0
6A8GT—Osc.-Mod.	......	......	195	78.6	......	136	*6.3	1.0
6SK7—I-F Amp.	......	......	......	......	5.5 B.C. 2.6 S.W.	78.6	*6.3	234
6SQ7—Det. A.V.C. 1st A-F	......	......	......	......	......	110	*6.3	......
6J5GT—Phase Invert.	......	......	118	195	......	110	*6.3	4.5
6K6GT—Output	......	......	220	228	......	......	*6.3	15.0
6K6GT—Output	......	......	220	228	......	......	*6.3	15.0
6SK7—Mike Amp.	......	......	......	......	......	......	*6.3	POS.
5Y3G—Rectifier	......	305 D.C.	......	*325	......	*325	......	305 D.C.
6E5—Indicator	......	......	......	225	......	*6.3		

*Measured with A.C. volt meter

VOLTAGE DROP ACROSS SPEAKER FIELD= 77 VOLTS
MAXIMUM POWER OUTPUT @ 130 V. Line=7.5 Watts
POWER CONSUMPTION @ 117.5 V. Line=Radio 80 Watts, Phono Motor 35 Watts—TOTAL=115 WATTS
Voltages may vary 10% of values given.

MODEL A250 Roamio

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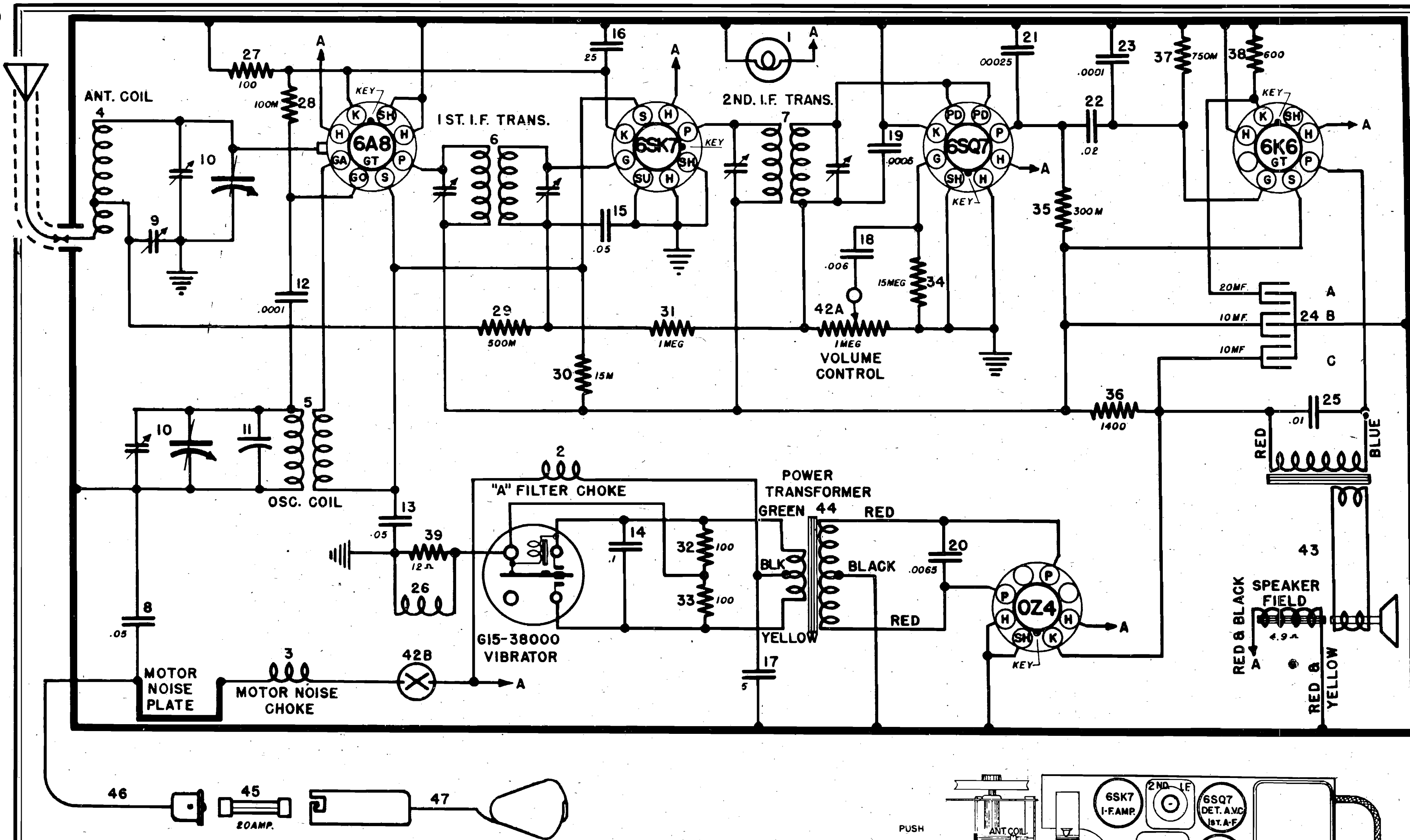


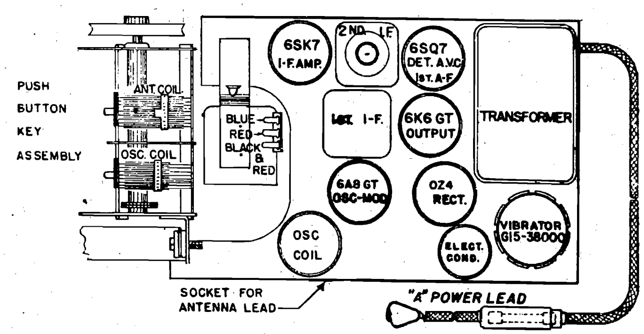
SETTING PUSH BUTTONS for A160 and A250

MARCH 1940

The push buttons are easily reset if necessary. Remove the push button by pulling straight out. Loosen the set screw two or three turns. With the manual control tune-in station to which key is to be set. With a small screw driver inserted in set screw push the key ALL THE WAY DOWN, then securely tighten set screw.

MODEL --- A250

455 KC. I.F.



THE CROSLEY CORP.

Recorder data (Part 1)

I—RECORDERS

The quality and life of instantaneous home recordings is largely dependent upon the operators working knowledge of his equipment and the type blank discs and cutting needles used. For the operation and adjustment of the various controls read the operating instructions supplied with the receiver.

The type recorders used in Crosley equipment employ low impedance magnetic cutting heads and have crystal tone arms for play back. The turntable is rim driven. The deluxe recorder also has the automatic record changer capable of playing 14 ten inch or 10 twelve inch records at one loading.

A.—CUTTING NEEDLES

The cutting needle or stylus as furnished with the Crosley recorders will cut approximately 30, 6½" records one side or 15, 6½" records both sides (one hour life cutting time).

These needles are of the hardened steel type and the cutting point and edges are extremely sharp and quite easily damaged should they be bumped or scraped against a metal surface. The point of these needles is

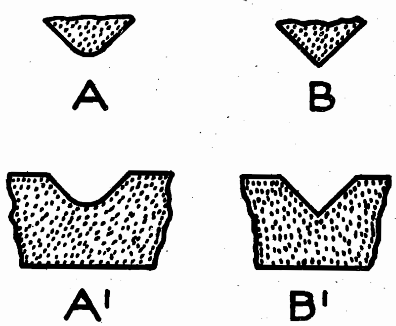


Figure 1

ground to a sharp "V" as shown in fig. 1B while the more expensive needles are of sapphire or a special metal alloy with their points having a very slight radius as shown in fig. 1A.

A simple rule of the thumb method for determining needle wear is, that the grooves cut out with a new or good needle have a high brilliance and as the needle wears the lustre of the cut section will be less and eventually appear gray.

If cutting needle tends to chatter as it is recording, it is advisable to replace it with a new one. (Also check the cutting arm height, see following paragraphs). The recording needle may be removed and replaced as desired, provided the adjustments are checked each time before recording. In all events, every precaution must be taken to protect the cutting point at all times; in cutting it should be lowered GENTLY on the blank with turntable RUNNING.

NOTE: Most cutting needles have a flat ground on the shank. The needle screw must be tightened against this flat. Always firmly tighten the needle screw before making a recording.

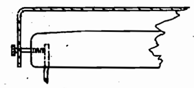


Figure 2

B.—PLAY BACK NEEDLES. (Use Recoton needles as furnished by Crosley for best results)

Instantaneous recordings (home recordings) require special play back needles if the quality and life of the record is to be retained. Needles purchased as "100% shadowgraphed" steel needles should be used at all times. This type needle is individually inspected to see that it has a perfectly rounded point of proper radius with no sharp edges or flat sides so that it will have no tendency to harm the record.

Several home recordings may be played with one needle, *PROVIDED* the needle does not touch a commercial record. Never play an instantaneous recording with a needle that has been used on a commercial record.

A rule of the thumb method for judging the amount of wear on a home recording when it is being played back it to watch the change in the color of that portion of the record which the needle has played in comparison with the rest of the record. The first time the record is played back after it has been recorded the grooves may turn slightly darker as the playback needle passes over them, but the change should not be great. Further play-back shoud how little or no change in color, provided the play-back is in good condition and that the record is free from dust and dirt. Whenever any great changes in color does occur, it is advisable to immediately stop the record and put in a new needle.

C.—CUTTING ARM ADJUSTMENTS.

"Recorder with Automatic Record Changer." "Seeburg Type" used on Models 28AZ, 34BH, 31BF, and 48BF.

The height of the cutting arm can be varied by means of the slotted screw head which is on top of the arm and near the back, approximately flush with the top surface of the arm. In order to make this adjustment, it is necessary to insert a cutting needle and, with the motor turned OFF and a record blank on the turntable, place the recording arm in the cutting position. Now turn cutting arm height adjusting screw UNTIL THE NEEDLE SCREW IS CENTERED IN THE SLOT THROUGH WHICH IT PROTRUDES (AT FRONT END OF RECORDER ARM).

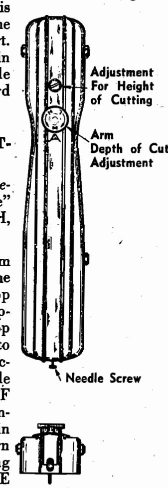


Figure 3

Any change in the cutting arm height adjustment will change the vertical angle of the cutting needle therefore it is absolutely essential that the depth of cut be rechecked.

"Recorder as used in Model 33BG." (General Industries Type).

The height adjustment of the cutting arm on this recorder is accomplished by raising the cutting arm and loosening the locknut of the cutting arm Height Adjusting Screw, see fig. 4. Place needle in cutting arm and place a record blank on turn table. Carefully lower cutting arm on record, with the motor turned OFF.

Set the Arm Height Adjusting Screw so that there is

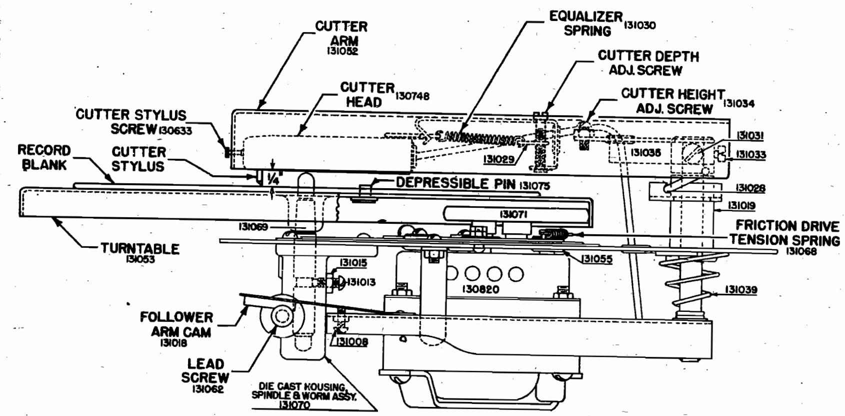


Figure 4

exactly ¼" space between the surface of the record and the bottom edge of the cutting arm (Front) see fig. 4.

NOTE: A change in cutting arm height adjustment may affect the depth of cut or vice-versa.

C.—ADJUSTING DEPTH OF CUT.

The correct depth of cut is important to insure maximum record life and good reproduction quality.

The depth of cut which is determined by the cutting needle pressure on the blank disc should be such THAT THE WIDTH OF THE GROOVE IS APPROXIMATELY THE WIDTH OF THE SPACE (Land) BETWEEN THE GROOVES. With no sound applied the ratio of 60 percent groove and 40 percent land is the ideal cutting depth for most conditions. The importance of the depth of cut CANNOT BE OVER EMPHASIZED, since too light a cut or too heavy a cut will tend to give distortion and generally poor results.

Illustrations A, B, C, and D in fig. 5, are typical results obtained, "A" shows a groove which is cut too light, "C" a groove of approximately 60-40 or which is the generally preferred depth, "D" illustrates an appearance of a groove of "C" depth after recording while "B" illustrates a too heavy a cut (over 60-40) with an excessive amount of (too high a cutting level) signal applied to cutting head causing an overcut of the grooves.

The adjustment of the depth of cut is accomplished by rotating the chrome knob on the cutting arm of the recorder with automatic record changer, see fig. 3. This knob has the letters "L, M, and H" engraved on it indicating Light, Medium and Heavy pressures. In general, the machine is properly adjusted and set at the factory so that it will cut the average record correctly when this knob is in the "M" position.

On the recorder as employed in Model 33BG the

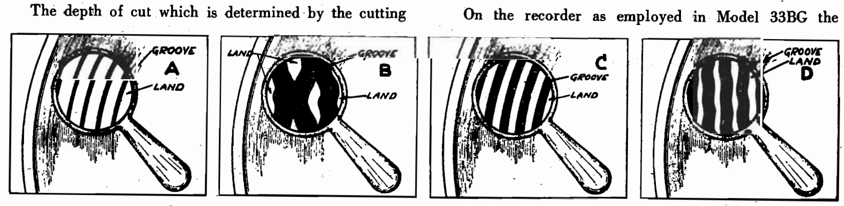


Figure 5

Recorder data (Part 2), Auto. record changer

THE CROSLEY CORP.

depth of cut is adjusted by rotating the screw approximately in the middle of the cutting arm and flush with the top, see fig. 4. To increase the depth of cut this screw should be turned to the right (clockwise). Conversely to decrease the depth of the cut the screw should be turned to the left (counter-clockwise). This adjustment is rather critical and should be moved only in quarter or half turns at a time.

When the cutting head is in proper adjustment, and the cutter arm is raised to the point (approximately 45°) where it can be freely moved over the record, the cutting head needle screw should JUST REST on the bottom of the slot in the nose of the arm,—that is, the equalizer spring tension should be such that the cutter head ALMOST FLOATS FREELY.

ALWAYS TRY A TEST CUT WITH A NEW CUTTING NEEDLE before making any adjustments, since often times when casual observation indicates faulty adjustment, the whole trouble may be due to a cutting needle that has been dulled either through accident or natural wear.

NOTE: Changing the arm height usually necessitates a change in cutting depth adjustment and changing the depth of cut may call for a slight variation in the arm height adjustment to prevent cutting needle chatter or reduce surface noise.

E.—CUTTING LEVEL.

The cutting level as required for instantaneous recordings as made on the two type recorders as used in Crosley equipment will vary with the type cutting needle used and its condition and the type record blank used. Provided the cutting arm height is correct and the depth of cut is correct the following cutting levels should give good results.

For those models having the cathode ray type indicator, the volume level should be adjusted until the shadow on the indicator tube forms a narrow vertical line approximately 1/32" wide for loud or peak signals. During recording this shadow will vary in width in accordance with the loud and soft passages of the program.

For the models equipped with a Neon Tube as a Cutting Level Indicator the volume level should be raised to a point where the neon tube elements give an even pinkish glow during loud or peak signals. The correct cutting level can only be found by experimentation as the level is dependent upon the type and condition of cutting needle and blank disc used.

F.—RECORDS (BLANK & CUT)

The record blanks for instantaneous home recordings differ from commercial records in many respects. Commercial records are usually made of shellac compound pressings formed under hydraulic pressure, resulting in recordings which are extremely resistant to wear but which are quite brittle and easily broken. Record blanks for instantaneous recordings are quite soft in comparison with commercial records but their durability is about as good as that of the cheaper grade phonograph record provided they are given the proper care.

NEVER USE REPRODUCING NEEDLE ON INSTANTANEOUS RECORD THAT HAS BEEN USED TO PLAY COMMERCIAL PHONOGRAPH RECORD.

The Crosley home recording disc is of the non-flamable or slow burning type. Always exercise care in the storage of home recordings. Keeping them clean, free from dust and dirt will add many hours to the life of the record.

NEVER ATTEMPT TO PLAYBACK AN INSTANTANEOUS RECORDING ON A MECHANICAL PHONOGRAPH.

NOTE: Excessive rumble which may sometimes be encountered during the playback of home recordings usually can be eliminated entirely (on Models 33BG, 28AZ, and 34BH by just turning the microphone fader or level control in a clockwise direction until the switch clicks.

II—SERVICE NOTES

Recorder with Automatic Record Changer.

(Models 28AZ, 34BH, 31BF, and 48BF)

1.—FUNCTION OF MANUAL CONTROL BUTTON AND RELATIVE PARTS

When Manual Control Button (Item 84, Fig. 6) is moved to the Manual Play-Back recording position, it moves the Manual Control Slide (Item 102, Fig. 7) which in turn moves Clutch Lock Slide (Item 103, Fig. 7) into a position which prevents Engagement Clutch Cam Assembly (Item 79, Fig. 8) from rotating. When Engagement Clutch Cam Assembly is in the above mentioned position and is not free to rotate, the Changer will not go into its changing cycle.

Also when the Manual Control Button is in the above mentioned position, the Manual Control Slide has moved the Locator Lock Slide (Item 106, Fig. 7) into a position where it engages the Tone Arm Locator & Bushing Assembly (Item 12, Fig. 7) and prevents same from bearing against Tone Arm Lever Assembly (Item 19, Fig. 7) allowing the Tone Arm to swing freely without hindrance and without setting Changer into its changing cycle. When the Manual Control button is in the automatic position the Changer will function normally as an automatic record changer.

2.—POSSIBLE MECHANICAL CAUSES OF POOR RECORDINGS

(A) Threads from record cuttings getting down onto Rubber Idler wheel (Item 83, Fig. 6) and between drive wheel and motor pulley. This will cause very bad speed variation of the turntable and, of course, will result in very inferior recording. Cuttings may also wrap around motor shaft and cause motor to slow down or stop.

To remove the record cuttings, the turntable should be lifted by applying an even lifting force at opposite edges of the turntable while the turntable spindle is gently tapped downward on its top end, and the record cuttings then removed. The Rubber Idler Drive Wheel should be taken off—this can be accomplished by unsnapping the small snap cotter ring and slipping Rubber Idler Drive Wheel off its shaft, after which all record cuttings can be removed.

NOTE: It is very important that no grease or oil be gotten on the surface of the Rubber Idler Drive Wheel.

(B). *Tight pivot bearings:* Check cartridge pivot screw (Item 108, Fig. 6) for binding. Also recording arm pivot screw (Item 107, Fig. 6) and Traverse arm pivot screws (Item 101, Fig. 8). These bearings should all be free, but have no looseness or play.

If the pivot screw, (Item 108, Fig. 6) of the Cutter Cartridge is tight, the Cutter Cartridge cannot follow a slight up and down variation of the record or turntable. A record cut in this manner will, when played back, have a high scratch level, rough cutting and a tendency for the needle to jump from one groove to another.

(C) *Damaged Rubber Idler Drive Wheel* (Item 83, Fig. 6) *Rubber Idler Drive Wheel may have become damaged by:*

1. Allowing oil or grease to come in contact with same.
2. By allowing turntable to drop and cut into the outside surface of the Rubber Idler Drive Wheel.
3. Stopping the turntable by hand while the motor is running will cause a flat spot on the surface of the Rubber Idler Drive Wheel.

NOTE: If the Rubber Idler Drive Wheel has been damaged in any of the above mentioned ways, it should be replaced with a new one.

(D) *Vibration Reaching the Recorder While A Blank is Being Cut:*

It is very important the floor or the surface upon which the Recorder rests remain quiet as any vibration such as people walking across the floor or shaking of the instrument in which the recorder is mounted will seriously affect the quality of the finished recording.

(E) *Recorder Not Level:* It is very important that the Recorder is standing Level. This can be checked by placing a small level on the turntable and checking same in two positions at right angles to each other and then leveling instrument in which Recorder is mounted.

(F) *Bent or Damaged Turntable Spindle:* If the Turntable Spindle (Item 59 Fig. 6) has been bent in shipment, or by someone exerting a heavy pressure on one side, it should be replaced with a new one. A bent Turntable Spindle will cause the surface of the Turntable to move up and down while it is turning and, of course, will seriously effect the quality of both recording and play-back.

NOTE: When removing the Turntable an even upward lifting force should be applied at opposite edges of the Turntable while Turntable Spindle is gently tapped downward on its top end.

(G) *Record Cutting Causing A Bind Between Turntable Spindle* (Item 59, Fig. 6) *and Its Bearing:*

It is very important that all record cuttings are removed from Turntable Spindle and its bearing.

(H) *Tension On Rubber Idler Drive Wheel* (Item 83, Fig. 6) *Too Great:*

If the tension on the Rubber Idler Drive Wheel is too great, this will result in a "wow" or a rumble in the recording. To decrease the tension on Rubber Idler Drive Wheel, loosen the screw holding the lug which is located beneath the Rubber Idler Drive Wheel and turn it slightly in a clockwise direction. This will reduce the spring tension on the Rubber Idler Drive Wheel. When the spring tension is correct, the spring will be approximately at right angles to the lug.

(I) *Tension On Rubber Idler Drive Wheel* (Item 83, Fig. 6) *Too Weak:*

This will cause very bad speed variation. Turntable will slow down and then speed up as audio current of varying intensity reaches the cutter cartridge.

RECORDER AS USED IN MODEL 33BG

(a) *Possible Mechanical causes of Poor Recordings.* Thread from record cuttings getting down on to Turntable Drive Wheel (Fig. 4, Section I). This will cause very bad speed variation of turntable. Cuttings may also wrap around motor shaft and cause motor to slow down or stop. To remove record cuttings, the turntable should be lifted by applying an even lifting force at opposite edges of the turntable. The rubber drive wheel should be taken off—Remove hairpin retainer and fibre washer and left wheel off, remove all cuttings and replace wheel.

NOTE: It is very important that NO GREASE or OIL be gotten on the surface of the rubber on drive wheel.

Turntable Drive Wheel may become damaged by—

1. By permitting turntable to drop and cut into the outside surface of the rubber drive wheel.
2. Stopping the turntable by hand while the motor is still running is liable to cause a flat spot on the surface of rubber drive wheel.
3. Permitting oil or grease to come in contact with the rubber surface of drive wheel.

NOTE: If the rubber drive wheel has been damaged in any of the above ways, replace with a new one.

(b) *Mechanical Vibration Transmitted to Recorder while a record is being cut.*

It is VERY IMPORTANT THAT THE BASE UPON WHICH RECORDER RESTS REMAINS QUIET, as any vibration such as people walking across the floor or shaking of instrument will seriously affect the quality of the finished recording.

(c) *Recorder Not Level.*

It is very important that recorder is standing level. This can be checked by placing a smooth marble on uncut record.

(d) *Tension On Turntable Drive Wheel.*

If the tension on the rubber drive wheel is too great the usual result is a rumble in the recording. To decrease the tension on the drive wheel, loosen screw holding the tension spring lug, located beneath the drive wheel and turn lug a few degrees in a clockwise direction.

If the tension on the rubber drive wheel is too weak, a very marked change in the turntable speed will be noted during cutting operation. To increase tension move the tension spring lug a few degrees in a counter-clockwise direction.

THE CROSLEY CORP.

Automatic record changer

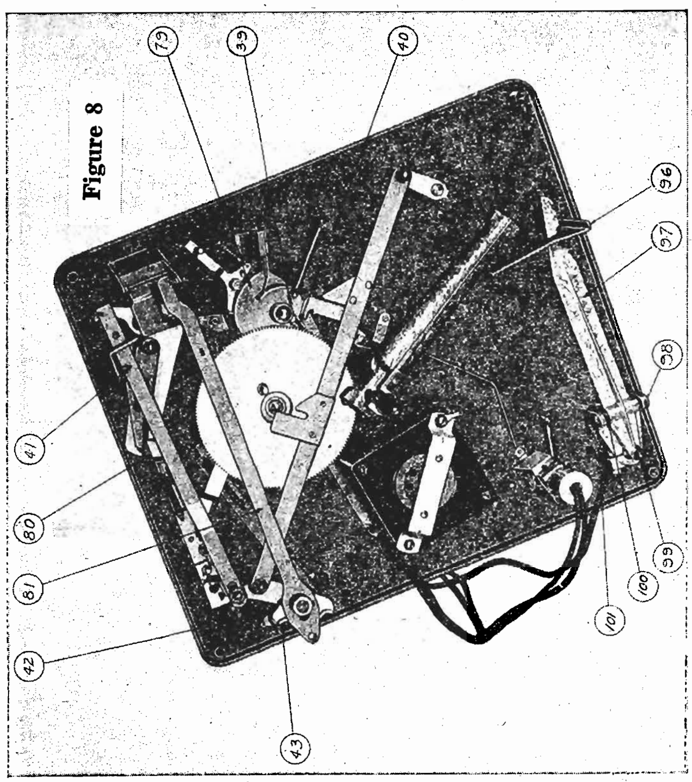


Figure 8

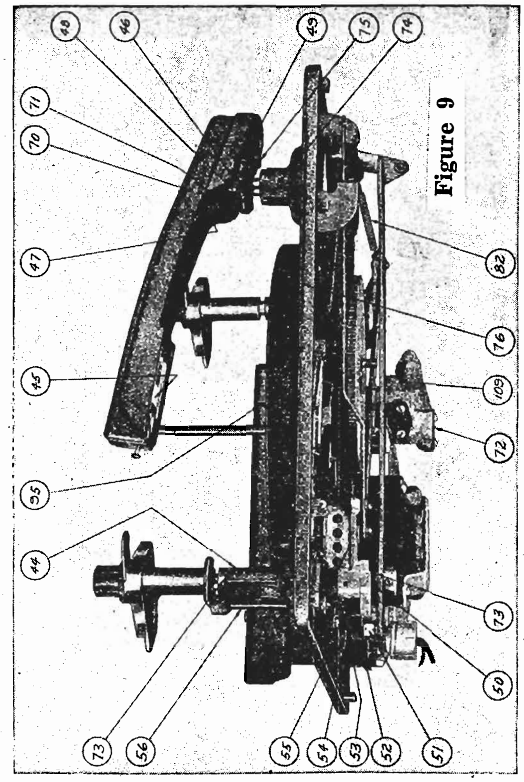


Figure 9

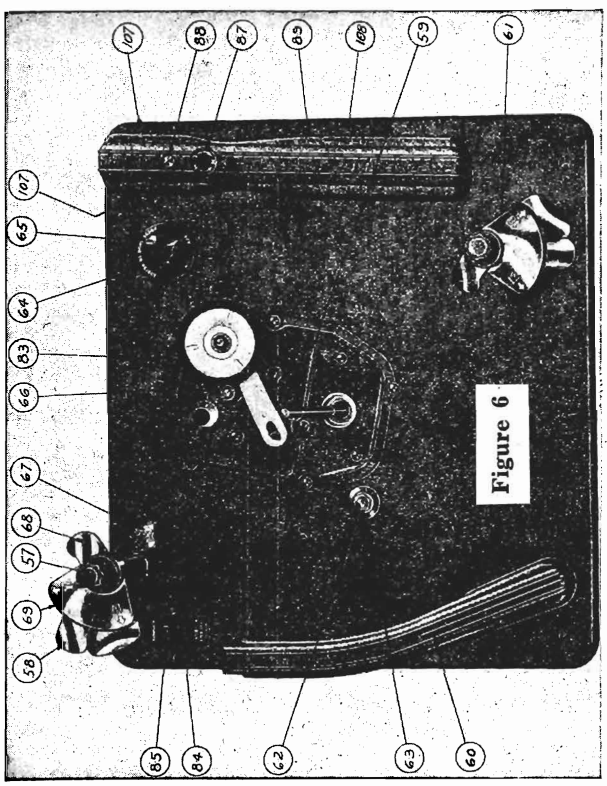


Figure 6

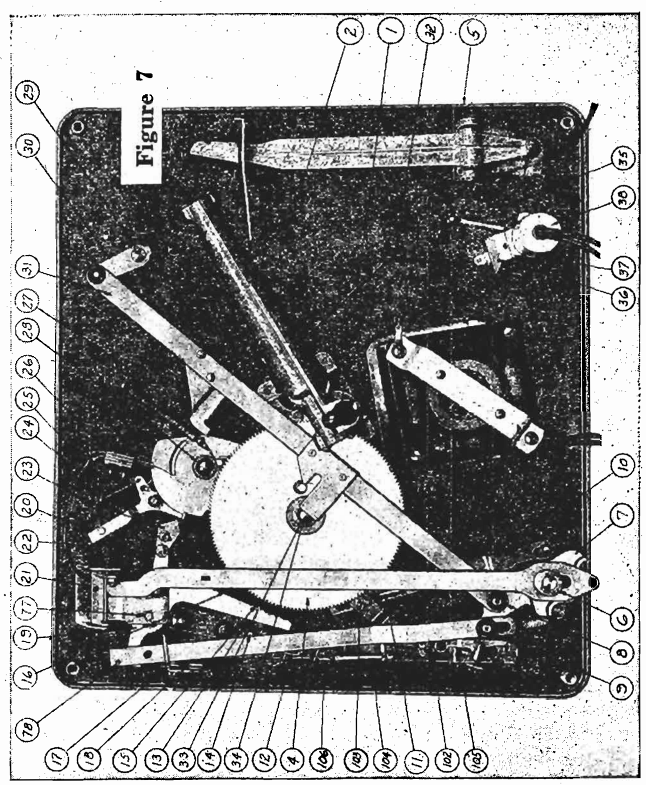


Figure 7

Automatic record changer

THE CROSLEY CORP.

III—AUTOMATIC RECORD CHANGER

General Instructions

1.—FUNCTION OF RECORD CHANGER WHEN IT IS GOING THRU A CHANGE CYCLE—

The Record Changer plays and automatically changes 14 or less ten-inch records or 10 or less 12-inch records.

The Record Changer is started by turning the switch control knob, (Item 65, Fig. 11) to "ON" this starts the motor and moves trip rod (Item 32, Fig. 12), which rotates trip lever assembly (Item 20, Fig. 12), causing it to disengage from Engagement Clutch Cam, (Item 79, Fig. 12). The Engagement Clutch Cam will then rotate due to tension from spring, (Item 27, Fig. 12). This causes it to contact the pin on the top side of Drive Gear Assembly, (Item 4, Fig. 12), as it rotates, and in turn, moves the Drive Link Assembly, (Item 31, Fig. 12), and the Selector Shaft Crank Assembly No. 11 and No. 12 to the position shown in Fig. 12. Also the tone arm reset link (Item 80, Fig. 12), has moved to where it has released the latch, (Item 18, Fig. 12), and carried the tone arm to its extreme outward position. The Tone Arm lifter link (Item 81, Fig. 12), has raised the tone arm to its extreme height, by means of the Lifter Plate Assembly, (Item 21, Fig. 12). The tone arm is kept from "floating" free by the friction of the Tone Arm Brake Spring which also compresses the tone arm booster spring, (Item 13, Fig. 12) due to its very light tension.

The Drive Gear Assembly (Item 4, Fig. 12) continues to rotate which causes the top pin to disengage from the Automatic Engagement Clutch Cam which is moved back to latch with the tone arm trip lever, and the lower pin to engage the drive link assembly, moving it back to its initial position. This swings in the tone arm to either the 10-inch or 12-inch record playing position and lowers it to the record. At the same time it releases the Tone Arm Brake Spring allowing the Tone Arm Booster Spring to act.

2.—PHONOGRAPH NEEDLES

Various types and kinds of needles are available for use in phonograph tone arms.

For playing ten or more records at one setup with this Record Changer, no attempt should be made to use ordinary needles with steel or fibre points since continued use of worn needle points will damage the records being played.

Any needle can be used that is designed to play 15 or more records. It is well to keep in mind that even if the amplifying system, speaker and tone arm are of the best quality, a poor needle will result in poor reproduction of music.

There are a number of good semi-permanent types of needles on the market which are rated in number of plays. It is usually more economical to use one of these needles which is rated at 1000 plays or more.

It is very important to remember not to remove and then replace any needle that has been used.

3.—CHASSIS MOUNTING

On the bottom surface of the panel are four mounting studs, each threaded to take a 1/4"—20 machine screw. The mounting panel rests on four tapered coil springs, the small end of each spring is pressed over a mounting stud and the large end of each spring fits into a socket in the top surface of the mounting shelf in cabinet.

Four spacing blocks 1/2" thick and with a 5/8" hole are fastened to the lower side of the mounting shelf. The 5/8" hole in each is centered with the center of the 7/16" screw clearance hole. These are to be provided and located on the lower side of the mounting shelf into which each of the lower mounting springs are to fit.

The 1/4"—20 machine screws are turned through the four wing nuts until the head of each screw is against the bottom side of each wing nut.

The four lower springs which are of smaller diameter than the upper springs are slipped over the ends of each of the 1/4"—20 machine screws with the tapered end toward the head and resting on the wing nuts.

OPERATING INSTRUCTIONS

1.—TO PREPARE CHANGER FOR OPERATION

(A) *Setting Record Changer to Play Ten-Inch Records:*

Turn both knobs until the arrows are pointing toward the center of the turntable. When in this position any number up to and including fourteen 10-inch records can be played.

(B) *Setting Record Changer to Play Twelve Inch Records:*

Turn both knobs until the arrows marked "12" are pointing toward the center of the turntable. When in this position any number up to and including ten 12-inch records can be played.

2.—LOADING

(A) If 10-inch records are to be played, set knobs as described in (A) above and place any number up to and including 14 records (*ten inch only*) over center pin so that they will rest on the selecting arms.

(B) If 12-inch records are to be played, set knobs as described in (B) above and place any number up to and including 10 records (*twelve inch only*) over center pin so that they will rest on the arms.

3.—STARTING THE RECORD CHANGER

1. Turn on the radio (allowing approximately 30 seconds for the tubes to warm up) and throw the phonograph-radio knob or control to the phonograph position.

2. Turn the switch knob on the Record Changer panel to "ON". The motor will then start and the record changer will go into automatic operation of its own accord.

4.—PLAYING AN INDIVIDUAL RECORD

An individual record can be played in the same manner as a stack of records would be played, i. e., if it is a 10-inch record, follow the instructions pertaining to 10-inch records. If it is a 12-inch record, follow the instructions pertaining to 12-inch records.

A 10-inch record may be played manually by turning the selecting arm knobs to the unloading position and leaving them in this position—records may then be put on or taken off the turntable by merely moving the tone arm outward until it catches, and placing the 10-inch records over the spindle and down onto the turntable. The "ON" and "OFF" switch knob is then pushed down and the 10-inch record will be played and repeated if left on the turntable. To remove the record it is only necessary to move the tone arm outward until it catches, and lift the record off of the turntable.

5.—TURNING OFF RECORD CHANGER

Turn switch knob to "OFF" position *while the tone arm is still on the record.* If the switch knob should be turned off while Record Changer is going through a change cycle, it will be difficult to adjust the selector arms correctly for the automatic playing of 10-inch or 12-inch records.

6.—UNLOADING RECORDS

1. Turn switch knob to "OFF" position.

2. Remove any records remaining on the selector arms.

3. Move tone arm outward until it catches in outward position.

4. Turn selector arms so that records will clear them.

5. Remove records from turntable.

7.—LUBRICATION

(A) *Motor:* The motor is equipped with oilless bearing and requires no lubrication.

(B) *Turntable Spindle Bearings:* Are lubricated at the factory and do not require any lubrication for one year. After one year they should be oiled with 1 or 2 drops of a light grade oil. The top bearing can be oiled by lifting off turntable. Make sure when replacing turntable to see that pin in Turntable Spindle slips into slot on bottom surface of Turntable hub and also care should be taken not to injure Rubber Idler Drive Wheel.

Never under any circumstances allow oil to come in contact with Rubber Idler Drive Wheel.

(C) *Squeak Due To Records Rubbing On Turntable Spindle:* This can be eliminated by gently lining up the stack of records.

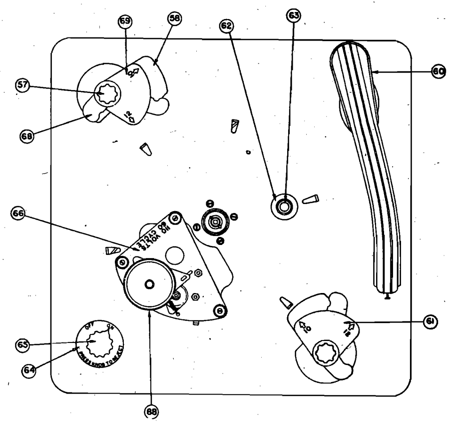


Figure 11

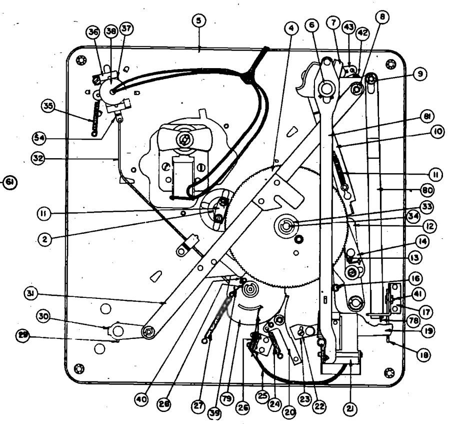


Figure 12

THE CROSLEY CORP.

Auto. record changer,
Phono motors,
Tone arms

IV—SERVICE NOTES

1.—PICKUP DOES NOT INDEX PROPERLY ON TEN OR TWELVE INCH RECORDS

(A) *Adjustment for correct indexing of 10-inch records:*

1. Swing tone arm outward until tone arm lever assembly, (Item 19, Fig. 12) latches with tone arm latch lever, (Item 18, Fig. 12) which is held to the tone arm shaft, (Item 77, Fig. 13) by two setscrews.

2. Make sure these setscrews are tight and that there is a slight play between the tone arm lever assembly and the panel, (Item 5, Fig. 12). This will give proper clearance at ball race assembly, (Item 74, Fig. 13).

The tone arm lever assembly, (Item 19, Fig. 12) is held against tone arm latch lever, (Item 18, Fig. 12) by the tension of tone arm locater lever spring, (Item 16, Fig. 12).

3. Next loosen the clamping screw in the Swivel Bracket Assembly, (Item 46, Fig. 13).

4. Now move tone arm, (Item 60, Fig. 11) until its outside edge is 1/8" from the outside edge of the panel (Item 5, Fig. 12) and re-tighten screw securely.

2.—RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE AT END OF RECORD

(A) *Worn or Damaged Stop Groove:* If the stop groove in the record is worn out or damaged, discard such a record.

(B) *Cut-off Adjustment May Be Incorrect:* The Record Changer should go into its changing cycle when the needle enters the stop groove and has traveled to within a distance of 1 7/8" from the center of the turntable shaft.

If the Record Changer does not go into its changing cycle when the needle has reached the above-mentioned distance, the Tone Arm Trip Lever Shoe, (Item 23, Fig. 12), should be moved toward the outside edge of the panel. To do this, it is necessary to loosen the thumb nut, (Item 22, Fig. 12), and then retighten after adjustment has been made.

If the Record Changer goes into its changing cycle before the needle has reached a distance of 1 7/8" from the center of the turntable, the Tone Arm Trip Lever Shoe should be moved inward toward the center of the Record Changer.

3.—RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE WHEN SWITCH KNOB IS TURNED ON

When the switch is turned to "ON" the Record Changer should start its changing cycle. If it does not, the following points should be checked.

1. Make sure motor is running.

2. Check Trip Rod, (Item 32, Fig. 12), to make sure it releases Trip Lever Assembly, (Item 20, Fig. 12), from Engagement Clutch Cam Assembly, (Item 79, Fig. 12), when Switch Knob is being turned on. If Trip Lever Assembly is not released, Trip rod should be shortened by bending until Trip Lever clears Engagement Clutch Cam Assembly, when Switch Knob is turned.

3. Make sure that Clutch Reset Pawl, (Item 40, Fig. 12) clears Drive Link Assembly, (Item 31, Fig. 12).

4.—RECORD CHANGER CONTINUES TO REPEAT ITS CHANGING CYCLE WITHOUT PLAYING RECORDS

(A) Trip Lever Assembly, (Item 20, Fig. 2) does not latch in Engagement Clutch Cam Assembly (Item 79, Fig. 12), which may be due to causes listed below:

1. Trip Rod (Item 32, Fig 12), may be bent so that it is too short, holding Trip Lever Assembly from contacting Engagement Clutch Cam Assembly.

2. Springs (Item 24 or 35, Fig. 12) may disconnected.

5.—NO SOUND WHEN NEEDLE IS ON MOVING RECORD

1. Muting switch (Item 26, Fig. 12), may be out of adjustment. The contacts of this switch should be open whenevver its long blade is not resting on the shoe of the Engagement Clutch Cam Assembly (Item 79, Fig. 12). If the contacts remain closed after the long blade has left the shoe, they should be adjusted by bending until there is a separation of approximately 1/32".

Switch should be checked to make sure contacts are closed when long blade is resting on the shoe of the Engagement Clutch Cam Assembly.

2. The lugs on the Muting switch may have been bent together.

3. Pickup cartridge in Tone Arm may have been damaged or may be defective.

6.—TONE ARM ADJUSTMENTS FOR 12" RECORDS

1. Turn both Control Knobs until the arrows marked "12" are pointing toward the center of the turntable.

2. Place a twelve inch record on the turntable.

3. Start Record Changer and note where needle contacts record. Correct contacting is about 1/8" from the outside edge of record.

4. Set Rod (Item 56, Fig. 13), is operated by Selector Arm (Item 61, Fig. 11). The 12" Set Link (Item 10, Fig. 11), operates as a stop when Record Changer is set for 12" records. When Tone Arm Locator Assembly (Item 12, Fig. 11) contacts 12" Set Link the Tone Arm should be in the correct position to play a 12" record.

If at this point, the position of Tone Arm is incorrect, loosen the screw which holds the Tone Arm Locator Shoe 12" (Item 14, Fig. 11) and move in either direction as required and tighten screw.

7.—TONE ARM ADJUSTMENTS FOR 10" RECORDS

1. Turn both knobs until the arrows marked "10" are pointing toward the center of the turntable.

2. Place a 10" record on the turntable and start Record Changer.

3.—Note where needle contacts record. Correct contacting is about 1/8" from the outside edge of record. If contacting of needle is not correct as mentioned, loosen the screw which holds Tone Arm Locator Shoe 10" (Item 15, Fig. 13) and slide shoe in or out as required, then tighten screw.

8.—TONE ARM HEIGHT ADJUSTMENTS

Set the Record Changer for ten-inch records, turn Switch to "ON" and allow Record Changer to go thru a changing cycle with no record on the turntable. The clearance between Turntable and the bottom surface of the Tone Arm should be approximately 1/8". Usually this clearance can be obtained by adjusting the Tone Arm Adjustment Screw (Item 70, Fig. 13). It is well to check the following points before making any adjustment.

Check clearance between Roller (Item 51, Fig. 13), and Selector Crank Shaft Assembly (Item 7, Fig. 12). There should be approximately 1/32" clearance at this point. If the clearance is greater, it would be due to the pressure on the Spring Washer (Item 50, Fig. 13) being too great. This will prevent the Tone Arm Lifter Reset Spring (Item 82, Fig. 13) from returning the Tone Arm Lifter Link Assembly (Item 81, Fig. 12) sufficiently. To relieve the pressure on the Spring Washer, lower the Selector Shaft Collar (Item 6, Fig. 11) slightly.

9.—TONE ARM LOWERS ON RECORD TOO SUDDENLY

If the Tone Arm lowers too suddenly, the Spring Washer (Item 50, Fig. 3) which is located between the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) and Selector Crank Shaft Assembly Post (Item 7, Fig. 2) is not under sufficient pressure. The setscrews in the Selector Shaft Collar (Item 6, Fig. 2) should be loosened and the Selector Shaft Collar pressed upward slightly and set screws tightened.

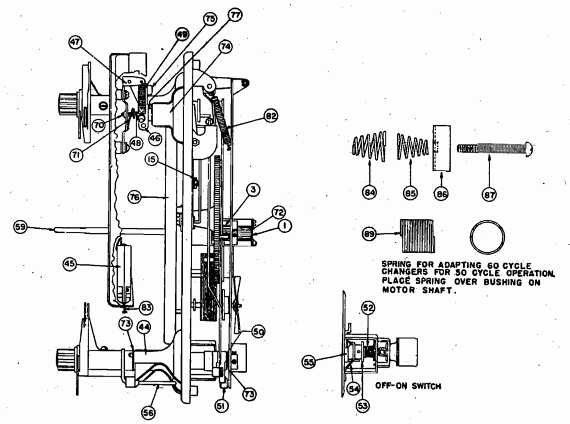


Figure 13

V—PHONO MOTORS & TONE ARMS

As Used on Models 22AS and 35AK

The miscellaneous parts for the Phono motors and tone arms as used in models 22 and 35 combination receivers are illustrated below along with their part numbers.

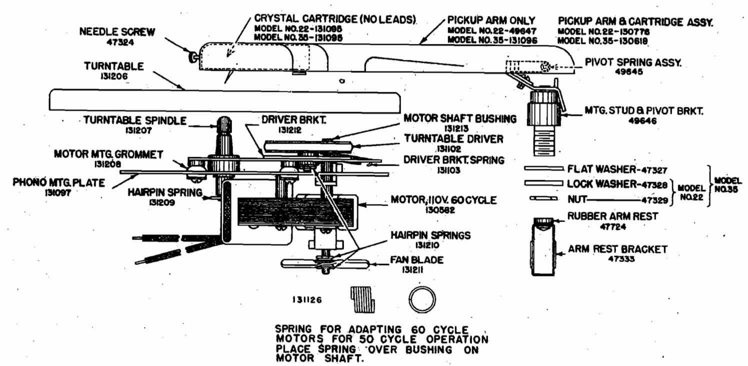
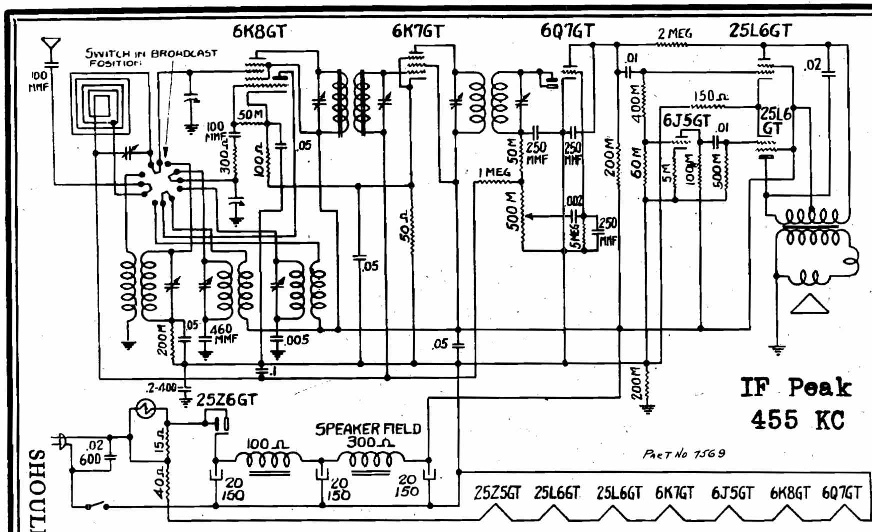


Figure 14

DETROLA CORP.

MODELS 327, 3271, 3331, 3332



IF Peak 455 KC

ALINEMENT PROCEDURE

Turn the band switch to the Broadcast position.

Connect an output meter across the speaker voice coil. The volume control should be set a few degrees from the maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

IF alignment: Connect the signal generator ground to the receiver chassis through a .1 mfd. condenser. Using a .1 mfd. condenser in series with the high side of the generator, apply a 455 kc. signal to the grid of the 6K7GT tube and align the 2nd IF transformer. Connect to the grid of the 6K8 tube and align the 1st IF transformer. (See Tube Layout Diagram for location of these adjustments.) From this postion recheck both transformers again.

Broadcast Band Alignment: Turn the band switch to the Broadcast position, turn the tuning condenser all the way to the right, (minimum capacity), apply a 1720 kc. signal to the grid of the 6K8 tube and adjust the broadcast oscillator trimmer. The oscillator coil is under the right hand end of the chassis and this trimmer is the one nearest the front of the chassis. To align the loop antenna, connect a single turn loop across the terminals of the generator, place the receiver about one foot in front of the single turn loop, set the generator at about 1400 kc., tune in the signal and adjust the trimmer on the loop antenna assembly for maximum response.

Short Wave Alignment: Using a 400 ohm resistor between the high side of the generator and the antenna terminal (on the LOOP frame), turn the tuning condenser to minimum capacity, set the generator at 18,500 kc., and adjust the short wave oscillator trimmer. This trimmer is immediately in back of the broadcast oscillator trimmer. Set the generator at about 17,000 kc., tune in the signal and adjust the short wave antenna trimmer for maximum response. This trimmer is mounted on the loop antenna.

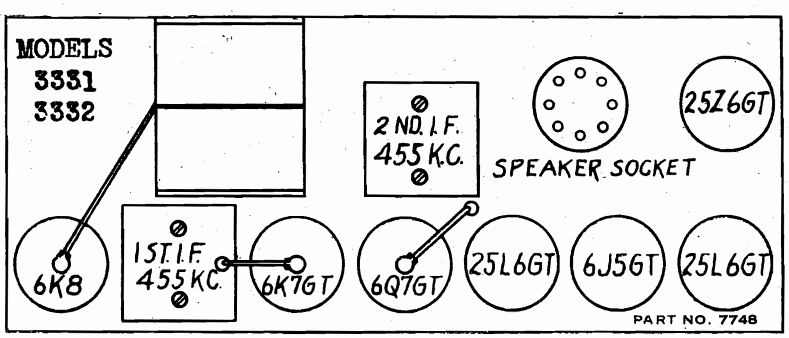
NOTE: If considerable hum appears when the generator is connected as described above use smaller condensers between the generator and the receiver. The best way is to use a 1:1 transformer to isolate either the receiver or the generator from the line. The adjustments of this receiver are very stable and no aligning should be attempted unless absolutely necessary.

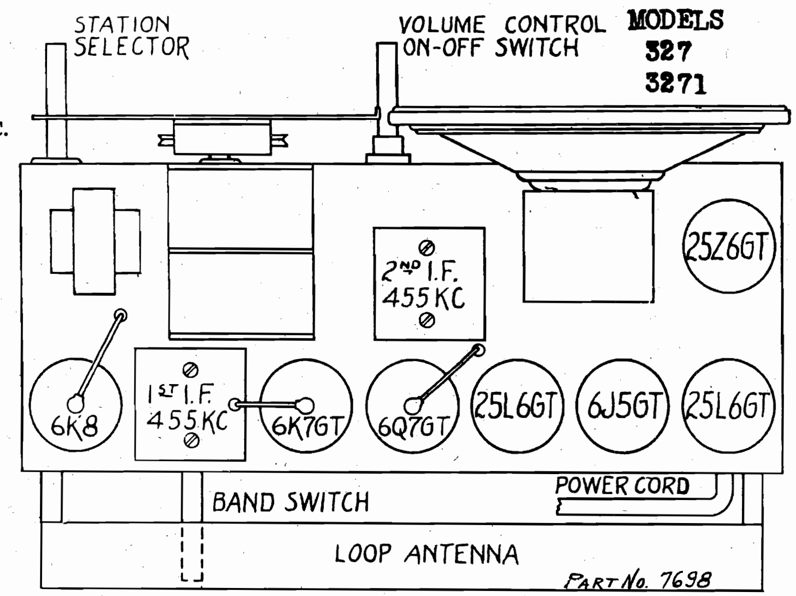
Part Number	Description
7564	Loop Antenna Assembly
7566	Oscillator Coil
6625	Volume Control and Switch
7567	Variable Condenser
5780	20 MF 150 Volt Electrolytic Condenser
7664	460 MMF Padding Condenser
7660	Filter Choke 100 Ohm
7661	Candohm Resistor—15/40 Ohm
7326	150 Ohm Wire Wound Resistor

Part Number	Description
6623	1st IF Transformer
6624	2nd IF Transformer
7028	Antenna Reel and Wire
7570	Dial Chart
7096	Pointer
7746	8" Speaker
7575	Wave Switch
7576	Speaker, 5"

short wave range 5.55 to 18.5 megacycles
105 to 125 volts D.C. or 50-60 cycle A.C.
broadcast range 540 to 1720 K.C.

1—6K8 Translator-Oscillator
6K7GT—Intermediate Frequency Amplifier
1—6Q7GT Detector-AVC-First Audio
1—6J5GT Phase Inverter
2—25L6GT Power Output
1—25Z6GT Rectifier

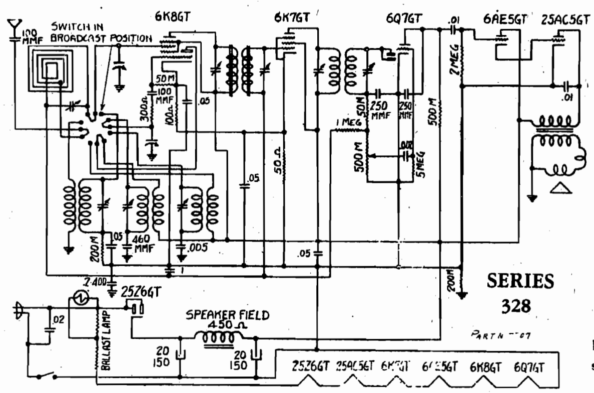




NO GROUND IS NECESSARY AND UNDER NO CONDITION SHOULD A GROUND CONNECTION BE MADE TO THIS RECEIVER.

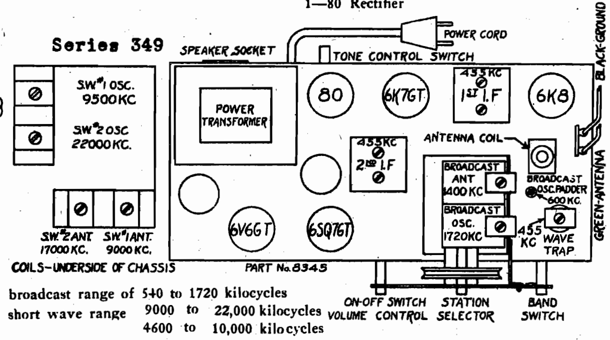
MODEL 328
MODEL 349

DETROLA CORP.



1—6K8GT Oscillator Translator
1—6K7GT I.F. Amplier
1—6SQ7GT Detector AVC Audio
1—6V6GT—Power Output
1—80 Rectifier

Series 349



broadcast range of 540 to 1720 kilocycles
short wave range 9000 to 22,000 kilocycles
4600 to 10,000 kilocycles

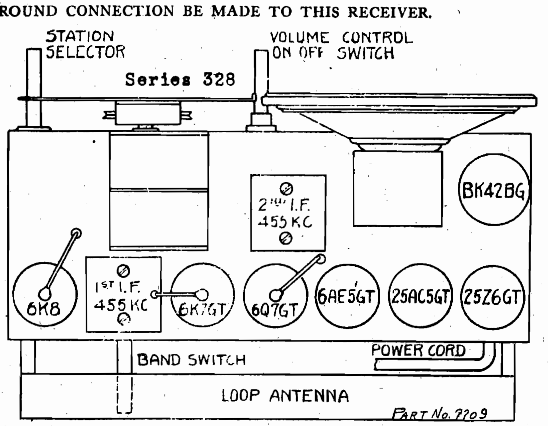
Series 328

Part Number	Description	Part Number	Description
7564	Loop Antenna Assembly	6623	1st IF Transformer
7566	Oscillator Coil	6624	2nd IF Transformer
6625	Volume Control and Switch	7028	Antenna Reel and Wire
7567	Variable Condenser	7570	Dial Chart
5780	20 MF 150 Volt Electrolytic Condenser	7096	Pointer
		7710	Speaker, 5"
7664	460 MMF Padding Condenser		
7575	Wave Switch		
5197	Ballast Tube		

105 to 125 volts D.C. or 50-60 cycle A.C.
short wave range 5.55 to 18.5 megacycles
broadcast range 540 to 1720 K.C.

6K7GT—Intermediate Frequency Amplifier
1—6K8 Translator-Oscillator
1—6Q7GT Detector-AVC-First Audio
1—6AE5GT Driver
1—25AC5GT Power Output
1—25Z6GT Rectifier

NO GROUND IS NECESSARY AND UNDER NO CONDITION SHOULD A GROUND CONNECTION BE MADE TO THIS RECEIVER.



ALINEMENT PROCEDURE 328 SERIES

Turn the band switch to the Broadcast position.

Connect an output meter across the speaker voice coil. The volume control should be set a few degrees from the maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

IF alignment: Connect the signal generator ground to the receiver chassis through a .1 mfd. condenser. Using a .1 mfd. condenser in series with the high side of the generator, apply a 455 kc. signal to the grid of the 6K7GT tube and align the 2nd IF transformer. Connect to the grid of the 6K8 tube and align the 1st IF transformer. (See Tube Layout Diagram for location of these adjustments.) From this postion recheck both transformers again.

Broadcast Band Alignment: Turn the band switch to the Broadcast position, turn the tuning condenser all the way to the right, (minimum capacity), apply a 1720 kc. signal to the grid of the 6K8 tube and adjust the broadcast oscillator trimmer. The oscillator coil is under the right hand end of the chassis and this trimmer is the one nearest the front of the chassis. To align the loop antenna, connect a single turn loop across the terminals of the generator, place the receiver about one foot in front of the single turn loop, set the generator at about 1400 kc., tune in the signal and adjust the trimmer on the loop antenna assembly for maximum response.

Short Wave Alignment: Using a 400 ohm resistor between the high side of the generator and the antenna terminal (on the LOOP frame), turn the tuning condenser to minimum capacity, set the generator at 18,500 kc., and adjust the short wave oscillator trimmer. This trimmer is immediately in back of the broadcast oscillator trimmer. Set the generator at about 17,000 kc., tune in the signal and adjust the short wave antenna trimmer for maximum response. This trimmer is mounted on the loop antenna.

NOTE: If considerable hum appears when the generator is connected as described above use smaller condensers between the generator and the receiver. The best way is to use a 1:1 transformer to isolate either the receiver or the generator from the line. The adjustments of this receiver are very stable and no aligning should be attempted unless absolutely necessary.

ALIGNMENT PROCEDURE SERIES 349

The alignment adjustments of this receiver are very stable. Should realignment be necessary, it should only be attempted by a competent technician with an accurately calibrated test oscillator or signal generator and an output meter with a one or two volt scale. The following realignment procedure should be followed exactly. For accurate alignment, all adjustments must be made with a weak signal. The location of the I.F. transformers and all trimmers and the frequencies at which they should be adjusted are shown on the diagram at the top of this page.

Connections

Connect the output meter across the speaker voice coil. Connect the ground side (outer cable) of the signal generator to the receiver chassis. These connections are used during the entire alignment. Other necessary connections are described in the following paragraphs.

Intermediate Frequency Alignment

Turn the band selector switch to the broadcast position ("B" on the band selector knob). Connect a .1 mfd. condenser to the output terminal of the signal generator and connect the other end of this condenser to the control grid of the 6K7GT tube. Do not disconnect the grid clip on the tube. Generate a weak 455 KC signal in the signal generator, and adjust the trimmer of the second I.F. transformer for maximum response in the output meter. If the signal measures above ½ volt during the adjustment, reduce its strength. Now transfer the connection of the signal generator through the .1 mfd. condenser to the grid of the 6K8GT tube and align the trimmers of the first I.F. transformer.

R. F. ALIGNMENT

Broadcast Band

Disconnect the .1 mfd. condenser from the output of the signal generator and in its place substitute a 200 or 250 mmf. condenser, connecting the other end of this condenser to the ANTENNA LEAD of the receiver. Turn the tuning condenser to about 600 KC. With the generator producing a fairly powerful signal of 455 KC, adjust the WAVE TRAP trimmer for MINIMUM RESPONSE. Set the tuning condenser of the receiver at minimum capacity (plates all the way out). Generate a weak signal of 1700 KC in the signal generator. Adjust the BROADCAST OSCILLATOR TRIMMER until the signal is tuned in. Next produce a weak signal of 1400 KC in the signal generator. Tune the receiver very carefully to the signal and adjust the BROADCAST ANTENNA TRIMMER for maximum response in the output meter. Produce a 600 KC signal in the signal generator and tuning the receiver carefully to this signal, adjust the BROADCAST OSCILLATOR PADDER for maximum response. The tuning condtnser of the receiver should be rocked back and forth through the signal while varying the padder in order to assure perfect alignment.

Tune in a broadcast station of known frequency between 1200 and 800 KC and set the pointer to the proper calibration on the dial chart. Be sure to use a station whose frequency is reliable as the accuracy of calibration depends on this setting. Note that the square dots in the upper half of the black band are accurately calibrated for the frequencies of the broadcast band.

ALIGNMENT OF SHORT WAVE BANDS

S. W. Band No. 1

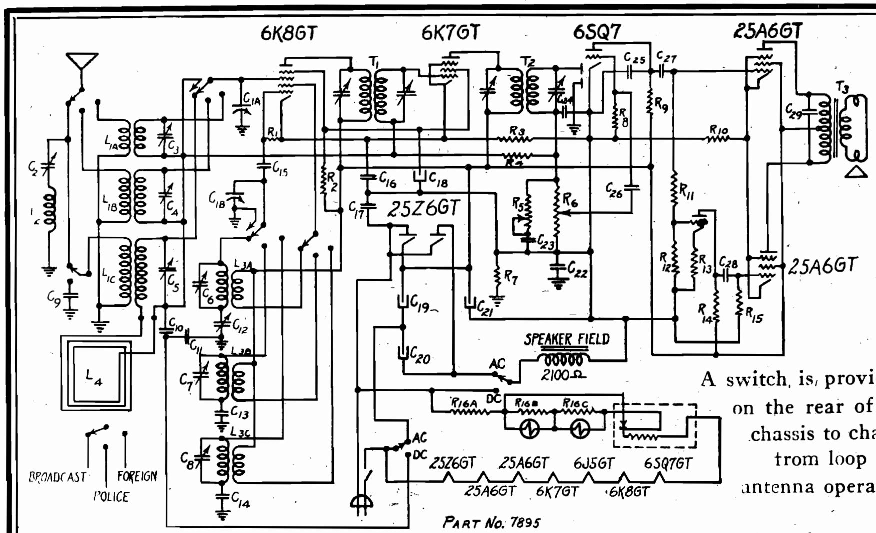
Rotate the band selector switch to the center position (No. 1 on band selector knob). Disconnect the 200 mmf. condenser from the output of the signal generator and in its place substitute a 400 ohm resistor which serves as a dummy antenna for aligning both short wave bands. The other end of the 400 ohm resistor is connected to the antenna lead of the receiver. Tune the receiver so that the pointer is at exactly 9500 KC. The pointer should bisect tht small black dot to the right and slightly above the figures 9.5. Produce a weak signal of exactly 9500 KC in the signal generator. Screw the S. W. No. 1 OSCILLATOR TRIMMER all the way down and then unscrew it to the second peak at which the signal is heard. If the trimmer is not unscrewed to the second peak, the circuits will not be in proper relation and the calibration will be incorrect and there may also be a dead spot on some position on the dial. Next produce a signal of 9000 KC in the signal generator and tune this signal carefully in the receiver. If the signal can be heard at two places, the proper signal to tune is the one which is the closest to 9000 KC (the black dot above 9.0) on the dial chart of the receiver. Adjust the S. W. No. 1 ANTENNA TRIMMER until a definite peak is noted in the output meter. During this adjustment, rock the tuning condenser back and forth through the signal, while adjusting this trimmer in order to assure perfect alignment.

S. W. Band No. 2

Using exactly the same procedure and taking the same precautions as for S. W. band No. 1, turn the band selector switch to the No. 2 position. Align the S. W. No. 2 OSCILLATOR TRIMMER at 21,000 KC, with signal generator producing a signal of 21,000 KC and with pointer indicating 21,000 KC on the dial chart. The pointer should bisect the light coloreddot in the black band immediately at the right of the figure 22. Align the S. W. No. 2 ANTENNA TRIMMER at 17,000 KC with a 17,000 KC signal in the signal generator and be sure to tune the receiver to the signal nearest 17,000 KC on the dial chart (light colored dot in black band above and slightly to the right of figure 17). The same procedure of screwing the oscillator trimmer all the way down and then unscrewing on the second peak is followed and the same precautions of rocking the tuning condenser back and forth through the signal are followed to secure a proper alignment of this band.

MODEL 335A

DETROLA CORP.



A switch is provided on the rear of the chassis to change from loop to antenna operation.

Symbol	Part No.	Description
C1a,b	7975	Variable Condenser
C2	3272	Trimmer Cond. 140mmf.
C3	1611	Trimmer Cond. 3-35 mmf.
C4,5,6,7,8	2597	Trimmer Cond. 1-10 mmf.
C9,25,24		250 mmf. Mica
C10,16		.1 mfd. 200 volt
C11,22		.1 mfd. 400 volt
C12	2560	250 mmf. Padder
C13	2741	1330 mmf. 5%
C14	2793	.006 mfd. 600 volt 10%
C15		50 mmf Mica
C17		.02 mfd. 600 volt
C18		4 mfd. 150 volt Electrolytic
C19	5779	8 mfd. 150 volt Electrolytic
C20	7892	8 mfd. 250 volt Electrolytic
C21	7894	16 mfd. 250 volt Electrolytic
C23		.003 mfd. 600 volt
C26		.01 mfd. 200 volt
C27,28		.02 mfd. 400 volt
C29		.005 mfd. 600 volt
R1		50 M 1/3 watt
R2		10 M 1/3 watt
R3		150 ohm 1/3 watt
R4		1 meg. 1/3 watt
R5	2737	2 meg tone control
R6	2726	500 M volume control
R7		200 M 1/3 watt
R8		5 meg. 1/3 watt
R9		200 M. 1/3 watt
R10		500 ohm 1 watt
R11		400 M 1/3 watt 10%
R12		60 M 1/3 wat 10%
R13		5 M 1/3 watt
R14		100 M 1/3 watt
R15		500 M 1/3 watt
R16a,b,c	7898	30/22½/22½ Special wire wound
L1a,b,c	7890	Antenna coil
L2	7891	Wave trap coil
L3a,b,c	7482	Oscallator coil
L4	7908	Loop Antenna
	7909	6 In. Speaker
T1	7903	1st IF transformer
T2	7904	2nd IF transformer
T3		Output Trans.
	7615	Dial Chart
		Dial light bulb Mazda No. 47
	4689	Pointer
	2724	Wave Switch
	5422	AC-DC Switch
	6182	Dial light socket
	7902	Dial light socket (Long leads)

105 to 125 volts AC or DC. WHEN OPERATED ON DIRECT CURRENT THE SWITCH LOCATED ON THE BACK OF THE CHASSIS MUST BE TURNED TO THE DC POSITION. WHEN OPERATED ON ALTERNATING CURRENT THE SWITCH MUST BE IN THE AC POSITION.

NO GROUND IS NECESSARY—UNDER NO CONDITION SHOULD A GROUND WIRE BE ATTACHED TO THIS RECEIVER.

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 455 kc. signal to grid of 6K7GT I.F. amplifier tube, and aline transformer No. 2. Connect generator to grid of 6K8GT tube and aline transformer No. 1.

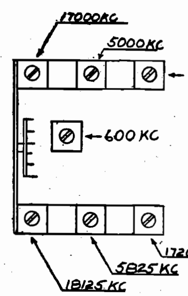
RF. (See above diagram for location of trimmers.)

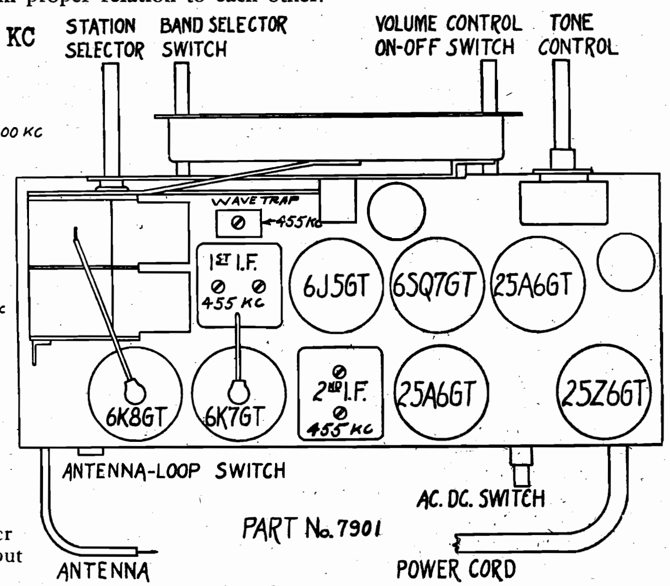
Using a 200 MMF. condenser in series with the high side of the generator, turn band selector switch to left hand position and the tuning condenser to about 600 kc. Feed a 455 kc. signal to the antenna and adjust wave trap trimmer for minimum response. With the tuning condenser at minimum capacity feed 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 center position, set generator to 5825 kc. and adjust oscillator trimmer for top frequency. 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 18,100 kc.—screw trimmer down tight, then unscrew to *second* peak. Set generator to 17,000 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 17,000 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.

IF Peak 455 KC





335A SERIES

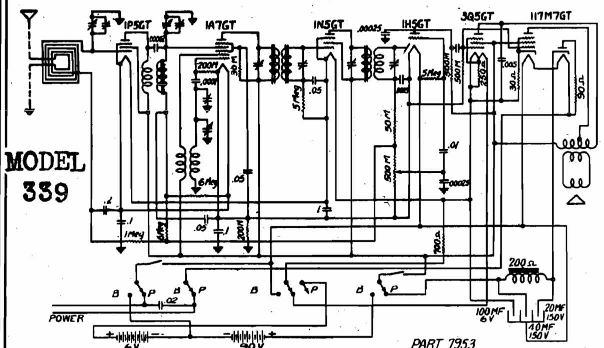
6J5GT	Phase Inverter
25A6GT	Power Output
25Z6GT	Rectifier
6A8GT	Oscillator-translator
6K7GT	Intermediate Frequency Amplifier
6SQ7GT	Detector-AVC-Audio

broadcast range from 540 to 1720 kilocycles.
short wave range
1.65 megacycles to 5.8 megacycles
5.5 megacycles to 18.1 megacycles.

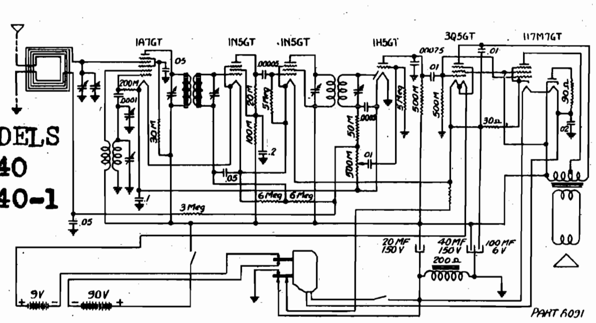
MODEL 339 — MODELS 340,340-1 — MODELS 341,341-1,341-2 — MODELS 360,360-1,360-2

DETROLA CORP.

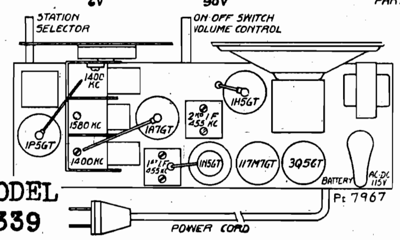
MODEL 339



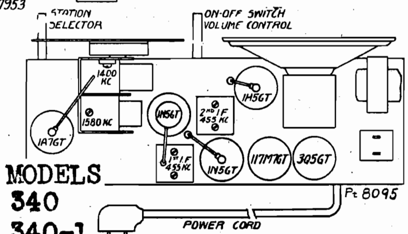
MODELS 340 340-1



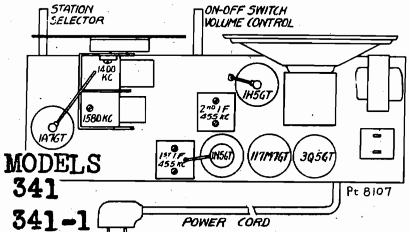
MODEL 339



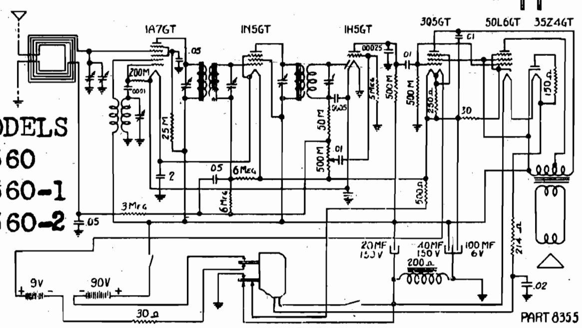
MODELS 340 340-1



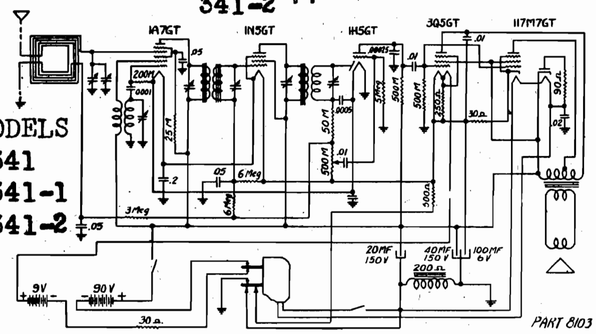
MODELS 341 341-1 341-2



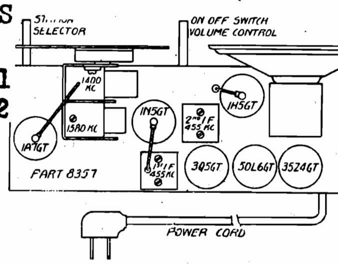
MODELS 360 360-1 360-2



MODELS 341 341-1 341-2



MODELS 360 360-1 360-2



Part No.	Description	
6256	Oscillator Coil	for all models
7952	Volume Control	
7958	Pointer	
7954	Dial Indicator	
7968	1st IF Transformer	
7969	2nd IF Transformer *	
8070	Dial Crystal	
8138	200 Ohm Choke	
8102	40MF 150V ** 100MF 6V Dual Condenser	
5780	20MF 150V Condenser **	
7957	"A" Battery Plug	
6263	"B" Battery Plug	
7990	"A" Battery	
7991	"B" Battery	
6644	30 Ohm 10% Resistor	
8158	30 Ohm 5% Resistor	
8088	90 Ohm 5% Resistor	
7951	Loop Assembly ***	

* 8096 2nd IF Transformer **on 340 series**

** 8010 20MF 150 V 40 MF 150 V 100MF 6V Triple Condenser **on 339 only**

*** 8164 Loop Assembly **on 341 series**

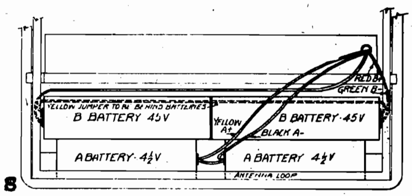
on Model 339

The power control switch is on the back of the chassis. Pushing this lever towards the center of the set connects the circuits for power operation, 115 V. AC-DC. With the lever in the other position the circuits are connected for battery operation. **on all other models**

For power operation of the receiver it is only necessary to plug into a 115 volt AC or DC outlet. To connect the receiver for battery operation, plug the line cord into the socket provided in the back of the chassis. This makes all the necessary battery connections. **for all models**

Since in the power-operation position the batteries are completely disconnected, there is no need of disconnecting the batteries when using the receiver where power is available.

DO NOT USE A GROUND WHEN SET IS OPERATED OFF THE POWER LINES AS AN AC- DC SET.



for all models

INSTRUCTIONS FOR BATTERY INSTALLATION

Remove the batteries from the shipping carton. Save some of the packing. Pull the bottom of the loop away from the cabinet. Plug the "A" leads into the two "A" batteries and place the batteries in the bottom of the cabinet. Fold a piece of the packing and wedge between the two "A" batteries. Plug the "B" leads into the two 45 volt "B" batteries and place these batteries on top of the "A" batteries with the plugs facing the sides of the cabinet. Before the "B" batteries are pushed all the way in, slip the loop over the "B" batteries then push the batteries and loop in as far as they will go. The long connection between the two "B" batteries should be towards the front of the cabinet away from the loop. Wedge some of the packing over the "B" batteries to keep them from being loose in the case.

WARNING

Be sure the switch is turned off when connecting batteries.

ALIGNMENT PROCEDURE

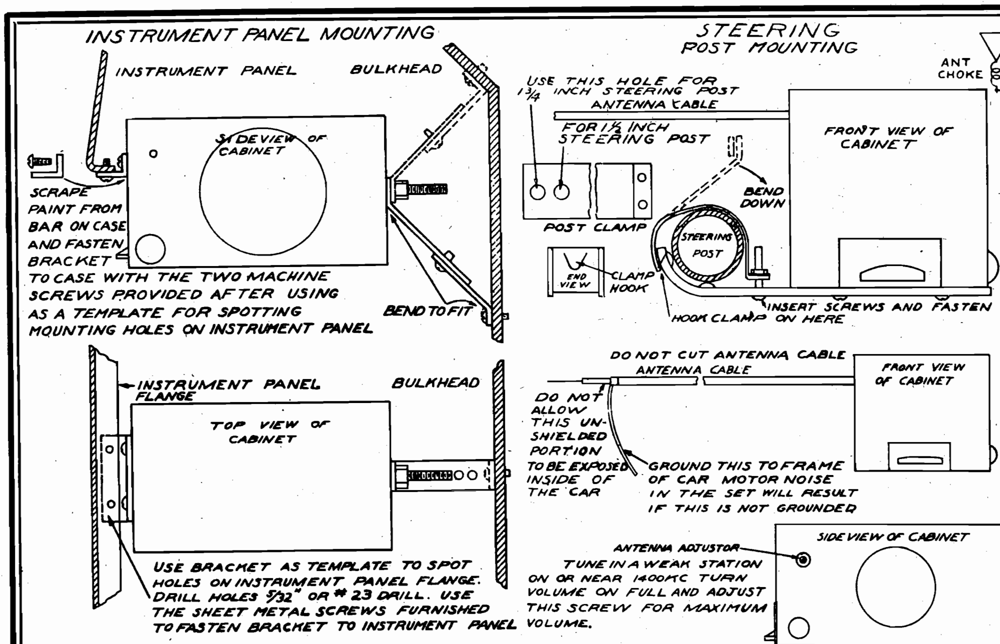
I.F. Frequency 455 KC. Set Range 540-1580 KC.

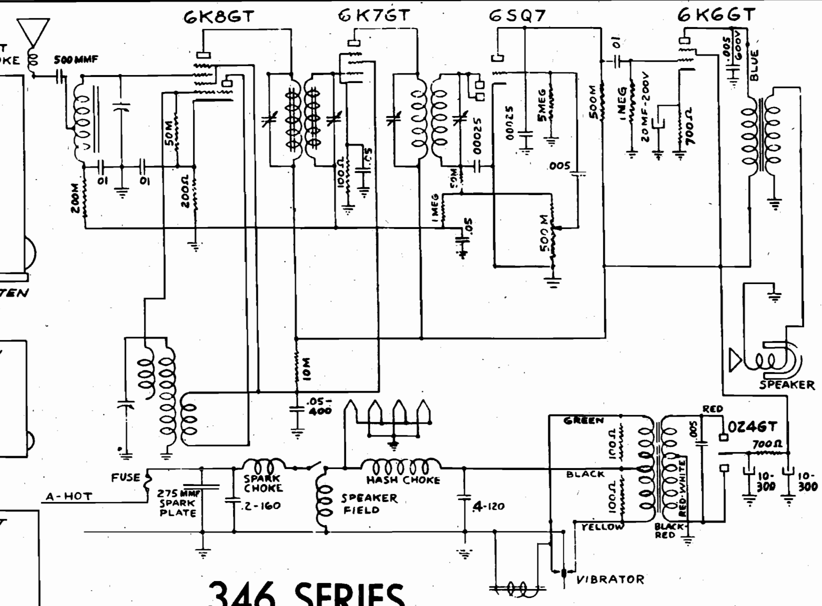
Connect the test oscillator, or signal generator, to the set as follows: Connect the "hot" side of the signal generator to the grid of the 1A7GT tube, and the ground side to the chassis. If the set is alined on AC or DC be sure that the test oscillator or signal generator is isolated from the receiver and line by either a transformer or .2MFD condensers in both test leads. 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.

Turn the condenser plates all the way out. Set the test oscillator to 1580 KC and adjust the oscillator trimmer for maximum signal. Disconnect the test oscillator and tune in a weak station near 1400 KC. at full volume. Adjust the trimmer on the front of the variable condenser for maximum 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.

MODEL 346

DETROLA CORP.

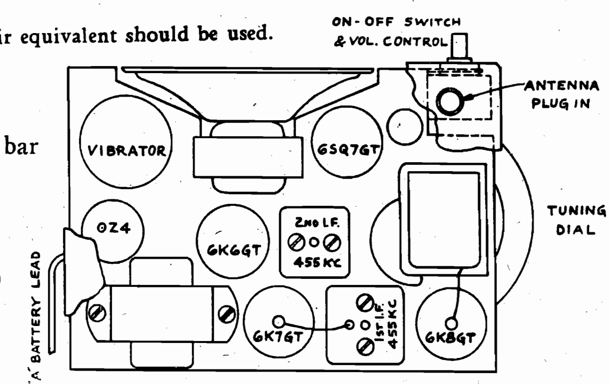




346 SERIES

This receiver is designed to use *only* the whip type of antenna. Cowl or hinge pin mounting types or their equivalent should be used.

Part No.	Description	Part No.	Description	Part No.	Description
8205	Antenna Coil	8216	10-ohm Flexohm Resistor	8223	Speaker, 4 inch
8206	Oscillator Coil	6704	Speaker Grille	6691	Front mounting bracket
6687	Volume Control	8229	Power Transformer	6686	Steering Post mounting bar
8211	10 x 10—350V x 20 25V	6689	1st IF. Transformer	6696	Steering Post clamp
6715	.005-1200V Buffer condenser	8821	2nd IF. Transformer	6739	Dial Escutcheon
6682	Tuning Dial	3000	Vibrator	6740	Volume control knob
		8210	Variable condenser	6694	Clamp bar (for screws)
		6717	Spark plate	6746	Rear mounting straps



PART #8227

ANTENNA ADJUSTMENT

When the set is installed and the antenna is connected, tune in a weak station on or near 1400 kc. (140 on dial), turn volume full on, remove the upper snap button above the volume control, and with a long screwdriver, turn the adjusting screw in and out until maximum volume is obtained. Replace the snap button. The set is then adjusted.

ALIGNMENT

I.F. Frequency .... 455 KC.
Frequency Range .... 1550—540 KC.
Dummy Antenna .... 30 MMF.
Input to I.F. .... 1/10 MF.

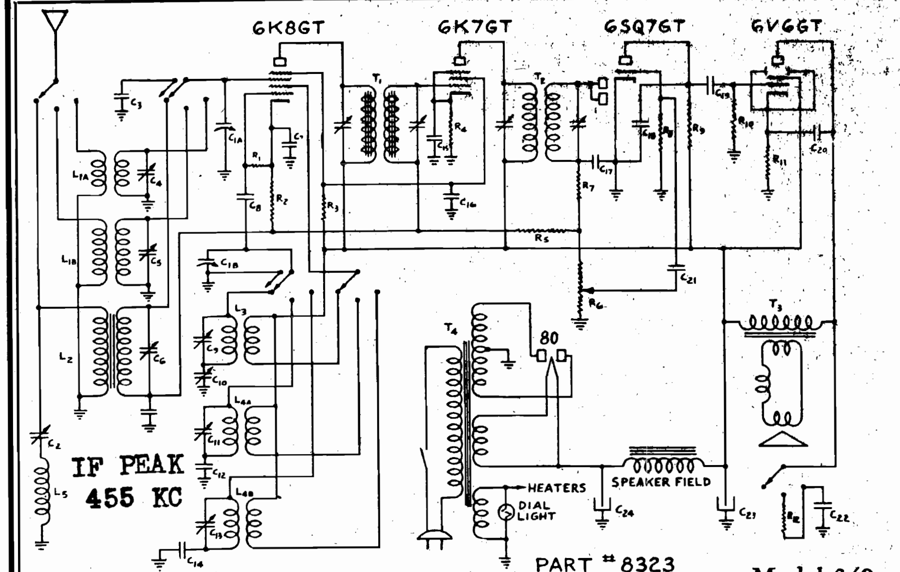
To align the I.F., feed the signal generator or test oscillator through a 1/10 MF condenser to the grid of the 6K8 tube, ground the ground side of signal generator to the case. With volume control full on and a weak signal, adjust screws of 1st and 2nd I.F. transformers using a suitable output meter to indicate resonance.

The oscillator should be set at 1550 K.C. Turn variable condenser to minimum capacity and with a 30 MMF dummy antenna condenser connected to the antenna cable and a low signal input, set the oscillator to its top frequency. The antenna trimmer should be adjusted at 1400 KC. The antenna trimmer should be readjusted at this frequency when the set is installed in the car.

PART NO. 8214

MODEL 349
MODEL 372
MODEL 3422

DETROLA CORP.

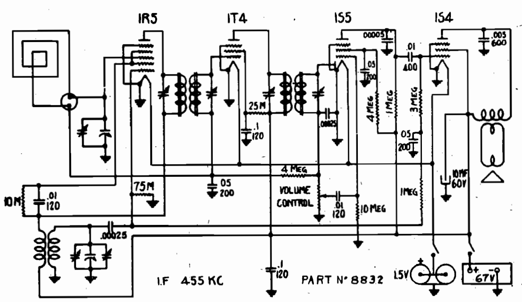


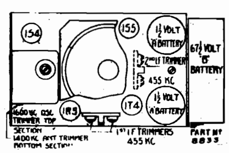
Model 349

Symbol	Part No.	Description
C1a,b	8318	Variable Condenser
C2 & L5	8315	Wave Trap Assembly
C3		.01 mfd. 200 volt
C4,5,6,9, 11,13	7197	2-25 mmf. Trimmer
C7,15,16 26,27		.1 mfd. 200 Volt
C8		50 mmf. Mica
C10	2560	200-550 mmf. Padder
C12		.006 mfd. 600 Volt
C14		.01 mfd. 400 Volt
C17		500 mmf. Mica
C18		250 mmf. Mica
C19		.02 mfd. 400 Volt
C20,21		.01 mfd. 400 Volt
C22		.02 mfd. 600 Volt
C23	5101	16 mfd. 225 Volt Electrolytic
C24	3285	16 mfd. 350 Volt Electrolytic
R1,7,12		50 M 1/3 Watt
R2,4		200 Ohm 1/3 watt
R3		10 M 1/3 watt
R5		1 Meg 1/3 watt
R6	8314	500 M Vol. Control and Switch
R8		5 Meg. 1/3 watt
R9		200 M 1/3 watt
R10		500 M 1/3 watt
R11		300 Ohm 1/3 watt
R13		25 M 1/3 watt
L1a,b	8334	2 Band S. W. Antenna Coil
L2	8415	Broadcast Antenna Coil
L3	8336	Broadcast Oscillator Coil
L4a,b	8335	2 Band S. W. Oscillator Coil
T1	8325	Input IF Transformer
T2	8326	Output IF Transformer
T3		*Output Transformer
T4	8324	Universal Power Transformer
	8369	Power Transformer
	8337	Band Switch
	8330	Dynamic Speaker 7½"
	6158	Dial Lamp (Mazda No. 47)
	8319	Dial Chart
	8343	Pointer
	5142	Drive Pulley
	8322	Drive Shaft
	8373	Tone Control Switch
	8374	Dial Lamp Socket

Two types of power transformers are available for these receivers. Unless specifically stated otherwise on a tag attached to the receiver it is equipped with a transformer for operation on 105 to 125 volts 50 to 60 cycle alternating current.

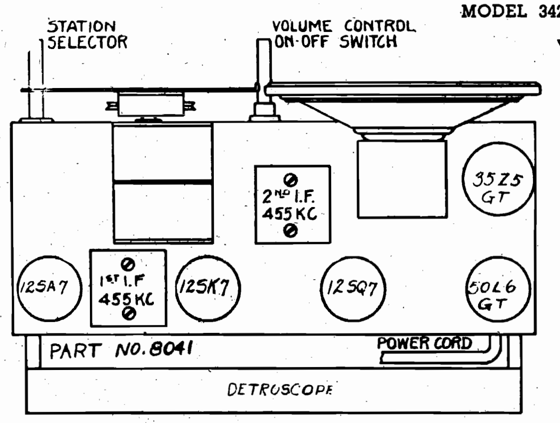
The receivers equipped with UNIVERSAL POWER TRANSFORMERS will operate on 110, 120, 150, or 225 volts 50 to 60 cycles alternating current. A small cover on top of the transformer should be removed and the plug inserted in the proper clip for the voltage available.





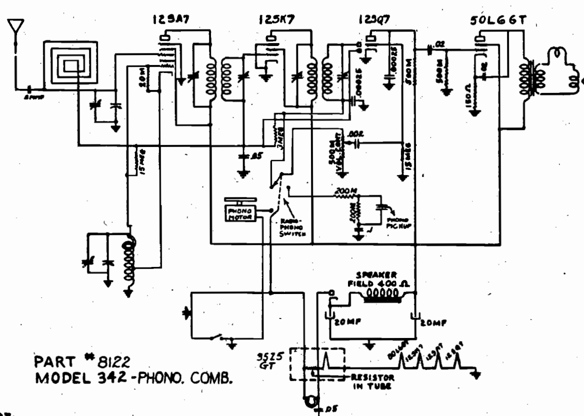
DETROLA
MODEL 372
PORTABLE
SUPERHETERODYNE

MODEL 3422 SERIES



For radio operation make certain that the Radio-Phono switch, which is on the phonograph motor panel, is turned to the left position.

For phonograph operation turn the Radio Phono switch to the Phono position. THE AC-DC SWITCH MUST BE SET IN THE PROPER POSITION. (This switch is on the phonograph panel.)

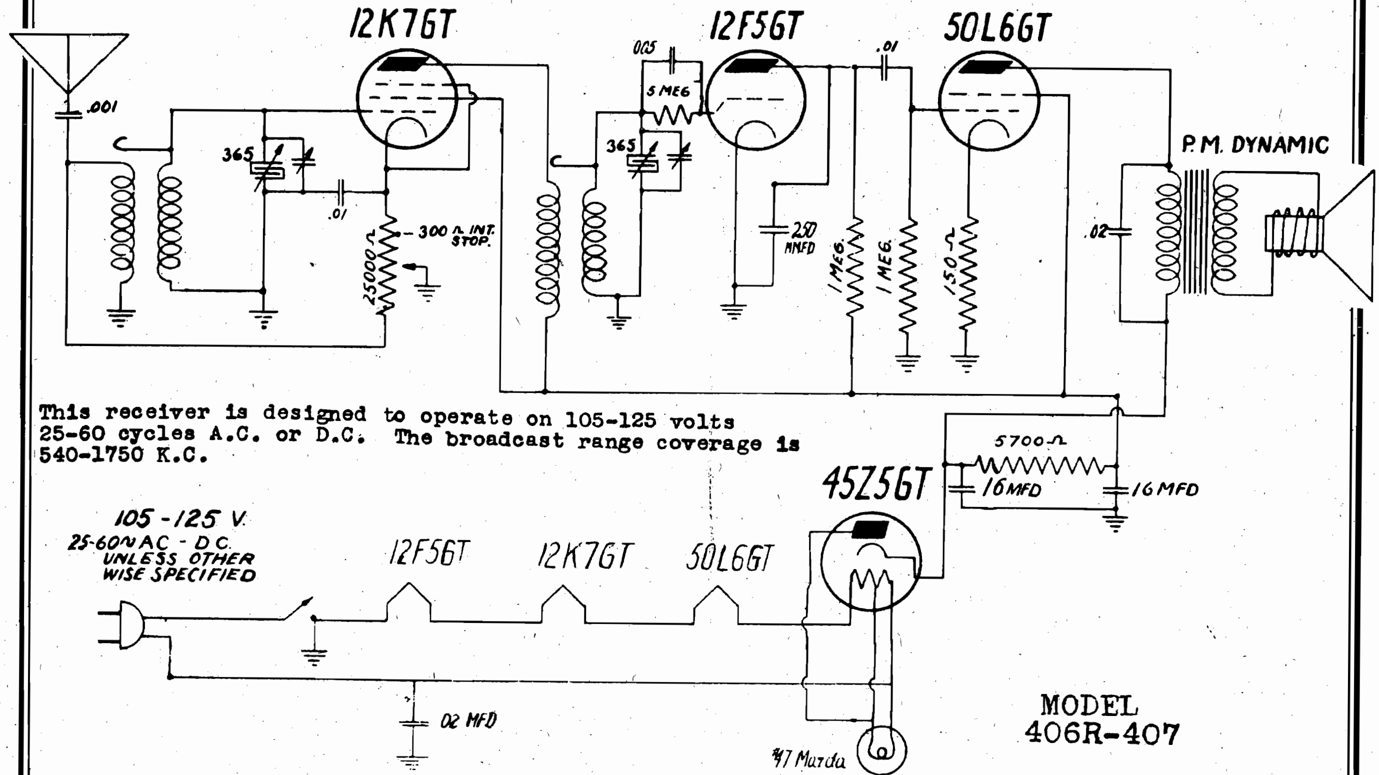


105 TO 125 VOLTS,
DIRECT OR ALTERNATING CURRENT.

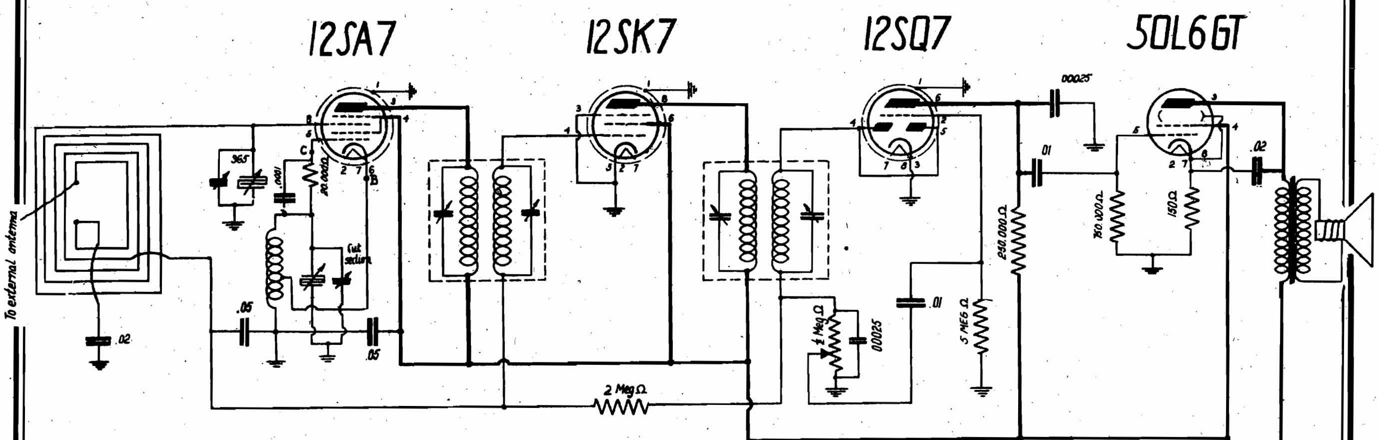
12SA7 Translator
12SK7 IF Amplifier
12SQ7 Detector AVC
50L6GT Output
35Z5GT Rectifier

DeWALD RADIO MFG. CORP.

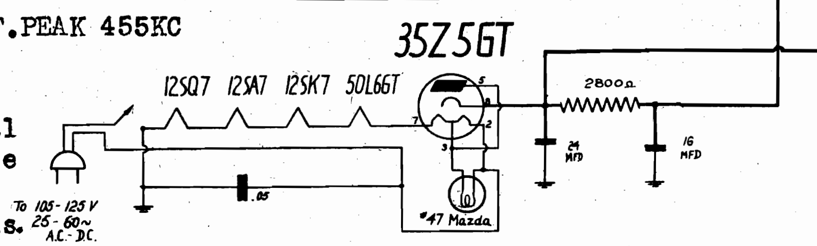
MODELS 406R,407
MODELS 501A,561,562



This receiver is designed to operate on 105-125 volts 25-60 cycles A.C. or D.C. The broadcast range coverage is 540-1750 K.C.



I.F.PEAK 455KC



MODELS 501A,561,562

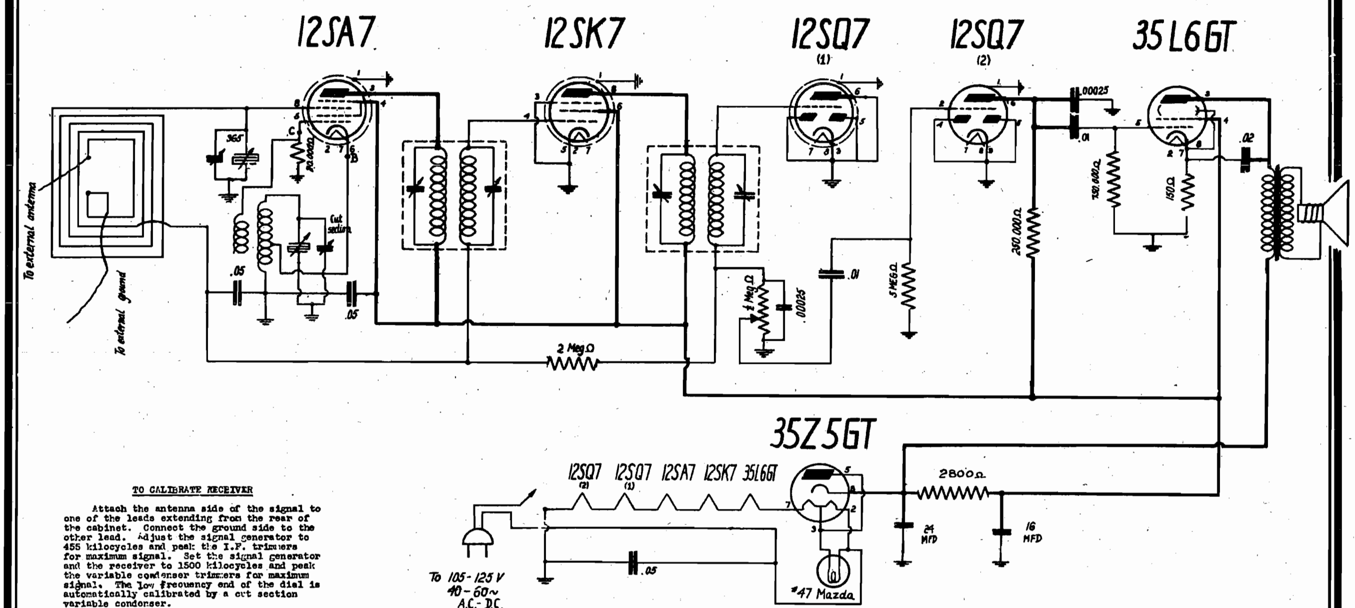
To Calibrate Receiver

Attach hot side of signal gen. to one of the flexible ant. loop leads. Connect ground side to rec. chassis. Peak I.F. Trimmers at 455kc. Adj. rec. dial and sig.gen. to 1500kc and peak variable condenser trimmers to max.

This model is a five tube superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. The range coverage is 540-1700 kilocycles. The receiver has been designed to operate on 105-125 volts, 40-60 cycles A.C.-D.C. unless otherwise specified.

MODELS 410,410A,410R
MODEL 666

DeWALD RADIO MFG. CORP.



TO CALIBRATE RECEIVER

Attach the antenna side of the signal to one of the leads extending from the rear of the cabinet. Connect the ground side to the other lead. Adjust the signal generator to 455 kilocycles and peak the I.F. trimmers for maximum signal. Set the signal generator and the receiver to 1500 kilocycles and peak the variable condenser trimmers for maximum signal. The low frequency end of the dial is automatically calibrated by a cut section variable condenser.

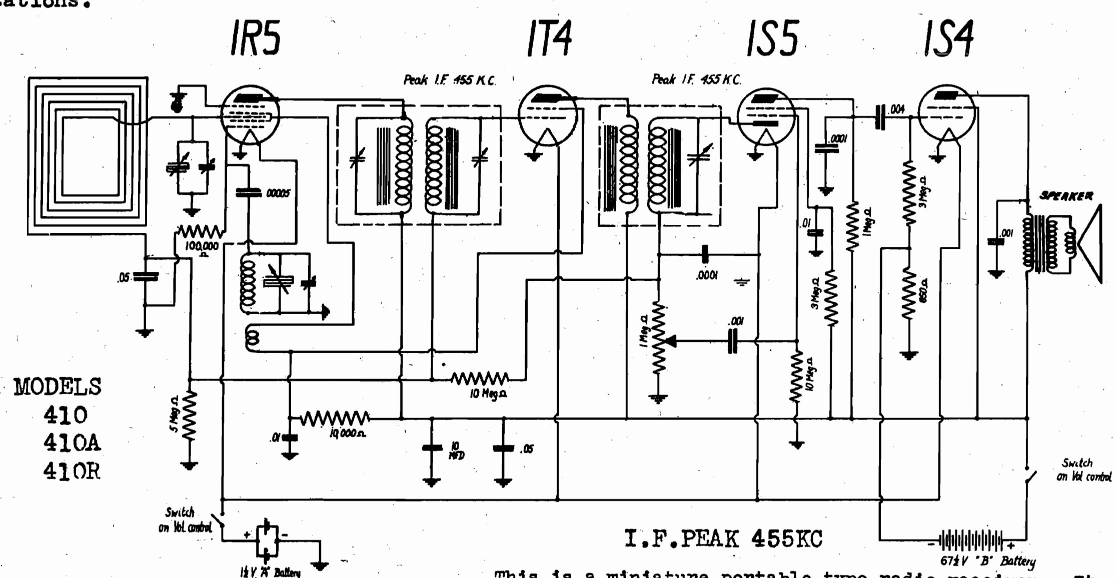
This model is a six tube superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. The range coverage is 540-1700 kilocycles. The receiver has been designed to operate on 105-125 volts, 40-60 cycles A.C.-D.C. unless otherwise specified.

MODEL 666

IMPORTANT:

Since the loop used has a directional effect, it may be found necessary at times to turn the receiver for best reception on weaker stations.

I.F.PEAK 455KC



MODELS
410
410A
410R

I.F.PEAK 455KC

This is a miniature portable type radio receiver. It employs a superheterodyne circuit with full automatic volume control. A self-contained antenna loop is incorporated, which makes the use of an outside aerial or ground unnecessary. The "A" supply consists of two dry-cell batteries, EVEREADY #950 or the equivalent. The "B" supply consists of one 67.5 volt battery, EVEREADY #467 or the equivalent. The range coverage is 540 to 1700 kilocycles.

INSTALLATION OF BATTERIES

Rest the cabinet on the knobs with the speaker grille facing you. Open up the door by sliding the latch of the lock toward the leather tab. Then pull on the tab. The dry cell batteries go on the right side. Slide them in the metal container so that the brass terminal of the battery runs along the narrow slot of the container (see sketch on cover). For the "B" battery, merely snap the two connectors to the battery and place it in the cabinet with the terminals toward the left.

LIST PRICE OF REPLACEMENT PARTS

1621	1st I.F.coil	1.10
1622	2nd det. I.F.	1.10
1623	Antenna loop	.85
1624	oscillator coil	.40
2520	2 gang var. cond.	1.75
2521	8 mfd. electrolytic	1.00
3515	volume control	.90
5206	"B" battery cable	.30
7309	speaker	3.00
80026	knob	.15

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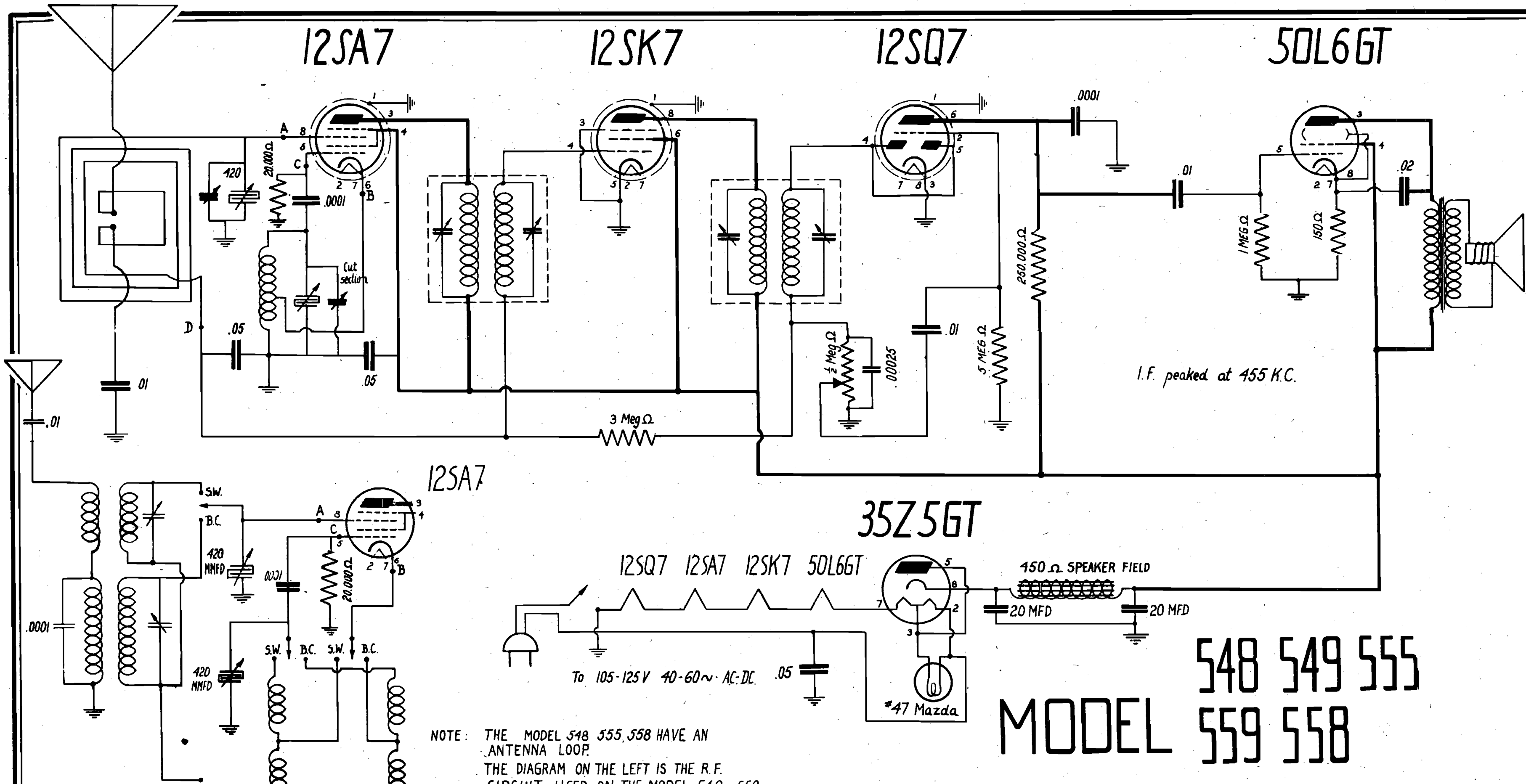
DeWALD RADIO MFG. CORP.

MODELS 548,549,555(1940) 558,559



TO CALIBRATE RECEIVER

I.F. ALIGNMENT

Attach the antenna lead of the signal generator to the antenna lead of the receiver. Connect the ground side of the signal generator to the receiver chassis. If calibrating the model 549, the wave band switch should be in the broadcast position. Attach an output meter or resonance indicator across the primary leads of the speaker output transformer, or across the speaker voice coil. Adjust the signal generator to 455 kilocycles. Have the volume control in the maximum position. Peak the I.F. adjusting screws for maximum output. Do not use a greater generator signal than is necessary to obtain a good output level.

BROADCAST ALIGNMENT

The model 548 and 555 have the adjusting trimmers on the variable condenser. The model 549 has individual trimmers on each coil and no trimmers on the variable condenser. Set the signal generator and receiver dial to 1500 kilocycles. Adjust the broadcast oscillator trimmer screw until the signal from the generator is heard. Peak the antenna trimmer screw for maximum output. The low frequency end of the receiver on the model 548 and 555 is automatically adjusted. To adjust the low frequency of the model 549, set the signal generator and receiver to 600 kilocycles. Peak the broadcast padder for maximum output. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT

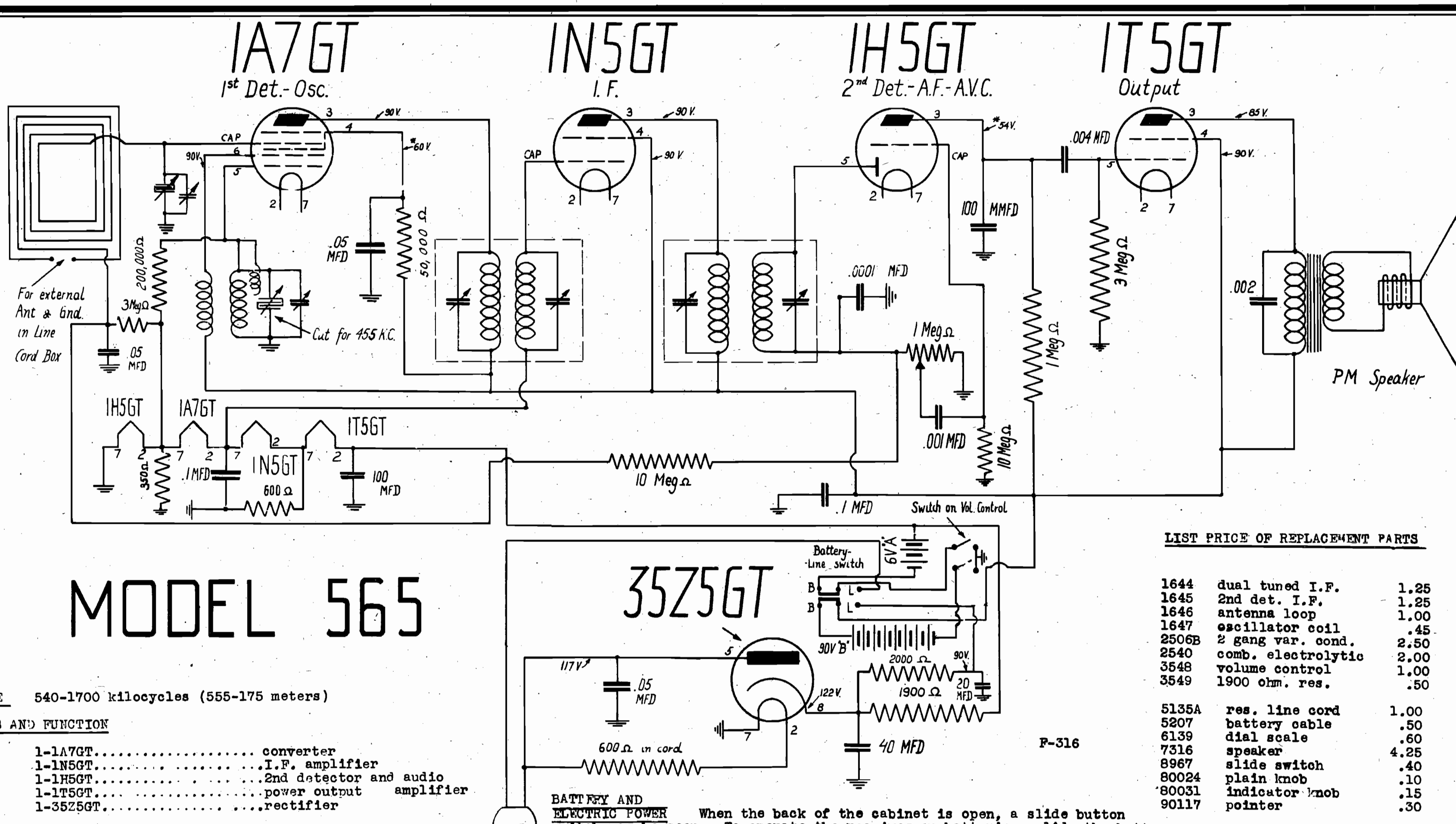
Slide the wave band switch button to the short wave position. Set the signal generator and receiver to 16 megacycles. Adjust the short wave oscillator coil trimmer until the generator signal is heard. Peak the short wave antenna coil trimmer for maximum output. The low frequency end of the dial is automatically adjusted.

HOW TO ADJUST THE PUSH BUTTONS

Insert a screw driver blade into the hole in the button which is to be adjusted. After engaging the blade in the adjusting screw slot, loosen the screw by turning it one complete revolution counterclockwise. Keep the blade engaged in the slot and bear down on the screw driver so that the adjusting screw will remain depressed. Tune in the desired station with the station selector knob. Maintain enough pressure on the screw driver to keep the adjusting screw depressed; and, at the same time tighten it by turning it in a clockwise direction. The adjustment may be checked by setting the pointer in any position, pushing the knob down as far as it will go and noting if the intended station is received. The remaining knobs can be adjusted in the same manner. After all adjustments have been made the station tabs and celluloid pieces may be placed in the recess on the buttons.

MODEL 565

DEWALD RADIO MFG. CORP.



IMPORTANT • BE SURE THE RECEIVER IS TURNED "OFF" WHEN NOT IN USE. SINCE THE LOOP USED IN THE RECEIVER HAS A DIRECTIONAL EFFECT, IN ORDER TO OBTAIN BEST RECEPTION AND DECREASE NOISE INTERFERENCE, IT MAY BE FOUND NECESSARY AT TIMES TO TURN THE RECEIVER.

F-316

RANGE 540-1700 kilocycles (555-175 meters)

TUBES AND FUNCTION

1-1A7GT.................... converter
1-1N5GT.................... I.F. amplifier
1-1H5GT.................... 2nd detector and audio
1-1T5GT.................... power output amplifier
1-35Z5GT.................... rectifier

MODEL 565 PORTABLE BATTERY ELECTRIC RECEIVER

The model 565 is a combination portable battery and electric receiver. It uses the latest low drain tubes and employs a circuit designed for low power consumption. An antenna loop is incorporated which makes the use of an outside aerial unnecessary for reception in most localities. The receiver will operate with an "A" supply of 6 volts and a "B" supply of 90 volts. It will also operate on 105-125 volts, 40-60 cycles A.C. or D.C. unless otherwise specified. Following is a list of manufacturers and their numbers of the batteries that may be used with this receiver. Other batteries may be used if the electrical and physical characteristics correspond to the recommended list.

"A" battery (one required)		"B" battery (two required)	
EVEREADY	# 747	EVEREADY	# 482
BRIGHT STAR	# 868	BRIGHT STAR	# 30-33
USALITE	# 646	USALITE	# 640
RAY-O-VAC	# P698L	RAY-O-VAC	# P5S30
BURGESS	# 2F4L	BURGESS	# M30

The life of the batteries is from 250-300 hours, when the receiver is used about four hours per day.

BATTERY AND ELECTRIC POWER When the back of the cabinet is open, a slide button switch may be seen. To operate the receiver on batteries, slide the button to the side marked BATT. Keep the line cord in the remaining space of the "A" battery compartment: When desiring to operate the receiver on electric power, the slide button should be on LINE position. Bring the line cord out of the cabinet so that when the back is closed, the cord is in the notch provided in the corner of the cabinet The back of the cabinet should always be kept closed when operating the receiver.

The batteries may be installed or replaced without removing the antenna loop from the back. Care should be exercised not to break the loop connecting leads when connecting or disconnecting the batteries. The tubes are accessible so that they may be changed without removing the chassis from the cabinet.

ANTENNA In most locations the receiver will operate satisfactorily without an outside antenna. For unfavorable localities, additional signal pick up may be desired. To obtain this, attach an aerial to one of the leads inside the back. A ground wire may be attached to the other lead. Tape the connections well to prevent short-circuiting of leads together and ground.

LIST PRICE OF REPLACEMENT PARTS

1644	dual tuned I.F.	1.25
1645	2nd det. I.F.	1.25
1646	antenna loop	1.00
1647	oscillator coil	.45
2506B	2 gang var. cond.	2.50
2540	comb. electrolytic	2.00
3548	volume control	1.00
3549	1900 ohm. res.	.50
5135A	res. line cord	1.00
5207	battery cable	.50
6139	dial scale	.60
7316	speaker	4.25
8967	slide switch	.40
80024	plain knob	.10
80031	indicator knob	.15
90117	pointer	.30

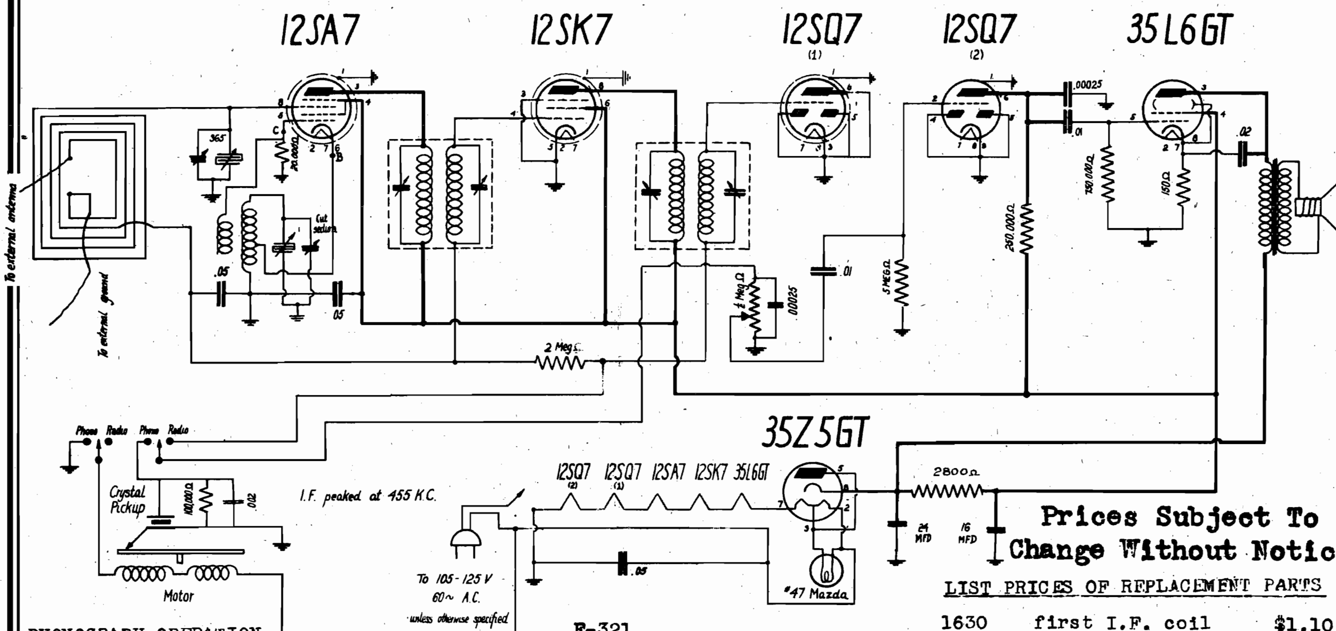
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

I.F. PEAK

455 KC

DeWALD RADIO MFG. CORP.

MODEL 669
MODEL 812



F-321

Prices Subject To Change Without Notice

MODEL 669

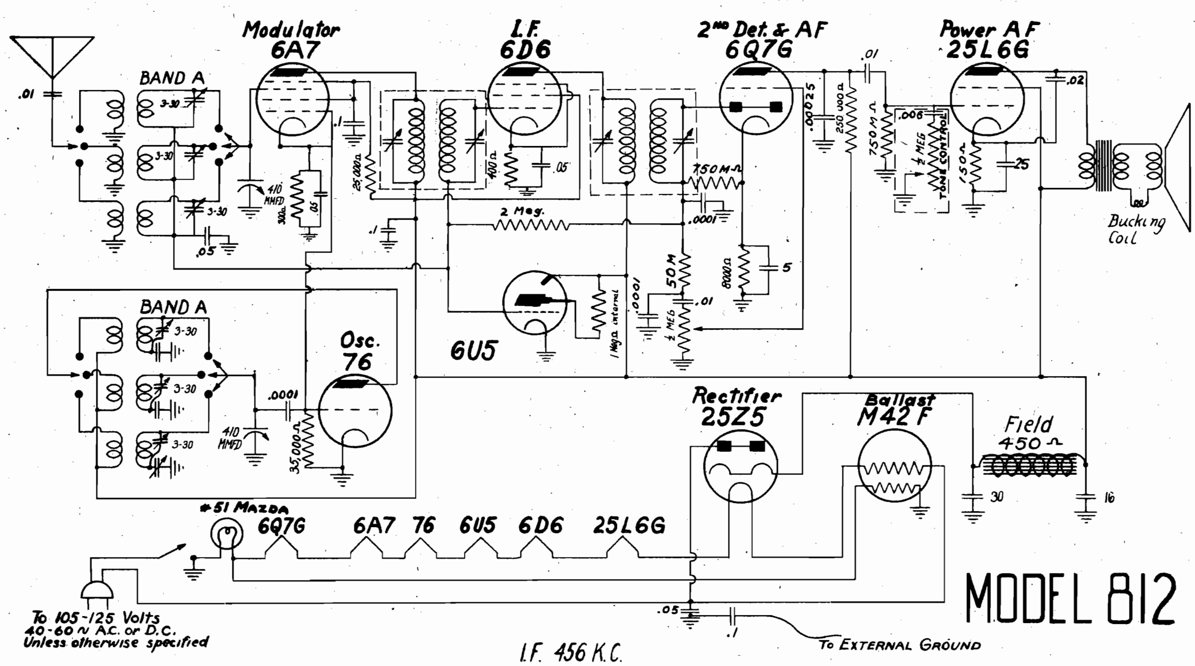
PHONOGRAPH OPERATION

The button on the top panel of the cabinet is the phono-radio switch. When the slide switch button is on the "radio" side, the receiver will pick up radio signals. When on the "phono" side, the turn table will begin to turn and phonograph records may be reproduced through the receiver. For best results, the lid cover should be closed while playing records.

The model 669 is a RADIO-PHONO combination that provides reproduction of recordings with good fidelity as well as regular radio broadcast reception. All types of records up to 12 inches may be played with the lid closed. A self-starting motor together with a crystal pick-up are used for phonograph reproduction. The radio receiver employs a superheterodyne circuit using the latest low drain tubes for low power consumption. A self-contained antenna loop is incorporated which makes the use of an outside antenna unnecessary in most localities. It will operate on 105-125 volts, 40-60 cycles A.C. or D.C. The phonograph motor will function on 105-125 volts, 60 cycles A.C. only, unless otherwise specified. A range of 540-1700 kilocycles is covered by the receiver.

LIST PRICES OF REPLACEMENT PARTS

1630	first I.F. coil	$1.10
1631	second det. coil	1.10
1632	loop antenna	.85
1633	oscillator coil	.45
2507	comb. electrolytic	1.10
2529	2 gang var. cond.	2.00
3519A	volume control	.90
4229	cabinet	15.00
6228	dial scale	.40
6229	dial crystal	.30
7311	speaker	$3.50
8906	pick-up cartridge	5.00
8916	pilot lamp	.10
8939	phono switch	.40
8958	phono pick-up	5.25
8973	switch plate	.35
80032	knob	.20
80034	phono motor	6.00
80035	pilot socket	.30
90157	dial pointer	.25

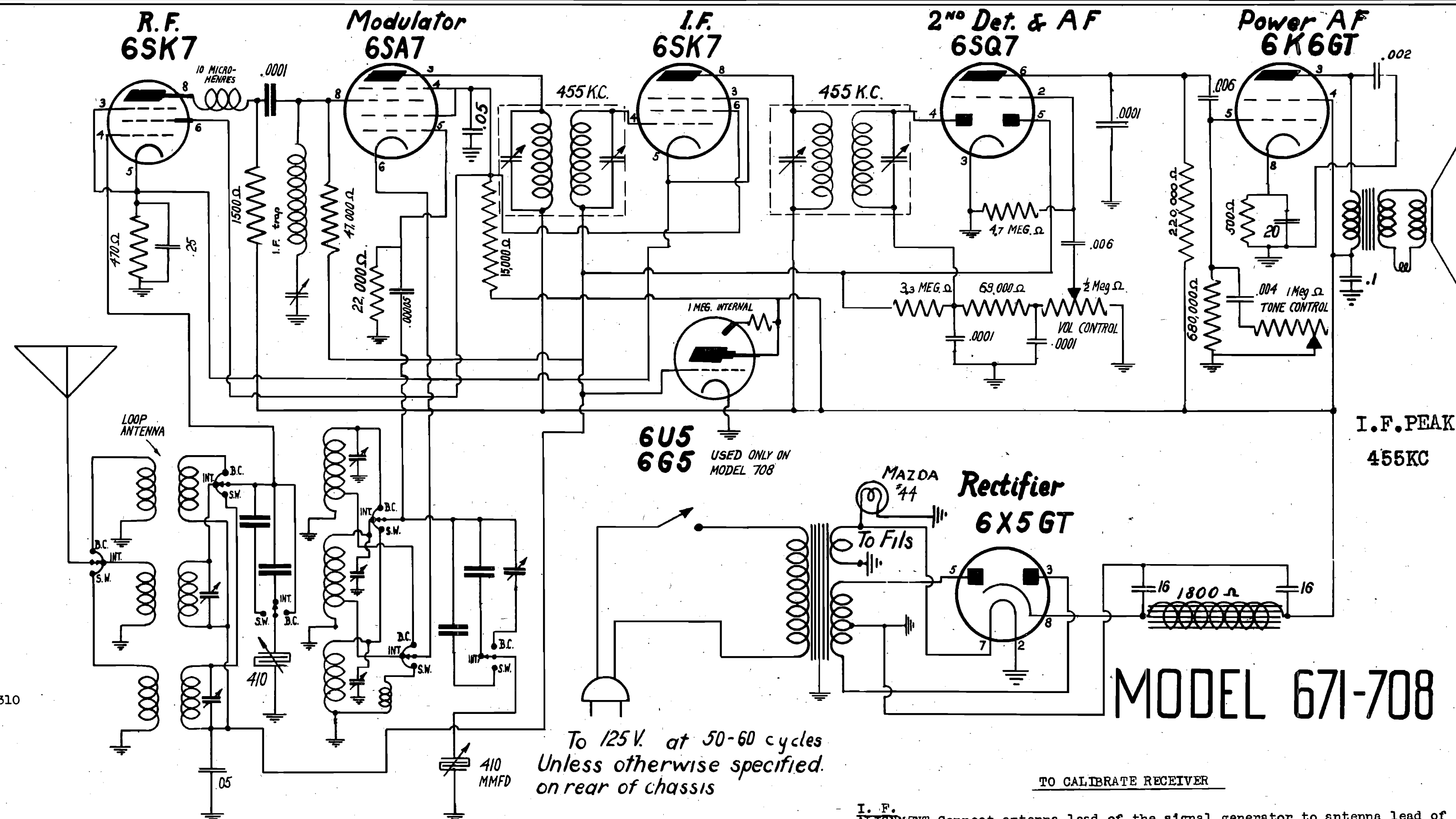


I.F. 456 K.C.

MODEL 812

MODELS 671,708

DEWALD RADIO MFG. CORP.



F-310

These models are superheterodyne receivers having full automatic volume control on all bands. They are designed to operate on 117 volts A.C. 50-60 cycles, unless otherwise specified. A slide rule instrument type dial with a high ratio tuning mechanism is used to facilitate station tuning. In addition a circuit incorporating a semi-band spread feature is used to make station selection on some parts of the short wave bands almost as simple as on broadcast. The range coverage is 540-1650 K.C. (555-182 meters) 4.7-10 M.C. (64-30 meters) 11.5-24 M.C. (26-12.6 meters).

LIST PRICES OF REPLACEMENT PARTS

1473	wave trap coil	.35	3538	comb. vol. cont.	1.00
1635	power transformer	4.50	3539	tone control	.75
1637	comb. osc. coil	1.75	6232	dial scale	1.10
1638	comb. ant. coil	1.25	7314	speaker	4.50
1639	antenna loop	1.00	8067	pilot lamp	.10 net
1640	dual tuned I.F.	1.10	8975	pilot lamp assembly	.20
1641	2nd det. I.F.	1.10	80042	wave band switch	2.00
1643	tuned choke	.25	80043	plain knob	.20
2533A	2 gang var cond.	2.00	80044	indicator knob	.20
2554	comb electrolytic	1.25	9779	drive string	.15
90174	pointer	.30	90138	pilot lamp shade	.10

Prices Subject To Change Without Notice

TO CALIBRATE RECEIVER

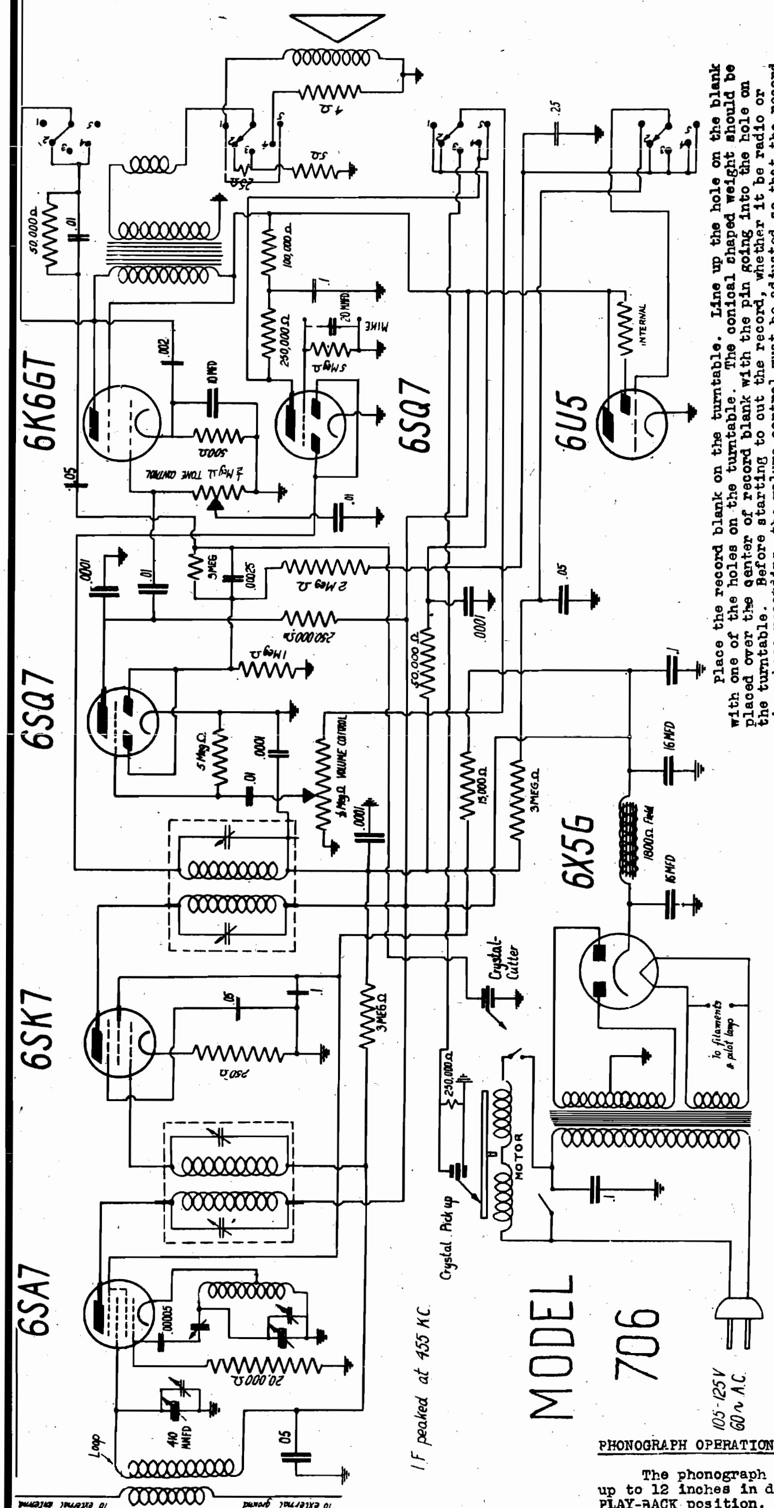
I. F. ALIGNMENT: Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 455 K.C. and peak I.F. trimmers or maximum signal.

BROADCAST ALIGNMENT: Remove short from variable condenser. Have the wave band switch on broadcast position. Adjust the generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C. and peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT: For 4.7-10 M.C. Turn wave band switch knob to this band. Adjust the generator and receiver to 10 M.C. and peak the trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder. For 11.5-24 M.C. Turn wave band switch knob to this band. Adjust the generator and receiver to 22 M.C. Peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

DEWALD RADIO MFG. CORP.

MODEL 706



NOTES ON RECORDING:

Before attempting to cut any records, it is important to observe the following precautions.

1. Records up to 10 inches in diameter may be cut.
2. A proper cutting stylus must be used in the cutting head.
3. Insert the cutting stylus into the head so that the flat portion of it will face the knurled screw. The stylus is held in place by tightening the thumb screw.
4. Great care must be exercised whenever moving the cutting arm. It should be raised to an angle of about 45 degrees before moving it along a horizontal plane, in order to avoid injuring the feed mechanism.
5. A new cutting stylus will cut dozens of records satisfactorily before being dulled so that replacement is necessary.
6. Some record blanks are made of inflammable material. Do not bring the thread material cut from the record near a flame or have it come in contact with a hot object.
7. When not in use the cutting arm should be kept on the arm rest provided.

RECORD CUTTING PROCEDURE

Favorite radio programs may be easily recorded. Records may also be made of a person or group talking, singing, or playing instruments. The procedure for either type of recording is essentially the same. To make records of radio programs, the five point selector switch knob should be in the RADIO RECORDING position. When making microphone recordings the switch knob should be in the MICROPHONE RECORDING position. and the plug at the end of the microphone cable inserted in the microphone socket. The microphone should be held at a distance of 6 to 18 inches away from the sound.

Place the record blank on the turntable. Line up the hole on the blank with one of the holes on the turntable. The conical shaped weight should be placed over the center of record blank with the pin going into the hole on the turntable. Before starting to cut the record, whether it be radio or microphone recording, the volume control must be adjusted so that the record will be properly cut. The correct adjustment can be made by watching the tuning eye. Components in the circuit have been so chosen to permit the "eye" to close just before the recorded volume becomes great enough to cause over-cutting into adjacent grooves on the record. For this reason it is necessary to adjust the control so that the "eye" just closes when recording. It may be necessary to regulate the volume during the cutting because of variations of signal input to the receiver. The tone control should be adjusted to the "brilliant" position. After the recording has been made, the control may be used to adjust the tone to the desired shade.

Bring the cutting head over the record blank until the stylus is about 1/8 inch in from the edge of the record Lower the cutting arm gently on the face of the disc. From now on the cutting is done automatically. However, as the grooves are being cut, threads will appear on the record surface. These threads should be brushed off occasionally. When the record is finished, the depth of cut may be observed by holding it in such a position that a light is reflected from the grooves If the depth of cut is correct, the grooves will appear to be as wide as the space between them. The cut may also be checked by the quality of the thread being cut. It should not be coarse and stiff nor light and fluffy.

Should the cut be unsatisfactory, it may be due to a dulled cutting stylus or improper adjustment of the recording arm. The depth of cut may be regulated by an adjustment of the flat head screw on the top of the recording arm. Turning the screw to the left (counterclockwise) decreases the depth of cut. Turning the screw to the right (clockwise) increases the depth of cut.

MICROPHONE ADDRESS

The unit may be used on an audio amplifier. hen the five position selector switch knob is in the MICROPHONE ADDRESS position, any sound picked up by the microphone will be greatly amplified. The volume may be adjusted by means of the volume control knob. Do not keep the microphone too close to the receiver. for it may cause a feedback howl. To avoid this effect either keep the volume control at a low level or take the microphone into another room.

PHONOGRAPH OPERATION

The phonograph unit will reproduce either home-made or commercial records up to 12 inches in diameter. Turn the SELECTOR SWITCH knob to the PHONOGRAPH PLAY-BACK position. Make certain the receiver power is turned "on", and the volume control sufficiently advanced to allow reproduction through the speaker. Slide the button of the switch on the motorboard to the "on" position. As soon as the turntable begins to spin, the pick-up arm (the one on the left of the cabinet) may be brought gently on the record. When not in use, this arm should be placed on the arm rest provided.

TUBE COMPLEMENT

1-6SA7 -	oscillator and first detector.
1-6SK7 -	intermediate frequency amplifier.
1-6SQ7 -	second detector, A.V.C. and first audio.
1-6K6GT-	power output.
1-6X5G -	rectifier
1-6U5 -	tuning indicator.
1-6SQ7 -	pre-amplifier

This receiver has a superheterodyne circuit with full automatic volume control, and will operate on 105-125 volts, 60 cycles ALTERNATING CURRENT unless otherwise specified. An antenna loop has been incorporated which makes the use of an outside aerial or ground unnecessary. A large slide rule instrument type dial with a high tuning ratio is used to make tuning of stations easy and accurate. The range coverage is 540 to 1700 kilocycles. The recording instructions should be carefully read and followed for best results.

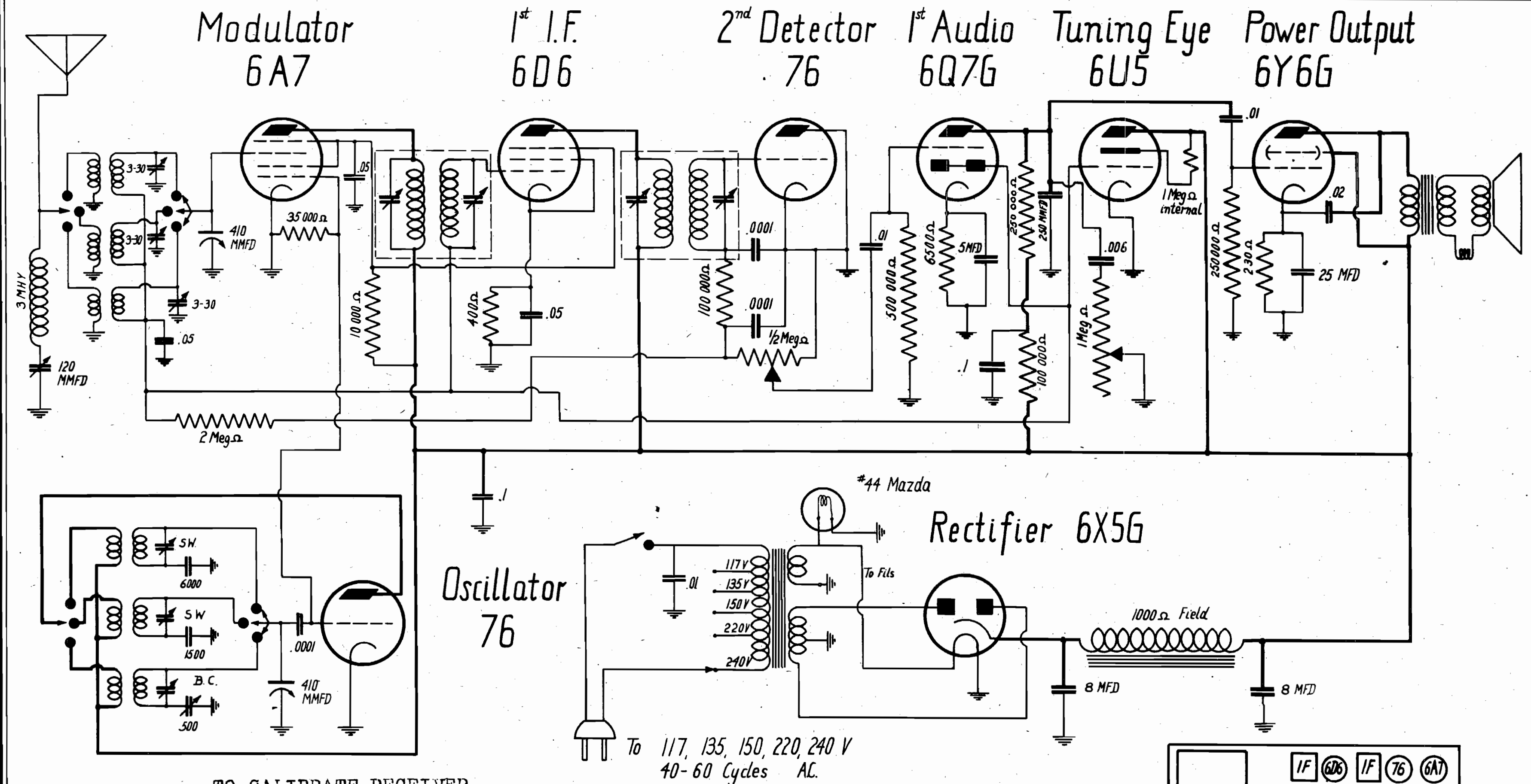
LIST PRICES OF REPLACEMENT PARTS

1625	power transformer	3.00	7310	speaker	4.25
1626	first I.F. coil	1.10	3916	pilot lamp	.10 net
1627	second det. coil	1.10	8947A	pilot socket	.30
1628	antenna loop	1.50	80024	knob	10
1529	oscillator coil	.50	80031	indicator knot	.15
2526A	variable cond.	2.50	80033	selector switch	1.30
2527	comb. electrolytic	1.75	80039	slide switch	.25
3430	volume control	1.00	9762	drive spring	.05
3432	tone control	.75	9943	dial pointer	.30
6113	dial scale	.85			

Prices Subject To Change Without Notice.

MODEL 810

DeWALD RADIO MFG. CORP.



TO CALIBRATE RECEIVER

I.F. ALIGNMENT: Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit **left** section of variable condenser. Adjust generator to 456 K.C. and peak I.F. trimmers for maximum signal.

BROADCAST ALIGNMENT: Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.G. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C., peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

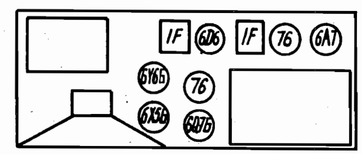
SHORT WAVE ALIGNMENT: For 2.7-8.2 M.C. (Model 810). Turn wave band switch to this band. Adjust the generator and receiver to 7.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder. For 7.8-24 M.C. Turn wave band switch to this band.

RANGE COVERAGE

I.F. 456 KC.

555-174 meters, 112-37 meters, 39-12.5 meters
540-1725 K.C. 2.7-8.2 M.C. 7.8-24 M.C.

Adjust generator and receiver to 22 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.



HOW TO ADJUST THE PUSH-BUTTONS

Tune in the desired station with the station selector knob. Determine which button is to be used to receive this station. Loosen this button by turning it in a counterclockwise direction approximately one full turn. Then push the button in as far as it will go and tighten with a coin in the button slot. The adjustment may be checked by setting the pointer in any position, pushing the button in as far as it will go and noting if the intended station is received. After all adjustments have been made the station tabs and celluloids may be put on the button.

DeWALD RADIO MFG. CORP.

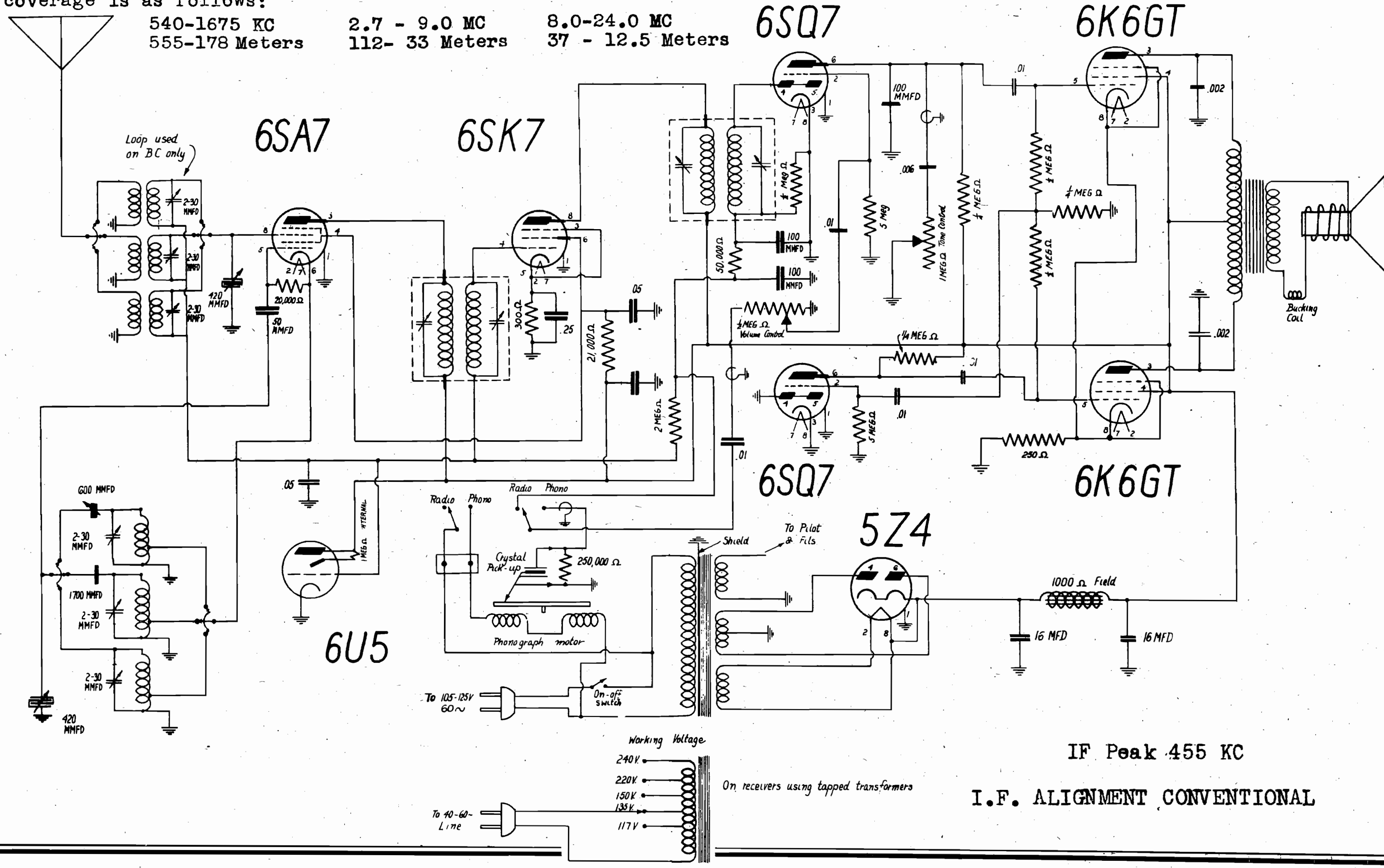
MODELS 814, 815, 816, 817

This model is a radio phonograph combination which operates on alternating current. It has full automatic volume control on all bands. The receivers with multi-tap transformers will operate on **117** V., 135 V., 150 V., 220 V., or 240 V., 40-60 cycles A.C. Those that do not have multi-tap transformers will operate on **117**- volts, 60 cycles A.C. unless otherwise specified. A large slide rule instrument type dial with a high ratio tuning mechanism has been incorporated in order to make station tuning easy and accurate. An antenna loop which makes the use of an outside aerial unnecessary is also featured in these receivers. Provisions have been made for attaching a television unit to the receiver. The range coverage is as follows:

540-1675 KC	2.7 - 9.0 MC	8.0-24.0 MC
555-178 Meters	112- 33 Meters	37 - 12.5 Meters

6SA7	oscillator and first detector
6SK7	intermediate frequency amplifier
6SQ7	second detector, A.V.C. and first audio
6SQ7	phase inverter
6K6GT	power output
5Z4	rectifier
6U5	tuning indicator

FOR OTHER DATA SEE INDEX



IF Peak 455 KC

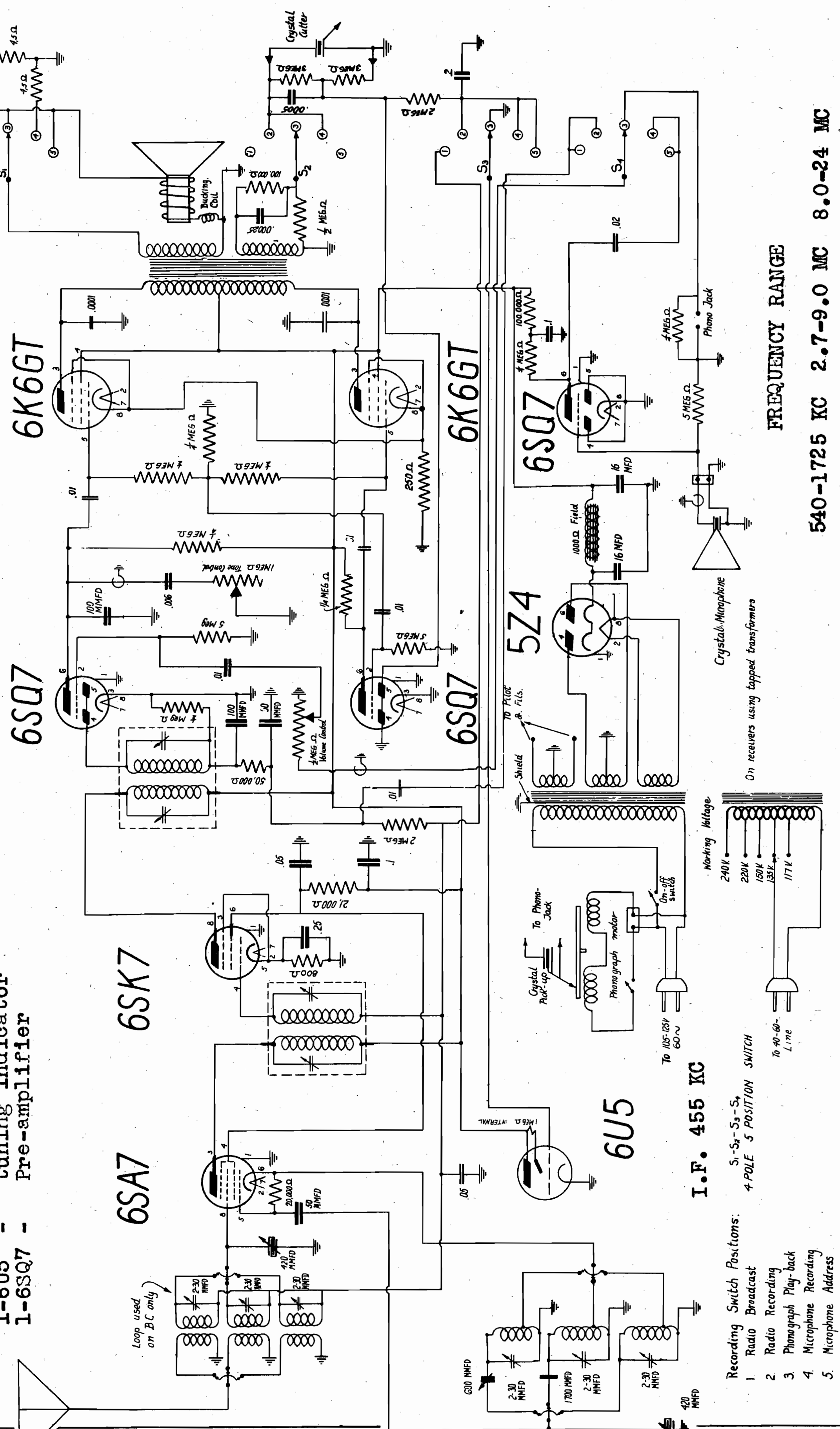
I.F. ALIGNMENT CONVENTIONAL

MODELS 906,907,908

DeWALD RADIO MFG. CORP.

FOR OTHER DATA SEE INDEX

1-6SA7 - oscillator and first detector
1-6SK7 - intermediate frequency amplifier
1-6SQ7 - second detector, A.V.C. and first audio
1-6SQ7 - phase inverter
2-6K6GT- power output
1-5Z4 - rectifier
1-6U5 - tuning indicator
1-6SQ7 - Pre-amplifier



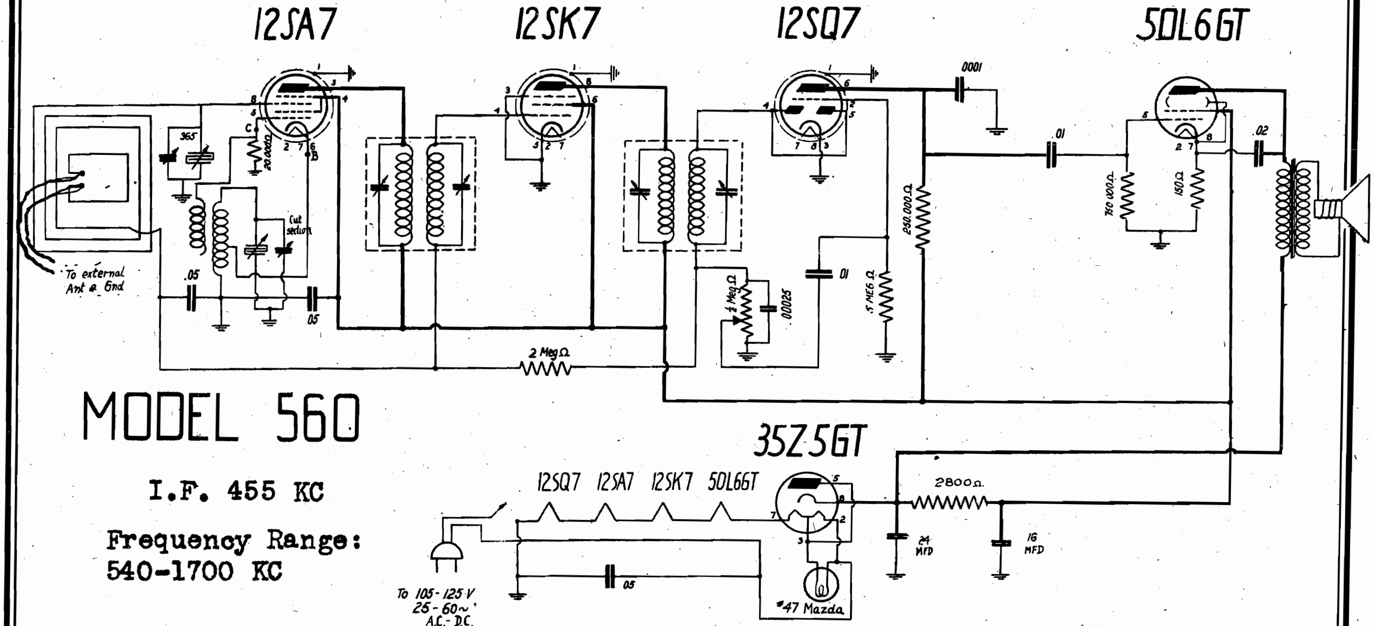
FREQUENCY RANGE
540-1725 KC 2.7-9.0 MC 8.0-24 MC

I.F. 455 KC

DeWALD RADIO MFG. CORP.

MODELS 814,815,816,817
MODELS 906,907,908
MODEL 560

This model is a five tube superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. The range coverage is 540-1700 kilocycles. The receiver has been designed to operate on 105-125 volts, 25-60 cycles A.C.-D.C. unless otherwise specified.



MODEL 560

I.F. 455 KC

Frequency Range:
540-1700 KC

MODEL 560

ALIGNMENT: Attach the hot side of signal generator to one of the flexible antenna loop leads. Connect the ground side to the other flexible lead. Adjust signal generator to 455 kc and peak I.F. trimmer screws for maximum signal. Adjust receiver dial and generator to 1500 kc peak the variable condenser trimmer screws for maximum gain.

MODELS 906,907,908, MODELS 814,815,816,817

I.F.ALIGNMENT

Attach the antenna lead of the signal generator to the antenna lead of the receiver. Connect the ground side of the generator to the ground lead of the set. Turn the wave band switch knob of the receiver to broadcast position. Attach an output meter or resonance indicator across the primary leads of the speaker or across the voice coil terminals. Adjust the signal generator to 455 K.C. Have the volume control in the maximum position. Peak the I.F. adjusting screws to maximum output. Do not use a greater generator signal than is necessary to obtain a good output meter reading. For location of first and second I.F. transformers, see the tube layout diagram.

BROADCAST ALIGNMENT

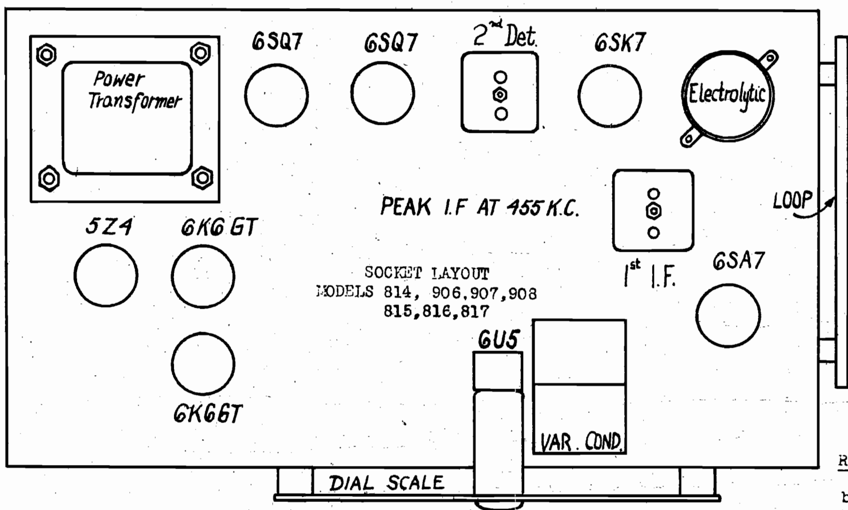
Keep the receiver in the broadcast position. Set the signal generator to 1500 KC. and adjust the broadcast oscillator coil trimmer screw until the signal from the generator is heard. Peak the broadcast antenna loop trimmer for maximum output. Tune the receiver and signal generator to 600 KC. Adjust the broadcast padder for maximum output. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT

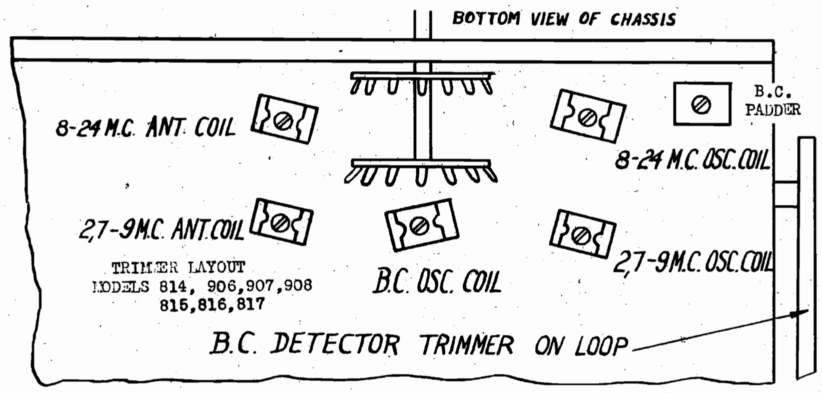
To calibrate the 2.7-9.0 M.C. band, turn the wave band switch to this range. Adjust the receiver dial and signal generator to 8.0 megacycles. Turn the oscillator coil trimmer screw until the generator signal is heard. Peak the detector coil trimmer for maximum output. The low frequency is automatically adjusted by a fixed calibrated padder. To calibrate the 8.0 - 24.0 M.C. band, turn the wave band switch to this range. Adjust the receiver and signal generator to 22.0 megacycles and proceed adjusting the trimmers as for the 2.7-9.0 M.C. band.

MODELS 814,815,816,817
MODELS 906,907,908

DEWALD RADIO MFG. CORP.



SOCKET LAYOUT
MODELS 814, 906,907,908
815,816,817



TRIMMER LAYOUT
MODELS 814, 906,907,908
815,816,817

NOTES ON RECORDING   MODELS 906,907,908

Before attempting to cut any records, it is important to observe the following precautions.

1. Records up to 10 inches in diameter may be cut.
2. A proper cutting stylus must be used in the cutting head.
3. Insert the cutting stylus into the head so that the flat portion of it will face the knurled thumb screw.
4. Tighten the cutting stylus in position by means of the knurled screw.
5. Great care must be exercised whenever moving the cutting arm. It should be raised to an angle of about 45 degrees before moving it along the horizontal plane, in order to avoid injury to the feed mechanism.
6. To check the adjustment of the cutting stylus, place a blank record on the turntable. Then bring the cutting head over the record and let it rest on the face of the record. If the cutting head is properly adjusted, it will be in a plane parallel to the record surface and the stylus perpendicular to it. This condition is obtained only when the nose of the recording arm is adjusted to the correct height of ¼ inch above the record surface.
7. Whenever the recording arm is not being used, it should always be returned to its normal horizontal position to the right of the turntable. NEVER ALLOW THE CUTTING STYLUS TO REST ON THE TURNTABLE.
8. A new cutting stylus will cut dozens of records satisfactorily before being dulled so that replacement is necessary.
9. Some record blanks are made of inflammable material. Do not bring the thread material cut from the record near a flame, or have it come in contact with a hot object.

RECORD CUTTING PROCEDURE

Favorite radio programs may be easily recorded. Records may also be made of a person or group talking, singing, or playing instruments. The procedure for either type of recording is essentially the same. To make records of radio programs, the five point selector switch knob should be in the RADIO RECORDING position. When making microphone recordings the switch knob should be in the MICROPHONE RECORDING position, and the plug at the end of the microphone cable inserted in the microphone socket. The microphone should be held at a distance of 6 to 18 inches away from the sound.

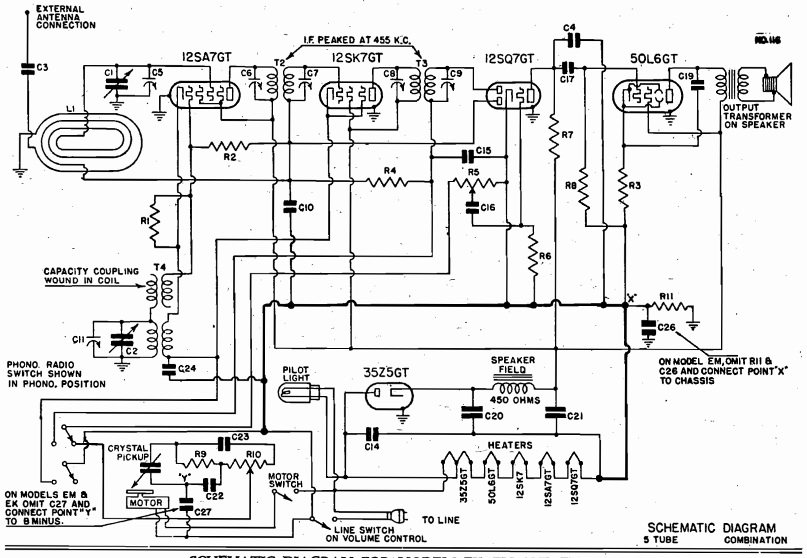
Place the record blank on the turntable allowing the spring pin to come up through one of the small holes on the record. Snap the toggle switch to the "on" position. Before starting to cut the record, whether it be radio or microphone recording, the volume control must be adjusted so that the record will be properly cut. The correct adjustment can be made by watching the tuning eye located in the middle of the dial. Components in the circuit have been so chosen to permit the "eye" to close just before the recorded volume becomes great enough to cause overcutting into adjacent grooves on the record. For this reason, it is necessary to adjust the control so that the "eye" just closes when recording. It may be necessary to regulate the volume during the cutting because of variations of signal input to the receiver.

Raise the cutting head so that it is at about 45 degrees angle with the turntable. Bring it over the record until the cutting stylus is about 1/8 inch in from the edge of the record. Slowly lower the cutting arm onto the face of the disc. From now on, the cutting is done automatically. However, as the grooves are being cut threads will appear on the record surface. These threads should be brushed off occasionally. When the record is finished, the depth of cut may be observed by holding it in such a position that a light is reflected from the grooves. If the depth of cut is correct, the grooves will appear to be about as wide as the space between them. The cut may also be checked by noting the quality of the thread being cut. It should not be coarse and stiff, nor light and fluffy.

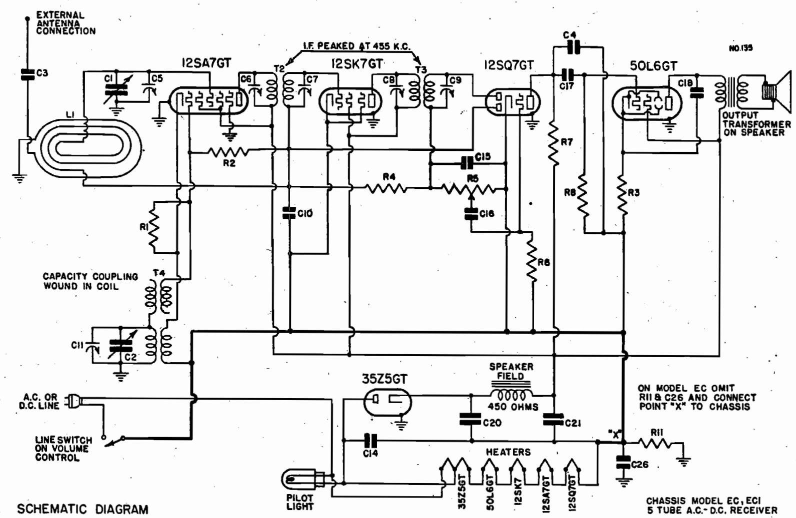
Should the cut be unsatisfactory, it may be due to a dulled cutting stylus or improper adjustment of the recording arm. The depth of cut may be regulated by an adjustment of the flat head screw on the top of the recording arm. Turning the screw to the left (counterclockwise) decreases the depth of cut. Turning the screw to the right (clockwise) increase the depth of cut.

EMERSON RADIO & PHONOGRAPH CORP.

Chassis EC, EC1, EK, EM, EM1



SCHEMATIC DIAGRAM FOR MODELS EK, EM AND EM1



SCHEMATIC DIAGRAM FOR MODELS EC AND EC1

MODELS: EC-296, EC-301, EC-314, EC-315, EC-327, EC-336, EC-347, EC-353 and EC-366

CHASSIS MODEL: EC

COMBINATION RADIO AND PHONOGRAPH

MODELS: EM-345, EM-346 and EM-382

(For operation on A.C. only)

EM2-345, EM2-346 and EM2-382

(For operation on A.C. or D.C.)

CHASSIS MODEL: EM

MODEL: EK-377 and EK-403

(For operation on A.C. only)

EK2-377

(For operation on A.C. or D.C.)

CHASSIS MODEL: EK

If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re aligned.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and 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 oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

FREQUENCY RANGE: 540-1600 kc.

Models below listed under reexamination service of Underwriters' Laboratories, Inc.

MODELS: EC1-296, EC1-301, EC1-314, EC1-315, EC1-327, EC1-336, EC1-347, EC1-353 and EC1-366

CHASSIS MODEL: EC1

COMBINATION RADIO AND PHONOGRAPH

MODELS: EM1-345 and EM1-346

(For operation on A.C. only)

EM3-345 and EM3-346

(For operation on A.C. or D.C.)

CHASSIS MODEL: EM1

—EC-EK-EM—S1
—S2

1—12SA7GT, pentagrid oscillator-modulator
1—12SK7GT, first i-f amplifier
1—12SQ7GT, diode detector, a-f amplifier, a.v.c.
1—50L6GT, beam power output
1—35Z5GT, half-wave rectifier.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION:
30 watts for receiver
20 watts for a.c. motor
30 watts for a.c.-d.c. motor.

The receivers used in all models are of the a.c.-d.c. type. The motors in the A.C. ONLY type combinations will operate only if used on alternating current and will be damaged if connected to direct current.

L1	Loop antenna assembly (EM)
L1	Loop antenna assembly (EK)
L1	Loop antenna assembly (EC)
T4	Oscillator coil (EC1, EM and EK)
T4	Oscillator coil (EC)
T2	Double-tuned 455 kc first i-f transformer
T3	Double-tuned 455 kc second i-f transformer
R1	20,000 ohm ¼ watt carbon resistor
R3	140 ohm ½ watt wire-wound resistor
R4	3 megohm ¼ watt carbon resistor
R5	Volume control .5 megohm with line switch
R6, R2	15 megohm ¼ watt carbon resistor
R7, R8	500,000 ohm ¼ watt carbon resistor
R11	200,000 ohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser (EM)
C1, C2	Two-gang variable condenser (EC)
C3, C16	0.002 mf, 600 volt tubular condenser
C4, C15	0.0002 mf, 600 volt tubular or mica condenser
C5, C11	Trimmers, part of variable condenser
C6, C7, C8, C9	Trimmers, part of i-f transformers
C10, C27	0.05 mf, 200 volt tubular condenser
C14	0.05 mf, 400 volt tubular condenser
C17, C18	0.02 mf, 400 volt tubular condenser
C19	0.03 mf, 400 volt tubular condenser (EM) (see production change no. 2)
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (EM1 and EM3)
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (EC)
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (EM, EM2 and EK)
C24	0.1 mf, 200 volt tubular condenser
C26	0.2 mf, 200 volt tubular condenser
R9	3 megohm ¼ watt carbon resistor
R10	Tone control .5 megohm with motor line switch (EK)
R10	Tone control .5 megohm with motor line switch (EM1)
R10	Tone control .5 megohm with motor line switch (EM)
C22	0.001 mf, 600 volt tubular condenser
C23	0.00054 mf, 600 volt tubular or mica condenser
C25	0.01 mf, 400 volt tubular condenser (for a.c.-d.c. motors only)

color coding of the i-f transformer leads
Grid—green
Grid return—black
Plate—blue
B plus—red

PRODUCTION CHANGES

1. EM chassis which use Motor, part numbers 6JPM-46, 6JPM-46A or 6JPM-53A may use part number 8CPM-64 for replacement.
2. EK chassis use C19, .05 mf, 400 volt condenser.
3. Model EM-382 uses Motor 8CPM-64C.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

DIAL CORD REPLACEMENT

For chassis using the narrow "V" shaped notch in the drive pulley use a half turn of cord, part number 6RZ-870. For chassis using the drive pulley with a broad "U" shaped groove, use a turn and a half of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

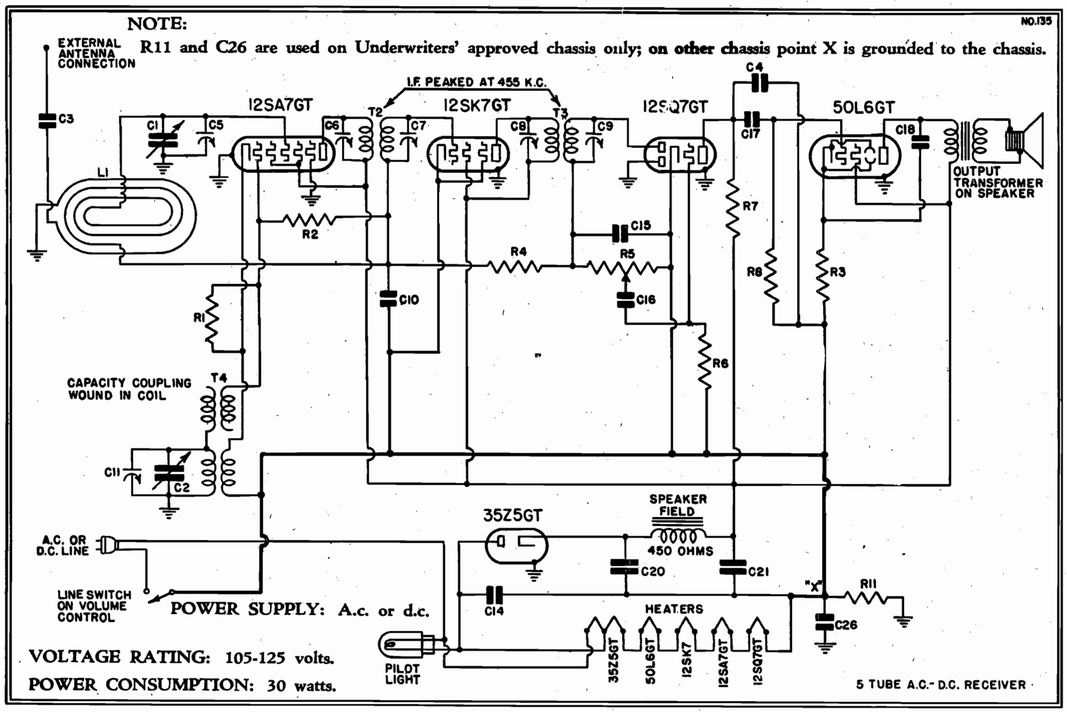
R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

MODEL FG-330
Chassis FG
MODEL FC-400
Chassis FC

EMERSON RADIO & PHONOGRAPH CORP.



DIAL CORD REPLACEMENT

Draw the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

L1	Loop antenna assembly (FC)
L1	Loop antenna assembly (FG)
T4	Oscillator coil
T2	Double-tuned 455 kc first i-f transformer
T3	Double-tuned 455 kc second i-f transformer
R1	20,000 ohm ¼ watt carbon resistor
R3	140 ohm ½ watt wire-wound resistor
R4	3 megohm ¼ watt carbon resistor
R5	Volume control .5 megohm with line switch (FC)
R5	Volume control .5 megohm with line switch (FG)
R6, R2	15 megohm ¼ watt carbon resistor
R7, R8	500,000 ohm ¼ watt carbon resistor
R11	200,000 ohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser (FC)
C1, C2	Two-gang variable condenser (FG)
C3, C16	0.002 mf, 600 volt tubular condenser
C4, C15	0.002 mf, 600 volt tubular condenser
C5, C11	Trimmers, part of variable condenser
C6, C7, C8, C9	Trimmers, part of variable condenser
C10, C27	0.05 mf, 200 volt tubular condenser
C14	0.05 mf, 400 volt tubular
C17, C18	0.02 mf, 400 volt tubular condenser
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (FC)
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (FG)
C24	0.1 mf, 200 volt tubular condenser
C26	0.2 mf, 200 volt tubular condenser
7BS-409	5" dynamic speaker

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and 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 oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

R-f Alignment

—FC,FG-S1

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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.

VOLTAGE ANALYSIS

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

MODEL: FC-400
CHASSIS MODEL: FC

MODEL: FG-330
CHASSIS MODEL: FG

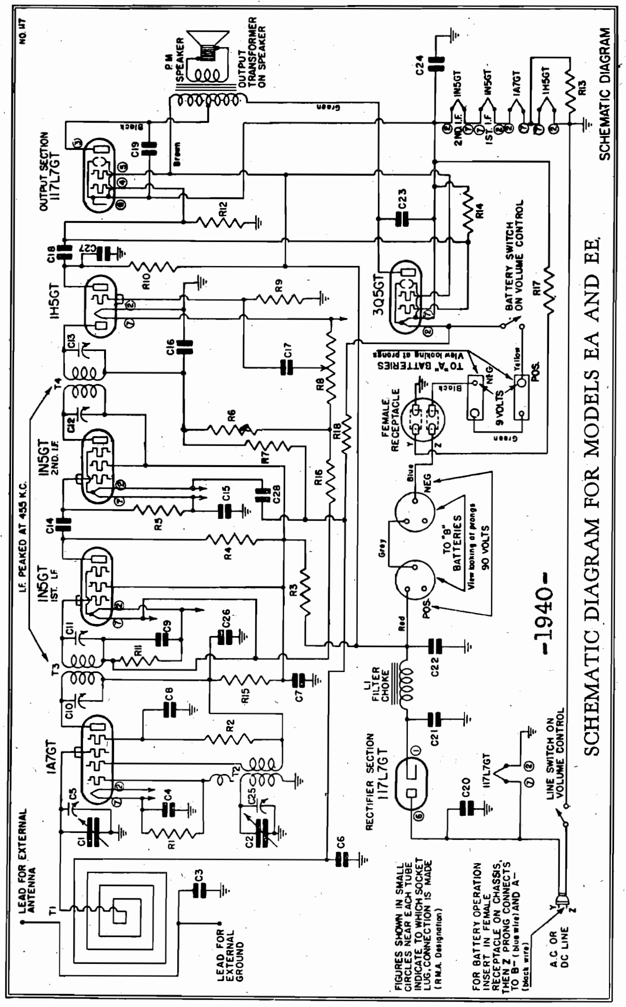
TYPE: Single-band superheterodyne.

FREQUENCY RANGE: 540-1600 kc.

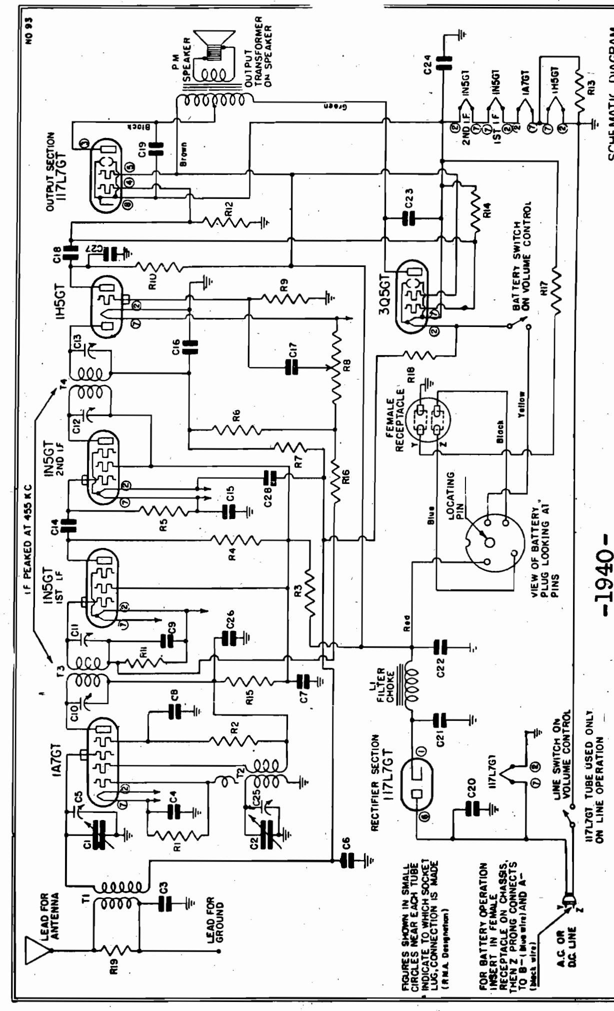
12SA7GT, pentagrid oscillator-modulator
12SK7GT, first i-f amplifier
12SQ7GT, diode detector, a-f amplifier, a.v.c.
50L6GT, beam power output
35Z5GT, half-wave rectifier.

EMERSON RADIO & PHONOGRAPH CORP.

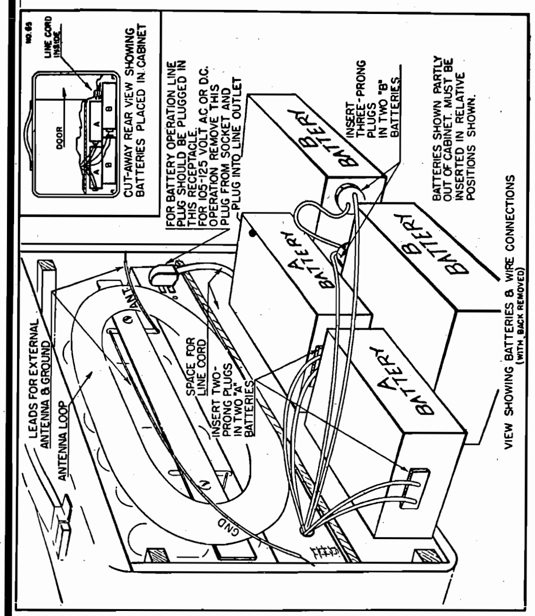
Chassis EA, EE, EB, EW



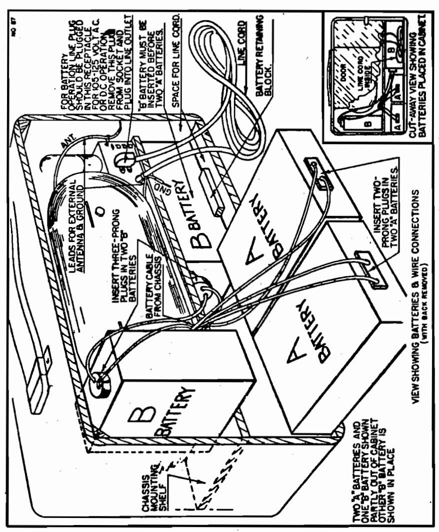
SCHEMATIC DIAGRAM FOR MODELS EA AND EE. -1940-



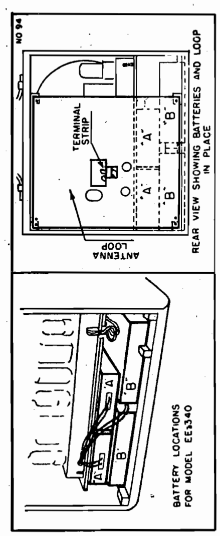
SCHEMATIC DIAGRAM FOR MODEL EB AND EW -1940-



FOR MODEL EA-312, 338, 339, 385, 389 AND 390



FOR MODEL EA-357



FOR MODEL EE-340

In some 340 cabinets, the A batteries face the left end. See the diagram on the cabinet back.

TYPE: Universal (battery, a.c.-d.c.) superheterodyne.

FREQUENCY RANGE: 540-1600 kc.

POWER SUPPLY: Battery, a.c. or d.c.

VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c.

POWER CONSUMPTION: (Line operation) 30 watts

CURRENT DRAIN: (Battery operation) "A" battery 0.05 amp. "B" battery 0.01 amp.

Chassis EA, EE
EB, EW

EMERSON RADIO & PHONOGRAPH CORP.

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the front section of the variable condenser.

In Models EA and EE the loop antenna acts as the antenna coil. The trimmer for the loop is on the rear section of the variable condenser.

In Model EB the antenna coil is mounted to the speaker frame.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is at the right of the variable condenser and the diode i-f transformer is to the left of the variable condenser. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

I-f Alignment

Swing variable condenser to minimum capacity position.
Feed 455 kc to the grid of the 1A7GT 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 from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop approximately one foot away from and parallel to the receiver loop antenna and advance the output of the signal generator until a suitable deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the radiating loop. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 140.

Battery Installation

For Models 312, 338, 339, 385, 389 and 390.

To install and connect the batteries in this cabinet observe the following procedure:

1. Remove the back panel of the cabinet by taking out the screws.

2. Locate the battery cable coming from the receiver and identify the plugs on the cable ends.

3. Insert the three-prong plug on the battery cable into the two "B" batteries. Place the two batteries in the bottom of the cabinet with the plug-ends of the batteries facing each other. Push the batteries up against the front of the cabinet. The wood blocks at the rear corners and rear center of the cabinet serve to hold the "B" batteries in place.

4. Insert the two-prong plug on the battery cable into the two "A" batteries. Place the "A" batteries, one at a time, above the "B" batteries in the cabinet. The plug-ends of the "A" batteries should be facing to the left, as indicated in the illustration. Push the "A" batteries to the left, when placing them in the cabinet, in order to clear the small wood block in the front right-hand corner of the cabinet.

5. Replace the back panel of the cabinet and fasten it in place with the screws.

See diagrams for other models.

T1	Loop antenna assembly (EE-340)
T1	Loop antenna assembly (EE-390)
T1	Loop antenna assembly (EA)
	Antenna coil (EB, EW)
L1	Iron core filter choke.
T2	Oscillator coil
T3	Double-tuned 455 kc first i-f transformer.
T4	Double-tuned 455 kc diode i-f transformer (EA, EE)
T4	Double-tuned 455 kc diode i-f transformer (EB, EW)
R1, R6	50,000 ohm ¼ watt carbon resistor
R2	30,000 ohm ¼ watt carbon resistor
R3	500 ohm ¼ watt carbon resistor.
R4	25,000 ohm ¼ watt carbon resistor.
R5	100,000 ohm ¼ watt carbon resistor
R7, R14	3 megohm ¼ watt carbon resistor.
R8	Volume control with line and battery switch (500,000 ohms) (EA, EE, EB).
R8	Volume control with line and battery switch (500,000 ohms) (EW).
R9, R11	5 megohm ¼ watt carbon resistor
R10, R12	500,000 ohm ¼ watt carbon resistor
R13	330 ohm ¼ watt carbon resistor. (see production change no. 1)
R15	1,000 ohm ¼ watt carbon resistor.
R17	1,200 ohm ¼ watt carbon resistor. (see production change no. 1a)
R16, R18	15 megohm ¼ watt carbon resistor.
R19	10,000 ohm ¼ watt carbon resistor (EB, EW)
C1, C2	Two-gang variable condenser.
C3	0.002 mf, 600 volt tubular condenser
C6, C7, C9, C26	0.05 mf, 200 volt tubular condenser
C8, C18	0.02 mf, 400 volt tubular condenser
C10, C11, C12, C13	Trimmers, part of i-f transformers.
C14, C27	0.00022 mf, mica condenser.
C15, C4	0.25 mf, 100 volt tubular condenser.
C16	0.0002 mf, 600 volt tubular or mica condenser
C17	0.006 mf, 600 volt tubular condenser.
C19	0.003 mf, 600 volt tubular condenser.
C20	0.05 mf, 400 volt tubular condenser.
C21, C22	Dual 20 mf, 150 volt dry electrolytic condenser.
C23	0.01 mf, 400 volt tubular condenser (EA, EE, EB) (see production change no. 2)
C23	0.0005 mf, 600 volt tubular condenser (EW)
C24	40 mf, 25 volt dry electrolytic condenser
C25, C5	Trimmer, part of variable condenser.
C28	0.015 mf, 200 volt tubular condenser

The color coding of the battery cable is as follows:
Red—B plus, 90 volts; Yellow—A plus, 9 volts
Blue—B minus; Black—A minus

The color coding of the i-f transformer leads is as follows:
Grid—green; Plate—blue
Grid return—black; B plus—red

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" 9.0 volts, "B" 90 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7GT	88	50	82	1.5
1N5GT, 1st i-f	50	88	—	1.5
1N5GT, 2nd i-f	88	88	—	1.5
1H5GT	27	—	—	1.5
3Q5GT	85	88	—	3.0
117L7GT (line operation only)	86	95	—	117
117L7GT rectifier cathode (Pin No. 1	(line operation only)—125 volts.			

MODELS: EA-312, EA-338, EA-339, EA-357, EA-385 and EA-389

CHASSIS MODEL: EA

MODELS: EB-344 and EB-359

CHASSIS MODEL: EB

MODEL: EE-340 and EE-390

CHASSIS MODEL: EE

MODEL: EW-391

CHASSIS MODEL: EW

If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.

A.C.-D.C. Operation: In portable models open the small door at the back of the cabinet. It is important that this small door be left open while operating the receiver on either a.c. or d.c. power. Take out the line cord, removing the plug from its receptacle at the rear of the chassis. Insert the plug in the wall outlet. If the power supply is d.c. and the receiver does not operate at first, remove the plug from the wall outlet, turn it half way around and re-insert it in the outlet, thus obtaining the proper polarity.

Battery Operation: Important: Remove the line plug from the electrical outlet. Insert the plug into the receptacle at the rear of the receiver. This is important since the receiver will not operate from batteries with the plug out of the receptacle. The loose portion of the cord can then be coiled and placed in the cabinet.

Dial Cord Replacement

Dials which use the drive shaft pulley with a narrow "V" shaped groove use a half turn of drive cord, part no. 6RZ-870. Dials using the drive shaft pulley with a broad "U" shaped groove use a turn and a half of cord, part no. 7BZ-867A. The cord should be drawn snugly around the condenser pulley and knotted with no slack near the opening in the pulley groove, after which the spring may be hooked on. The dial face should bear against the fiber washer when finally assembled.

BATTERY COMPLEMENT

FOR MODELS EA, EE

Type Battery	No. Req.	Eveready Part No.	Rayovac Part No.	Burgess Part No.
4½ volt "A"	2	746 (plug-in type)	P83A or EM-83 (plug-in type)	3G (plug-in type)
45 volt "B"	2	482 Minimax (plug-in type)	——	——

FOR MODELS EB, EW

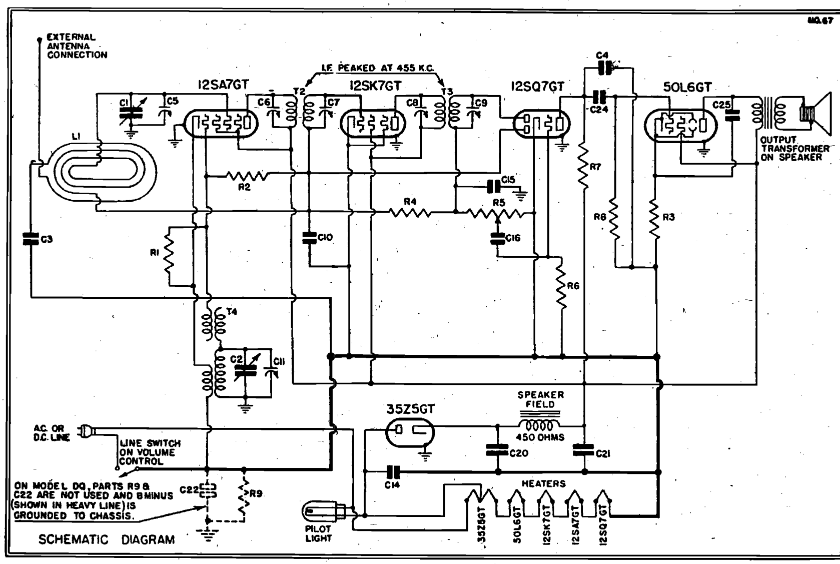
Type Battery	No. Req.	Eveready Part No.	Rayovac Part No.	Burgess Part No.
"A" and "B" Pack	1	——	——	3G6D60 (plug-in type)

1—1A7GT, oscillator-modulator
1—1N5GT, 1st i-f amplifier
1—1N5GT, 2nd i-f amplifier
1—1H5GT, 2nd detector, a.v.c., a-f amplifier
1—3Q5GT, beam power output (battery operation)
1—117L7GT, beam power output and half-wave rectifier (line operation).

PRODUCTION CHANGES

1. EA chassis bearing serial numbers below 3,606, 650 use: (a) Resistor R17, 1000 ohms, part number PR-79. (b) Battery cable, part number 8AW-268.
2. EA chassis bearing serial numbers below 3,625,961 use C23, 0.001 mf, part number NNC-199 in place of 0.01 mf, part number KC-58.
3. EA chassis which use speaker, part number 6XS-424, may use 7JS-443 for replacement.
4. EA chassis which use electrolytic, part number 6JC-426D, may use 6JC-426E for replacement.
5. EE chassis which use electrolytic, part number 6ZC-460, may use 7FC-451 for replacement.

EMERSON RADIO & PHONOGRAPH CORP. Chassis DQ, DQ1, EH, EH1



SCHEMATIC DIAGRAM

L1	Loop antenna assembly
T4	Oscillator coil (DQ1, EH1)
T4	Oscillator coil (DQ, EH) (see prod. ch. No. 1)
T2	Double-tuned 455 kc first i-f transformer
T3	Double-tuned 455 kc second i-f transformer
R1	20,000 ohm ¼ watt carbon resistor
R3	140 ohm ½ watt wire-wound resistor
R4	3 megohm ¼ watt carbon resistor
R5	Volume control .5 megohm with line switch (DQ-DQ1)
R5	Volume control .5 megohm with line switch (EH, EH1)
R6, R2	15 megohm ¼ watt carbon resistor
R7, R8	500,000 ohm ¼ watt carbon resistor
R9	200,000 ohm ¼ watt carbon resistor (DQ1, EH1)
C1, C2	Two-gang variable condenser (DQ-DQ1)
	Two-gang variable condenser (EH, EH1)
C5, C11	Trimmers, part of variable condenser.
C6, C7, C8, C9	Trimmers, part of i-f transformers.
C10	0.1 mf, 200 volt tubular condenser
C14	0.05 mf, 400 volt tubular condenser
C15, C4	0.0002 mf, 600 volt tubular or mica condenser
C16, C3	0.002 mf, 600 volt tubular condenser
C25	0.01 mf, 400 volt tubular condenser (see production change no. 3)
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (see production change no. 2)
C22	0.2 mf, 200 volt tubular condenser (DQ1, EH1)
C24	0.02 mf, 400 volt tubular condenser
7KS-446	6½" dynamic speaker (DQ1)
7KS-446A	6½" dynamic speaker (DQ) (see prod. ch. no. 2).
8HS-490	8" dynamic speaker (EH)
8HS-490A	8" dynamic speaker (EH1)

The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

MODELS: DQ-333, DQ-334, DQ-351 and DQ-398
CHASSIS MODEL: DQ

MODEL: EH-342
CHASSIS MODEL: EH

MODELS: DQ1-333 and DQ1-334
CHASSIS MODEL: DQ1

MODEL: EH1-342
CHASSIS MODEL: EH1

Listed under Re-examination Service of Underwriters' Laboratories, Inc.

TYPE: Single-band Superheterodyne.

FREQUENCY RANGE: 540-1600 kc.

NUMBER OF TUBES: Five.

TYPE OF TUBES:
1—12SA7GT, pentagrid oscillator-modulator
1—12SK7GT, first i-f amplifier
1—12SQ7GT, diode detector, a-f amplifier, a.v.c.
1—50L6GT, beam power output
1—35Z5GT, half-wave rectifier.

POWER SUPPLY: a.c. or d.c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts.

If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

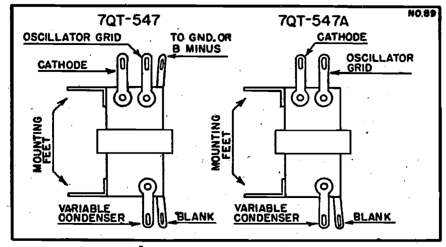
The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

DIAL CORD REPLACEMENT

Chassis which have the dial drive shaft pulley with a narrow "V" cut use a half turn of dial cord, part number 6RZ-870. Chassis which have the dial drive shaft pulley with a wide groove use one and a half turns of dial cord, part number 7BZ-867A. The cord should be drawn snugly around the condenser pulley and knotted with no slack, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.



Oscillator Coils—See Production Change No. 1

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.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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.

VOLTAGE ANALYSIS

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

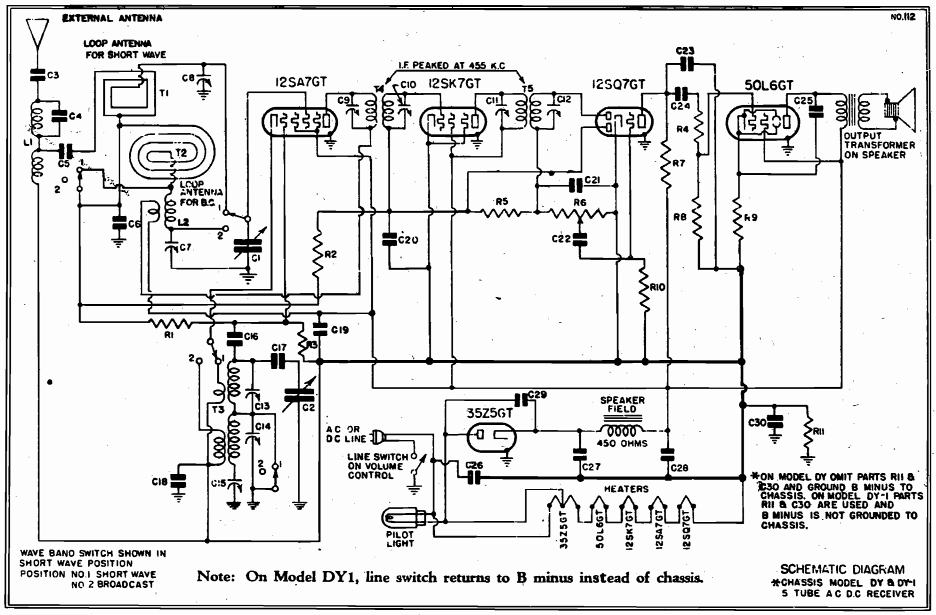
PRODUCTION CHANGES

—DQ, DQ1, EH—S2 1. Chassis DQ uses both type oscillator coils listed above. For correct lug connections see Figure on next page. Notice on 7QT-547 the low end of the coil returns to a lug which is connected to chassis on DQ and to B minus on DQ1. On coil 7QT-547 the low end of the coil returns to the mounting foot.

—DQ, DQ1, EH—S1 2. DQ chassis using (a) speaker 6QS-387 may use 7KS-446A for replacement. (b) electrolytic 6JC-466AU may use 6JC-426F for replacement.

3. EH, EH1 chassis use C25—.02 mf, 400 volt condenser.

Chassis DY, DY1 **EMERSON RADIO & PHONOGRAPH CORP.**



Note: On Model DY1, line switch returns to B minus instead of chassis.

SCHEMATIC DIAGRAM
*CHASSIS MODEL DY & DY-1
5 TUBE A C D.C RECEIVER

MODELS: DY-337 DY-349 DY-351

CHASSIS MODEL: DY

MODELS: DY1-337 DY1-349 DY1-351

CHASSIS MODEL: DY1
(Listed under reexamination service of Underwriters' Laboratories, Inc.)

TYPE: Two-band superheterodyne.

FREQUENCY RANGES:
540-1600 kc.
2.5-6.5 mc.

PRODUCTION CHANGES

1. Chassis which use C27, C28—6JC-426B, may use 6JC-426H for replacement.
2. Chassis using speaker 7YS-476 may use 6MS-395 for replacement.
3. Chassis bearing serial number above 4,083,550 use 7YT-552B loading coil.
4. Chassis bearing serial number above 4,083,550 use 7YW-249B loop antenna assembly.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The loop antenna acts as the broadcast antenna coil. The short-wave antenna coil is the larger of the two coils mounted on the loop.

The trimmers for the antenna coils (loops) for both bands are located on a dual strip fastened to the loop board. The innermost trimmer is for short-wave and outermost trimmer for broadcast.

The oscillator coil is located underneath the chassis, just below the variable condenser. The trimmers for both bands are mounted on a dual strip beneath the first i-f transformer. The short-wave trimmer is the one farthest from the mounting foot.

L1	Antenna choke and 455 kc wave-trap (DY1)	—DY-DY1—S1
L1	Antenna choke and 455 kc wave-trap (DY)	
L2	Broadcast loop antenna loading coil (see production change No. 3)	—DY-DY1—S2
T1, T2	Two-band loop antenna assembly (see production change No. 4)	
T3	Two-band oscillator coil	
T4	Double-tuned 455 kc first i-f transformer	
T5	Double-tuned 455 kc second i-f transformer	
R1, R10	15 megohm ¼ watt carbon resistor	
R2, R11	200,000 ohm ¼ watt carbon resistor	
R3	20,000 ohm ¼ watt carbon resistor	
R4	50,000 ohm ¼ watt carbon resistor	
R5	2 megohm ¼ watt carbon resistor	
R6	Volume control .5 megohm with line switch	
R7, R8	500,000 ohm ¼ watt carbon resistor	
R9	140 ohm, ½ watt wire-wound resistor	
C1, C2	Two-gang variable condenser	
C3	0.006 mf, 600 volt tubular condenser	
C4	0.001 mf, part of L1, wave-trap assembly	
C5, C19	0.02 mf, 200 volt tubular condenser	
C6	0.0025 mf mica condenser	
C7, C8	Trimmers, part of loop antenna assembly.	
C9, C10, C11, C12	Trimmers, part of i-f transformers.	
C13, C14	Dual trimmer assembly	
C15	Single adjustable padding condenser	
C16	0.00022 mf mica condenser	
C17	0.00114 mf mica condenser (coded 0.0011 mf)	
C18	0.01 mf, 400 volt tubular condenser	
C20	0.1 mf, 200 volt tubular condenser	
C21, C23	0.0002 mf, 600 volt tubular or mica condenser	
C22	0.002 mf, 600 volt tubular condenser	
C24	0.02 mf, 400 volt tubular condenser	

7YS-476A	5" dynamic speaker (DY1)	
7YS-476	5" dynamic speaker (DY)	
7YS-477	Wave-band switch	
C27, C28	Dual 20 mf, 150 volt dry electrolytic condenser	
C29	0.01 mf, 600 volt tubular condenser	
C30	0.2 mf, 200 volt tubular condenser	
C25	0.03 mf, 400 volt tubular condenser	
C26	0.05 mf, 400 volt tubular condenser	

TYPE OF TUBES:
12SA7GT, pentagrid oscillator-modulator
12SK7GT, first i-f amplifier
12SQ7GT, diode detector, a-f amplifier, a.v.c.
50L6GT, beam power output
35Z5GT, half-wave rectifier.

POWER SUPPLY: a.c. or d.c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

DIAL CORD REPLACEMENT

Use a half turn of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot with no slack, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip to the stator lug. This lug is easily identified by the connection of the green lead to the loop.

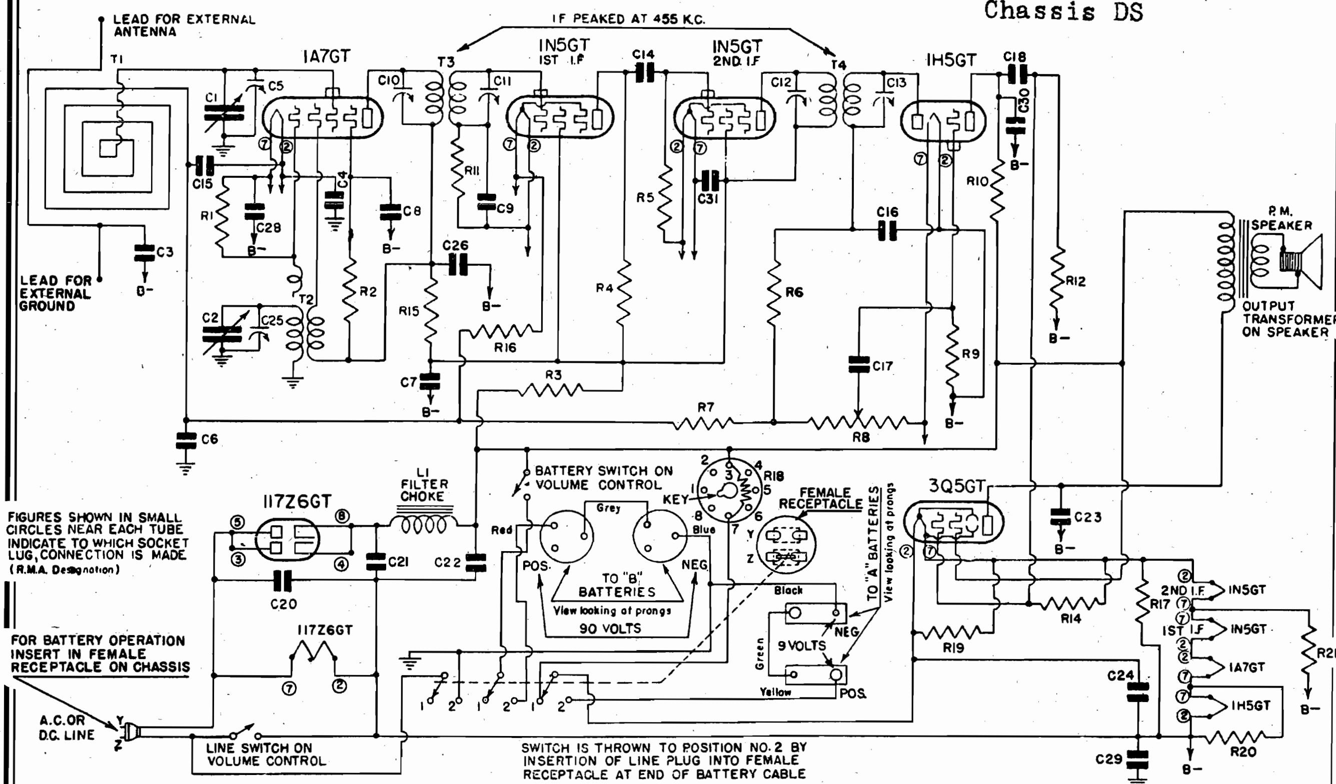
R-f Alignment

Rotate the wave-band switch counter-clockwise to the short-wave position. Set the dial pointer at 6 megacycles and feed 6 megacycles from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from the loop antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the short-wave oscillator trimmer (farthest from mounting foot, beneath the chassis) and then the antenna trimmer (innermost trimmer of dual trimmer strip on loop board) for maximum response.

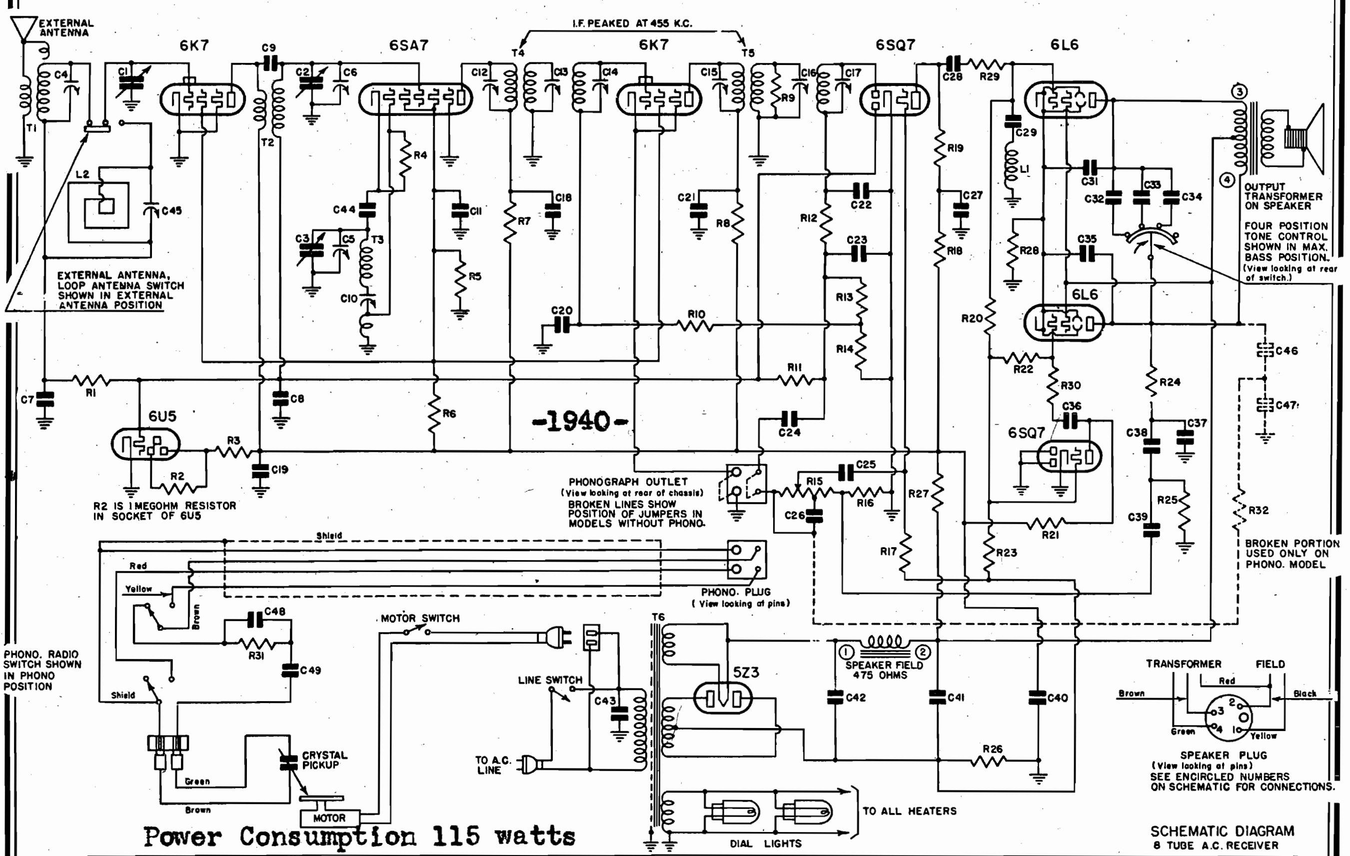
Without changing the above set-up, rotate the band-switch clockwise to the broadcast position, set the dial pointer at 150 and feed 1500 kc into the radiating loop. Adjust first the broadcast oscillator trimmer (closest to mounting foot, beneath the chassis), and then the antenna trimmer (outermost of dual trimmer on the loop) for maximum response. Rotate the dial to 60, feed 600 kc into the radiating loop and adjust the broadcast series padder (mounted on the rear wall) for maximum response while rocking the variable back and forth. Repeat alignment at 1500 kc.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EA1-341
Chassis EA1
MODELS DS-365, DS-372
Chassis DS



MODEL: EA1-341 CHASSIS MODEL: EA1 TYPE: Universal (Battery, A.C.-D.C.) Superheterodyne.



Power Consumption 115 watts

PHONOGRAPH OUTLET IS AS SHOWN WHEN CHASSIS IS UPSIDE DOWN

MODELS: DS-365 DS-372 CHASSIS MODEL: DS TYPE: Single-band superheterodyne.

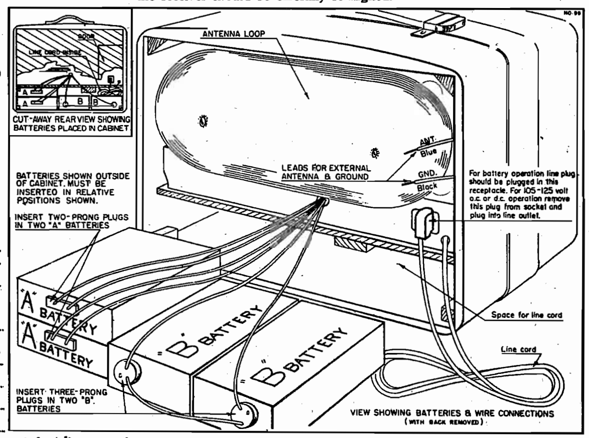
MODEL EA1-341
Chassis EA1
MODELS DS-365, DS-372
Chassis DS

EMERSON RADIO & PHONOGRAPH CORP.

EA1-341

TYPE OF TUBES
1A7GT, oscillator-modulator
1N5GT, 1st i-f amplifier
1N5GT, 2nd i-f amplifier
1H5GT, 2nd detector, a.v.c., a-f amplifier
3Q5GT, beam power output (battery operation)
117Z6GT, rectifier (line operation)

If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.



PARTS

T1	Loop antenna assembly	
L1	Iron core filter choke	
T2	Oscillator coil	
T3	Double-tuned 455 kc first i-f transformer	
T4	Double-tuned 455 kc diode i-f transformer	
R1, R6	50,000 ohm ¼ watt carbon resistor	
R2	30,000 ohm ¼ watt carbon resistor	
R3	500 ohm ¼ watt carbon resistor	
R4	25,000 ohm ¼ watt carbon resistor	
R5	200,000 ohm ¼ watt carbon resistor	
R7, R14	3 megohm ¼ watt carbon resistor	
R8	Volume control with line and battery switch (500,000 ohms)	
R9, R11	5 megohm ¼ watt carbon resistor	
R10, R12	500,000 ohm ¼ watt carbon resistor	
R15	1000 ohm ¼ watt carbon resistor	
R17	1000 ohm 2 watt wire-wound resistor	
R16	15 megohm ¼ watt carbon resistor	
R18	Plug-in ballast resistor	
R19	1500 ohm 2 watt wire-wound resistor	
R20, R21	1000 ohm ½ watt carbon resistor	
C1, C2	Two-gang variable condenser	
C3	0.002 mf, 600 volt tubular condenser	
C6, C7, C9, C15, C26, C28, C31	0.05 mf, 200 volt tubular condenser	
C8, C18	0.02 mf, 400 volt tubular condenser	
C10, C11, C12, C13	Trimmers, part of i-f transformers.	
C14, C16	0.0002 mf, 600 volt tubular or mica condenser	
C17	0.006 mf, 600 volt tubular condenser	
C20	0.05 mf, 400 volt tubular condenser	
C21, C22	Dual 20 mf, 150 volt dry electrolytic condenser	
C23	0.01 mf, 400 volt tubular condenser	
C24	40 mf, 135 volt dry electrolytic condenser	
C25, C5	Trimmer, part of variable condenser.	
C29, C4	0.1 mf, 200 volt tubular condenser	
C30	0.0004 mf, 600 volt tubular or mica condenser	
7JS-444	Door switch (for DJ-311)	
8AS-500	5" permanent magnet dynamic speaker	
7JS-472	Line-battery switch	

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" 9.0 volts, "B" 90 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7GT	88	50	82	1.5
1N5GT, 1st i-f	50	88	—	1.5
1N5GT, 2nd i-f	88	88	—	1.5
1H5GT	27	—	—	1.5
3Q5GT		88	—	3.0

117Z6GT rectifier cathode (Pin No. 8 and 4) (line operation only—125 volts. Filament—117 volts.

I-f Alignment

Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7GT 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 from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop approximately one foot away from and parallel to the receiver loop antenna and advance the output of the signal generator until a suitable deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the radiating loop. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 140.

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the front section of the variable condenser.

The loop antenna acts as the antenna coil. The trimmer for the loop is on the rear section of the variable condenser.

The first i-f transformer is located on the top of the chassis behind the variable condenser. The trimmers can be reached through holes in the top of the can. The diode i-f transformer is mounted on the rear wall beneath the chassis. The trimmers can be reached through holes in the rear of the chassis.

POWER SUPPLY:
Battery, A.C. or D.C.

VOLTAGE RATING:
(Line operation) 105-125 volts, a.c.-d.c.

POWER CONSUMPTION:
(Line operation) 30 watts.

CURRENT DRAIN:
(Battery operation)
"A" battery 0.05 amp. at 9 volts.
"B" battery 0.01 amp. at 90 volts.

CHASSIS EA1
MODEL EA1-341

color coding of the i-f transformer leads
Grid—green
Grid return—black
Plate—blue
B plus—red

color coding of the battery cable
Yellow—A plus, 9 volts
Black—A minus
Red—B plus, 90 volts
Blue—B minus

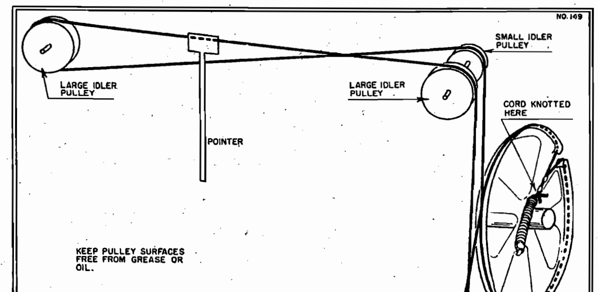
A.C.-D.C. Operation: Open the small door at the back of the cabinet. It is important that this small door be left open while operating the receiver on either a.c. or d.c. power. Take out the line cord, removing the plug from its receptacle at the rear of the chassis. Insert the plug in the wall outlet.

Battery Operation: Important—Remove the line plug from the electrical outlet. Insert the plug into the receptacle at the rear of the receiver. This is important since the receiver will not operate from batteries with the plug out of the receptacle.

FREQUENCY RANGE: 540-1600 kc. —EA1-81

DS-365 DS-372

The switch located at the rear of the chassis is provided to allow the use of either the enclosed loop antenna or an external antenna. Push the switch to the left for use of external antenna.



CHASSIS DS
MODELS DS-365, DS-372

CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS.

PARTS

R1, R12, R29, R30	50,000 ohm ¼ watt carbon resistor.
R2	1 megohm resistor in 6U5 tube socket.
R3	20,000 ohm 1 watt carbon resistor.
R4	20,000 ohm ¼ watt carbon resistor.
R5	40,000 ohm ½ watt carbon resistor.
R6	15,000 ohm 2 watt carbon resistor.
R7, R8	1000 ohm ¼ watt carbon resistor.
R9	190,000 ohm resistor, part of T6
R10, R11	3 megohm ¼ watt carbon resistor.
R13	200,000 ohm ¼ watt carbon resistor.
R14, R18, R19, R21	100,000 ohm ¼ watt carbon resistor.
R15	Volume control, 1.2 megohm, double tapped, with line switch
R16	75 ohm ½ watt wire-wound resistor.
R17	2 megohm ¼ watt carbon resistor.
R20, R22, R23	250,000 ohm ¼ watt carbon resistor
R24	10,000 ohm 2 watt carbon resistor.
R25	3500 ohm ½ watt carbon resistor.
R26	11 ohm ½ watt wire-wound resistor.
R27	1500 ohm 2 watt carbon resistor.
R28	180 ohm 3 watt carbon resistor.
C1, C2, C3	Three-gang variable condenser.
C4	Trimmer, part of T1
C5, C6	Trimmers, part of variable condenser
C7, C8, C20	0.05 mf, 200 volt tubular condenser.
C9	0.000,008 mf mica condenser.
C10	Single adjustable padding condenser; range—300 to 600 mmf
C11, C19, C27, C28	0.1 mf, 400 volt tubular condenser.
C12, C13, C14, C15, C16, C17	Trimmers, part of i-f transformers
C18, C21, C36	0.05 mf, 400 volt tubular condenser.
C22, C26	0.00011 mf mica condenser.
C23	0.00006 mf mica condenser.
C24, C25	0.01 mf, 400 volt tubular condenser.
C29	0.0014 mf mica condenser, part of L1
C31, C35	0.003 mf, 600 volt tubular condenser.
C32	0.1 mf, 600 volt tubular condenser.
C33	0.05 mf, 400 volt tubular condenser.
C34	0.015 mf, 600 volt tubular condenser. (See production change No. 1)
C37	0.08 mf, 600 volt tubular condenser.
C38	0.04 mf, 400 volt tubular condenser.
C39	0.5 mf, 200 volt tubular condenser.
C40, C4	16 mf, 400 volt dry electrolytic condenser.
C42	30 mf, 450 volt wet electrolytic condenser. 30 mf, 450 volt fabricated plate electrolytic condenser
C43	0.01 mf, 400 volt molded condenser.
T1	Antenna coil
T2	Interstage coil
T3	Loop antenna (365 cabinet)
T3	Loop antenna (372 cabinet)
T4	Oscillator coil
T5	First i-f transformer.
T6	Second i-f transformer.
T7	Power transformer
L1	10 K.C. filter choke.
R31	2 megohm ¼ watt carbon resistor.
R32	20 megohm ¼ watt carbon resistor.
C46	0.0011 mf mica condenser
C47	0.006 mf, 600 volt tubular condenser
C48	0.00011 mf mica condenser
C49	0.001 mf, 400 volt tubular condenser

PRODUCTION CHANGE

1. In DS-372 condenser C34 is 0.01 mf, 600 volt,

POWER SUPPLY: A.C. only.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 115 watts.

TYPE OF TUBES: —DS-S1
6K7GT, r-f amplifier
6SA7GT, oscillator-modulator
6K7GT, i-f amplifier
6SQ7GT, diode detector, audio amplifier and a.v.c.
6SQ7GT, phase inverter
6L6G, push-pull power output
5Z3, full-wave rectifier
In addition, a 6U5 electron-ray tuning indicator is used.

FREQUENCY RANGE:
540-1650 kc (555-182 meters)

color coding of the power transformer
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.

color coding of the i-f transformers
Grid—green Plate—blue
B plus—red Grid return—black

Chassis DS

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DS-365, DS-372

AUTOMATIC RECORD CHANGER

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 pickup 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 switch located just in front of the Index and Record Reject Lever controls the current to the turntable motor. To start the turntable, set the switch to the "ON" position. To stop the turntable, set the switch to the "OFF" position.

PICKUP AND TOP-LOADING NEEDLE SOCKET.—The pickup is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pickup arm should be moved to the right beyond the turntable and placed at rest on the support with the edge of the pickup arm to the right of the small extension post and the pickup over the polished needle gauge plate. The pickup must be in this position to insert a needle.

The pickup support plate with extension post, gauge plate and box holder is at the front of the motorboard on the right. The box slides in and out at the back for emptying, and is held secure by a spring piece on the bottom.

To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle gauge plate and then tighten up the needle screw.

To change a needle, place pickup in rest position, loosen needle screw and push pickup to the right to drop the used needle into the box below. Then with pickup against extension post insert a new needle as described above.

RECORD HOLDER SHELVES.—To place a record on the turntable or to remove records, raise the record holder shelves by lifting the knobs, 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.

To Insert Needle

The pickup 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 pickup, place needle in hole at the top so that it drops down against the needle gauge plate and then tighten up the needle screw. The extending tab on the needle gauge plate operates the needle ejector. To change a needle, place pickup in rest position, loosen needle screw and press the extending tab on 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 pickup as described above. The used needle box may be taken out and emptied by first lifting the pickup off its rest and allowing it to float between the rest and the turntable. Then tilt the box upwards at the front and lift out. To replace the box, tilt it upwards at front and lower it into the hole with the lug on the back of the box in the slot in the motorboard. Slide the lug under the motorboard and push the box in place. Replace the pickup on its rest.

SPECIAL PRECAUTIONS

The following precautions are of the utmost importance and should be carefully observed:

1. Do not handle or move manually the pickup or any part of the mechanism while it is going through the record-changing operation.

2. Do not use force in handling the mechanism at any time.

3. Warped or thick records should not be used for automatic operation.

4. 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.

5. 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 fashion.

6. Never leave pickup with needle resting on a record or on the turntable. When finished playing, be sure that the turntable has stopped and the pickup is in the rest position over needle gauge plate.

7. 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 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.

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. Turn the motor on. Lift the pickup and gently lower it on the record. 5. Adjust the volume to the desired level.

Automatic Operation

1. Turn the receiver "on" in the usual way, as explained above.

2. Rotate the phono-radio switch knob counter-clockwise to the phonograph position. Wait about a minute for the tubes in the receiver to warm up.

3. See that the pickup 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 pickup arm will follow through. When the pickup 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 is located near the right front corner of the motorboard. With this lever at "Manual" position, place the series of records (up to eight 10-inch or seven 12-inch records) on the record holder posts. This is shown in the illustration.

5. Set the Index and Record Reject Lever to the proper position. With this 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 pickup 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. When playing a series of 12-inch records, the lever should be returned to the "12" position after rejecting a record.

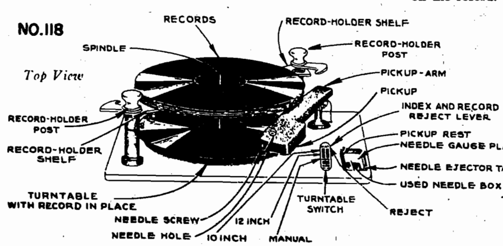
6. Throw the turntable switch to the "on" position. The turntable should start to revolve.

7. When turntable has attained speed, push the Index and Record Reject Lever to the "Reject" position. The first record will drop on the turntable and the pickup will move into position on the record.

8. Adjust to the desired volume by means of the regular receiver volume control.

9. 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 pickup, swing the arm to the right beyond the edge of the record and lower it onto the pickup rest with pickup over needle gauge plate. The record player is then ready for reloading, or for manual operation.



MODEL DS-365, DS-372 CHASSIS DS

ADJUSTMENTS

An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Use a standard dummy antenna or a .0002 mf condenser for aligning the antenna coil.

Always use as weak a test signal as possible during alignment.

The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave the 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.

I-f Alignment

Push the switch at the rear of the chassis to "external antenna" and feed 455 kc through a .01 mf condenser to the grid of the 6K7 i-f tube. Unscrew the copper colored screw of the second i-f transformer as far as possible and then align the other trimmers of this transformer for maximum response. Shift the input to the grid of the 6SA7 (clip input to stator lug of right end section of variable condenser) and repeat the same procedure on the first i-f transformer. Do not disturb the alignment of the second i-f transformer. Feed the signal again to the 6K7GT i-f tube, shunt the primary and secondary of the second i-f transformer with 25,000 ohm resistors, and adjust the tertiary (copper color) trimmer for maximum response. Again feed the grid of the 6SA7, shunt the primary and secondary of the first i-f transformer with resistors and then, without removing the shunting resistors from the second transformer, adjust the first transformer tertiary for maximum response. Do not disturb the alignment of any of the second i-f trimmers. Remove the resistors and sweep the signal generator through the band. The response should be quite flat with a slight peak in the middle, with a band width of about 10-12 kilocycles.

Visual alignment may be used in which case a similar procedure should be followed except that it will be unnecessary to shunt the transformers with resistors. With either method of adjustment, however, the alignment should be repeated until a satisfactory, broad response curve is obtained or the fidelity of reception will be seriously impaired.

R-f Alignment

With the switch at the rear of the chassis in the position marked "external antenna" set the pointer at 60 and feed 600 kc to the external antenna lead through a standard dummy antenna or a 0.0002 mf mica condenser. Adjust the series padder (located at the left of the variable condenser, on the top of the chassis) for maximum response. Move the pointer to 160, feed 1600 kc and align first the oscillator trimmer (right end condenser section) and then the interstage and antenna trimmers (see preceding for location) for maximum response. Return to 600 kc and adjust the series padder (while rocking the variable back and forth) for maximum response. Realign at 1600 kc.

To align the loop, set the dial pointer at 160. Set the signal generator at 1600 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter and then adjust trimmer on loop for maximum response.

Location of Coils and Trimmers

The two triple-tuned i-f transformers are mounted in cans on the top of the chassis. The trimmers are available through holes in the tops of the cans. The copper colored screw is for the tertiary coil. The first i-f transformer is the one at the left side of the chassis.

The broadcast antenna coil is the open coil on the top of the chassis between the 6SA7G and the 6K7GT i-f tube. The trimmer for the coil is mounted on top of the coil.

The interstage coil is the larger of the two coils underneath the chassis. Its trimmer is located on the right end section of the variable condenser.

The oscillator coil is the smaller of the two coils underneath the chassis. Its trimmer is located on the center section of the variable condenser.

The trimmer for the loop is mounted on the loop board.

VOLTAGE ANALYSIS

Tube	Plate	Screen	Cathode	Heaters
6K7GT	245	70	0	6.3
6SA7GT	245	70	0	6.3
6K7GT	235	70	0	6.3
6SQ7GT (det.)	125	—	0	6.3
6SQ7GT (P.I.)	150	—	0	6.3
6L6 (2)	275	285	18.5	6.3

Voltage drop across field—65 volts.
Voltage at 5Z3 filament to ground—350 volts.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

MODELS
DS-365, DS-372
CHASSIS DS

EMERSON RADIO & PHONOGRAPH CORP.

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.

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.

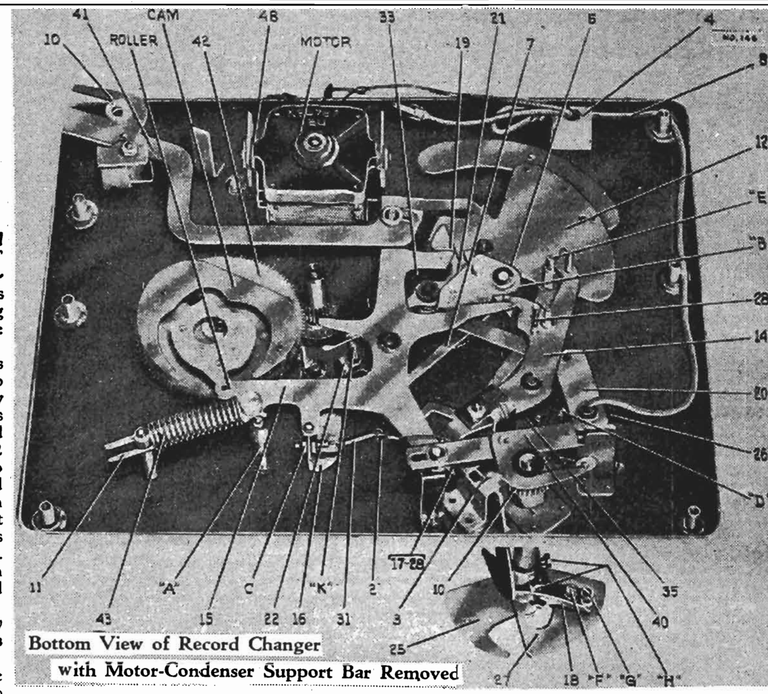
The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

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.

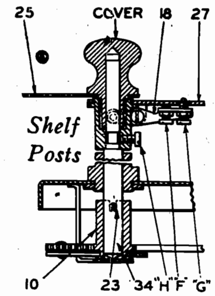
1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A".

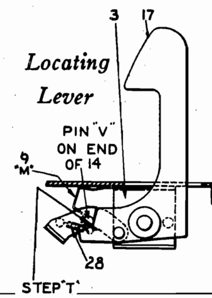


Bottom View of Record Changer
with Motor-Condenser Support Bar Removed

AUTOMATIC RECORD CHANGER

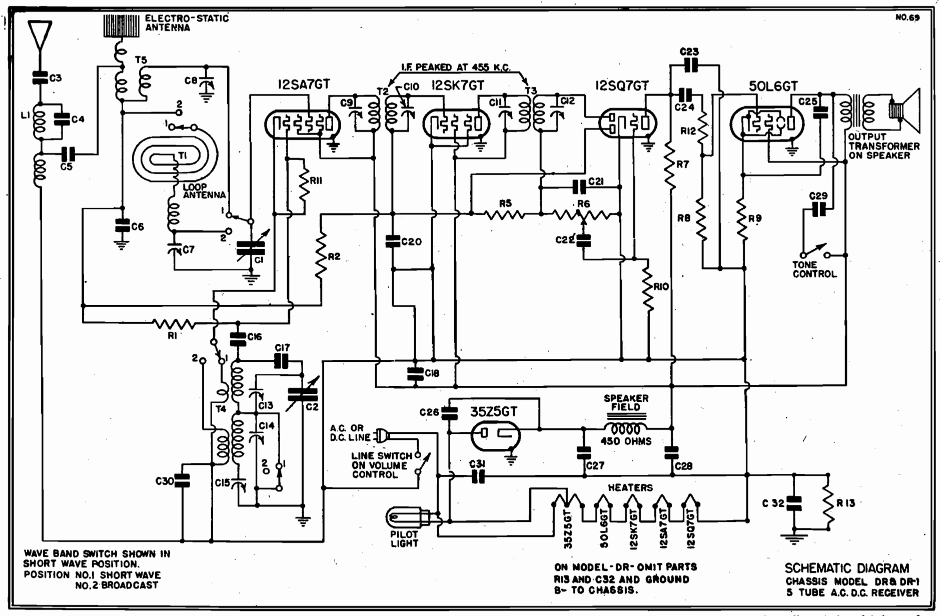
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E".
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E".
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B". Also, see that 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;
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





EMERSON RADIO & PHONOGRAPH CORP.

Chassis DR, DR1



SCHEMATIC DIAGRAM
CHASSIS MODEL DR & DR1
5 TUBE A.C. D.C. RECEIVER

MODELS: DR-343, DR-348, DR-349, DR-350, DR-352

CHASSIS MODEL: DR

MODELS: DR1-343, DR1-348, DR1-350, DR1-352

CHASSIS MODEL: DR 1

Listed under Re-examination Service of Underwriters' Laboratories, Inc.

TYPE: Two band superheterodyne.

FREQUENCY RANGES:
540-1600 kc.
5.8- 18.3 mc.

L1	Antenna choke and 455 kc wave-trap
T1	Loop antenna assembly
T2	Double-tuned 455 kc first i-f transformer
T3	Double-tuned 455 kc second i-f transformer.
T4	Two-band oscillator coil
T5	Short-wave antenna coil
R1, R10	15 megohm ¼ watt carbon resistor
R2, R13	200,000 ohm ¼ watt carbon resistor
R7, R8	500,000 ohm ¼ watt carbon resistor
R5	3 megohm ¼ watt carbon resistor
R6	Volume control .5 megohm with line switch
R9	140 ohm, ½ watt wire-wound resistor
R11	20,000 ohm ¼ watt carbon resistor
R12	50,000 ohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser
C3	0.006 mf, 600 volt tubular condenser
C4	0.001 mf, part of L1, wave-trap assembly
C5, C18	0.02 mf, 200 volt tubular condenser (see production change no. 1).
C6	0.0025 mf mica condenser
C7, C8	Dual trimmer assembly
C9, C10, C11, C12	Trimmers, part of i-f transformers.
C13, C14	Dual trimmer assembly
C15	Single adjustable padding condenser
C16	0.00011 mf mica condenser
C17	0.0016 mf mica condenser.
C20, C29	0.05 mf, 200 volt tubular condenser
C21, C23	0.0002 mf, 600 volt tubular or mica condenser
C22	0.002 mf, 600 volt tubular condenser
C24	0.02 mf, 400 volt tubular condenser
C25	0.03 mf, 400 volt tubular condenser
C26	0.01 mf, 600 volt tubular condenser
C27, C28	Multiple dry electrolytic condenser, 150 volt. C27—20 mf; C28—40 mf.
C30	0.01 mf, 400 volt tubular condenser
C31	0.05 mf, 400 volt tubular condenser
C32	0.2 mf, 200 volt tubular condenser
7RS-452	6½" dynamic speaker
7RS-450	Wave-band switch
7RS-451	Tone control switch

—DR-S1 —DR-S2

POWER SUPPLY: a.c. or d.c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts.

TYPE OF TUBES:

12SA7GT, pentagrid oscillator-modulator
12SK7GT, first i-f amplifier
12SQ7GT, diode detector, a-f amplifier, a.v.c.
50L6GT, beam power output
35Z5GT, half-wave rectifier.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

VOLTAGE ANALYSIS

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

PRODUCTION CHANGES

1. Chassis bearing serial numbers below 3,630,550 use C5 and C8—0.015 mf, 400 volt tubular condenser.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.

DIAL CORD REPLACEMENT

Use a half turn of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot with no slack, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The loop antenna acts as the broadcast antenna coil. The short-wave antenna coil is the larger of the two coils mounted on the loop frame.

The trimmers for the antenna coils for both bands are located on a dual strip behind the variable condenser. The upper trimmer is for broadcast, and lower for short-wave.

The oscillator coil is located underneath the chassis, just below the variable condenser. The trimmers for both bands are mounted on a dual strip beneath the first i-f transformer. The short-wave trimmer is the one closest to the mounting foot.

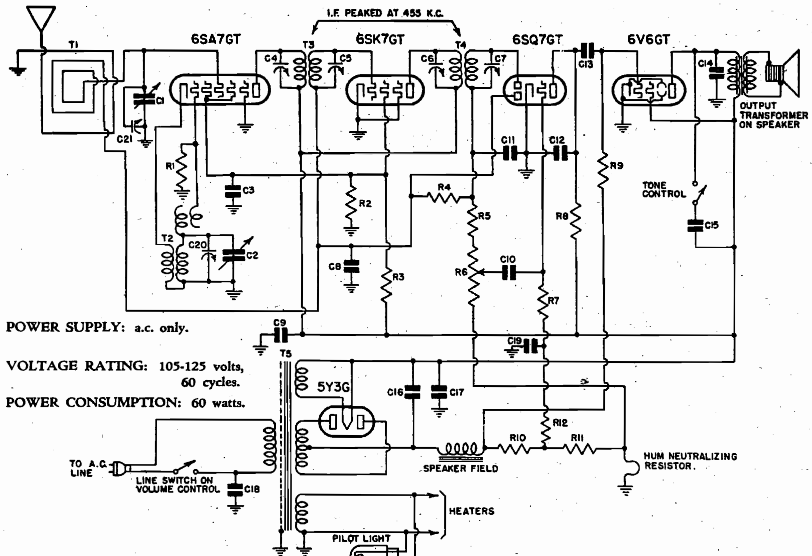
R-f Alignment

Rotate the wave band switch counter-clockwise to the short-wave position. Set the dial pointer at 16 megacycles and feed 16 megacycles from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from the electrostatic antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the short-wave oscillator trimmer (closest to mounting foot—beneath the chassis) and then the antenna trimmer (lower of dual trimmer behind the variable) for maximum response.

Without changing the above set up, rotate the band switch clockwise to the broadcast position, set the dial pointer at 150 and feed 1500 kc into the radiating loop. Adjust first the broadcast oscillator trimmer (farthest from mounting foot—beneath the chassis), and then the antenna trimmer (upper of dual trimmer behind the variable) for maximum response. Rotate the dial to 60, feed 600 kc into the radiating loop and adjust the broadcast series padder (mounted on the rear wall) for maximum response while rocking the variable back and forth. Repeat alignment at 1500 kc.

MODEL ED-354
Chassis ED

EMERSON RADIO & PHONOGRAPH CORP.

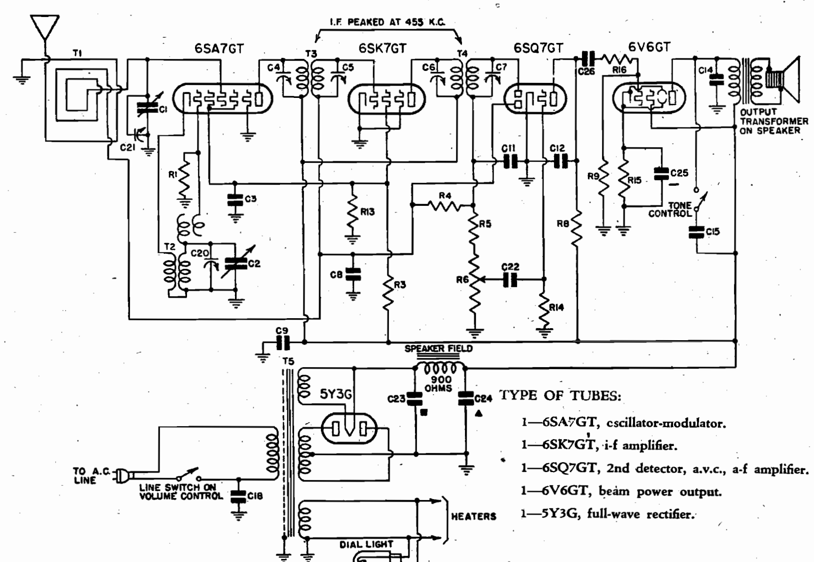


POWER SUPPLY: a.c. only.

VOLTAGE RATING: 105-125 volts, 60 cycles.

POWER CONSUMPTION: 60 watts.

5 TUBE A.C. RECEIVER — SCHEMATIC DIAGRAM



TYPE OF TUBES:

1—6SA7GT, oscillator-modulator.
1—6SK7GT, i-f amplifier.
1—6SQ7GT, 2nd detector, a.v.c., a-f amplifier.
1—6V6GT, beam power output.
1—5Y3G, full-wave rectifier.

5 TUBE A.C. RECEIVER — SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM FOR CHASSIS BEARING SERIAL NUMBERS BELOW 3,816,700

T1	8DW-278	Loop antenna assembly (see production change No. 1f)
T2	8DT-572	Oscillator coil (see production change No. 1a)
T3	7QT-548B	Double-tuned 455 kc first i-f transformer
T4	8AT-555A	Double-tuned 455 kc second i-f transformer
T5	8DT-554	Power transformer, 117 volts, 60 cycles.
R1	LR-60	20,000 ohm ¼ watt carbon resistor.
R2	3BR-247	40,000 ohm ¼ watt carbon resistor
R3	8DR-397	15,000 ohm 3 watt carbon resistor
R4, R7	HR-42U	2 megohm ¼ watt carbon resistor
R5	OR-73U	25,000 ohm ½ watt carbon resistor
R6	6GR-352	Volume control, .25 megohm, with line switch
R8	KR-55	250,000 ohm ¼ watt carbon resistor
R9, R12	KR-56	500,000 ohm ¼ watt carbon resistor
R10	8DR-396	180 ohm 1 watt wire-wound resistor.
R11	3RR-266	23 ohm ½ watt wire-wound resistor
R13	3LR-265	40,000 ohm ½ watt carbon resistor
R14	3RR-275	10 megohm ¼ watt carbon resistor
R15	8GR-421	240 ohm 1 watt
R16	KR-53	50,000 ohm ¼ watt carbon resistor
C1, C2	8DC-492	Two-gang variable condenser (see production change No. 1b)
C3, C13	LC-64	0.05 mf, 400 volt tubular condenser.
C4, C5, C6, C7		Trimmers, part of i-f transformers
C8	BC-12	0.05 mf, 200 volt tubular condenser
C9	EEC-132	0.1 mf, 400 volt tubular condenser
C10	HC-34	0.006 mf, 600 volt tubular condenser
C11, C12	5AC-384	0.0002 mf, 600 volt tubular or mica condenser.
C14	8DC-493	0.005 mf, 1000 volt tubular condenser
C15, C26	LC-65	0.02 mf, 400 volt tubular condenser
C16	7AC-443	16 mf, 450 volt dry electrolytic condenser
C17	7AC-444	16 mf, 400 volt dry electrolytic condenser (see production change No. 2)
C18	3LC-297A	0.01 mf, 400 volt molded condenser
C19	5AC-388	0.25 mf, 100 volt tubular condenser
C20, C21		Trimmers, part of variable condenser
C22	3HC-274	0.002 mf, 600 volt tubular condenser
C23, C24, C25	8DC-522	Multiple dry electrolytic condenser. C23—15 mf, 400 volt. C24—15 mf, 350 volt. C25—20 mf. 25 volt
	8DS-486	8" dynamic speaker
	3ES-256J	Tone control switch

—ED-81 —ED-82

VOLTAGE ANALYSIS

Voltage from transformer center tap to ground—85 volts (negative).

Voltage across resistor R10 and R11—15 volts (negative).

Always use as weak a test signal as possible when aligning the receiver.

An output meter should be used across the voice coil or output transformer for observing maximum response.

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.

color coding of the i-f transformers

Grid—green	Plate—blue
B plus—red	Grid return—black

PRODUCTION CHANGES

1. ED chassis bearing serial numbers below 3,8137,750 use.
   (a) 8DT-565—Oscillator coil
   (b) 6SC-438—Variable condenser
   (c) 6GC-430—Dual trimmer strip in place of trimmers on variable.
   (d) 2NC-231A—Adjustable series padding condenser.
   (e) 8DD-116—Dial face
   (f) 8DW-272—Loop antenna
2. ED chasses which use wet second electrolytic, C17, part No. 3SC-303 or 3XC-329 may use dry electrolytic 7AC-444 for replacement.

SCHEMATIC DIAGRAM FOR CHASSIS BEARING SERIAL NUMBERS ABOVE 3,816,700

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 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	255	85	0	6.3 ac.
6SK7GT	255	85	0	6.3 ac.
6SQ7GT	110	—	0	6.3 ac.
6V6GT	245	255	0	6.3 ac.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis. The trimmers are accessible through holes in the back of 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 oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

MODEL: ED-354

CHASSIS MODEL: ED

TYPE: Single-band superheterodyne.

FREQUENCY RANGE: 530-1650 kc.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 6SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

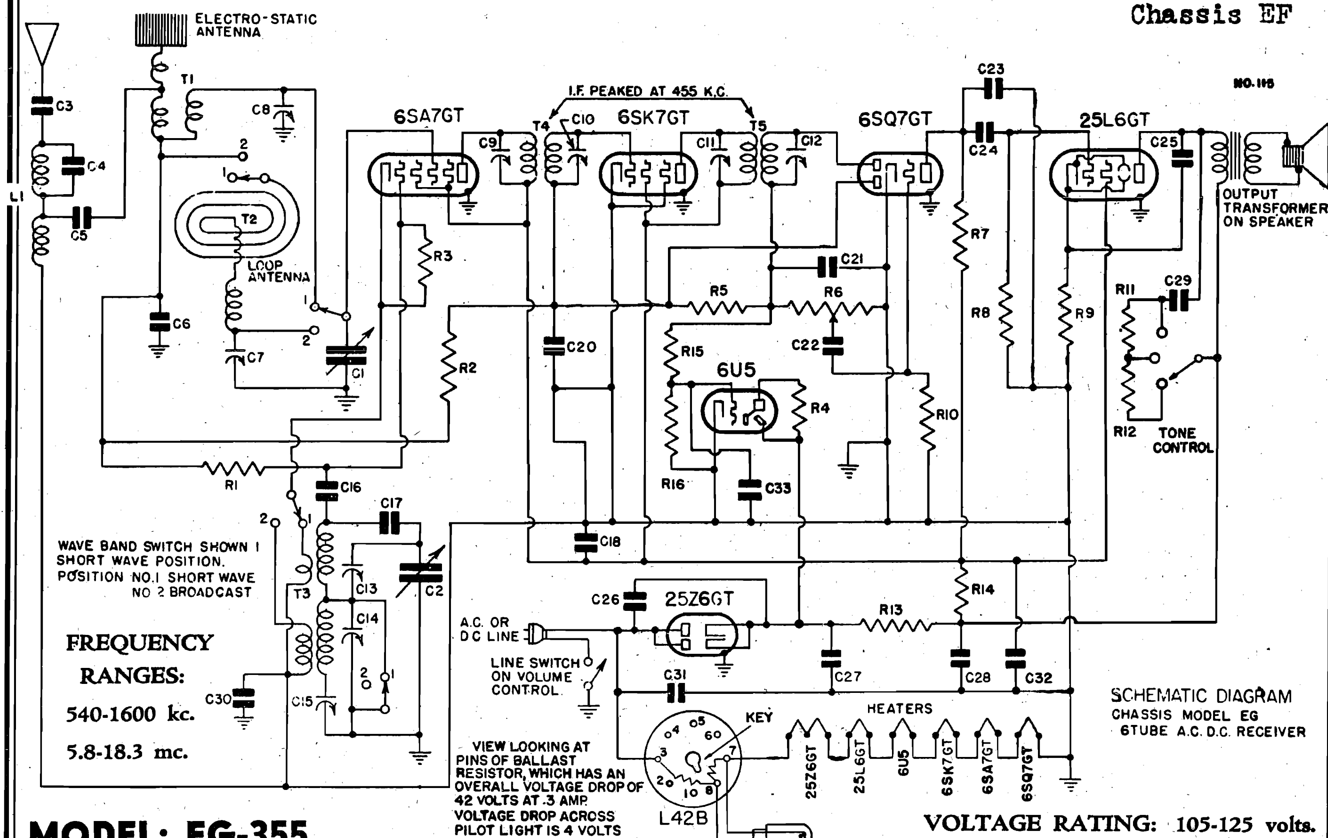
R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the radiating loop. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EG-355
Chassis EG
MODEL EF-363
Chassis EF



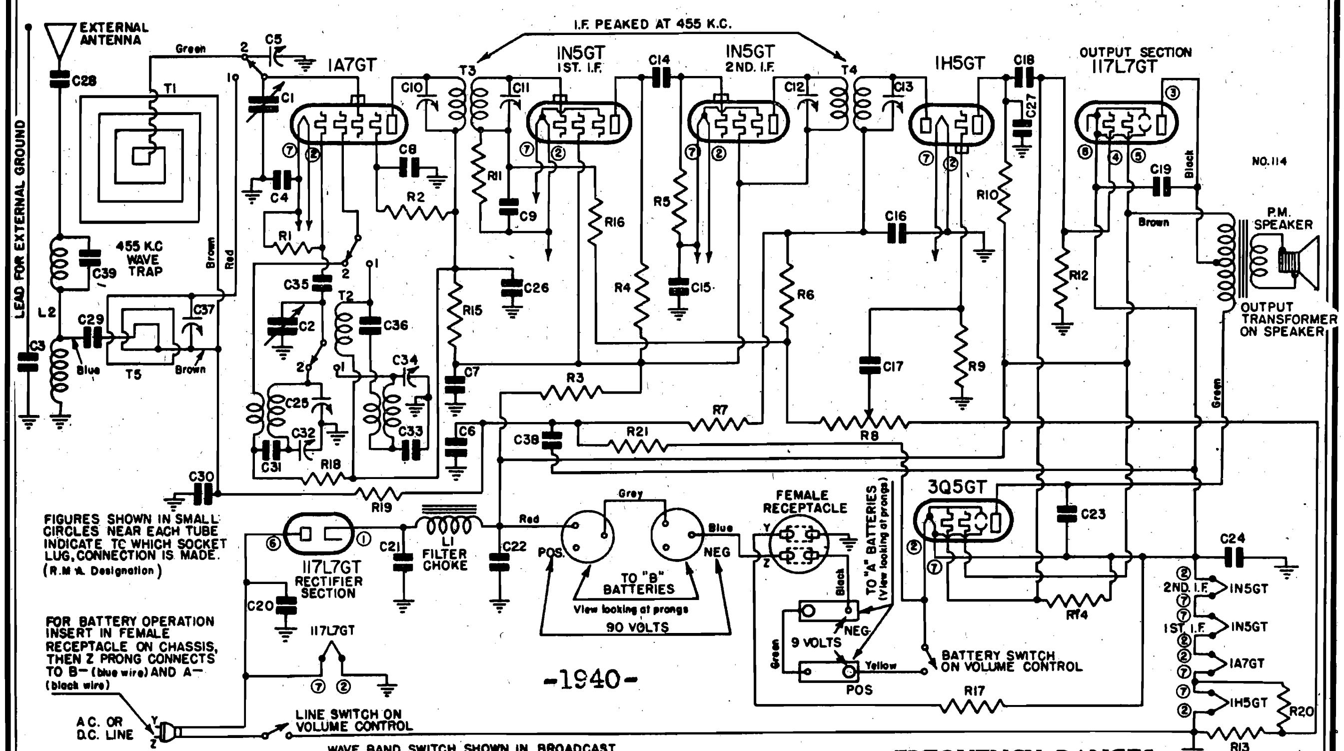
FREQUENCY RANGES:
540-1600 kc.
5.8-18.3 mc.

MODEL: EG-355

CHASSIS MODEL: EG

TYPE: Two-band superheterodyne.

VOLTAGE RATING: 105-125 volts.
POWER SUPPLY: a.c. or d.c.
POWER CONSUMPTION: 45 watts.



WAVE BAND SWITCH SHOWN IN BROADCAST POSITION POSITION NO. 1 SHORT WAVE NO. 2 BROADCAST

MODEL: EF-363

CHASSIS MODEL: EF

Two-band Universal (Battery, A.C.-D.C.) Superheterodyne.

FREQUENCY RANGES:
540-1600 kc.
5.8-18.3 mc.

MODEL EG-355
Chassis EG
MODEL EF-363
Chassis EF

EMERSON RADIO & PHONOGRAPH CORP.

MODEL: EG-355 CHASSIS MODEL: EG

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The loop antenna acts as the broadcast antenna coil. The short-wave antenna coil is the larger of the two coils mounted on the loop board. The trimmers for the antenna coils for both bands are located on a dual strip behind the variable condenser. The upper trimmer is for broadcast and lower, for short-wave.

The oscillator coil is located underneath the chassis, just below the variable condenser. The trimmers for both bands are mounted on a dual strip beneath the first i-f transformer. The short-wave trimmer is the one closest to the mounting foot.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 6SA7 tube is connected to the stator lug of the rear variable condenser section.

R-f Alignment

Rotate the wave-band switch counter-clockwise to the short-wave position. Set the dial pointer at 16 megacycles and feed 16 megacycles from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from the electrostatic antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the short-wave oscillator trimmer (closest to mounting foot, beneath the chassis) and then the antenna trimmer (lower of dual trimmer, behind the variable) for maximum response.

Without changing the above set-up, rotate the band-switch clockwise to the broadcast position, set the dial pointer at 150 and feed 1500 kc into the radiating loop. Adjust first the broadcast oscillator trimmer (farthest from mounting foot, beneath the chassis) and then the antenna trimmer (upper of dual trimmer, behind the variable) for maximum response. Rotate the dial to 60, feed 600 kc into the radiating loop and adjust the broadcast series padder (on the rear flange of the chassis) for maximum response while rocking the variable back and forth. Repeat alignment at 1500 kc.

DIAL CORD REPLACEMENT

Chassis which have the dial drive shaft pulley with a wide groove use one and a half turns of dial cord, part number 7BZ-867A. The cord should be drawn snugly around the condenser pulley and knotted with no slack, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

L1	Antenna choke and 455 kc wave trap
T1	Short-wave antenna coil
T2	Broadcast loop antenna assembly
T3	Two-band oscillator coil
T4	Double-tuned 455 kc first i-f transformer
T5	Double-tuned 455 kc second i-f transformer
R1, R10	15 megohm ¼ watt carbon resistor.
R2	200,000 ohm ¼ watt carbon resistor.
R3	20,000 ohm ¼ watt carbon resistor
R4	1 megohm ¼ watt carbon resistor (in indicator socket)
R5	3 megohm ¼ watt carbon resistor.
R6	Volume control .5 megohm with line switch
R7, R8	500,000 ohm ¼ watt carbon resistor.
R9	140 ohm ½ watt wire-wound resistor
R11	4000 ohm ¼ watt carbon resistor.
R12	1500 ohm ½ watt carbon resistor
R13	175 ohm 1 watt metallized resistor
R14	740 ohm 1 watt wire-wound resistor
R15	5 megohm ¼ watt carbon resistor
R16	10 megohm ¼ watt carbon resistor
	Plug-in ballast resistor...
C1, C2	Two-gang variable condenser.
C3	0.006 mf, 600 volt tubular condenser.
C4	0.001 mf mica condenser, part of 455 kc wave-trap.
C5, C18	.02 mf, 200 volt tubular condenser
C6	0.0025 mf mica condenser.
C7, C8	Dual trimmer assembly...
C9, C10, C11, C12	Trimmer, part of i-f transformer
C13, C14	Dual trimmer assembly
C15	Single adjustable padding condenser
C16	0.00011 mf mica condenser.
C17	0.0016 mf mica condenser
C20, C33	0.05 mf, 200 volt tubular condenser.
C21, C23	0.0002 mf, 600 volt tubular or mica condenser
C22	0.002 mf, 600 volt tubular condenser.
C24	0.02 mf, 400 volt tubular condenser.
C25, C30	0.01 mf, 400 volt tubular condenser.
C26	0.01 mf, 600 volt tubular condenser.
C27, C28	Multiple 20-40 mf, 150 volt dry electrolytic condenser: C27—20 mf; C28—40 mf.
C29	0.1 mf, 200 volt tubular condenser.
C31	0.05 mf, 400 volt tubular condenser.
C32	40 mf, 135 volt dry electrolytic condenser

TYPE OF TUBES:

6SA7GT, pentagrid oscillator-modulator
6SK7GT, first i-f amplifier
6SQ7GT, diode detector, a-f amplifier, a.v.c.
25L6GT, beam power output
25Z6GT, rectifier. TUNING INDICATOR: 6U5 Electron Ray.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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

VOLTAGE ANALYSIS

Voltage at 25Z6 cathode—128 volts.
Voltage across pilot light—4.5 volts.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	100	100	0	6
6SK7GT	100	88	0	6
6SQ7GT	40	—	0	6
25L6GT	112	100	5.6	25

—EG—S1 —EG—S2

MODEL: EF-363 CHASSIS MODEL: EF

L1	Iron core filter choke
L2	Antenna choke and 455 kc wave trap
T1	Broadcast loop antenna
T2	Two-band oscillator coil
T3	Double-tuned 455 kc first i-f transformer.
T4	Double-tuned 455 kc diode i-f transformer
T5	Short-wave loop antenna.
R1	200,000 ohm ¼ watt carbon resistor
R2	30,000 ohm ¼ watt carbon resistor
R3	500 ohm ¼ watt carbon resistor
R4	25,000 ohm ¼ watt carbon resistor.
R5, R19	100,000 ohm ¼ watt carbon resistor
R6	50,000 ohm ¼ watt carbon resistor.
R7, R14	3 megohm ¼ watt carbon resistor.
R8	Volume control, 500,000 ohm with double pole line switch.
R9, R11	5 megohm ¼ watt carbon resistor.
R10, R12	500,000 ohm ¼ watt carbon resistor.
R13, R20	160 ohm ¼ watt carbon resistor
R15	1000 ohm ¼ watt carbon resistor.
R16, R21	15 megohm ¼ watt carbon resistor
R17	1200 ohm ¼ watt carbon resistor
R18	15,000 ohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser.
C3	0.002 mf, 600 volt tubular condenser
C4, C15	0.25 mf, 100 volt tubular condenser.
C5, C37	Dual antenna trimmer strip...
C6, C7, C9, C26	0.05 mf, 200 volt tubular condenser
C8, C31	0.02 mf, 200 volt tubular condenser
C10, C11, C12, C13	Trimmers, part of i-f transformers.
C14, C16	0.00022 mf mica condenser.
C17, C28	0.006 mf, 600 volt tubular condenser.
C18	0.02 mf, 400 volt tubular condenser.
C19	0.003 mf, 600 volt tubular condenser.
C20	0.05 mf, 400 volt tubular condenser.
C21, C22	Multiple dry electrolytic condenser: C21—20 mf, 150 volt; C22—40 mf, 150 volt.
C23	0.01 mf, 400 volt tubular condenser.
C24	40 mf, 25 volt dry electrolytic condenser
C25, C34	Dual oscillator trimmer strip.
C27	0.0002 mf, 600 volt tubular condenser
C29	0.1 mf, 200 volt tubular condenser
C30	0.0025 mf mica condenser...
C32	Single adjustable padding condenser, 300-600 mmf
C33	0.00185 mf mica condenser (coded 0.0019)
C35	0.00011 mf mica condenser
C36	0.0001 mf mica condenser...
C38	0.015 mf, 400 volt tubular condenser..
7JS-443	6½" permanent magnet dynamic speaker..
8FS-479	Wave band switch
8AW-268	Battery cable

Location of Coils and Trimmer Adjustments

The two-band oscillator coil is located beneath the chassis underneath the variable condenser. The trimmer for the short-wave oscillator is close to the foot of the dual trimmer strip beneath the chassis. The trimmer farthest from the foot is for broadcast.

The large loop antenna acts as the antenna coil for broadcast and the smaller loop for short-wave.

The trimmer for short-wave is the one closer to the foot of the dual trimmer strip behind the variable condenser. The trimmer farthest from the foot is for broadcast.

The broadcast series padding condenser is mounted on the inside rear wall of the chassis and can be reached from the rear of the chassis.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is at the right of the variable condenser and the diode i-f transformer is to the left of the variable condenser. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

I-f Alignment

With the band switch in the broadcast (clockwise) position swing the variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

R-f Alignment

(Short-Wave)

With the band switch in the short-wave (counter-clockwise) position, set the dial pointer at 16. Feed 16,000 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop approximately one foot away from and parallel to the receiver short-wave loop antenna and advance the output of the signal generator until a suitable deflection is obtained on the output meter. Adjust first the oscillator trimmer, then the antenna trimmer for maximum response.

(Broadcast)

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver broadcast loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer, then the antenna trimmer for maximum response.

Feed 600 kc, into radiating loop, tune in near 60 and adjust series padder, while rocking the variable back and forth, for maximum response.

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" 9.0 volts, "B" 90 volts.

TYPE OF TUBES:

1A7GT, oscillator-modulator
1N5GT, 1st i-f amplifier
1N5GT, 2nd i-f amplifier
1H5GT, 2nd detector, a.v.c., a-f amplifier
3Q5GT, beam power output (battery operation)
117L7GT, beam power output and half-wave rectifier (line operation)

Tube	Plate	Screen	Osc. Plate	Fil.
1A7GT	88	50	82	1.5
1N5GT, 1st i-f	50	88	—	1.5
1N5GT, 2nd i-f	88	88	—	1.5
1H5GT	27	—	—	1.5
3Q5GT	85	88	—	3.0
117L7GT (line operation only)	86	95	—	117

117L7GT rectifier cathode (Pin No. 1) (line operation only)—125 volts.

Battery Operation: Important—Remove the line plug from the electrical outlet. Insert the plug into the receptacle at the rear of the receiver. This is important since the receiver will not operate from batteries with the plug out of the receptacle. The loose portion of the cord can then be coiled and placed in the cabinet underneath the shelf.

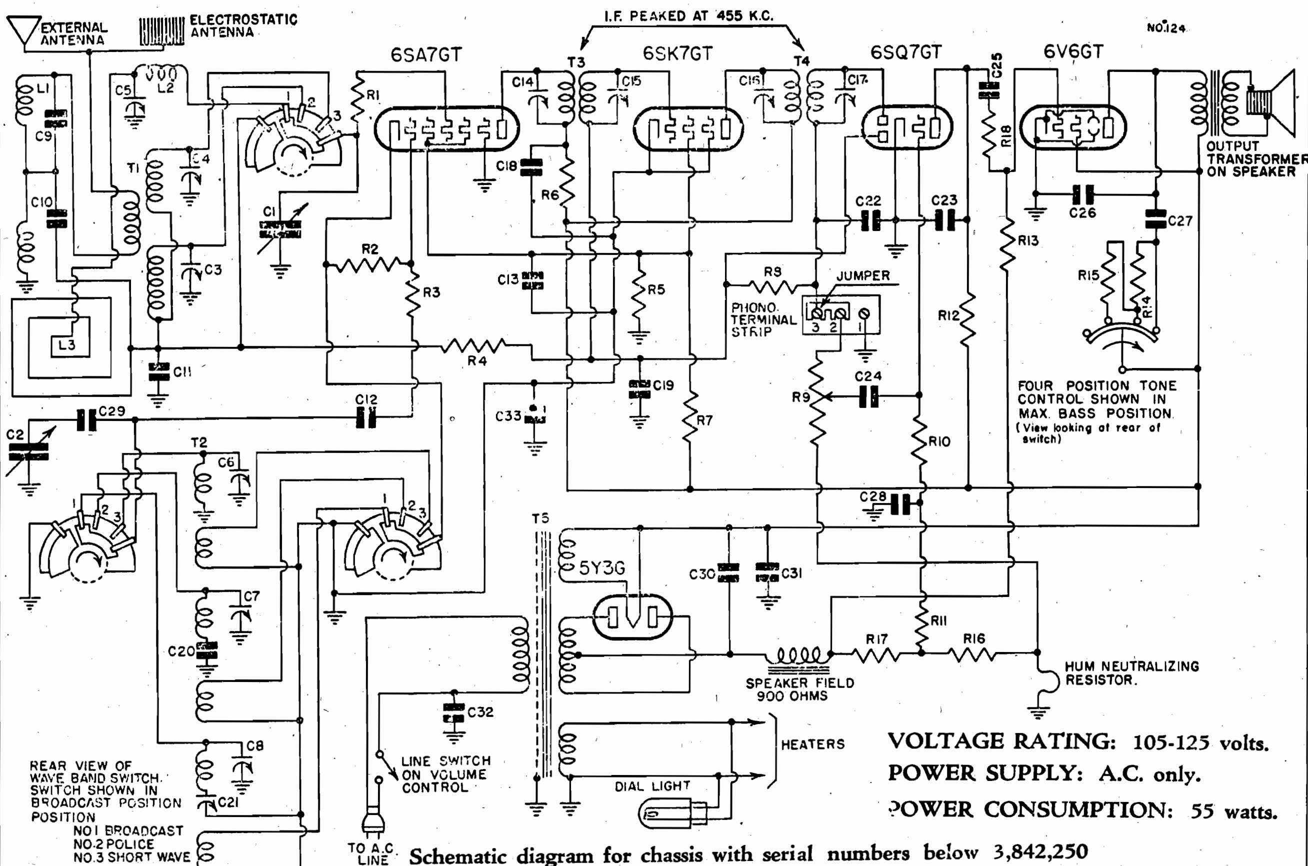
A.C.-D.C. Operation: Open the small door at the back of the cabinet. It is important that this small door be left open while operating the receiver on either a.c. or d.c. power. Take out the line cord, removing the plug from its receptacle at the rear of the chassis. Insert the plug in the wall outlet.

POWER SUPPLY: Battery, A.C. or D.C.
POWER CONSUMPTION: (Line operation) 30 watts.
VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c.

CURRENT DRAIN: —EF-S1 —EF—S2
(Battery operation) "A" battery 0.05 amp.
"B" battery 0.01 amp.

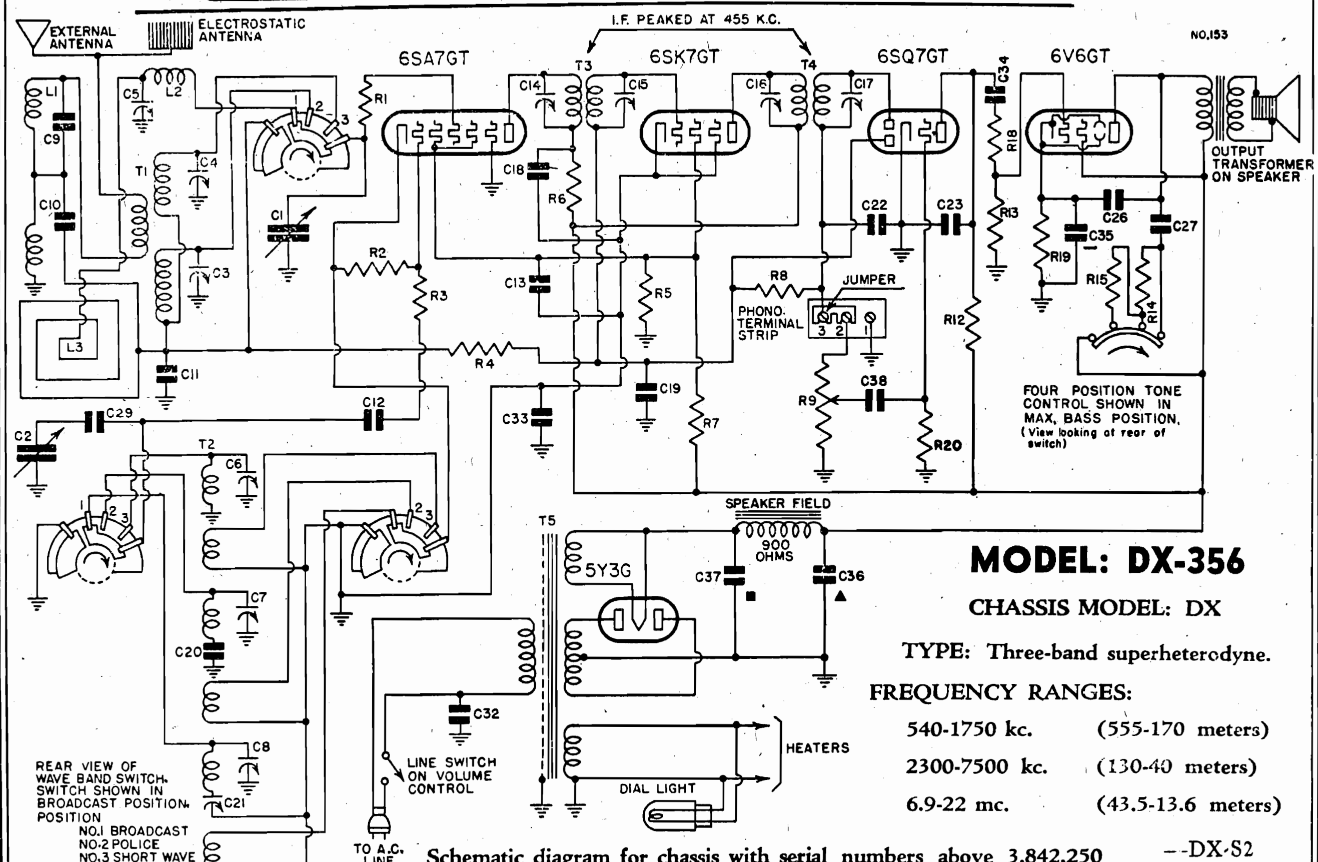
EMERSON RADIO & PHONOGRAPH CORP.

MODEL DX-356
Chassis DX



VOLTAGE RATING: 105-125 volts.
POWER SUPPLY: A.C. only.
POWER CONSUMPTION: 55 watts.

Schematic diagram for chassis with serial numbers below 3,842,250



MODEL: DX-356

CHASSIS MODEL: DX

TYPE: Three-band superheterodyne.

FREQUENCY RANGES:

540-1750 kc.	(555-170 meters)
2300-7500 kc.	(130-40 meters)
6.9-22 mc.	(43.5-13.6 meters)

Schematic diagram for chassis with serial numbers above 3,842,250

--DX-S2

MODEL DX-356
Chassis DX

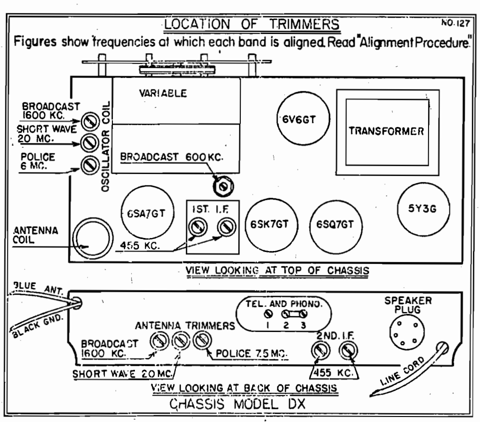
EMERSON RADIO & PHONOGRAPH CORP.

PARTS LIST

L1, C9	Antenna choke and 455 kc fixed wave-trap
L2	Broadcast antenna loading coil
L3	Broadcast loop antenna assembly
T1	Police and short-wave antenna coil
T2	Three-band oscillator coil
T3	Double-tuned 455 kc first i-f transformer
T4	Double-tuned 455 kc second i-f transformer
T5	Power transformer
R1, R3	100 ohm ¼ watt carbon resistor
R2	20,000 ohm ¼ watt carbon resistor
R4	100,000 ohm ¼ watt carbon resistor
R5	40,000 ohm ¼ watt carbon resistor
R6	1000 ohm ¼ watt carbon resistor
R7	15,000 ohm 3 watt carbon resistor
R8, R10	2 megohm ¼ watt carbon resistor
R9	Volume control, .25 megohm with line switch.
R11, R13	.5 megohm ¼ watt carbon resistor
R12	.25 megohm ¼ watt carbon resistor
R14	2500 ohm ¼ watt carbon resistor
R15	5000 ohm ¼ watt carbon resistor
R16	23 ohm ½ watt wire-wound resistor
R17	180 ohm 1 watt wire-wound resistor
R18	50,000 ohm ¼ watt carbon resistor
R19	240 ohm 1 watt wire-wound resistor
R20	10 megohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser
C3, C4, C5	Tripple trimmer strip for antenna circuits
C6, C7, C8	Trimmers, part of oscillator coil.
C9	0.001 mf condenser, part of 455 kc wave-trap.
C10, C33	0.01 mf, 400 volt tubular condenser
C11	0.0025 mf, mica condenser
C12	0.00011 mf, mica condenser
C13	0.1 mf, 400 volt tubular condenser
C14, C15, C16, C17	Trimmers, part of i-f transformers.
C18, C25, C27	0.05 mf, 400 volt tubular condenser
C19	0.05 mf, 200 volt tubular condenser
C20	0.0022 mf, mica condenser
C21	Single adjustable padding condenser. Range: 150-300 mmf.
C22, C23	0.00022 mf, mica condenser
C24, C26	0.006 mf, 600 volt tubular condenser
C28	0.25 mf, 100 volt tubular condenser
C29	0.002 mf, mica condenser
C30	16 mf, 400 volt dry electrolytic condenser
C31	16 mf, 400 volt dry electrolytic condenser
C32	0.01 mf, 400 volt molded condenser
C34	0.02 mf, 400 volt tubular condenser
C35, C36, C37	Multiple dry electrolytic condenser: C35—20 mf, 25 volt; C36—15 mf, 350 volt; C37—15 mf, 400 volt.
C38	0.002 mf, 600 volt tubular condenser
8DS-486	8" dynamic speaker
7XS-511	Wave-band switch
8GS-485A	Tone-control switch

PRODUCTION CHANGE

1. Chassis bearing serial numbers below 3,842,250 use second i-f transformer, part number 8AT-55A.



The outlet marked "Television" at rear of the chassis may be used with any "Television Attachment" which is designed to feed audio frequencies to a separate amplifier. Detailed instruction for such a connection is given with any "Television Attachment."

The adjustable padding condenser for the broadcast band is mounted on the top of the chassis, with the screw adjustment accessible in the top of the chassis. The police and short-wave bands have fixed padders, C20 and C29 on the schematic. When replacing these fixed padders be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600, 6500 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 the police and short-wave bands. A .0001 mf condenser in series with a 400 ohm carbon resistor may be used for the police band dummy antenna. For the short-wave band a 400 ohm carbon resistor may be used.

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 the 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 of the 6SA7 tube. The input may be fed to the stator lug of the front condenser section. Adjust the four i-f trimmers for maximum response.

Broadcast Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the dial pointer at 160 and feed 1600 kc from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the oscillator coil trimmer then the antenna trimmer for maximum response. Reset the pointer at 60, feed 1600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 kc 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 pointer at 6.5. Feed 6500 kc to the antenna (using a 400 ohm dummy antenna) and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. The police band padder is fixed and therefore requires no adjustment.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer 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 antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

The color coding of the i-f transformers is as follows:

Grid—green	Plate—blue
B plus—red	Grid return—black

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.

CHASSIS DX

DX-356

TYPE OF TUBES:
1—6SA7GT, pentagrid converter
1—6SK7GT, i-f amplifier
1—6SQ7GT, diode detector, audio amplifier and a.v.c.
1—6V6GT, power output
1—5Y3G, full-wave rectifier.

VOLTAGE ANALYSIS

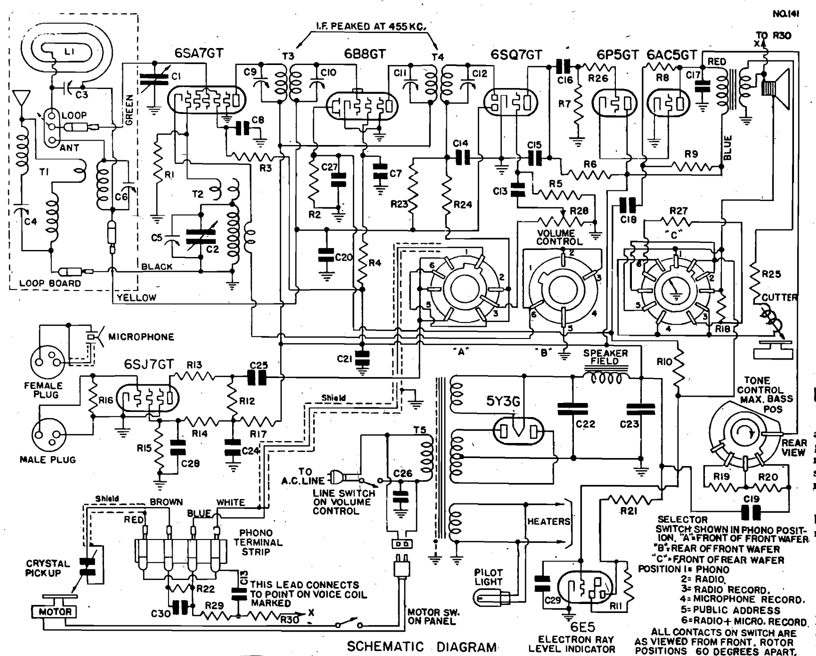
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	250	85	0	6.3 ac.
6K7GT	250	85	0	6.3 ac.
6SQ7GT	125	—	0	6.3 ac.
6V6GT	235	250	*0	6.3 ac.

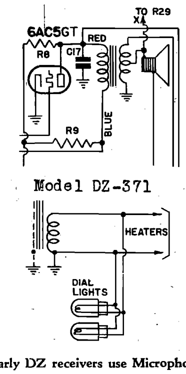
Voltage across resistors R16 and R17—15 volts (negative).
*Chassis bearing serial numbers above 3,842,250 should measure 12 volts.
Voltage from power transformer center tap to ground (red and yellow lead)—87 volts (negative).

EMERSON RADIO & PHONOGRAPH CORP.

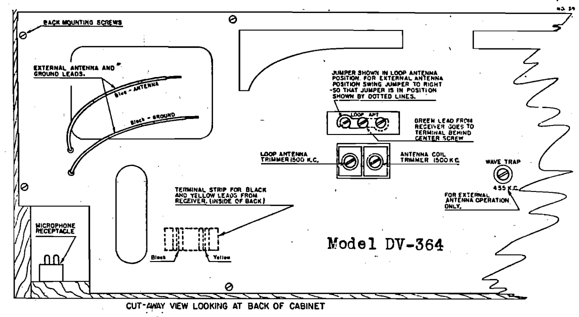
MODEL DV-364
Chassis DV
MODEL DZ-371
Chassis DZ



SCHEMATIC DIAGRAM

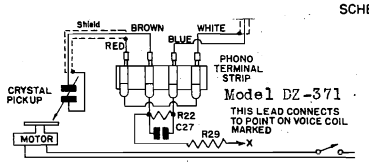


Model DZ-371



Model DV-364

CUT-AWAY VIEW LOOKING AT BACK OF CABINET



Model DZ-371

R29 (for DV) 1 meg., 1/4 w. resistor
R29 (for DZ) 2 meg. 1/4 w. resistor

T1	Antenna coil with 455 kc wave-trap.
T2	Oscillator coil
T3	Double-tuned 455 kc first i-f transformer.
T4	Double-tuned 455 kc second i-f transformer
T5	Power transformer
T6	Speaker transformer
L1	Loop antenna
R1	20,000 ohm ¼ watt carbon resistor.
R2	500,000 ohm ¼ watt carbon resistor.
R3	20,000 ohm 2 watt carbon resistor.
R4	100,000 ohm ½ watt carbon resistor.
R5, R16	10 megohm ¼ watt carbon resistor.
R6	200,000 ohm ¼ watt carbon resistor
R7, R10, R14, R26	1 megohm ¼ watt carbon resistor.
R9, R30	60,000 ohm ¼ watt carbon resistor
R8	560,000 ohm ¼ watt carbon resistor
R11	1 megohm resistor in 6U5 socket.
R12, R13, R15, R17	250,000 ohm ¼ watt carbon resistor.
R18	45 ohms ½ watt wire-wound resistor
R19	15,000 ohm ½ watt carbon resistor
R20	1500 ohm 1 watt carbon resistor.
R21	20,000 ohm 1 watt carbon resistor.
R22, R23	3 megohm ¼ watt carbon resistor.
R24	50,000 ohm ¼ watt carbon resistor
R25	3 ohm ½ watt wire-wound resistor.
R26	100,000 ohm ¼ watt carbon resistor
R27	50 ohm ¼ watt carbon resistor
R28	Volume control 500,000 ohms with line switch.

C1, C2	Two-gang variable condenser.
C3, C6	Trimmers, part of loop antenna.
C4	Trimmer, part of 455 kc wave-trap assembly.
C5	Trimmer, part of variable condenser.
C7, C8, C18, C19	0.05 mf, 400 volt tubular condenser.
C9, C10, C11, C12	Trimmers, part of i-f transformers.
C13	0.004 mf, 600 volt tubular condenser.
C14	0.00011 mf mica condenser.
C15	0.00006 mf mica condenser.
C16	0.02 mf, 400 volt tubular condenser.
C17	0.001 mf, 1000 volt tubular condenser.
C20, C28	0.1 mf, 200 volt tubular condenser.
C21	0.1 mf, 400 volt tubular condenser.
C22, C23	Dual 16 mf, 450 volt dry electrolytic condenser
C24	0.5 mf, 400 volt tubular condenser.
C25	0.01 mf, 400 volt tubular condenser.
C26	0.01 mf, 400 volt molded condenser.
C27	0.0002 mf, 600 volt tubular or mica condenser.
C29	0.25 mf, 100 volt tubular condenser.
C30	0.00022 mf mica condenser.

FREQUENCY RANGES:

540-1600 kc —DV-S1
555-187 meters. —DV-S2

POWER CONSUMPTION: —DZ-S1

60 watts for radio.

95 watts for recorder and radio.

95 watts for changer and radio (DZ-371)

A ground is necessary if the microphone is to be used for recording or public address. Use the conventional method of grounding to a water pipe or steam radiator. Connect the ground to the flexible black lead emerging from the rear of the loop antenna board.

Early DZ receivers use Microphone, part number 7VC-484

I-f and Wave-Trap Alignment

Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid of the 6SA7GT tube. Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna lead (using a standard dummy antenna) and adjust the 455 kc wave-trap for minimum response. (See General Notes, No. 5.)

Note: The grid of the 6SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

R-f Alignment

(LOOP ALIGNMENT)

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (located on the dual strip on the loop) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

Antenna Coil Alignment

With the link in the "antenna" position feed 1500 kc from the signal generator to the blue antenna lead through a standard dummy antenna or a 0.0002 mf mica condenser. Align the oscillator as above and then the antenna trimmer (on dual strip) for maximum response.

Location of Coils and Trimmer Adjustments

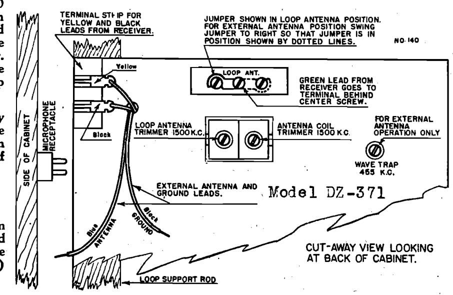
The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted beneath the chassis. The trimmers are accessible through holes in the rear of the chassis.

The oscillator coil is mounted underneath the chassis. The oscillator trimming condenser is located on the front section of the variable condenser.

The 455 kc wave-trap and its trimmer are mounted on the loop board. The trimmer is accessible through a hole in the board. See the figure on previous page.

The trimmers for the antenna coil and loop winding are mounted on a dual trimmer strip on the loop board. See the figure on previous page for the location and identification of the antenna trimmers and loop connecting leads.



Model DZ-371

CUT-AWAY VIEW LOOKING AT BACK OF CABINET.

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 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	Fil.
6SA7GT	240	90	0	6.3 a.c.
6B8GT	240	75	0	6.3 a.c.
6SQ7GT	100	—	0	6.3 a.c.
6SJ7GT	*25	*15	0	6.3 a.c.
6P5GT	240	—	12	6.3 a.c.
6AC5GT	230	—	0	6.3 a.c.

Voltage at 5Y3G filament to ground—315 volts.
Voltage across speaker field—75 volts.

Late DZ chassis use 5Y4G rectifier
Voltage at 5Y4G filament to ground—315 volts.

*Actual operating voltages cannot be measured because of high resistance in circuit.

MODEL DV-364
Chassis DV
MODEL DZ-371
Chassis DZ

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EV-384
Chassis EV

Models DV-364, DZ-371, EV-384

OPERATING THE RECORDING MECHANISM

Chassis DV, DZ, EV

General Recording Instructions

In the "Radio Recording" position, recordings can be made of any program which can be tuned in with sufficient clarity and volume. If the station is too weak or if man-made or atmospheric static is strong the noise level on the recording will be sufficient to make the results quite unsatisfactory.

While the radio program is being recorded it can be heard faintly from the loudspeaker. This arrangement is made so that the operator can select any part of a program for recording by listening to the loudspeaker.

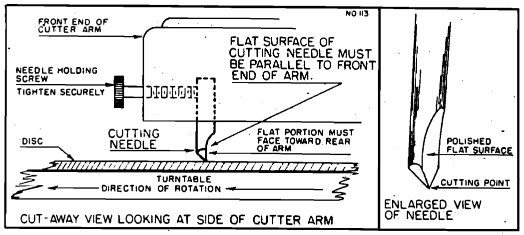
When the phono-radio-recorder switch is in the "Microphone Recording" position records can be made only by means of the microphone furnished with the unit. The microphone may be attached by plugging into the receptacle mounted on the inside of the cabinet wall, near the loop antenna. It is of great importance that an external ground be connected to the chassis if microphone recordings are to be made, otherwise hum pickup may make the recordings unusable.

When the phono-radio-recorder knob indicates "Radio + Microphone Recording" the microphone may be used to inject local speech or music with the radio program being recorded. Since the recording level for radio must be controlled by the volume control, the microphone recording level should be adjusted by moving the microphone stand closer to or farther from the person speaking. The proper level can be set by first adjusting the volume control for radio recording level. Then without changing the volume control setting switch over to microphone recording position where the distance of the speaker from the microphone should be determined for proper cutting level. Switching back to Radio-Microphone Recording now allows the combined sounds to be recorded at their proper levels.

Recording Level

The "Electron Ray" indicator on the tuning panel is furnished to indicate the "level" at which the record is cut. It will be noticed that when the selector switch is in the recording position the indicator will flicker open and partly closed. The volume control should slowly be increased until the indicator just closes on the loudest passages of music or voice being recorded. The two fluorescent portions of the indicator should never overlap.

If a recording is being made using the microphone, the speaker should first read or speak a few lines in the tone of voice and at the distance from the microphone that he will use during recording. This will enable the operator to preset the volume control so that the first few words will not be recorded either too loudly or too softly.



Cutting the Record

1. The illustration above indicates the correct position of the cutting needle in the cutting arm. It is important to note that the polished flat portion of the needle is parallel to the front end of the cutting arm and that it faces toward the rear. Be sure the needle is tightened as firmly as possible.

2. Turn the selector switch to the type of recording desired. Be sure the tone control switch is in the treble position, clockwise.

3. Place a recording blank on the turntable so that the retractable driving pin in the turntable engages one of the holes in the blank. This is necessary to prevent the blank from slipping during recording.

4. Start the motor and allow the turntable to come up to speed.

5. Raise the recording arm from its rest position and move it inward toward the record, placing the cutting needle approximately ⅛ inch from the outer edge of the blank.

A lead screw underneath the sub-panel will then drive the cutter arm slowly across the blank and the needle will cut a continuously spiral groove until such a time as the operator lifts the recorder arm and replaces it in its rest position at the side of the turntable. During the time that the needle is recording, a fine thread will be cut from the record itself and this thread will pile up toward the center of the blank. Remove this thread continually with a "soft" brush while the record is being cut. Considerable care must be taken that the operator does not tangle it around the cutting needle, nor slow up the turntable by touching it with his hands since either one will make for poor recordings.

Be sure to turn the motor off before attempting to remove the recorded blank. The recorded blank may be played back at any time after the recorder arm has been returned to the rest position.

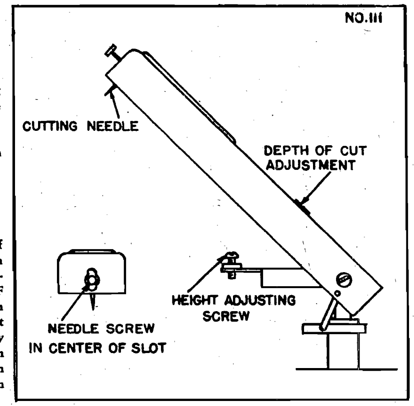
CAUTION: Never stall the turntable by hand; this turntable is weighted for use in recording and it will acquire an appreciable time to come to rest.

Chassis DV and EV

Recording Adjustments

The following adjustments should be carefully noted. Examine the recording arm to locate the controls indicated and to become familiar with their use. In general, it is unnecessary to move either the height or pressure adjustment unless a recording blank other than the type furnished by Emerson is used or the cutting needle shows great wear or has been replaced.

Two adjustments are provided on the recorder arm: arm height and needle pressure.



Recorder Arm Height

The height of the recorder arm can be varied by means of the slotted screw which is located on the bracket just beneath the cutting arm. In order to make this adjustment, it is necessary to insert a cutting needle, and, with the motor turned OFF and a record blank on the turntable, place the recorder arm in the cutting position. Now lift the cutting arm, turn the height adjusting screw and lower the arm to the record. When properly adjusted, the needle screw should be approximately centered in the slot at the front of the arm, when the needle is resting on the record. Tighten the lock nut to prevent the screw from moving. See figure at right.

Cutting the Record

1. The illustration above indicates the correct position of the cutting needle in the cutting arm. It is important to note that the polished flat portion of the needle is parallel to the front end of the cutting arm and that it faces toward the rear. Be sure the needle is tightened as firmly as possible.

3. Place a recording blank on the turntable so that the retractable driving pin in the turntable engages one of the holes in the blank. This is necessary to prevent the blank from slipping during recording.

4. Start the motor and allow the turntable to come up to speed.

Note: The two cutting arm pivot screws (item P—see back page) should be screwed down firmly. If they should become loose the recording may be cut unevenly.

Chassis DZ only

Recording Adjustments

The following adjustments should be carefully noted. Examine the recording arm to locate the controls indicated and to become familiar with their use. In general, it is unnecessary to move either the height or pressure adjustment unless a recording blank other than the type furnished by Emerson is used or the cutting needle shows great wear or has been replaced.

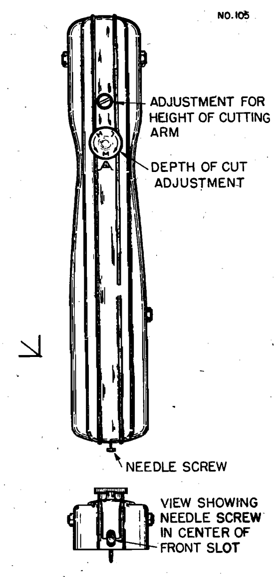
Recorder Arm Height

Two adjustments are provided on the recorder arm: arm height and needle pressure.

The height of the recorder arm can be varied by means of the slotted screw head which is on the top of the arm and toward the back, approximately flush with the surface. In order to make this adjustment, it is necessary to insert a cutting needle, and, with the motor turned OFF and a record blank on the turntable, place the recorder arm in the cutting position. Now raise or lower the recorder arm by means of the above mentioned adjustment until the needle screw is approximately "centered" in the slot at the front end of the recorder arm.

Pressure Adjustment

The pressure on the cutting needle is controlled by the chrome-plated knob on the top of the recorder arm. This knob has engraved upon it the letters "L, M, and H" indicating Light, Medium and Heavy pressures and provides an easy means of compensating for different types of needles, or blanks, or for the wearing of a cutting needle after it is used. In general, the machine is properly set at the factory so that it will cut the average record correctly. Any adjustment of this knob is dependend upon the factors discussed under "Recording Technique." Once the proper adjustment of this knob has been determined, its position should be permanently marked with ink or by scratching a thin line with a sharp instrument. Thus, if by accident, the knob should be turned off adjustment, it may be reset to the proper position without repeating a trial recording.



RECORDER ADJUSTMENTS

Make no adjustments unless repeated tests show that adjustment is absolutely necessary

1. FUNCTION OF MANUAL CONTROL BUTTON AND RELATIVE PARTS.

When Manual Control Button (Item 84, Fig. 4) is moved to the Manual Play-Back recording position, it moves the Manual Control Slide (Item 102, Fig. 1) which in turn moves Clutch Lock Slide (Item 103, Fig. 1) into a position which prevents Engagement Clutch Cam Assembly (Item 79, Fig. 2) from rotating. When Engagement Clutch Cam Assembly is in the above mentioned position and is not free to rotate, the Changer will not go into its changing cycle.

Also when the Manual Control Button is in the above mentioned position, the Manual Control Slide has moved the Locator Lock Slide (Item 106, Fig. 1) into a position where it engages the Tone Arm Locator & Bushing Assembly (Item 12, Fig. 1) and prevents same from bearing against Tone Arm Lever Assembly (Item 19, Fig. 1) allowing the Tone Arm to swing freely without hindrance and without setting Changer into its changing cycle. When the Manual Control is in the automatic position the Changer will function normally as an automatic record changer.

2. POSSIBLE MECHANICAL CAUSES OF POOR RECORDINGS.

(a) Threads from record cuttings getting down onto Rubber Idler Drive Wheel (Item 83, Fig. 4) and between drive wheel and motor pulley. This will cause very bad speed variation of the turntable and, of course, will result in very inferior recording. Cuttings may also wrap around motor shaft and cause motor to slow down or stop.

To remove the record cuttings, the turntable should be lifted by applying an even lifting force at opposite edges of the turntable while the turntable spindle is gently tapped downward on its top end, and the record cuttings then removed. The Rubber Idler Drive Wheel should be taken off; this can be accomplished by unsnapping the small snap cotter ring and slipping Rubber Idler Drive Wheel off its shaft, after which all reocrd cuttings can be removed.

NOTE: It is very important that no grease or oil be gotten on the surface of the Rubber Idler Drive Wheel.

(b) Tight Pivot Bearings: Check Cartridge Pivot Screw (Item 108, Fig. 4) for binding. Also Recording Arm Pivot Screw (Item 107, Fig. 4) and Traverse Arm Pivot Screws (Item 101, Fig. 2). These bearings should all be free, but have no looseness or play.

If the Pivot Screw (Item 108, Fig. 4) of the Cutter Cartridge is tight, the Cutter Cartridge cannot follow a slight up and down variation of the record or turntable. A record cut in this manner will, when played back, have a high scratch level, rough cutting and a tendency for the needle to jump from one groove to another.

(c) Damaged Rubber Idler Drive Wheel (Item 83, Fig. 4). Rubber Idler Drive Wheel may have become damaged by:

1. Allowing oil or grease to come in contact with same.

2. By allowing turntable to drop and cut into the outside surface of the Rubber Idler Drive Wheel.

3. Stopping the turntable by hand while the motor is running will cause a flat spot on the surface of the Rubber Idler Drive Wheel.

NOTE: If the Rubber Idler Drive Wheel has been damaged in any of the above mentioned ways, it should be replaced with a new one.

(d) Vibration Reaching The Recorder While A Blank Is Being Recorded: It is very important the floor or the surface upon which the Recorder rests remain quiet as any vibration such as people walking across the floor or shaking of the instrument in which the Recorder is mounted will seriously effect the quality of the finished recording.

(e) Recorder Not Level: It is very important that the Recorder is standing level. This can be checked by placing a small level on the turntable and checking same in two positions at right angles to each other and then leveling Instrument in which Recorder is mounted.

(f) Bent Or Damaged Turntable Spindle: If the Turntable Spindle (Item 59, Fig. 4) has been bent in shipment, or by someone exerting a heavy pressure on one side, it should be replaced with a new one. A bent Turntable Spindle will cause the surface of the Turntable to move up and down while it is turning and, of course, will seriously effect the quality of both recording and play-back.

NOTE: When removing the Turntable an even upward lifting force should be applied at opposite edges of the Turntable while Turntable Spindle is gently tapped downward on its top end.

(g) Record Cutting Causing A Bind Between Turntable Spindle (Item 59, Fig. 4) And Its Bearing: It is very important that all record cuttings are removed from Turntable Spindle and its bearing.

(h) Tension On Rubber Idler Wheel (Item 83, Fig. 4) Too Great: If the tension on the Rubber Idler Drive Wheel is too great, this will result in a "wow" or a rumble in the recording. To decrease the tension on Rubber Idler Drive Wheeel, loosen the screw holding the lug which is located beneath the Rubber Idler Drive Wheel and turn it slightly in a clockwise direction. This will reduce the spring tension on the Rubber Idler Drive Wheel. When the spring tension is correct, the spring will be approximately at right angles to the lug.

(i) Tension On Rubber Idler Drive Wheel (Item 83, Fig. 4) Too Weak: This will cause very bad speed variation. Turntable will slow down and then speed up as audio current of varying intensity reaches the cutter cartridge.

MODEL DZ-371
Chassis DZ

EMERSON RADIO & PHONOGRAPH CORP.

RECORD CHANGER ADJUSTMENTS

The following is detailed information for adjusting the Record Changer Mechanism. Do not make any adjustments before reading the instructions carefully.

1. PICKUP DOES NOT INDEX PROPERLY ON TEN-INCH OR TWELVE-INCH RECORDS.

(a) Adjustment for correct indexing of 10-inch records:

1. Swing tone arm outward until tone arm lever assembly (Item 19, Fig. 1) latches with tone arm latch lever (Item 18, Fig. 1) which is held to tone arm shaft (Item 77, Fig. 1) by two set-screws.

2. Make sure these set-screws are tight and that there is a slight play between the tone arm lever assembly and the panel (Item 5, Fig. 1. This will give proper clearance at ball race assembly (Item 74, Fig. 3).

The tone arm lever assembly (Item 19, Fig. 1) is held against tone arm latch lever (Item 18, Fig. 1) by the tension of tone arm locator lever spring (Item 16, Fig. 1).

3. Next loosen the clamping screw in the Swivel Bracket Assembly (Item 46, Fig. 3).

4. Now move tone arm until its outside edge is 1/8" from the outside edge of the panel (Item 5, Fig. 1) and retighten screw securely.

2. RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE AT END OF RECORD.

(a) Worn or Damaged Stop Groove: If the stop groove in the record is worn out or damaged, discard such a record.

(b) Cut-off Adjustment May Be Incorrect: The Record Changer should go into its changing cycle when the needle enters the stop groove and has traveled to within a distance of 1 7/8" from the center of the turntable shaft.

If the Record Changer does not go into its changing cycle when the needle has reached the above mentioned distance, the Tone Arm Trip Lever Shoe (Item 23, Fig. 1) should be moved toward the outside edge of the panel. To do this, it is necessary to loosen the thumb nut (Item 22, Fig. 1) and then retighten after adjustment has been made.

If the Record Changer goes into its changing cycle before the needle has reached a distance of 1 7/8" from the center of the turntable, the Tone Arm Trip Lever Shoe should be moved inward toward the center of the Record Changer.

3. RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE WHEN SWITCH KNOB IS TURNED ON.

When the switch is turned to "ON" the Record Changer should start its changing cycle. If it does not, the following points should be checked.

1. Make sure motor is running.

2. Check Trip Rod (Item 32, Fig. 1), to make sure it releases Trip Lever Assembly (Item 20, Fig. 1) from Engagement Clutch Cam Assembly (Item 79, Fig. 2) when Switch Knob is being turned on. If Trip Lever Assembly is not released, Trip Rod should be shortened by bending until Trip Lever clears Engagement Clutch Cam Assembly, when Switch Knob is turned.

3. Make sure that Clutch Reset Pawl (Item 40, Fig. 2) clears Drive Link Assembly (Item 31, Fig. 1).

4. RECORD CHANGER CONTINUES TO REPEAT ITS CHANGING CYCLE WITHOUT PLAYING RECORDS.

(a) Trip Lever Assembly (Item 20, Fig. 1) does not latch in Engagement Clutch Cam Assembly (Item 79, Fig. 2) which may be due to causes listed below:

1. Trip Rod (Item 32, Fig. 1) may be bent so that it is too short, holding Trip Lever Assembly from contacting Engagement Clutch Cam Assembly.

2. Springs (Item 24 or 35, Fig. 1) may be disconnected.

5. NO SOUND WHEN NEEDLE IS ON MOVING RECORD.

1. Muting Switch (Item 26, Fig. 1) may be out of adjustment. The contacts of this switch should be open whenever its long blade is not resting on the shoe of the Engagement Clutch Cam Assembly (Item 79, Fig. 2). If the contacts remain closed after the long blade has left the shoe, they should be adjusted by bending until there is a separation of approximately 1/32".

Switch should be checked to make sure contacts are closed when long blade is resting on the shoe of the Engagement Clutch Cam Assembly.

2. The lugs on the Muting Switch may have been bent together.

3. Pickup cartridge in Tone Arm may have been damaged or may be defective.

6. TONE ARM ADJUSTMENTS FOR 12" RECORDS.

1. Turn both Control Knobs until the arrows marked "12" are pointing toward the center of the turntable.

2. Place a 12" record on the turntable.

3. Start Record Changer and note where needle contacts record. Correct contacting is about 1/8" from the outside edge of record.

4. Set Rod (Item 56, Fig. 3) is operated by Selector Arm (Item 61, Fig. 4). The 12" Set Link (Item 10, Fig. 1) operates as a stop when Record Changer is set for 12" records. When Tone Arm Locator Assembly (Item 12, Fig. 1) contacts 12" Set Link the Tone Arm should be in the correct position to play a 12" record.

If at this point, the position of Tone Arm is incorrect, loosen the screw which holds the Tone Arm Locator Shoe 12" (Item 14, Fig. 1) and move in either direction as required and tighten screw.

7. TONE ARM ADJUSTMENTS FOR 10" RECORDS.

1. Turn both knobs until the arrows marked "10" are pointing toward the center of the turntable.

2. Place a 10" record on the turntable and start Record Changer.

3. Note where needle contacts record. Correct contacting is about 1/8" from the outside edge of record. If contacting of needle is not correct as mentioned, loosen the screw which holds Tone Arm Locator Shoe 10" (Item 15, Fig. 1) and slide shoe in or out as required, then tighten screw.

8. TONE ARM HEIGHT ADJUSTMENTS.

Set the Record Changer for 10" records, turn Switch to "ON" and allow Record Changer to go through a changing cycle with no record on the turntable. The clearance between Turntable and the bottom surface of the Tone Arm should be approximately 3/8". Usually this clearance can be obtained by adjusting the Tone Arm Adjustment Screw (Item 70, Fig. 3). It is well to check the following points before making any adjustment.

Check clearance between Roller (Item 51, Fig. 3) and Selector Crank Shaft Assembly (Item 7, Fig. 1). There should be approximately 1/32" clearance at this point. If the clearance is greater, it would be due to the pressure on the Spring Washer (Item 50, Fig. 3) being too great. This will prevent the Tone Arm Lifter Reset Spring (Item 82, Fig. 3) from returning the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) sufficiently. To relieve the pressure on the Spring Washer, lower the Selector Shaft Collar (Item 6, Fig. 1) slightly.

9. TONE ARM LOWERS ON RECORD TOO SUDDENLY.

If the Tone Arm lowers too suddenly, the Spring Washer (Item 50, Fig. 3) which is located between the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) and Selector Shaft Crank Assembly Post (Item 7, Fig. 1) is not under sufficient pressure. The set-screws in the Selector Shaft Collar (Item 6, Fig. 1) should be loosened and the Selector Shaft Collar pressed upward slightly and set-screws tightened.

10. LUBRICATION.

(a) Motor: The motor is equipped with oil-less bearing and requires no lubrication.

(b) Turntable Spindle Bearings: Are lubricated at the factory and do not require any lubrication for one year. After one year they should be oiled with 1 or 2 drops of a light grade oil.

The top bearing can be oiled by lifting off turntable. Make sure when replacing turntable to see that pin in Turntable Spindle slips into slot on bottom surface of turntable hub and also care should be taken not to injure Rubber Idler Drive Wheel.

Never, under any circumstance, allow oil to come in contact with Rubber Idler Drive Wheel.

(c) Squeak Due To Records Rubbing On Turntable Spindle: This can be eliminated by gently lining up the stack of records.

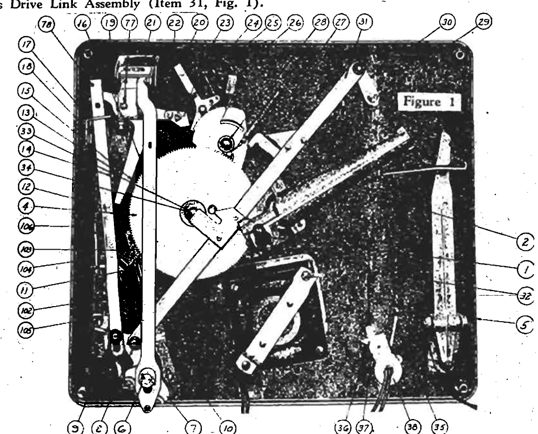


Figure 1

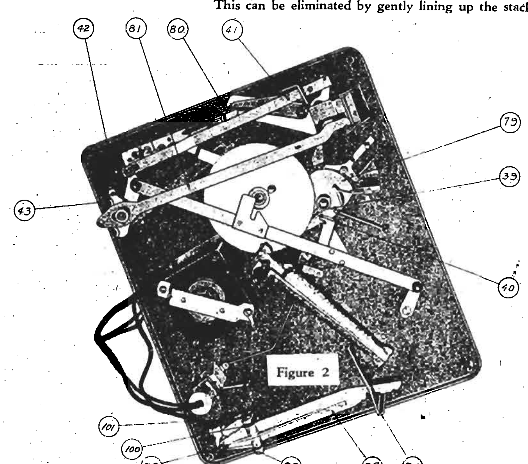


Figure 2

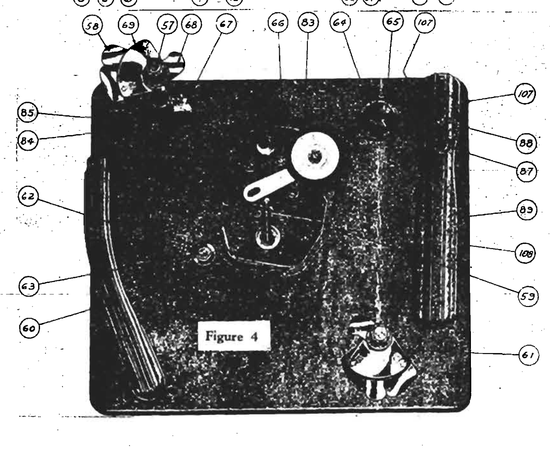


Figure 4

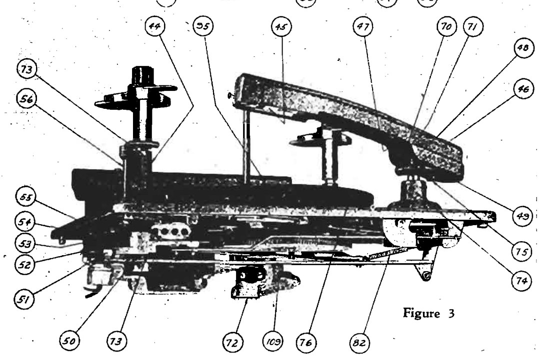
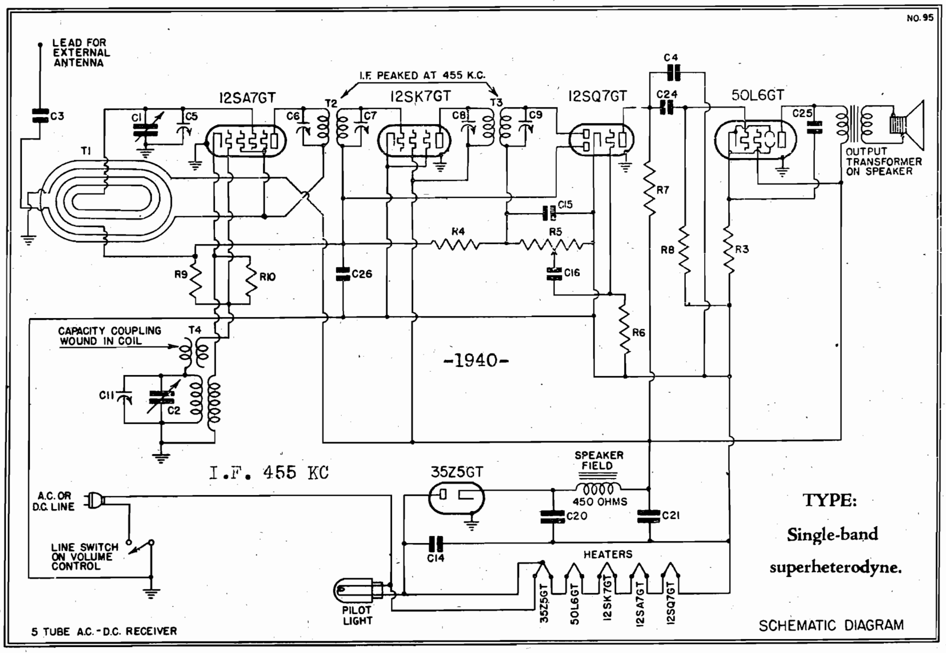


Figure 3

MODELS EP-367, EP-375, EP-381, EP-405, EP-406, Chassis EP

EMERSON RADIO & PHONOGRAPH CORP.

MODELS EL-360, EL-361, EL-362. EL-373 Chassis EL



If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.

TYPE OF TUBES:

1—12SA7GT, pentagrid oscillator-modulator
1—12SK7GT, first i-f amplifier
1—12SQ7GT, diode detector, a-f amplifier, a.v.c.
1—50L6GT, beam power output
1—35Z5GT, half-wave rectifier.

MODELS: EL-360, EL-361, EL-362 and EL-373

CHASSIS MODEL: EL

MODELS: EP-367, EP-375, EP-381, EP-405, EP-406

CHASSIS MODEL: EP

POWER SUPPLY: A.C. or D.C.
POWER CONSUMPTION: 30 watts.
VOLTAGE RATING: 105-125 volts.

T1	Loop antenna assembly (see prod. ch. No. 2)
T4	Oscillator coil (EL).
T4	Oscillator coil .
T2	Double-tuned 455 kc first i-f transformer (EL)...
T2	Double-tuned 455 kc first i-f transformer (EP)......
T3	Double-tuned 455 kc second i-f transformer (EL)
T3	Double-tuned 455 kc second i-f transformer (EP)
R2, R9	15 megohm ¼ watt carbon resistor...
R3	140 ohm ½ watt wire-wound resistor.
R4	3 megohm ¼ watt carbon resistor......
R5	Volume control .5 megohm with line switch (EL)
R5	Volume control .5 megohm with line switch (EP)
R7, R8	500,000 ohm ¼ watt carbon resistor.
R10	20,000 ohm ¼ watt carbon resistor....
C1, C2	Two-gang variable condenser (EL)...
C1, C2	Two-gang variable condenser (EP).
C3, C16	0.002 mf, 600 volt tubular condenser....
C4	0.0004 mf, 600 volt tubular or mica condenser..
C15	0.00022 mf mica condenser.....
C5, C11	Trimmers, part of variable condenser.
C6, C7, C8, C9	Trimmers, part of i-f transformers.
C14	0.05 mf, 400 volt tubular condenser.
C24	0.02 mf, 400 volt tubular condenser..
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (EL)
C20, C21	Dual 20 mf, 150 volt dry electrolytic condenser (EP)
C25	0.01 mf, 400 volt tubular condenser.
C26	0.1 mf, 200 volt tubular condenser..
8LS-493	4" dynamic speaker (EL) (see prod. ch. No. 1)
6WS-403C	4" dynamic speaker (EP).

PRODUCTION CHANGES

1. Chassis using speakers 6JS-368 or 6WS-403 may use 8LS-493 for replacement.
2. a. EP chassis bearing serial number above 4,133,831 use 8PW-324 loop antenna.
   b. Model EP-405 uses 8PW-332 loop antenna.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left 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 to the right of 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. In Model EL the trimmer on the front section is for the antenna coil (loop). In Model EP the trimmer on the rear section is for the antenna coil (loop). The oscillator coil is located directly beneath the speaker.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. The grid of the 12SA7GT tube may be reached by clipping the input lead to the stator lug of the antenna section.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop about 12 inches away from and parallel to the receiver loop antenna. Advance the input to the loop until a satisfactory deflection is obtained on the output meter. Adjust first the oscillator trimmer then the antenna trimmer for maximum response. If the loop antenna has been replaced it may be necessary to retrack the loop inductance. With the dial set at 60 feed 600 kc to the antenna lead. A portion of the outside may be swung to either side of the center to give maximum response. Repeat the trimmer alignment at 140.

FREQUENCY RANGE: 540-1600 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

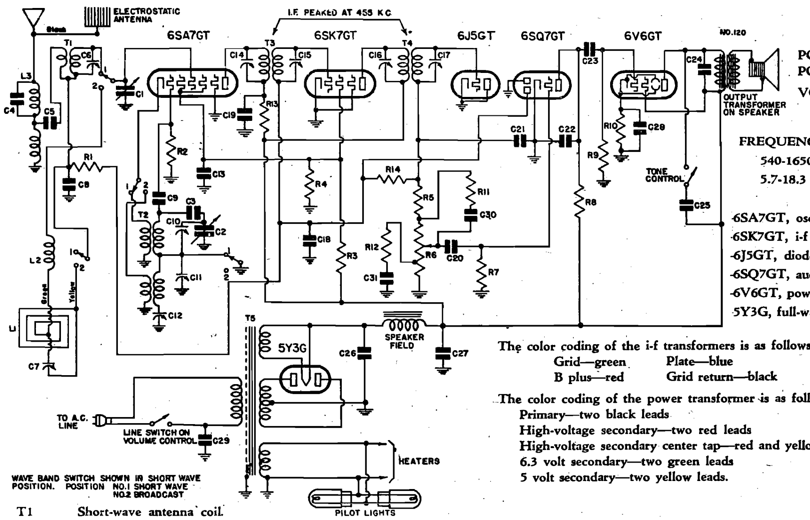
color coding of the i-f transformer leads

Grid—green   Plate—blue
Grid return—black   B plus—red

—EL-EP-S2

MODELS EQ-368, EQ-410
Chassis EQ

EMERSON RADIO & PHONOGRAPH CORP.



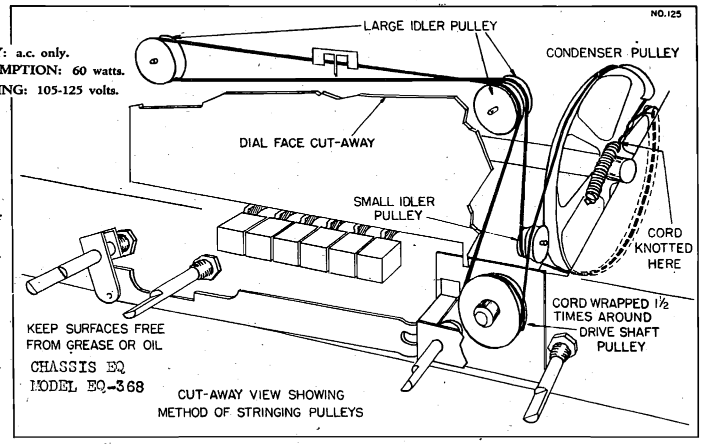
POWER SUPPLY: a.c. only.
POWER CONSUMPTION: 60 watts.
VOLTAGE RATING: 105-125 volts.

FREQUENCY RANGES:
540-1650 kc.
5.7-18.3 mc.

6SA7GT, oscillator-modulator
6SK7GT, i-f amplifier
6J5GT, diode detector, a.v.c.
6SQ7GT, audio amplifier
6V6GT, power output
5Y3G, full-wave rectifier.

The color coding of the i-f transformers is as follows:
Grid—green Plate—blue
B plus—red Grid return—black

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.



CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS

T1	Short-wave antenna coil.
T2	Two-band oscillator coil.
T3	Double-tuned 455 kc first i-f transformer.
T4	Double-tuned 455 kc second i-f transformer
T5	Power transformer
L1	Broadcast loop antenna
L2	Broadcast antenna loading coil.
L3	Antenna choke and 455 kc wave-trap
R1	100,000 ohm ¼ watt carbon resistor
R2	20,000 ohm ¼ watt carbon resistor.
R3	15,000 ohm 3 watt carbon resistor.
R4	40,000 ohm ¼ watt carbon resistor
R5	25,000 ohm ¼ watt carbon resistor.
R6	Volume control .5 megohm with line switch
R7	10 megohm ¼ watt carbon resistor
R8	250,000 ohm ¼ watt carbon resistor
R9, R11	500,000 ohm ¼ watt carbon resistor
R10	240 ohm 1 watt wire-wound resistor
R12	10,000 ohm ¼ watt carbon resistor
R13	1000 ohm ¼ watt carbon resistor.
R14	2 megohm ¼ watt carbon resistor.
C1, C2	Six-button tuning unit with two-gang variable condenser
C4	0.001 mf mica condenser—Part of L3
C5	0.01 mf, 400 volt tubular condenser.
C6	Trimmer, part of T1
C7	Trimmer, part of L1
C8	0.003 mf mica condenser.
C9	0.00011 mf mica condenser.
C10, C11	Dual oscillator trimming condenser.
C12	Single adjustable padding condenser.
C13, C19	0.1 mf, 400 volt tubular condenser.
C14, C15, C16, C17	Trimmers, part of i-f transformers
C18	0.05 mf, 200 volt tubular condenser.
C20	0.002 mf, 600 volt tubular condenser
C21, C22	0.0002 mf, 600 volt tubular or mica condenser
C23, C25	0.02 mf, 400 volt tubular condenser.
C24, C31	0.005 mf, 400 volt tubular condenser.
C26, C27, C28	Multiple dry electrolytic condenser. C26, 15 mf—450 volt; C27, 15 mf—350 volt; C28, 20 mf—25 volt
C28	0.01 mf, 400 volt molded condenser
C30	0.00005 mf mica condenser.
C3	0.002 mf mica condenser.

VOLTAGE ANALYSIS

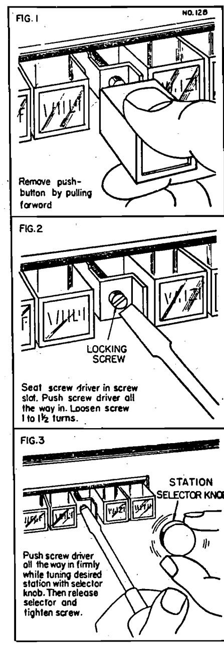
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	252	85	0	6.3 a.c.
6SK7GT	260	85	0	6.3 a.c.
6J5GT	0	—	0	6.3 a.c.
6SQ7GT	110	—	0	6.3 a.c.
6V6GT	245	260	14	6.3 a.c.

EQ-410
MODEL: EQ-368
CHASSIS MODEL: EQ

Voltage at 5Y3G filament to ground—330 volts.
Voltage across speaker field—70 volts.

PREADJUSTMENT OF PUSHBUTTONS FOR AUTOMATIC TUNING



Rotate the wave-band switch to the broadcast position, clockwise. Select six 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. Grasp the button firmly and remove it from its shaft by pulling straight out. See Fig. 1.

2. Insert a screw-driver into the slot of the locking screw. Press in and loosen the screw 1 to 1½ turns. See Fig. 2.

3. With the screw-driver seated in the screw slot, press the screw in as far as possible. Hold it in firmly with one hand and tune in the desired station with the other hand by pressing in and rotating the selector knob. See Fig. 3.

4. Release the selector knob and tighten screw firmly.

5. Check the adjustment by turning well past the station, using the selector knob, and then pushing in the button shaft. The station should come back in again clearly and with maximum volume.

After the adjustment is tested, check to see that the locking screw is tightened firmly. Replace the button on its shaft.

—EQ-S1 —EQ-S2

Location of Coils and Trimmer Adjustments

The first i-f transformer is the shorter and second i-f the taller of the two cans mounted on the left side of the chassis. The trimmers for both are accessible through holes in the tops of the cans.

The short-wave antenna coil is mounted just to the left of the variable condenser in front of the 6SA7GT tube. Its trimmer is mounted on the coil. The loop acts as the broadcast antenna coil. Its trimmer is accessible through a hole in the loop support board.

The oscillator coil for both bands is located beneath the chassis. Trimmers for both oscillators are mounted on a dual strip on the front center wall of the chassis. The left-hand trimmer is for short-wave and the right-hand trimmer for broadcast.

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 of the 6SA7 tube. Adjust the four i-f trimmers for maximum response. (The grid of the 6SA7 is connected to the stator of the antenna (center) section of the variable condenser.)

Short-Wave Alignment

(Short-wave alignment should precede broadcast alignment.) Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 18 and feed 18,000 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 antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

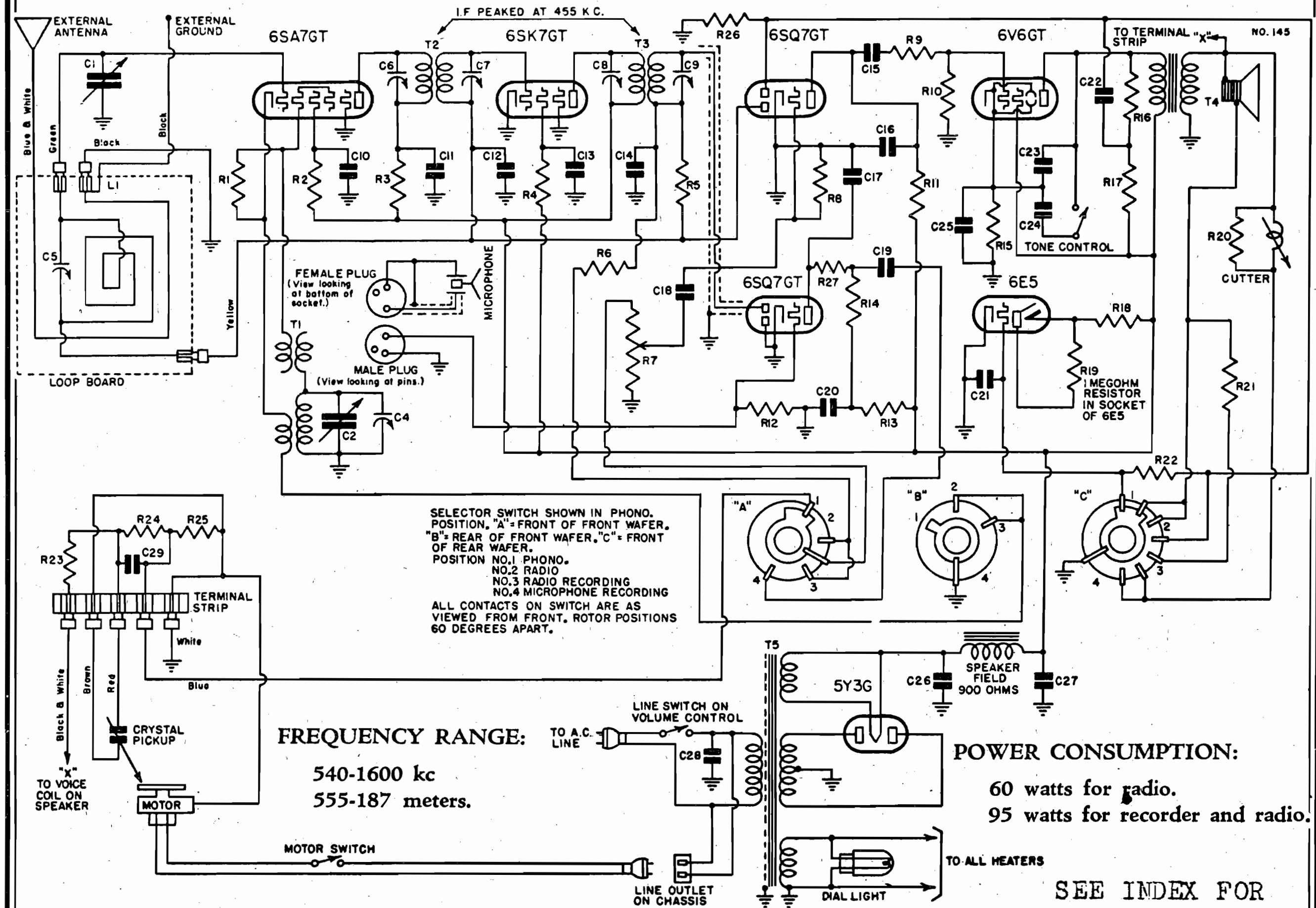
Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the pointer 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 pointer to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the loop trimmer for maximum response. Reset the pointer 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. (The broadcast padder is located on top of the chassis to the left of the variable condenser.)

The adjustable padding condenser for the broadcast band is mounted on the top of the chassis near the short-wave antenna coil. The short-wave band has a fixed padder, C3 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.

MODEL EV-384
Chassis EV

EMERSON RADIO & PHONOGRAPH CORP.



FREQUENCY RANGE:
540-1600 kc
555-187 meters.

POWER CONSUMPTION:
60 watts for radio.
95 watts for recorder and radio.

SEE INDEX FOR PHONO RECORDER DATA

TYPE: Portable single-band superheterodyne and phonograph recorder.

TYPE OF TUBES:

1—6SA7GT, oscillator-modulator
1—6SK7GT, i-f amplifier
†1—6SQ7GT, diode detector, microphone preamplifier and a.v.c.
1—6SQ7GT, audio amplifier
1—6V6GT, beam power output
1—5Y3G, full-wave rectifier

In addition, a 6E5 electron ray recording level indicator is used.

The color coding of the i-f transformers is as follows:

Grid—green | Plate—blue
B plus—red | Grid return—black

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.

A ground is necessary if the microphone is to be used for recording. Use the conventional method of grounding to a water pipe or steam radiator. Connect the ground to the flexible black lead emerging from the motor board.

VOLTAGE ANALYSIS

Voltage at 5Y3G filament to ground—325 volts.
Voltage across speaker field—70 volts.

***Actual operating voltages cannot be measured because of high resistance in circuit.**
†This tube is located in corner of chassis.

POWER SUPPLY: a.c. only. 60 cycle.

VOLTAGE RATING: 105-125 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 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	252	80	0	6.3 a.c.
6SK7GT	255	67	0	6.3 a.c.
6SQ7GT	100	—	0	6.3 a.c.
†6SQ7GT	*48	—	0	6.3 a.c.
6V6GT	247	255	12	6.3 a.c.

MODEL: EV-384

CHASSIS MODEL: EV

—EV—S1

MODEL EV-384
Chassis EV
MODELS ER-369, ER-370
Chassis ER

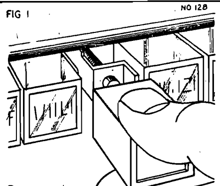
EMERSON RADIO & PHONOGRAPH CORP.

MODELS: ER-369 and ER-370 CHASSIS MODEL: ER

PREADJUSTMENT OF PUSHBUTTONS FOR AUTOMATIC TUNING

Rotate the wave-band switch to the broadcast position, clockwise. Select six nearby stations desired for automatic tuning. Choose one of these stations and any button to be adjusted for it. Follow the procedure outlined below.

FIG 1

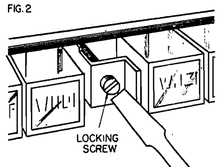


Remove push-button by pulling forward

1. Grasp the button firmly and remove it from its shaft by pulling straight out. See Fig. 1.

2. Insert a screw-driver into the slot of the locking screw. Press in and loosen the screw 1 to 1½ turns. See Fig. 2.

FIG.2



Seat screw driver in screw slot. Push screw driver all the way in. Loosen screw 1 to 1½ turns.

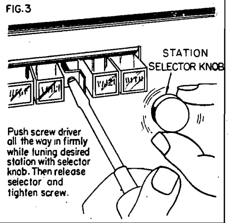
3. With the screw-driver seated in the screw slot, press the screw in as far as possible. Hold it in firmly with one hand and tune in the desired station with the other hand by pressing in and rotating the selector knob. See Fig. 3.

4. Release the selector knob and tighten screw firmly.

5. Check the adjustment by turning well past the station, using the selector knob, and then pushing in the button shaft. The station should come back in again clearly and with maximum volume.

After the adjustment is tested, check to see that the locking screw is tightened firmly. Replace the button on its shaft.

FIG.3



Push screw driver all the way in firmly while tuning desired station with selector knob. Then release selector and tighten screw.

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 of the 6SA7 tube. Clip input to stator lug of middle variable condenser section. Adjust the four i-f trimmers for maximum response.

Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the pointer 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 pointer to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Reset the pointer 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 re-adjustment is necessary return to 600 and repeat entire procedure.

Police Alignment

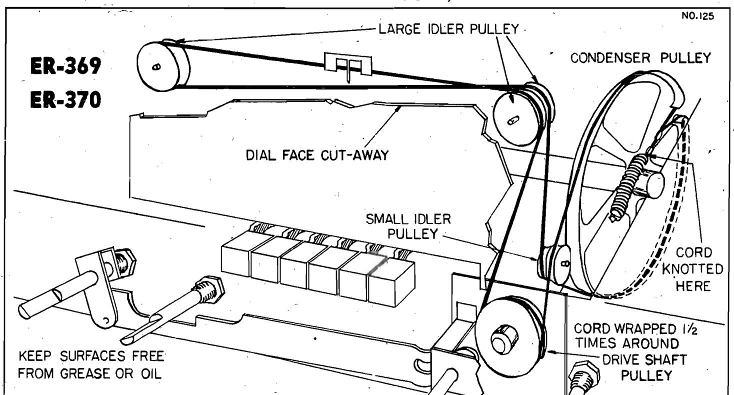
Set the wave-band switch at the police band (central) position and the pointer at 7.0. Feed 7000 kc to the antenna (using the dummy described above). Adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer 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 antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

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 in series with a 400 ohm carbon resistor for the police band dummy antenna and a 400 ohm non-inductive resistor for the short-wave band dummy antenna.

The adjustable padding condenser for the broadcast band is located on the top of the chassis near the 6SQ7 tube. The short-wave and police padders are fixed mica condensers. When replacing, be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the coils may not track.



CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS

String indicator pulleys (not shown) in same manner as ordinary dial drive.

On broadcast reception only, to tune in a station manually, the station selector knob must be pressed in while it is rotated.

T1	Police and short-wave antenna coil
T2	Three-band oscillator coil
T3	Double-tuned 455 kc first i-f transformer
T4	Double-tuned 455 kc second i-f transformer
T5	Power transformer
L1	Antenna choke and 455 kc wave-trap
L2	Broadcast loop antenna
L3	Broadcast antenna loading coil
R1	20,000 ohm ¼ watt carbon resistor
R2	50 ohm ¼ watt carbon resistor
R3	40,000 ohm ½ watt carbon resistor
R4	1,000 ohm ¼ watt carbon resistor
R5, R13	100,000 ohm ¼ watt carbon resistor
R6	15,000 ohm 3 watt carbon resistor
R7	2 megohm ¼ watt carbon resistor
R8, R16, R18	250,000 ohm ¼ watt carbon resistor
R9	20,000 ohm 1 watt carbon resistor
R10	1 megohm ¼ watt carbon resistor (in 6U5 socket)
R11	Volume control 2.5 megohm with line switch tapped at .4 meg. and 50,000 ohms
R12	15,000 ohm ¼ watt carbon resistor
R14	50,000 ohm ¼ watt carbon resistor
R15	15 megohms ¼ watt carbon resistor
R17, R19, R20	500,000 ohm ¼ watt carbon resistor
R21	25,000 ohm ¼ watt carbon resistor
R22	1,000 ohm 1 watt carbon resistor
R23	3 megohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser (complete with 6 push button assembly)
C7	0.01 mf, 400 volt tubular condenser
C8	0.001 mf mica condenser (part of L1)
C3, C13	0.003 mf mica condenser
C4, C5	Dual trimmer strip
C6	Loop antenna trimming condenser.
C9	0.002 mf mica condenser
C10, C11, C12	Trimmer, part of oscillator coil.
C14	Single adjustable padding condenser Range: 400-700 mmf
C15, C24, C30	0.00011 mf mica condenser
C16, C23	0.1 mf, 400 volt tubular condenser
C17, C18, C19, C20	Trimmers, part of i-f transformers.
C21, C34, C35	0.05 mf, 400 volt tubular condenser
C22, C41	0.05 mf, 200 volt tubular condenser
C25	0.00006 mf mica condenser
C26, C28	0.02 mf, 400 volt tubular condenser
C27, C29, C32, C36	0.002 mf, 600 volt tubular condenser
C31, C33	0.005 mf, 400 volt tubular condenser
C37, C38, C39	Triple 15 mf dry electrolytic condenser. C37—250 volt; C38 and C39—400 volt
C40	0.01 mf, 400 volt molded condenser
R24	3 megohm ¼ watt carbon resistor
R25	2 megohm ¼ watt carbon resistor
R26	1,000 ohm ¼ watt carbon resistor
C42	0.0005 mf mica condenser

MODEL: EV-384 CHASSIS MODEL: EV

T1	Oscillator coil
T2	Double-tuned 455 kc first i-f transformer
T3	Double-tuned 455 kc second i-f transformer.
T4	Output transformer
T5	Power transformer
L1	Loop antenna assembly
R1	20,000 ohm ¼ watt carbon resistor
R2	20,000 ohm 2 watt carbon resistor
R3	1000 ¼ watt carbon resistor
R4	100,000 ohm ½ watt carbon resistor
R5, R24	3 megohm ¼ watt carbon resistor
R6, R9, R17	50,000 ohm ¼ watt carbon resistor
R7	Volume control .5 megohm with line switch.
R8, R12	10 megohm ¼ watt carbon resistor
R10, R26	500,000 ohm ¼ watt carbon resistor
R11	200,000 ohm ¼ watt carbon resistor
R13, R14, R25, R27	250,000 ohm ¼ watt carbon resistor
R15	240 ohm 1 watt wire-wound resistor
R16	560,000 ohm ¼ watt carbon resistor
R18	20,000 ohm 1 watt carbon resistor
R19	1 megohm resistor in 6E5 socket
R20	23 ohm ½ watt wire-wound resistor
R21	45 ohm ½ watt wire-wound resistor
R22	1 megohm ¼ watt carbon resistor
R23	2 megohm ¼ watt carbon resistor
R24	3 megohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser
C4	Oscillator trimmer, on variable condenser.
C5	Antenna trimmer, part of loop assembly.
C6, C7, C8, C9	Trimmers, part of i-f transformers.
C10, C13, C22	0.05 mf, 400 volt tubular condenser
C11	0.1 mf, 400 volt tubular condenser
C12	0.05 mf, 200 volt tubular condenser
C14	0.00011 mf, mica condenser
C15	0.02 mf, 400 volt tubular condenser
C16	0.00006 mf, mica condenser
C17	0.00022 mf, mica condenser
C18	0.002 mf, 600 volt tubular condenser
C19	0.01 mf, 400 volt tubular condenser
C20	0.5 mf, 400 volt tubular condenser
C21	0.25 mf, 100 volt tubular condenser
C23	0.005 mf, 1000 volt tubular condenser
C24	0.035 mf, 1000 volt tubular condenser
C25, C26, C27	Multiple dry electrolytic condenser. C25—20 mf, 25 volt; C26—15 mf, 450 volt; C27—15 mf, 350 volt.
C28	0.01 mf, 400 volt molded condenser
C29	0.000026 mf mica condenser

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted beneath the chassis. The trimmers are accesible through holes in the rear of the chassis.

The oscillator coil is mounted underneath the chassis. The oscillator trimming condenser is located on the front section of the variable condenser.

The trimmer for the loop winding is mounted on the loop board. It is accessible through a hole in the rear of the cabinet and should be trimmed when the chassis is mounted in its position.

I-f Alignment

Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid of the 6SA7GT tube. Adjust the four i-f trimmers for maximum response.

Note: The grid of the 6SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

R-f Alignment (LOOP ALIGNMENT)

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (located on the loop board) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

Radio

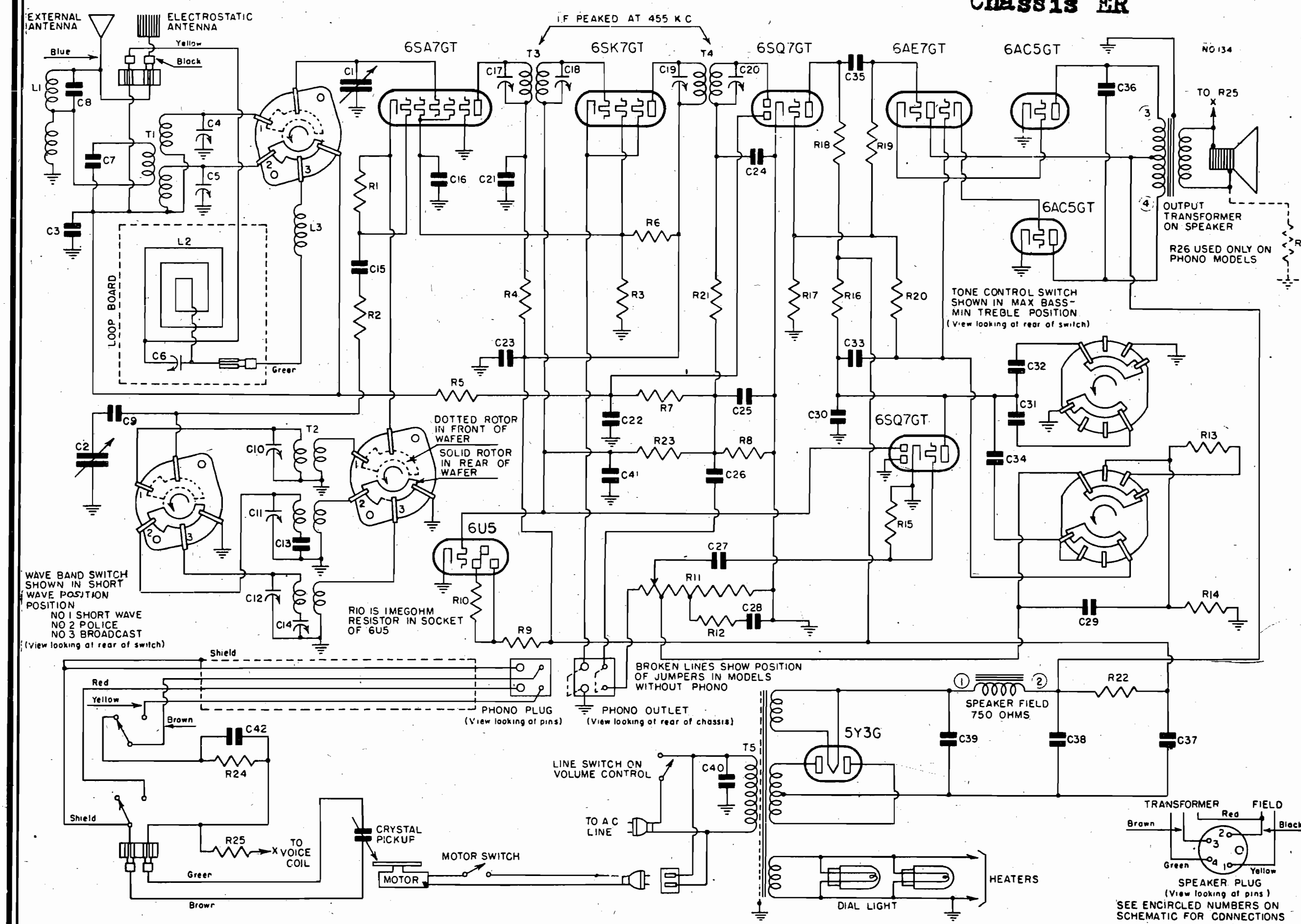
With the selector switch in "Radio" position the receiver can be used as any ordinary radio. The electron ray indicator near the top of the panel is a level indicator for recording and is not intended for use as a tuning indicator.

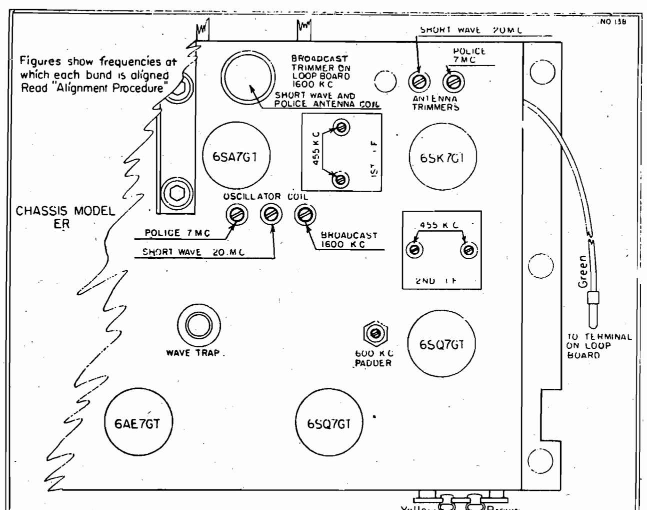
Phonograph Operation

With the selector switch in the "Phonograph" position the receiver may be used as to reproduce records up to 12". Never use the cutting needle in the reproducing pick-up since this will immediately ruin the records.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS
ER-369, ER-370
Chassis ER





CUT-AWAY VIEW SHOWING LOCATION OF TRIMMERS

VOLTAGE RATING: 105-125 volts.
POWER SUPPLY: A.C. only.
POWER CONSUMPTION:
85 watts for receiver.
120 watts for combination.

FREQUENCY RANGES:
540-1630 kc.
2.3-7.5 mc.
6.9-22.3 mc.

6SA7GT, oscillator-modulator
6SK7GT, i-f amplifier
6SQ7GT, diode detector, audio amplifier and a.v.c.
6SQ7GT, audio amplifier
6AE7GT, audio amplifier
6AC5G, power output
5Y3G, full-wave rectifier.
6U5 electron-ray tuning indicator.

VOLTAGE ANALYSIS

Voltage at 5Y3 filament to ground—345 volts.
Voltage drop across speaker field—90 volts.
†Same voltage for each tube.
*Same voltage for both cathodes.

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 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

MODELS: ER-369 and ER-370

CHASSIS MODEL: ER

—ER-S1 —ER-S2

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	235	72	0	6.3
6SK7GT	235	72	0	6.3
†6SQ7GT	75	—	0	6.3
*6AE7GT	255	—	12	6.3
*†6AC5GT	245	—	0	6.3

EMERSON RADIO & PHONOGRAPH CORP.

RECORD CHANGER ADJUSTMENTS

1. PICKUP DOES NOT INDEX PROPERLY ON TEN-INCH OR TWELVE-INCH RECORDS.

(a) Adjustment for correct indexing of 10-inch records:

1. Swing tone arm outward until tone arm lever assembly (Item 19, Fig. 1) latches with tone arm latch lever (Item 18, Fig. 1) which is held to tone arm shaft (Item 77, Fig. 1) by two set-screws.

2. Make sure these set-screws are tight and that there is a slight play between the tone arm lever assembly and the panel (Item 5, Fig. 1. This will give proper clearance at ball race assembly (Item 74, Fig. 3).

The tone arm lever assembly (Item 19, Fig. 1) is held against tone arm latch lever (Item 18, Fig. 1) by the tension of tone arm locator lever spring (Item 16, Fig. 1).

3. Next loosen the clamping screw in the Swivel Bracket Assembly (Item 46, Fig. 3).

4. Now move tone arm (Item 60, Fig. 4) until its outside edge is ⅜" from the outside edge of the panel (Item 5, Fig. 1) and retighten screw securely.

2. RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE AT END OF RECORD.

(a) Worn or Damaged Stop Groove: If the stop groove in the record is worn out or damaged, discard such a record.

(b) Cut-off Adjustment May Be Incorrect: The Record Changer should go into its changing cycle when the needle enters the stop groove and has traveled to within a distance of 1⅞" from the center of the turntable shaft.

If the Record Changer does not go into its changing cycle when the needle has reached the above mentioned distance, the Tone Arm Trip Lever Shoe (Item 23, Fig. 1) should be moved toward the outside edge of the panel. To do this, it is necessary to loosen the thumb nut (Item 22, Fig. 1) and then retighten after adjustment has been made.

If the Record Changer goes into its changing cycle before the needle has reached a distance of 1⅞" from the center of the turntable, the Tone Arm Trip Lever Shoe should be moved inward toward the center of the Record Changer.

3. RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE WHEN SWITCH KNOB IS TURNED ON.

When the switch is turned to "ON" the Record Changer should start its changing cycle. If it does not, the following points should be checked.

1. Make sure motor is running.

2. Check Trip Rod (Item 32, Fig. 1), to make sure it releases Trip Lever Assembly (Item 20, Fig. 1) from Engagement Clutch Cam Assembly (Item 79, Fig. 2) when Switch Knob is being turned on. If Trip Lever Assembly is not released, Trip Rod should be shortened by bending until Trip Lever clears Engagement Clutch Cam Assembly, when Switch Knob is turned.

3. Make sure that Clutch Reset Pawl (Item 40, Fig. 2) clears Drive Link Assembly (Item 31, Fig. 1).

4. RECORD CHANGER CONTINUES TO REPEAT ITS CHANGING CYCLE WITHOUT PLAYING RECORDS.

(a) Trip Lever Assembly (Item 20, Fig. 1) does not latch in Engagement Clutch Cam Assembly (Item 79, Fig. 2) which may be due to causes listed below:

1. Trip Rod (Item 32, Fig. 1) may be bent so that it is too short, holding Trip Lever Assembly from contacting Engagement Clutch Cam Assembly.

2. Springs (Item 24 or 35, Fig. 1) may be disconnected.

5. NO SOUND WHEN NEEDLE IS ON MOVING RECORD.

1. Muting Switch (Item 26, Fig. 1) may be out of adjustment. The contacts of this switch should be open whenever its long blade is not resting on the shoe of the Engagement Clutch Cam Assembly (Item 79, Fig. 2). If the contacts remain closed after the long blade has left the shoe, they should be adjusted by bending until there is a separation of approximately 1/32".

Switch should be checked to make sure contacts are closed when long blade is resting on the shoe of the Engagement Clutch Cam Assembly.

2. The lugs on the Muting Switch may have been bent together.

3. Pickup cartridge in Tone Arm may have been damaged or may be defective.

6. TONE ARM ADJUSTMENTS FOR 12" RECORDS.

1. Turn both Control Knobs until the arrows marked "12" are pointing toward the center of the turntable.

2. Place a 12" record on the turntable.

3. Start Record Changer and note where needle contacts record. Correct contacting is about ⅜" from the outside edge of record.

4. Set Rod (Item 56, Fig. 3) is operated by Selector Arm (Item 61, Fig. 4). The 12" Set Link (Item 10, Fig. 1) operates as a stop when Record Changer is set for 12" records. When Tone Arm Locator Assembly (Item 12, Fig. 1) contacts 12" Set Link the Tone Arm should be in the correct position to play a 12" record.

If at this point, the position of Tone Arm is incorrect, loosen the screw which holds the Tone Arm Locator Shoe 12" (Item 14, Fig. 1) and move in either direction as required and tighten screw.

7. TONE ARM ADJUSTMENTS FOR 10" RECORDS.

1. Turn both knobs until the arrows marked "10" are pointing toward the center of the turntable.

2. Place a 10" record on the turntable and start Record Changer.

3. Note where needle contacts record. Correct contacting is about ⅜" from the outside edge of record. If contacting of needle is not correct as mentioned, loosen the screw which holds Tone Arm Locator Shoe 10" (Item 15, Fig. 1) and slide shoe in or out as required, then tighten screw.

8. TONE ARM HEIGHT ADJUSTMENTS.

Set the Record Changer for 10" records, turn Switch to "ON" and allow Record Changer to go through a changing cycle with no record on the turntable. The clearance between Turntable and the bottom surface of the Tone Arm should be approximately ⅜". Usually this clearance can be obtained by adjusting the Tone Arm Adjustment Screw (Item 70, Fig. 3). It is well to check the following points before making any adjustment.

Check clearance between Roller (Item 51, Fig. 3) and Selector Crank Shaft Assembly (Item 7, Fig. 1). There should be approximately 1/32" clearance at this point. If the clearance is greater, it would be due to the pressure on the Spring Washer (Item 50, Fig. 3) being too great. This will prevent the Tone Arm Lifter Reset Spring (Item 82, Fig. 3) from returning the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) sufficiently. To relieve the pressure on the Spring Washer, lower the Selector Shaft Collar (Item 6, Fig. 1) slightly.

9. TONE ARM LOWERS ON RECORD TOO SUDDENLY.

If the Tone Arm lowers too suddenly, the Spring Washer (Item 50, Fig. 3) which is located between the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) and Selector Shaft Crank Assembly Post (Item 7, Fig. 1) is not under sufficient pressure. The set-screws in the Selector Shaft Collar (Item 6, Fig. 1) should be loosened and the Selector Shaft Collar pressed upward slightly and set-screws tightened.

10. LUBRICATION.

(a) Motor: The motor is equipped with oil-less bearing and requires no lubrication.

(b) Turntable Spindle Bearings: Are lubricated at the factory and do not require any lubrication for one year. After one year they should be oiled with 1 or 2 drops of a light grade oil.

The top bearing can be oiled by lifting off turntable. Make sure when replacing turntable to see that pin in Turntable Spindle slips into slot on bottom surface of turntable hub and also care should be taken not to injure Rubber Idler Drive Wheel.

Never, under any circumstance, allow oil to come in contact with Rubber Idler Drive Wheel.

(c) Squeak Due To Records Rubbing On Turntable Spindle: This can be eliminated by gently lining up the stack of records.

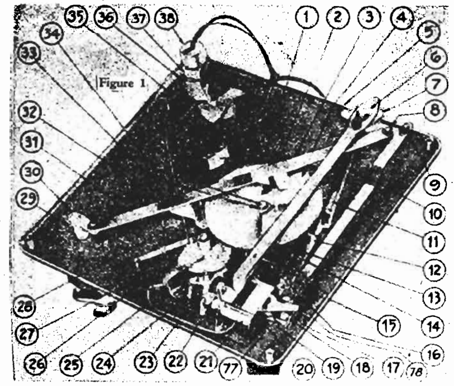


Figure 1

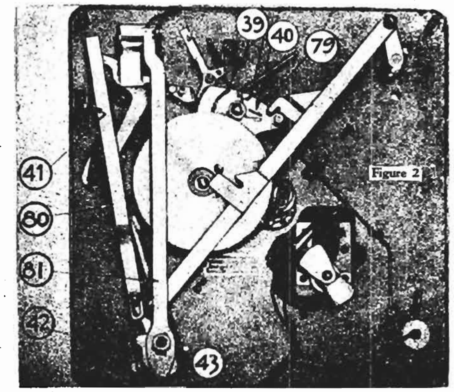


Figure 2

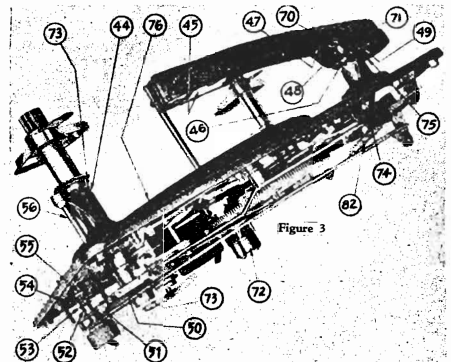


Figure 3

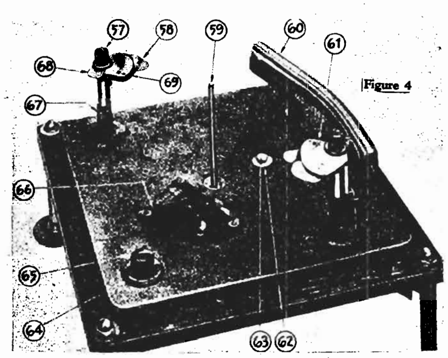


Figure 4

Automatic Phonograph Operation

1. Turn the radio on in the regular manner and then rotate the radio-phono switch to the phonograph position, counter-clockwise.

2. The selector arms on the record holder posts are free to rotate when the posts are lifted by means of the control knobs. (See Fig. 5) For 10" records lift the posts and rotate until the 10" arrows on the arms point to the center of the turntable. For 12" records, rotate the posts so that the 12" arrows point to the center of the turntable. Both posts must be set for the same size record.

3. Two Emerson Multi-Playing phonograph needles are supplied with each combination. Each of these needles is good for 25 playings with high quality of reproduction and minimum record wear. Insert one of these needles all the way in the tone arm, fastening it securely by means of the small set-screw provided. It is important, once a needle has been removed from the tone arm, that it never be reinserted in the tone arm.

4. Check to see that the selector arms are set correctly for the size record to be played and load the records over the motor spindle so that they rest on top of the selector arms. Be sure the records are all of one size. Up to fourteen 10-inch records or ten 12-inch records may be used at one loading. It is not necessary to place a record on the turntable.

5. Turn the switch knob on the metal panel to the "on" position. The turntable should start to revolve.

6. The first record should drop into place and the tone arm should swing into place on the record. If it does not, push the switch knob down once.

7. To reject a record at any time, all that is necessary is to push down on the switch knob.

8. The volume should be adjusted to the desired level by means of the regular receiver volume control.

9. During operation, the cabinet lid should be closed to eliminate mechanical noises due to needle vibration.

10. 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 cycles before the switch is turned off. Then lift the pickup, swing the arm to the rgiht beyond the edge of the record and lower it.

11. Grasp each post by its knob and rotate until the record holder arms are clear of the turntable. (See Fig. 6.) The records may then be removed

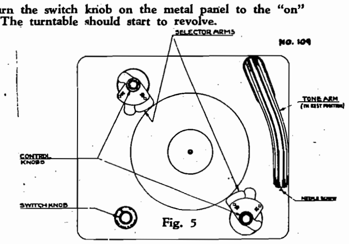


Fig. 5

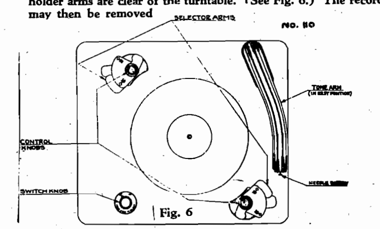
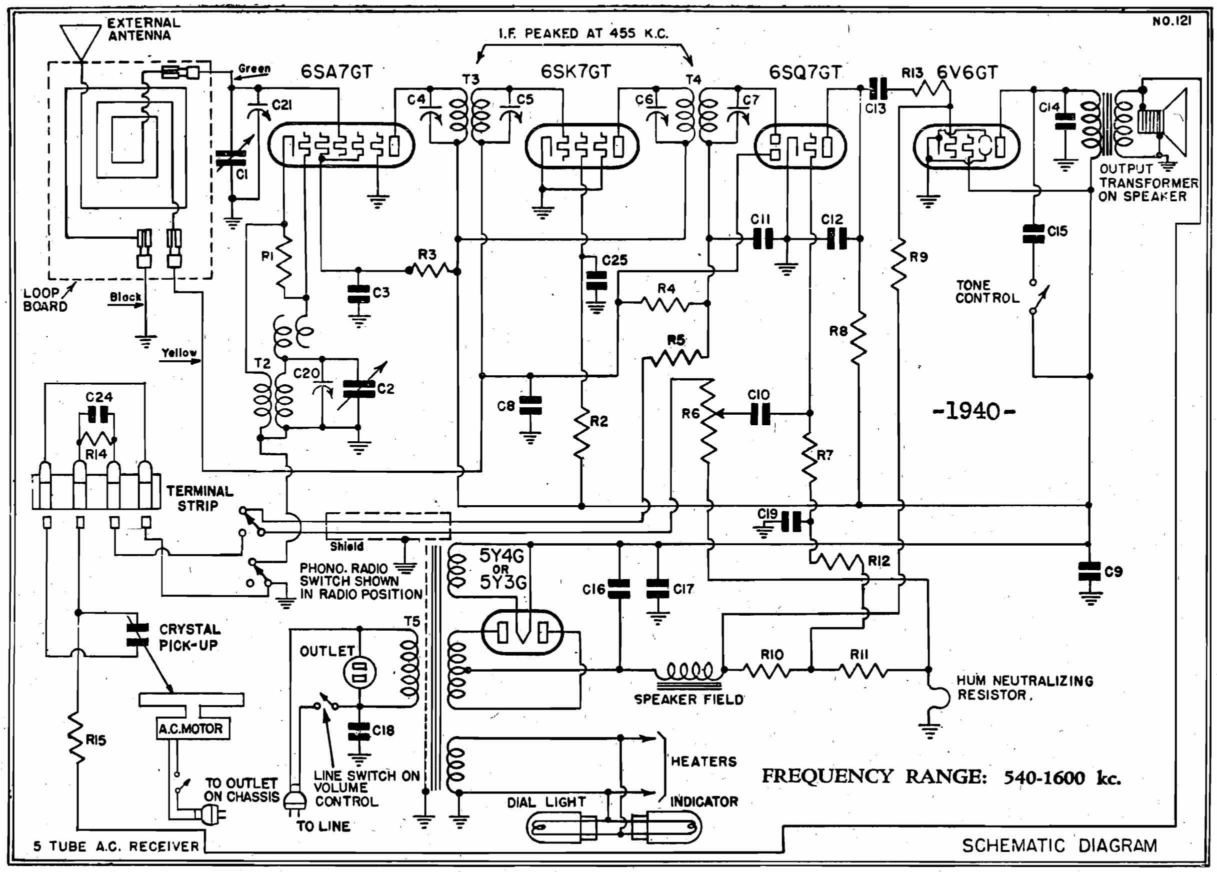
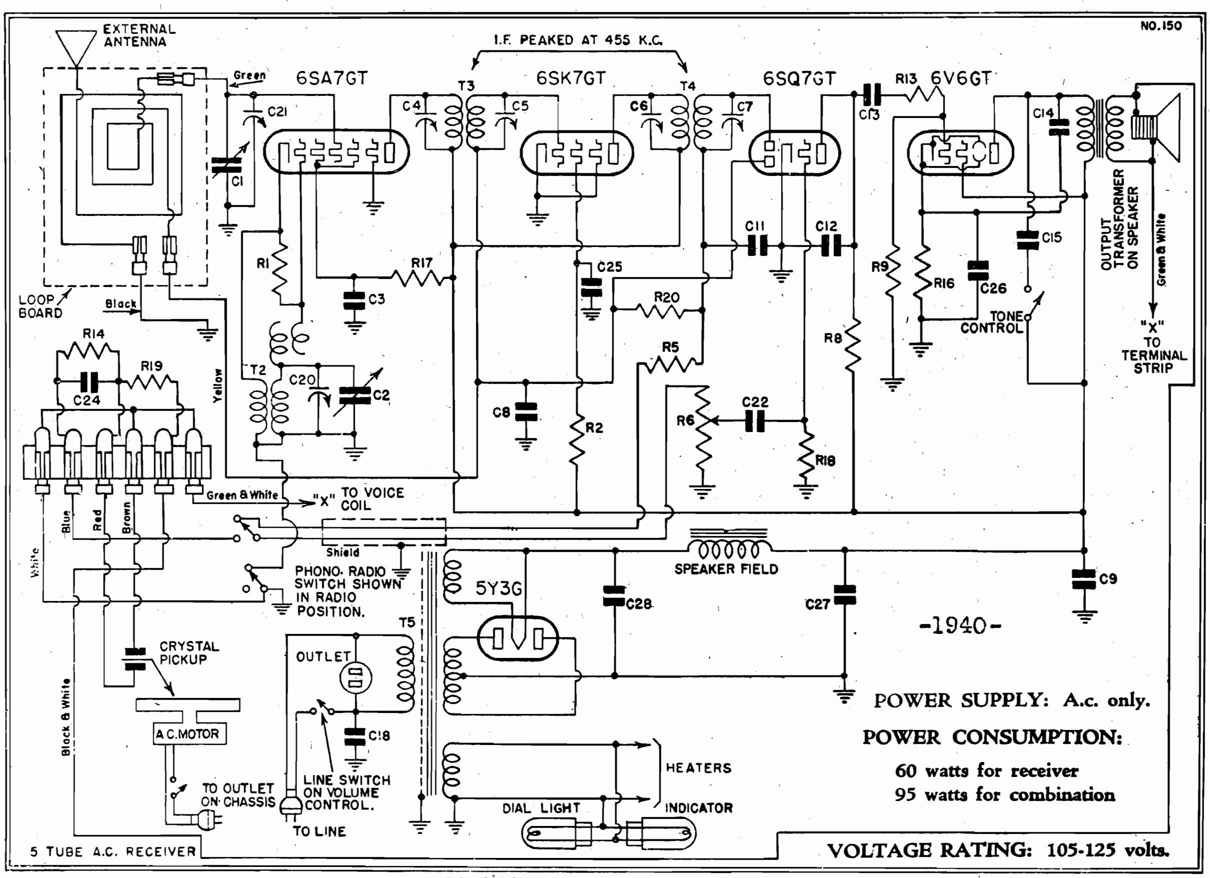


Fig. 6

EMERSON RADIO & PHONOGRAPH CORP. MODELS ES-374, ES-397 Chassis ES



SCHEMATIC DIAGRAM No. 1



SCHEMATIC DIAGRAM No. 2

MODELS
ES-374, ES-397
Chassis ES

EMERSON RADIO & PHONOGRAPH CORP.

T1	Loop antenna assembly
T2	Oscillator coil
T3	Double-tuned 455 kc first i-f transformer
T4	Double-tuned 455 kc second i-f transformer.
T5	Power transformer
R1	20,000 ohm ¼ watt carbon resistor
R2	20,000 ohm 3 watt carbon resistor (see prod. change no 1a)
R3	100,000 ohm ½ watt carbon resistor
R4	3 megohm ¼ watt carbon resistor
R5	25,000 ohm ¼ watt carbon resistor
R6	Volume control .25 megohm with line switch
R7, R14, R15	2 megohm ¼ watt carbon resistor
R8	250,000 ohm ¼ watt carbon resistor
R9, R12	500,000 ohm ¼ watt carbon resistor (see prod. change no. 1b)
R10	180 ohm 1 watt wire-wound resistor (see prod. change no. 1a)
R11	23 ohm ½ watt wire-wound resistor (see prod. change no. 1a)
R13	50,000 ohm ¼ watt carbon resistor
R16	240 ohm 1 watt wire-wound resistor
R17	20,000 ohm 2 watt carbon resistor
R18	15 megohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser (see prod. change no. 1a)
C3, C25	0.05 mf, 400 volt tubular condenser
C4, C5, C6, C7	Trimmers, part of i-f transformers.
C8	0.05 mf, 200 volt tubular condenser
C9	0.1 mf, 400 volt tubular condenser
C10	0.006 mf, 600 volt tubular condenser (see prod. change no. 1c)
C11, C12	0.0002 mf, 600 volt tubular or mica condenser
C14	0.005 mf, 1000 volt tubular condenser
C13, C15	0.02 mf, 400 volt tubular condenser
C16	16 mf, 450 volt dry electrolytic condenser
C17	16 mf, 400 volt dry electrolytic condenser
C18	0.01 mf, 400 volt tubular condenser
C19	0.25 mf, 100 volt tubular condenser (see prod. change no. 1c)
C20	Trimmer, part of loop antenna assembly.
C21	Trimmer, part of variable condenser.
C23	0.002 mf, 600 volt tubular condenser
C24	0.00006 mf mica condenser
C26, C27, C28	Multiple dry electrolytic condenser; C26—20 mf, 25 volt; C27—15 mf, 350 volt; C28—16 mf, 400 volt (see prod. change no. 1e)
TTS-111V	Phono-radio switch
3ES-256J	Tone control switch
8SS-519	12" dynamic speaker

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis. The trimmers are accessible through holes in the rear of the chassis.

The oscillator coil is mounted underneath the chassis. The oscillator trimmer is located on the front variable condenser section.

The loop antenna acts as the antenna coil. Its trimmer is mounted on the loop board.

FOR AUTOMATIC RECORD CHANGER ADJUSTMENTS SEE INDEX

Automatic Record Changer

This record changer is provided with two trip mechanisms so that automatic changing can be secured from records with the conventional Eccentric Center Groove or with records lacking the Eccentric Center Groove, but which are recorded sufficiently near the center so that the Positive Trip comes into operation.

1. **THE RATCHET TRIP**

The Ratchet Trip requires no adjustment, as its range of operation is greater than that of any standard records.

2. **THE POSITIVE TRIP**

The Positive Trip can be adjusted to operate at a definite point from the center spindle in the following manner: Remove the button covering the hole on the left side of the pick-up arm. Using a small screw-driver rotate the screw-head appearing thru this hole. (Caution: This screw can be rotated only one-half turn or 180 degrees. Therefore, slight adjustments are all that should be required.) A slight turn to the right or in a clockwise direction makes the trip operative earlier in the playing cycle or farther from the center of the record. Turning this screw slightly to the left or in a counter-clockwise direction causes the positive trip to set later in the playing cycle or nearer to the center of the record. The exact adjustment can be determined only by playing a record with its last groove located at the desired distance from its center.

3. **TONE ARM DROP POINT**

This record changer is provided with an adjustment controlling the position at which the Tone Arm is dropped on the outer edge of the record. This adjustment has a constant relationship for 10- or 12-inch records. Therefore, one adjustment on either diameter of record is sufficient. To make this adjustment, remove the button on the right side of the pick-up arm and with a small screw-driver, rotate the exposed screw-head slightly. (Caution: This screw also can be rotated only one-half turn or 180 degrees. Therefore, slight adjustments are all that should be required.) Turning to the right or in a clockwise direction causes the needle to drop farther from the edge of the record. Turning to the left or counter-clockwise direction causes the needle to drop nearer the edge of the record. The proper position for the needle to drop is approximately ⅛" from the edge of the record and in the blank space at this point; that is, in the space at the edge of the record where there are no grooves.

4. **TONE ARM LIFT**

This record changer is designed so that the pickup will start at the proper position on the top record of twelve 10-inch records on the turntable. This is based upon the use of a needle which is inserted with approximately 5/16" protruding from the underside of the tone arm. Adjustment for this is readily available by lifting the tone arm to its maximum position. Turning the hexagon headed screw thus exposed on the underside of the tone arm makes the adjustment. Turning the screw to the left or counter-clockwise raises the operating position of the tone arm and turning the screw to the right, or clockwise, lowers its position.

Refer to the diagram at the right and become familiar with the parts to be handled during automatic phonograph operation. To play any series of records proceed as follows:

1. Turn the radio on in the regular manner and then rotate the radio-phono switch to the phonograph position, counter-clockwise.
2. The record holder posts are free to rotate when the posts are lifted. Turn both posts until they snap into a locked position.
3. Insert a needle all the way in the tone arm, fastening it securely by means of the small set-screw provided. It is important, once a needle has been removed from the tone arm, that it never be reinserted in the tone arm.
4. Load the records over the motor spindle so that they rest on top of the record platforms. Up to twelve 10-inch records or ten 12-inch records may be used at one loading. It is not necessary to place a record on the turntable.
5. Move the Control Button to "Rej" (reject) position and release. The turntable should start to revolve.
6. The first record should drop into place and the tone arm should swing into place on the record.
7. To reject a record at any time, all that is necessary is to push the control button to "Rej."
8. The volume should be adjusted to the desired level by means of the regular receiver volume control.
9. During operation, the cabinet lid should be closed to eliminate mechanical noises due to needle vibration.
10. 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 cycles before the switch is turned off. Then lift the pickup, swing the arm to the right beyond the edge of the record and lower it.
11. Lift each post and rotate until the record platforms are clear of the turntable. The records may then be removed.

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 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

VOLTAGE ANALYSIS

Tube	Plate	Screen	Cathode	Fil.
6SA7	255	100	0	6.3 a.c.
6SK7	255	85	0	6.3 a.c.
6SQ7GT	110	—	0	6.3 a.c.
6V6	245	255	*12	6.3 a.c.

In chassis below 3,923,600 *6V6 cathode voltage is zero on chassis below 3,923,600. In chassis above 3,923,600:

Voltage from power transformer center tap to ground—85 volts (negative). Voltage across field—70 volts

Voltage across resistors R10 and R11—15 volts (negative). Voltage at 5Y3 filament to ground—325

PRODUCTION CHANGES

1 For chassis bearing serial numbers above 3,923,600

(a) This part is not used. (refer to schematic diagram no. 2)
(b) Resistor R12—.5 megohm is not used.
(c) Condenser C10—.006 mf; C19—.25 mf; are not used.
(d) This variable condenser is used. Chassis below 3,923,600 use 8SC-507.
(e) This electrolytic is used. Chassis below 3,923,600 use:
C16—7AC-443—16 mf, 450 volt
C17—7AC-444—16 mf, 400 volt

MODELS: ES-374 and ES-397

CHASSIS MODEL: ES

TYPE OF TUBES:

1—6SA7GT, oscillator-modulator
1—6SK7GT, i-f amplifier
1—6SQ7GT, diode detector, audio amplifier and a.v.c.
1—6V6GT, power output
1—5Y3G, full-wave rectifier.
Chassis below 3,923,600 use 5Y3G or 5Y4G

I-f Alignment

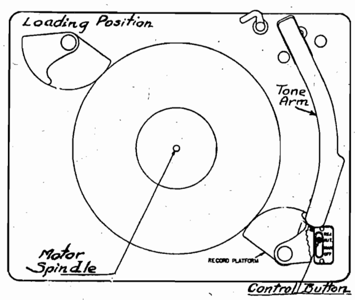
Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 6SA7 tube is connected to the stator lug of the rear variable condenser section.

R-f Alignment

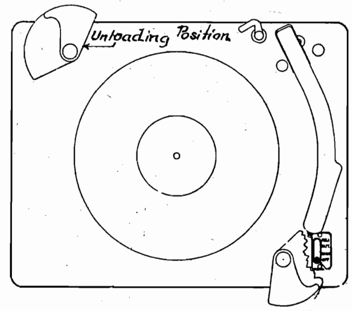
Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.



Manual Operation

First lift the record holder posts upward and turn them so that no portion of them overhangs the Record Turntable. Place the record over the Center Spindle. Push the Control Button to the first or Manual position and place the Tone Arm in the Starting Groove. When the record has been played thru, return the Tone Arm to its rest position and the Control Button to its "Off" position.



SPECIAL PRECAUTIONS

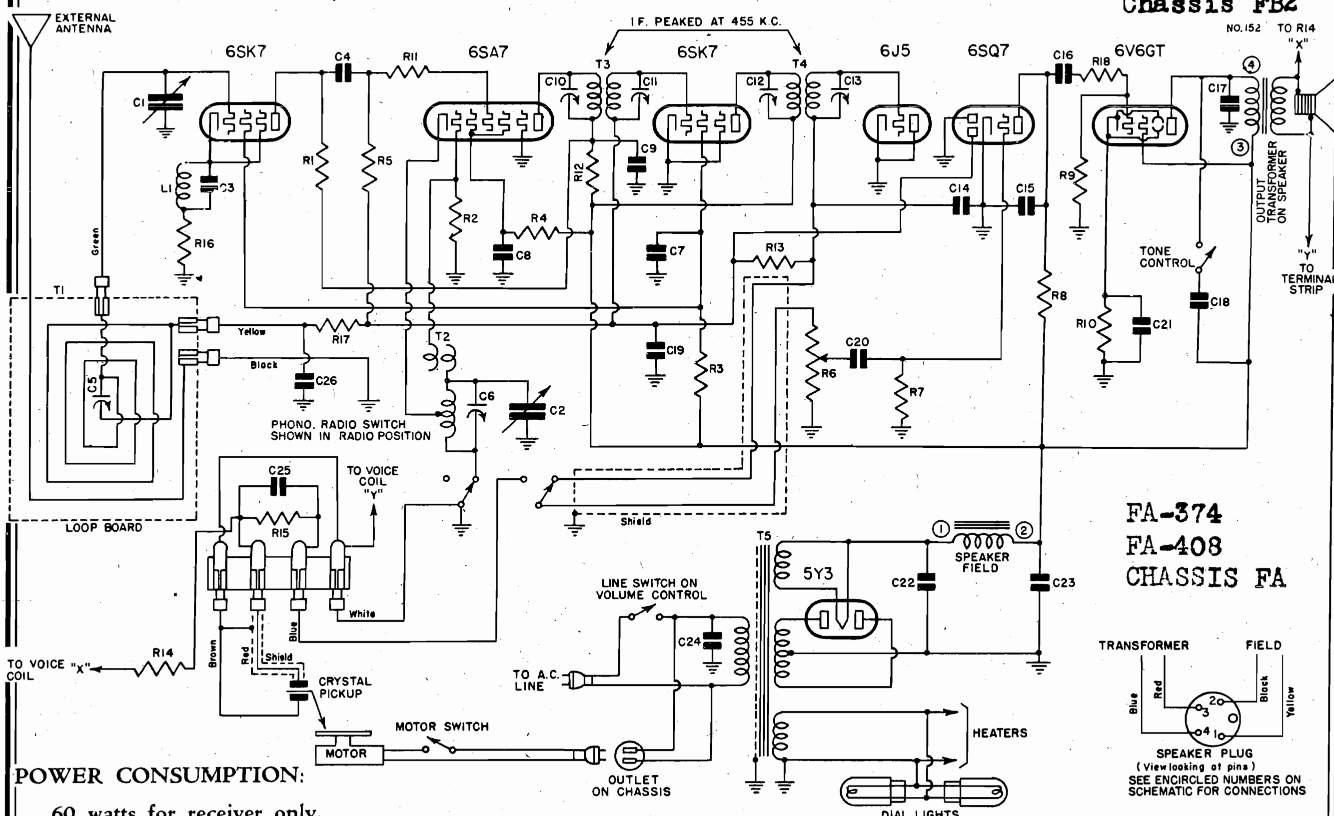
The following precautions are of the utmost importance and should be carefully observed:

1. Do not handle or move manually the pickup or any part of the mechanism while it is going through the record-changing operation.
2. Do not use force in handling the mechanism at any time.
3. Off-standard thickness or warped records should not be used for automatic operation.
4. 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.
5. Never leave tone arm with needle resting on a record or on the turntable. When finished playing, be sure that the turntable has stopped and the pickup is in the rest position.
6. For playing ten or more records at one set-up, as with this changer, no attempt should be made to use ordinary steel or fibre points, since continued use of worn points will be likely to ruin both quality of reproduction and the records as well.
7. 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.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS FA-374, FA-408
Chassis FA

MODEL FB2-374
Chassis FB2



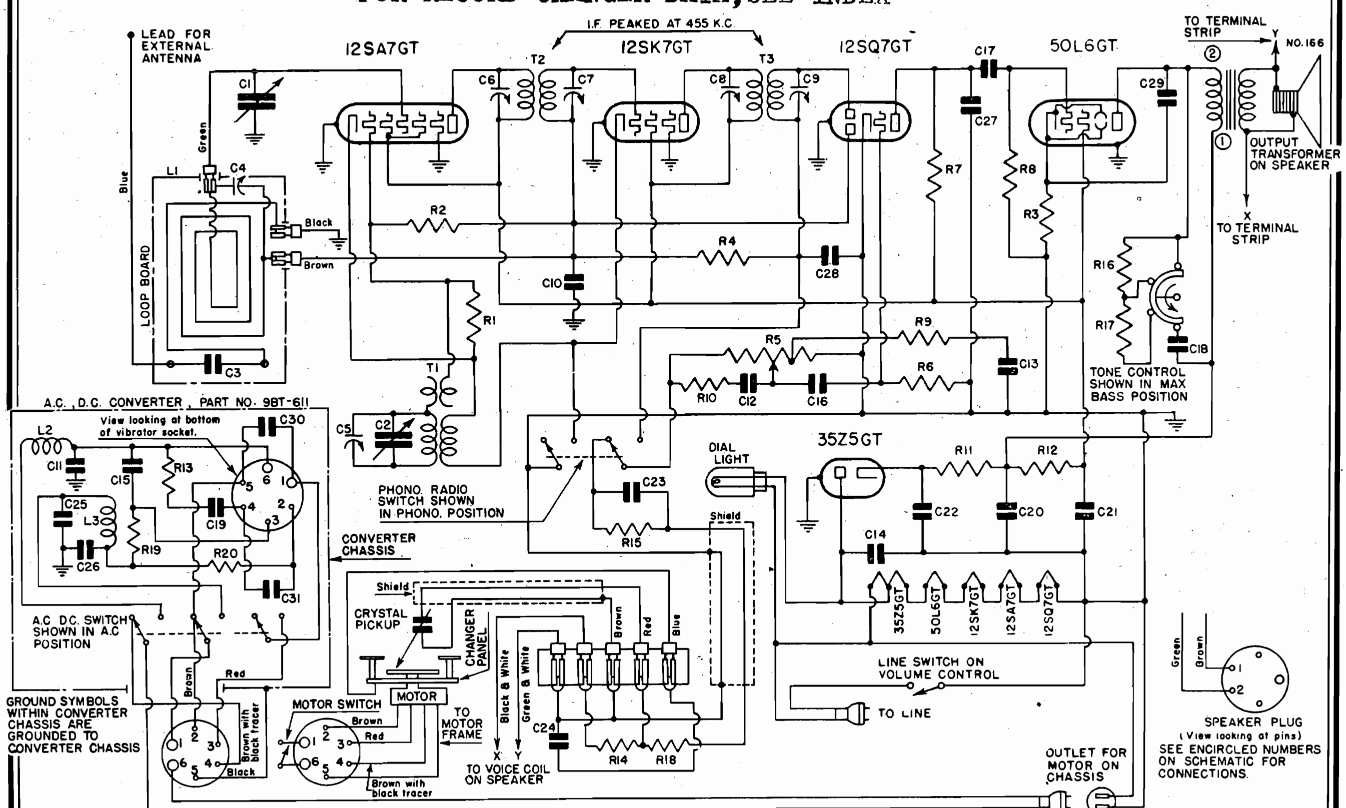
POWER CONSUMPTION:

60 watts for receiver only.
95 watts for combination.

VOLTAGE RATING: 105-125 volts.

FREQUENCY RANGE: 540-1600 kc.

FOR RECORD-CHANGER DATA, SEE INDEX



VOLTAGE RATING: 105-125 volts.

MODEL: FB2-374

CHASSIS MODEL: FB2

FREQUENCY RANGE: 540-1630 kc.

MODEL FB2-374
Chassis FB2
MODELS FA*374, FA-408
Chassis FA

EMERSON RADIO & PHONOGRAPH CORP.

MODELS FA-374, FA-408 — CHASSIS MODEL FA

L1, C3	455 kc wave-trap
T1	Loop antenna assembly
T2	Oscillator coil
T3	Double-tuned 455 kc first i-f transformer
T4	Double-tuned 455 kc second i-f transformer
T5	Power transformer
R1	10,000 ohm 1 watt carbon resistor
R2	20,000 ohm ¼ watt carbon resistor
R3	40,000 ohm 1 watt carbon resistor
R4	30,000 ohm 2 watt carbon resistor
R5, R11	25,000 ohm ¼ watt carbon resistor
R6	Volume control .5 megohm with line switch
R7	10 megohm ¼ watt carbon resistor
R8, R9	500,000 ohm ¼ watt carbon resistor
R10	260 ohm 1 watt carbon resistor
R12	1000 ohm ¼ watt carbon resistor
R13	3 megohm ¼ watt carbon resistor
R14, R15	2 megohm ¼ watt carbon resistor
C1, C2	Two-gang variable condenser
C3	Part of 9AT-602 wave-trap.
C4	0.00022 mf mica condenser
C5	Antenna trimmer, part of loop antenna assembly
C6	Oscillator trimmer, part of variable condenser.
C7, C8, C9	0.05 mf, 400 volt tubular condenser
C10, C11, C12, C13	Trimmers, part of i-f transformers.
C14, C15	0.0002 mf, 600 volt tubular or mica condenser
C16	0.02 mf, 400 volt tubular condenser
C17	0.005 mf, 1000 volt tubular condenser
C18	0.024 mf, 400 volt tubular condenser
C19	0.05 mf, 200 volt tubular condenser
C20	0.002 mf, 600 volt tubular condenser
C21	20 mf, 25 volt dry electrolytic condenser
C22	16 mf, 450 volt dry electrolytic condenser
C23	16 mf, 400 volt dry electrolytic condenser
C24	0.01 mf, 400 volt molded condenser
C25	0.00006 mf mica condenser

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis. The trimmers are accessible through holes in the rear of the chassis.

The oscillator coil is mounted underneath the chassis. The oscillator trimmer is located on the front variable condenser section.

The loop antenna acts as the antenna coil. Its trimmer is mounted on the loop board.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

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 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	Heater
6SK7GT	184	80	1.25	6.3
6SA7GT	249	74	0	6.3
6SK7GT	254	80	0	6.3
6SQ7GT	67	—	0	6.3
6V6GT	240	25.5	13	6.3

Voltage at rectifier filament—330 volts.

Voltage drop across speaker field—85 volts.

The color coding of the i-f transformers is as follows:
Grid—green Plate—blue
B plus—red Grid return—black

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.

TYPE OF TUBES:
1—6SK7GT, r-f amplifier
1—6SA7GT, triode-hexode oscillator-modulator
1—6SK7GT, i-f amplifier
1—6SQ7GT, audio amplifier
1—6J5GT, diode detector and a.v.c.
1—6V6GT, power output
1—5Y3G, full-wave rectifier

—FA—S1

MODEL: FB2-374 — CHASSIS MODEL: FB2

L1	Loop antenna assembly
L2, L3	R-f choke
T1	Oscillator coil
T2	Double-tuned 455 kc first i-f transformer
T3	Double-tuned 455 kc second i-f transformer
R1	20,000 ohm ¼ watt carbon resistor
R2, R6	15 megohm ¼ watt carbon resistor
R3	140 ohm ½ watt wire-wound resistor
R4	3 megohm ¼ watt carbon resistor
R5	Volume control .5 megohm with line switch, tapped at 160,000 ohms.
R7, R8, R10	500,000 ohm ¼ watt carbon resistor
R9	40,000 ohm ¼ watt carbon resistor
R11	175 ohm 1 watt metallized resistor
R12	750 ohm 1 watt wire-wound resistor
R13	220 ohm ½ watt wire-wound resistor
R14	1 megohm ¼ watt carbon resistor
R15	2 megohm ¼ watt carbon resistor
R16	1,000 ohm ½ watt carbon resistor
R17	4,000 ohm ¼ watt carbon resistor
R18	10,000 ohm ¼ watt carbon resistor
R19	25 ohm 5 watt wire-wound resistor
R20	2,200 ohm 2 watt wire-wound resistor
C1, C2	Two-gang variable condenser
C3, C13, C16	0.002 mf, 600 volt tubular condenser
C4	Trimmer, part of loop antenna assembly
C5	Trimmer, part of variable condenser
C6, C7, C8, C9	Trimmers, part of i-f transformers
C10, C19, C31	0.1 mf, 200 volt tubular condenser
C11, C14	0.05 mf, 400 volt tubular condenser
C12, C27, C28	0.00011 mf mica condenser
C15	0.5 mf, 200 volt tubular condenser
C17	0.02 mf, 400 volt tubular condenser
C18	0.15 mf, 200 volt tubular condenser
C20, C21, C22	Multiple dry electrolytic condenser 150 volt. C20—40 mf; C21, C22—20 mf.
C23	0.00006 mf mica condenser
C24	0.05 mf, 200 volt tubular condenser
C25	0.01 mf, 400 volt tubular condenser
C26	0.1 mf, 400 volt tubular condenser
C29	0.005 mf, 600 volt tubular condenser
C30	7.0 mf, 200 volt tubular condenser

TYPE OF TUBES:
1—12SA7GT, pentagrid oscillator-modulator
1—12SK7GT, first i-f amplifier
1—12SQ7GT, diode detector, a-f amplifier, a.v.c.
1—50L6GT, beam power output
1—35Z5GT, half-wave rectifier.

DIAL CORD REPLACEMENT

Use a turn and a half of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The loop antenna trimmer is mounted on the loop assembly. The oscillator trimmer is mounted on the front section of the variable condenser.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f traimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on the loop assembly) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

POWER SUPPLY:

A.c. or d.c. Caution—This combination is equipped with an a.c.-d.c. switch for the motor. Before plugging line cord in electric outlet make certain that the switch is in the position corresponding to the house supply. The set was shipped with the switch in the D.C. position. The switch is the red lever located on the small chassis which is to the right of the speaker when viewed from the rear. To change position of switch, remove locking screw from red switch lever, throw switch to desired position and replace locking screw.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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.

Voltage at 35Z5 cathode—115 volts.
Voltage across pilot light—4.5 volts.

POWER CONSUMPTION:
30 watts for receiver.
20 watts for phono motor.

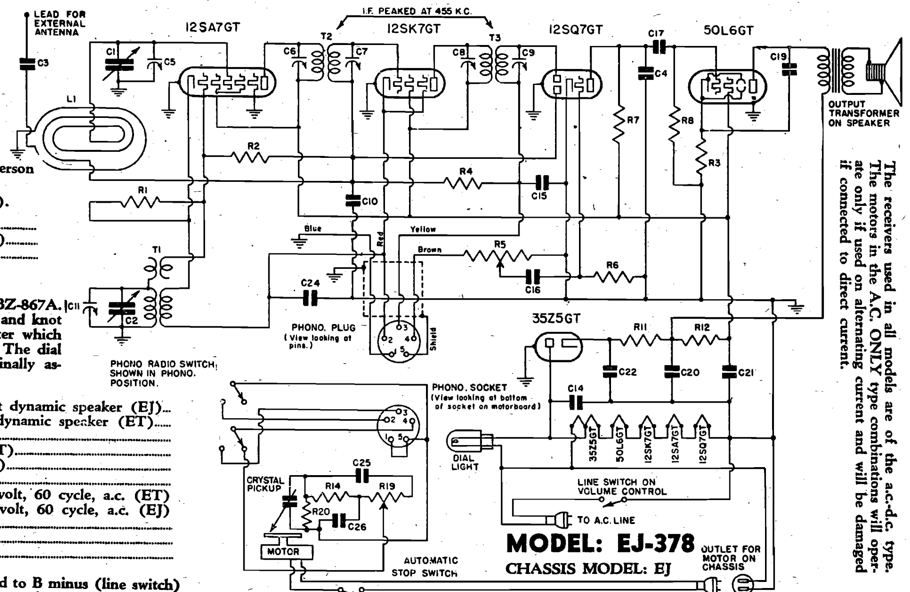
Tube	Plate	Screen	Cathode	Fil.
12SA7GT	85	85	0	12
12SK7GT	85	85	0	12
12SQ7GT	25	—	0	12
50L6GT	98	85	5.0	50

—FB2-S1

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EJ-378
Chassis EJ
MODEL ET-383
Chassis ET

The receivers used in all models are of the a.c.-d.c. type. The motors in the A.C. ONLY type combinations will operate only if used on alternating current and will be damaged if connected to direct current.



The motor board on later models has been drilled to allow the installation of the Emerson D.C. to A.C. Converter. See separate Service Notes for the Converter, part no. 8MT-574.

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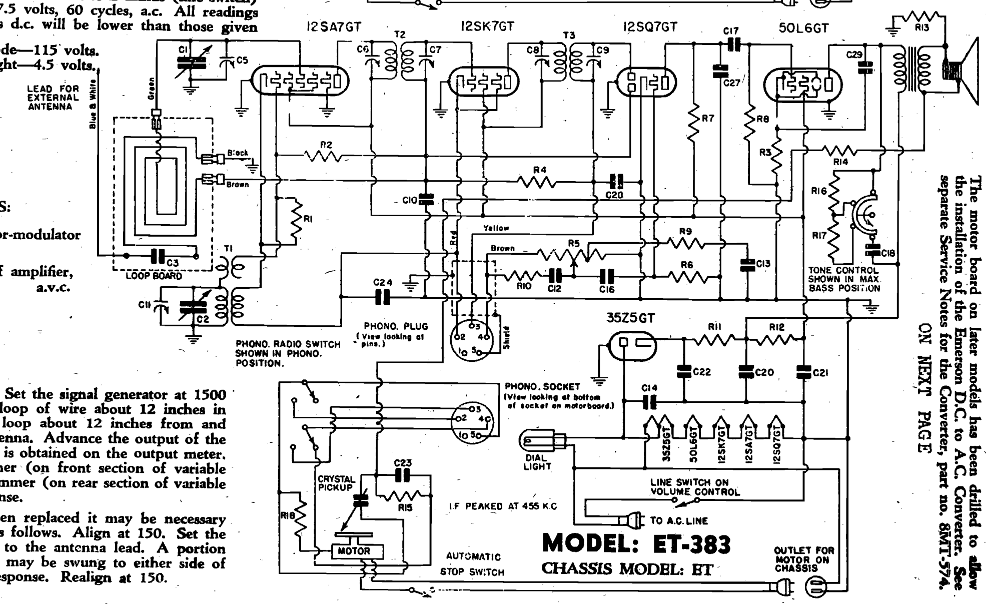


L1	Loop antenna assembly (EJ)	
L1	Loop antenna assembly (ET)	
T1	Oscillator coil (EJ)	
T1	Oscillator coil (ET)	
T2	Double-tuned 455 kc first i-f transformer	
T3	Double-tuned 455 kc second i-f transformer	
R1	20,000 ohm ¼ watt carbon resistor	
R3	140 ohm ½ watt wire-wound resistor	
R4	3 megohm ¼ watt carbon resistor	
R5	Volume control .5 megohm with line switch (ET)	
R5	Volume control .5 megohm with line switch (EJ)	
R6, R2	15 megohm ¼ watt carbon resistor	
R7, R8, R20	500,000 ohm ¼ watt carbon resistor	
R9	40,000 ohm ¼ watt carbon resistor	
R10, R18	250,000 ohm ¼ watt carbon resistor	
R11	175 ohm 1 watt metallized resistor	
R12	750 ohm 1 watt wire-wound resistor	
R13	1,000 ohm ¼ watt carbon resistor	
R14	1 megohm ¼ watt carbon resistor	
R15	2 megohm ¼ watt carbon resistor	
R16	1000 ohm ½ watt carbon resistor (ET)	
R17	2200 ohm ¼ watt carbon resistor (ET)	
R19	Tone control .5 megohm (EJ)	
C1, C2	Two-gang variable condenser (ET)	
C1, C2	Two-gang variable condenser (EJ)	
C3, C16, C13	0.002 mf, 600 volt tubular condenser	
C4, C15, C25	0.0002 mf, 600 volt tubular or mica condenser	
C5, C11	Trimmers, part of variable condenser.	
C6, C7, C8, C9	Trimmers, part of i-f transformers.	
C10	0.1 mf, 200 volt tubular condenser	
C12, C27, C28	0.00011 mf mica condenser	
C14	0.05 mf, 400 volt tubular condenser	
C17	0.02 mf, 400 volt tubular condenser	
C18	0.15 mf, 200 volt tubular condenser	
C24	0.05 mf, 200 volt tubular condenser	
C19	0.01 mf, 400 volt tubular condenser	
C20, C21, C22	Multiple dry electrolytic condenser, 150 volt. C20—40 mf; C21, C22—20 mf.	
C23	0.00006 mf mica condenser	
C26	0.001 mf, 600 volt tubular condenser (EJ)	
C29	0.005 mf, 600 volt tubular condenser	
8JS-522	6½" permanent magnet dynamic speaker (EJ)	
8GS-487	8" permanent magnet dynamic speaker (ET)	
8GS-485	Tone control switch	
6XS-432	Phono-radio switch (ET)	
6VS-445	Phono-radio switch (EJ)	
6VG-24	Rubber needle cup	
8TPM-68	Rim drive motor, 117 volt, 60 cycle, a.c. (ET)	
8CPM-64F	Rim drive motor, 117 volt, 60 cycle, a.c. (EJ)	
4XC-418B	Crystal pick-up (ET)	
4XC-418A	Crystal pick-up (EJ)	
8JS-523	Automatic stop switch	

FREQUENCY RANGE: 540-1630 kc.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION:
30 watts for receiver
20 watts for a.c. motor.

POWER SUPPLY:
A.c. or d.c. (for receivers using Emerson D.C. to A.C. Converter on phono motors)
A.c. only (for models so designated).

DIAL CORD REPLACEMENT

Use a turn and a half of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

VOLTAGE

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	85	85	0	12
12SK7GT	85	85	0	12
12SQ7GT	25	—	0	12
50L6GT	98	85	5.0	50

Voltage at 35Z5 cathode—115 volts.
Voltage across pilot light—4.5 volts.

—EJ, ET—S2

TYPE OF TUBES:

12SA7GT, pentagrid oscillator-modulator
12SK7GT, first i-f amplifier
12SQ7GT, diode detector, a-f amplifier, a.v.c.
50L6GT, beam power output
35Z5GT, half-wave rectifier.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and 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 oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f traimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.

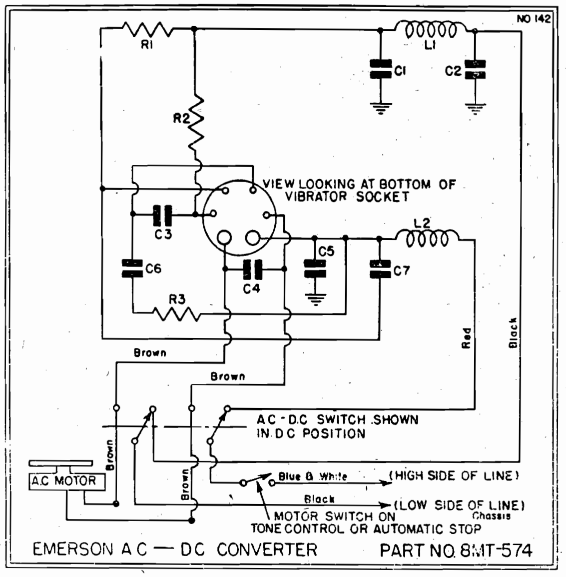
R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

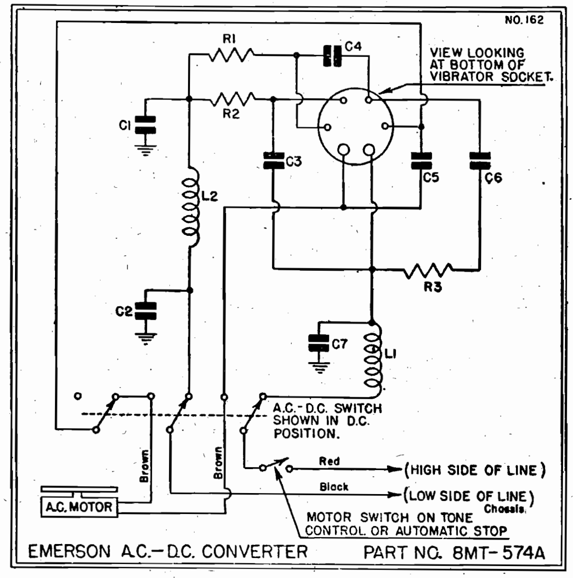
If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

MODEL 8MT-574
Converter

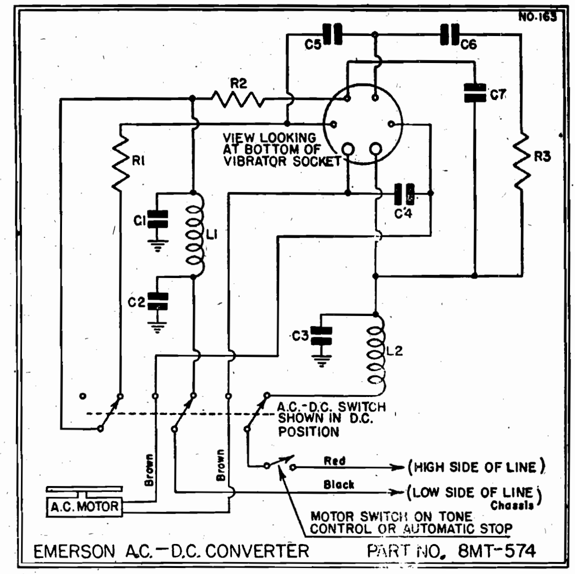
EMERSON RADIO & PHONOGRAPH CORP.



Schematic for converter having separate AC-DC toggle switch



Schematic for latest series converter having A.C.-D.C. switch mounted on unit



Schematic for converter having AC-DC switch mounted on unit

L1, L2	Line r-f filter choke...
R1	25 ohm 5 watt metal-clad resistor......
R2	2,200 ohm 2 watt wire-wound resistor.
R3	220 ohm 1 watt wire-wound resistor...
C1	0.1 mf, 400 volt tubular condenser.......
C2	0.01 mf, 400 volt tubular condenser..
C3, C6	0.1 mf, 200 volt tubular condenser....
C4	3 mf, 200 volt paper condenser............
C5	0.05 mf, 400 volt tubular condenser
C7	0.5 mf, 200 volt "A" condenser..
	A.C-D.C. toggle switch (used on early models)
	A.C.-D.C. wafer switch (used on late models).
	Vibrator 117 volt, d.c. to a.c.

TYPE: Synchronous vibrator.

INPUT VOLTAGE: 105-125 volts.

INPUT CURRENT: D.C. only.

OUTPUT VOLTAGE: 105-125 volts.

OUTPUT CURRENT: A.C. only.

CAPACITY: 20 watts (maximum).

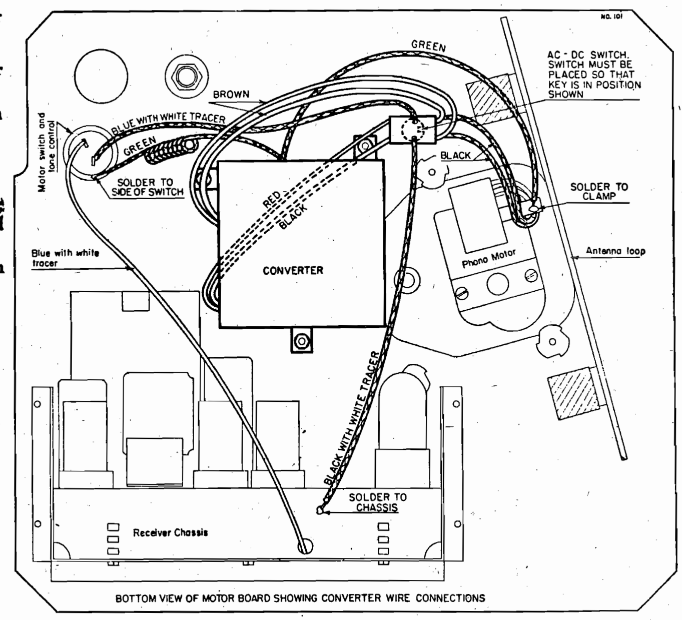
(For converters with a.c.-d.c. switch mounted on converter chassis.)

1. a. Disconnect two black motor leads; one from the motor switch and one from the chassis.
   b. Solder each of the two black motor leads to the brown leads emerging from the converter.
   c. Solder the red lead to the motor switch.
   d. Solder the black wire to the receiver chassis.
   e. Solder one green lead to the clamp on the phono motor; grounding the other green lead to some point in the ground circuit will reduce vibrator hash.
   f. Unit is shipped with a.c.-d.c. switch on converter in d.c. position.

The converter should not be turned on when phono-radio switch is in the radio position, as the vibrator noise will make the receiver unusable.

At no time should the a.c.-d.c. switch be thrown to the a.c. position when the line switch is plugged into a d.c. outlet.

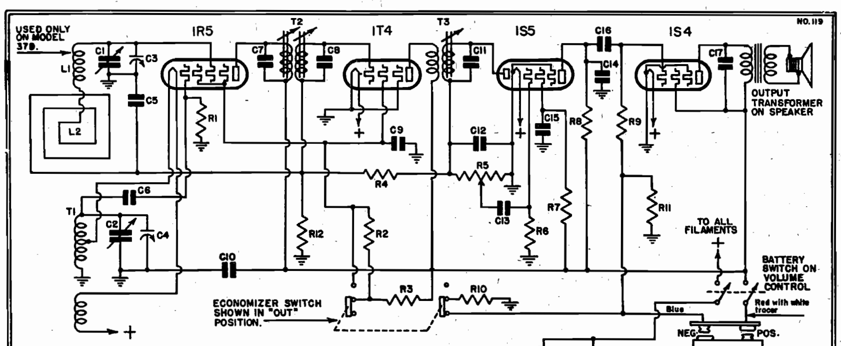
IMPORTANT: Do not plug receiver into house outlet until having first ascertained that this supply is d.c. If house supply is a.c., remove lever-switch clamp and push switch to a.c. position. Always see that switch is in position corresponding to house supply (a.c. or d.c.). Replace clamp over switch after any change in switch position.



Cut showing installation on EM-345 and EM-346 motorboards.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DU-379, DU-380
Chassis DU



VOLTAGE RATING:
"A" Battery—1.5 volts
"B" Battery—67.5 volts.

CURRENT DRAIN:
"A" Battery—0.25 amp.
"B" Battery—0.0075 amp with Battery Saver "OUT"
0.0055 amp with Battery Saver "IN"

L1	Iron core loading coil (379)	R7, R9	3 megohm ¼ watt carbon resistor
L2	Shoulder strap loop assembly (379)	R8	1 megohm ¼ watt carbon resistor
L2	Loop antenna (380)	R10	2200 ohm ¼ watt carbon resistor
T1	Oscillator coil	R11	1800 ohm ¼ watt carbon resistor
T2	Iron core double-tuned 455 kc first i-f transformer	C1, C2	Two-gang variable condenser
T3	Iron core single-tuned 455 kc second i-f transformer.	C3, C4	Trimmers, part of variable condenser.
R1	100,000 ohm ¼ watt carbon resistor	C5, C9, C15	0.02 mf, 200 volt tubular condenser
R2	5,000 ohm ¼ watt carbon resistor	C6, C12, C14	0.00011 mf mica condenser
R3	10,000 ohm ¼ watt carbon resistor	C7, C8, C11	Fixed trimming condensers, contained inside i-f cans.
R4, R12	5 megohm ¼ watt carbon resistor	C10	10 mf, 100 volt dry electrolytic condenser
R5	Volume control 1.5 megohm with double pole battery switch.	C13	0.002 mf, 600 volt tubular condenser
R6	10 megohm ¼ watt carbon resistor	C16, C17	0.001 mf, 600 volt tubular condenser

PRODUCTION CHANGE

1. On all models, except early ones, R12 is removed.

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" 67.5 volts. All readings except filaments were taken on the 250 volt scale, with battery saver "out."

Bias for the 1S4 tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.5 volts with battery saver "out" or 9.4 volts with battery saver "in."

*The operating voltage of this tube cannot be measured because of the high resistor in the circuit.

Tube	Plate	Screen	Osc. Plate	Fil.
1R5	57	60	57	1.5
1T4	57	60	—	1.5
1S5	*5	*3	—	1.5
1S4	55	60	—	1.5

—DU-S1

—DU-S2

BATTERY COMPLEMENT

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:

Type Battery	Number Required	Manufacturer's Part No.
1½ volt "A"	2	Standard "D" size (1 5/16" diameter) flashlight cell
67½ volt "B"	1	Eveready "Mini-max" No. 467

MODEL: DU-379 and DU-380

CHASSIS MODEL: DU

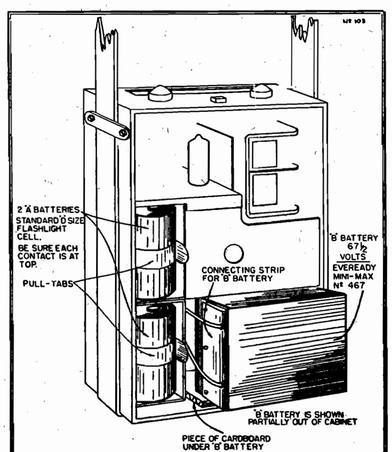
Location of Coils and Trimmer Adjustments

DU-379, DU-380

The first i-f transformer is located in the bottom outer edge of the chassis behind the lower flashlight cell. The brass screws which protrude from either end of the can are the core adjustment for trimming the transformer. The second i-f transformer is located between the 1T4 and 1S5 tubes. The single trimming core screw extends from the end of the can.

The oscillator coil is located inside the chassis, beside the variable condenser. Trimmer for the oscillator is located on the lower section of the variable condenser.

The loop antenna acts as the antenna coil. Trimmer for the loop is located on the upper section of the variable condenser.



CABINET VIEWED FROM REAR WITH BACK REMOVED

BATTERY INSTALLATION

To install and connect the batteries in this cabinet observe the following procedure:

1. Remove the back panel of the cabinet by taking out the screw.
2. Examine the battery cable coming from the receiver and identify the fasteners on the terminal strip.
3. With the "B" battery out of the cabinet, snap the two fasteners on the terminal strip into the two "B" battery snap fasteners.
4. Place the "B" battery into the cabinet as shown in diagram. Slide the two "pull-tabs" over the flashlight cells and then push the cells into the two compartments shown in the diagram with the brass center-contact at the top.
5. Replace the back panel of the cabinet and fasten it in place with the screw.

TYPE: Single-band (battery operated) superheterodyne.

The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

The color coding of the battery cable is as follows:
Red—B plus, 90 volts   Blue—B minus.

If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.

The receiver has a self-contained antenna and does not require additional antenna or ground connection. Model DU-379 has the loop antenna contained in the shoulder strap. If it is not worn around the shoulder it is important that the strap be stretched out into a loop of about the same width as the cabinet.

When Model DU-379 is worn about the shoulders, the correct position of the antenna may be found by the wearer turning through a quarter circle as mentioned below.

The self-contained loop antenna in Model DU-380 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.

I-f Alignment

DU-379, DU-380

Swing variable condenser to minimum capacity position.

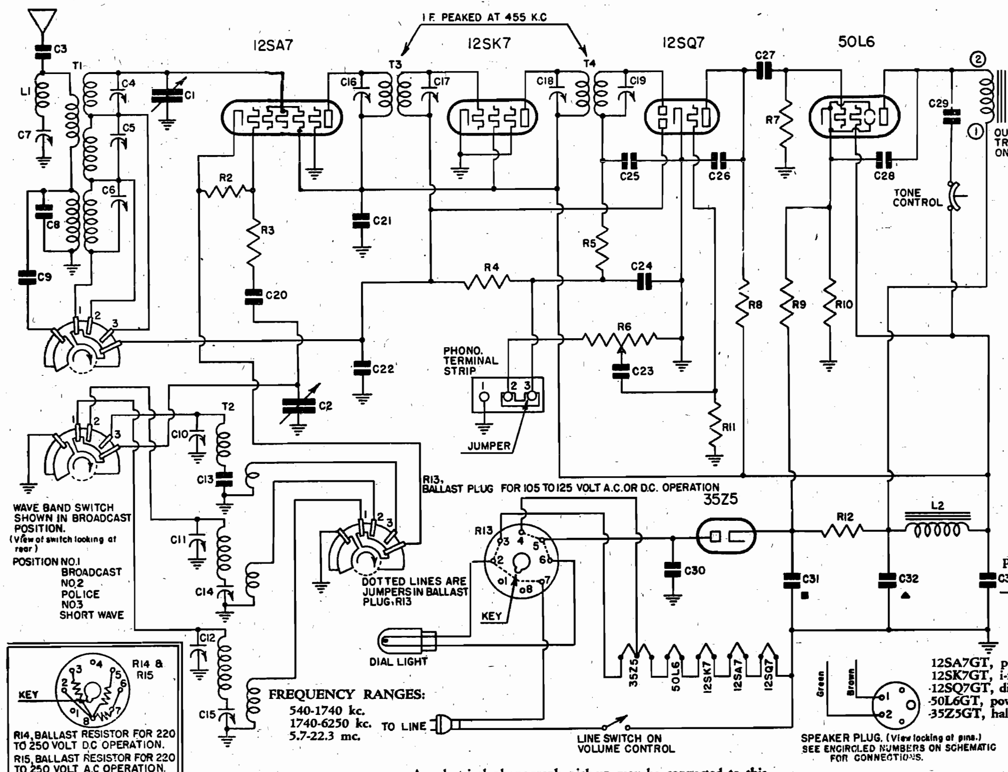
Feed 455 kc to the grid of the 1R5 tube through a 0.01 mf condenser. Adjust the three i-f trimmer core screws for maximum response. (Clip the i-f input to the stator lug of the upper variable condenser section.)

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about one foot in diameter. Hold this radiating loop about one foot away from and parallel to the receiver loop antenna. Advance the output of the generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on lower section of variable condenser) then the antenna trimmer (on upper section of variable condenser) for maximum response.

MODEL EX-386
Chassis EX

EMERSON RADIO & PHONOGRAPH CORP.



POWER SUPPLY: A.C. or D. C., 105-125 volts with shorting plug, Part No. 8XR-432
D.C. 220-250 volts with ballast resistor, Part No. 8XR-433
A.C. 220-250 volts with ballast resistor, Part No. 8XR-434

This receiver has been designed to operate without a ground connection. Under no circumstances should any ground (or ground wire) be permitted to come in contact with any metal part of the receiver.

POWER CONSUMPTION:
30 watts (105-125 volts)
60 watts (220-250 volts)

12SA7GT, pentagrid oscillator-modulator
12SK7GT, i-f amplifier
12SQ7GT, diode detector, audio amplifier and a.v.c.
50L6GT, power output
35Z5GT, half-wave rectifier

L1	Adjustable 455 kc wave-trap
L2	Filter choke
T1	Three-band antenna coil
T2	Three-band oscillator coil
T3	Double-tuned 455 kc first i-f transformer
T4	Double-tuned 455 kc second i-f transformer
R2	20,000 ohm ¼ watt carbon resistor
R3	50 ohm ¼ watt carbon resistor
R4	3 megohm ¼ watt carbon resistor
R5	5000 ohm ¼ watt carbon resistor
R6	Volume control .5 megohm with line switch
R7	500,000 ohm ¼ watt carbon resistor
R8	250,000 ohm ¼ watt carbon resistor
R9	20,000 ohm 1 watt carbon resistor
R10	140 ohm 1 watt wire-wound resistor
R11	15 megohm ¼ watt carbon resistor
R12	75 ohm 1 watt wire-wound resistor
R13	Shorting plug for 105-125 volt a.c. or d.c. operation
R14	Ballast resistor for 220-250 volt d.c. operation
R15	Ballast resistor for 220-250 volt a.c. operation
C1, C2	Two-gang variable condenser
C3	0.01 mf, 400 volt tubular condenser
C4, C5, C6	Trimmers, part of antenna coil assembly
C7	Trimmer, part of 455 kc wave-trap
C13	0.0034 mf, mica condenser
C14	Single adjustable padding condenser (Range: 750-1500 mmf.)
C15	Single adjustable padding condenser (Range: 300-600 mmf.)
C16, C17	Trimmers, part of first i-f transformer
C18, C19	Trimmers, part of second i-f transformer
C20, C25	0.00011 mf, mica condenser
C21	0.1 mf, 200 volt tubular condenser
C22, C29	0.05 mf, 200 volt tubular condenser
C23	0.002 mf, 600 volt tubular condenser
C24	0.00006 mf, mica condenser
C25	0.00011 mf, mica condenser
C26	0.00022 mf, mica condenser
C27	0.02 mf, 400 volt tubular condenser
C28	0.024 mf, 400 volt tubular condenser
C30	0.05 mf, 400 volt tubular condenser
C31, C32, C33	Three section dry electrolytic condenser. C31, C32—40 mf, 150 volt; C33—20 mf, 150 volt

An electrical phonograph pick-up may be connected to this receiver for playing records. Connections to the receiver may be made at the "phono" terminal strip which is located on the rear wall of the receiver chassis.

Remove the link connecting two of the terminals on the phono strip. The switch should be wired to the pick-up and terminal strip so that in the phonograph position the switch should short terminals 1 and 3 and at the same time connect the high side of the pick-up to a lead from terminal 2. (The ground side of the pick-up may be permanently wired to terminal 1.) When the switch is in the radio position terminals 2 and 3 should be shorted together and the pick-up disconnected from terminal 2.

ADJUSTMENTS

The adjustable padding condensers for the broadcast and police bands are mounted on the top of the chassis with the screw adjustment accessible through holes 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 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.

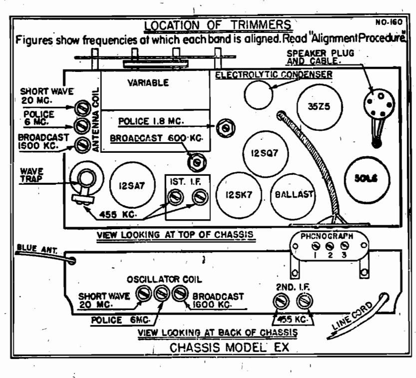
Use a dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for broadcast band dummy antenna, a .0001 mf condenser for the police band dummy antenna and a 400 ohm non-inductive resistor for the short-wave band dummy antenna.

Always 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.

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 of the 12SA7 tube. Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna (using a standard dummy antenna) and adjust the 455 kc wave-trap for minimum response.



Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the pointer 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 pointer to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Reset the pointer 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 re-adjustment is necessary return to 600 and repeat entire procedure. (The broadcast padder is located beneath the chassis to the left of the variable condenser.)

Police Alignment

Set the wave-band switch at the police band (central) position and the pointer 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 pointer to 6.0, feed 6000 kc and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. Return the pointer to 1.8, feed 1800 kc to the antenna and rock the variable condensers 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. The police band padder is located beneath the chassis behind the variable condenser.)

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer 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 antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line 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.

Voltage at 35Z5 cathode—115 volts.

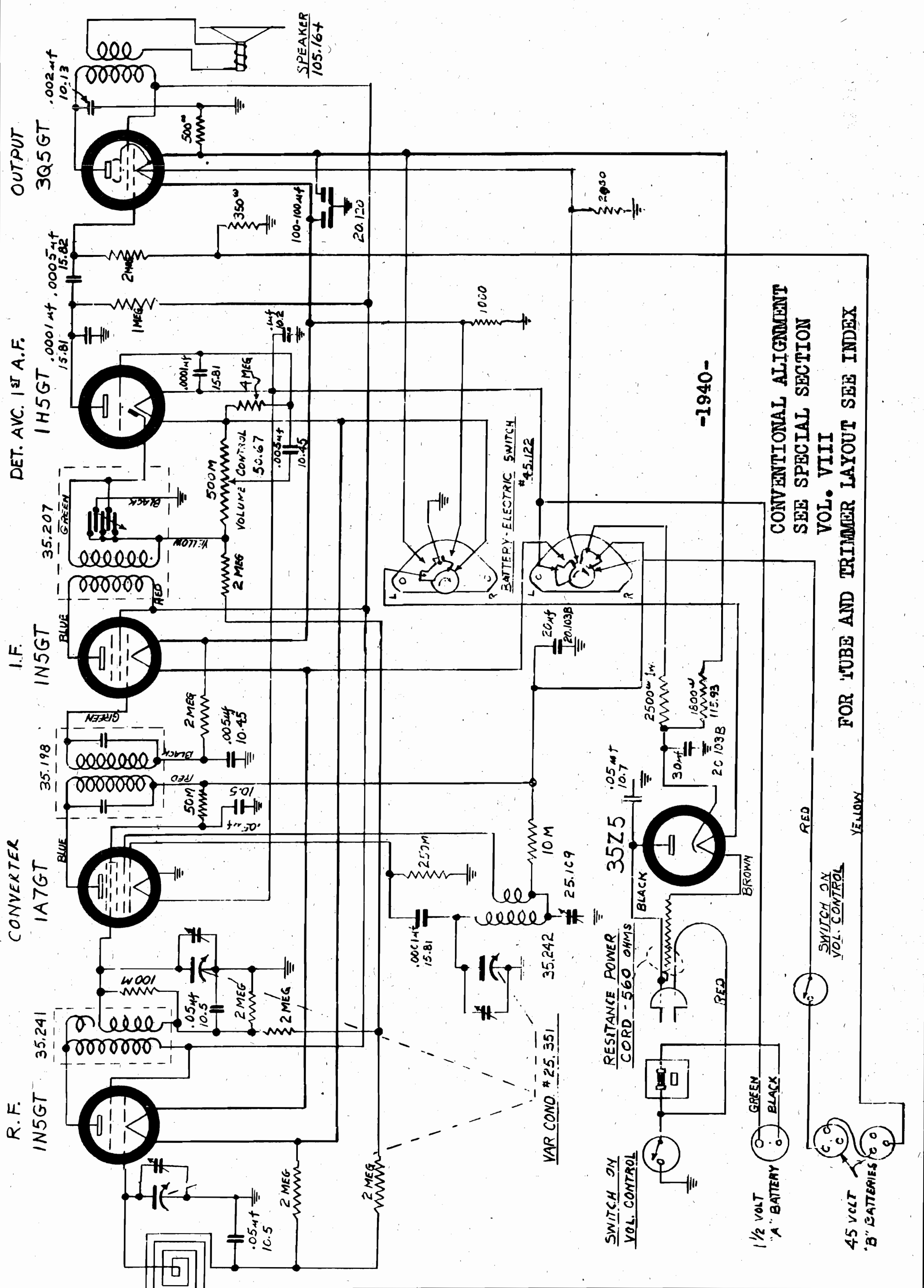
Tube	Plate	Screen	Cathode	Fil.
12SA7GT	100	100	0	12
12SK7GT	100	100	0	12
12SQ7GT	45	—	0	12
50L6GT	97	100	6.2	50

MODEL: EX-386 —EX—S1

CHASSIS MODEL: EX

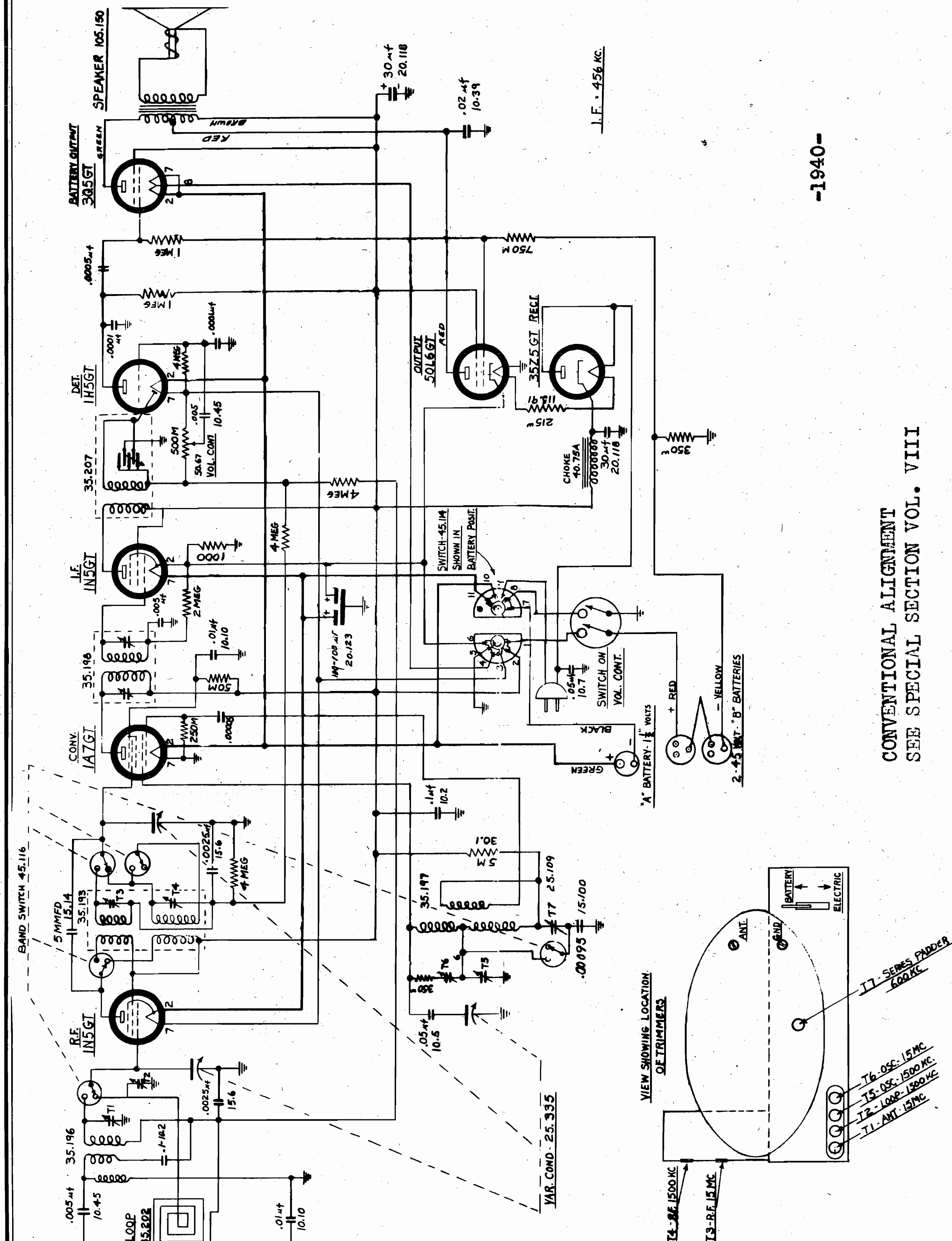
MODEL P23

FADA RADIO & ELECTRIC CO



MODEL P24

FADA RADIO & ELECTRIC CO

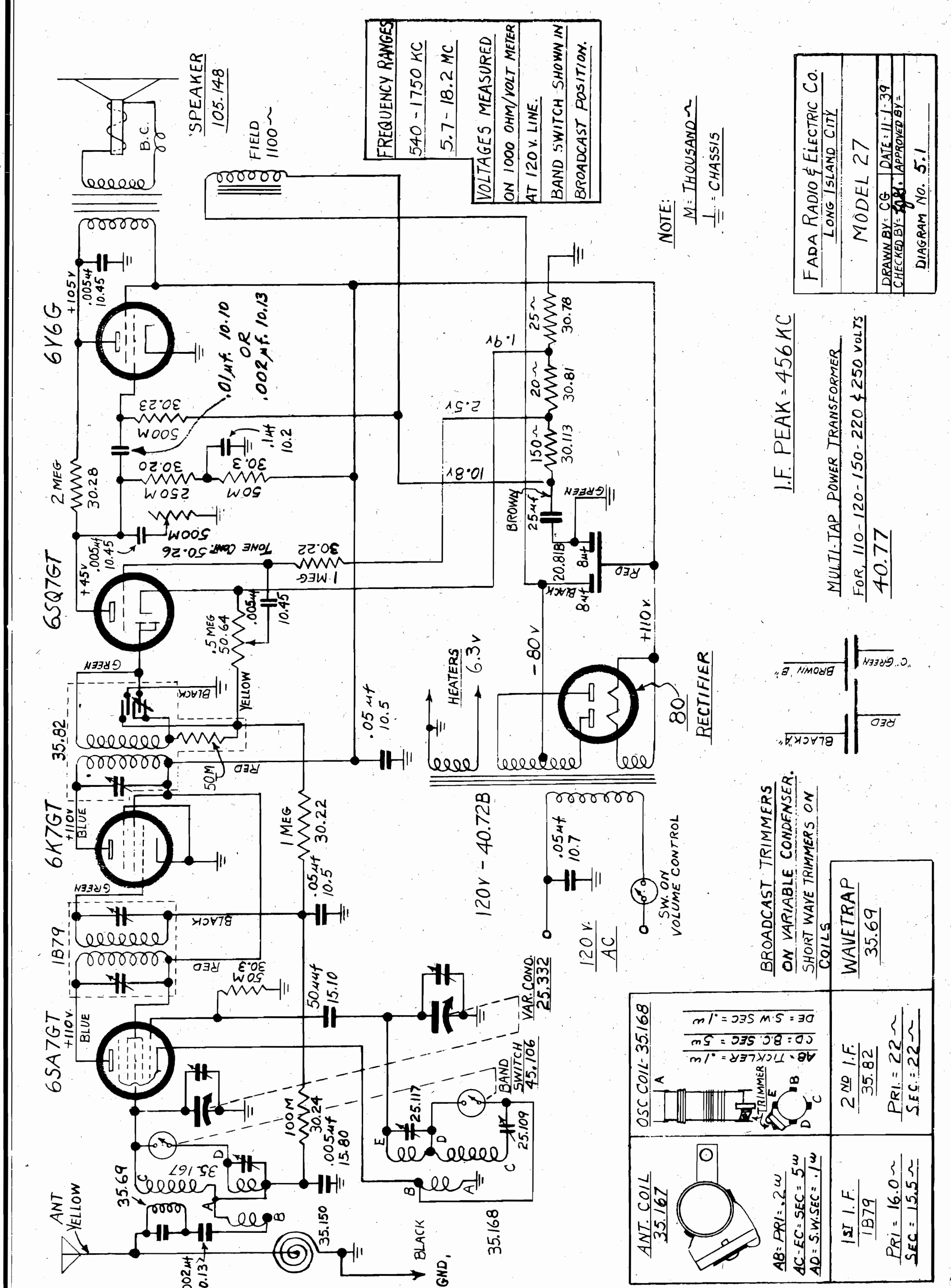


-1940-

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

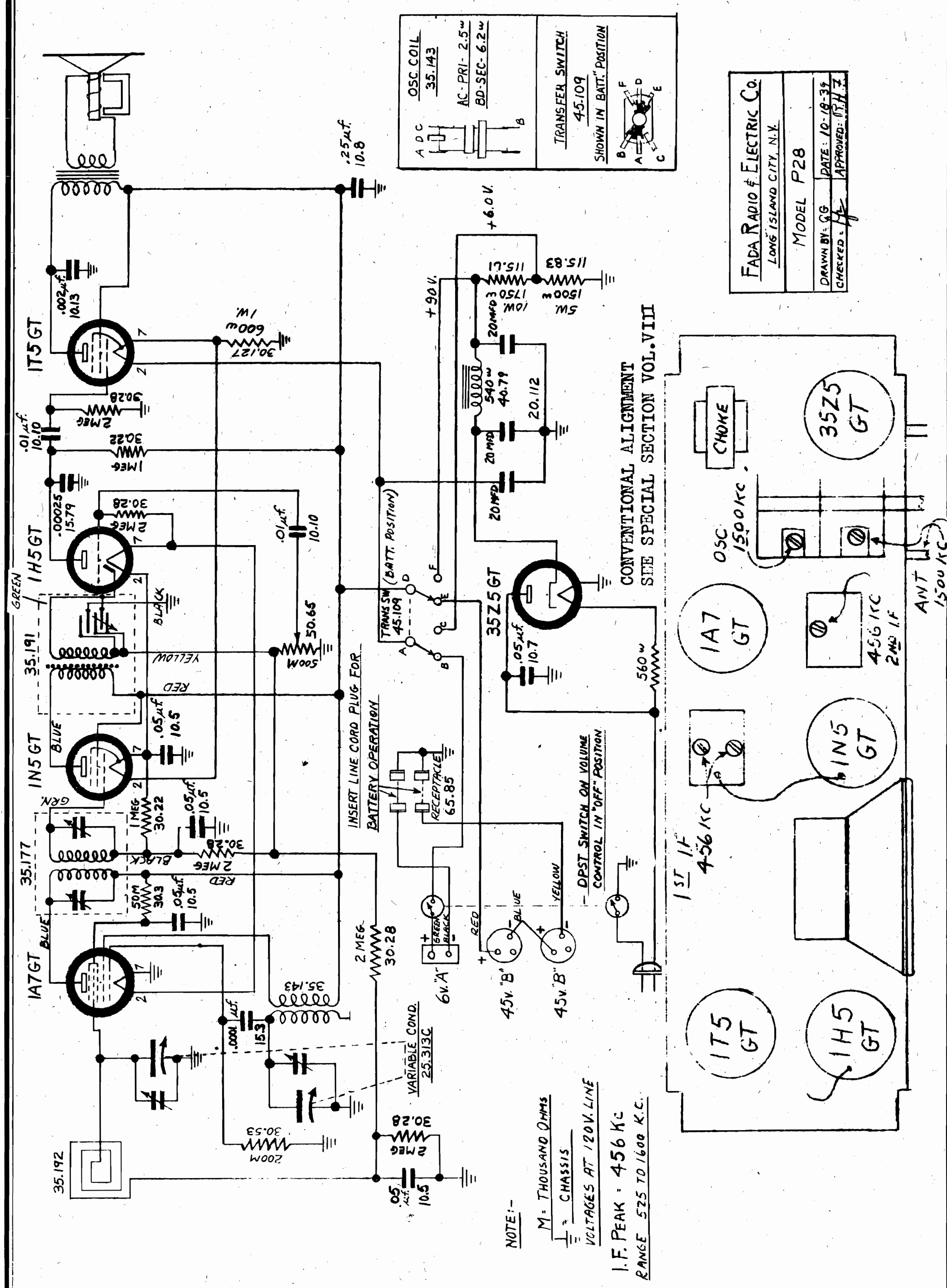
MODEL 27

FADA RADIO & ELECTRIC CO



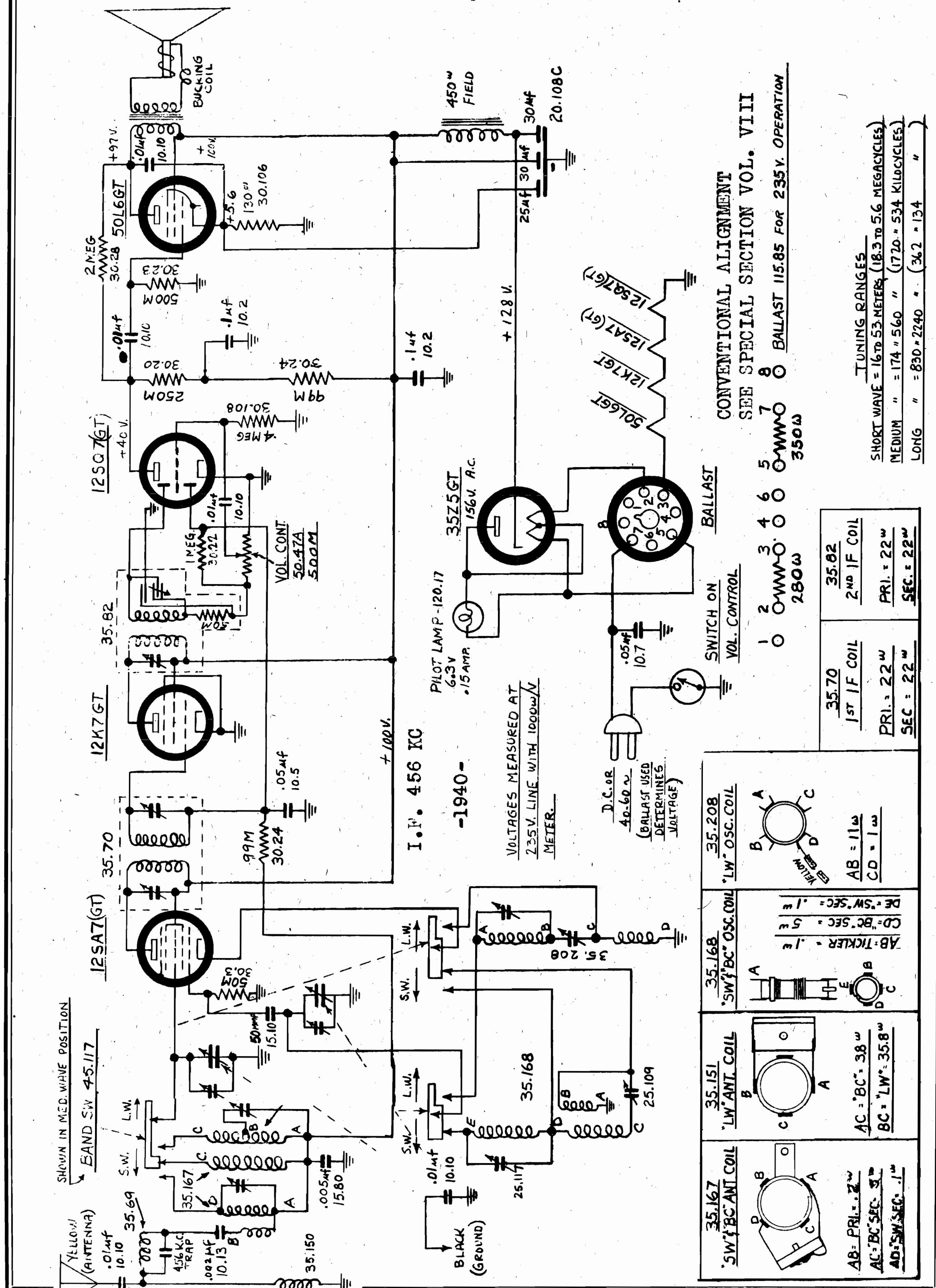
MODEL P28

FADA RADIO & ELECTRIC CO



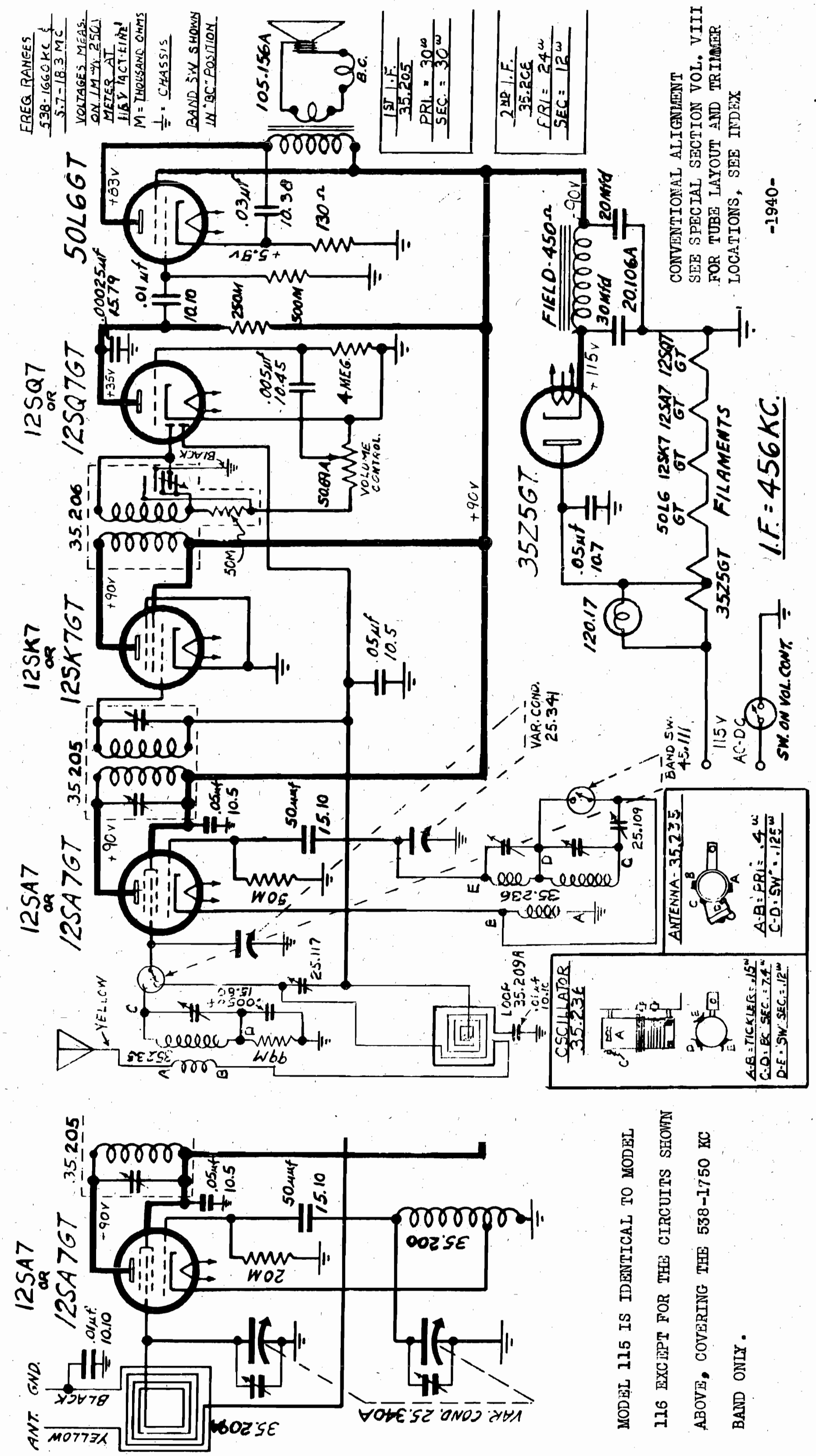
FADA RADIO & ELECTRIC CO

MODEL LW36



MODEL 115
MODEL 116

FADA RADIO & ELECTRIC CO



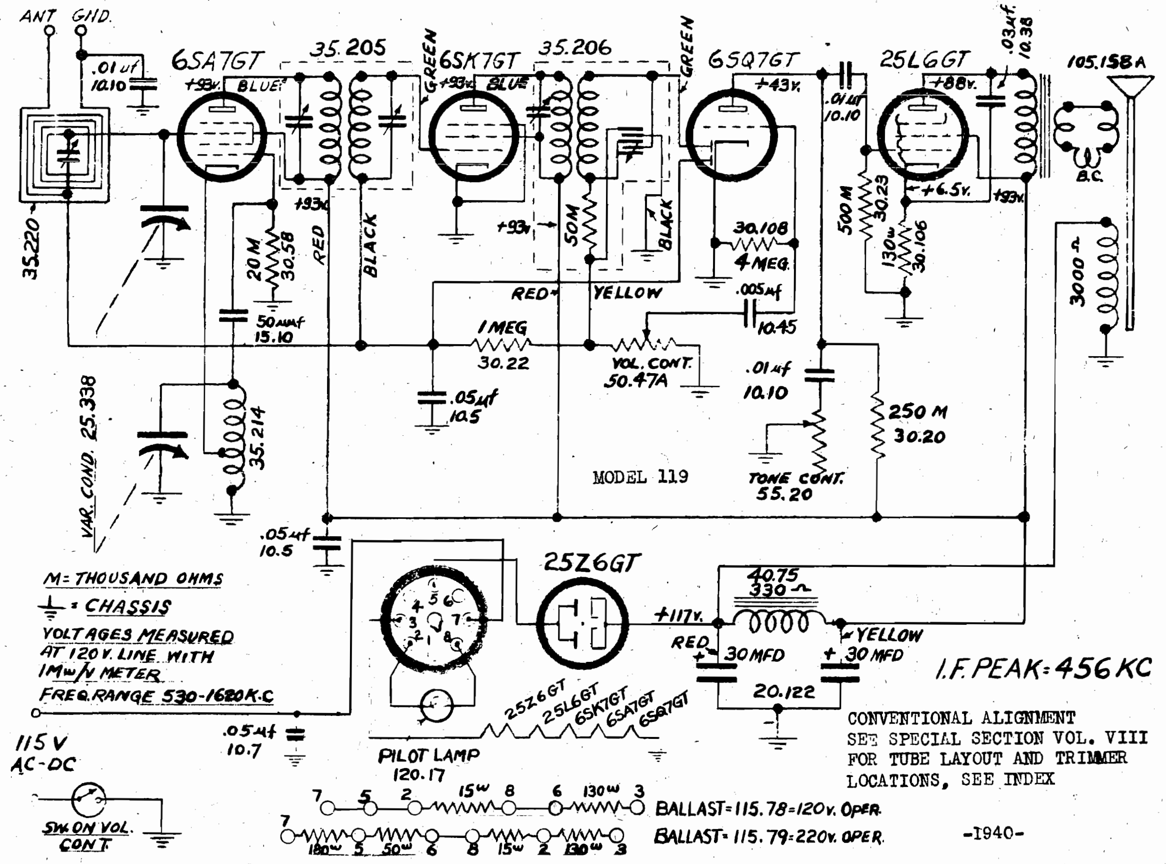
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII
FOR TUBE LAYOUT AND TRIMMER
LOCATIONS, SEE INDEX

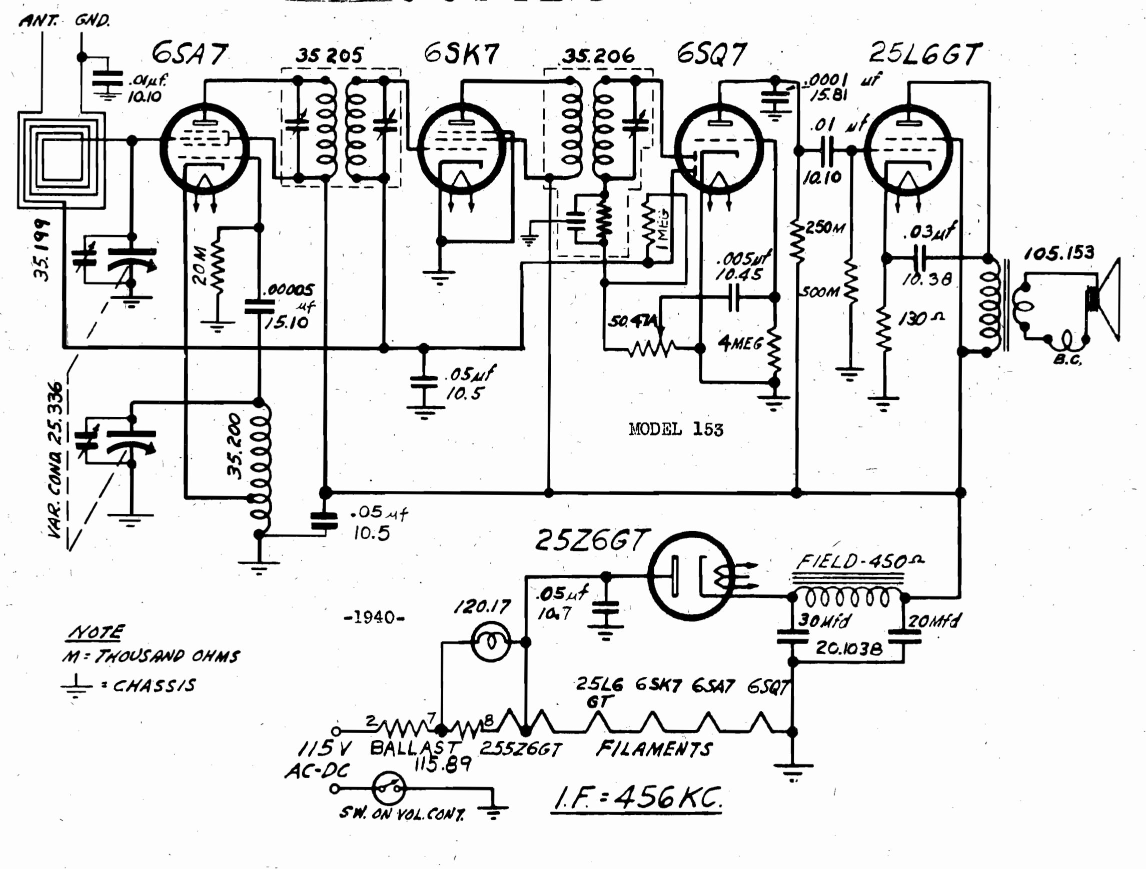
-1940-

MODEL 115 IS IDENTICAL TO MODEL 116 EXCEPT FOR THE CIRCUITS SHOWN ABOVE, COVERING THE 538-1750 KC BAND ONLY.

FADA RADIO & ELECTRIC CO

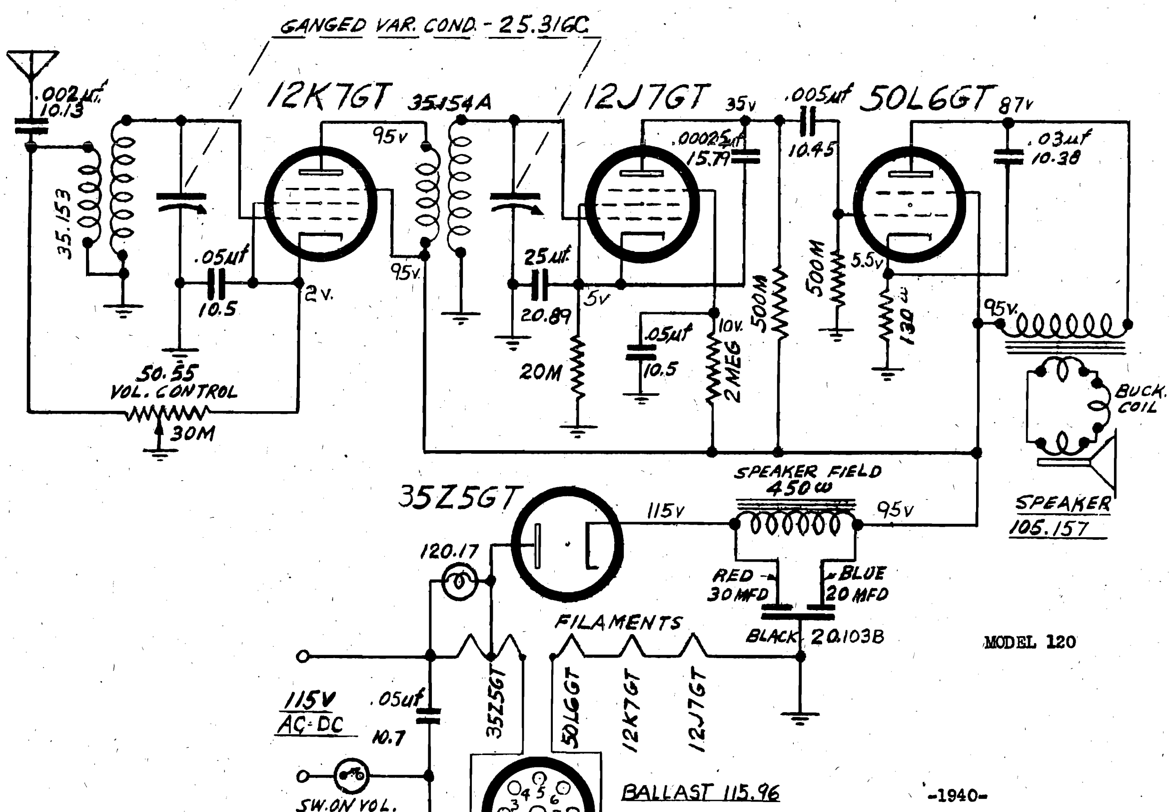
MODEL 119
MODEL 153





MODEL 120
MODEL 137

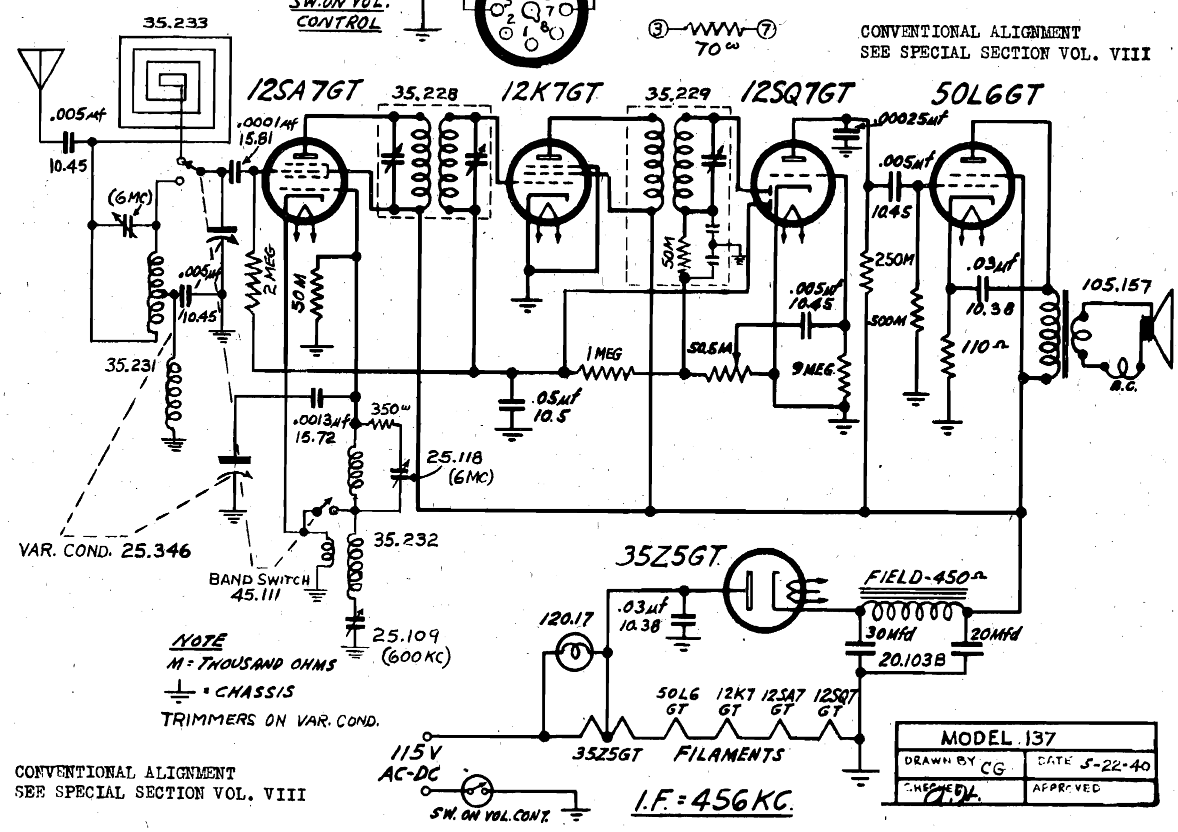
FADA RADIO & ELECTRIC CO



MODEL 120

-1940-

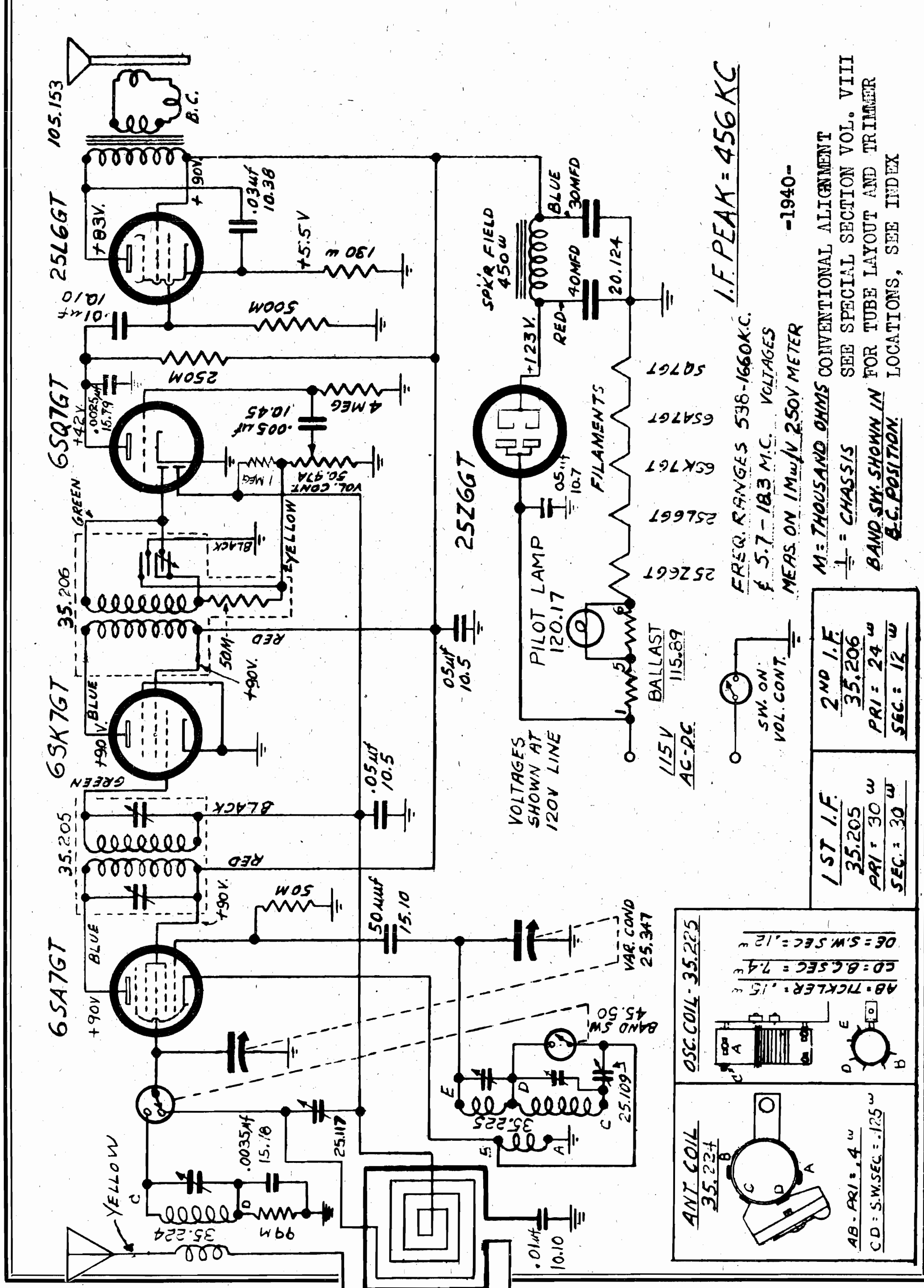
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

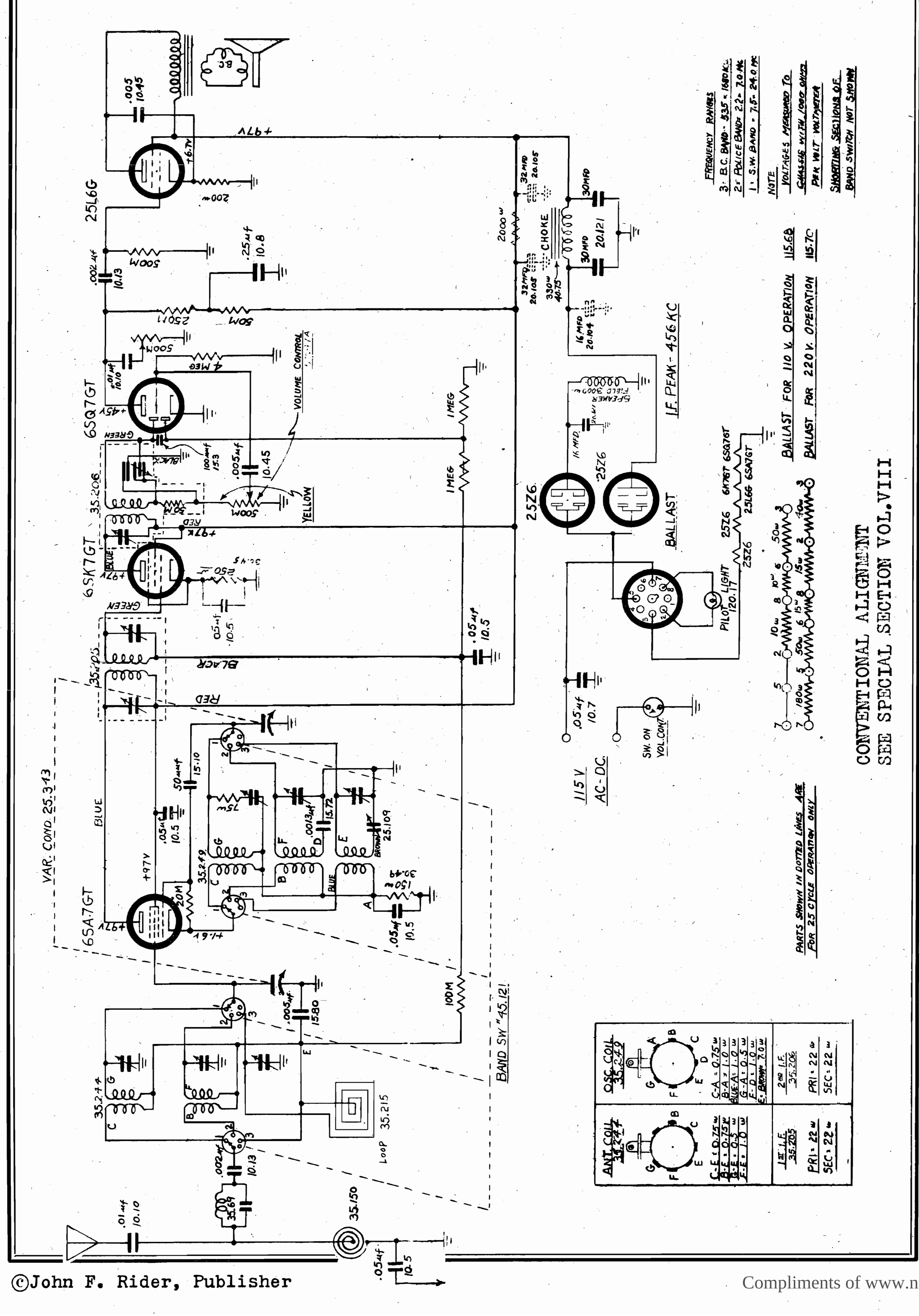
MODEL 154

FADA RADIO & ELECTRIC CO



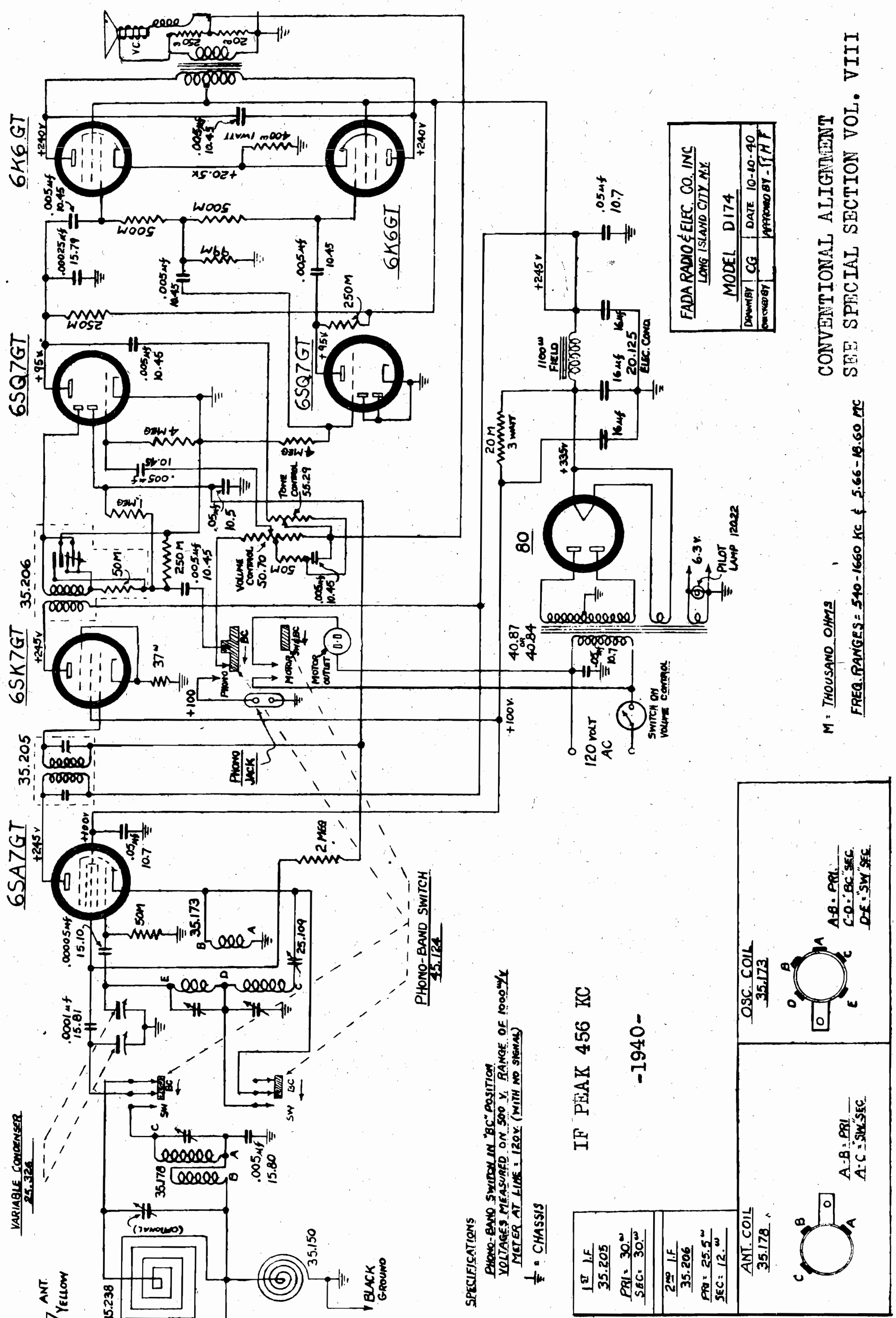
MODEL 169

FADA RADIO & ELECTRIC CO



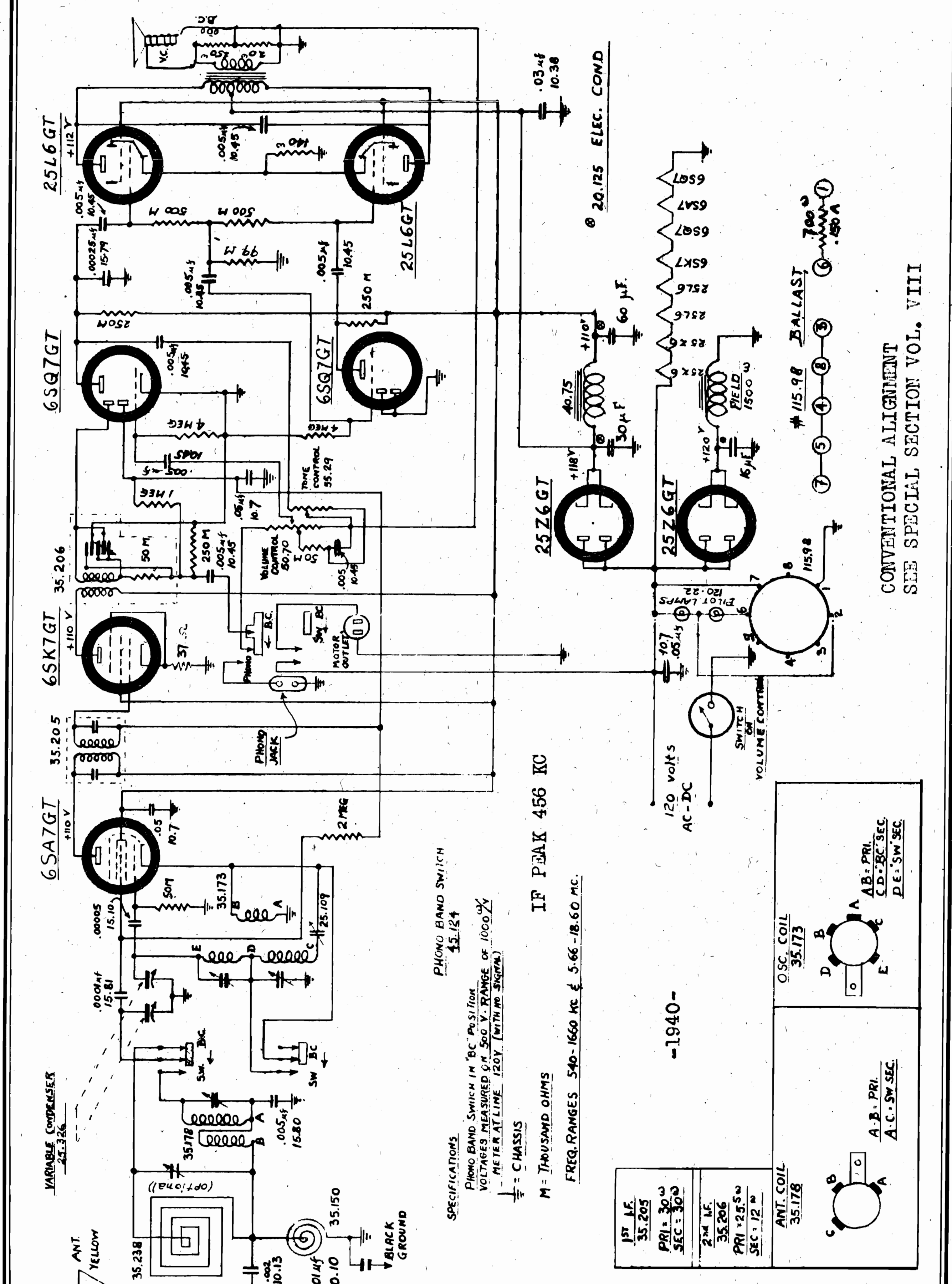
FADA RADIO & ELECTRIC CO

MODELS **174,D174,184**



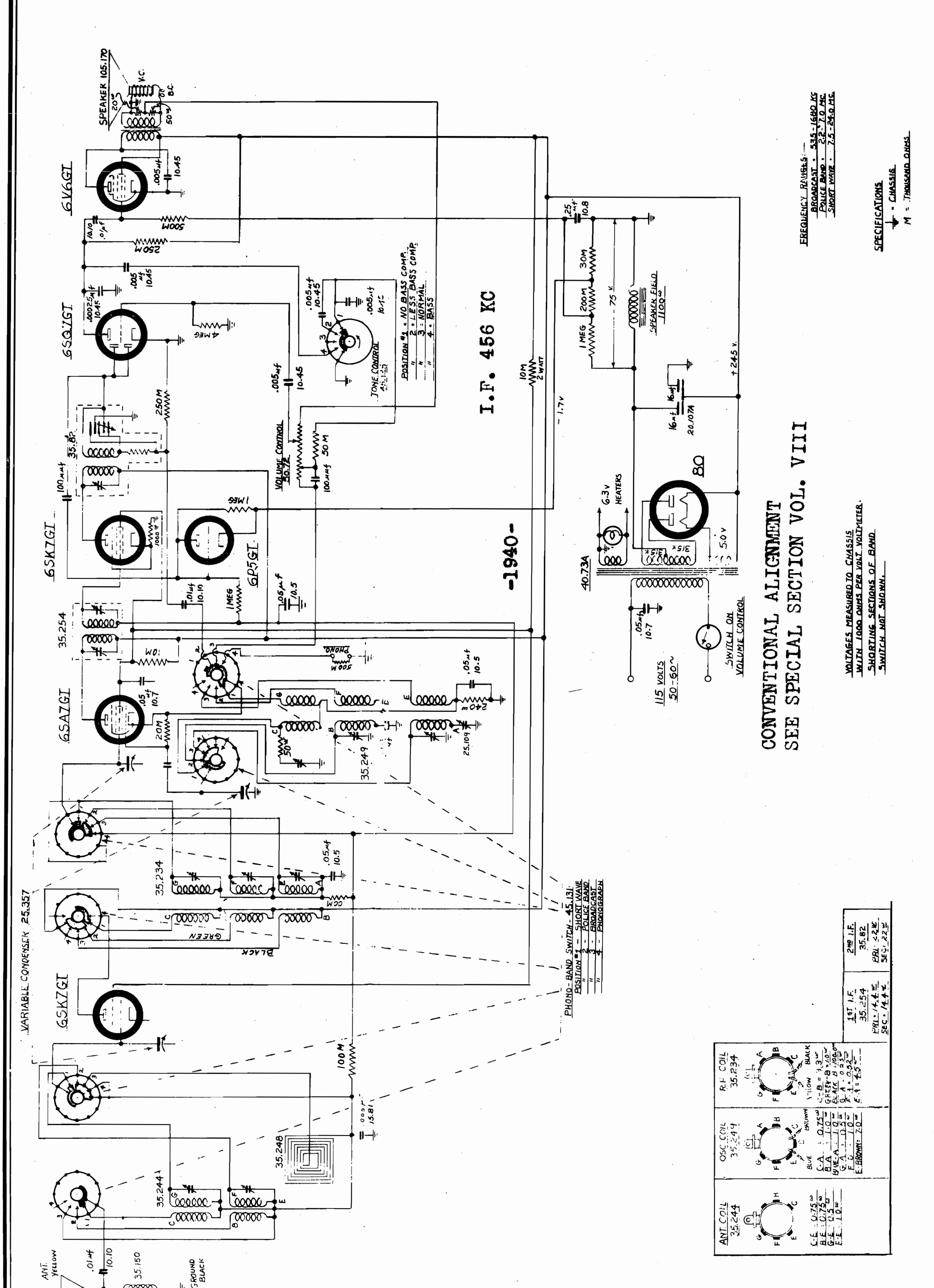
MODEL D175

FADA RADIO & ELECTRIC CO



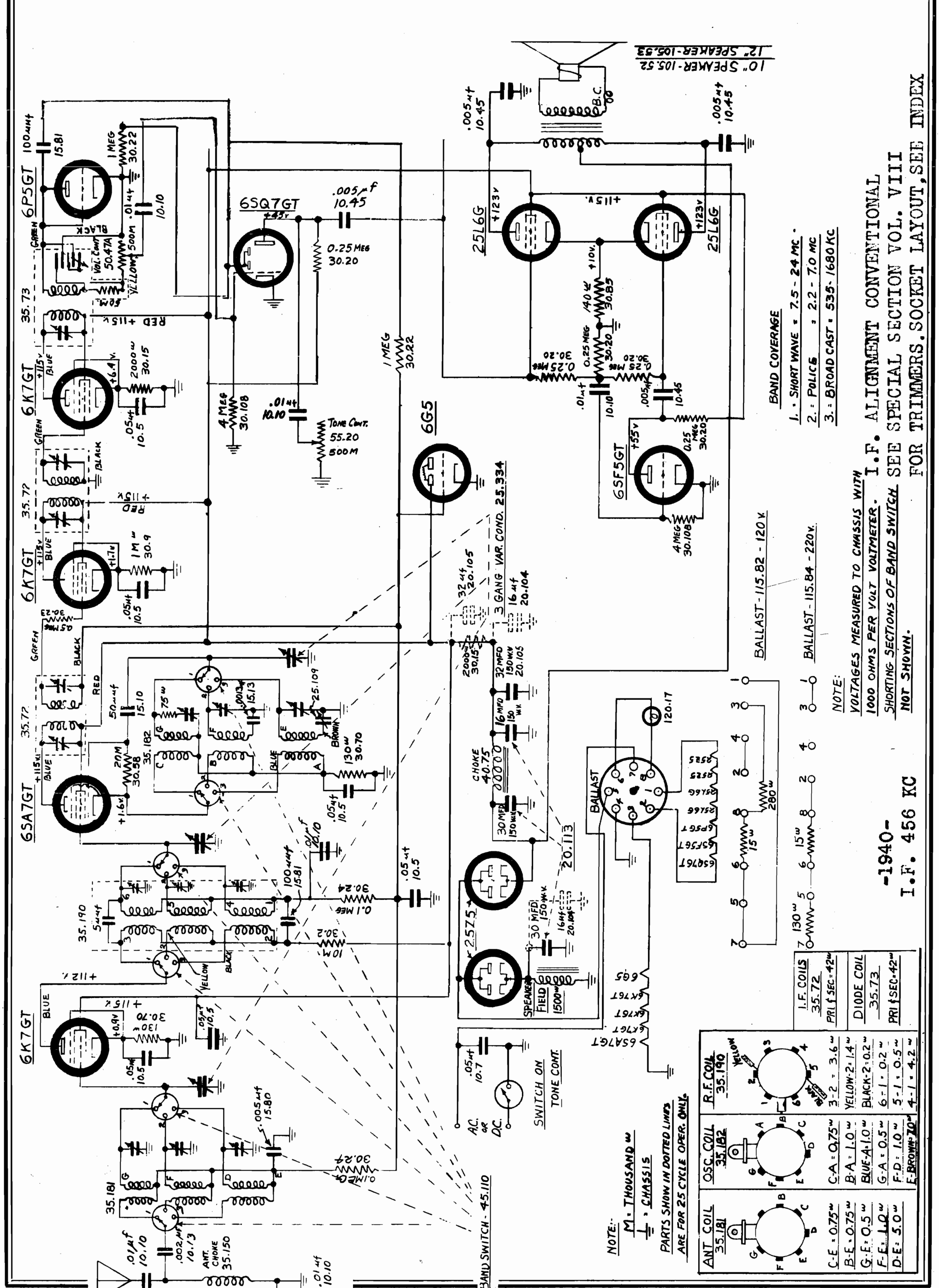
FADA RADIO & ELECTRIC CO

MODEL 176



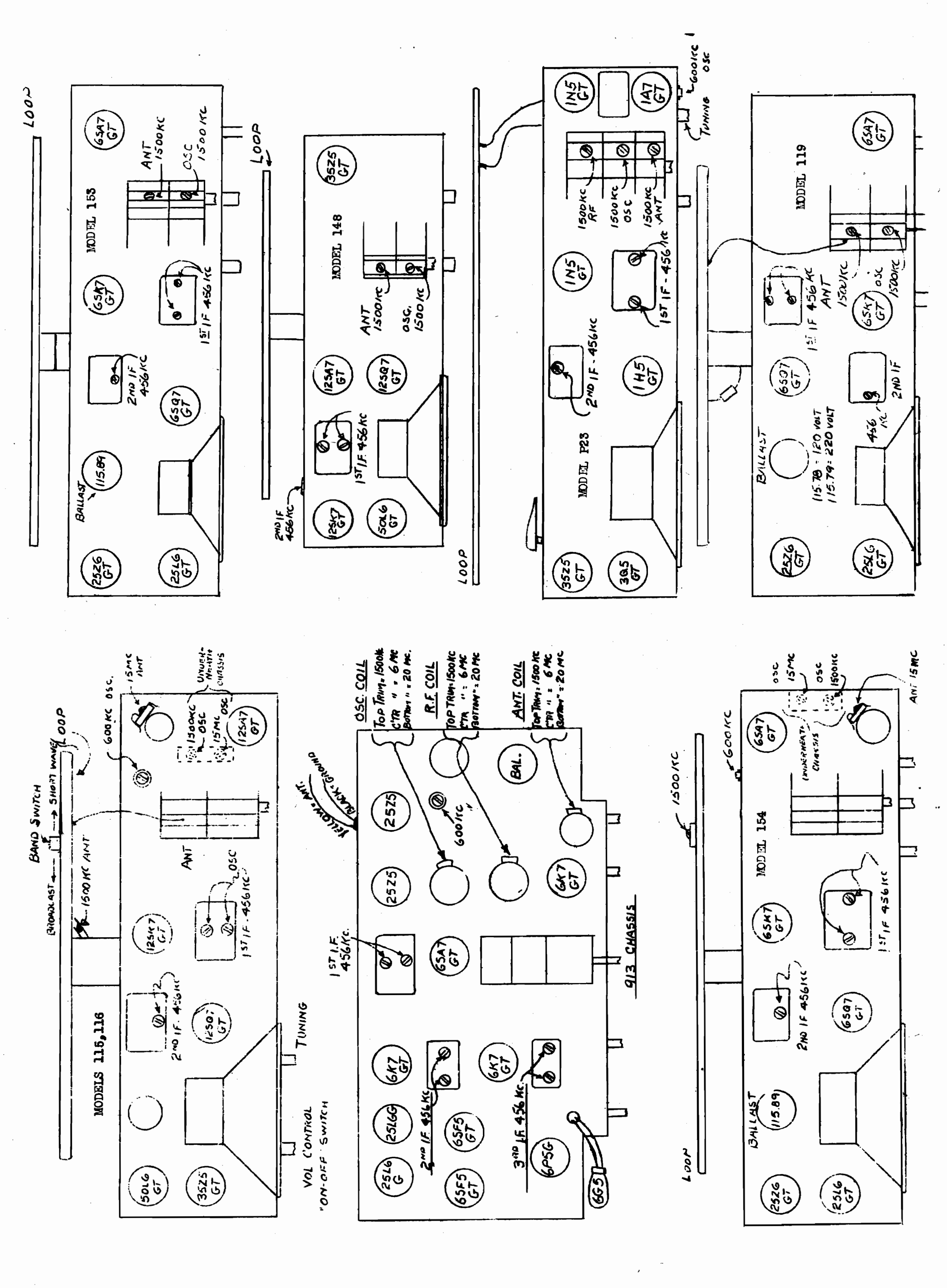
MODEL 913

FADA RADIO & ELECTRIC CO



FADA RADIO & ELECTRIC CO

MODEL 148 MODEL P23
MODEL 153 MODEL 115
MODEL 154 MODEL 116
MODEL 913 MODEL 119



Automatic Record Changer

FADA RADIO & ELECTRIC CO

AC. Unit - Part No. 125.10 Automatic Record Changer AC.-DC. Unit - Part No. 125.11

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.

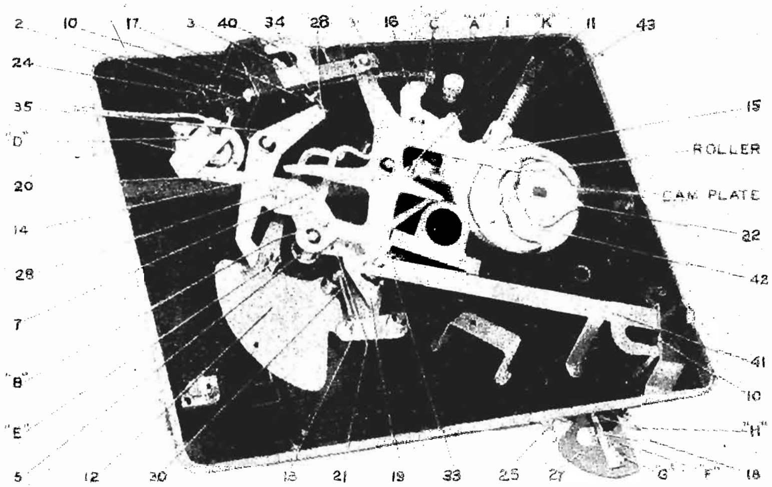
If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

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.



NOTE: Numbers refer to parts—letters refer to adjustments

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 .058 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 .055—.061 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 adjustment 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.

Apply a few drops of light machine oil to the motor spindle bearing and oil hole adjacent to the spindle bearing. The oil hole has a screw plug.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

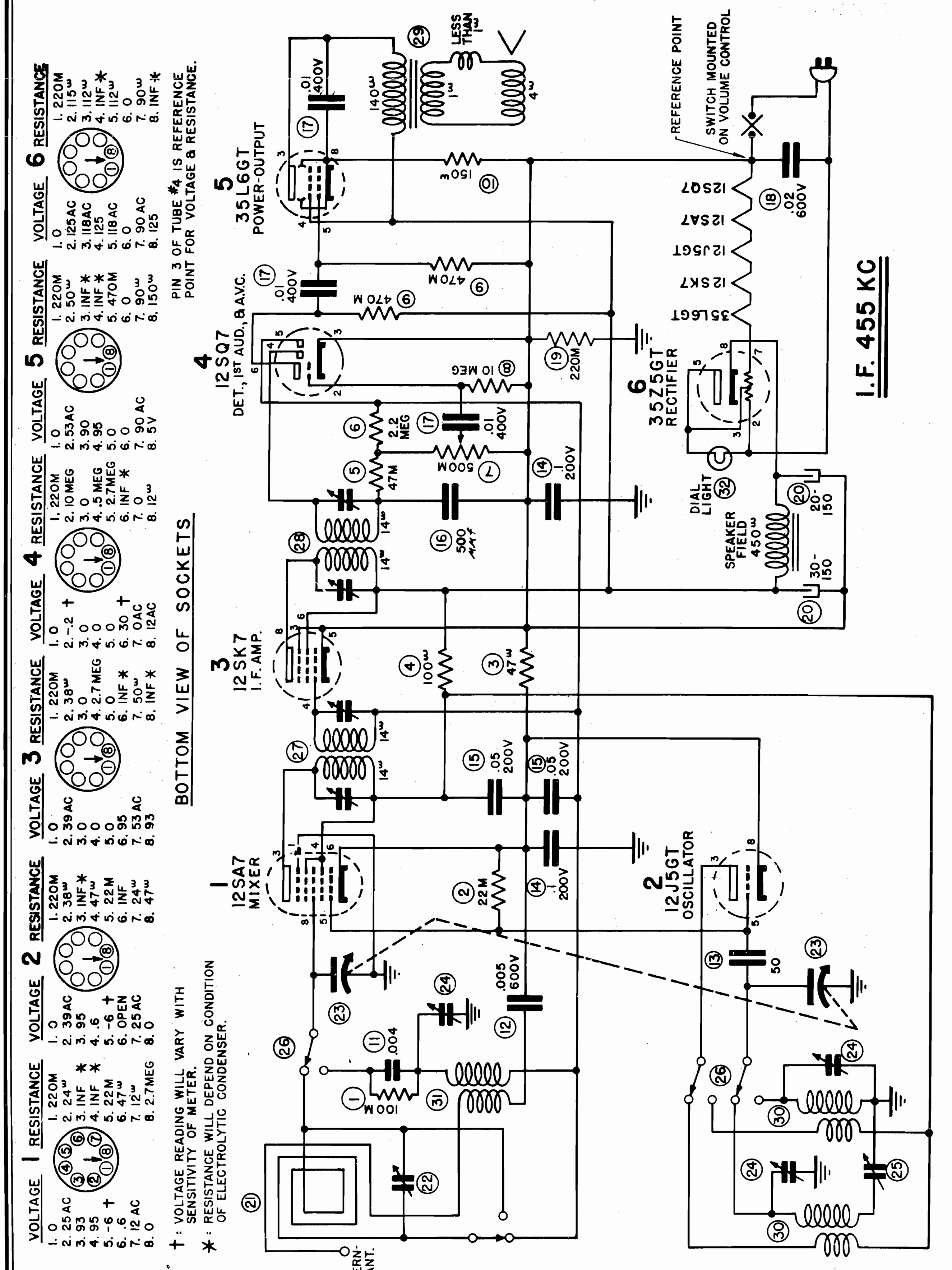
MISCELLANEOUS SERVICE HINTS

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. 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; 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 "34."
12. On AC. - DC. Models only - Spindle loosens from motor. - To tighten: Remove turntable, hold governor of motor and tighten spindle.

FARNSWORTH TELEV. & RADIO CORP.

MODELS BT20, BT22, BT61 BT63, BT66



1 VOLTAGE	1 RESISTANCE	2 VOLTAGE	2 RESISTANCE	3 VOLTAGE	3 RESISTANCE	4 VOLTAGE	4 RESISTANCE	5 VOLTAGE	5 RESISTANCE	6 VOLTAGE	6 RESISTANCE
1. 0	1. 220M	1. 0	1. 220M	1. 0	1. 220M	1. 0	1. 220M	1. 0	1. 220M	1. 0	1. 220M
2. 25AC	2. 24ω	2. 39AC	2. 38ω	2. 39AC	2. 38ω	2. -2 +	2. 10MEG	2. 53AC	2. 50ω	2. 125AC	2. 115ω
3. 93	3. INF *	3. 95	3. INF *	3. 0	3. 0	3. 0	3. 0	3. 90	3. INF *	3. 118AC	3. 112ω
4. 95	4. INF *	4. .6	4. 47ω	4. 0	4. 2.7MEG	4. 0	4. .5MEG	4. 95	4. INF *	4. 125	4. INF *
5. -6 +	5. 22M	5. -6 +	5. 22M	5. 0	5. 0	5. 0	5. 2.7MEG	5. 0	5. 470M	5. 118AC	5. 112ω
6. .6	6. 47ω	6. OPEN	6. INF	6. 95	6. INF *	6. 30 +	6. INF *	6. 0	6. 0	6. 0	6. 0
7. 12AC	7. 12ω	7. 25AC	7. 24ω	7. 53AC	7. 50ω	7. 0AC	7. 0	7. 90AC	7. 90ω	7. 90AC	7. 90ω
8. 0	8. 2.7MEG	8. 0	8. 47ω	8. 93	8. INF *	8. 12AC	8. 12ω	8. 5V	8. 150ω	8. 125	8. INF *

+ : VOLTAGE READING WILL VARY WITH SENSITIVITY OF METER.

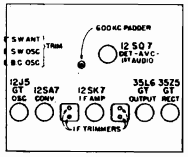
* : RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.

BT63, BT66
MODELS BT52, BT53, BT54
BT55, BT56
MODELS BT20, BT22, BT61

FARNSWORTH TELEV. & RADIO CORP.

When aligning the Short Wave Oscillator tighten the adjusting screw for maximum capacity and then loosen it until the first peak is reached. Do not use the signal heard at the lower capacity setting as in this receiver the oscillator works at a frequency lower than the one the R.F. is tuned to. If the loop is tuned to 18Mc the oscillator is tuned to 17,545Kc that is signal frequency minus I.F. frequency, instead of signal frequency plus I.F. frequency, or 18,455Kc as is customary.

Grid of 12SA7		Plate 12SA7	12 Gain
Plate of 12SA7		Grid 12SK7	Slight Loss
Grid of 12SK7	BT-20	Plate 12SK7	60 Gain
Plate of 12SK7	BT-22	Diode 12SQ7	25% Loss
Grid of 12SQ7	BT-61	Plate 12SQ7	30 Voltage Gain
Grid of 35L6GT	BT-63	Plate 35L6GT	5 Power Gain
	BT-66		



Oscillator Voltage 1500 Kc 8
Oscillator Voltage 600 Kc 10

Voltage Loss in Output Transformer 98½%.

TABULATION FOR ALIGNMENT

Steps	Dummy Antenna	Set Generator At	Set Gang At	Adjust	Located	To Obtain
1	Set volume control for maximum output.					
2	250 mmfd	455 Kc	Minimum	2nd I.F. Trimmers	Top of I.F. trans.	Maximum output
3				1st I.F. Trimmers		
4		1720 Kc		B.C. Osc.* Trimmer	Nearest front of chassis	
5		1500 Kc	Strongest Sig. & Rock Gang	B.C. R.F. Trimmer	On loop antenna	
6		600 Kc		600 Kc. Pad	Top of Chassis	
7	Check	1000 Kc				
8	400 ohms	18.1 Mc	Minimum	S.W. Osc.* Trimmer	Middle of three	
9		16 Mc	16 Mc	S.W. R.F.* Trimmer	Rear of three	

* These trimmers are on a strip of three at the right hand end of the chassis

PUSH BUTTON SET UP
(on BT-22 – BT-61 – BT-63 – BC-66)

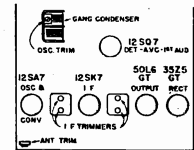
When the push buttons are lifted a screw is exposed. This screw should be loosened by one or two turns by a screwdriver. Tune in the desired station manually, then firmly press the button until it hits the stop, making certain the gang setting does not change. Again lift the push button and tighten the screw. Manually detune the set, press the button just set up. If the adjustment was properly made proceed with the remaining buttons.

Grid of 12SA7	BT-52	Plate 12SA7	15 Gain
Plate of 12SA7	BT-53	Grid 12SK7	1.3 Gain
Grid of 12SK7	BT-54	Plate 12SK7	60 Gain
Plate of 12SK7	BT-55	Diode 12SQ7	40% Loss
Grid of 12SQ7	BT-56	Plate of 12SQ7	30 Voltage Gain
Grid of 50L6GT		Plate 50L6GT	5 Power Gain

Oscillator Voltage 1500 Kc. – 6
Oscillator Voltage 600 Kc. – 7

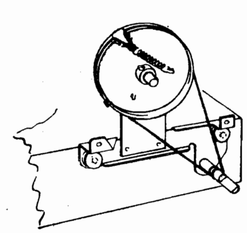
Voltage Loss in Output Transformer – 98½% Loss

All Values Above Are Approximate

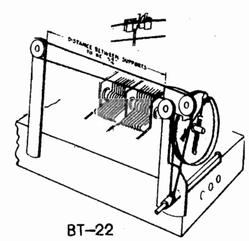


Steps	Connect High Side of Generator To	Set Generator At	Set Gang At	Adjust the Following	Located	To Obtain
1.	Set volume control at maximum					
2.	Antenna lead with 250 mmf. in series	455 Kc.	A Quiet Point	2nd I. F. Transformer	See Fig. Top of Chassis	Maximum output
3.				1st. I. F. Trimmers	See Fig. End of Chassis	
4.		1730 Kc.	Minimum Capacity	Oscillator Trimmer	Top of Gang Condenser	
5.		1400 Kc.	1400 Kc.	Antenna Trimmer		
6.		600 Kc.	600 Kc.	End Plates of Gang	See Fig. Rear Gang	
7.	Recheck all above adjustments					

STRINGING DIAGRAM



BT-52-53-54
BT-20



BT-22
BT-61
BT-63
BC-66
BT-55-56

FARNSWORTH TELEV. & RADIO CORP.

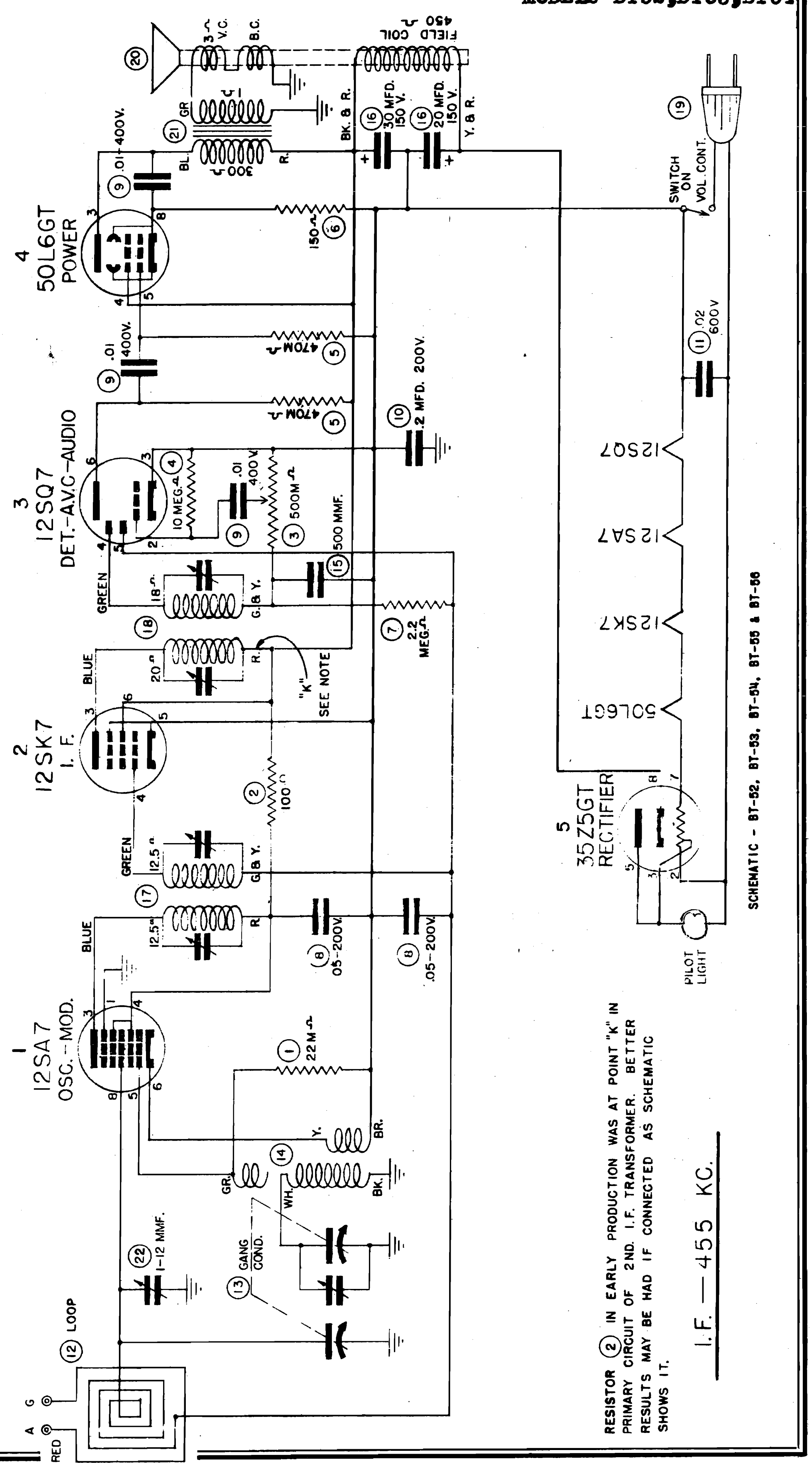
MODELS BT52, BT53, BT54, BT55, BT56

BOTTOM VIEW OF SOCKETS

Pin	1 Voltage	1 Resistance	2 Voltage	2 Resistance	3 Voltage	3 Resistance	4 Voltage	4 Resistance	5 Voltage	5 Resistance
1.	0 D.C.	INF	0	0	0	INF.	0	INF.		INF.
2.	27 A.C.	25	27 A.C.	25	0.75	INF.	41 A.C.	45	125 A.C.	100
3.	+85	INF	0	0	0	0	+75	INF.	119 A.C.	100
4.	+85	INF.	-3.5	2.5 MEG.	-.35	450M	+85	INF.	+125	INF.
5.	-8.5	25M	0	0	-.75	2.5 MEG.	0	550M	0	125
6.	0	0	+85	INF.	+52	INF.	0	0	0	0
7.	13 A.C.	15	41 A.C.	45	0 A.C.	0	90 A.C.	75	90 A.C.	75
8.	-.75	INF.	+85	INF.	13 A.C.	15	+5.75	150	+120	INF.

LINE VOLTAGE 125 V. A.C.

*REFERENCE POINT FOR A.C. & D.C. VOLTAGES AND RESISTANCE. MEASURE VOLTAGES WITH VOLTMETER HAVING RESISTANCE OF INFINITY OHMS PER VOLT.

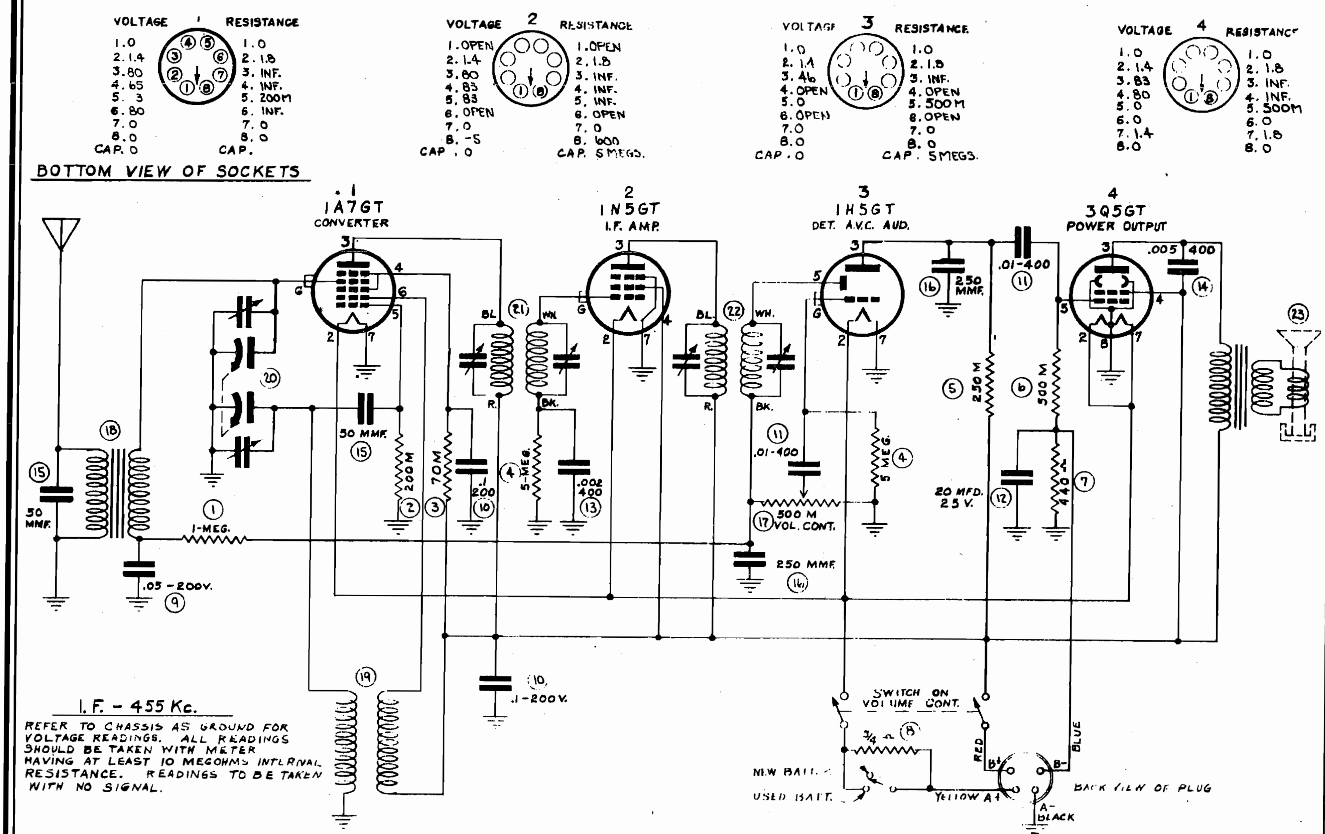


SCHEMATIC - BT-52, BT-53, BT-54, BT-55 & BT-56

RESISTOR (2) IN EARLY PRODUCTION WAS AT POINT "K" IN PRIMARY CIRCUIT OF 2ND. I.F. TRANSFORMER. BETTER RESULTS MAY BE HAD IF CONNECTED AS SCHEMATIC SHOWS IT.

I.F. — 455 KC.

MODELS BT41,BC45 FARNSWORTH TELEV. & RADIO CORP.



TO PROPERLY ALIGN THIS RECEIVER, A SIGNAL GENERATOR CALIBRATED AT 455 Kc., 1400 Kc., AND 1730 Kc., IS REQUIRED. THE OSCILLATOR TRIMMER IS NEAREST THE FRONT PANEL AND THE LOOP TRIMMER IS DIRECTLY BEHIND IT.

ANY COMBINATION OF ONE 1 1/2 VOLT "A" BATTERY AND TWO 45 VOLT "B" BATTERIES THAT WILL FIT IN THE RECEIVER CASE WILL BE SATISFACTORY. BATTERY DRAIN IS .2 AMP., AT 1 1/2 VOLTS AND 9 MA., AT 90 VOLTS.

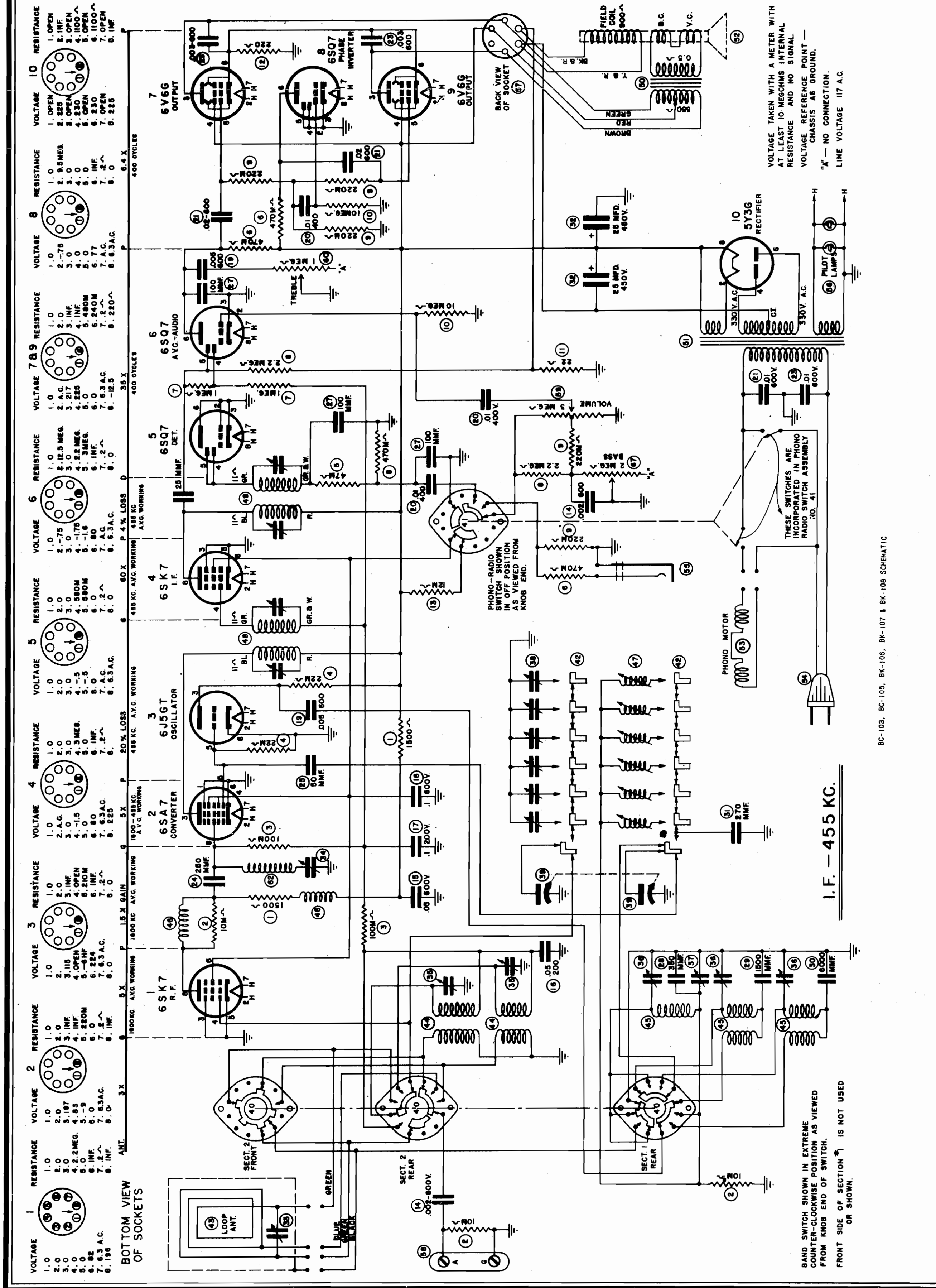
TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	.02 MFD. TO CHASSIS CONNECT HIGH SIDE OF GEN-ERATOR TO GRID CAP OF 1A7G TUBE.	455 Kc.	QUIET POINT	2ND I.F. TRIMMERS	TOP OF I.F. TRANS	MAXIMUM OUTPUT
				1ST I.F. TRIMMERS		
2.	250 M.M.F.	1730 Kc.	1730 Kc.	OSCILLATOR TRIMMER*	SEE NOTE BELOW	
3.	250 M.M.F.	1400 Kc.	1400 Kc. & ROCK GANG	LOOP TRIMMER*		

* SEE PRECEDING PARAGRAPH FOR LOCATION OF TRIMMERS.
**LOOP TO CONSIST OF FIVE TO TEN TURNS OF INSULATED WIRE WOUND ON A THREE TO FOUR INCH FORM TO BE CLOSELY COUPLED TO THE LOOP ANTENNA IN THE RECEIVER.

FARNSWORTH TELEV. & RADIO CORP.

**MODELS BC103, BC105
BK107, BK108, BK106**



MODELS BC103, BC105
BK107, BK108, BK106

FARNSWORTH TELEV. & RADIO CORP.

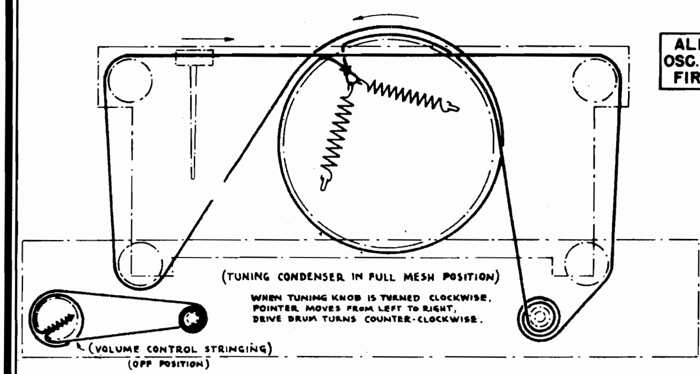
PUSH BUTTON SET UP

To prevent the buttons from being set up on the wrong stations a signal generator should be used.

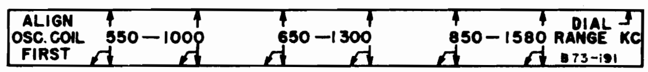
The button to the extreme right is the manual tuning button.

Adjust the lower screw (see fig.) first as this is the oscillator; then adjust the upper screw for maximum output.

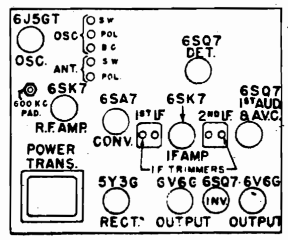
STRINGING DIAGRAM



BUTTON LAYOUT



OSCILLATOR TRIMMERS — BOTTOM ROW



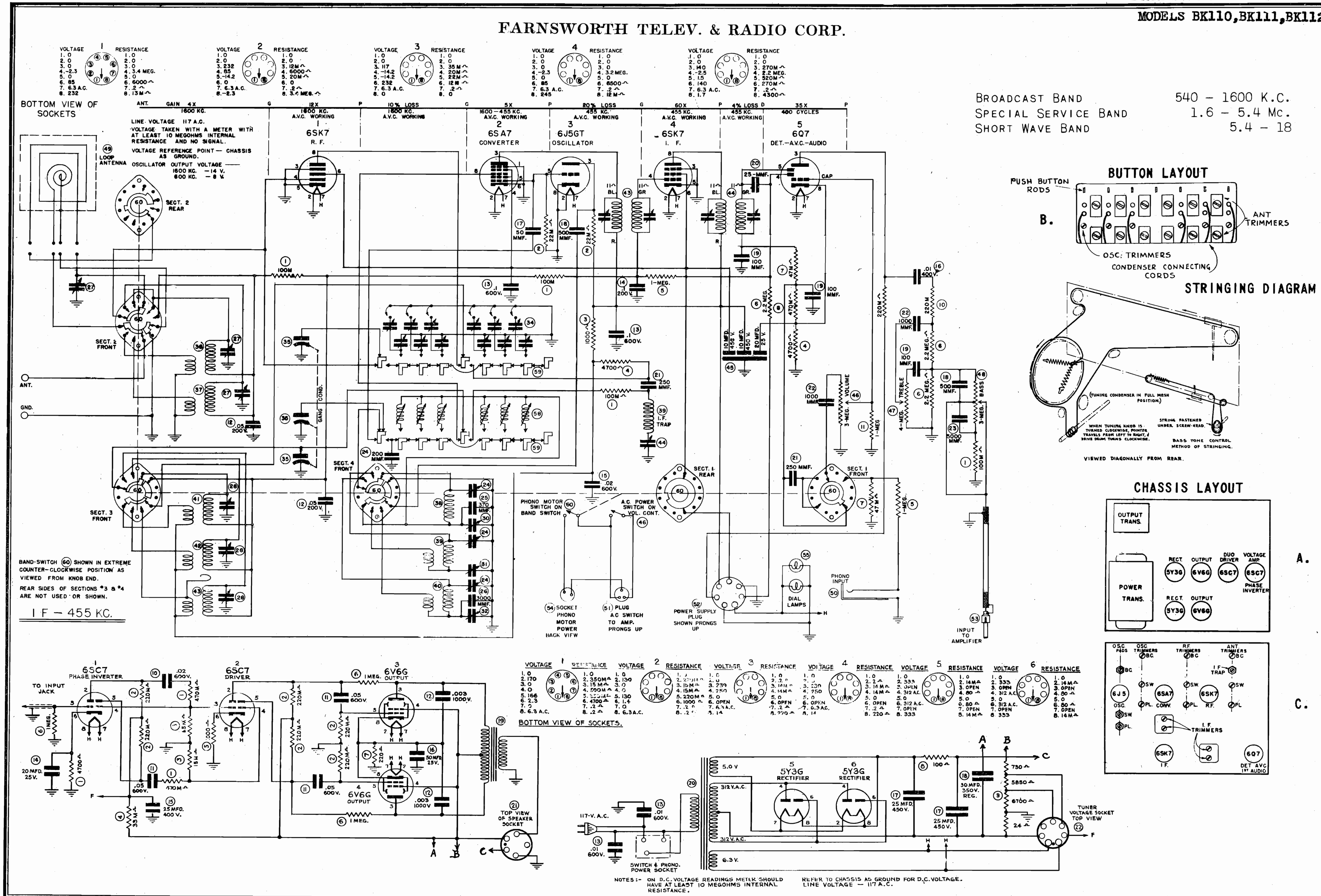
Steps	In Series With Antenna	Set Generator At	Set Gang At	Adjust	Located	To Obtain
1.	Set volume and tone controls at maximum					
2.	250 mmfd.	455 Kc.	Note A	2nd I.F. Trimmers	Top of I.F. Trans.	Max. Output
3.				1st I.F. Trimmers		
4.				Wave Trap Trimmer	Rear of Chassis	Min. Output
5.		1600 Kc.		Osc. B.C. Trimmer	On Loop	Maximum Output
6.		1500 Kc.	Note B	R.F. B.C. Trimmer		
7.		600 Kc.		600 Kc. Pad	See Fig.	
8.	Recheck 1500 Kc.					
9.	400 Ohms	5.4	Note A	Osc. Police Trimmer*		
10.		5 Mc.	Note B	R.F. Police Trimmer**		
11.	Check 1.8 Mc.					
12.	400 Ohms	18.1 Mc.	Note A	Osc. S.W. Trimmer*		
13.		16 Mc.	Note B	R.F.S.W. Trimmer**		
14.	Check 6 and 10 Mc.					

NOTE A. Set gang at minimum.
NOTE B. Strongest signal and rock gang.

*Tighten oscillator trimmer screw for maximum capacity, then unscrew until second peak is secured.

**Tighten R.F. trimmer screw for maximum capacity, then unscrew until first peak is secured.

MODELS BK110,BK111,BK112



FARNSWORTH TELEV. & RADIO CORP.

MODELS BK110, BK112 BK111

PUSH BUTTON SET UP

1. If the station you select for one of the buttons falls between 1500 to 1000 kilocycles be sure that the pin jack is in the upper strip.
2. Adjust the brass screw at the side of the lower trimmer until the wanted station is heard most clearly.
3. Adjust the lower trimmer screw for maximum volume.
4. Press Manual button making certain the station is still tuned in; check this reception against the reception on the button just set up. If it is the same proceed with the next station on the list.
5. If the station you desire to pick up falls between 1000 and 550 kilocycles, you must remove the pin jack and place in the hole provided at the bottom edge of the upper trimmer (see figure 1).
6. Turn the lower trimmer screw back until the screw is off the trimmer plates.
7. Adjust the brass screw until the wanted station is heard most clearly.
8. Then adjust the upper trimmer until maximum volume is secured; if maximum volume cannot be had and the upper trimmer screw is down tight you must finish tuning with the lower trimmer screw.

ALIGNMENT INSTRUCTIONS

An output meter and a signal generator are required for proper alignment of these sets. The oscillator should be calibrated at the following points, 455 Kc, 600 Kc, 900 Kc, 1400 Kc, 1600 Kc, 2.0 Mc. 5 Mc, 5.5 Mc, 6 Mc, 10 Mc, 16 Mc, and 18.0 Mc. Always keep the output of the signal generator as low as possible to prevent A.V.C. action and false settings. Connect the high side of the generator to the antenna terminal and the low side of it to the ground terminal making certain jumper on terminal strip is disconnected. Before aligning tighten wave trap trimmer screw.

TABULATION FOR ALIGNMENT

Steps	In Series With Antenna	Set Generator At	Set Gang At	Adjust	Located	To obtain
1.	SET VOLUME AND TONE CONTROLS AT MAXIMUM					
2.	250 mmfd.	455 Kc.	Note A	2nd I.F. Trimmers	Top of I.F. Trans.	Max. output
3.				1st I.F. Trimmers		
4.				Wave Trap Trimmer	See Fig.	Min. output
5.		1600 Kc.		Osc. B.C. Trimmer	See Fig.	MAXIMUM OUTPUT
6.		1400 Kc.	Note B	R.F. B.C. Trimmer Ant. B.C. Trimmer		
7.		600 Kc.		600 Kc. Pad.		
8.	Recheck 1400 Kc.					
9.	400 ohms	5.5	Note A	Osc. Police Trimmer*		
10.		5 Mc.	Note B	R.F. Police Trimmer** Ant. Police Trimmer**		
11.		2 Mc.	Note B	2 Mc. Pad.		
12.	Recheck 5 Mc.					
13.	400 ohms	18 Mc.	Note A	Osc. S.W. Trimmer*		
14.		16 Mc.	Note B	R. F. S.W. Trimmer** Ant. S.W. Trimmer**		
15.		6 Mc.	Note B	6 Mc. Pad.		
16.	Recheck 16 Mc.					

*Tighten oscillator trimmer screw for maximum capacity, then unscrew until second peak is secured.
**Tighten R.F. Trimmer screw for maximum capacity, then unscrew until first peak is secured.

NOTE A. Set gang at minimum.
NOTE B. Strongest signal and rock gang.

WATTS	AT 117 VOLTS A.C.	106
VOLTAGE	A. C.	105-125

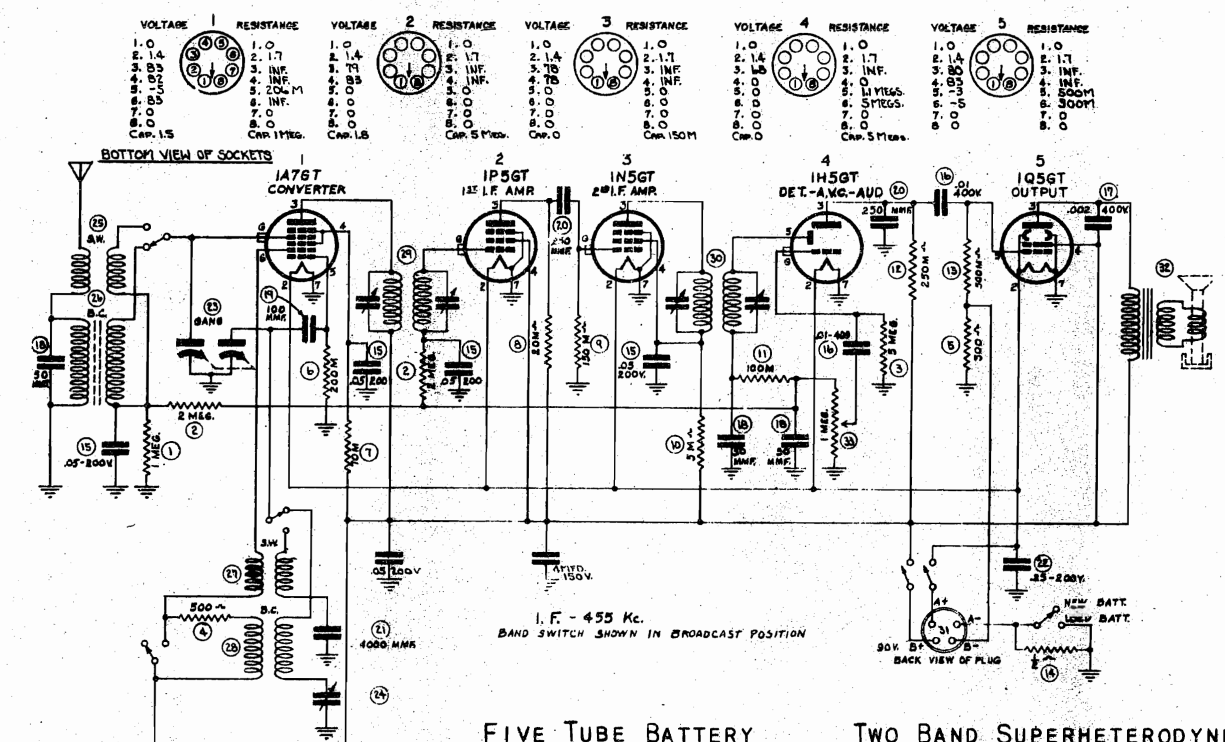
TUBE COMPLEMENT

6SK7 R. F. AMPLIFIER
6SA7 CONVERTER
6J5 OSCILLATOR
6SK7 I. F. AMPLIFIER
6Q7 DET A.V.C. 1ST AUDIO
6SC7 PHASE INVERTER
6SC7 DUO DRIVER
2 - 6V6 OUTPUT
2 - 5Y3G RECTIFIERS

MODELS	CHASSIS
BK-110	C-32
BK-111	C-73
BK-112	C-32

MODEL BT57

FARNSWORTH TELEV. & RADIO CORP.



FIVE TUBE BATTERY
BROADCAST BAND
SHORTWAVE BAND

TWO BAND SUPERHETERODYNE
540 Kc. - 1600 Kc.
6 Mc. - 18.3 Mc.

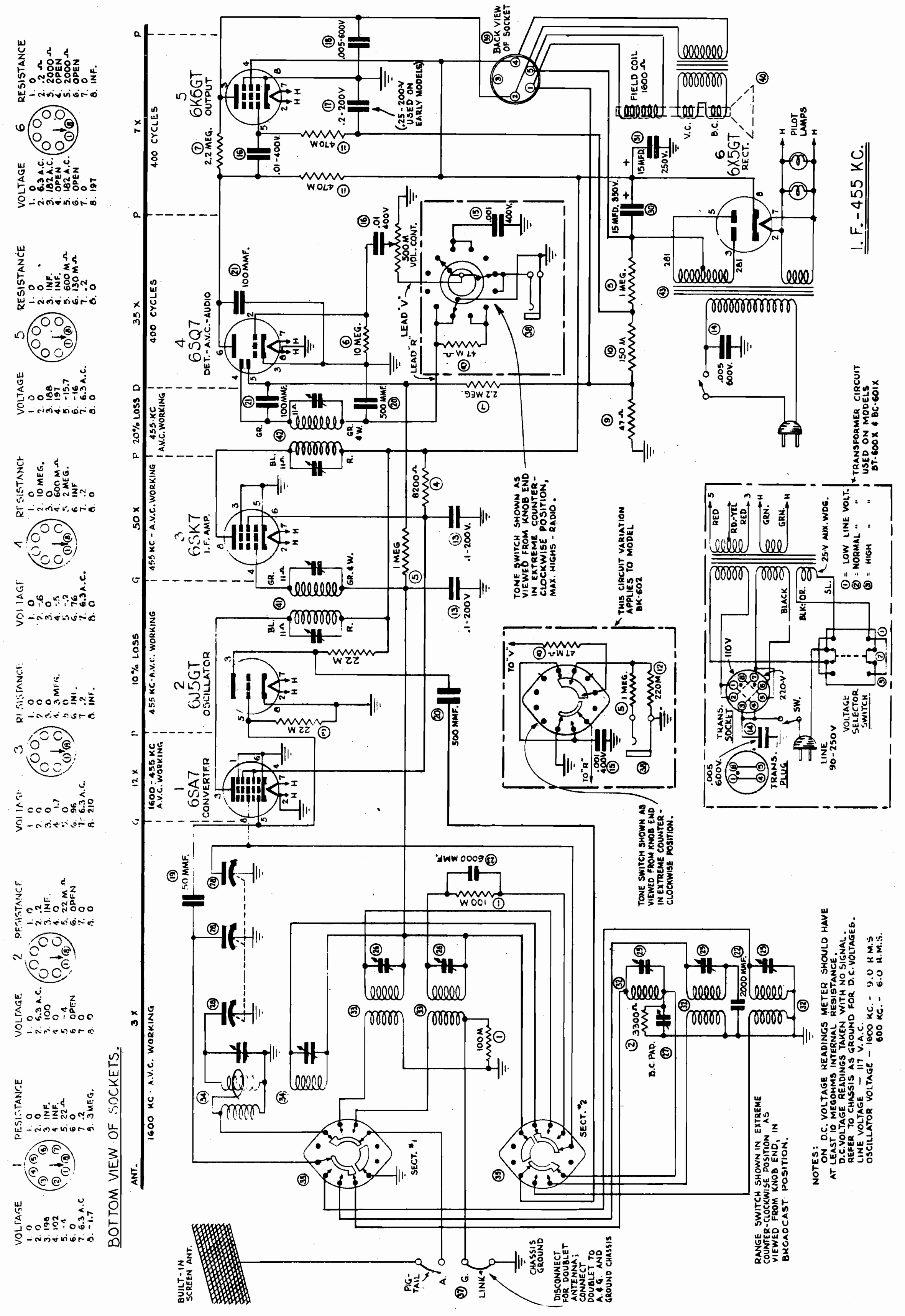
TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	SET VOLUME CONTROL AT MAXIMUM					
2.	250 MMFD.	455 Kc.	NOTE A	2ND I.F. TRIMMERS	TOP 2ND I.F. TRAN.	MAXIMUM OUTPUT
3.				1ST I.F. TRIMMERS	TOP 1ST I.F. TRAN.	
4.		1600 Kc.		B.C.R.F. TRIMMER	RIGHT FRONT OF CHASSIS	
5.		1500 Kc.	NOTE B	B.C.R.F. TRIMMER		
6.		600 Kc.		B.C.	SIDE OF CHASSIS	
7.	RECHECK 1600 Kc.				LEFT FRONT OF CHASSIS	
8.	400 OHMS	18.1 Mc.	NOTE A	S.W. OSC. TRIMMER		
9.		16 Mc.	NOTE B	S.W.R.F. TRIMMER		
10.	CHECK SIGNAL AT 6 Mc. AND 10 Mc.					

NOTE A. Set Gang at Minimum.
NOTE B. Strongest Signal and Rock Gang.

FARNSWORTH TELEV. & RADIO CORP

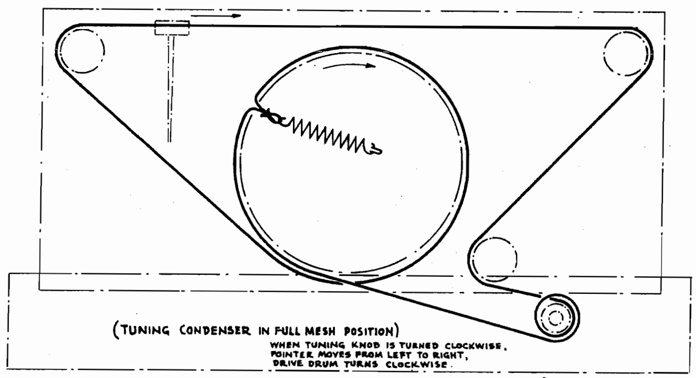
MODELS BT600, BC601, BK602, BK6025, BT600X, BC601X, BK602X, BK6025X



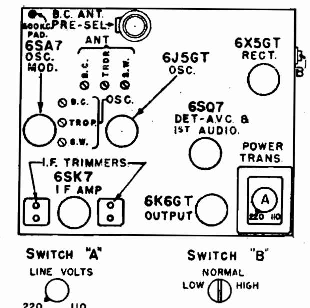
MODELS BT600, BC601, BK6025, BT600X, BC601X, BK602X, BK6025X BK602,

FARNSWORTH TELEV. & RADIO CORP.

STRINGING DIAGRAM



CHASSIS LAYOUT



SETTING	POSITION	OPERATING RANGE
110 VOLTS	LOW NORMAL HIGH	90 - 110 110 - 135 135 - 165
220 VOLTS	LOW NORMAL HIGH	200 - 225 225 - 250 250 - 300

TABULATION FOR ALIGNMENT

STEPS	IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	SET VOLUME AND TONE CONTROLS AT MAXIMUM					
2.	B.C. 250 MMFD.	455 Kc.	NOTE A	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	MAX. OUTPUT
3.	B.C. 250 MMFD.	455 Kc.	NOTE A	1ST I.F. TRIMMERS	TOP OF I.F. TRANS.	MAX. OUTPUT
4.	B.C. 250 MMFD.	455 Kc.	NOTE A			
5.	B.C. 250 MMFD.	1900 Kc.	NOTE A	OSC. B.C. TRIMMER	SEE FIG.	MAXIMUM OUTPUT
6.	B.C. 250 MMFD.	1500 Kc.	NOTE B	R.F. B.C. TRIMMER PRESELECTOR TRIMMER	SEE FIG.	MAXIMUM OUTPUT
7.	B.C. 250 MMFD.	600 Kc.	NOTE B	600 Kc. PAD	SEE FIG.	MAXIMUM OUTPUT
8.	RECHECK 1500 Kc.				SEE FIG.	MAXIMUM OUTPUT
9.	TROPICAL BAND 400 OHMS	7.0	NOTE A	OSC. POLICE TRIMMER*	SEE FIG.	MAXIMUM OUTPUT
10.	TROPICAL BAND 400 OHMS	6.0	NOTE B	R.F. POLICE TRIMMER**	SEE FIG.	MAXIMUM OUTPUT
11.	CHECK 2.2 Mc.				SEE FIG.	MAXIMUM OUTPUT
12.	S.W. 400 OHMS	22.0 Mc.	NOTE A	OSC. S.W. TRIMMER*	SEE FIG.	MAXIMUM OUTPUT
13.	S.W. 400 OHMS	18.0 Mc.	NOTE B	R.F.S.W. TRIMMER**	SEE FIG.	MAXIMUM OUTPUT
14.	CHECK 6 AND 10 Mc.					

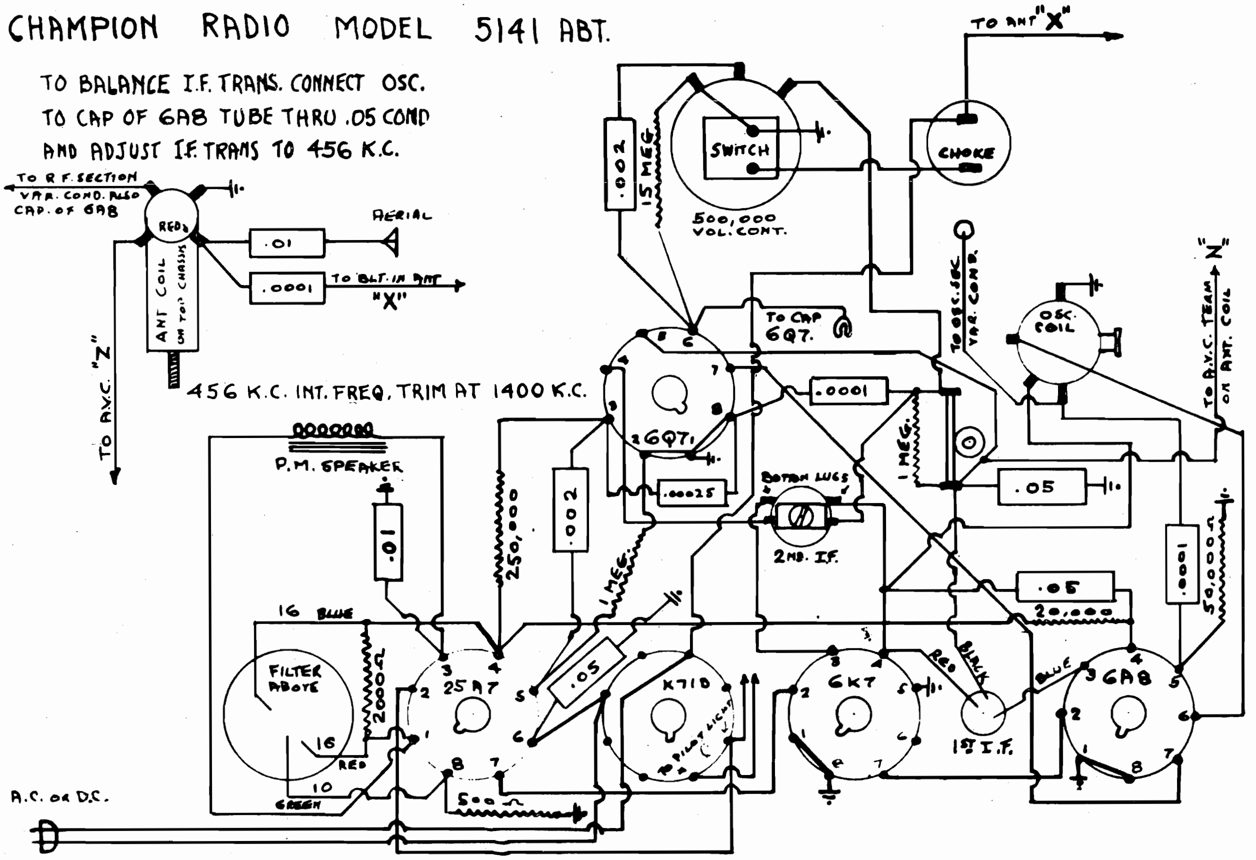
NOTE A. SET GANG AT MINIMUM.
NOTE B. STRONGEST SIGNAL AND ROCK GANG.

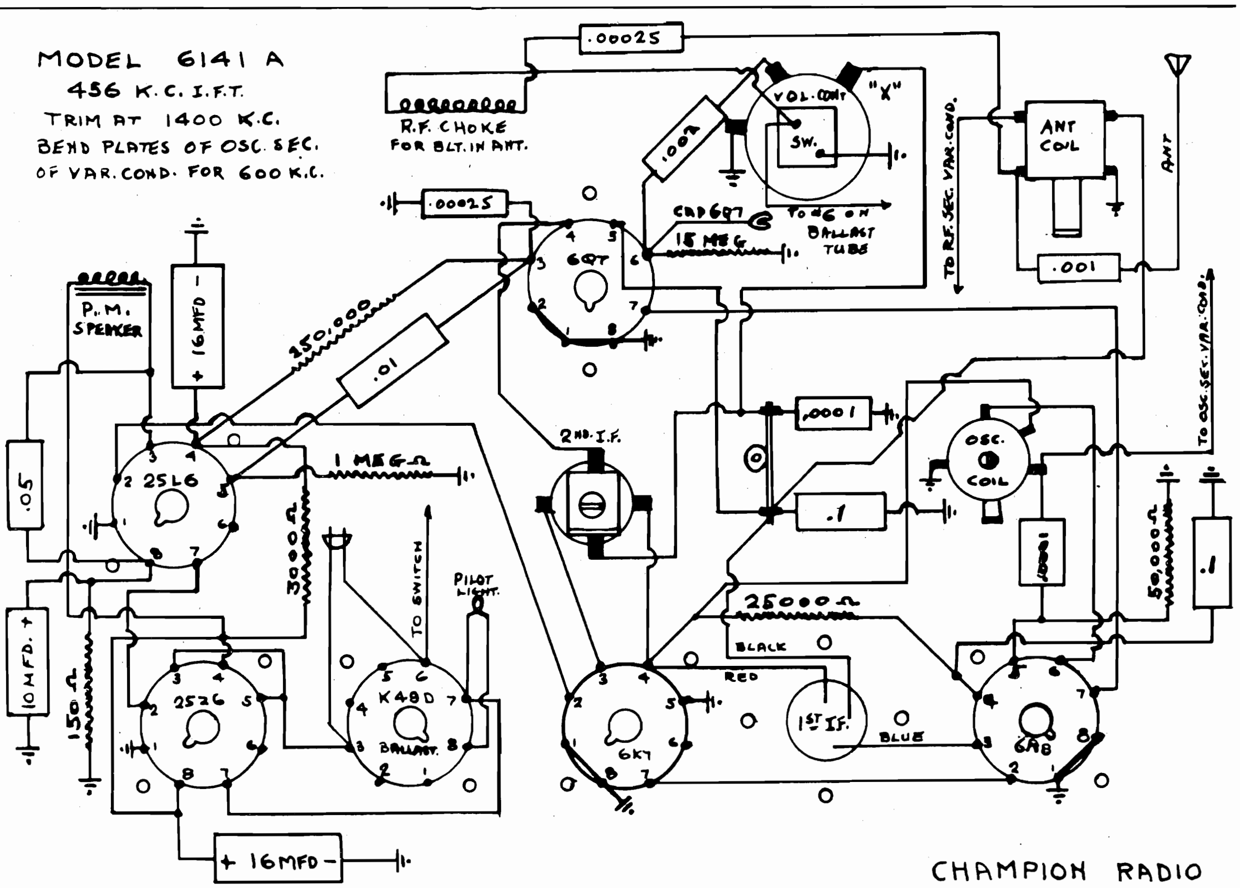
*TIGHTEN OSCILLATOR TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL SECOND PEAK IS SECURED.

**TIGHTEN R.F. TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL FIRST PEAK IS SECURED.

FERGUSON RADIO, INC.

MODEL 5141ABT
MODEL 6141A

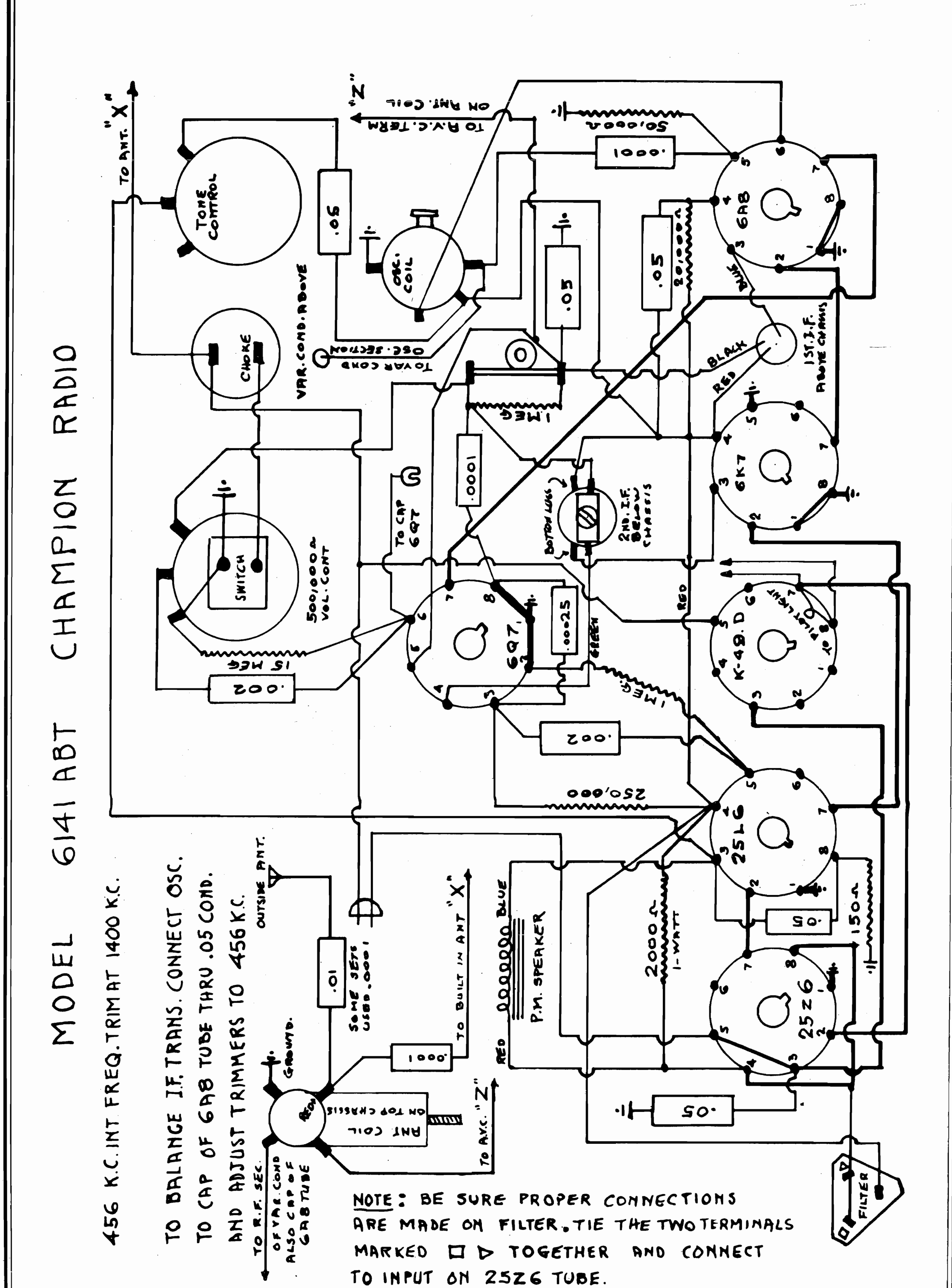




CHAMPION RADIO

MODEL 6141ABT

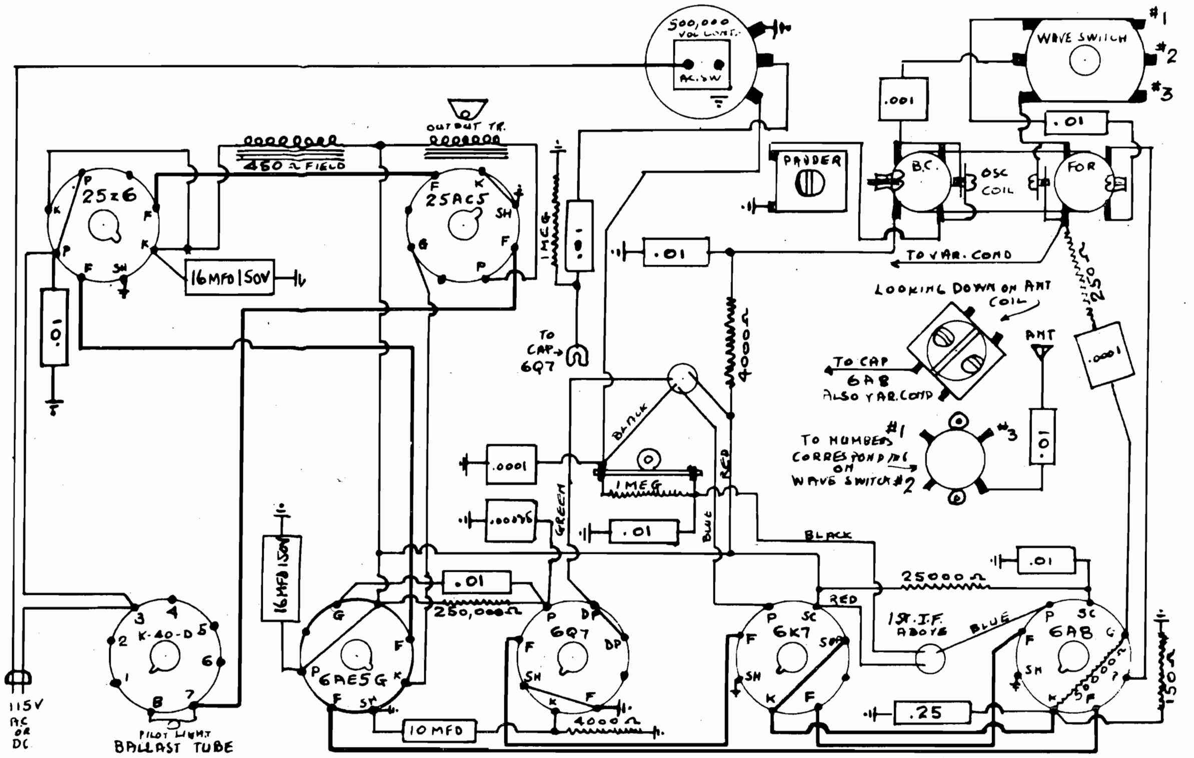
FERGUSON RADIO, INC.



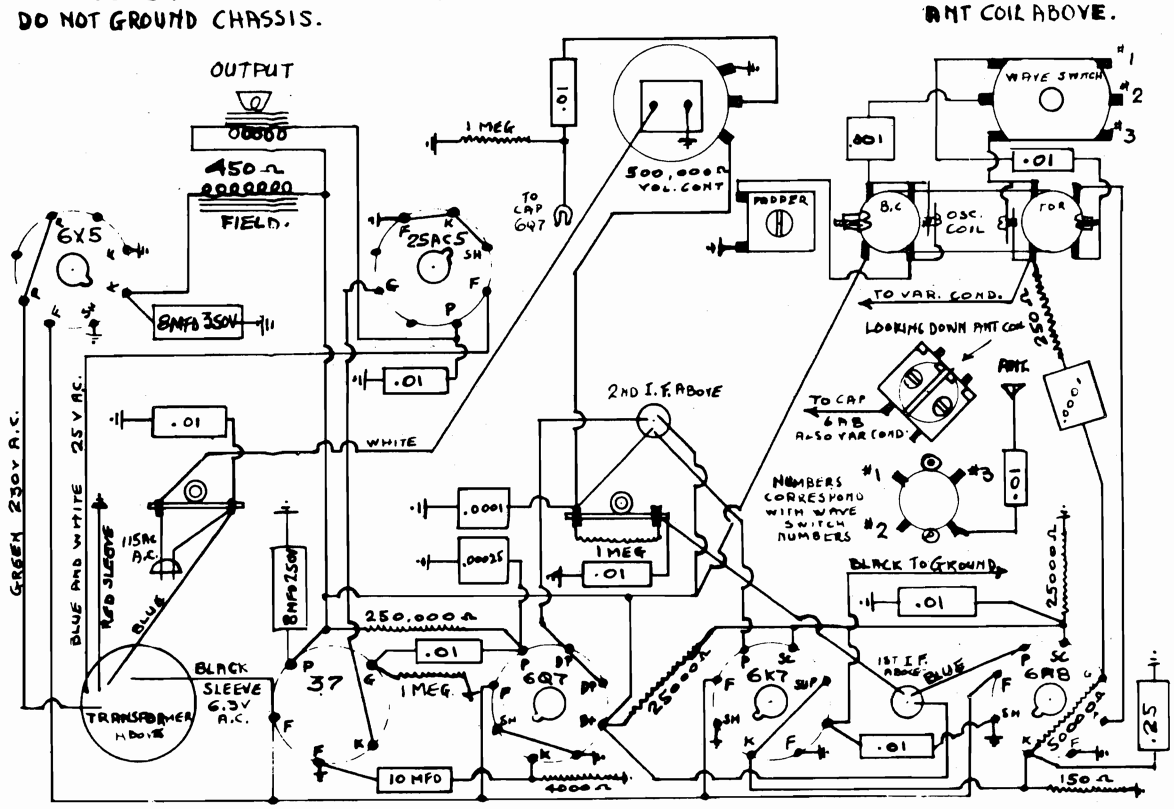
MODEL 7339-A
MODEL 7339-T

FERGUSON RADIO, INC.

MODEL 7339-A. CHAMPION RADIO
DO NOT GROUND CHASSIS. 456 K.C. 3 BAND A.C. or D.C. ANT. COIL ABOVE.

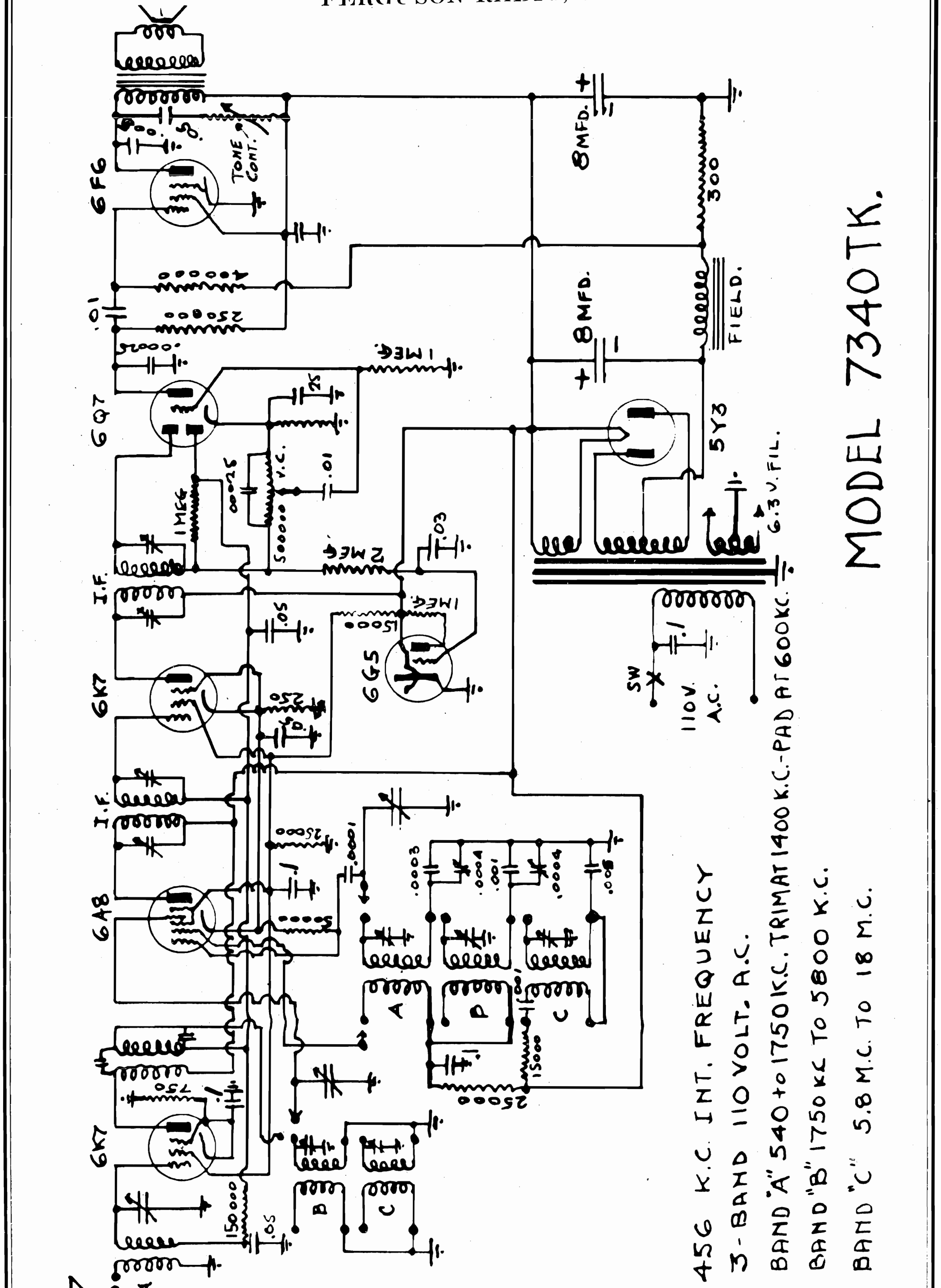


MODEL 7339T CHAMPION RADIO. A.C. ONLY. 3 BAND 456 K.C. PAD AT 600 K.C. TRIM AT 1400 KC & 19 MC.
DO NOT GROUND CHASSIS. ANT COIL ABOVE.



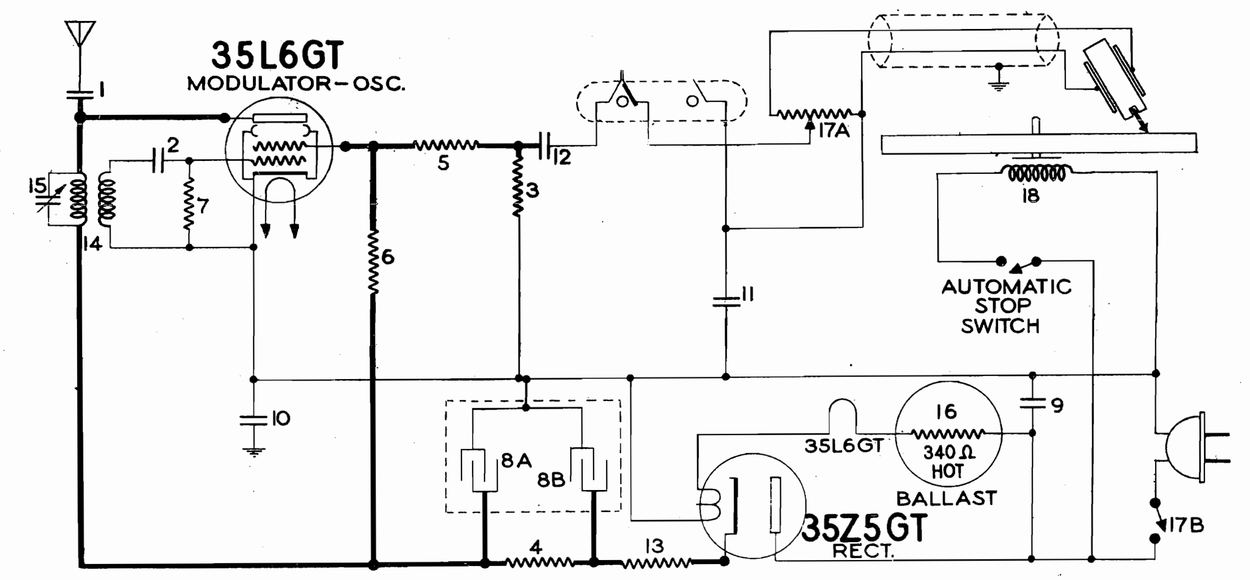
MODEL 7340TK

FERGUSON RADIO, INC.



MODEL S-7401-7

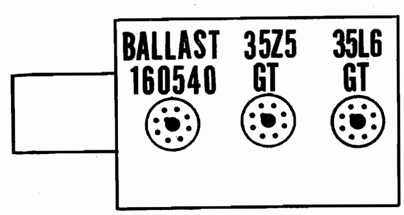
FIRESTONE TIRE & RUBBER CO.



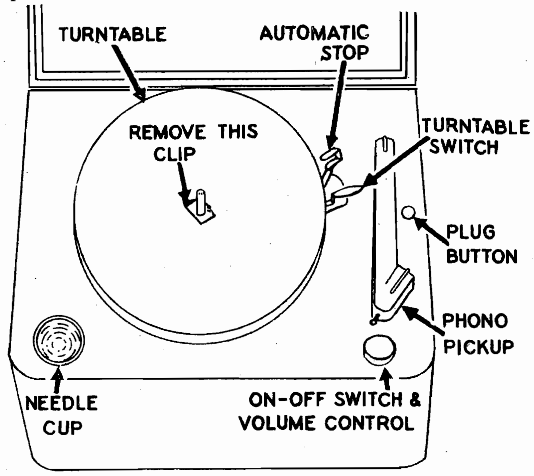
MICROPHONE CONNECTIONS

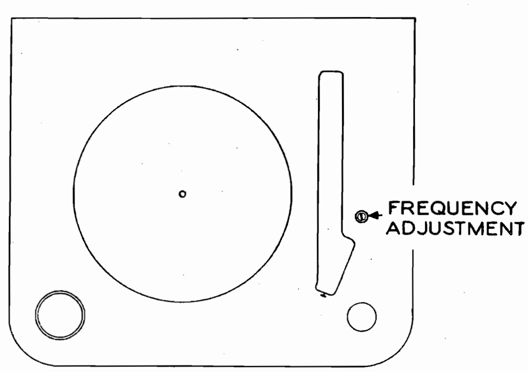
Provisions have been made so that a high impedance microphone may be connected to the record player. This will permit any sound picked up by the microphone to be heard through the radio receiver. The microphone cable should be equipped with standard ⅛" plugs which should be inserted into the holes in the plate marked "MICROPHONE" at the rear of the record player.

TUBE LOCATIONS



REAR OF CHASSIS





ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
4	110569	Resistor—carbon 10,000 ohms ¼ watt	.12
5	110578	Resistor—carbon 68,000 ohms ¼ watt	.12
6	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
7	116051	Resistor—insulated 33,000 ohms ¼ watt	.15
8A-8B	116470	Condenser—electrolytic 20-20 mfd. 150 volt	.95
9-10	116625	Condenser—.1 mfd. 600 volt	.25
11-12	116819	Condenser—.05 mfd. 600 volt	.20
13	118823	Resistor—1000 ohms 1 watt Wire Wound	.15
14	160499	Coil—oscillator	.26
15	160501	Condenser—tuning	.22
16	160540	Ballast tube	.60
17A-17B	160576	Volume control—250,000 ohms with switch	1.45
18	160603	Motor—less turntable	5.65

ALL D.C. VOLTAGES MEASURED TO B — (K on 35L6GT)

TUBE	FUNCTION	H	K	G	S	P
35L6GT	Oscillator Modulator	34 V. A.C.	0	—1	Note A	140
35Z5GT	Rectifier	34 V. A.C.	150	——	——	117 V. A.C.

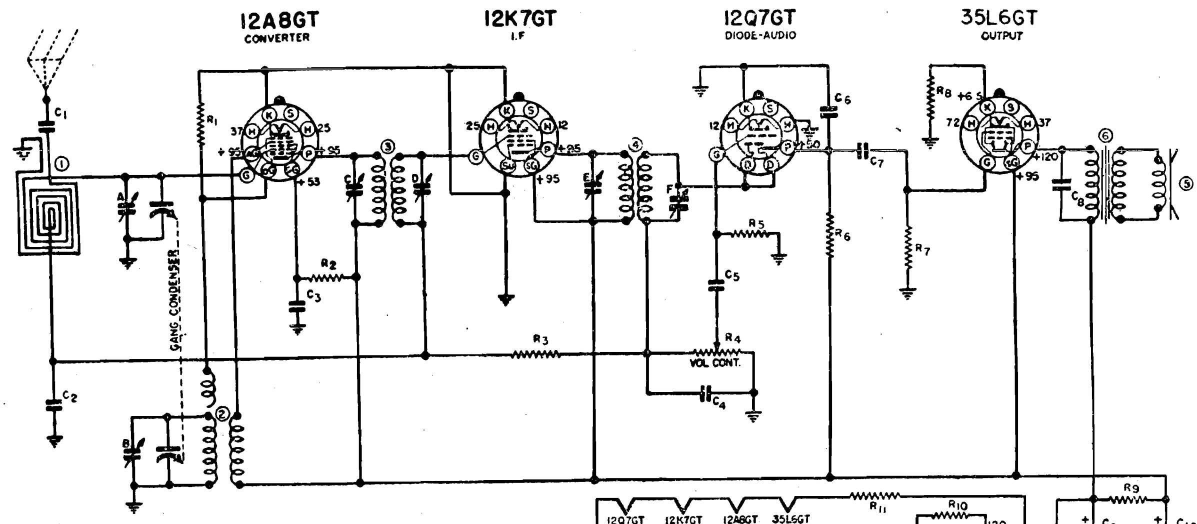
NOTE A: Voltage on the screen of the 35L6GT cannot be measured with the ordinary voltmeter because of the high resistance of resistor No. 6. **Use a voltmeter of at least 1000 ohms per volt.**

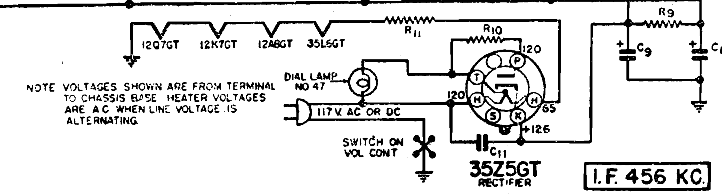
Set the receiver to be used with this record player, to some frequency between 540 and 750 KC which is clear and free from interfering stations. Remove the plug near the volume control on top of the record player. Using an insulated screwdriver turn the screw, located beneath this plug, until the signal from the record player is heard in the receiver. This will be heard as a reduction in noise as the signal comes in tune with the receiver. If a record is being played, the music or sound from it may be tuned in. If it is desired to change the frequency, set the receiver to the new frequency and turn the screw until the signal is heard. The fact that stations which are entirely absent during the day may be present at night with strong signals, should be kept in mind in choosing the frequency to be used. Always choose a frequency which is free from strong interference at all times, day or night.

When the record player is located at some distance from the receiver, or under conditions when the signal from it is too weak, the coil of wire from the record player should be uncoiled enough to give a satisfactory signal. Under no conditions should more wire be uncoiled than is necessary for a reasonably strong signal in the receiver.

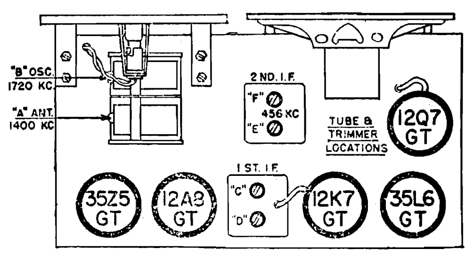
MODEL S-7403-5

FIRESTONE·TIRE & RUBBER CO.





DIAG NO	PART NO	DESCRIPTION	DIAG NO	PART NO	DESCRIPTION
R1	N-1260	50,000 OHM .5W 20%	1	N-3041	ANTENNA COIL LOOP
R2	N-1259	15,000 OHM .5W 20%	2	N-1452	OSCILLATOR COIL
R3	N-1262	1 MEGOHM .5W 20%	3	N-3043	1 ST. I.F. TRANSFORMER
R4	N-3045	.5 MEGOHM VOL. CONT.	4	N-3044	2ND I.F. TRANSFORMER
R5	N-1263	10 MEGOHM .5W 20%	5	N-3039	5" SPEAKER
R6	N-1377	200,000 OHM .5W 20%	6	N-3040	OUTPUT TRANSFORMER
R7	N-1264	500,000 OHM .5W 20%			
R8	N-1615	250 OHM .5W 10%			
R9	N-1237	2,000 OHM .5W 20%			
R10	N-1742	25 OHM .5W 20%			
R11	N-1618	80 OHM 2 W 10%			
				N-3046	2 GANG CONDENSER
C1	N-1344	.01 MFD. 400 V.			
C2	N-1345	.05 MFD. 200 V.			
C3	N-1345	.05 MFD. 200 V.			
C4	N-1374	100 MMFD.			
C5	N-1344	.01 MFD. 400 V.			
C6	N-1347	.0005 MFD 400 V.			
C7	N-1344	.01 MFD. 400 V.			
C8	N-1376	.02 MFD. 400 V.			
C9 C10	N-2015	35 MFD. 150 V. 20 MFD. 150 V ELECTRO.			
C11	N 1346	.05 MFD. 400 V.			



5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

DRWN L.T.C APP'D
MARCH 18, 1940
KH

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles and includes the popular 1712 KC police channel.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. 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.) 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.

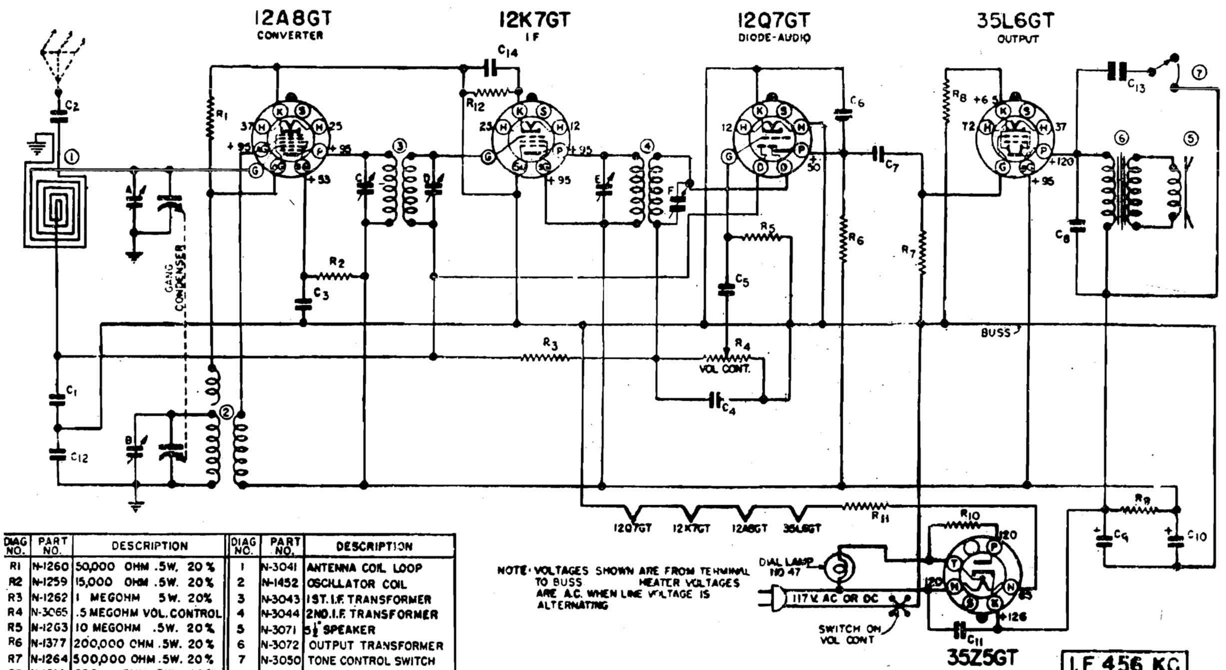
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis, shield, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

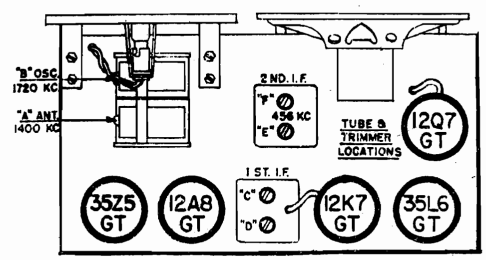
FIRESTONE TIRE & RUBBER CO.

MODEL S-7403-6



I.F. 456 KC.

DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20%	1	N-3041	ANTENNA COIL LOOP
R2	N-1259	15,000 OHM .5W. 20%	2	N-1452	OSCILLATOR COIL
R3	N-1262	1 MEGOHM 5W. 20%	3	N-3043	1ST. I.F. TRANSFORMER
R4	N-3065	.5 MEGOHM VOL. CONTROL	4	N-3044	2ND. I.F. TRANSFORMER
R5	N-1263	10 MEGOHM .5W. 20%	5	N-3071	5½" SPEAKER
R6	N-1377	200,000 OHM .5W. 20%	6	N-3072	OUTPUT TRANSFORMER
R7	N-1264	500,000 OHM .5W. 20%	7	N-3050	TONE CONTROL SWITCH
R8	N-1616	250 OHM .5W. 10%			
R9	N-1257	2000 OHM .5W. 20%			
R10	N-1742	25 OHM .5W. 20%			
R11	N-1618	80 OHM 2W. 10%			
R12	N-2487	200 OHM .5W. 20%			
C1	N-1345	.05 MFD. 200 V.		N-3046	2 GANG CONDENSER
C2	N-1344	.01 MFD. 400 V.			
C3	N-1345	.05 MFD. 200 V.			
C4	N-1374	100 MMFD.			
C5	N-1344	.01 MFD. 400 V.			
C6	N-1447	.0005 MFD. 400 V.			
C7	N-1344	.01 MFD. 400 V.			
C8	N-1376	.02 MFD. 400 V.			
C9 C10	N-3114	40 MFD. 150 V. 25 MFD. 150 V. ELECTRO.			
C11	N-1346	.05 MFD. 400 V.			
C12	N-3080	.22 MFD. 200 V.			
C13	N-1346	.05 MFD. 400 V.	C14	N-1351	.1 MFD. 200 V.



5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

DRWN. LTC APP'D.

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles and includes the popular 1712 KC police channel.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. 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.) 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.

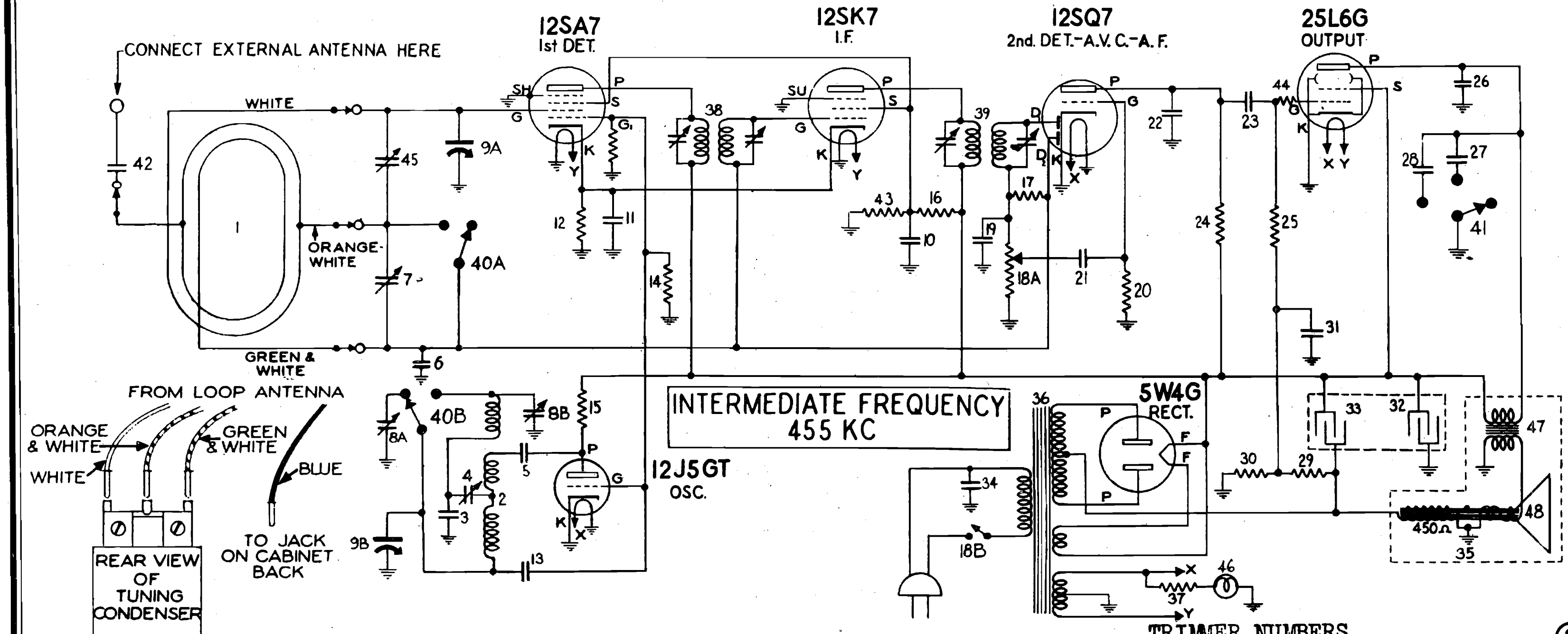
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis, shield, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

MODEL S-7403-7

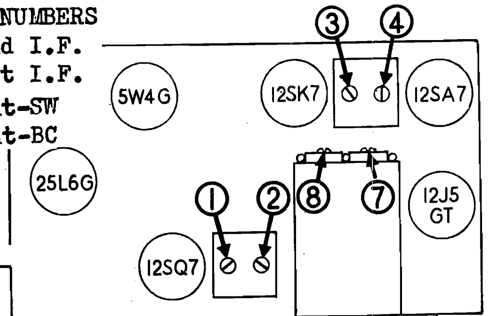
FIRESTONE TIRE & RUBBER CO.



ELECTRICAL PARTS

Diagram Number	Description
1	Loop antenna
2	Coil—oscillator
3	Condenser—mica .002 mfd.
4	Condenser—padder
5	Condenser—.01 mfd. 600 V.
6	Condenser—.05 mfd. 600 V.
7	Condenser—trimmer
8A-8B	Condenser—trimmer (2 section)
9A-9B	Condenser—tuning
10-11	Condenser—.1 mfd. 600 V.
12	Resistor—carbon 150 ohms ¼ watt
13	Condenser—mica 51 mmfd.
14	Resistor—carbon 47,000 ohms ¼ watt
15	Resistor—carbon 10,000 ohms ¼ watt
16	Resistor—carbon 2,200 ohms 2 watts
17	Resistor—carbon 3.3 meg. ¼ watt
18A-18B	Volume control (with switch) 1 meg.
19	Condenser—mica 260 mmfd.
20	Resistor—carbon 3.3 meg. ¼ watt
21	Condenser—.004 mfd. 600 V.
22	Condenser—mica 260 mmfd.
23	Condenser—.01 mfd. 600 volt
24	Resistor—carbon 470,000 ohms ¼ watt
25	Resistor—carbon 220,000 ohms ¼ watt
26	Condenser—.02 mfd. 600 volt
27	Condenser—.04 mfd. 600 volt
28	Condenser—.1 mfd. 600 volt
29	Resistor—carbon 680,000 ohms ¼ watt
30	Resistor—carbon 220,000 ohms ¼ watt
31	Condenser—.2 mfd. 600 volt
32-33	Condenser—electrolytic 20-40 mfd. 200 volt
34	Condenser—.01 mfd. 600 volt
35	Speaker—dynamic (5")
36	Transformer—power 60 cycle
36	Transformer—power 25 cycle
37	Resistor—20 ohms 2 watts Wire Wound
38	Transformer—1st I.F.
39	Transformer—2nd I.F.

TRIMMER NUMBERS
1-2 2nd I.F.
3-4 1st I.F.
7 Ant-SW
8 Ant-BC



SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

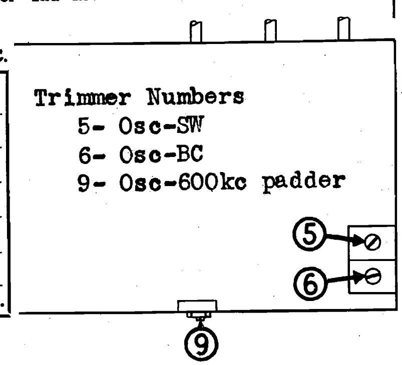
NO SIGNAL CONDITION — DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
12SA7	1st DET.	12.0 A.C.	1.9	0	—5	73		120		
12J5GT	OSC.	12.0 A.C.	0	—5				85		
12SK7	I.F.	12.0 A.C.	1.9	0		73	0	120		
12SQ7	2nd DET.-A.V.C.-A.F.	12.0 A.C.	0	0				NOTE B	0	0
25L6G	OUTPUT	25.0 A.C.	0	NOTE A		120		110		
5W4G	RECTIFIER	5.0 A.C.						150 V.A.C. to C.T.		

NOTE A: The 25L6G grid bias is —8.5 volts measured across resistor No. 30.
NOTE B: Due to the high resistance of No. 24, only a small voltage will be measured here.

Use a high resistance voltmeter of at least 1000 ohms per volt.

Trimmer Numbers
5- Osc-SW
6- Osc-BC
9- Osc-600kc padder

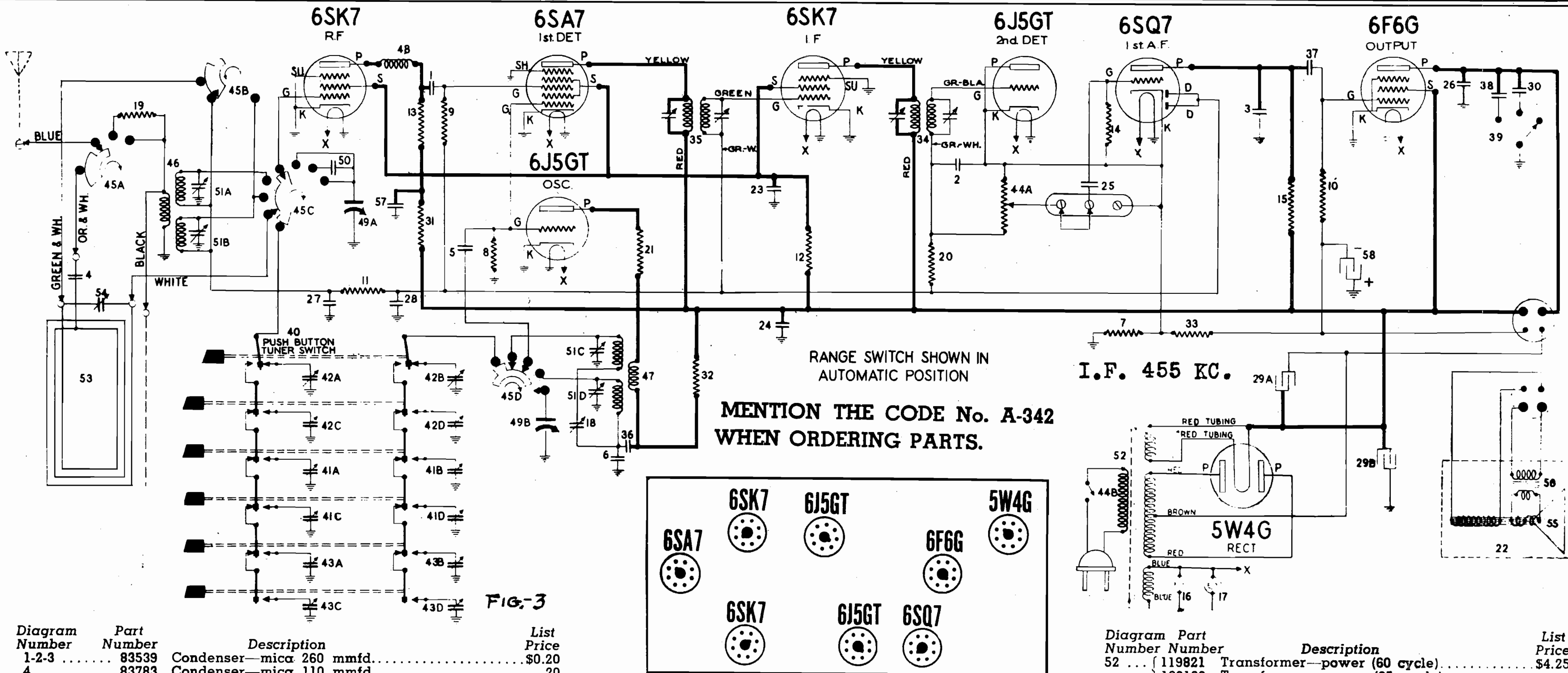


TRIM OSC-SW- 6 MC
" OSC-BC- 1500 KC
" ANT-SW- 6 MC
" ANT-BC- 1500 KC

Adjust ANT trimmers and OSC padder after replacing set in cabinet. Use 50 mmf condenser as dummy antenna, connected to blue wire- or lay RF lead of signal generator near the loop.

FIRESTONE TIRE & RUBBER CO.

MODEL S-7403-9



RANGE SWITCH SHOWN IN AUTOMATIC POSITION

I.F. 455 KC.

MENTION THE CODE No. A-342 WHEN ORDERING PARTS.

Rear of Chassis

Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 260 mmfd.	$0.20
4	83783	Condenser—mica 110 mmfd.	.20
5	85061	Condenser—mica 51 mmfd.	.15
6	88587	Condenser—mica .0042 mfd.	.35
7	110534	Resistor—wire wound 40 ohm ½ watt	.12
8	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
9	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
10-11	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
12	110561	Resistor—carbon 15,000 ohms 2 watt	.30
13	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
14	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
15	110591	Resistor—carbon 680,000 ohms ¼ watt	.12
16-17	110629	Lamp—6.3 volt—.25 amps.	.15
18	112799	Condenser—Padder	.36
19	112955	Resistor—carbon 1000 ohms ¼ watt	.12
20	112973	Resistor—insulated—1.5 meg. ¼ watt	.15
21	112994	Resistor—carbon 220 ohm ¼ watt	.16
22	U-115098	Speaker—dynamic (6")	4.60
23-24	116625	Condenser—.1 mfd. 600 volt	.25
25-26	116647	Condenser—.004 mfd. 600 volt	.15
27-28	116819	Condenser—.05 mfd. 600 volt	.20
29A-29B	117034	Condenser electrolytic, 15—10 mfd. 450 volt	1.45
30	118487	Condenser—.07 mfd. 600 volt	.25
31-32	118805	Resistor—carbon 10,000 ohm 1W	.12
33	118812	Resistor—180 ohms 1 watt, W.W.	.12
34	119024	Transformer—2nd I.F.	1.15
35	119042	Transformer—1st I.F.	1.10
36-37-38	119193	Condenser—.01 mfd. 600 volt	.15
39	119289	Switch—tone	.60
40	119603	P. B. Switch	2.30
41A to 41D	119663	Trimmer condenser for P.B. Trimmers (med. Freq.)	.24
42A to 42D	119664	Trimmer condenser for P.B. Trimmers (high Freq.)	.24
43A to 43D	119753	Trimmer condenser for P.B. Trimmers (low Freq.)	.24
44A-44B	119779	Volume control ½ meg. (with switch)	$1.25
45A to 45D	119780	Range Switch	1.25
46	119787	Coil Antenna	.85
47	119788	Coil—oscillator	.85
48	119789	Coil—compensating	.25
49A to 49B	119812	Gang condenser	2.65
50	119815	Condenser—mica 370 mmfd.	.24
51A to 51D	119819	Condenser—trimmer (4 section)	.60
52	119821	Transformer—power (60 cycle)	$4.25
	160160	Transformer—power (25 cycle)	
53	119838	Loop antenna & back (complete)	1.60
54	119845	Condenser—trimmer	.16
55	U-119868	Transformer—output for U-115098 speaker	1.75
56	U-119869	Cone & voice coil for U-115098 speaker	1.75
57	116706	Condenser—.2 mfd. 600 volt	.35
58	110377	Condenser—electrolytic—10 mfd. 35 volt	.80

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

NO SIGNAL CONDITION

DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.0 A.C.	0	Note A		93	0	125		
6SA7	1st Det.	6.0 A.C.	0	Note A	—5	93		235		
6J5GT	Osc.	6.0 A.C.	0	—5				155		
6SK7	I. F.	6.0 A.C.	0	Note A		93		235		
6J5GT	2nd Det - A.V.C.	6.0 A.C.	—2.8	Note A				—2.8		
6SQ7	1st A.F.	6.0 A.C.	—2.8	Note A				55	Note A	Note A
6F6G	Output	6.0 A.C.	0	Note B		235		215		
5W4G	Rectifier	5.0 A.C.						Plates 350 V.A.C to C.T.		

NOTE A: This voltage to ground is —2.8 volts measured across resistor No. 7.
NOTE B: The bias for this grid is —16 volts measured across resistor No. 33 and No. 7.
Use a high resistance voltmeter of at least 1000 ohms per volt.

FOR ALIGNMENT, TRIMMERS, P.B. DATA- SEE INDEX

MODEL S-7403-9

FIRESTONE TIRE & RUBBER CO.

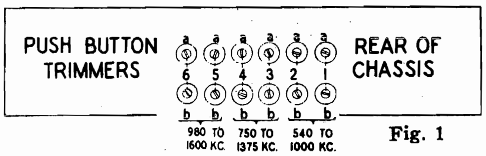
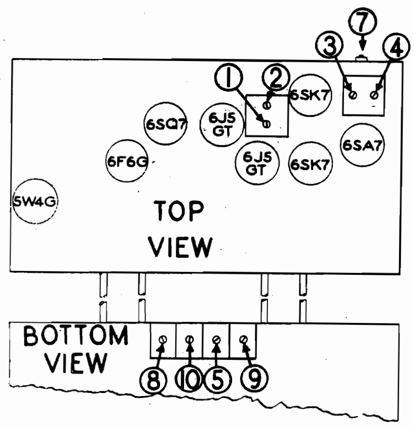
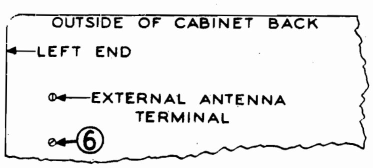


Fig. 1





TO SET UP THE BUTTONS FOR AUTOMATIC TUNING:

1. Turn the set on and allow it to operate at least fifteen minutes before attempting to set up the buttons.

2. Make a list of the frequencies of six nearby stations to which you wish to set up the buttons. Be sure to select the most powerful nearby stations, since weak signals will not give as satisfactory results. Also be sure to select stations that fall well within the frequency range of the buttons as shown in Fig. 1.

3. With the Band Switch in the "AM" Position tune in the station to be set up. Then turn the range switch to Automatic Position "AUT." Position and push in the button to be set up, being sure to select a button with the proper frequency range (see Fig. 1).

4. At the back of the chassis, as viewed from the rear of the radio, will be found 12 holes numbered in pairs to correspond to the numbers of the buttons. See Fig. 1. Adjust the "a" screw with the number corresponding to the number of the button you have pushed in, until the same station is again heard. Tune accurately, adjusting for deepest tone.

5. Now adjust the "b" screw (located below the "a" screw) until maximum output is obtained. Make a final adjustment on the "a" screw, always tuning for deepest tone.

6. The set-up is now complete for this button.

The remaining buttons may be set up in the same way.

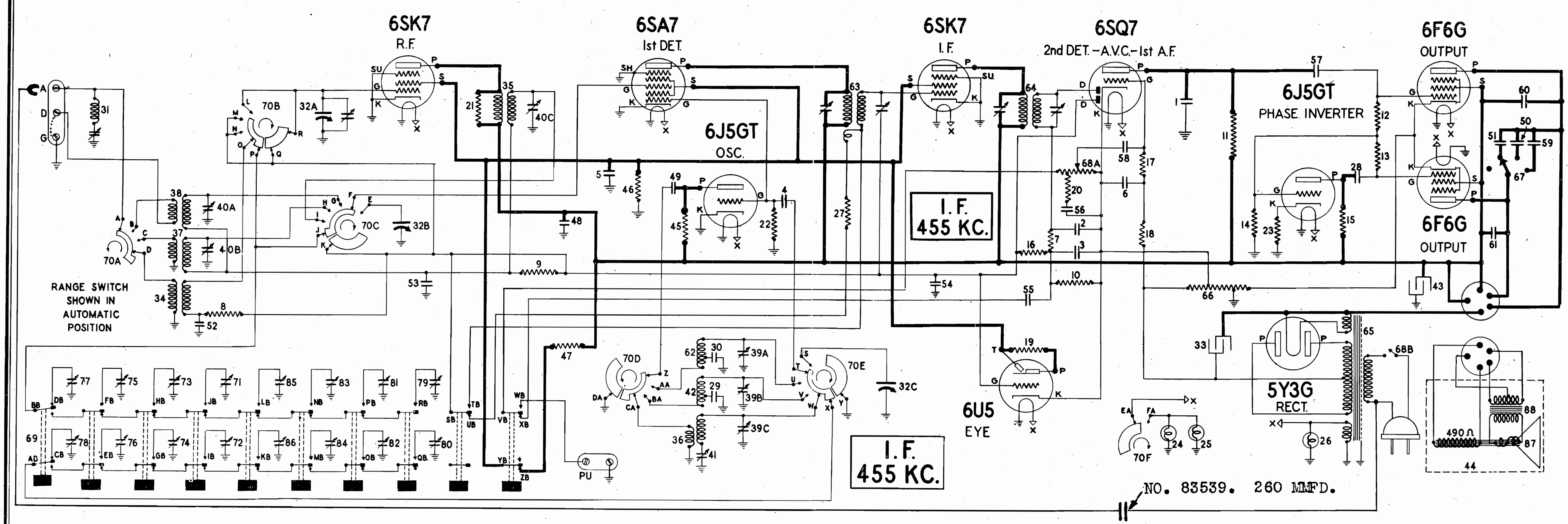
ALIGNMENT PROCEDURE

1. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to ground through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. Check the pointer to see that it is correctly set. Connect the loop antenna as shown in Fig. 3.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Rear Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	External Ant. Terminal	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Ant. Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Ant. Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	7*	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	External Ant. Terminal	2.5 MC	Intermediate	Tune to 2.5 MC Generator Signal	8	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	External Ant. Terminal	16 MC	Foreign	16 MC	9	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	External Ant. Terminal	16 MC	Foreign	Tune to 16 MC Generator Signal	10	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

*When making these adjustments the loop must be in the same relative position to the chassis as when in the cabinet. Using a weak radiated signal, repeat adjustment 6 after set is in cabinet.

FIRESTONE TIRE & RUBBER CO.



ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2-3	83783	Condenser—mica, 110 mmfd.	.20
4	85061	Condenser—mica, 51 mmfd.	.15
5	88682	Condenser—paper .1 mfd., 400 volt	.25
6	89421	Condenser—paper, .1 mfd., 200 volt	.25
7	110552	Resistor—carbon, 47,000 ohms, ¼ watt	.12
8-9-10-11-12-13-14-15	110553	Resistor—carbon, 220,000 ohms, ¼ watt	.12
16-17-18-19	110554	Resistor—carbon, 1 megohm, ¼ watt	.12
20	110565	Resistor—carbon, 22,000 ohms, ¼ watt	.12
21	110573	Resistor—carbon, 2,200 ohms, ¼ watt	.12
22	110578	Resistor—carbon, 68,000 ohms, ¼ watt	.12
23	110586	Resistor—carbon, 2,200 ohms, ¼ watt	.12
24-25-26	110629	Lamp—6.3 volt—.25 amps.	.15
27	110975	Resistor—33 ohms, ½ watt (10%), W.W.	.12
28	111252	Condenser—paper, .05 mfd., 400 volt	.13
29	112426	Condenser—mica, 1650 mmfd. (3%)	.30
30	112427	Condenser—mica, 4050 mmfd. (3%)	.40
31	112796	Coil—wave trap (with trimmer)	.50
32A-32B-32C	113216	Condenser—Gang	6.50
33	113261	Condenser—electrolytic, 30 mfd., 450 volt	1.40
34	113295	Coil—antenna (B.C.)	1.20
35	113296	Coil—R.F. (B.C.)	1.30
36	113297	Coil—oscillator (B.C.)	.48
37	113298	Coil—antenna (police)	.50
38	113301	Coil—antenna (S.W.)	.52
39A-39B-39C	113319	Condenser—trimmer—3 section	.54

Diagram Number	Part Number	Description	List Price
40A-40B-40C	113320	Condenser—trimmer—3 section	$0.54
41	113346	Condenser—padding	.38
42	113412	Coil—oscillator (police)	1.20
43	114972	Condenser—electrolytic, 16 mfd., 450 volt	.78
44	R-115070	Speaker—dynamic, 12"	10.50
45	116055	Resistor—carbon, 22,000 ohm, ½ watt	.12
46	116085	Resistor—10,000 ohms, 2 watt	.20
47	116093	Resistor—10,000 ohms, 5 watt	.38
48	116625	Condenser—.1 mfd., 600 volt	.25
49-50	116640	Condenser—.01 mfd., 600 volt	.15
51	116647	Condenser—.004 mfd., 600 volt	.15
52-53-54	116819	Condenser—.05 mfd., 600 volt	.15
55-56-57-58	116893	Condenser—.02 mfd., 600 volt	.15
59	116984	Condenser—.04 mfd., 600 volt	.20
60-61	117022	Condenser 0.002 mfd.—600 volt	.15
62	113607	Coil—short wave oscillator	.52
63	117616	Transformer—1st I.F.	1.50
64	117618	Transformer—2nd I.F.	1.50
65	117633	Transformer—power	9.00
66	117669	Resistor—bias strip	.52
67	117677	Switch—tone control	.80
68A-68B	117685	Volume control (400,000 ohms) with switch	1.00
69	117686	Push button switch	3.90
70A to 70F	117692	Range switch	5.00
71 to 78	117726	Condenser—trimmer gang (high frequency section)	3.90
79 to 86	117727	Condenser—trimmer gang (low frequency section)	3.90
87	R-117789	Cone & Voice Coil for R-115070 speaker	3.00
88	R-117790	Output transformer for R-115070	1.95

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES—ALL D.C. VOLTAGES MEASURED TO CHASSIS

ANTENNA GROUNDED **DIAL TUNED TO 540 K.C.**

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.0 A.C.	0	Note A		95	0	285		
6SA7	1st Det.	6.0 A.C.	0	Note A	—8	95		285		
6J5GT	Oscillator	6.0 A.C.	0	—8				104		
6SK7	I.F.	6.0 A.C.	0	Note A		95	0	285		
6SQ7	2nd Det., A.V.C., A.F.	6.0 A.C.	—3	Note B				175	Note A	Note A
6J5GT	Phase Inverter	6.0 A.C.	2	0				41		
6F6G	Output	6.0 A.C.	20	0		285		270		
6F6G	Output	6.0 A.C.	20	0		285		270		
6U5	Tuning Eye	6.0 A.C.	—3	Note* A		T=95 Volts*				
5Y3G	Rectifier	5.0 A.C.				Plates 375 V. A.C.				

NOTE A: Due to the high resistance of resistors No. 16, No. 7, No. 8, and No. 9, only very slight deflections of the voltmeter will be obtained.

NOTE B: Voltage is —5 volts measured at resistor No. 66.

*Voltages measured at end of tuning eye cable.

Use a high resistance voltmeter of at least 1000 ohms per volt.

MODEL S-7404-3

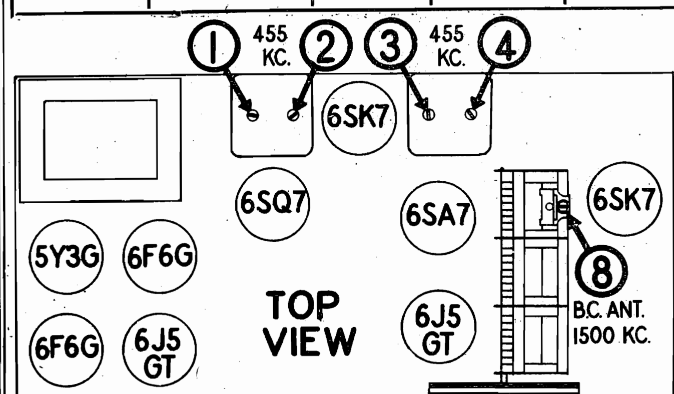
FIRESTONE TIRE & RUBBER CO.

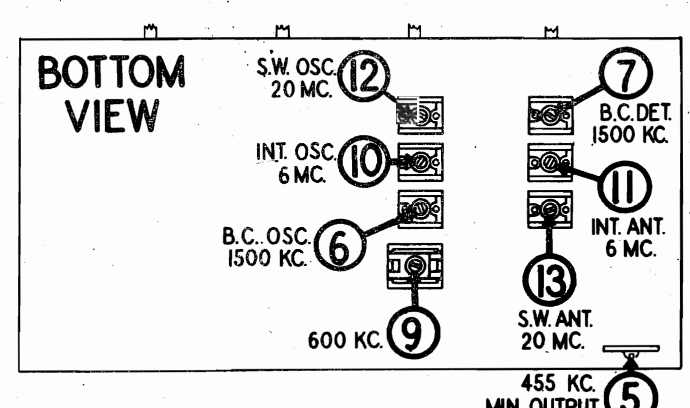
ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or across the plates of the 6F6G output tubes depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis. NOTE: The "G" and "D" terminals on this terminal strip must be connected together.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. Push in the "Selectivity" button and keep it pushed in. Check the pointer to see that it is correctly set.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Middle Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	"A" Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output, Using a Strong Generator Signal.
400 OHM Carbon Resistor	"A" Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7	Broadcast Detector	Adjust for Maximum Output.
					8	Broadcast Antenna	
400 OHM Carbon Resistor	"A" Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	6 MC	10	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	Tune to 6 MC Generator Signal	11	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	20 MC	12	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 19.1 MC. If image does not appear, Realign at 20MC. with Trimmer Screw farther out. Recheck image.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	Tune to 20 MC Generator Signal	13	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.





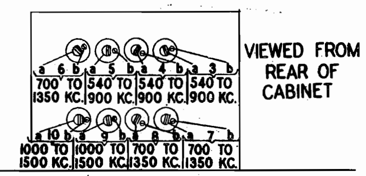
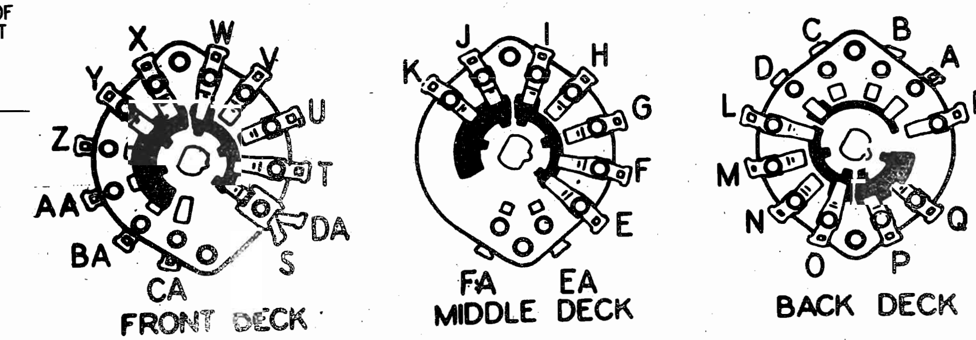


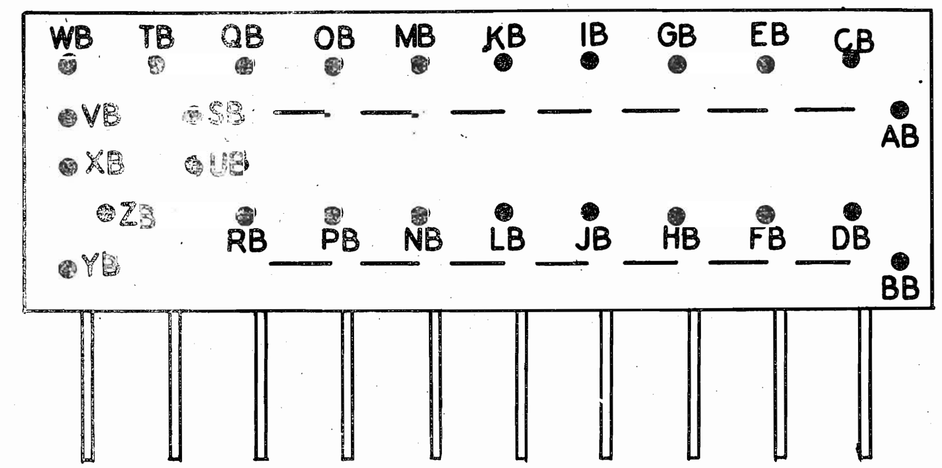
Fig. 1

FOR PUSH BUTTON DATA SEE INDEX.

FRONT VIEW OF RANGE SWITCH DECKS.



PUSH-BUTTON TUNER SWITCH



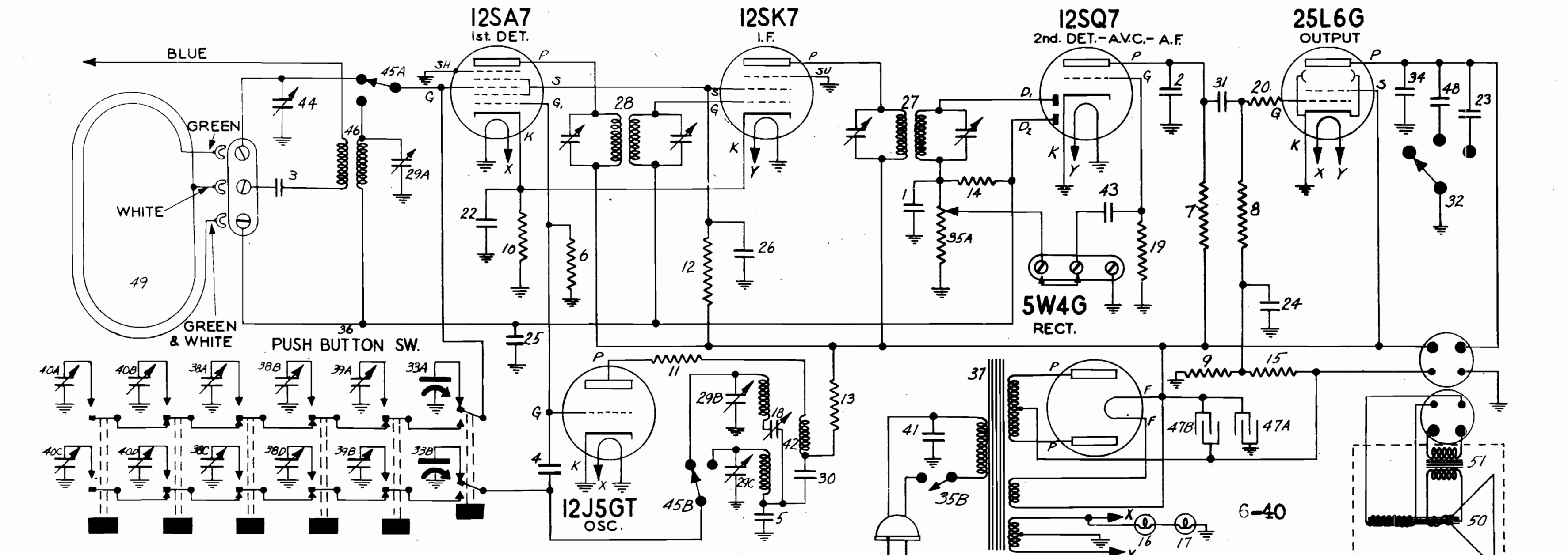
LETTERS ON TERMINALS OF SWITCHES SHOWN ABOVE CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE SWITCHES SHOWN IN THE CIRCUIT DIAGRAM.

MISCELLANEOUS PARTS

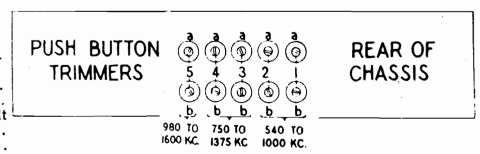
Part No.	Description	List Price
114043	Band Indicator slide & strip	$0.36
113442	Bracket—for tuning eye	.16
114032	Bracket and pulley assembly—right hand	.34
114034	Bracket and pulley assembly—left hand	.34
117703	Cable & socket for tuning eye	1.00
114955	Clamp for dial cord	.01
114042	Clamp for dial scale	.10
112798	Clip for mtg. wave trap coil	.01
110808	Clip—for tuning eye support	.14
114031	Collar—for band switch shaft	.10
85321	Connector—for antenna strip	.01
113178	Cord—dial	.30
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18
117057	Cord—drive (supplied in 2 foot lengths	.15
111973	Cushion—rubber rest for back of chassis	.06
117740	Dial scale	1.00
113338	Drum—dial drive	.54
114052	Escutcheon—dial	2.00
113890	Escutcheon—eye	.10
114053	Escutcheon—push button	.60
113347	Gear—on range switch shaft	.20
113207	Gear—pinion on auxiliary range switch shaft	.25
117087	Knob for tuning or volume	.12
117687	Light shield	.05
117662	Pointer assembly	$0.32
112762	Pulley—dial cord drive	.04
114047	Pulley—on band indicator shaft	.34
113887	Push button	.04
113463	Rubber bushing—chassis mtg.	.03
83624	Screw—self tapping 8x¼	.01
85040	Screw—No. 6 Hex. Hd. Per C	.35
85827	Set screw—8-32 sq. head	.02
111116	Screw— No. 5x⅝; mechanism mtg.	.02
112874	Screw—No. 10x1⅛ chassis mtg.	.01
114914	Screw—special head for mtg. escutcheon	.15
117661	Shaft—auxiliary range switch shaft	.28
114084	Slide and strip assembly for tone indicator	.36
114117	Socket—dial lamp	.18
85427	Socket—octal base (standard)	.15
113025	Socket—octal base (with special ground)	.15
117704	Socket—for speaker 5 prong	.13
111090	Spacer—steel, mechanism mtg. to chassis	.02
113177	Spring—dial cord tension	.09
114046	Spring—for band indicator drive	.05
114041	Tabs—station call letters	.36
85066	Terminal strip—G.D.A.	.20
117664	Tuning shaft	.32
110829	Washer—flat steel, for mtg. chassis	.01
116530	Washer (paper) for back of knobs	.005

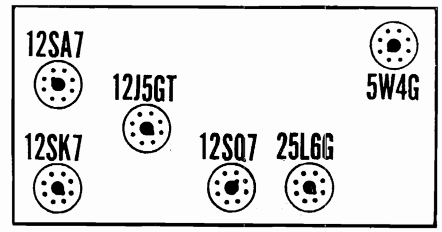
FIRESTONE TIRE & RUBBER CO.

MODEL S-7404-5



- 1-2-3 .. Condenser—mica, 260 mmfd.
- 4 .... Condenser—mica, 51 mmfd.
- 5 .... Condenser—mica, .0042 mfd.
- 6 .... Resistor—carbon 47,000 ohms 1/4 watt.
- 7-8-9 .. Resistor—carbon 220,000 ohms 1/4 watt
- 10 .... Resistor—carbon 330 ohms 1/4 watt...
- 11 .... Resistor—carbon 100 ohms 1/4 watt...
- 12 .... Resistor—carbon 10,000 ohms 1/4 watt.
- 13 .... Resistor—carbon 2,200 ohms 1/4 watt..
- 14 .... Resistor—carbon 3.3 meg. 1/4 watt....
- 15 .... Resistor—carbon 680,000 ohms 1/4 watt
- 16-17 . Lamp—6.3 volt—.25 amps.
- 18 .... Condenser—padder
- 19 .... Resistor—carbon 10 meg. 1/4 watt....
- 20 .... Resistor—carbon 220 ohms 1/4 watt....
- 21 .... Speaker—dynamic (8")
- 22-23 . Condenser—.1 mfd. 600 volt
- 24 .... Condenser—.2 mfd. 600 volt
- 25-26 . Condenser—.05 mfd. 600 volt
- 27 ...... Transformer—2nd I.F.
- 28 ...... Transformer—1st I.F.
- 29A-29B-29C Condenser—trimmer—3 section
- 30-31 ...... Condenser—.01 mfd. 600 volt
- 32 ...... Switch—tone
- 33A-33B ...... Condenser—variable tuning
- 34 ...... Condenser—.02 mfd. 600 volt
- 35A-35B ...... Volume control—1 meg. (with switch)
- 36 ...... P. B. Switch
- 37 ...... Transformer—power 60 cycle / Transformer—power 25 cycle
- 38A to 38D. Trimmer condenser for P.B. trimmers (med. freq.)
- 39A-39B ... Trimmer condenser for P.B. trimmers (high freq.)
- 40A to 40D. Condenser—P. B. trimmer (low freq.)
- 41 ...... Condenser—(metal clad) .01 mfd. 600 volt
- 42 ...... Coil—oscillator
- 43 ...... Condenser—.004 mfd. 600 volt
- 44 ...... Condenser—trimmer
- 45A-45B Switch—range
- 46 ...... Coil—short wave antenna
- 47A-47B . Condenser—electrolytic 20-40 mfd. 250 volt
- 48 ...... Condenser—.04 mfd. 600 volt
- 49 ...... Loop antenna—complete
- 50 ...... Cone and Voice Coil for U-115100 Speaker
- 51 ...... Transformer—output for U-115100 Speaker





REAR OF CHASSIS

SOCKET VOLTAGES — ALL D.C. POTENTIAL MEASURED TO CHASSIS

ANTENNA GROUNDED. DIAL TUNED TO 540 KC.

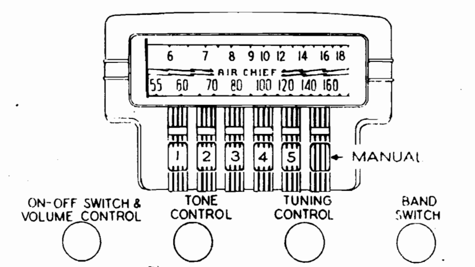
TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
12SA7	1st DET.	12.0 A.C.	3.1	O	—8	80	O	130		
12J5GT	OSC.	12.0 A.C.	O	—8				115		
12SK7	I.F. AMP.	12.0 A.C.	3.1	O		80		130		
12SQ7	2nd DET. — A.V.C. & A.F.	12.0 A.C.	O	O				65	O	O
25L6G	OUTPUT	24.0 A.C.	O	Note A		130		122		
5W4G	RECTIFIER	5.0 A.C.						Plate Voltage 200 A.C. to C.T.		

NOTE A: Bias on this grid is —8.5 volts. It can not be measured with an ordinary voltmeter because of the high resistances of resistors No. 9 and No. 15.

Use a high resistance voltmeter of at least 1000 ohms per volt.

I.F. 455 KC

FOR PUSH-BUTTON TUNER DATA SEE INDEX



MODEL S-7404-5
S-7404-6
S-7406-6

FIRESTONE TIRE & RUBBER CO.

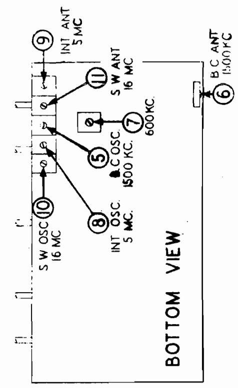
S-7404-6

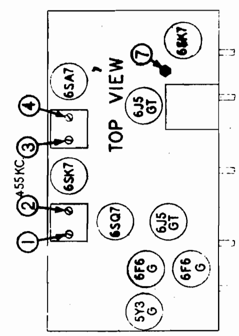
ALIGNMENT EQUIPMENT & PROCEDURE

1. Connect the output meter across the voice coil or from plate to plate of the 6F6G output tubes through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and plug black wire lead from chassis into the inside clip on loop drum top.
3. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
4. Push in the "Manual" button and keep it pushed in. Check the pointer to see that it is correctly set to 540 KC. with gang in full mesh.
5. The loop must be connected as indicated in circuit diagram at all times.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Front Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment
					3-4	1st I.F.	
200 MMFD. Mica Condenser	Clip on Loop Drum	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Loop Drum	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Clip on Loop Drum	600 KC	Broadcast	Tune to 600 KC Generator Signal	7	Broadcast Oscillator (Series)	Adjust for Maximum Output Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Clip on Loop Drum	5 MC	Intermediate	5 MC	8	Intermediate Oscillator	Adjust for Maximum Output Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 4.1 MC. If Image does not appear, Realign at 5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Loop Drum	5 MC	Intermediate	Tune to 5 MC Generator Signal	9	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Clip on Loop Drum	16 MC	Foreign	16 MC	10	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Loop Drum	16 MC	Foreign	Tune to 16 MC Generator Signal	11	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

NOTE: Realign trimmer No. 6 after set is in cabinet by placing range switch in broadcast position, and adjusting for maximum output on a weak signal at approximately 1500 KC.



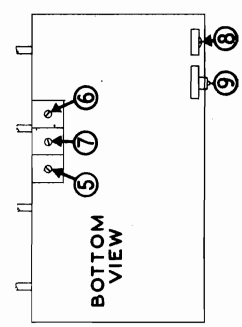


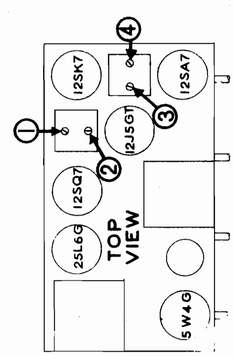
S-7404-5 S-7406-6

ALIGNMENT EQUIPMENT & PROCEDURE

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Rear Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I. F.	
400 OHM Carbon Resistor	External Antenna Terminal Blue Wire	16 MC	Foreign	16 MC	5	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 15.1 MC. If image does not appear realign at 16 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	External Antenna Terminal Blue Wire	16 MC	Foreign	Tune to 16 MC. Generator Signal	6	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
200 MMFD. Mica Condenser	External Antenna Terminal Blue Wire	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	External Antenna Terminal Blue Wire	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	External Antenna Terminal Blue Wire	600 KC	Broadcast	Tune To 600 KC Generator Signal	9*	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.

*NOTE: These adjustments should be made with the set in the cabinet. Use a weak radiated signal at 1500 KC.





MODEL S-7404-6

FIRESTONE TIRE & RUBBER CO.

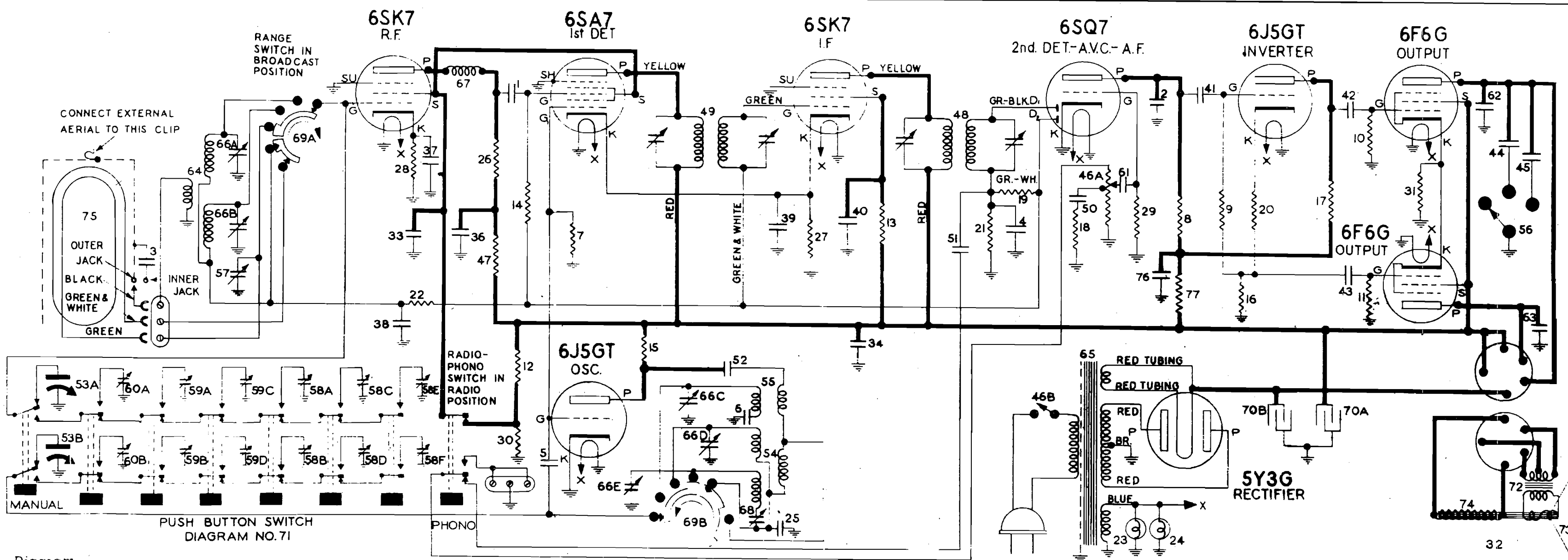
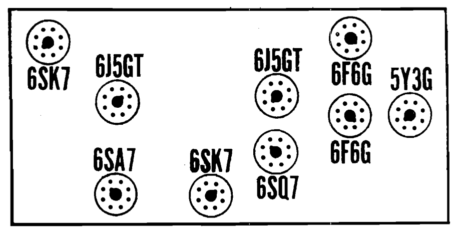


Diagram Number	Description
1-2	Condenser—mica 260 mmfd.
3-4	Condenser—mica, 110 mmfd.
5	Condenser—mica, 51 mmfd.
6	Condenser—mica .0042 mfd.
7	Resistor carbon 47,000 ohms ¼ watt
8	Resistor—carbon 220,000 ohms ¼ watt
9 to 11	Resistor—carbon 470,000 ohms ¼ watt
12	Resistor—carbon 15,000 ohms 2 watts
13-14	Resistor—carbon 100,000 ohms, ¼ watt
15 to 17	Resistor—carbon 22,000 ohms ¼ watt
18	Resistor—carbon 68,000 ohms ¼ watt
19	Resistor—carbon 2.2 meg. ¼ watt
20	Resistor—carbon 2,200 ohms ¼ watt
21-22	Resistor—carbon 330,000 ohms ¼ watt
23-24	Lamp—6.3 volt—.25 amps
25	Condenser—mica 1650 mmfd.
26	Resistor—carbon 3,300 ohms ¼ watt
27	Resistor—carbon 220 ohms ¼ watt
28	Resistor—insulated 470 ohms ¼ watt
29	Resistor—carbon 10 meg. ¼ watt
30	Resistor—carbon 22,000 ohms 1 watt
31	Resistor—wire wound 360 ohms 2 watts
32	Speaker—12"
33 to 35	Condenser—.1 mfd. 600 volt
36 to 40	Condenser—.05 mfd. 600 volt
41 to 44	Condenser—.02 mfd. 600 volt
45	Condenser—.07 mfd. 600 volts
46A-46B	Volume control—1 meg. (with switch)
47	Resistor—carbon 10,000 ohms 1 watt
48	Transformer—2nd I.F.
49	Transformer—1st I.F.
50	Condenser—.02 mfd. 600 volt
51 to 52	Condenser—.01 mfd. 600 volt
53A-53B	Condenser—variable tuning
54	Coil—B.C. & Police Oscillator
55	Coil—short wave—oscillator
56	Switch—tone
57	Condenser—trimmer for loop
58A to 60B	Trimmer—cond. for P.B. trimmer (low freq.) Trimmer cond. for P.B. trimmers (med. freq.) Trimmer cond. for P.B trimmers (high freq.)
61 to 63	Condenser—.004 mfd. 600 volt
64	Coil—antenna
65	Transformer—power (50-60 cycle) Transformer—power (25 cycle)
66A to 66E	Trimmer condenser—five sections
67	Coil—compensating
68	Condenser—padder
69A-69B	Range switch
70A-70B	Condenser—electrolytic 15-30 mfd. 450 v.
71	Switch—push button
72	Transformer—output for M-115101 spkr.
73	Cone & Voice coil for M-115101 speaker.
75	Loop antenna (complete)
76	Condenser—.2 mfd. 600 volt
77	Resistor—22,000 ohms ¼ watt

TUBE LOCATIONS



REAR OF CHASSIS

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

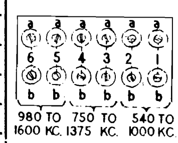
NO SIGNAL CONDITION

DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.0 A.C.	3.5	0		90	0	175		
6SA7	1st Det.	6.0 A.C.	3.1	0	—5	90	0	255		
6J5GT	Osc.	6.0 A.C.	0	—5				125		
6SK7	I.F.	6.0 A.C.	3.1	0		85	0	255		
6SQ7	2nd Det. - A.V.C. Audio	6.0 A.C.	0	0				85	0	0
6J5GT	Inverter	6.0 A.C.	4.5	Note A				190		
6F6G	Output	6.0 A.C.	19.5	0		255		248		
6F6G	Output	6.0 A.C.	19.5	0		255		248		
5Y3G	Rectifier	5.0 A.C.						Plates 370 V.A.C to C.T.		

NOTE A: Bias for the 6J5GT Inverter Grid is approximately 0.5 volt measured across Resistor No. 20.
Use a high resistance voltmeter of at least 1000 ohms per volt.

PUSH BUTTON TRIMMERS



REAR OF CHASSIS

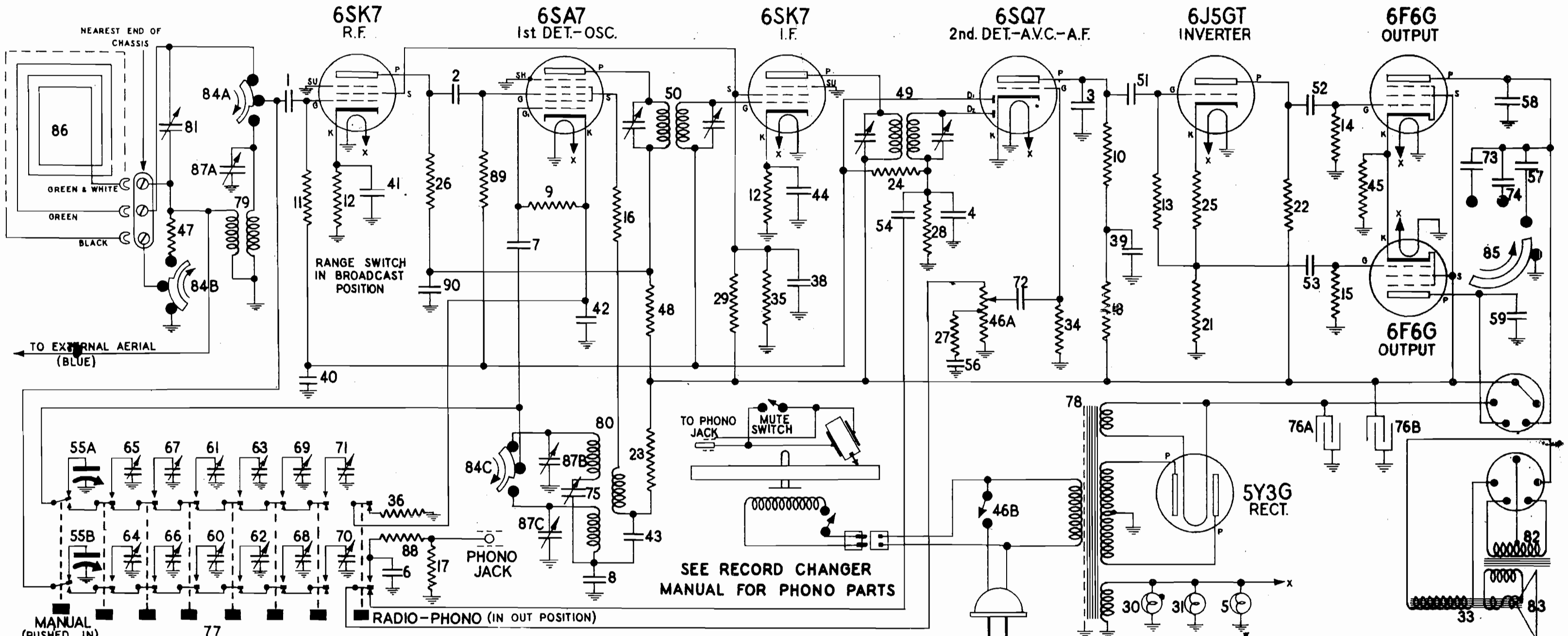
FOR ALIGNMENT PROCEDURE AND PUSH-BUTTON TUNER DATA

SEE INDEX

NOTE: MENTION CODE No. A-344 WHEN ORDERING PARTS.

MODEL S-7406-6

FIRESTONE TIRE & RUBBER CO.



1-2-3-4	Condenser—mica 260 mmfd.	
5	Lamp (bull's eye) 6 to 8 volt (Mazda 51).	
6	Condenser—mica 510 mmfd.	
7	Condenser—mica 51 mmfd.	
8	Condenser—mica .0042 mfd.	
9	Resistor—carbon 47,000 ohms 1/4 watt	
10	Resistor—carbon 220,000 ohms 1/4 watt	
11	Resistor—carbon 1 megohm 1/4 watt	
12	Resistor—carbon 330 ohms 1/4 watt	
13-14-15	Resistor—carbon 470,000 ohms 1/4 watt	
16	Resistor—carbon 100 ohms 1/4 watt	
17 to 20	Resistor—carbon 100,000 ohms 1/4 watt	
21-22	Resistor—carbon 22,000 ohms 1/4 watt	
23	Resistor—carbon 10,000 ohms 1/2 watt	
24	Resistor—carbon 2.2 meg. 1/4 watt	
25-26	Resistor—carbon 2,200 ohms 1/4 watt	
27	Resistor—carbon 68,000 ohms 1/4 watt	
28	Resistor—carbon 330,000 ohms 1/4 watt	
29	Resistor—carbon 22,000 ohms 1 watt	
30-31	Lamp—dial 6-8 volt, Mazda No. 44	
33	Speaker (12")	
34	Resistor—carbon 10 meg. 1/4 watt	
35	Resistor—carbon 27,000 ohms 1 watt	
36	Resistor—150 ohms 1/4 watt	
37	Resistor—560 ohms 1/4 watt	
38	Condenser—.1 mfd. 600 volt	
39	Condenser—.2 mfd. 600 volt	
40 to 44	Condenser—.05 mfd. 600 volt	
45	Resistor—wire wound 260 ohm 2 watts	
46A-46B	Volume control—1 meg. (with switch)	
47	Resistor—carbon 400 ohms 1/4 watt	
48	Resistor—carbon 1500 ohms 1/2 watt	
49	Transformer—2nd I.F.	
50	Transformer—1st I.F.	
51 to 54	Condenser—.01 mfd. 600 volt	
55A-55B	Condenser—variable tuning	
56-57	Condenser—.02 mfd. 600 volt	
58-59	Condenser—.006 mfd. 600 volt	
60 to 63	Condenser—P.B. trimmer (med. freq.)	
64 to 67	Condenser—P.B. trimmer (high freq.)	
68 to 71	Condenser—P.B. trimmer (low freq.)	
72	Condenser—.004 mfd. 600 volt	
73-74	Condenser—.04 mfd. 600 volt	
75	Condenser—padder	
76A-76B	Condenser—electrolytic 30-15 mfd. 450 v	
77	Switch—push button	
78	Transformer—power (50-60 cycle)	
79	Coil—short wave antenna	
80	Coil—oscillator	
81	Condenser—trimmer	
82	Transformer—output	
83	Cone & voice coil for	
84A-84B-84C	Range switch	
85	Switch—tone	
86	Loop antenna—complete	
87A-87B-87C	Condenser—trimmer—3 section	
88	Resistor—carbon 470,000 ohms 1/4 w	
89	Resistor—carbon 68,000 ohms 1/4 w	
90	Condenser—.05 mfd. 600 volt	

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

NO SIGNAL CONDITION

DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.0 A.C.	2.2	0		85	0	185		
6SA7	1st Det. & Osc.	6.0 A.C.	1.4	0	—11	100	0	200		
6SK7	I.F.	6.0 A.C.	2.0	0		85	0	228		
6SQ7	2nd Det. - A.V.C. Audio	6.0 A.C.	0	0				75	0	0
6J5GT	Inverter	6.0 A.C.	50	Note A				175		
6F6G	Output	6.0 A.C.	16	0		228		220		
6F6G	Output	6.0 A.C.	16	0		228		220		
5Y3G	Rectifier	5.0 A.C.						Plates 250 V.A.C. to C.T.		

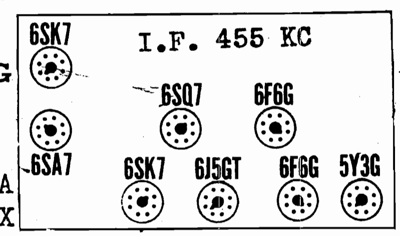
NOTE A: Bias for the 6J5GT inverter grid is approximately 8 volts measured across resistor No. 25.

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE: MENTION CODE No. A-346 WHEN ORDERING PARTS.

FOR P.B. DATA SEE INDEX

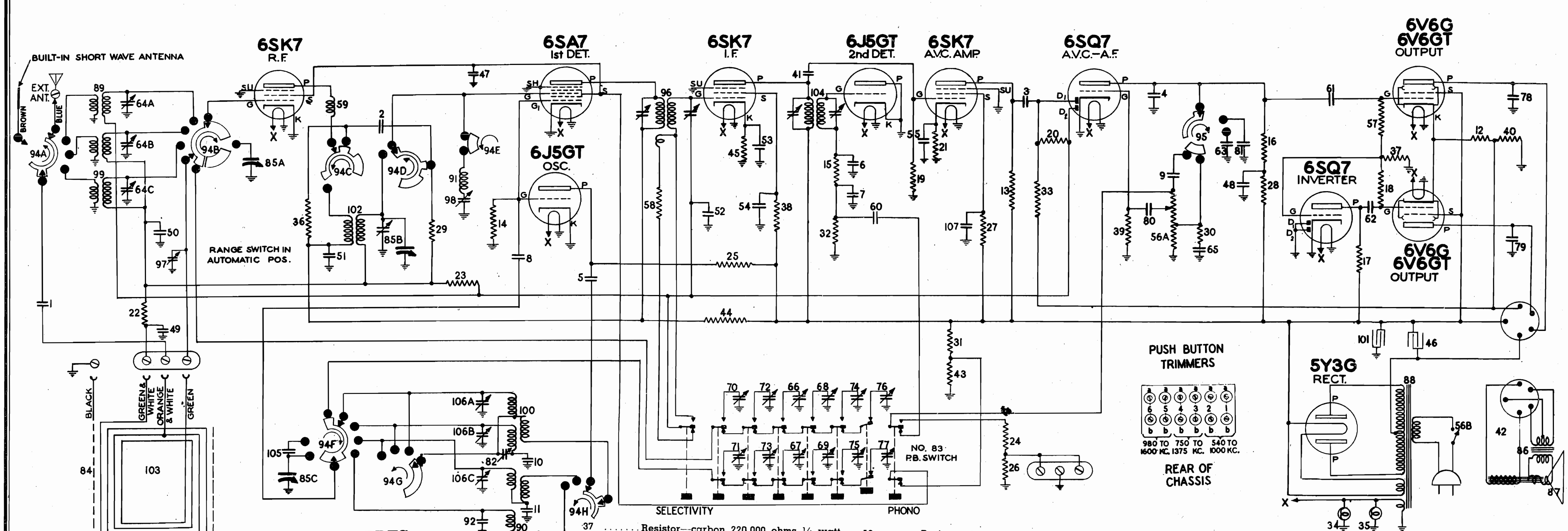
FOR ALIGNMENT SEE INDEX



REAR OF CHASSIS

MODEL S-7404-7

FIRESTONE TIRE & RUBBER CO.



ELECTRICAL PARTS

Diagram Number	Description
1-2-3-4	Condenser mica 260 mmfd.
5-6-7	Condenser mica 110 mmfd.
8	Condenser mica 51 mmfd.
9	Condenser mica 510 mmfd.
10	Condenser—.00144 mfd. mica
11	Condenser mica .00255 mfd.
12	Resistor wire wound 200 ohms 2 watts
13	Resistor carbon 15,000 ohms 1 watt
14-15	Resistor carbon 47,000 ohms 1/4 watt
16-17-18	Resistor carbon 220,000 ohms 1/4 watt
19-20	Resistor carbon 1 megohm 1/4 watt
21	Resistor carbon 4700 ohms 1/4 watt
22-23-24	Resistor carbon 470,000 ohms 1/4 watt
25	Resistor carbon 22,000 ohms 1/2 watt
26-27-28	Resistor carbon 100,000 ohms 1/4 watt
29-30	Resistor carbon 68,000 ohms 1/4 watt
31	Resistor carbon 18,000 ohms 2 watts
32-33	Resistor—carbon 330,000 ohms 1/4 watt
34-35	Dial light—6.3 volt
36	Resistor—carbon 3,300 ohms 1/4 watt
37	Resistor—carbon 220,000 ohms 1/4 watt
38	Resistor—carbon 150,000 ohms 1/4 watt
39	Resistor—carbon 10 meg. 1/4 watt
40	Resistor—wire wound 110 ohms 1/2 watt
41	Condenser—mica 15 mmfd.
42	Speaker—cynamic 12 inch
43	Resistor carbon 27,000 ohms 1 watt
44	Resistor—carbon 1500 ohms 1/2 watt
45	Not used in most sets, K goes to ground.
46	Condenser—electrolytic 16 mfd. 450 volt
47	Condenser—.1 mfd. 600 volt
48	Condenser—.2 mfd. 600 volt
49 to 55	Condenser—.05 mfd. 600 volt
56A to 56B	Volume control—1 meg. (with switch)
57	Resistor—carbon 180,000 ohms 1/4 watt
58	Resistor insulated 12 ohms 1/4 watt
59	Coil—compensating
60 to 63	Condenser—.01 mfd. 600 volt
64A to 64D	Condenser trimmer (4 section)
65	Condenser—.02 mfd. 600 volt
66 to 69	Condenser—P. B. trimmer (med. freq.)
70 to 73	Condenser—P. B. trimmer (high freq.)
74 to 77	Condenser—P. B. trimmer (low freq.)
78 to 81	Condenser—.004 mfd. 600 volt
82	Condenser—padder
83	Switch—push button
84	Loop antenna shield
85A-B-C	Condenser—variable tuning
86	Transformer—output for M-115116 speaker
87	Cone & voice coil for M-115116 speaker
88	Transformer—power—60 cycle Transformer—power 25 cycle
89	Coil—antenna (Band spread)
90	Coil—oscillator (Band spread)
91	Wave trap coil
92	Condenser—mica .0001 mfd. (low drift)
93	Condenser—compensating .0001 mfd.
94A to 94H	Switch—range
95	Switch—tone control
96	Transformer—1st I. F.
97-98	Condenser—trimmer
99	Coil—Police & Short Wave antenna
100	Oscillator coil with trimmers
101	Condenser—electrolytic 30 mfd. 450 volt
102	Coil—Broadcast R. F.
103	Loop antenna—complete
104	Transformer—2nd I. F.
105	Condenser—low drift—75 mmfd.
106A to 106C	Condenser—trimmer (3 section)
107	Condenser—.05 mfd., 600 volt

Note
Mention Code No. 347 when ordering parts

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

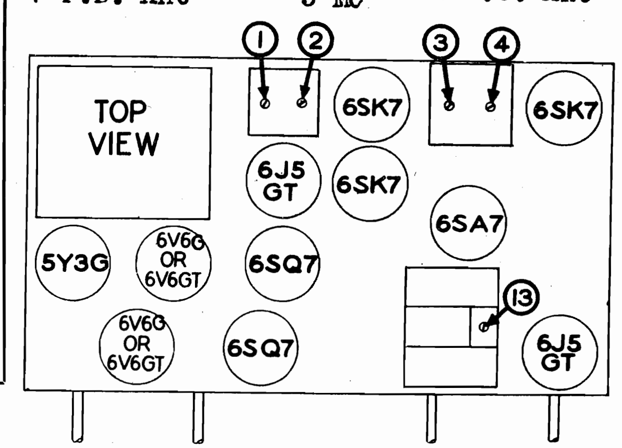
NO SIGNAL CONDITION — DIAL TUNED TO 540 KC

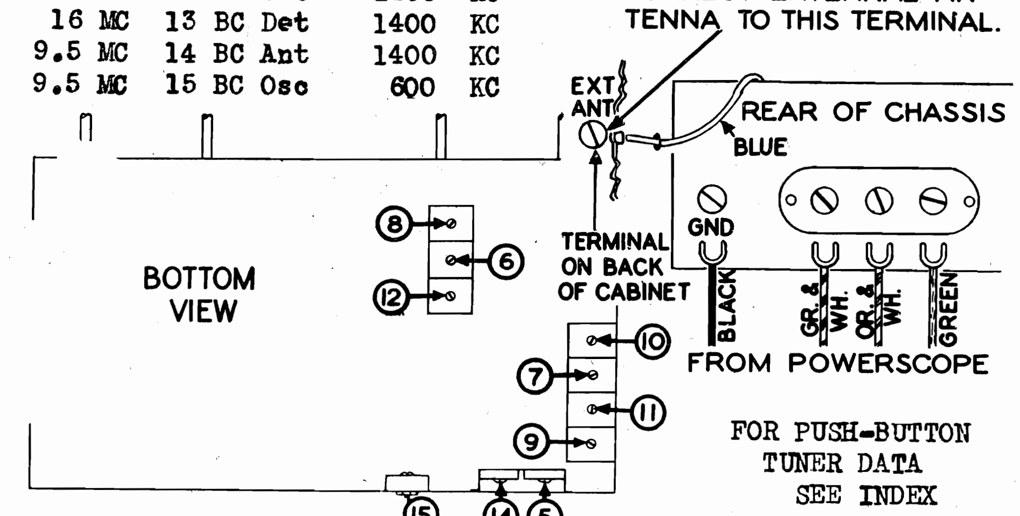
TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.0 A.C.	0	Note A		85	0	235		
6SA7	1st. Det.	6.0 A.C.	0	Note A	—10	85	0	250		
6J5GT	Osc.	6.0 A.C.	0	—10			0	137		
6SK7	I.F.	6.0 A.C.	0	Note A		70	0	260		
6J5GT	2nd Det.	6.0 A.C.	0	0				0		
6SK7	A.V.C. Amp.	6.0 A.C.	15	0		140		230		
6SQ7	A.F.—A.V.C.	6.0 A.C.	0	0				80	Note A	Note A
6SQ7	Inverter	6.0 A.C.	0	0				70	0	0
6V6G or 6V6GT	Output	6.0 A.C.	12			260		252		
6V6G or 6V6GT	Output	6.0 A.C.	12			260		252		
5Y3G	Rectifier	5.0 A.C.	Plates 370 V.A.C. to C.T.							

USE A VOLTMETER OF AT LEAST 1000 OHMS PER VOLT.

NOTE A: Bias is —3.7 volts at these points, measured across resistor No. 40.

TRIMMERS	ALIGN AT				
1-2 2nd I.F.	455 KC	8 S.W. Osc	16 MC	12 BC Osc	1400 KC
3-4 1st I.F.	455 KC	9 S.W. Ant	16 MC	13 BC Det	1400 KC
5 Wave Trap	455 KC	10 B.S. Osc	9.5 MC	14 BC Ant	1400 KC
6 P.B. Osc	5 MC	11 B.S. Ant	9.5 MC	15 BC Osc	600 KC
7 P.B. Ant	5 MC				

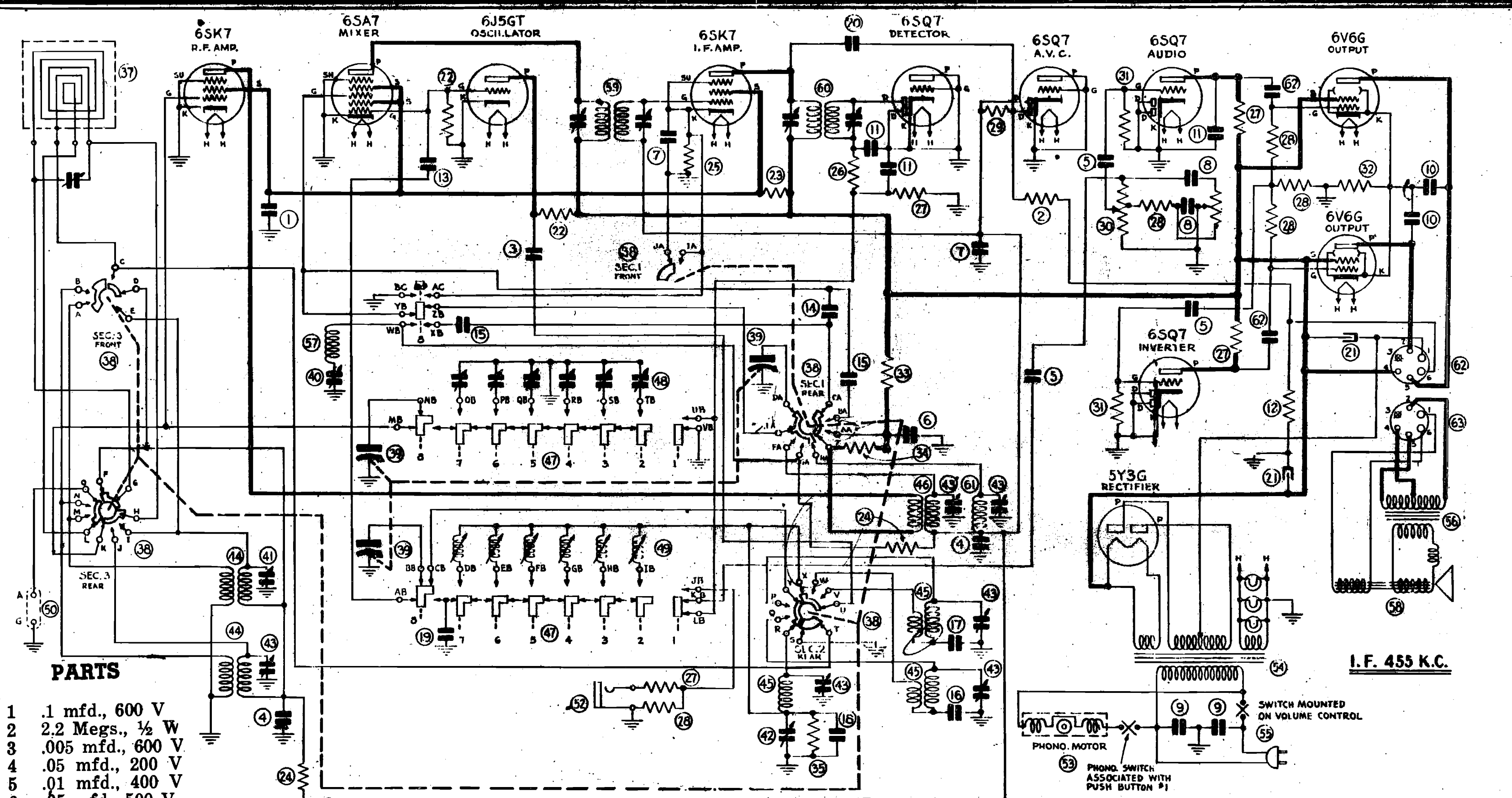




FOR PUSH-BUTTON TUNER DATA SEE INDEX

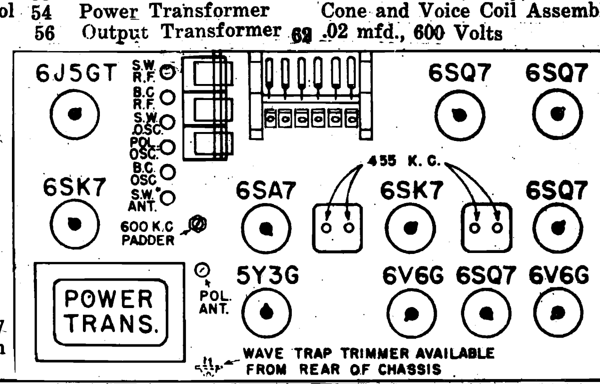
FIRESTONE TIRE & RUBBER CO.

MODEL S-7406-7

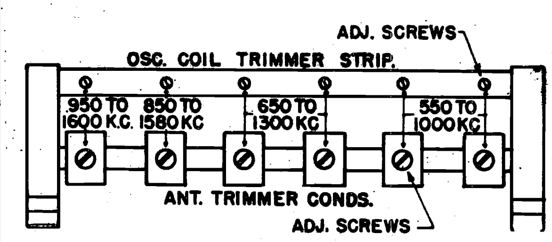


PARTS

1	.1 mfd., 600 V	28	220 M Ohm.,	49	Button Oscillator Coil Strip
2	2.2 Megs., ½ W	29	1 Meg. Ohm.,	53	Phono Motor ......
3	.005 mfd., 600 V	30	3.3 Meg. Ohm., Volume Control	54	Power Transformer
4	.05 mfd., 200 V	31	10 Meg. Ohm., ½ Watt	56	Output Transformer
5	.01 mfd., 400 V	32	220 Ohm, 2 Watt	57	Wave Trap Coil Assem
6	.05 mfd., 500 V	33	1500 Ohm., ½ Watt	61	Mixer Coil Assembly, Broadcast
7	.1 mfd., 200 V	34	4700 Ohm., ½ Watt		Cone and Voice Coil Assembly
8	.002 mfd., 600	35	10 M Ohm., ½ Watt	62	.02 mfd., 600 Volts
9	.01 mfd., 600 V	36	2.2 Meg. Ohm., Tone Control		
10	.01 mfd., 600 V	37	Loop Assembly		
11	100 mmf., Mica	38	Band Switch Assembly		
12	22 Ohm, ½ W.	39	Tuning Condenser Gang		
13	50 mmf., Mica	40	Wave Trap Trimmer		
14	10 mmf., Mica	41	Short Wave Trimmer		
15	250 mmf., Mica	42	Broadcast Padder		
16	1500 mmf., Mica	43	Trimmer Strip Assembly		
17	6000 mmf., Mica	44	Antenna Coil Assembly		
18	350 mmf., Silver 3%	45	Oscillator Coil Assembly		
19	270 mmf., Silver 3%	46	Mixer Coil Assembly, Short W		
20	25 mmf., Mica	47	Push Button Assembly Switch		
21	25 mfd., 450 V	48	Push Button Trimmer Strip		
22	22 M Ohm., ½ W				
23	12 M Ohm., 2 W				
24	100 M Ohm., ½ W				
25	2200 Ohm., ½ W				
26	47 M Ohm.,				
27	470 M Ohm.,				



FOR SWITCH DATA, PUSH-BUTTON TUNER ALIGNMENT, VOLTAGES-SEE INDEX.

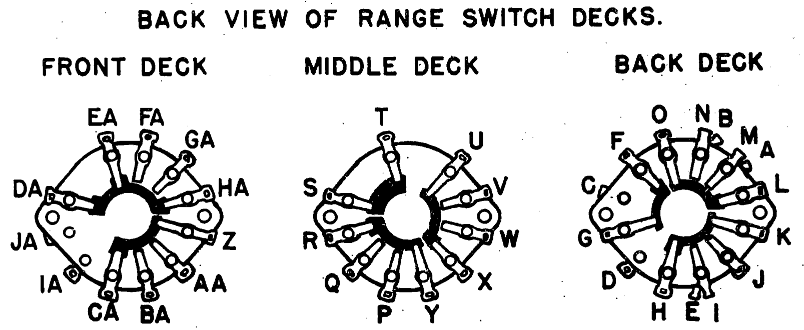


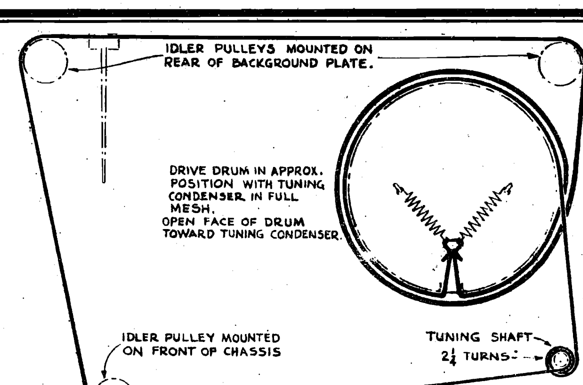
VIEWED FROM REAR OF CABINET

MODEL S-7406-7

FIRESTONE TIRE & RUBBER CO.

BACK VIEW OF RANGE SWITCH DECKS.





STRINGING DIAGRAM

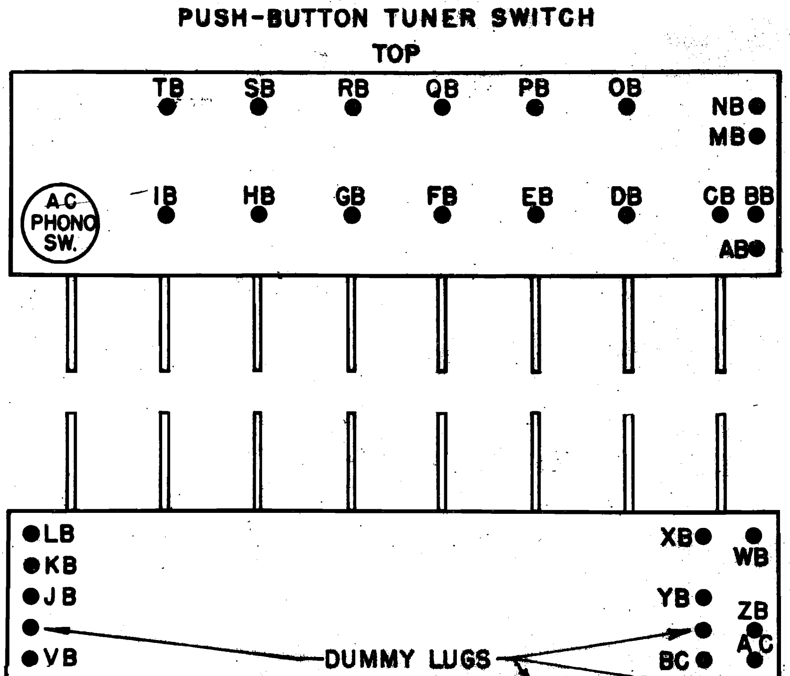
SEE INDEX FOR PUSH BUTTON TUNER DATA

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII

ALIGN
BROADCAST BAND
OSC- 1600 KC
ANT- 1500 KC
PAD- 600 KC

POLICE BAND
OSC- 5.4 MC
ANT- 5 MC
SHORT WAVE
OSC- 18.1 MC
ANT- 16 MC

PUSH-BUTTON TUNER SWITCH



LETTERS ON TERMINALS OF SWITCHES SHOWN ABOVE CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE SWITCHES SHOWN IN THE CIRCUIT DIAGRAM.

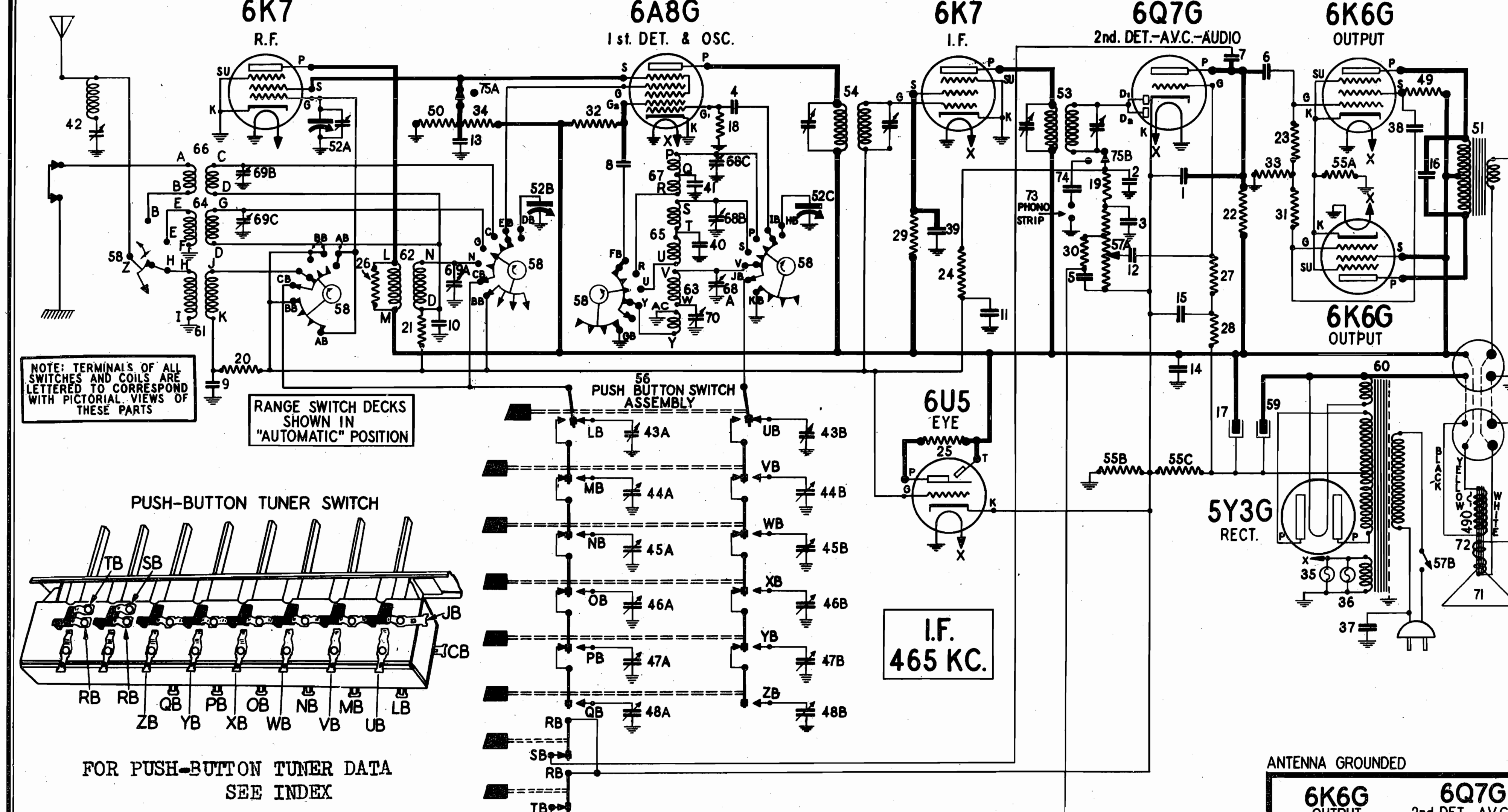
SOCKET VOLTAGES—ALL D.C. VOLTAGES MEASURED TO CHASSIS

ANTENNA GROUNDED — DIAL TUNED TO 540 K.C.

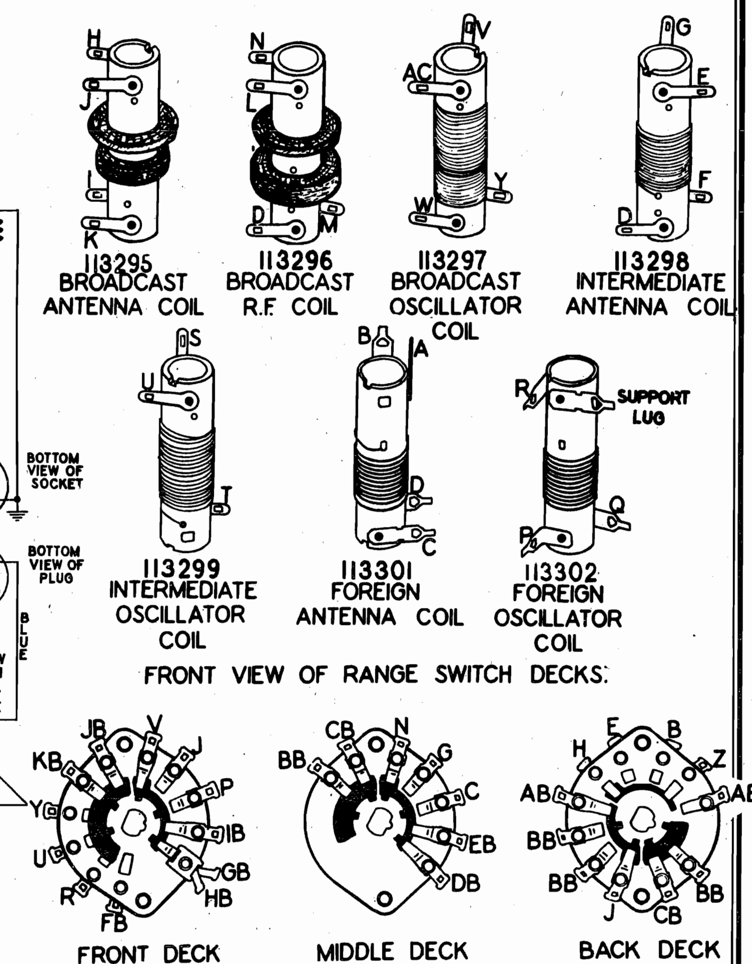
TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.3 A.C.	0	Note A		100		180		
6SA7	Mixer	6.3 A.C.	0	Note A		100		245		
6J5GT	Oscillator	6.3 A.C.	0					115		
6SK7	I. F.	6.3 A.C.	+3	Note A		100		245		
6SQ7	Det.	6.3 A.C.	0						Note A	Note A
6SQ7	A.V.C.	6.3 A.C.	0						Note A	Note A
6SQ7	1st Audio	6.3 A.C.	0					62		
6SQ7	Inverter	6.3 A.C.	0					62		
6V6G	Audio	6.3 A.C.	15			245		232		
6V6G	Audio	6.3 A.C.	15			245		232		
5Y3	Rect.	5 A.C.					230 A.C.			230A.C.

NOTE A: Due to the high resistance in the circuit, only very slight deflections of the voltmeter will be obtained.

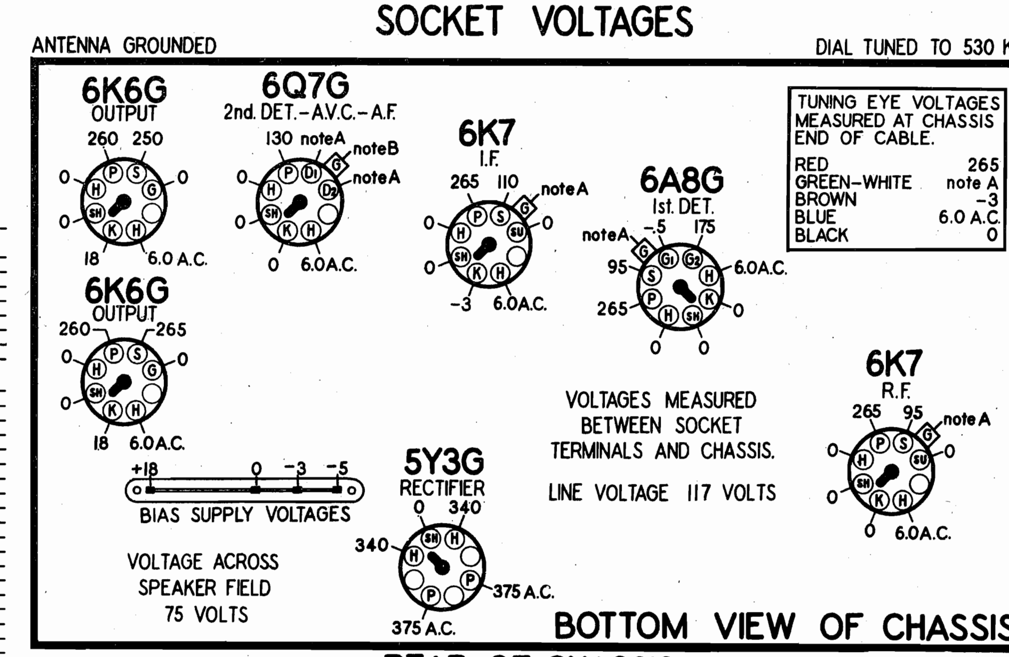
FIRESTONE TIRE & RUBBER CO.



FOR PUSH-BUTTON TUNER DATA
SEE INDEX



SOCKET VOLTAGES



REAR OF CHASSIS

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: The bias for the control grids of the 6A8-G, 6K7 R.F., 6K7 I.F., 6U5 and the diode plates of the 6Q7-G tubes is -3 volts measured across resistor 55B.

NOTE B; The bias for the control grid of the triode section of the 6Q7-G tube is -5 volts measured across resistors 55B and 55C.

ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	83539	Condenser - mica 260 mmfd.
2-3	83783	Condenser - mica 110 mmf.
4	85061	Condenser - mica 51 mmfd.
6	88026	Condenser - paper .02 mfd. 400 volt
7	88029	Condenser - paper .004 mfd. 400 volt
5-8	88030	Condenser - paper .01 mfd. 400 volt
9-10 11-12	88189	Condenser - paper .05 mfd. 200 volt
13-14	88682	Condenser - paper .1 mfd. 400 volt
15	89421	Condenser - paper .1 mfd. 200 volt
16	89826	Condenser - paper .004 mfd. 750 volt
17	89937	Condenser - electrolytic 30 mfd. 450 volt
18-19	110552	Resistor - carbon 47,000 ohms 1/4 watt
20-21-22 23	110553	Resistor - carbon 220,000 ohms 1/4 watt
24-25	110554	Resistor - carbon 1 megohm 1/4 watt
26	110557	Resistor - carbon 4700 ohms 1/4 watt
27-28	110559	Resistor - carbon 470,000 ohms 1/4 watt
29	110564	Resistor - carbon 100,000 ohms 1/4 watt
30-31	110565	Resistor - carbon 22,000 ohms 1/4 watt
32	110568	Resistor - carbon 15,000 ohms 1 watt
33	110578	Resistor - carbon 68,000 ohms 1/4 watt
34	110596	Resistor - carbon 15,000 ohms 3 watt
35-36	110629	Lamp - 6.3 volt - .25 amps
37	111214	Condenser - paper .01 mfd. 600 volt
38-39	111252	Condenser - paper .05 mfd. 400 volt
40	112426	Condenser - mica 1650 mmfd. (3%)
41	112427	Condenser - mica 4050 mmfd. (3%)
42	112796	Coil - wave trap (with trimmer)
43A - B 44A - B	112942	Condenser - dual push button trimmer (1100 KC to 1700 KC)
45A - B 46A - B	114505	Condenser - dual push button trimmer (770 KC to 1350 KC)
47A - B 48A - B	112944	Condenser - dual push button trimmer (550 KC to 1000 KC)
49	112952	Resistor - carbon 3,300 ohms 1/4 watt
50	112954	Resistor - carbon 10,000 ohms 1 watt
51	113192	Transformer - output
52A - C	113216	Condenser - gang
53	113229	Transformer - 2nd I.F.
54	113237	Transformer - 1st I.F.

PARTS LIST

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
55A - C	113251	Resistor - wire wound - Section A 240 ohms; Section B 26 ohms; Section C 18 ohms
56	114022	Switch - push button
57A - B	114020	Volume control - 250,000 ohms(with switch)
58	114030	Range switch
59	113261	Condenser - electrolytic 30 mfd. 450 volt
60	113271	Transformer - power 117 volt - 60 cycle
61	113295	Coil - antenna (B.C.)
62	113296	Coil - R.F. (B.C.)
63	113297	Coil - oscillator (B.C.)
64	113298	Coil - antenna (police)
65	113299	Coil - oscillator (police)
66	113301	Coil - antenna (S.W.)
67	113302	Coil - oscillator (S.W.)
68A - C	113319	Condenser - trimmer - 3 section
69A - C	113320	Condenser - trimmer - 3 section
70	113346	Condenser - padding
71	R-114163	Cone & Voice Coil assembly
72	R-115030	Speaker (Dynamic) 12 inch
73	84407	Phono Terminal Strip
74	89421	Condenser - 0.1 mfd. 200 volts
75A - B	114141	Switch - Radio Phono (D.P.D.T.)

DIAL & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION
67568	Washer - embossed (for mtg. electrolytic)
83624	Screw - self tapping 8 X 1/4
84407	Terminal Strip - phono
85066	Terminal Strip - G.D.A.
85321	Connector - ground
85427	Socket - octal base (standard)
85827	Set Screw - 8/32 square head for tone or band ind.
88348	Eyelet - for dial cord
89746	Washer - (paper) for back of knobs
110496	Plug - speaker (4 prong)
110501	Socket - 4 prong (for spkr.)
110829	Washer - flat steel for chassis mtg.
111302	Cord - dial drive 6 or 50 ft. lengths
112745	Clip - coil mounting (osc. & ant.)
112798	Clip - for mtg. wave trap coil
112865	Base - for tube shield
112874	Screw - #10 X 1 1/8 chassis mtg.
112879	Screws - escutcheon mtg.
113025	Socket - octal base (with special ground)
113077	Shield - tube
113177	Spring - dial cord tension
113178	Cord - for band indicator (28" req.) supplied in 4 ft. lengths
113205	Thrust Plate - for tuning shaft
113207	Gear - pinion on auxiliary range switch shaft
113288	Shaft - auxiliary - for range switch
113338	Drum - dial drive
113347	Gear - on range switch shaft
113463	Rubber bushing - for chassis mtg.
113710	Washer - ceramic for trimmer condensers
113723	Knobs
113762	Push button
114023	Socket - dial lamp with bracket
114025	Shaft - tuning
114027	Socket - dial lamp - with clip
114031	Collar - for band switch shaft
114032	Bracket and pulley assembly - right hand
114034	Bracket and pulley assembly - left hand
114036	Dial mtg. plate
114040	Dial scale
114041	Tabs - call letter
114042	Clamp - for dial scale
114043	Band indicator slides & strip
114046	Spring for band indicator
114047	Pulley - on band indicator shaft
114048	Dial pointer & slide
114052	Escutcheon - dial
114088	Cable & Plug - for tuning eye
114089	Escutcheon - push button

FORM NO. 8829 PRINTED IN UNITED STATES OF AMERICA

FIRESTONE TIRE & RUBBER CO.

MODEL S-7427-2

CIRCUIT FEATURES

This chassis is an 8 tube, three band, push button tuning superheterodyne receiver. The tuning ranges are 530 to 1730 KC, 2.2 to 7.0 MC and 6.8 to 22.5 MC.

Incorporated in each chassis is an eight button tuner switch. The first two buttons on the left are tone controls. Four different tone qualities may be imparted to a program by properly setting these tone buttons. The remaining six buttons are used for automatic tuning. Automatic tuning is accomplished by substituting pre-set trimmers for the variable gang condenser. The push-button switch provides a simple rapid method of effecting this substitution.

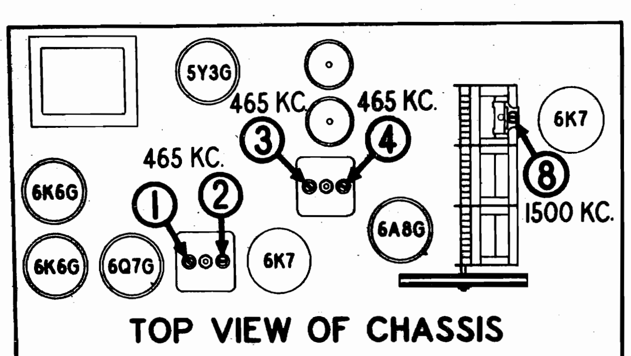
It should be noted that the R.F. stage in this receiver operates only on the Broadcast Band. When the band switch is in the "Automatic", "Intermediate" or "Foreign" positions this R.F. stage is not utilized.

A feature of this set is the special push-pull output stage. Instead of using a push-pull input transformer or a separate phase inverter tube the phase inversion is accomplished as follows. One of the 6K6G output tubes has a 3,300 ohm load resistor in its screen circuit across which is built up an audio voltage which is 180 electrical degrees out of phase with respect to the input grid voltage. This phase inverted voltage obtained across the screen resistor is now applied to the grid of the other output tube in this push-pull output combination. NOTE: It can be readily seen from the above explanation that if the 6K6G output tube, from which the phase inversion voltage is obtained, is removed from the set or becomes defective, it will be impossible for any signal to be heard in the speaker.

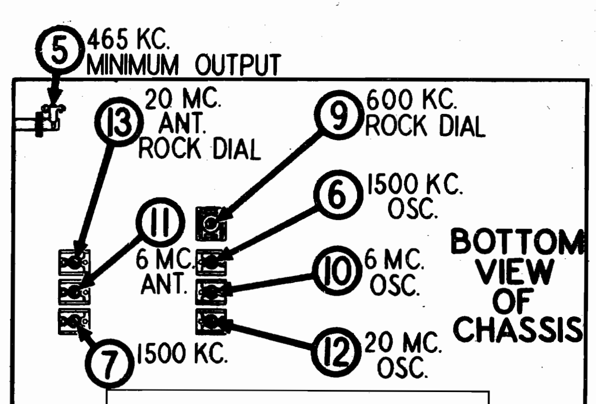
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 20 MC are required.

1. Connect the output meter across the voice coil or between the plates of the 6K6G output tubes depending upon the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis. NOTE: The "G" and "D" terminals on this terminal strip must be connected together.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screw on the dial cord drive drum and push the gang condenser in full mesh with the pointer properly set, then retighten the set screw.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION (INDICATED BY DIAL)	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 6A8G TUBE	465 KC	BROADCAST	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2ND I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1ST I.F.	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	465 KC	BROADCAST	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT. USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC	BROADCAST	1500 KC	6	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC	BROADCAST	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST DETECTOR	ADJUST FOR MAXIMUM OUTPUT.
					8	BROADCAST ANTENNA	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	600 KC	BROADCAST	TUNE TO 600 KC GENERATOR SIGNAL	9	BROADCAST OSCILLATOR (SERIES)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC	INTERMEDIATE	6 MC	10	INTERMEDIATE OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 5.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 6 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC	INTERMEDIATE	TUNE TO 6 MC GENERATOR SIGNAL	11	INTERMEDIATE ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC	FOREIGN	20 MC	12	FOREIGN OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC	FOREIGN	TUNE TO 20 MC GENERATOR SIGNAL	13	FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED



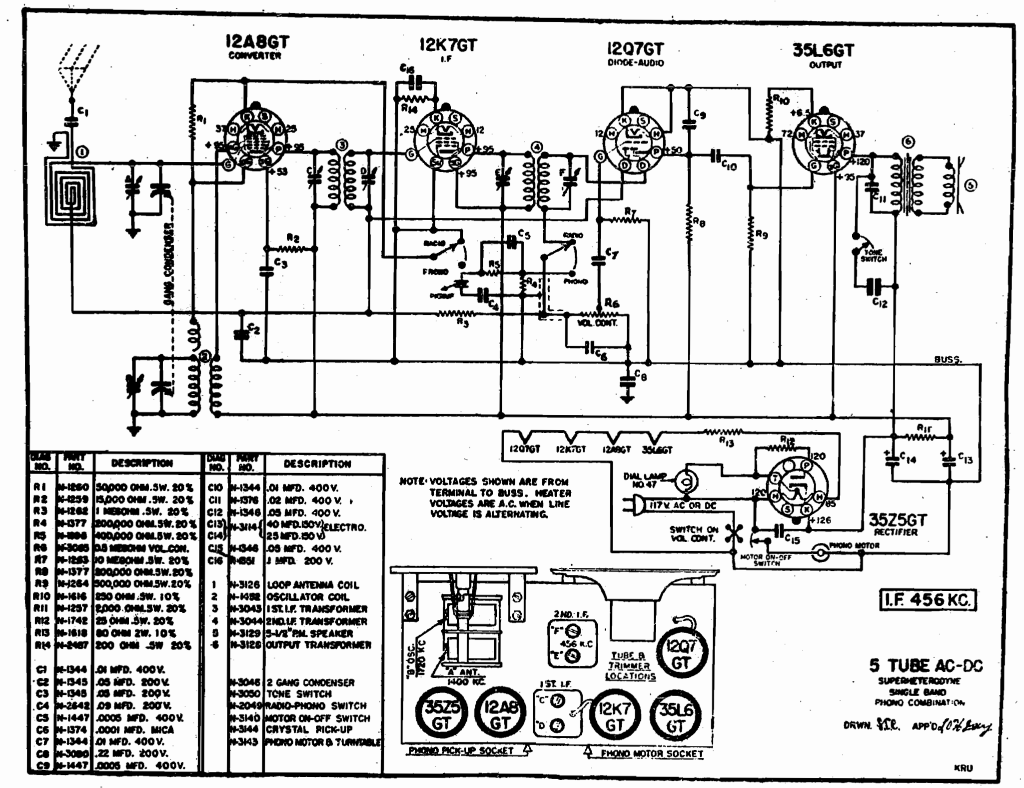
TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

MODEL S-7406-5

FIRESTONE TIRE & RUBBER CO.



TUNING RANGE AND DIAL CALIBRATION

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Meters). The upper scale is calibrated from 55 to 170 (Standard Broadcast). This band covers all Standard Broadcast frequencies of the United States, Canada, Mexico, Cuba and many Central and South American Countries; also the popular 1712 kilocycle (KC) Police Band. Add a zero to figures on the scale to obtain kilocycles. The lower scale is calibrated directly in meters. If stations are listed by kilocycles (KC), use the upper scale and if they are listed by meters use the lower scale.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. 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.) 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 (12A8GT) 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. Remove chassis, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

CAUTION: NEVER LEAVE RECORDS ON TURNTABLE, EXCEPT WHILE PLAYING THEM. THE RECORDS WILL BECOME DAMAGED BY WARPING

GALVIN MFG. CO.

MODELS B2RC
B3RC
B4RC

Models B2RC, B3RC and B4RC

IMPORTANT

All service adjustments on Motorola Record Changers should be made with the instrument in a normal operating position.

Therefore, the instrument should be supported in such fashion that parts underneath are accessible. A jig consisting of four corner support posts would be helpful. A mirror would also permit the service man to make observations and adjustments without getting into awkward positions.

CHECK THE RECORDS FIRST

Before attempting to service or adjust this Record Changer, check the records first to make sure they are not causing the trouble. The instrument will handle most of the 10 or 12 inch records now available on the market, but it is not guaranteed to handle all of them. Records must be in good mechanical condition, and should not be chipped, particularly around the center hole. Do not try to play automatically, records that are too thick, too thin, or that are oversized or undersized, as regards diameter of record or center hole. Do not mix 10 and 12 inch records on the Changer.

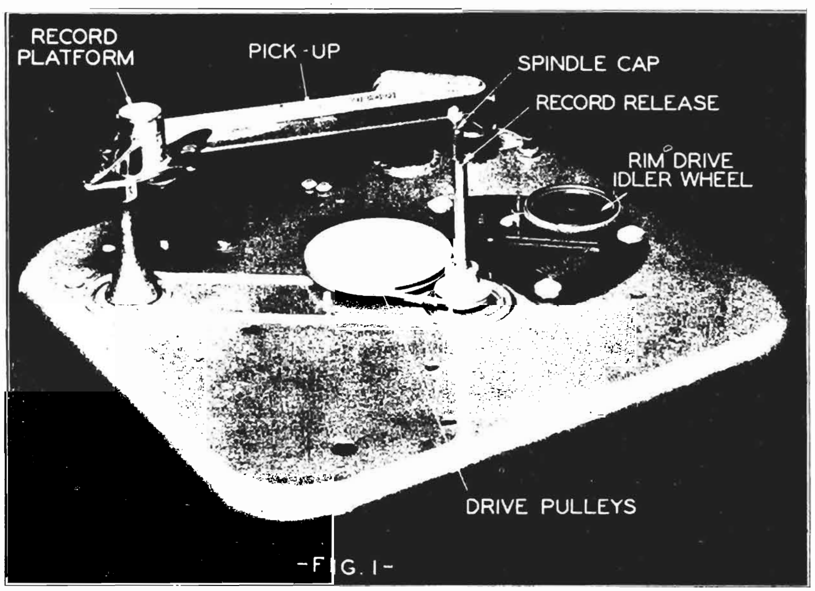
Old records made before the days of automatic record changers may not change automatically, due to the differences in thickness, or to lack of a proper eccentric groove at the finish. Most of the old records, however, may be played one at a time.

THEORY OF OPERATION

As in most modern phonograph turntables, power is derived from an electric motor. This power is transmitted to the turn-table through a geared down rim drive of the friction type.

The turntable is keyed to a small drive pulley, which in turn drives a large (3 inch) pulley, through a spring belt, both of these units being located on top of the base plate. (See Fig. 1). The 3 inch pulley transmits power by direct drive to another small pulley located under the mounting plate. This second small pulley in turn drives the large (4 inch) main drive wheel, also located under the mounting plate.

When the turntable revolves, all of these pulleys and wheels mentioned above, also revolve-regardless of whether or not the Changer is going through a cycle of changing a record. By means of this series of pulleys, a high ratio is obtained between the motor and the changing mechanism, which assures ample power.



-FIG. 1-

SETTING FOR 10 OR 12 INCH RECORDS

The record support platform is adjustable for either 10 or 12 inch records, depending upon which "lip" is turned toward the center of the turntable. The platform may be swung in an arc of 180 degrees, so that either the 10 or 12 inch lip may point toward the spindle.

Underneath the mounting plate, and mounted rigidly to the record platform support shaft is an eccentric mechanism which moves the 10" - 12" selector lever when the platform is moved. The position of this selector lever determines the point where the needle will come down on the record at the end of a changing cycle. In other words, it adjusts the pick-up for playing automatically either 10 or 12 inch records, depending upon the position to which the record support platform is turned. The eccentric cam and the selector lever are shown in Figs. 4 and 6.

START-REJECT SWITCH

The push switch mounted near one corner of the mounting plate is connected in parallel with the automatic change switch previously discussed. When this switch is closed, it energizes the electro magnet exactly in the same fashion as does the automatic change switch, thereby making it possible to start the changing cycle at any time, regardless of whether or not the record has been completely played. By this means a record can be "rejected". **The wiring diagram showing switches and magnet can be seen in Fig. 2.**

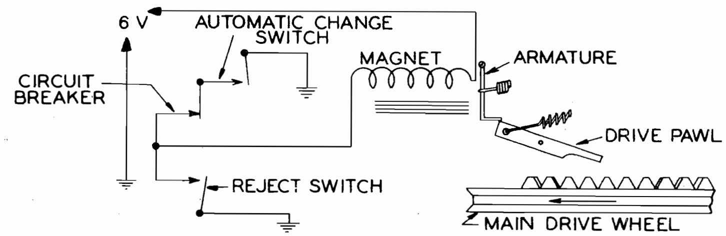
TO ADJUST AUTOMATIC CHANGE SWITCH

The Automatic Switch (See Fig. 7) starts the changing cycle after a record has been completely played. The switch is actuated by the oscillating of the tone arm in the eccentric groove of the record, through the spring clip which grips the movable switch blade.

If the switch fails to operate positively, it may be readily adjusted by means of the adjustment screw (F). (See Fig. 7).

To make the adjustment, place a record on the turntable, start it revolving, and move the pick-up over to the end of the record. Adjust screw (F) until switch closes the magnet circuit and starts the change cycle. Check points visually to make sure they do not remain closed after cycle is completed.

If the Changer immediately starts another cycle, it is an indication that the points are remaining closed or that the clutch release spring (G) (Fig.7) does not have enough tension. This tension may be increased by taking it up another notch.



- ELECTRICAL CIRCUIT -
FIG. 2

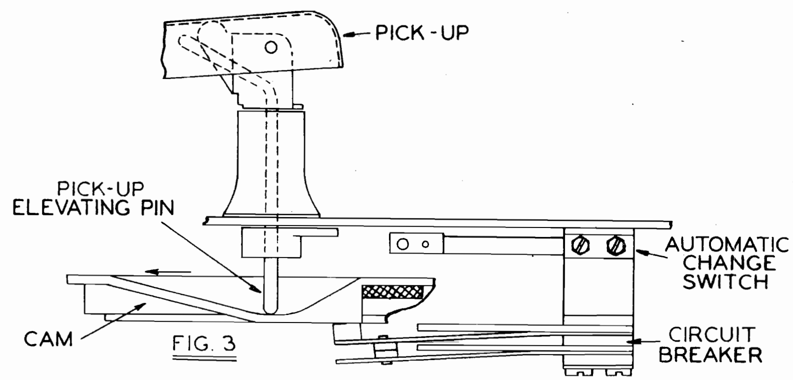


FIG. 3

MODELS B2RC
B3RC
B4RC

GALVIN MFG. CO.

CHANGING CYCLE

By referring to the various photographs and figures which will be found in this Service Manual, you can readily follow through the changing cycle from the continuity given hereafter.

1. The needle in the pick-up finishes a record and enters the eccentric groove.

2. As the pick-up has slowly approached the eccentric groove, a phosphor bronze spring clip has gripped a fin of the automatic change switch.

3. When the needle enters the eccentric groove on the record, the pick-up oscillates slightly, which in turn causes the automatic change switch to make contact.

4. The first momentary contact of the automatic change switch is all that is necessary to start the changing cycle. When the switch closes, a small electro magnet is energized. The electro magnet pulls an armature back out of the way, permitting a drive pawl which is mounted on the cam wheel to fall down and engage in one of the notches which are provided on the upper surface of the main drive wheel. (See Fig. 2.)

5. Since the main drive wheel is already revolving, the engagement of the pawl now causes the cam wheel to revolve with it.

6. When the cam wheel starts to revolve, it causes several things to occur. In the first few degrees of revolution, it opens a circuit breaker switch (Fig. 3) which automatically opens the magnet circuit, thereby de-energizing it, to prevent "chattering".

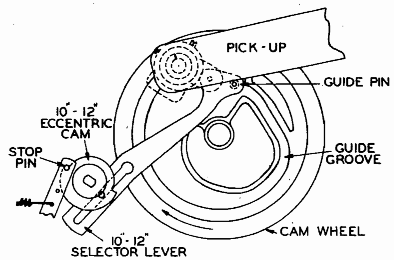


FIG. 4

7. The next few degrees of rotation causes the pick-up elevating pin to ride up on an inclined section of the cam, thereby elevating the pick-up and lifting the needle from the record which has just been played. (See Fig. 3).

8. A few more degrees of revolution cause the pick-up guide groove on top of the cam wheel. This part of the mechanism is not visible, since the cam wheel is mounted too close to the mounting plate, but Fig. 4 shows a drawing of the upper surface of the cam wheel. As the wheel revolves with the pin in the groove, it causes the pick-up to swing out beyond the edge of the record so it will be out of the way when the next record falls on the turntable.

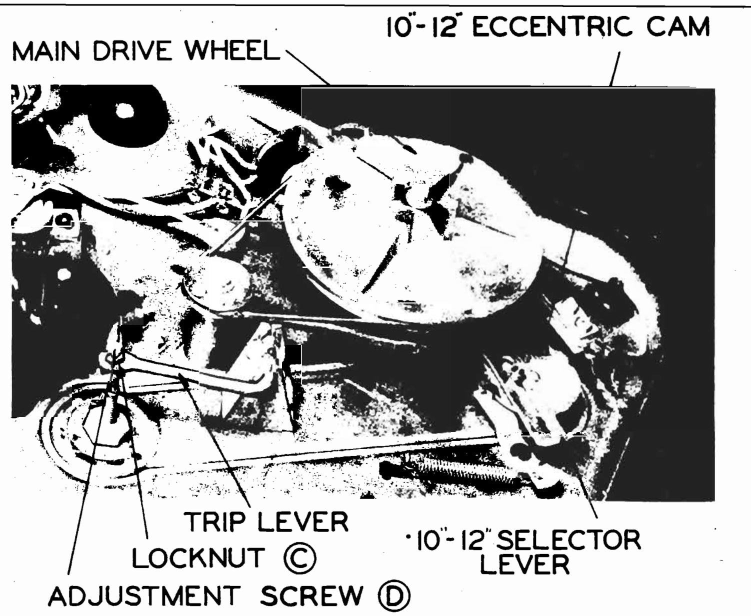
9. The cam wheel continues its revolution, and at another point on its circumference a roller on the end of the trip-lever rides up an inclined section on the cam. This trip-lever is the copper-plated rod which is hinged approximately in the center by running through a die cast fulcrum block. As the roller on one end of the trip-lever rolls up the incline on the cam, the other end of the trip-lever bears against the push rod which operates the record release, which is located near the top of the spindle, causing it to push the next record off its support, thereby dropping it on the turntable. (See Fig. 5).

10. The cam continues to revolve, the groove in the top bringing the pick-up back over the edge of the record to the proper position where the needle will fall near the first groove when it comes down.

11. A few more degrees of revolution, and the pick-up elevating pin rides down another incline, permitting the needle to settle gently on the first groove of the record. (Fig. 3).

12. At this point, the cam has completed one full revolution of 360 degrees. At the same time the needle touches the record, the drive pawl hits the magnet armature, which forces it up, thereby disengaging it from the notch in the drive wheel. The cam wheel therefore stops, the turntable continues to revolve, and the record is played.

13. During the last few degrees of revolution, the circuit breaker switch has again been closed, as its fibre stud rides up an incline on the lower surface of the cam. (Fig. 3). This switch must be closed at all times except when the instrument is going through a changing cycle, otherwise, it would be impossible to start a new changing cycle automatically.



-FIG. 6-

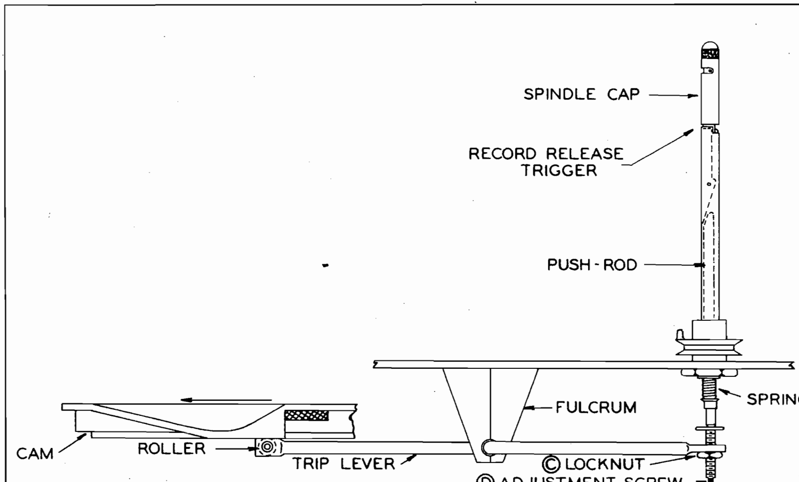
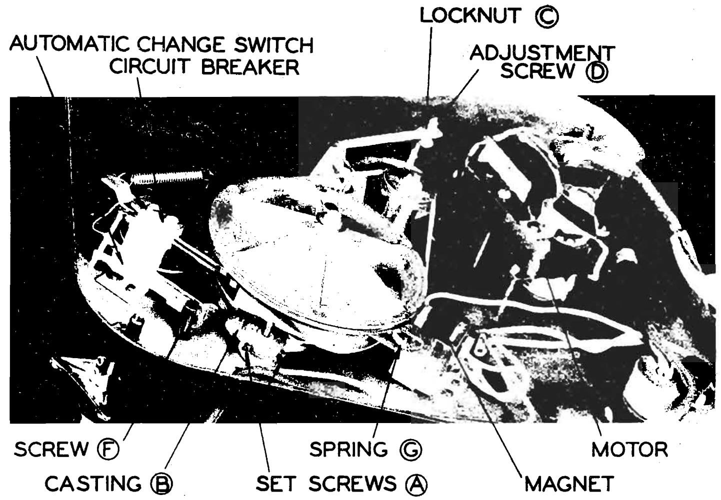


FIG. 5

GALVIN MFG. CO.

MODELS B2RC
B3RC
B4RC



-FIG.7-

TO ADJUST RECORD RELEASE

1. Place a stack of 10 inch records on the changer, after turning the record support platform to the "10 inch" position.
2. Start the turntable revolving.
3. Press the "Start-Reject" button.
4. If the first record does not drop to the turntable, double check the record to make sure that it is not too thick, or that the diameter of the center hole is not undersized, causing it to bind.
5. If the record proves to be normal, and is not causing the failure, loosen lock nut (C) which locks adjustment screw (D), as shown in Figs. 5, 6, or 7.
6. With a slab-head wrench, turn screw (D) a fraction of a turn clockwise, and press the "Start-Reject" button again, checking to see if record is released.
7. If the record fails to drop, tighten screw (D) a trifle at a time, testing after each adjustment, until setting is reached, which releases record.
8. Tighten lock nut (C), after which a few more records should be changed, to make sure that this did not alter adjustment of screw (D).

NOTE: If the Changer stalls during the adjustment procedure, it may be an indication that screw (D) is too tight, in which case it should be turned back (counter-clockwise).

TO ADJUST PICK-UP POSITION

This adjustment is made to cause the needle to drop in the first groove of the record, as the Changer completes a changing cycle.

1. Turn the record support to the 10 inch position. (See Fig. 1).
2. Place a standard 10 inch record on the turntable and start it revolving.
3. Press the "Start-Reject" button. The Changer will now start a changing cycle.
4. Do not let the Changer complete the cycle, but stop it at the point where the pick-up starts to drop downward towards the outer rim of the record. If the cycle is stopped at the right point, the pick-up will still be "in cycle" and will not be free to swing back and forth. Check this gently. Do not exert too much sidewise pressure on the pick-up.
5. Now loosen the two hex-head set screws (A) in the bell crank casting (B), which you can see in Fig. 7.
6. With the set screws loose, the pick-up arm can now be moved back and forth. Move it to the point where the needle rests directly over the first groove in the record.

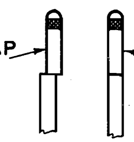


FIG. 8

(The correct dimension for proper adjustment is 4-25/32" from the needle point to the center of the spindle.)

7. Tighten one set screw securely so that the shaft does not move while checking proper position of the pick up arm. After proper position has been located tighten both set screws securely.
8. Now place a 12 inch record on the turntable; turn the record support to the 12 inch position.
9. Press the "Start-Reject" button and let the Changer go through another cycle, watching carefully to make sure the needle comes down on the record at the proper point. If necessary, make minor readjustment.

TO LINE UP RECORD PLATFORM

It is important that all points on the "lip" of the record support platform be equidistant from the center point of the spindle. This will assure that all points of the record will leave the platform at the same time. If the record support is too far out of alignment, the record would actually hang on the point nearest the spindle and fail to drop properly.

1. To check this alignment, turn the spindle-cap so it is in alignment with the rest of the spindle, which is the correct position for removing records. (See Fig. 8.)

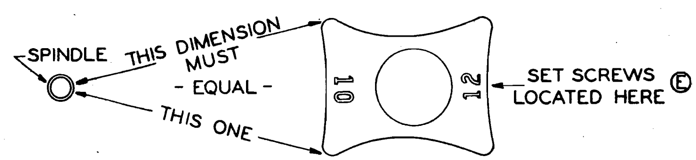
2. Turn the record support platform to the "10 inch record" position, making sure it is turned all the way to the stop.

3. Slip a standard 10 inch record over the spindle and check to make sure it clears the lip of the platform at all points. (See Fig. 9.)

4. If one point on the lip extends farther than the other, the position of the record support may be adjusted after loosening the two Bristo set screws (E), located directly under the numeral "12" on the record support. (See Fig. 9).

CAUTION: Make sure the eccentric selector cam, which is located under the base, is turned all the way to its stop. (See Fig. 4.)

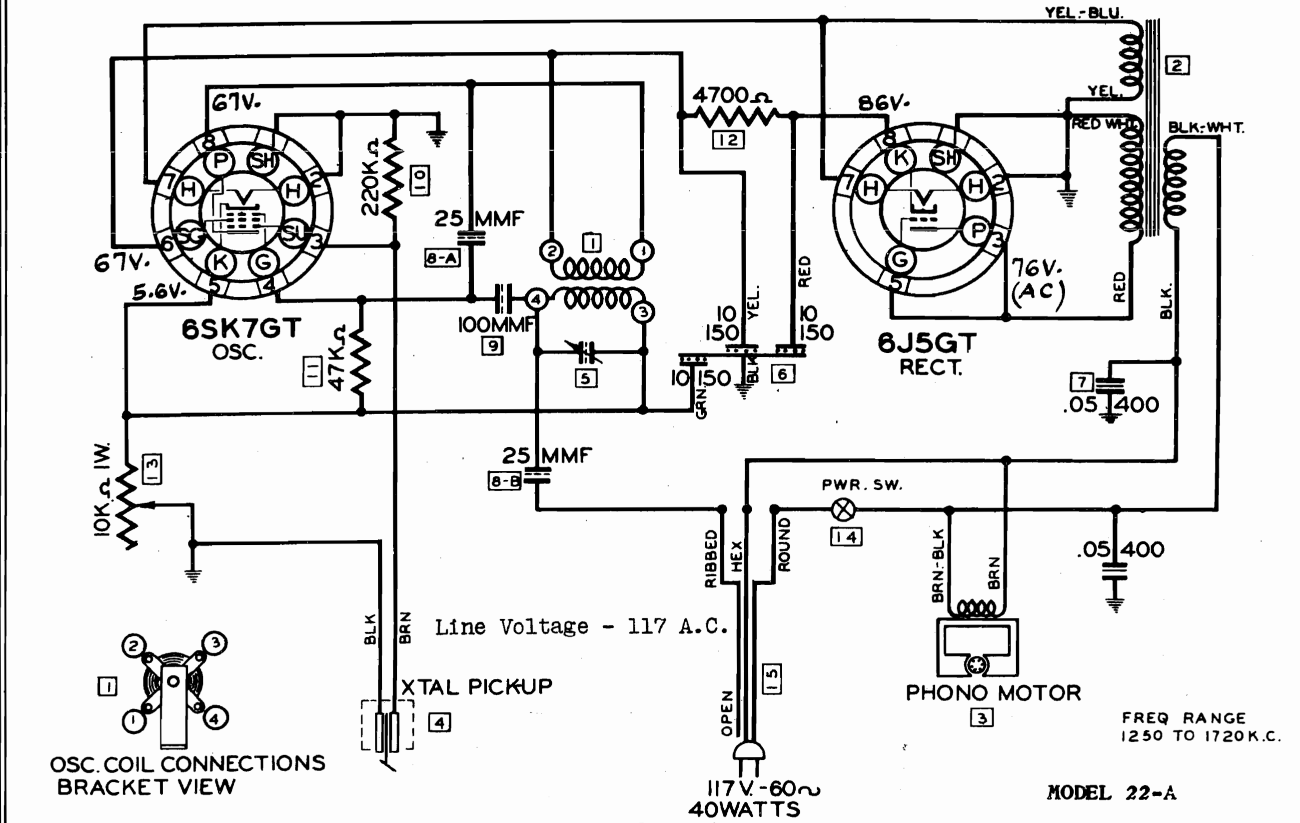
TEST: After tightening the set screws, test the adjustment by running a 10 inch record through a complete cycle and check the point where the needle falls. If the needle misses the record by one inch, the record platform is 180 degrees out of line with the eccentric cam, and should be turned one-half turn without turning the cam.



- RECORD SUPPORT -
FIG. 9

MODELS 22A,
23-RC, 23-RCW

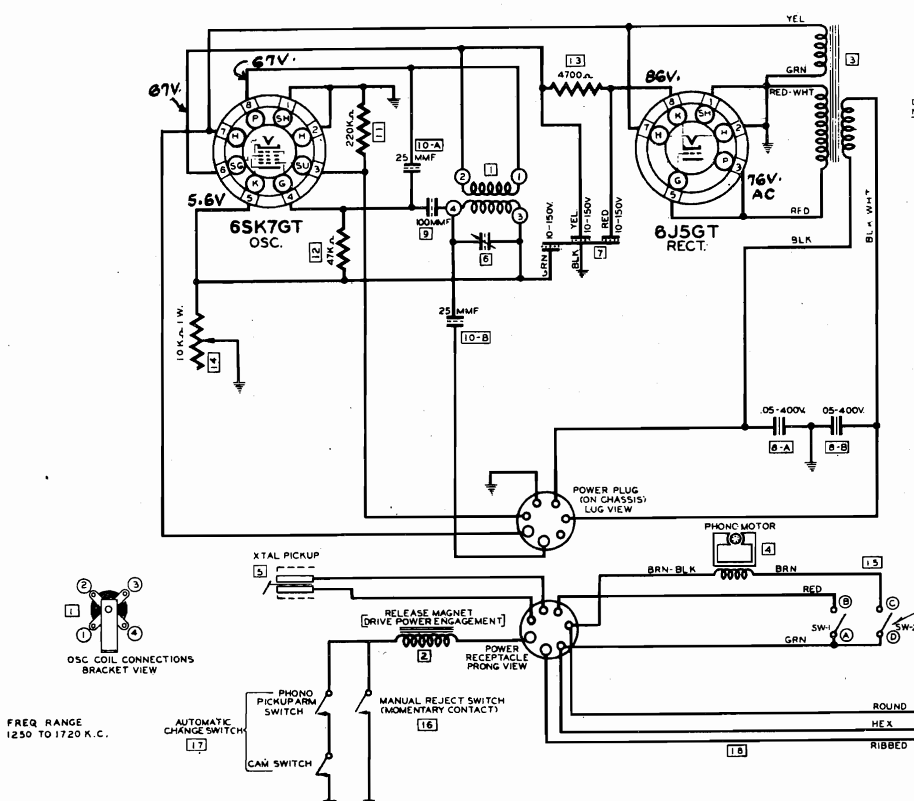
GALVIN MFG. CO.



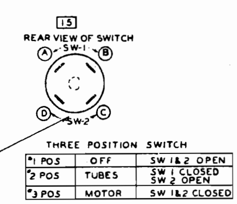
Diag. No.	Part No.	Description
1	24A20892	Osc. Coil (Ceramic) Org-Red
2	25A17449	Power Transformer
3	59X17433	Phono Motor (Complete Less Turn Table)
4	59B20888	Phono Pick-up
5	20A14502	Trimmer & Bracket
6	23A20887	Elect. Cond. & Strap (10-10-10/150V.)
7	8S9816	Tubular Condenser (.05-400V.)
8-A	21B6535	Molded Mica Condenser (25 mmf) 20%
8-B	21B6535	Molded Mica Condenser (25 mmf) 20%
9	21B6511	Molded Mica Condenser (100 mmf) 20%
10	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
11	6B6020	Carbon Resistor (47,000-1/3-20)N.I.
12	6B6101	Carbon Resistor (4700-1/3-20)N.I.
13	18A20889	Variable Bias Control
14	40X11539	Slider Switch (SPST)
15	30K20895	Line Cord & Plug (3 Conductor)

FOR AUTOMATIC RECORD-CHANGER

SEE MODEL B2RC



117 V. A.C.
40WATTS
60 ~



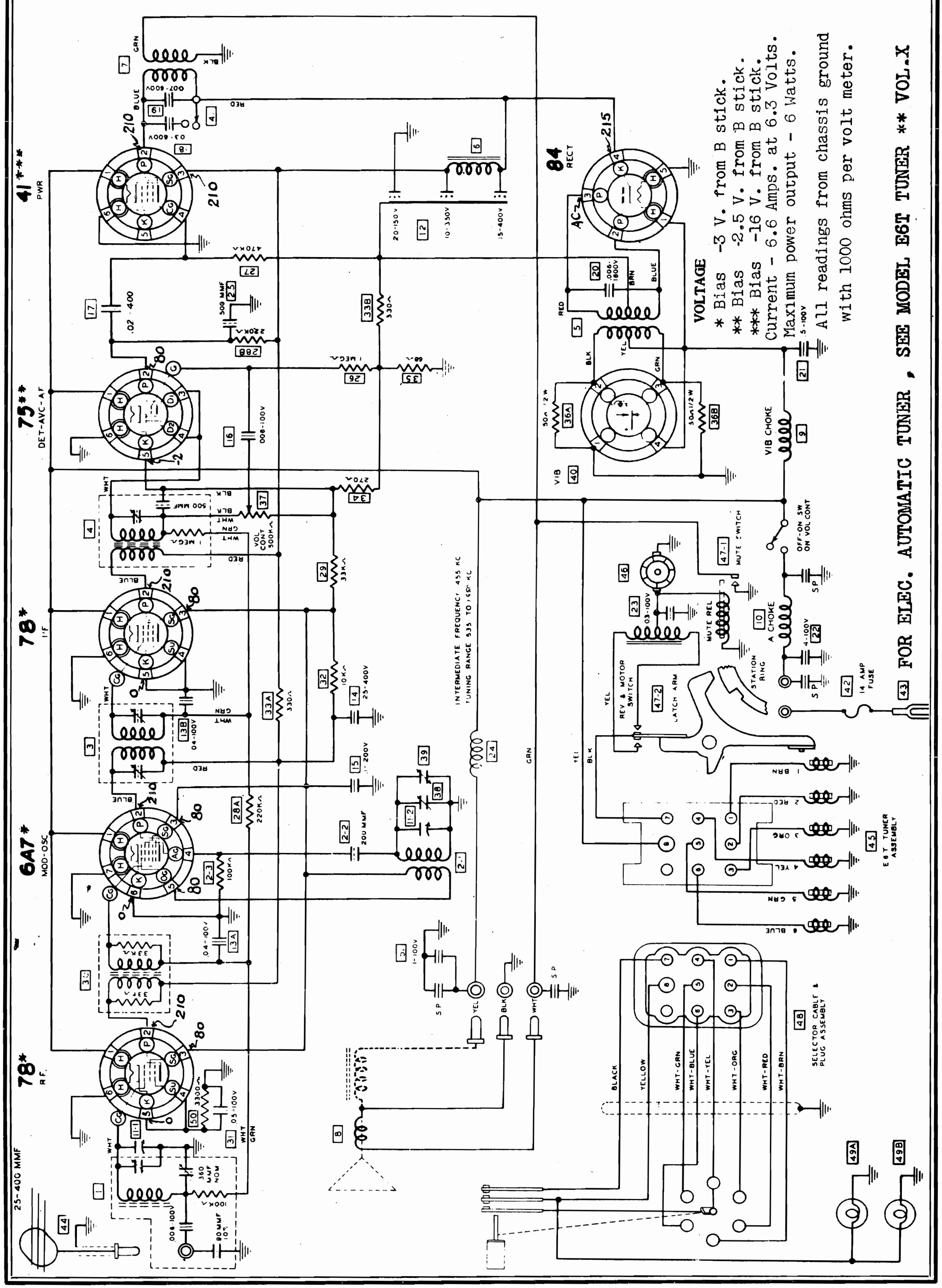
THREE POSITION SWITCH

*1 POS	OFF	SW 1&2 OPEN
*2 POS	TUBES	SW 1 CLOSED SW 2 OPEN
*3 POS	MOTOR	SW 1&2 CLOSED

Diag. No.	Part No.	Description
1	24A20892	Osc. Coil Ceramic (Org-Red Dot.)
2	1B21560	Release Magnet Assembly
3	25B21492	Power Transformer
4	59B21484	Phono Motor & Mtg. Plate
5	59B21840	Phono Pick-up Arm (Less Mtg.)
6	20A14502	Trimmer & Bracket (70 MMF)
7	23A20887	Elect. Cond. & Strap (10-10-10/150V.)
8-A	8S9816	Tubular Condenser (.05-400V.)
8-B	8S9816	Tubular Condenser (.05-400V.)
9	21B6511	Molded Mica Condenser (100 mmf) 20%
10-A	21B6535	Molded Mica Condenser (25 mmf) 20%
10-B	21B6535	Molded Mica Condenser (25 mmf) 20%
11	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
12	6B6020	Carbon Resistor (47,000-1/3-20)N.I.
13	6B6101	Carbon Resistor (4700-1/3-20)N.I.
14	18A20889	Variable Bias Control
15	40A21482	Power Switch
16	40K21526	Push Switch (Momentary Contact)
17	1A21443	Record Changer Switch Assembly
18	30K21528	Line Cord & Plug (3 Conductor)

MODELS 23-RC & 23-RCW

GALVIN MFG. CO. MODELS 22S, 25N



MODELS 22S, 25N, 550

GALVIN MFG. CO.

Model 550

ALIGNMENT PROCEDURE

Place the chassis on the service bench 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 R.F. coil can that is covered with Scotch Tape. The original adjustment, made in the factory should not be tampered with. (Fig. 1 below, shows all trimmer locations.)

I.F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6A8GT) 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. 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 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 adjustment several times for maximum accuracy.

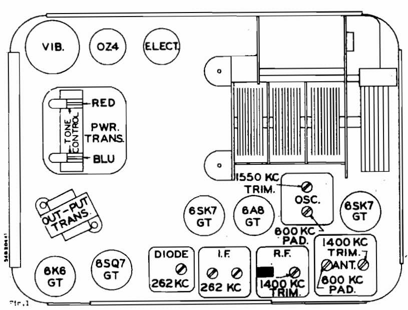
SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6SK7GT) 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 1550 K.C. oscillator trimmer 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. oscillator padder 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

NOTE: If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.
1. Set the signal generator at 4100 K.C. Turn the condenser gang until the signal is heard. Adjust the 1400 K.C. antenna trimmer in the antenna coil can for maximum output reading.



2. Adjust the 1400 K.C. R.F. trimmer in the R.F. coil can for maximum output reading.
3. 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 the maximum output reading.
4. Recheck steps 1, 2, and 3, for accuracy.

Model 22-S Model 25-N

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.

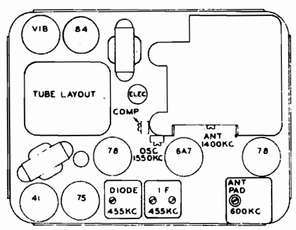


Figure 1--Trimmers

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.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

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 special dummy, part No. 1X18018, in place of the .1MF. 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.

Model 550

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READINGS **
42,000	262 K.C.	I.F. Grid	.1	.5 Meg	1.76
900	262 K.C.	Mod. Grid	.1	.5 Meg	1.76
950	600 K.C.	Mod. Grid	.1	.5 Meg	1.76
40	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
6	600 K.C.	Ant. Lead	***	None	1.76

* For one watt output.
** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No. 1X18018.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

Model 22-S Model 25-N

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

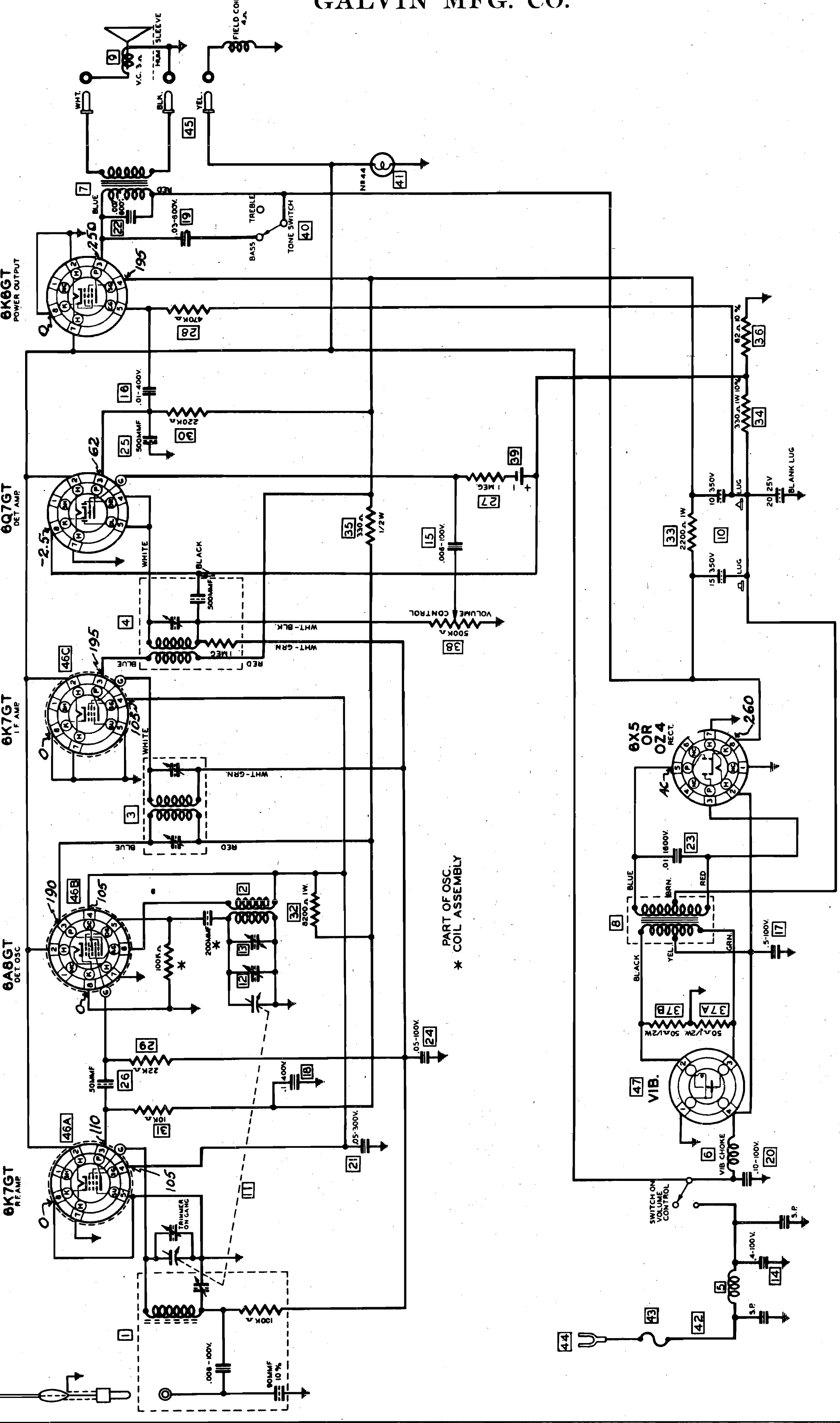
* For one watt output. V.C. impedance - 3 ohms at 400 cycles.

** Meter connected across voice coil. 1.74 volts equals 1 watt output.

MODEL 27-D-6

GALVIN MFG. CO.

VOLTAGE: All measurements from chassis ground to socket terminal using 1000 ohms per volt meter.
Current consumption—7 amps. Battery voltage—6.3.
Maximum power output—3 watts.



ALIGNMENT PROCEDURE: SAME AS MODEL 27-D.

DIAL CORD INSTRUCTIONS: SAME AS MODEL 27-D.

Model No. 27-D-6

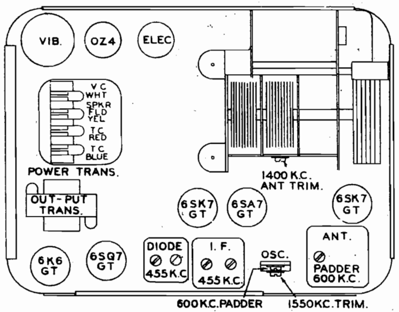
MODELS 27-D-6
34K-6, 34K-7

GALVIN MFG. CO.

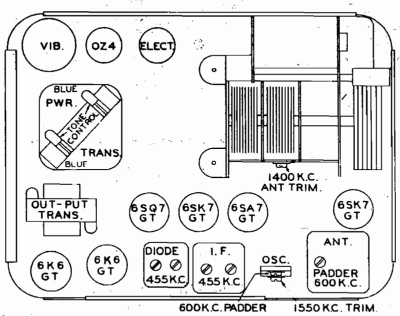
Models 34K-6 and 34K-7 For 1940 PACKARD

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.



Model 34-K6
Fig.1



Model 34-K7
Fig.2

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the oscillator tube and to chassis ground using a .1 Mfd. condenser in series with lead. 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 two trimmers 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. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.

2. Set the 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.

3. 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.

4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator padder to point giving highest output reading.

5. Leaving the signal generator set at 600 K.C., adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

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 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 special dummy, part No. 1X18018, 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 type, due to difference of tube characteristics, etc.

34K6 AVERAGE MICROVOLT INPUT *	34K7 AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READINGS **
28,000	13,000	455 K.C.	I.F. Grid	.1	.5 Meg	1.76
900	680	455 K.C.	Mod. Grid	.1	.5 Meg	1.76
1,000	780	600 K.C.	Mod. Grid	.1	.5 Meg	1.76
100	60	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
5	3	600 K.C.	Ant. Lead	***	None	1.76

* For one watt output.
** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No. 1X18018 or

NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

Model No. 27-D-6
Specifically Designed to be Installed in 1940
CHRYSLER DESOTO DODGE PLYMOUTH

SENSITIVITY AND STAGE GAIN MEASUREMENTS

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.

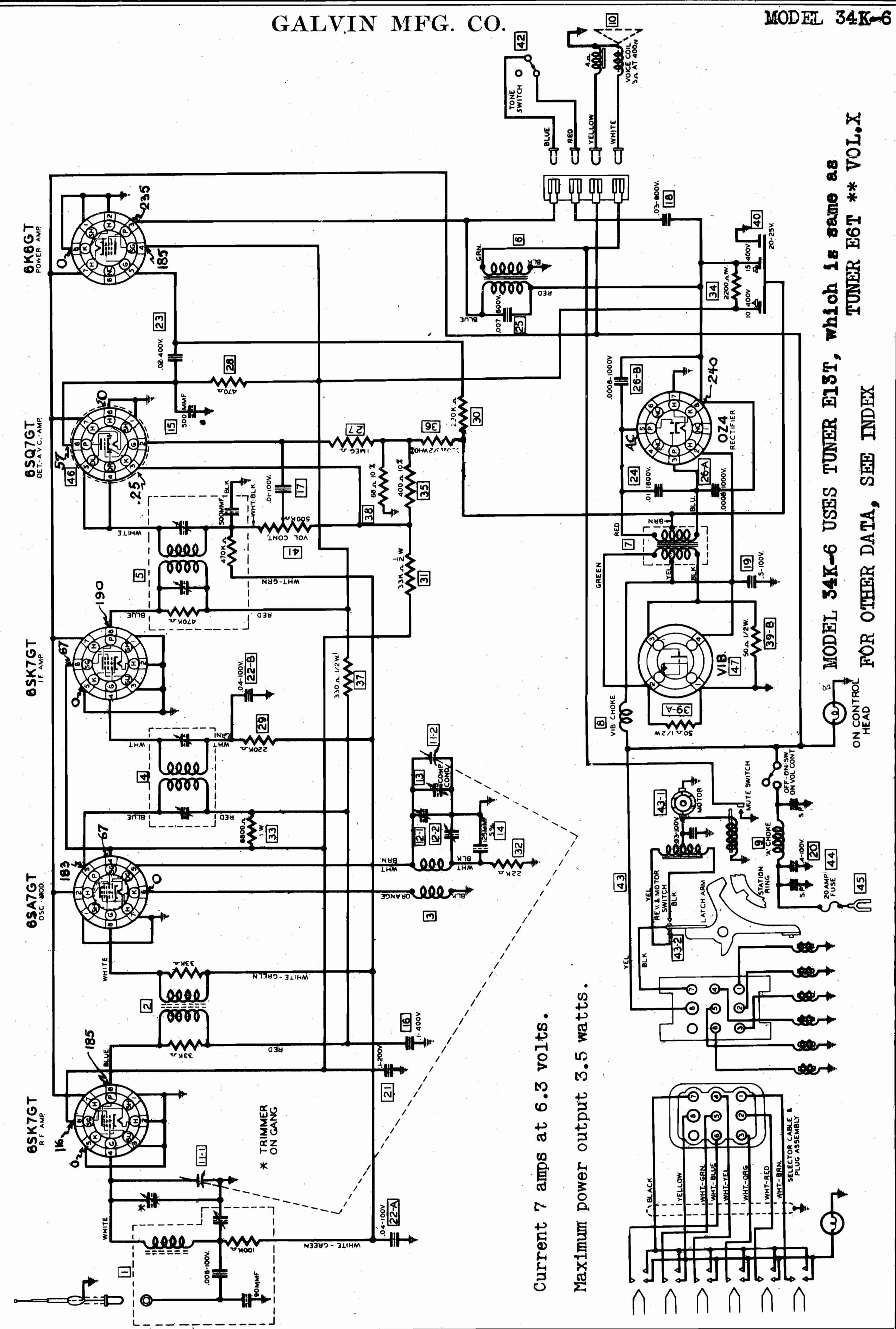
When measuring over-all sensitivity at the antenna terminal, use a special dummy part #1X18018 in place of the .1 MF.*** It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
8600	455 K.C.	I.F. Grid	.1 MF	.5 Meg	1.76 Volts
180	455 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
220	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
80	600 K.C.	R.F. Grid	.1 MF	.5 Meg	1.76 Volts
6	600 K.C.	Ant. Lead	***	None	1.76 Volts

** Meter connected across voice coil
1.76 Volts equals 1 watt output for 3 ohm voice coil
* For one watt output
*** Use special dummy part No.1X18018, or M434B booster coil Part No.17908 in series with 25 MMF cond.

GALVIN MFG. CO.

MODEL 34K-6



Current 7 amps at 6.3 volts.

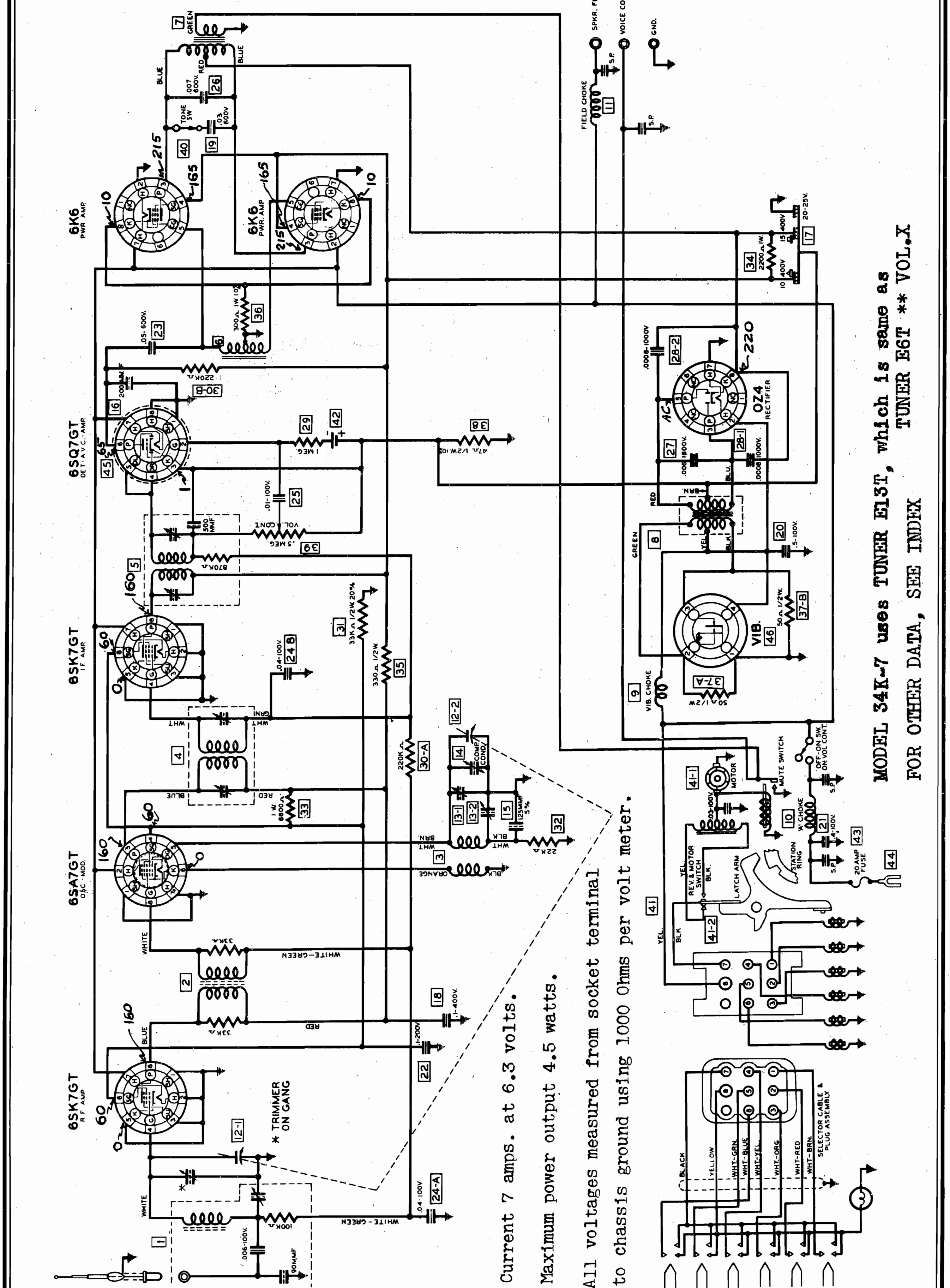
Maximum power output 3.5 watts.

MODEL 34K-6 USES TUNER E13T, which is same as TUNER E6T ** VOL.X

FOR OTHER DATA, SEE INDEX

MODEL 34K-7

GALVIN MFG. CO.



Current 7 amps. at 6.3 volts.

Maximum power output 4.5 watts.

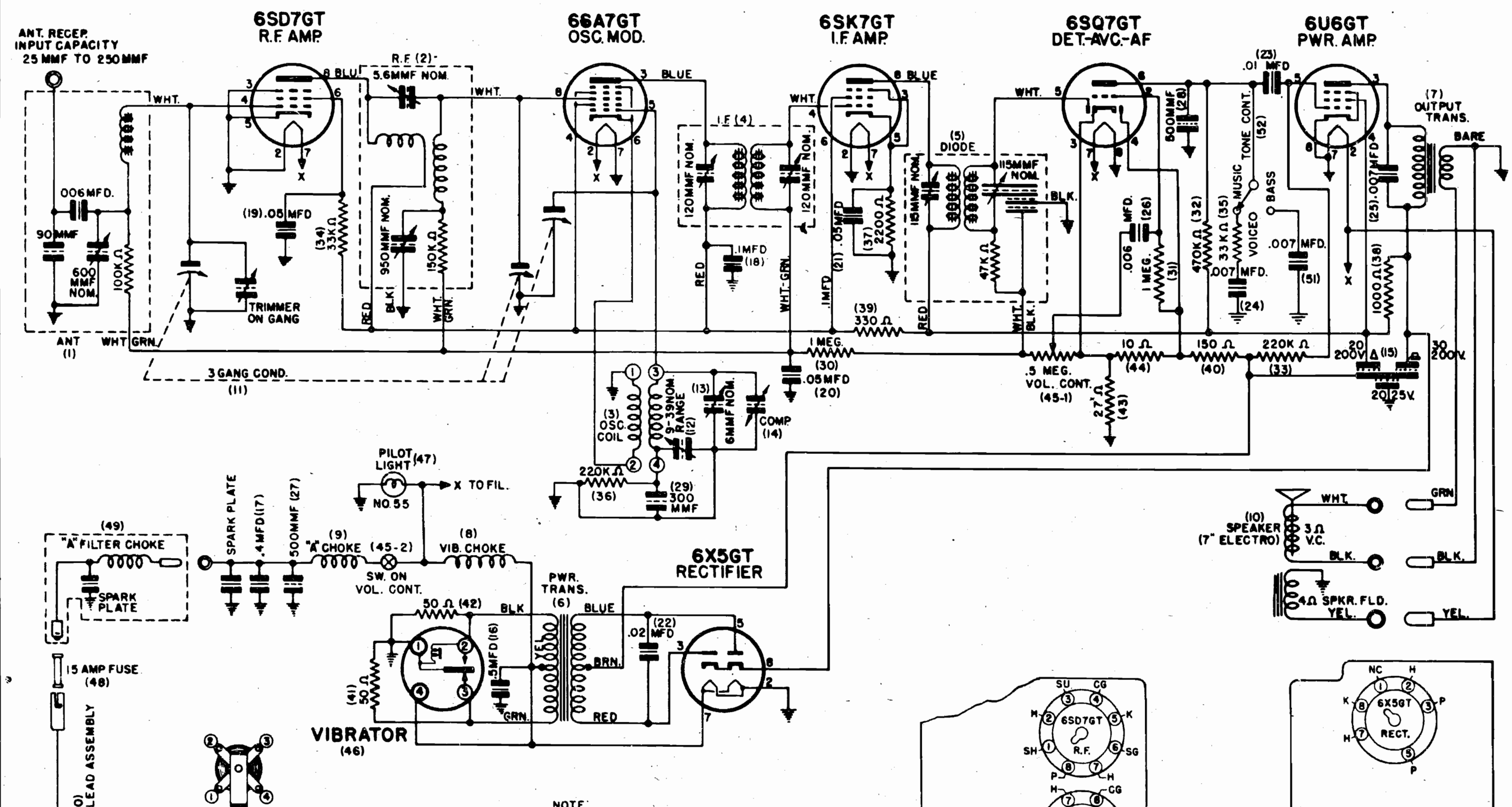
All voltages measured from socket terminal to chassis ground using 1000 Ohms per volt meter.

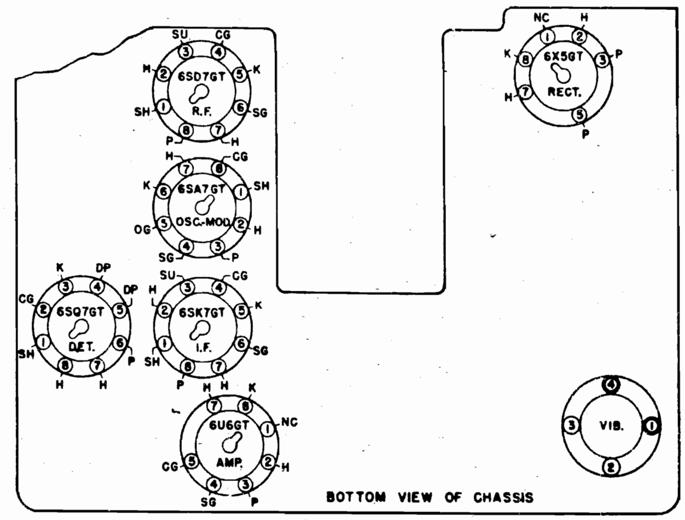
MODEL 34K-7 uses TUNER E13T, which is same as TUNER E6T ** VOL.X

FOR OTHER DATA, SEE INDEX

MODEE 35F

GALVIN MFG. CO.





NOTE:
ALL VOLTAGES MEASURED ON A 1000 OHM PER VOLT VOLTMETER

VOLTAGE CHART				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	115 V.	70 V.	3
6SA7GT	OSC MOD.	115 V.	115 V.	0
6SK7GT	I F AMP	120 V.	115 V.	7 V.
6SQ7GT	DET A.V.C. A.F.	35 V.	—	−2.8 V.
6U6GT	PWR. AMP.	140 V.	120 V.	0
6X5GT	RECT.	A. C.	—	145 V.

I.F. = 262 KC

FREQUENCY RANGE
545 KC TO 1600 KC

MODEL 35 F

GALVIN MFG. CO.

Model 35-F
SPECIFICALLY DESIGNED TO INSTALL IN 1941 FORD AND MERCURY

ALIGNMENT CHART

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	545 K.C.	.1 Mfd.	Osc.-Mod. Grid	6	545 K.C.
4	1400 K.C.	*	Special Dummy	7	1400 K.C.
5	1400 K.C.	*	Special Dummy	8	1400 K.C.
6	600 K.C.	*	Special Dummy	9	600 K.C.

* Use special dummy Part No. 1X26767 or Booster Coil Part No. 24K26751 in series with a 35 Mmf. condenser.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
22,250	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
700	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
710	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
13	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
3	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set at Maximum Tone Control Set At Voice
* 1 Watt = 1.74 Volts ** Output meter connected across voice coil.

*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24K26751 in series with a 35 Mmf. condenser.

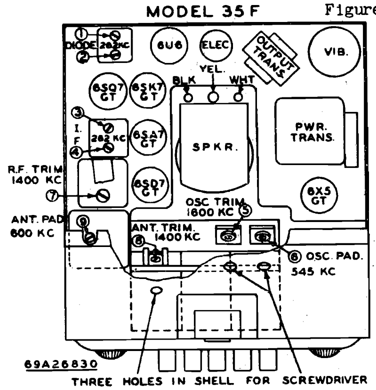


Figure 1

DIAL CORD INSTRUCTIONS

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 25 inches long.
5. Thread one end of cord through hole (X) in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clockwise direction, wind cord one half turn around drive pulley and up to tuning shaft. (See Fig. 2).
7. Route cord 7 turns around tuning shaft as shown in Fig. 2 and down to drive pulley.
8. Continue in a clockwise direction, one full turn to hole (X).

(CONT. IN NEXT COL.)

TUNING CORD—Continued

9. Thread the cord ends (inside pulley) through eyelet (Part No. 5S7824) and knot cord ends together.
10. Fasten one end of spring (Part No. 41A14759) to cord and the other end to hole (Y) in drive pulley.
11. Cut off surplus cord and place a drop of shellac on cord knot.

POINTER CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove broken string.
3. Set condenser gang to fully closed position.
4. Cut a length of 18 lb. silk fish cord 27 inches long.
5. Thread one end of cord through hole (C) in condenser pulley and with an ordinary paper clip fasten it to the tuner bracket to hold in place. (See Fig. 3).
6. In a clockwise direction run cord to idler pulley No. 1.
7. Route cord around idler pulley No. 1, as shown in Fig. 3, and then across chassis to idler pulley No. 2.
8. Continue around idler pulley No. 2 as shown in Fig. 3 and back across chassis to idler pulley No. 3.
9. Route cord around idler pulley No. 3 and in a clockwise direction around condenser pulley to hole (C).
10. Remove the paper clip from other end of cord and knot the two cord ends together inside of condenser pulley. Fasten one end of tension spring (Part No. 41A11091 to cord and other end to hole (D) in the condenser pulley. Place a drop of shellac on cord knot.
11. Cut off surplus cord and replace pointer.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on cord. Fasten pointer to cord with a drop of shellac.

TUNING CORD

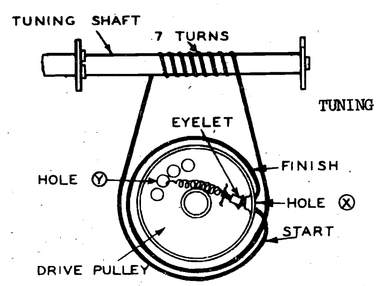


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Figure 2

POINTER CORD

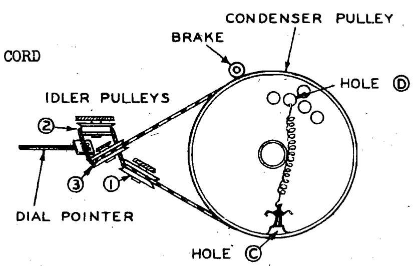
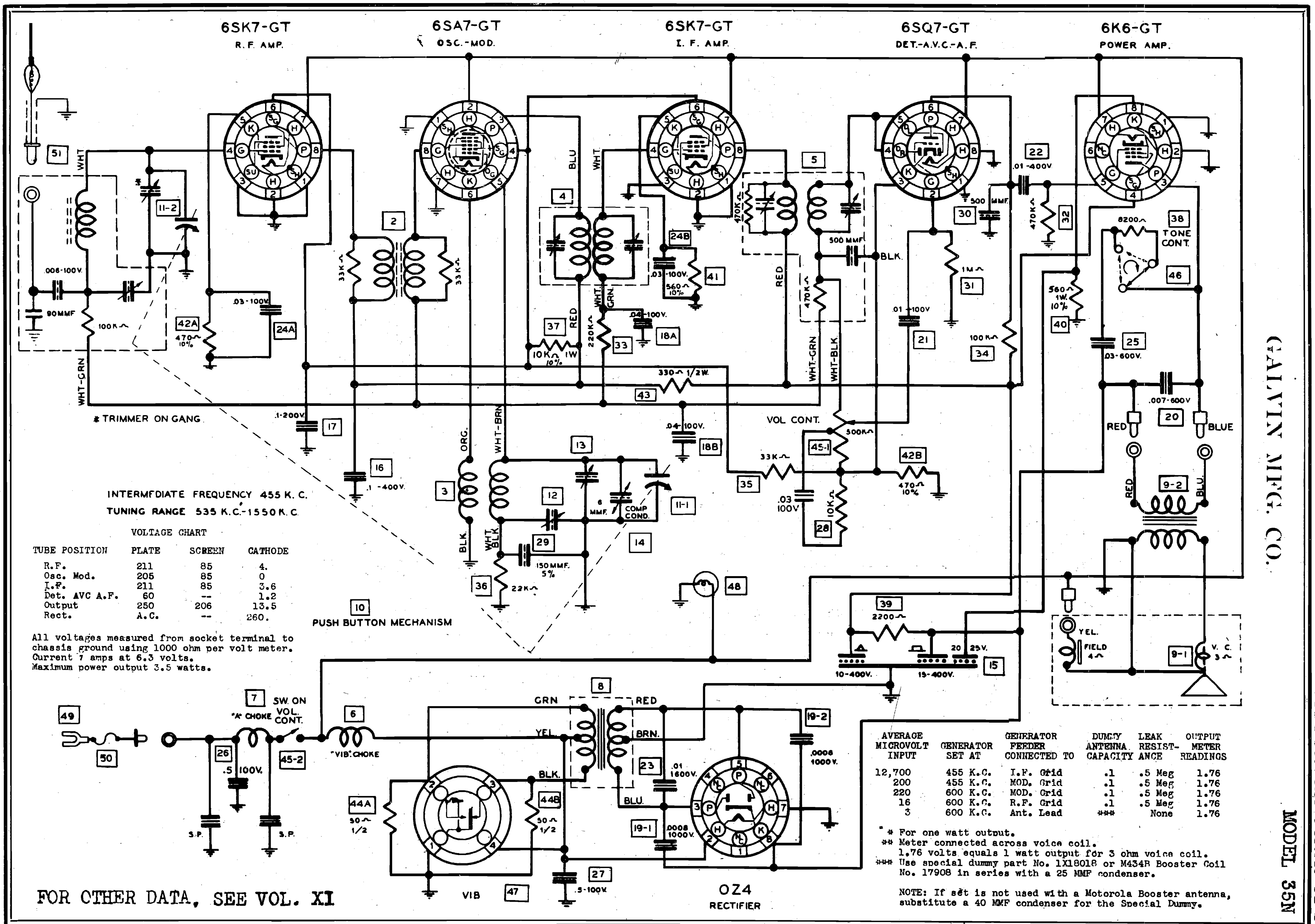


Figure 3

MODEL 35N

GALVIN MFG. CO.



INTERMEDIATE FREQUENCY 455 K.C.
TUNING RANGE 535 K.C.-1550 K.C.

VOLTAGE CHART

TUBE POSITION	PLATE	SCREEN	CATHODE
R.F.	211	85	4.
Osc. Mod.	205	85	0
I.F.	211	85	3.6
Det. AVC A.F.	60	--	1.2
Output	250	206	13.5
Rect.	A.C.	--	260.

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter. Current 7 amps at 6.3 volts. Maximum power output 3.5 watts.

AVERAGE MICROVOLT INPUT	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESIST-ANCE	OUTPUT METER READINGS
12,700	455 K.C.	I.F. Grid	.1	.5 Meg	1.76
200	455 K.C.	MOD. Grid	.1	.5 Meg	1.76
220	600 K.C.	MOD. Grid	.1	.5 Meg	1.76
16	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
3	600 K.C.	Ant. Lead	***	None	1.76

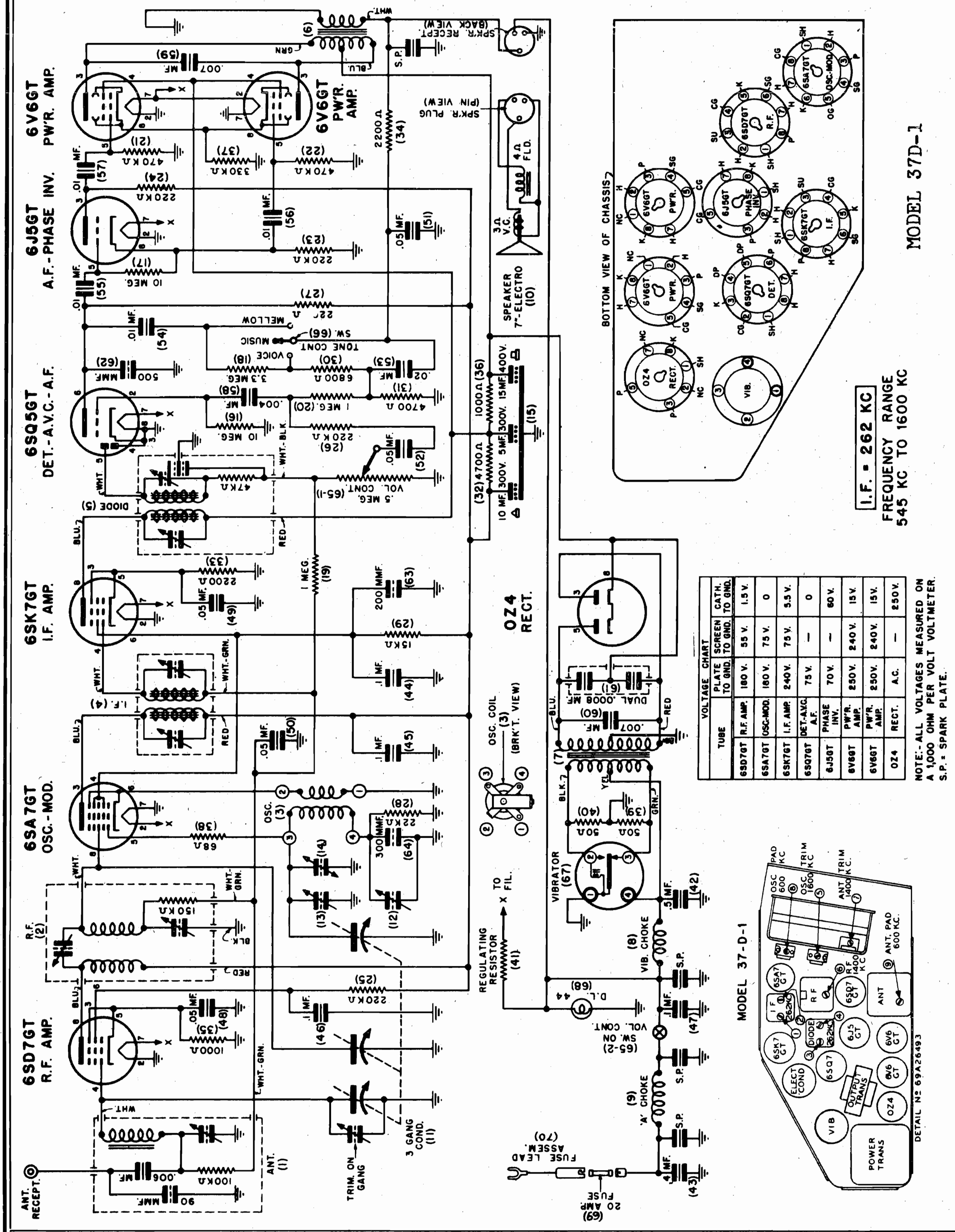
* For one watt output.
** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No. 1X18018 or M434R Booster Coil No. 17908 in series with a 25 MMF condenser.

NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

FOR OTHER DATA, SEE VOL. XI

MODEL 37D-1

GALVIN MFG. CO.

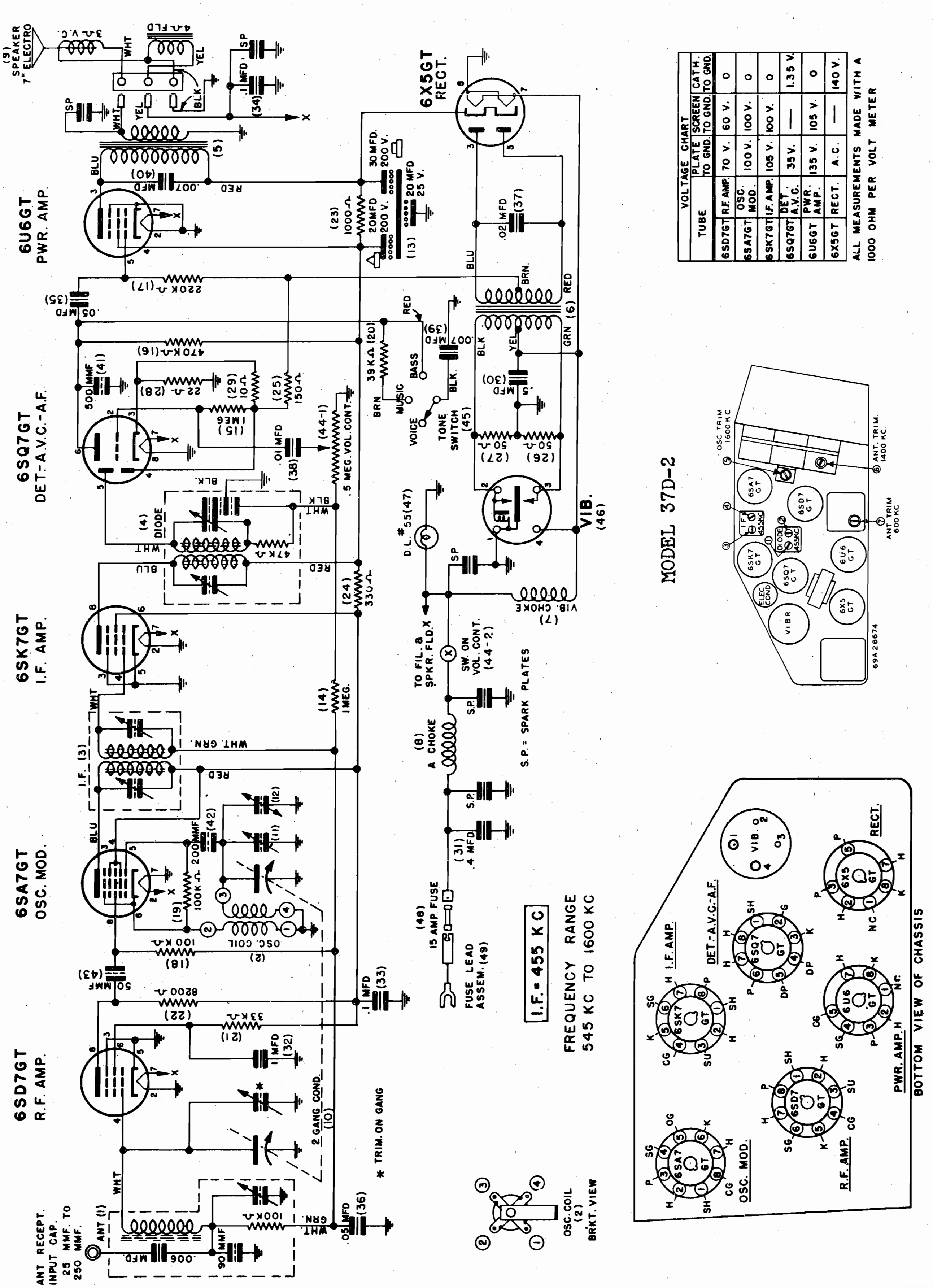


TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	180 V.	55 V.	1.5 V.
6SA7GT	OSC-MOD.	180 V.	75 V.	0
6SK7GT	I.F. AMP.	240 V.	75 V.	5.5 V.
6SQ7GT	DET.-A.V.C. A.F.	75 V.	—	0
6J5GT	PHASE INV.	70 V.	—	60 V.
6V6GT	PW'R. AMP.	250 V.	240 V.	15 V.
6V6GT	PW'R. AMP.	250 V.	240 V.	15 V.
0Z4	RECT.	A.C.	—	250 V.

NOTE:- ALL VOLTAGES MEASURED ON A 1,000 OHM PER VOLT VOLTMETER.
S.P. = SPARK PLATE.

MODEL 37D-2

GALVIN MFG. CO.



VOLTAGE CHART				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	70 V.	60 V.	0
6SA7GT	OSC. MOD.	100 V.	100 V.	0
6SK7GT	I.F. AMP.	105 V.	100 V.	0
6SQ7GT	DET. A.V.C.	35 V.	—	1.35 V.
6U6GT	PWR. AMP.	135 V.	105 V.	0
6X5GT	RECT.	A.C.	—	140 V.

ALL MEASUREMENTS MADE WITH A 1000 OHM PER VOLT METER

MODELS 37D-1, 37D-2

GALVIN MFG. CO.

For 1941 PLYMOUTH, DODGE, DE SOTO and CHRYSLER

SENSITIVITY AND STAGE GAIN MEASUREMENTS - MODEL 37D-1

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
30,000	262 K.C.	I.F. Grid	.1 Mmf.	.5 Meg.	1.74 Volts
470	262 K.C.	Mod. Grid	.1 MF	.5 Meg.	1.74 Volts
550	600 K.C.	Mod. Grid	.1 MF	.5 Meg.	1.74 Volts
13	600 K.C.	R.F. Grid	.1 MF	.5 Meg.	1.74 Volts
6	600 K.C.	Ant. Lead	***	None	1.74 Volts

Volume Control Set at Maximum Tone Control Set At Music
* 1 Watt = 1.74 Volts ** Output meter connected across voice coil.
*** Use Special Dummy Part No.1X26767 or Booster Coil Part No.24K26751 in series with a 35 MMF condenser.

SENSITIVITY AND STAGE GAIN MEASUREMENTS - MODEL 37D-2

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
9,500	455 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
250	455 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
300	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
95	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
14	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set at Maximum Tone Control Set At Voice
* 1 Watt = 1.74 Volts. ** Output meter connected across voice coil.
*** Use Special Dummy Part No.1X26767 or Booster Coil Part No.24K26751 in series with a 35 MMF condenser.

ALIGNMENT CHART MODEL 37D-1

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	1400 K.C.	.1 Mfd.	R.F. Grid	6	1400 K.C.
4	1400 K.C.	*	To special dummy	7	1400 K.C.
5	600 K.C.	*	To special dummy	8	600 K.C.
6	600 K.C.	*	To special dummy	9	600 K.C.

* Use special dummy part No. 1X26767, or Booster Coil Part No. 24K26751, in series with a 35 Mmf. condenser.

ALIGNMENT CHART MODEL 37D-2

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1	Osc.-Mod. Grid	1-2-3-4	455 K.C.
2	1600 K.C.	.1	Osc.-Mod. Grid	5	1600 K.C.
3	1400 K.C.	*	To special dummy	6	1400 K.C.
4	600 K.C.	*	To special dummy	7	600 K.C.

* Use special dummy part No. 1X26767 or Booster Coil Part No. 24K26751 in series with a 35 Mmf. condenser.

Fig. 4

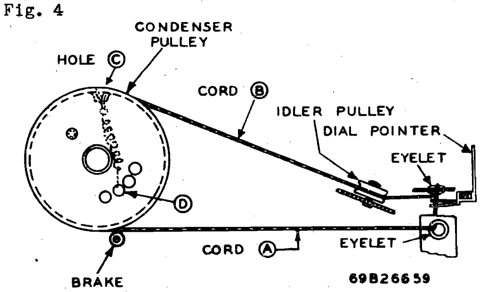
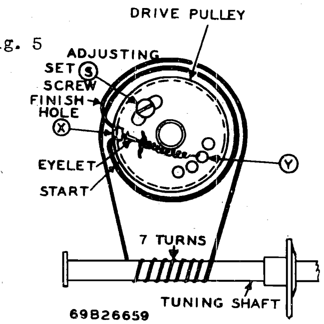


Fig. 5



TO RESTRING POINTER CORD - Models 37D-1 and 37D-2

Remove push-buttons, tone switch assembly, (tone switch on 37D-1 only) and control head from chassis. (This requires removal of three (two on 37D-2) screws from the right hand side of the control head, one from the left hand side (37D-1 only) of the control head, and a "C" washer from the volume control shaft.)
Cut a 30 inch length of 18 lb. silk fish cord.
Lay control head on service bench and route cord through the two eyelet holes and around idler pulley, exactly as shown in Fig. 3.
Adjust cord so both ends are approximately of equal length, and clip to control head as shown in Fig. 3.
Set pointer at approximately 550 K.C. on dial scale and interlace cord on pointer clips. Fasten to pointer with a drop of shellac or household cement.
Mount control head and tone switch (tone switch on 37D-1 only) back on chassis. Replace "C" washer on volume control shaft.
Turn gang to fully meshed position. This will place hole in condenser pulley at the top.
Remove paper clip from cord "A" and fish end of cord under brake shoe and around condenser pulley 1/2 turn to hole (C). Thread end of cord through hole (C) and clip to control head. (See Fig. 4).
Remove paper clip from cord (B) and route cord the short distance from idler pulley to the hole (C) in condenser pulley.
Tie both ends of cord together inside pulley; then tie in tension spring (Part No. 41A11091). Hook other end of spring in hole (D). Cut off surplus cord.
Place a drop of shellac or household cement on cord knot.
Tune in a station of known frequency and adjust dial pointer to correct dial reading by loosening the screw (S) in the drive pulley, (See Fig. 5) and moving pointer pulley. Tighten screw securely after adjustment.
Reassemble in housing.

TO RESTRING TUNING CORD - Model 37D-1 & 37D-2

Remove the chassis from the housing, and place on service bench with the tubes up.
Remove the broken string.
Turn condenser gang to fully meshed position.
Cut a length of 30 lb. silk fish cord 25 inches long.
Thread one end of cord through hole (X) in drive pulley, and with an ordinary paper clip fasten to volume control bracket so that cord will stay in place.
In a counter-clockwise direction, wind cord one full turn around drive pulley and down to tuning shaft. (See Fig. 5).
Wind cord in a clockwise direction seven turns around tuning shaft and up to drive pulley.
Continue in a counter-clockwise direction one half turn to hole (X).
Thread cord through hole (X) and then thread both ends through eyelet (Part No. 5S7824).
Knot the two ends of cord together and fasten one end of spring (Part No.41A14759) to cord and other end to hole (Y) in drive pulley.
Place a drop of shellac or household cement on cord knot.
Pinch eyelet on cord with a pair of pliers.

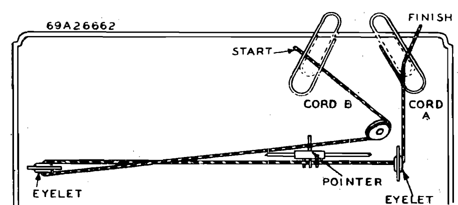
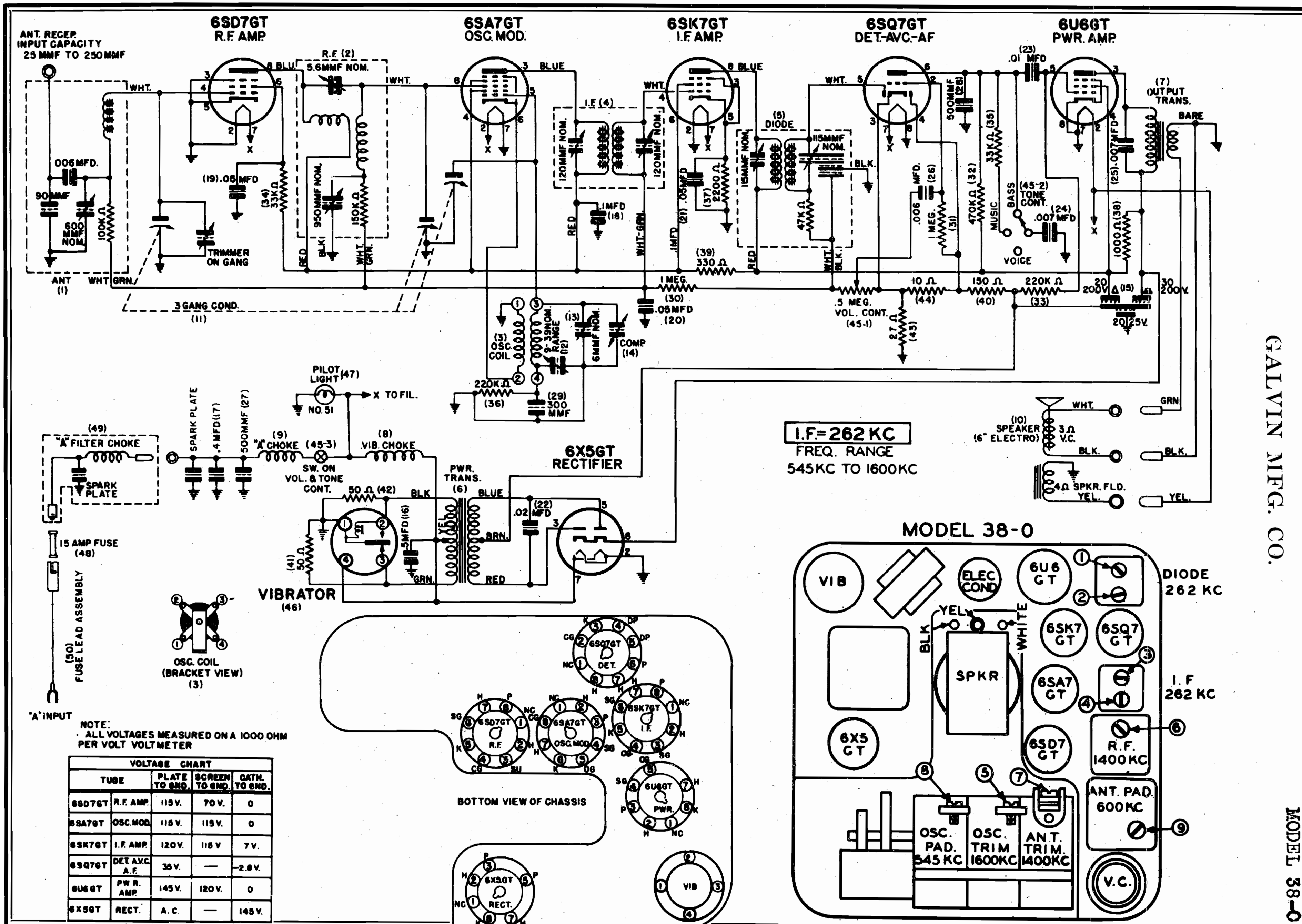


Fig. 3

GALVIN MFG. CO.



NOTE:
- ALL VOLTAGES MEASURED ON A 1000 OHM PER VOLT VOLTMETER

VOLTAGE CHART

TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	115 V.	70 V.	0
6SA7GT	OSC. MOD.	115 V.	115 V.	0
6SK7GT	I.F. AMP.	120 V.	115 V	7 V.
6SQ7GT	DET. AVC. A.F.	35 V.	—	-2.8 V.
6U6GT	PWR. AMP.	145 V.	120 V.	0
6X5GT	RECT.	A.C.	—	145 V.

GALVIN MFG. CO.

Model 38-0
Specifically Designed to be Installed in 1941
OLDSMOBILE

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 25 inches long.
5. Thread one end of cord through Slot (B) in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clockwise direction, wind cord one full turn around drive pulley and up to tuning shaft. (See Fig. 2).
7. Route cord 7 turns around tuning shaft as shown in Fig. 2 and down to drive pulley.
8. Continue in a clockwise direction around drive pulley and through slot (B).
9. Slip the two cord ends through eyelet (Part No.5S7824) inside of pulley.
10. Knot the two cord ends together and fasten to one end of spring (Part No. 41A14759). Hook other end of spring to hole (C) in drive pulley.
11. With a pair of pliers pinch eyelet on cord and place drop of shellac on cord knot.

POINTER CORD

1. Remove the chassis from housing and place on service bench.
2. Remove broken string.
3. Set condenser gang to fully open position.
4. Cut a length of 18 lb. silk fish cord 27 inches long.
5. Thread one end of cord through slot (A) in condenser pulley and with an ordinary paper clip fasten it to the tuning shaft bracket to hold in place. (See Fig. 3).
6. In a clockwise direction run cord around condenser pulley, under brake shoe and over to idler pulley No. 3 and around it in a counter-clockwise direction.
7. Route string across chassis to idler pulley No. 2, and around it in a counter-clockwise direction.
8. Route cord back across chassis and down over idler pulley No. 1.
9. Route cord down and around condenser pulley one-half turn to slot (A).
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of drive pulley and fasten one end of spring (Part No.41A11091) to cord and the other end to hook in condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string.
13. Fasten pointer to string with a drop of shellac. Place a drop of shellac on cord knot.

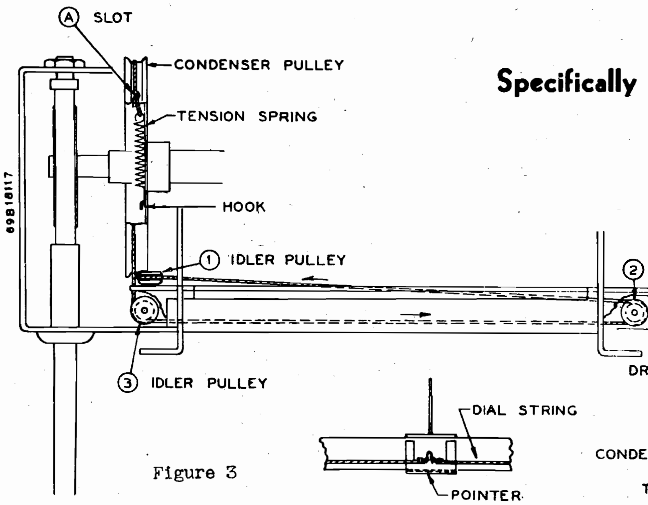


Figure 3

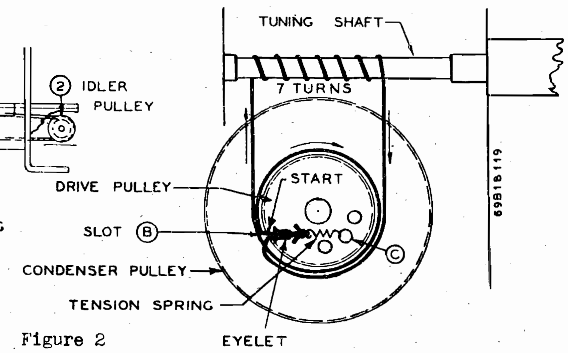


Figure 2

ALIGNMENT CHART MODEL 38-0

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	1400 K.C.	.1 Mfd.	R.F. Grid	6	1400 K.C.
4	1400 K.C.	*	To Special Dummy	7	1400 K.C.
5	545 K.C.	*	To Special Dummy	8	545 K.C.
6	600 K.C.	*	To Special Dummy	9	600 K.C.

* Use special dummy Part No.1X26767 or booster coil Part No.24K26751 in series with a 35 Mmf. condenser.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

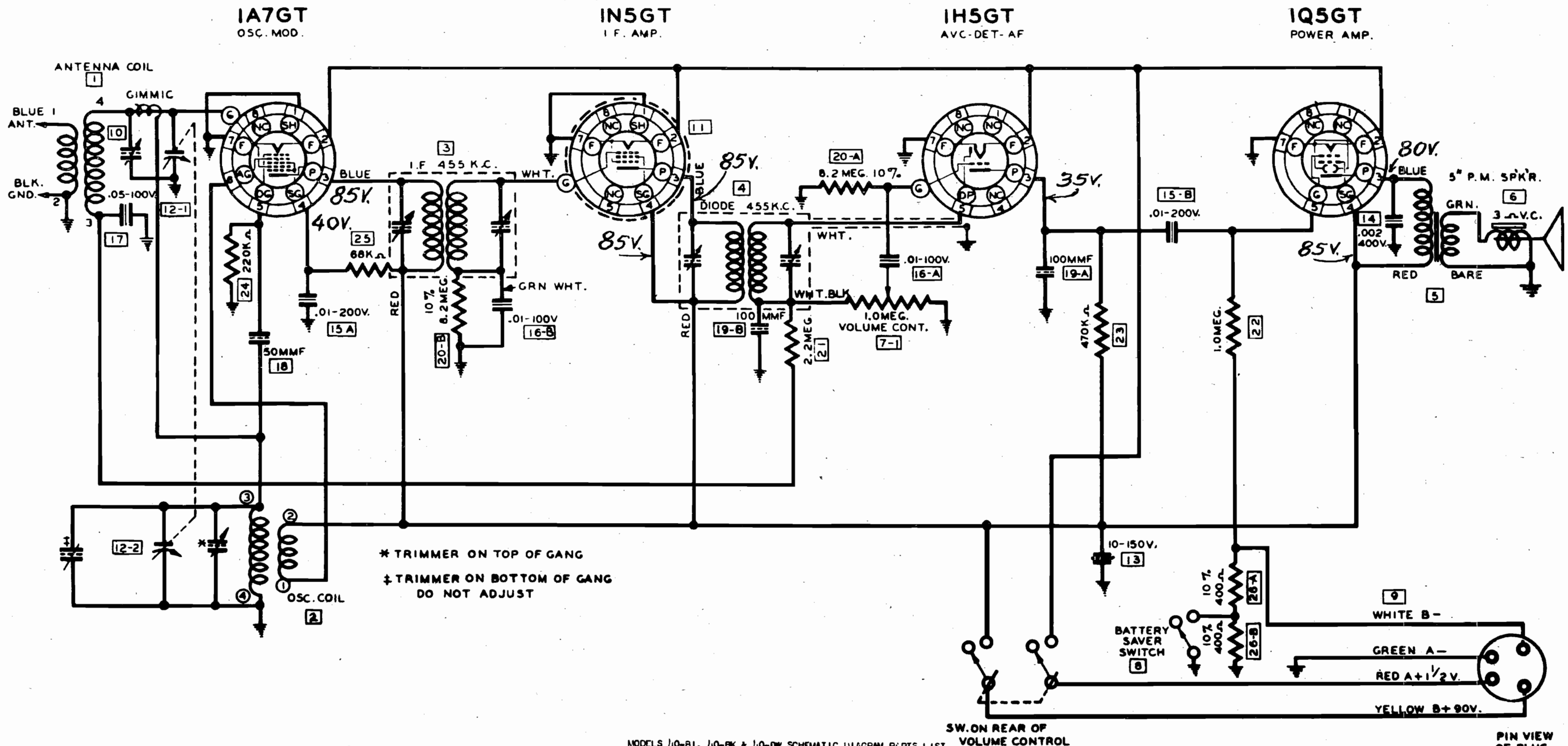
Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
22,750	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg	1.74
700	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	1.74
700	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	1.74
13	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg	1.74
3	600 K.C.	Ant. Lead	***	None	1.74

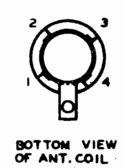
Volume Control Set at Maximum.
* 1 Watt = 1.74 Volts.

Tone Control Set At Voice.
** Output meter connected across voice coil.
*** Use special dummy Part No.1X26767 or booster coil part No.24K26751 in series with a 35 Mmf. condenser.

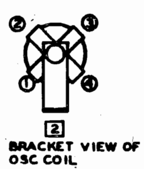
MODELS 40-B1, 40-BK, 40-BW

GALVIN MFG. CO.





BOTTOM VIEW OF ANT. COIL



BRACKET VIEW OF OSC COIL

MODELS 40-B1, 40-BK & 40-BW SCHEMATIC DIAGRAM PARTS LIST

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
1	24A19975	Antenna Coil	16-A	8S9801	Tubular Condenser (.01-100V.)
2	24A16227	Osc. Coil (Ceramic) White Dot	16-B	8S9801	Tubular Condenser (.01-100V.)
3	1X21342	I.F. Coil & Shield Assembly	17	8S9805	Tubular Condenser (.05-100V.)
4	1X21338	Diode Coil & Shield Assembly	18	21B6503	Molded Mica Cond. (50 mmf) 20%
5	25A15786	Output Transformer	19-A	21B6511	Molded Mica Cond. (100 mmf) 20%
6	50B19976	Speaker (5" P.M.)	19-B	21B6511	Molded Mica Cond. (100 mmf) 20%
7	1CA19979	Volume Control & Switch (1. meg.)	20-A	6B6297	Carbon Resistor (8.2 meg-1/3-10)N.I.
8	40A15939	Battery Saver Switch	20-B	6B6297	Carbon Resistor (8.2 meg-1/3-10)N.I.
9	1X12179	Battery Cable Assembly (5 feet)	21	6B6049	Carbon Resistor (2.2 meg-1/3-20)N.I.
10	20K20911	Trimmer & Bracket (RH)	22	6B6071	Carbon Resistor (1.0 meg-1/3-20)N.I.
11	26X14760	Tube Shield (Bantam)	23	6B6011	Carbon Resistor (470,000-1/3-20)N.I.
12	1X20506	Gang & Pulley Assembly	24	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
13	23A14727	Electrolytic Condenser (10-150V.)	25	6B6125	Carbon Resistor (68,000-1/3-20)N.I.
14	8S9824	Tubular Condenser (.002-400V.)	26-A	6B6025	Carbon Resistor (400-1/3-10)N.I.
15-A	8S9825	Tubular Condenser (.01-200V.)	26-B	6B6025	Carbon Resistor (400-1/3-10)N.I.
15-B	8S9825	Tubular Condenser (.01-200V.)	27	48X21257	Battery Pack (1-1/2V. "A" / 90 V. "B")

Eveready 748
Raytheon #AB 82
Burgess #17-GD-60
General 460L-11L

BATTERY PACK 27

Motorola

— Model 408K —
— Model 408W —
— Model 4081 —

MODELS 40-B1, 40-BK, 40-BW, 40-40B, 52XAH1, B-150

GALVIN MFG. CO.

ALIGNMENT CHART MODELS 40-40B, 40-B1, 40-BK, 40-BW

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmer No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	Osc-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	Osc-Mod. Grid	5	1720 K.C.
3	1400 K.C.	200 Mmf.	Antenna Lead	6	1400 K.C.

Volume Control Set at Maximum.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3600	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
105	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
120	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
22	600	Ant. Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum
* .05 Watts = .38 Volts

** Output Meter Connected Across Voice Coil.

ALIGNMENT CHART MODEL 52 XAH1

Operations In Order *	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	5	1720 K.C.
3	600 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	6	600 K.C.
4	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	7	1400 K.C.
5	18 M.C.	400 Ohm	S.W.	External Antenna Terminal	8	18 M.C.
6	16 M.C.	400 Ohm	S.W.	External Antenna Terminal	9	16 M.C.

Volume Control set at maximum.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input **	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3400	455	I.F. Grid	.1 Mfd.	.5 Meg.	.38
40	455	Mod. Grid	.1 Mfd.	.5 Meg.	.38
45	600	Mod. Grid	.1 Mfd.	.5 Meg.	.38
20	600	Antenna Terminal	200 Mmf.	None	.38

Volume Control set at maximum.
* .05 Watts .38 Volts.

** Output meter connected across voice coil.

ALIGNMENT CHART MODEL B 150

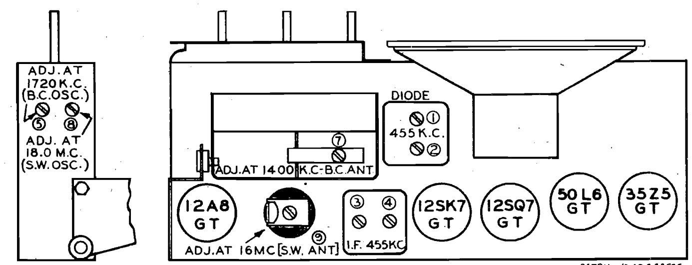
Operations In Order	Tuning Dial Set At	Dummy Antenna	Generator Connected To	Adjust. Trimmers No.	Generator Set At
1	Minimum 1600 K.C.	.1 Mfd	Osc-Mod. Grid	1-2-3	455 K.C.
2	Minimum 1600 K.C.	50 Mmf	Antenna Terminal	4	1600 K.C.
3	1200 K.C.	50 Mmf	Antenna Terminal	5	1200 K.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolts Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
4500	455	I.F. Grid	.1 Mfd.	.5 Meg	.32 Volts
85	455	Mod. Grid	.1 Mfd.	.5 Meg	.32 Volts
100	600	Mod. Grid	.1 Mfd.	.5 Meg	.32 Volts
15	600	Ant. Terminal	50 Mmfd.	None	.32 Volts

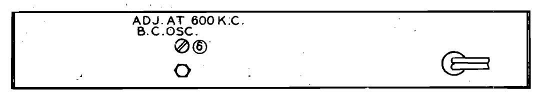
Volume Control Set at Maximum
* .05 Watts = .32 Volts

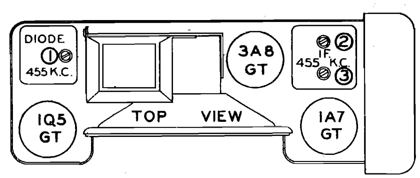
** Output meter connected across voice coil.

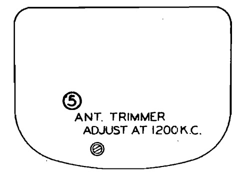


MODEL 52XAH1

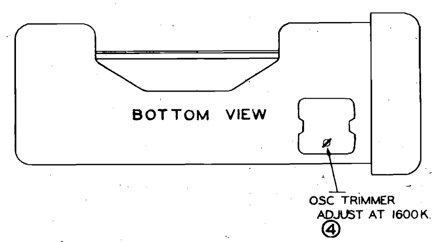
52XAHI TRIMMER ADJ. DETAIL

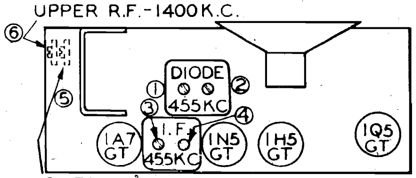




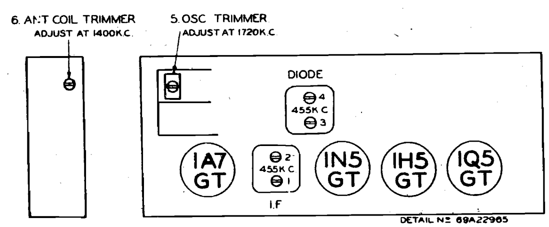


MODEL B-150





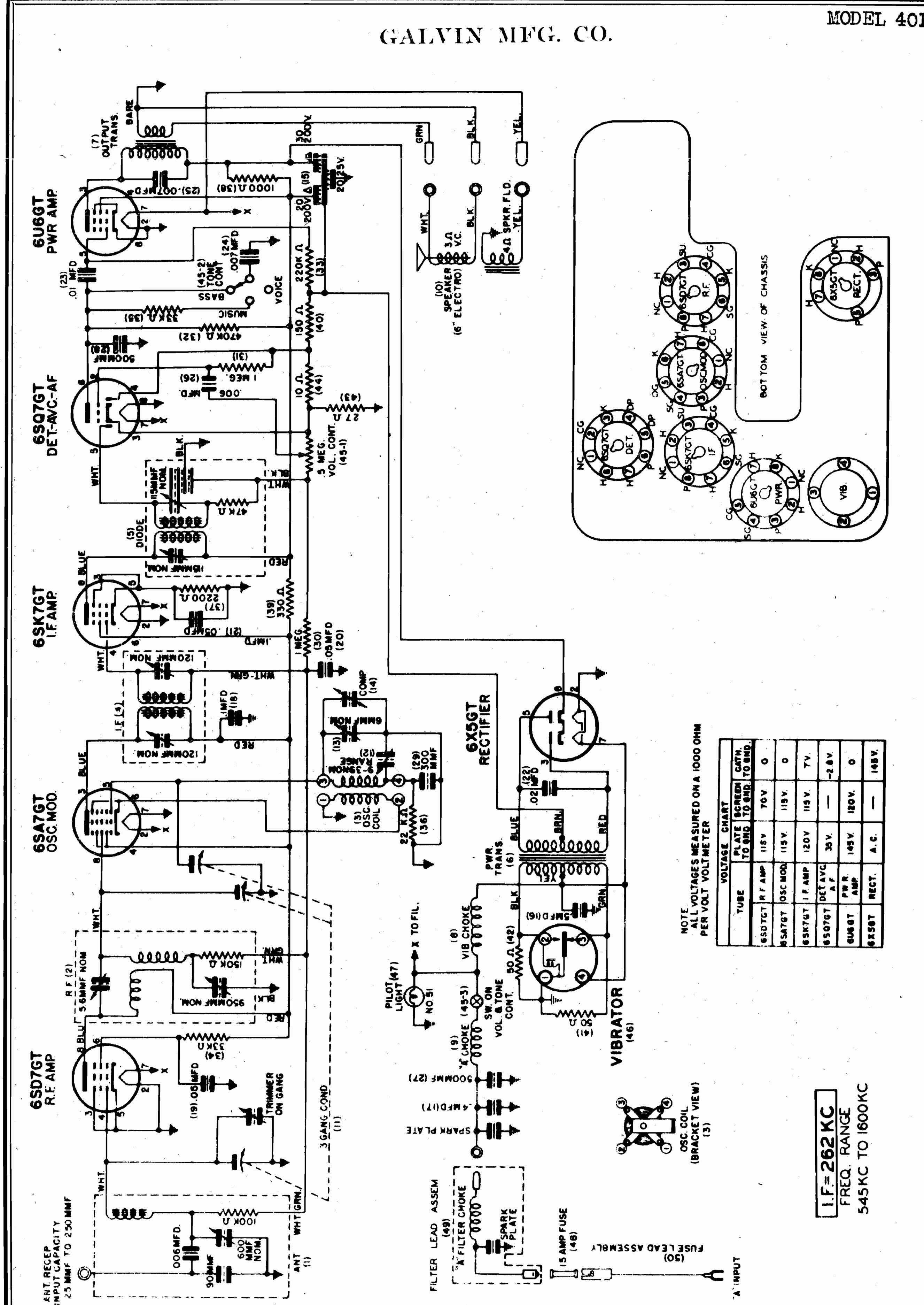
– Model 40-40B



MODELS 40-B1 40-BK 40-BW

MODEL 40P

GALVIN MFG. CO.



NOTE
ALL VOLTAGES MEASURED ON A 1000 OHM PER VOLT VOLTMETER

VOLTAGE CHART

TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R F AMP	115 V	70 V	0
6SA7GT	OSC MOD	115 V.	115 V.	0
6SK7GT	I F AMP	120 V	115 V.	7 V.
6SQ7GT	DET AVC A F	35 V.	—	-2.8 V.
6U6GT	PWR. AMP	145 V.	120 V.	0
6X5GT	RECT.	A.C.	—	145 V.

I.F. = 262 KC

FREQ. RANGE
545 KC TO 1600 KC

MODELS 40P, 43H, 44K

GALVIN MFG. CO.

Model 40-P
SPECIFICALLY DESIGNED TO INSTALL IN 1941 PONTIAC

Model 43-H
SPECIFICALLY DESIGNED TO INSTALL IN 1941 HUDSON

Model 44-K
SPECIFICALLY DESIGNED TO INSTALL IN 1941 PACKARD

ALIGNMENT CHART

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	545 K.C.	.1 Mfd.	Osc.-Mod. Grid	6	545 K.C.
4	1400 K.C.	*	To Special Dummy	7	1400 K.C.
5	1400 K.C.	*	To Special Dummy	8	1400 K.C.
6	600 K.C.	*	To Special Dummy	9	600 K.C.

* Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24K26751 in series with a 35 Mmf. condenser.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
22,250	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
700	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
710	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
13	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
3	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set at Maximum
* 1 Watt = 1.74 Volts

Tone Control Set At Voice Position.
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X126767.

MODEL 40 P DIAL CORD INSTRUCTIONS

POINTER CORD

Remove the chassis from housing and place on service bench.
Remove broken string.
Turn the gang to fully opened position.
Cut a length of 18 lb. silk fish cord 27 inches long.
Thread one end of cord thru hole (A) in pointer pulley and with an ordinary paper clip fasten it to the tuning shaft bracket to hold it in place. See Fig. 2.
In a counter-clockwise direction route cord to idler pulley No. 3 and around it in a clock-wise direction.
Route cord across chassis to idler pulley No. 2 and around it in a clock-wise direction.
Route cord back across chassis and down over idler Pulley No. 1.
Route cord down and around pointer pulley to hole (A).
Remove the paper clip from end of cord and knot the two ends of cord together inside of pointer pulley.
Fasten one end of spring (Part No. 41A11091) to cord and the other end to hook in pointer pulley.
Cut off surplus cord. Place a drop of shellac on cord knot.
To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string. Fasten to string with a drop of shellac.

TUNING CORD

Remove the chassis from the housing and place on service bench.
Remove the broken string.
Turn the gang to fully meshed position.
Cut a length of 30 lb. silk fish cord 25 inches long.
Thread one end of cord thru hole (B) in drive pulley and with an ordinary paper clip fasten to tuning shaft bracket so that cord will stay in place.
In a counter-clockwise direction, wind cord one full turn around drive pulley and up to idler pulley No. 5.
Continue around idler pulley No. 5 and down to tuning shaft.
Wind cord four full turns in a counter-clockwise direction around tuning shaft and continue down to idler pulley No. 4.
Continue cord in a counter-clockwise direction around idler pulley No. 4 and to hole (B) in drive pulley.
Thread both ends of cord (inside pulley) thru eyelet (Part No. 5S7824) and knot both ends together.
Fasten one end of spring (Part No. 41A14759) to cord and other end to hole in drive pulley. See Fig. 2.
Place a drop of shellac on cord knot.

MODEL 40 P

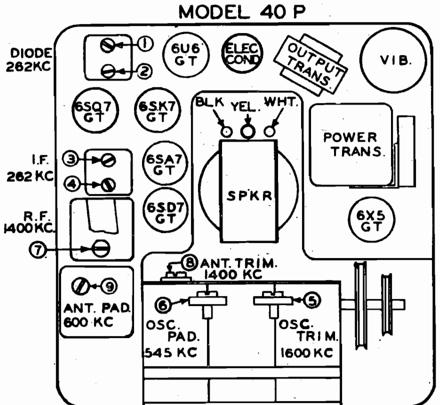


Figure 1

MODEL 43-H

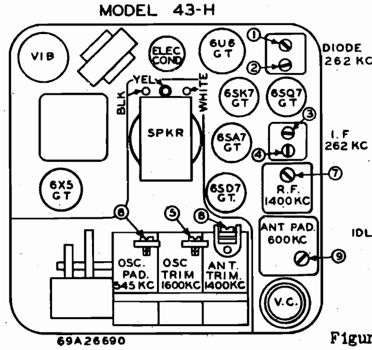


Figure 1

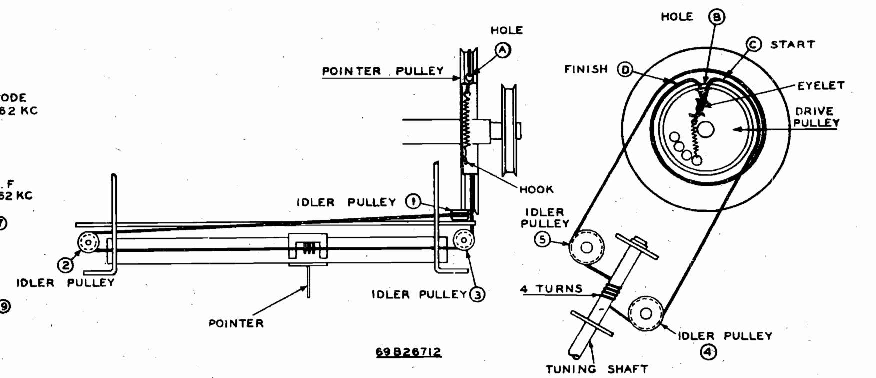


Figure 2

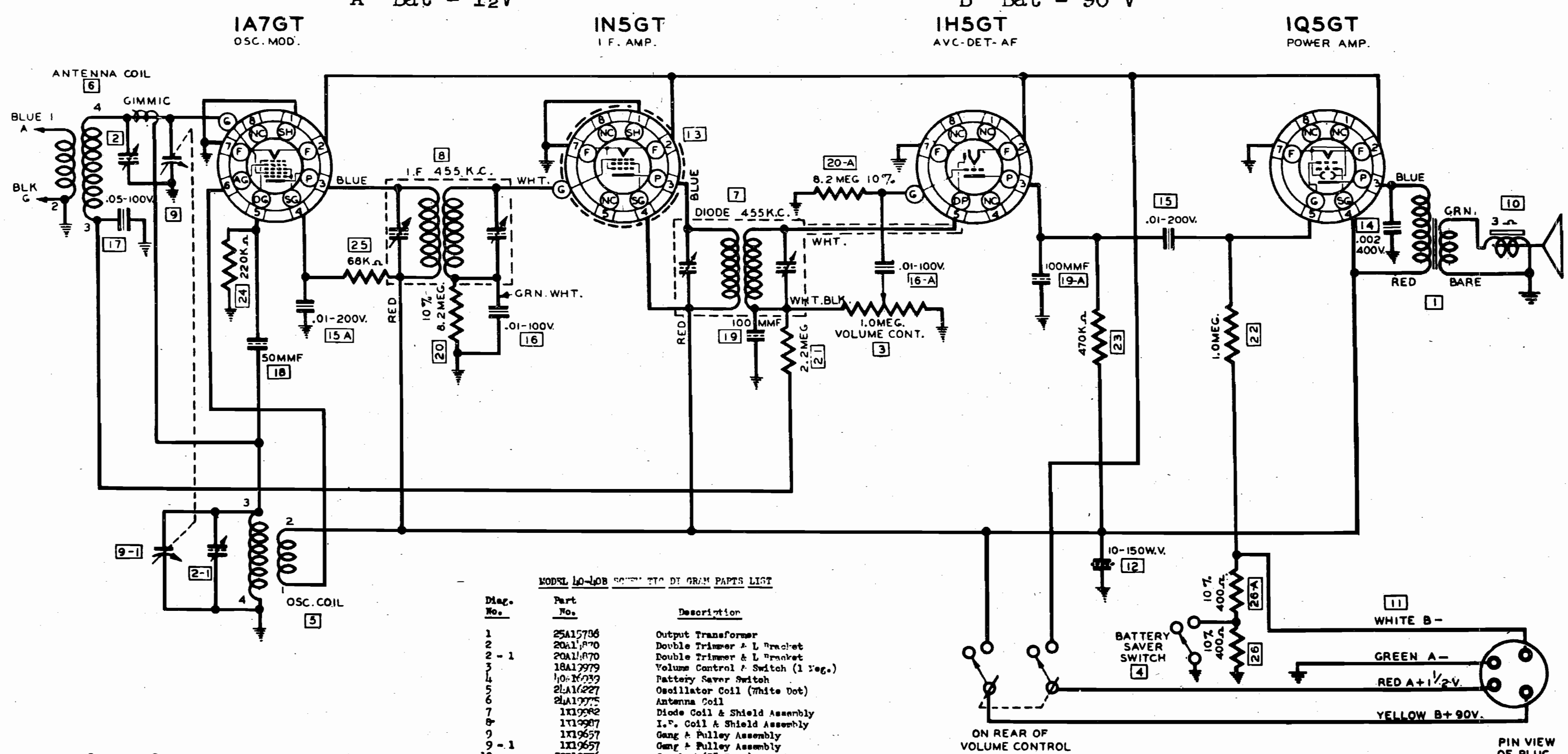
MODEL 40-40B

GALVIN MFG. CO.

VOLTAGE CHART

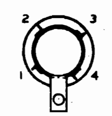
TUBE	PLATE	SCREEN
Osc.-Mod.	85	40
I.F.	85	85
Det. AVC AF	35	-
Output	80	85

"A" Bat - 1½V "B" Bat - 90 V

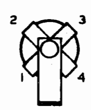


MODEL 40-40B SCHEMATIC DIAGRAM PARTS LIST

Diag. No.	Part No.	Description
1	25A15736	Output Transformer
2	20A14870	Double Trimmer & L Bracket
2 - 1	20A14870	Double Trimmer & L Bracket
3	18A19979	Volume Control & Switch (1 Meg.)
4	40A16039	Battery Saver Switch
5	24A16227	Oscillator Coil (White Dot)
6	24A19975	Antenna Coil
7	1X19982	Diode Coil & Shield Assembly
8	1X19987	I.F. Coil & Shield Assembly
9	1X19657	Gang & Pulley Assembly
9 - 1	1X19657	Gang & Pulley Assembly
10	50B19976	Speaker (5" P.M.)
11	1X12179	Battery Cable Assembly (5 Feet)
12	23A14727	Electrolytic Condenser (EP) (10-150V.)
13	26X14760	Tube Shield (Bantam)
14	8S9824	Tubular Condenser (.002-400V.)
15	8S9825	Tubular Condenser (.01- 200V.)
15 - A	8S9825	Tubular Condenser (.01- 200V.)
16	8S9801	Tubular Condenser (.01- 100V.)
16 - A	8S9801	Tubular Condenser (.01- 100V.)
17	8S9805	Tubular Condenser (.05- 100V.)
18	21B6503	Molded Mica Condenser (50 Mmf) 20%
19	21B6511	Molded Mica Condenser (100 Mmf) 20%
19-A	21B6511	Molded Mica Condenser (100 Mmf) 20%
20	6B6297	Carbon Resistor (8.2 Meg-1/3-10) NI
20-A	6B6297	Carbon Resistor (8.2 Meg-1/3-10) NI
21	6B6049	Carbon Resistor (2.2 Meg-1/3-20) NI
22	6B6071	Carbon Resistor (1.0 Meg-1/3-20) NI
23	6B6011	Carbon Resistor (470,000-1/3-20) NI
24	6B6003	Carbon Resistor (220,000-1/3-20) NI
25	6B6125	Carbon Resistor (68,000-1/3-20) NI
26	6B6025	Carbon Resistor (400 - 1/3-10) NI
26-A	6B6025	Carbon Resistor (400 - 1/3-10) NI



BOTTOM VIEW OF ANT. COIL



BRACKET VIEW OF OSC COIL

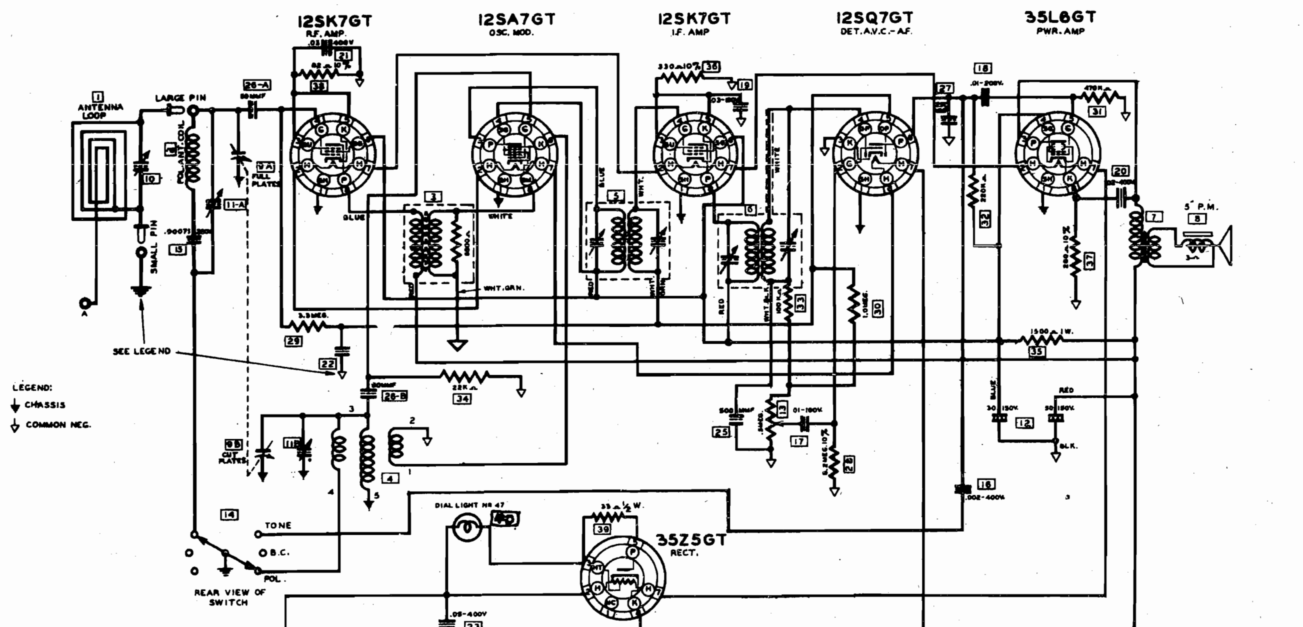
FOR OTHER DATA, SEE INDEX

Motorola

— Model 40-40B —

MODEL 40-60W

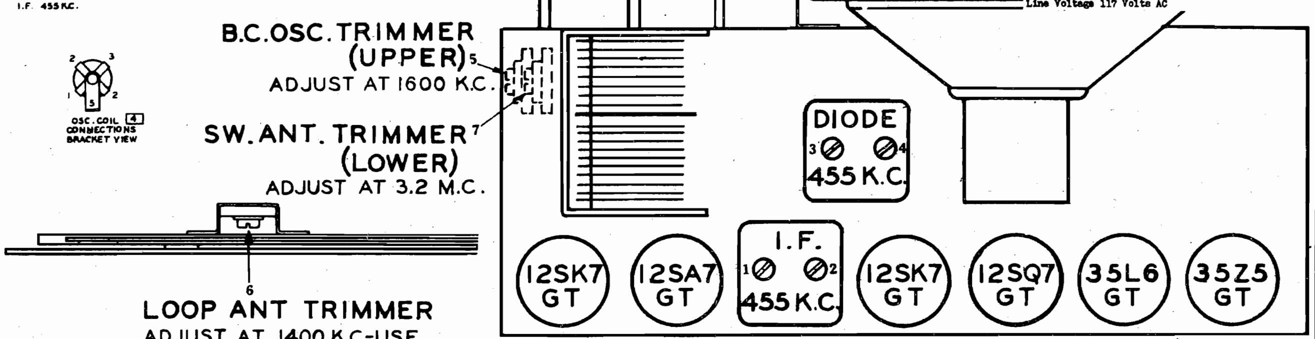
GALVIN MFG. CO.



VOLTAGE CHART

TUBE POSITION	PLATE	SCREEN	CATHODE
R.F.	117	85	1
Osc.-Mod.	85	85	0
I.F.	85	85	2.8
Det.-AVC-A.F.	40	--	0
Output	112	82	6
Rect.	AC	--	117

All voltages measured from common negative
Line Voltage 117 Volts AC



ALIGNMENT CHART Volume Control Set at Maximum

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	BAND SWITCH SET AT	GENERATOR CONNECTED TO	ADJUST. TRIMMERS NO.	GENERATOR SET AT
1	Minimum 1600 K.C.	.1	B.C.	Osc-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum 1600 K.C.	400 ohms	B.C.	External Antenna Terminal	5	1600 K.C.
3	1400 K.C.	400 ohms	B.C.	External Antenna Terminal	6	1400 K.C.
4	3.2 M.C.	400 ohms	S.W.	External Antenna Terminal	7	3.2 M.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

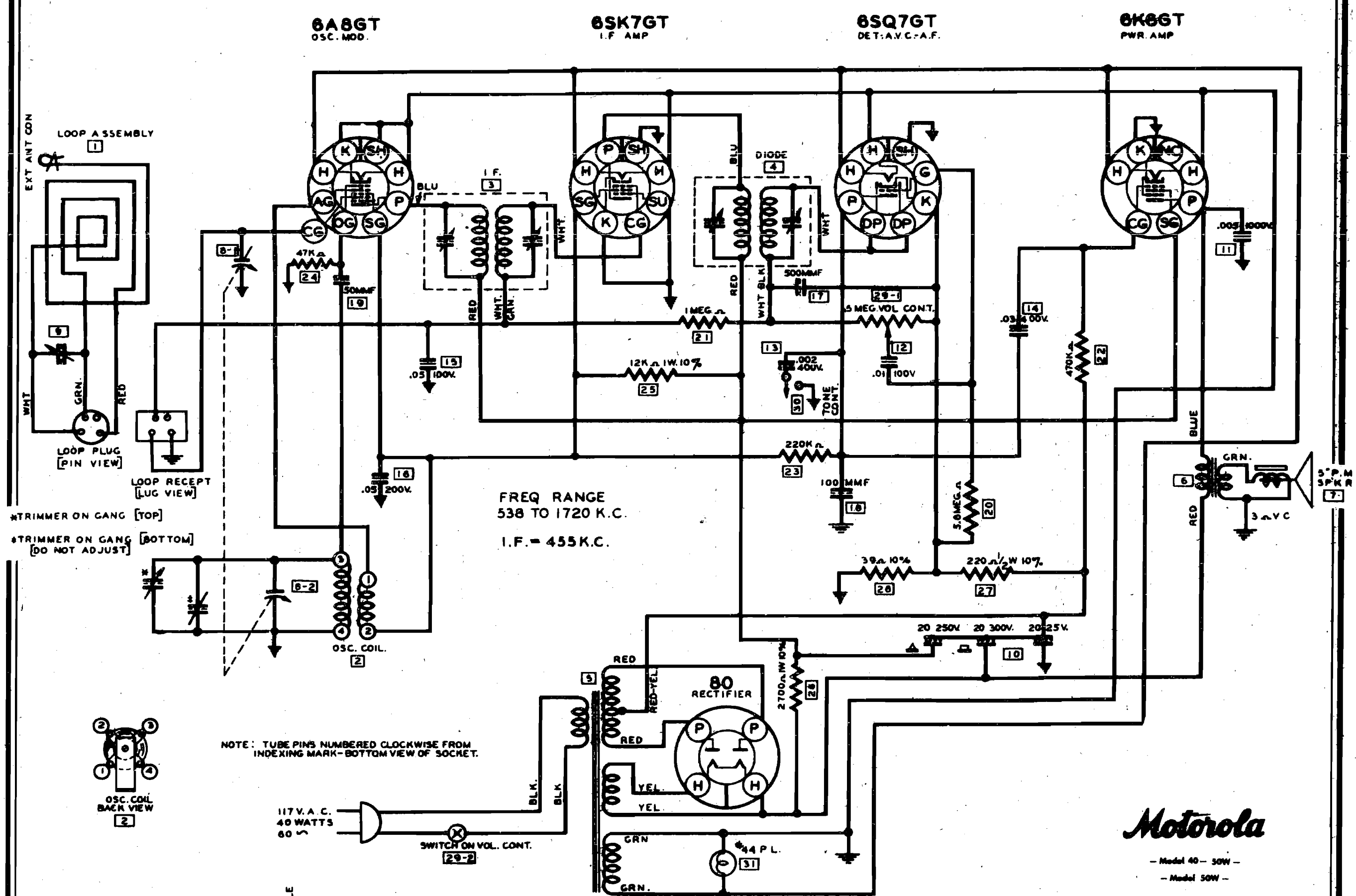
AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTOR	OUTPUT METER READING **
3200	455	I.F. Grid	.1 Mfd.	.5 Meg.	.38
70	455	Mod. Grid	.1 "	.5 Meg.	.38
90	600	Mod. Grid	.1 "	.5 Meg.	.38
25	600	R.F. Grid	.1 "	.5 Meg.	.38
3	600	Ant. Terminal	400 ohms	None	.38

Volume Control set at Maximum
* .05 Watts = .38 Volts

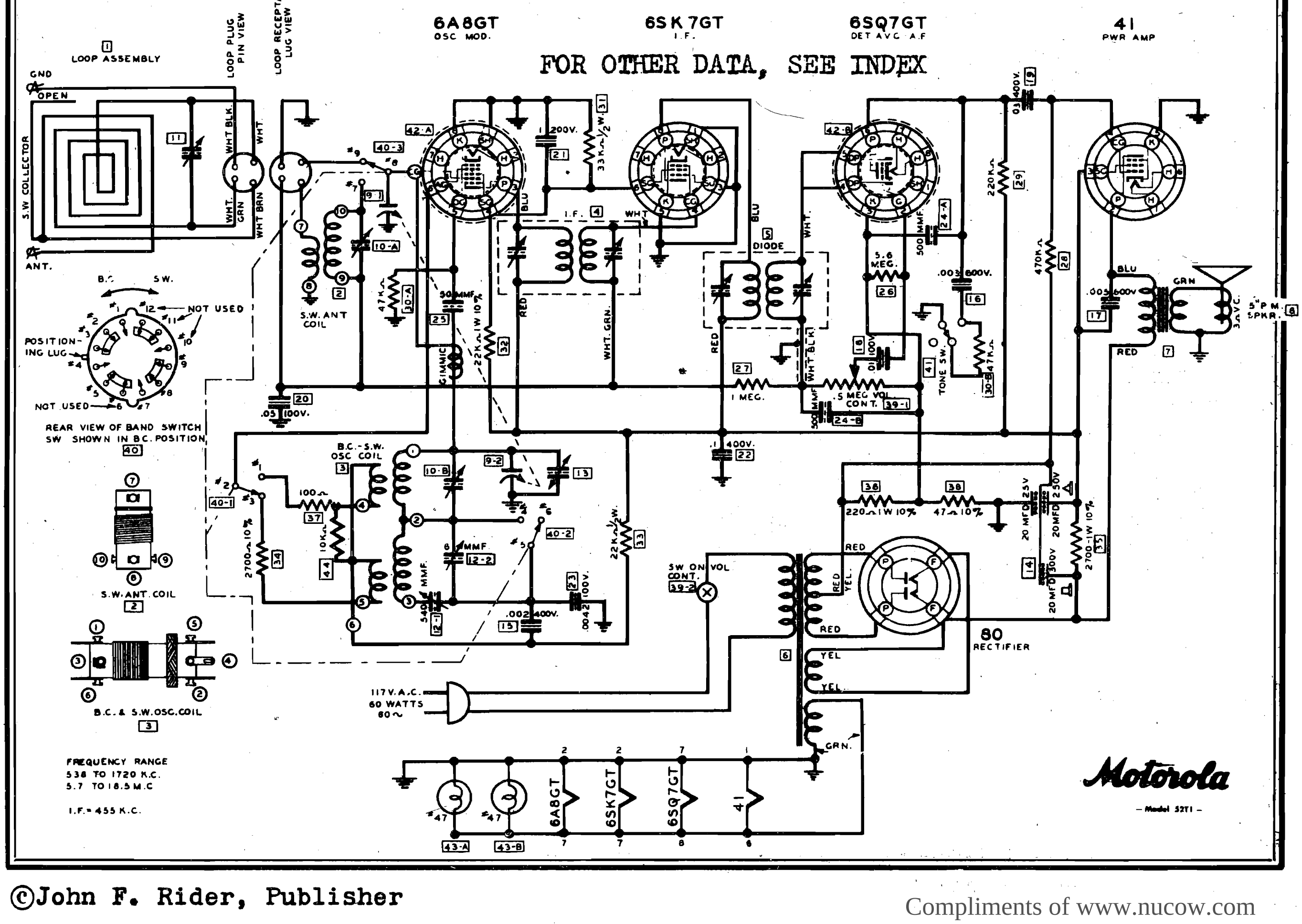
Tone Control set at Center Position
** Output Meter connected across voice coil

GALVIN MFG. CO.

MODEL 40--50W, 50-W, 52T1



FOR OTHER DATA, SEE INDEX



MODELS 40-50, 50W, 52T1
62T1, 56X1, 56XA1, 56XA2,
56XAW

GALVIN MFG. CO.

MODELS 50X1, 50X2, 50XC1, 50XC2,
50XC3, 50XC4, 50XH1, 50XH2, 50XW

MODELS 50X1 50X2 50XW 50XC4 50XH1 50XH2 50XC1 50XC2 50XC3 56X1 56XA1 56XAW

ALIGNMENT CHART

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1720 K.C.
3	1400 K.C.	200 Mmfd.	External Antenna Terminal	6	1400 K.C.

Volume Control Set at Maximum.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 50X1-50X2-50XW-50XC1-50XC2-50XC3-50XC4

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3200	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
45	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
50	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
12	600	Ant. Terminal	400 Ohms	None	.38

Volume Control Set at Maximum.
* .05 Watts = .38 Volts
** Output Meter Connected across voice coil.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 50XH1-50XH2

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3400	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
50	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
55	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
25	600	Ant. Terminal	200 MMF.	None	.38

Volume Control Set at Maximum.
* .05 Watt = .38 Volts
** Output Meter connected across voice coil.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 56XA1-56XA2-56XAW-56X1

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3700	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
50	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
55	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
15	600	Ant. Terminal	400 Ohms	None	.38

Volume Control Set at Maximum.
* .05 Watts = .38 Volts
** Output meter connected across voice coil.

VOLTAGE CHART

Tube	Plate	Screen	Cathode
Osc.-Mod.	85	85	0
I.F.	85	65	2
Det-AVC-AF	40-45	--	0
Pwr.-Amp.	75	85	5
Rect.	A.C.	--	105

All voltages measured from common negative. Line Voltage 117 Volts A.C.

VOLTAGE CHART MODEL 52T1

TUBE	PLATE	SCREEN	CATHODE
Osc. Mod.	185	70	0
I.F.	185	70	0
Det.-AVC-AF	75	-	-2V
Pwr - Amp	220	185	0
Rectifier	A.C.	-	235V(From fil.)

Measurements from socket terminal to chassis ground using 1000 ohms per voltmeter.
Line Voltage - 117 Volts A.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 40-50W, 50W, 52T1

Average Microvolts Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2300	455	I.F. Grid	.1	.5 Meg	.38
25	455	Mod. Grid	.1	.5 Meg	.38
30	600	Mod. Grid	.1	.5 Meg	.38
4	600	Ant. Terminal	200 Mmfd.	None	.38

Volume Control Set at Maximum. * .05 Watts .38 Volts. ** Output meter connected across voice coil.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODEL 62T1

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2500	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
35	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
40	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
4	600	R.F. Grid	.1 Mfd.	.5 Meg	.38
3	600	Ant. Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum.
* .05 Watts .38 Volts.
Tone Control set in treble position.
** Output meter connected across voice coil.

ALIGNMENT CHART MODEL 50-W
MODEL 40-50W

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	Osc-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	Osc-Mod.Grid	5	1720 K.C.
3	1400 K.C.	400 Ohms	External Antenna Terminal	6	1400 K.C.

Volume Control Set at Maximum.

ALIGNMENT CHART MODEL 52T1

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	5	1720 K.C.
3	538 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	6	538 K.C.
4	18 M.C.	.1 Mfd.	S.W.	Osc-Mod.Grid	7	18 M.C.
5	16 M.C.	400 Ohms	S.W.	External Antenna Terminal	8	16 M.C.
6	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	9	1400 K.C.

Volume Control Set at Maximum.

ALIGNMENT CHART MODEL 62T1

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	5	1720 K.C.
3	538 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	6	538 K.C.
4	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	7	1400 K.C.
5	18 M.C.	.1 Mfd.	S.W.	Osc-Mod.Grid	8	18 M.C.
6	16 M.C.	400 Ohms	S.W.	External Antenna Terminal	9	16 M.C.
7	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	10	1400 K.C.

Volume Control Set at Maximum.

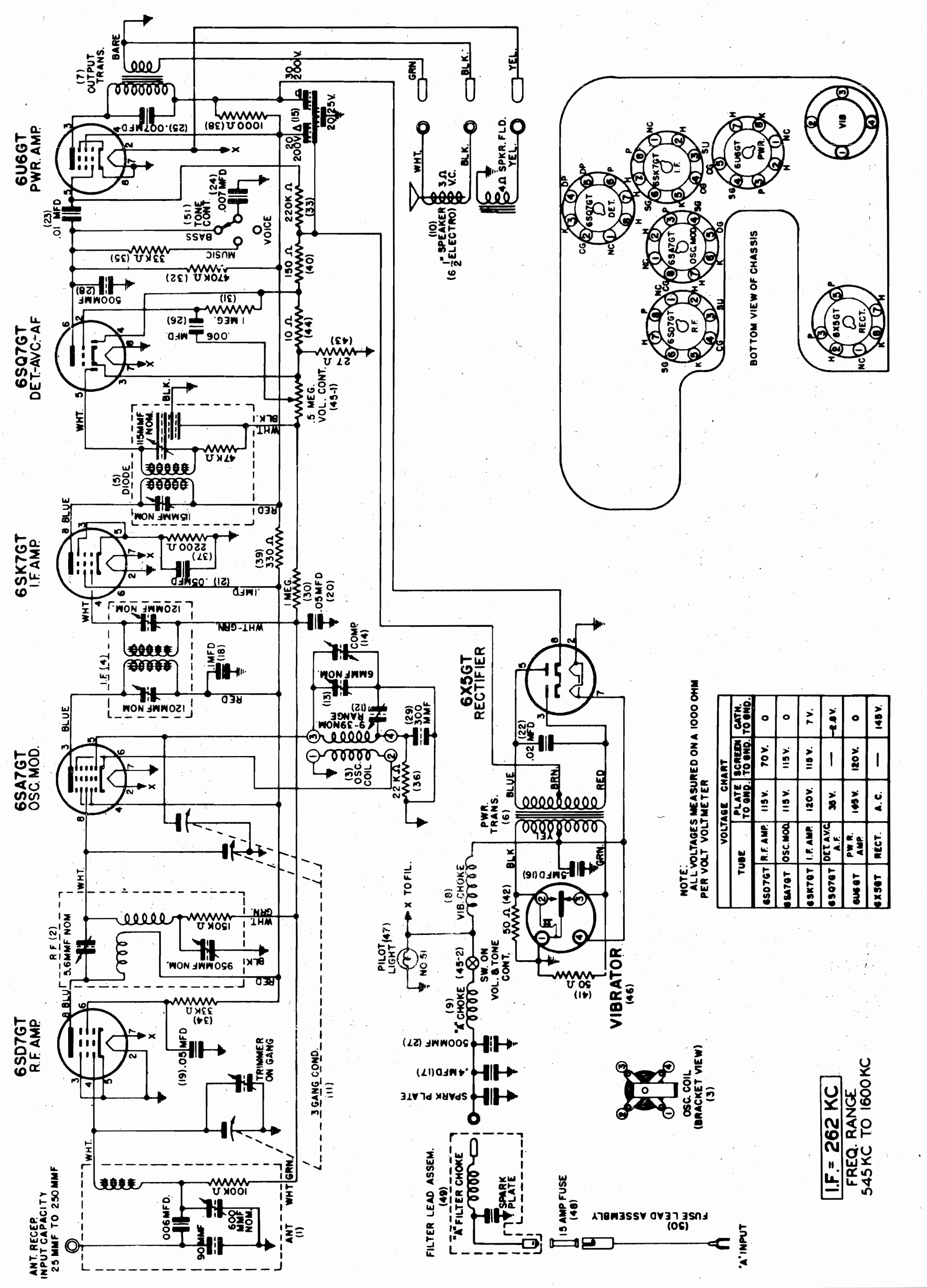
VOLTAGE CHART MODELS 40-50W - 50W

TUBE	PLATE	SCREEN	CATHODE
Osc. Mod.	175V	80V	0
I.F.	175V	80V	0
Det.-AVC-AF	40V	-	-2V
Pwr. Amp.	220V	175V	0
Rec.	A.C.	-	230V(from fil.)

Measurements from socket terminal to chassis ground using 1000 ohms per voltmeter.
Line Voltage - 117 Volts A.C.

MODEL 42S

GALVIN MFG. CO.



NOTE:
ALL VOLTAGES MEASURED ON A 1000 OHM PER VOLT VOLTMETER

VOLTAGE CHART				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	115 V.	70 V.	0
6SA7GT	OSC. MOD.	115 V.	115 V.	0
6SK7GT	I.F. AMP.	120 V.	115 V.	7 V.
6SQ7GT	DET. A.V.C. A.F.	36 V.	—	-2.8 V.
6U6GT	PWR. AMP.	165 V.	120 V.	0
6X5GT	RECT.	A.C.	—	145 V.

GALVIN MFG. CO.

SPECIFICALLY DESIGNED TO INSTALL IN 1941 STUDEBAKER

Model 42-S

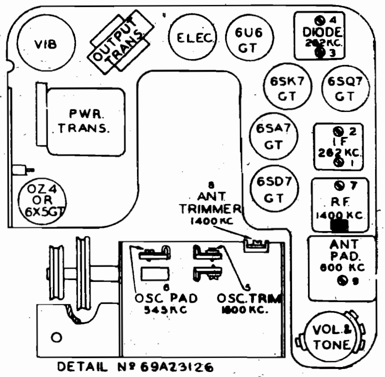


Figure 1

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 25 inches long.
5. Thread one end of cord through Slot (B) in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clockwise direction, wind cord one full turn around drive pulley and up to tuning shaft. (See Fig. 2).
7. Route cord 7 turns around tuning shaft as shown in Fig. 2 and down to drive pulley.
8. Continue in a clockwise direction around drive pulley and through slot (B).
9. Slip the two cord ends through eyelet (Part No. 5S7824) inside of pulley.
10. Knot the two cord ends together and fasten to one end of spring (Part No. 41A14759). Hook other end of spring to hole (C) in drive pulley.
11. With a pair of pliers pinch eyelet on cord and place drop of shellac on cord knot.

POINTER CORD

1. Remove the chassis from housing and place on service bench.
2. Remove broken string.
3. Set condenser gang to fully open position.
4. Cut a length of 18 lb. silk fish cord 27 inches long.
5. Thread one end of cord through slot (A) in condenser pulley and with an ordinary paper clip fasten it to the tuning shaft bracket to hold in place. (See Fig. 3).
6. In a clockwise direction run cord around condenser pulley, under brake shoe and over to idler pulley No. 3 and around it in a counter-clockwise direction.
7. Route string across chassis to idler pulley No. 2, and around it in a counter-clockwise direction.
8. Route cord back across chassis and down over idler pulley No. 1.
9. Route cord down and around condenser pulley one-half turn to slot (A).
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of drive pulley and fasten one end of spring (Part No. 41A11091) to cord and the other end to hook in condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string.
13. Fasten pointer to string with a drop of shellac. Place a drop of shellac on cord knot.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
22,250	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
700	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
710	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
13	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
3	600 K.C.	To Special Dummy	***	None	1.74

Volume Control Set at Maximum.
* 1 Watt = 1.74 Volts.

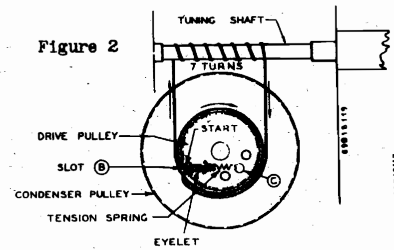
Tone Control Set At Voice.
** Output meter connected across voice coil.
*** Use special dummy Part No. 1X26767.

ALIGNMENT CHART

Operations In Order	Gang Condenser Set At	* Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	545 K.C.	.1 Mfd.	Osc.-Mod. Grid	6	545 K.C.
4	1400 K.C.	*	To Special Dummy	7	1400 K.C.
5	1400 K.C.	*	To Special Dummy	8	1400 K.C.
6	600 K.C.	*	To Special Dummy	9	600 K.C.

* Use Special Dummy Part No. 1X26767 or Booster coil Part No. 24K26751 in series with a 35 Mmf. condenser.

Figure 2



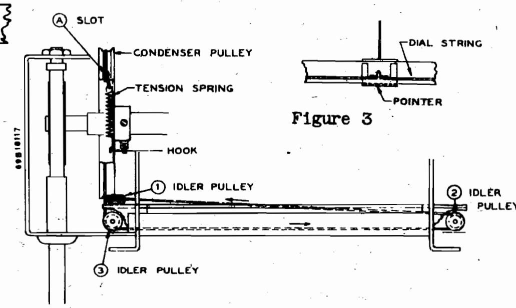
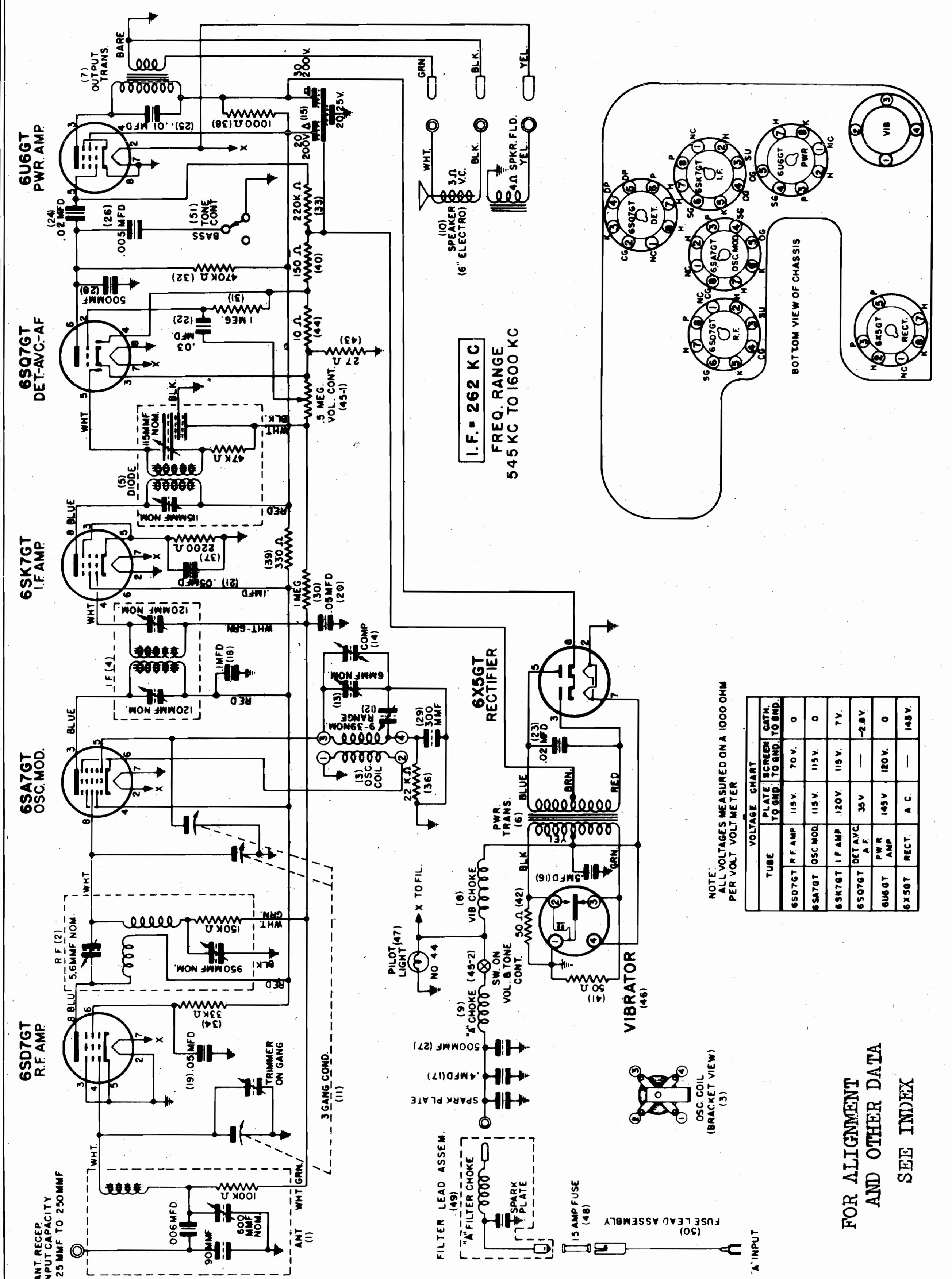


Figure 3

MODEL 43H

GALVIN MFG. CO.



NOTE:
ALL VOLTAGES MEASURED ON A 1000 OHM PER VOLT VOLTMETER

VOLTAGE CHART				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R F AMP	115 V.	70 V.	0
6SA7GT	OSC MOD.	115 V.	115 V.	0
6SK7GT	I F AMP	120 V.	115 V.	7 V.
6SQ7GT	DET AVC A F	35 V.	—	-2.8 V.
6U6GT	PWR AMP	145 V.	120 V.	0
6X5GT	RECT.	A C	—	145 V.

FOR ALIGNMENT
AND OTHER DATA
SEE INDEX

MODELS 43H, 44K

GALVIN MFG. CO.

MODEL 43H

TUNING CORD

1. Remove the chassis from the housing and place on service bench.
2. Remove the broken string.
3. Turn the gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 25 inches long.
5. Thread one end of cord thru hole (A) in drive pulley and with an ordinary paper clip fasten to tuning shaft bracket so that cord will stay in place.
6. In a clockwise direction wind cord one full turn around drive pulley and up to tuning shaft. See Fig. 2.
7. Route cord 8 turns around tuning shaft as shown in Fig. 2 and down to drive pulley.
8. Continue in a clockwise direction around drive pulley to hole (A).
9. Thread both ends of cord (inside pulley) thru eyelet (Part No. 557824) and knot ends together.
10. Fasten one end of spring (Part No. 41A14759) to cord and other end to hole (B) in drive pulley.
11. Cut off surplus cord and place drop of shellac on cord knot.
12. Pinch eyelet on cord with a pair of pliers.

POINTER CORD

1. Remove the chassis from housing and place on service bench.
2. Remove broken string.
3. Turn the gang to fully meshed position.
4. Cut a length of 18 lb. silk fish cord 27 inches long.
5. Thread one end of cord thru hole (C) in pointer pulley and with an ordinary paper clip fasten to the tuning shaft bracket to hold it in place. See Fig. 3.
6. In a counter-clockwise direction route cord to idler pulley No. 1 and around it in a clock-wise direction.
7. Route cord across chassis to idler pulley No. 2 and around it in a clock-wise direction.
8. Route cord back across chassis and around idler pulley No. 3.
9. Route cord counter-clockwise around pointer pulley to hole (C).
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of pointer pulley.
11. Fasten one end of spring (Part No. 41A11091) to cord and the other end to hole in pointer pulley.
12. Cut off surplus cord. Place a drop of shellac on cord knot.
13. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string. Fasten to string with a drop of shellac.

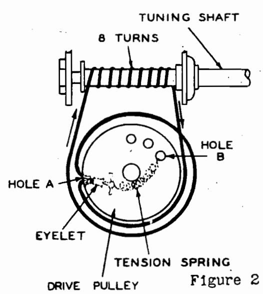


Figure 2

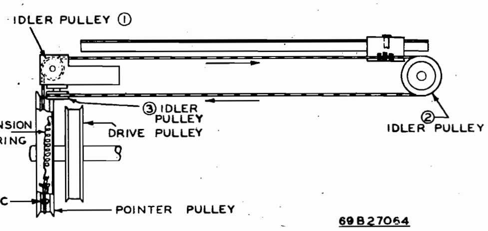


Figure 3

MODEL 44K

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 25 inches long.
5. Thread one end of cord through hole (X) in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clockwise direction, wind cord one full turn around drive pulley and up to tuning shaft. (See Fig. 2.)
7. Route cord 6 turns around tuning shaft as shown in Fib. 2 and down to drive pulley.
8. Continue in a clockwise direction around drive pulley and to hole (X).
9. Slip the two cord ends through eyelet (Part No. 5S7824) inside of pulley.
10. Knot the two cord ends together and fasten to one end of spring (Part No. 41A14759). Hook other end of spring to hole (Y) in drive pulley.
11. With a pair of pliers pinch eyelet on cord and place drop of shellac on cord knot.

POINTER CORD

1. Remove the chassis from housing and place on service bench.
2. Remove broken string.
3. Set condenser gang to fully meshed position.
4. Cut a length of 18 lb. silk fish cord 27 inches long.
5. Thread one end of cord through hole (C) in condenser pulley and with an ordinary paper clip fasten it to the tuning shaft bracket to hold in place. (See Fig. 3).
6. Route cord from hole (C) around idler pulley No. 1 in a clockwise direction.
7. Route string across chassis to idler pulley No. 2, and around it in a counter-clockwise direction.
8. Route cord back across chassis and around idler pulley No. 3.
9. Route cord down and around condenser pulley to hole (C).
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of drive pulley; fasten one end of spring (Part No. 41A11091) to cord and the other end to hook in condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string.
13. Fasten pointer to string with a drop of shellac. Place a drop of shellac on cord knot.

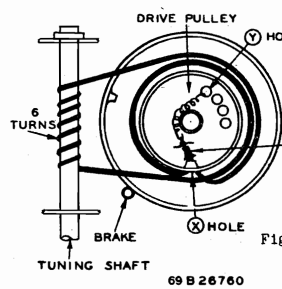


Figure 2

MODEL 44 K

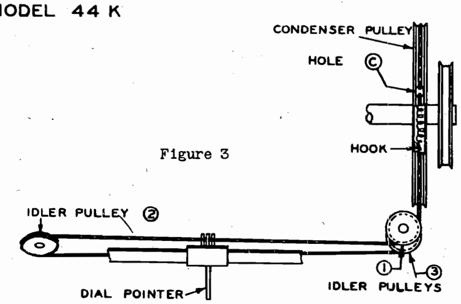
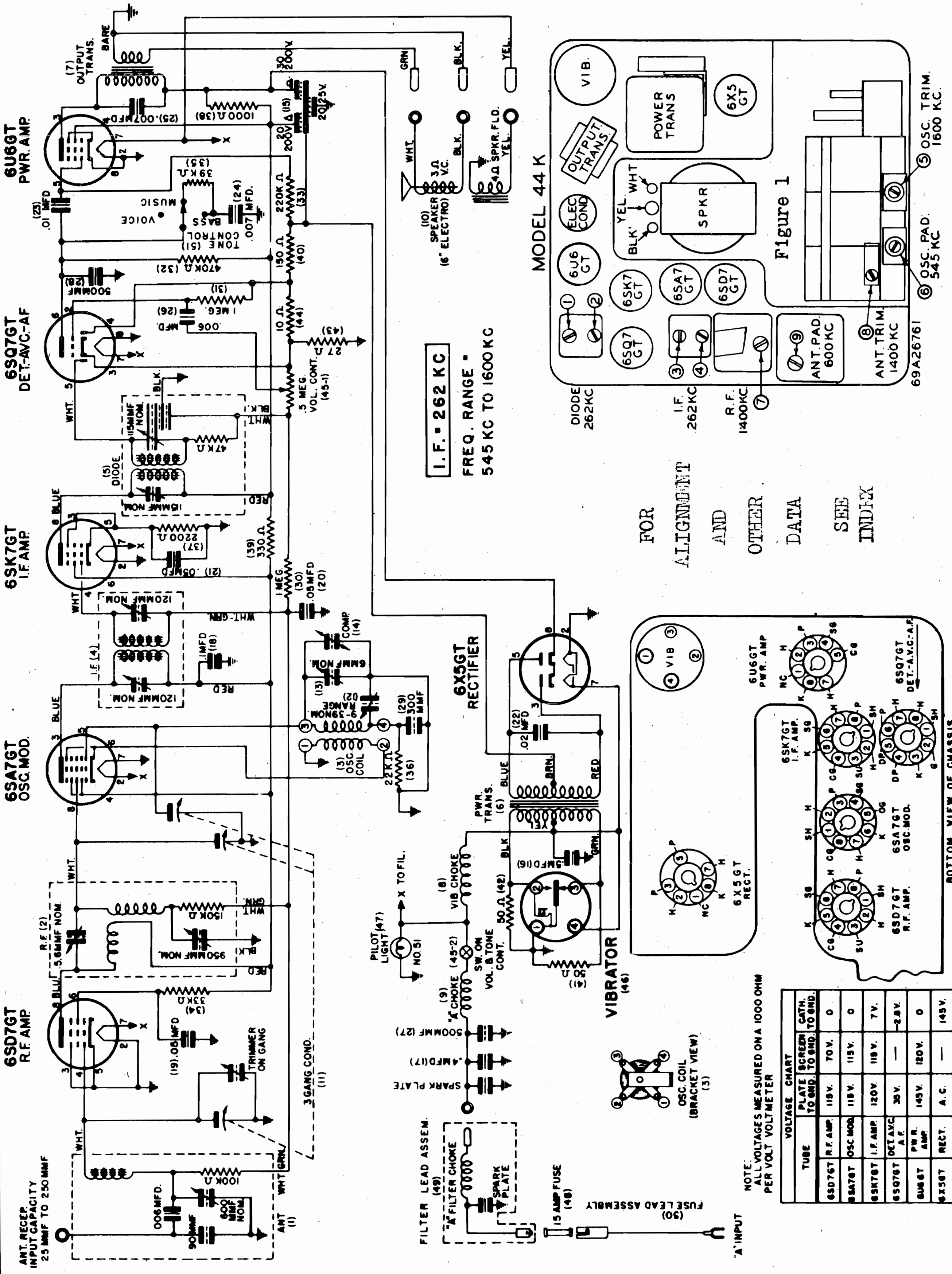


Figure 3

MODEL 44K

GALVIN MFG. CO.



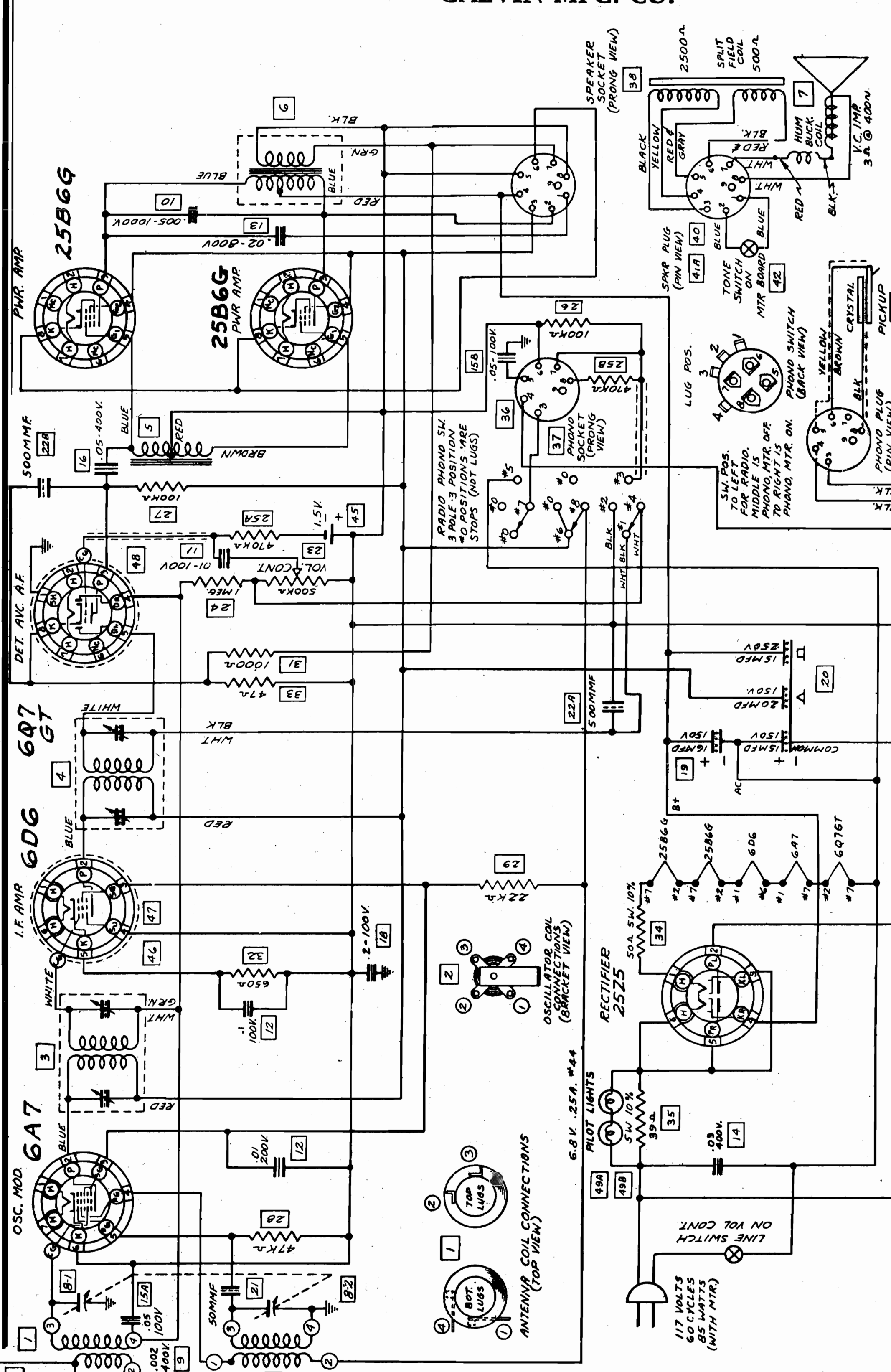
NOTE: ALL VOLTAGES MEASURED ON A 1000 OHM PER VOLT VOLTMETER

VOLTAGE CHART

TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	115V.	70V.	0
6SA7GT	OSC. MOD.	115V.	115V.	0
6SK7GT	I.F. AMP.	120V.	115V.	7V.
6SQ7GT	DET. AVC. A.F.	35V.	—	-2.8V.
6U6GT	PWR. AMP.	145V.	120V.	0
6X5GT	RECT.	A.C.	—	145V.

MODEL 61F

GALVIN MFG. CO.



IF PEAK 455 KC

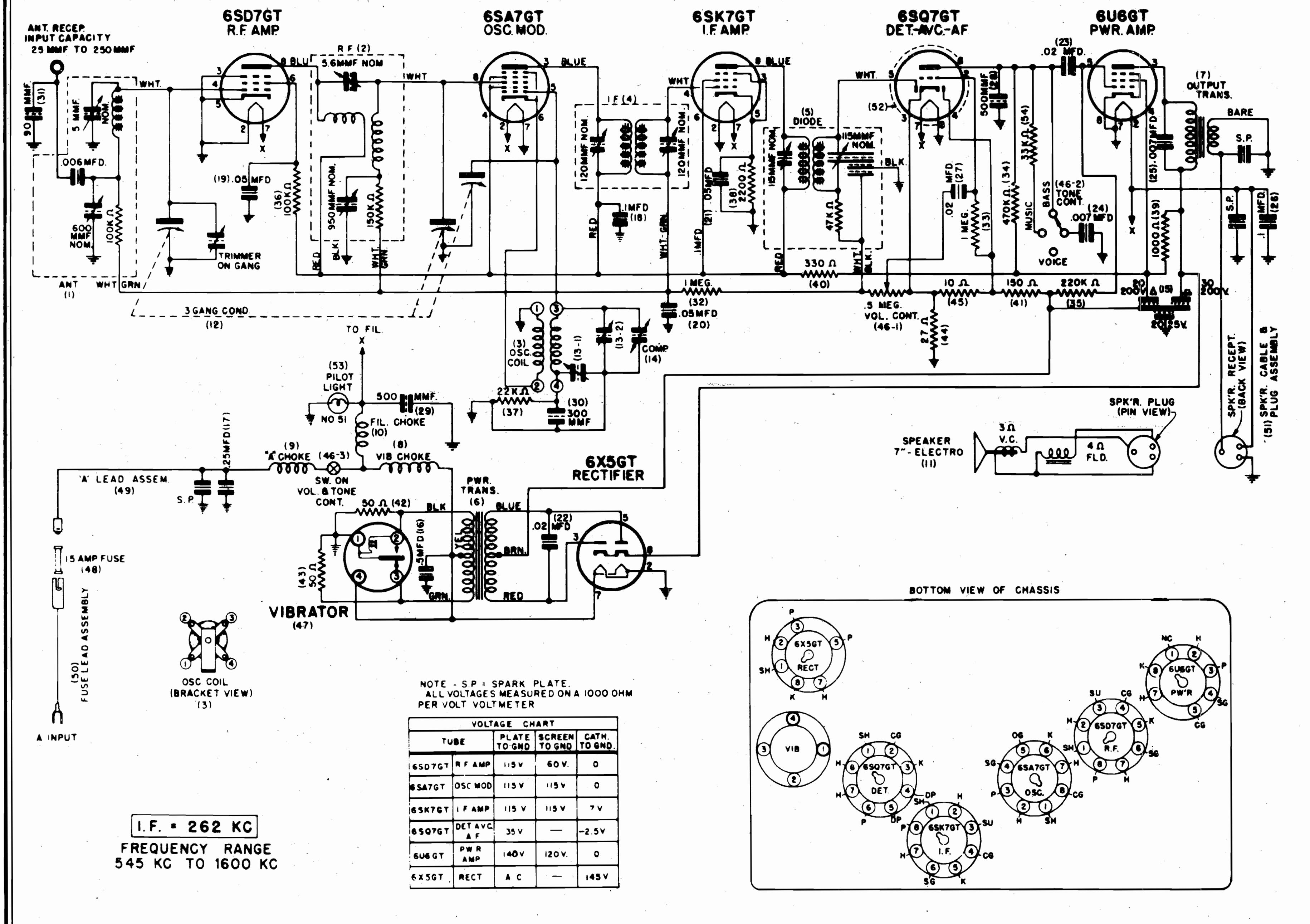
TUBE		PLATE	SCREEN	CATHODE	OSC. PLATE
6A7	Osc.-Mod.	160	90	0	160
6D6	IF	160	90	3.5	--
6Q7GT*	Det.-Avc.	95	--	0	--
25B6G	Output	190	160	26	--
	Output	190	160	26	
25Z5**	Rect.	P1--0 P2--195	--	K1--0 K2--100	

* Bias —1.1 V. from bias cell.
** Voltage doubler tube.
Measurements from B— to socket terminal, using 1000 ohms per volt meter.

ALIGNMENT 1. Conn. the sig. gen. to the ant. lead thru a 200 MMF cond. and to chass. gnd. Turn the cond. gang completely out of mesh. o.p. meter across the spkr. voice coil. 2. Set sig. gen. at 455 KC; carefully adj. the two IF trims. and the two DIODE trims. to point show. highest read. on o.p. meter. Advance sig. gen. atten. if necessary. 3. Turn sig. gen. to 1750 KC, and with cond. gang completely out of mesh adj. OSC. trim. until 1750 KC sig. is heard. 4. Set sig. gen at 1400 Adj. ANT. trim. to point showing highest reading on o.p. meter.

GALVIN MFG. CO.

MODEL 45N



NOTE - S.P. = SPARK PLATE.
ALL VOLTAGES MEASURED ON A 1000 OHM PER VOLT VOLTMETER

VOLTAGE CHART

TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R F AMP	115 V	60 V.	0
6SA7GT	OSC MOD	115 V	115 V	0
6SK7GT	I F AMP	115 V	115 V	7 V
6SQ7GT	DET AVC A F	35 V	—	-2.5 V
6U6GT	PWR AMP	140 V	120 V.	0
6X5GT	RECT	A C	—	145 V

I.F. = 262 KC

FREQUENCY RANGE
545 KC TO 1600 KC

GALVIN MFG. CO.

Model 45-N
SPECIFICALLY DESIGNED TO INSTALL IN 1941 NASH

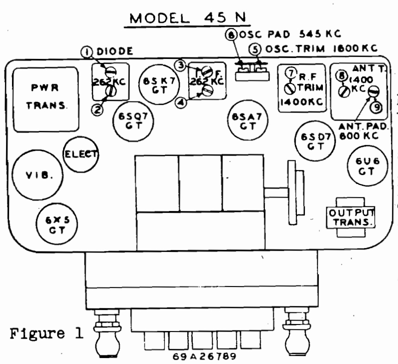


Figure 1

DIAL CORD INSTRUCTIONS

TUNING CORD

Remove the die cast escutcheon and the bottom cover from the receiver. The escutcheon is fastened by means of 9 screws and the bottom cover is fastened with two nuts and lockwashers.
Remove the broken string.
Turn the condenser gang to fully meshed position.
Cut a length of 30 lb. silk fish cord 25 inches long.
Thread one end of cord thru hole (X) in drive pulley and with an ordinary paper clip fasten cord to tuner bracket so that cord will stay in place.

(cont. in next column)

TUNING CORD (cont.)

In a counter-clockwise direction wind cord one turn on drive pulley and route to idler pulley No. 4. (See Fig. 2).
Route cord over idler pulley No. 4 and down to tuning shaft.
Wind four full turns in a clock-wise direction on tuning shaft and continue down to idler pulley.
Route cord under idler pulley No. 5 and to hole (X) in drive pulley.
Thread cord ends through eyelet (Part No. 5S7824) inside of pulley.
Knot cord ends together and fasten to one end of spring (Part No. 41A14759). Hook other end of spring to hole (Y) in drive pulley.
With a pair of pliers pinch eyelet on cord and place drop of shellac on cord knot.

POINTER CORD

1. Remove the die cast escutcheon and the bottom cover from the receiver (see step 1 above).
2. Remove the broken string.
3. Turn gang to fully opened position.
4. Cut a length of 18 lb. silk fish cord 27 inches long.
5. Thread one end of cord thru hole (C) in condenser pulley. See Fig. 3. With an ordinary paper clip fasten to tuner bracket to hold it in place.
6. Route cord in a counter-clockwise direction from hole (C) to idler pulley No. 1.
7. Route cord clockwise around pulley No. 1 and across chassis to idler pulley No. 2.
8. Continue counter-clockwise around pulley No. 2 and back across the chassis to idler pulley No. 3.
9. Continue around idler pulley No. 3 and in a counter-clockwise direction around condenser pulley to hole (C).
10. Remove the paper clip and knot the two ends of cord together inside of pulley. Fasten one end of spring (Part No. 41A11091) to cord and hook other end to hole in condenser pulley. Place a drop of shellac on cord knot.
11. Cut off surplus cord and assemble pointer to cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on cord. Fasten with a drop of shellac.
13. Minor calibration errors may be corrected by loosening set screw (S) in drive pulley and moving condenser pulley. Tighten set screw (S) after adjustment.

MODEL 45 N

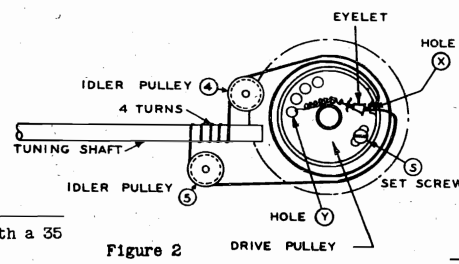
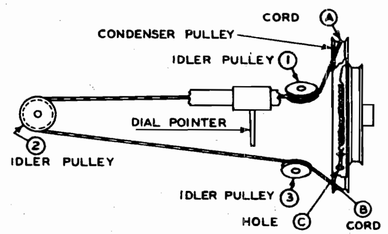


Figure 2



69B26816

Figure 3

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
25,000	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
825	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
835	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
14	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
3	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set At Maximum.
* 1 Watt = 1.74 Volts.

Tone Control Set At Voice.
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767.

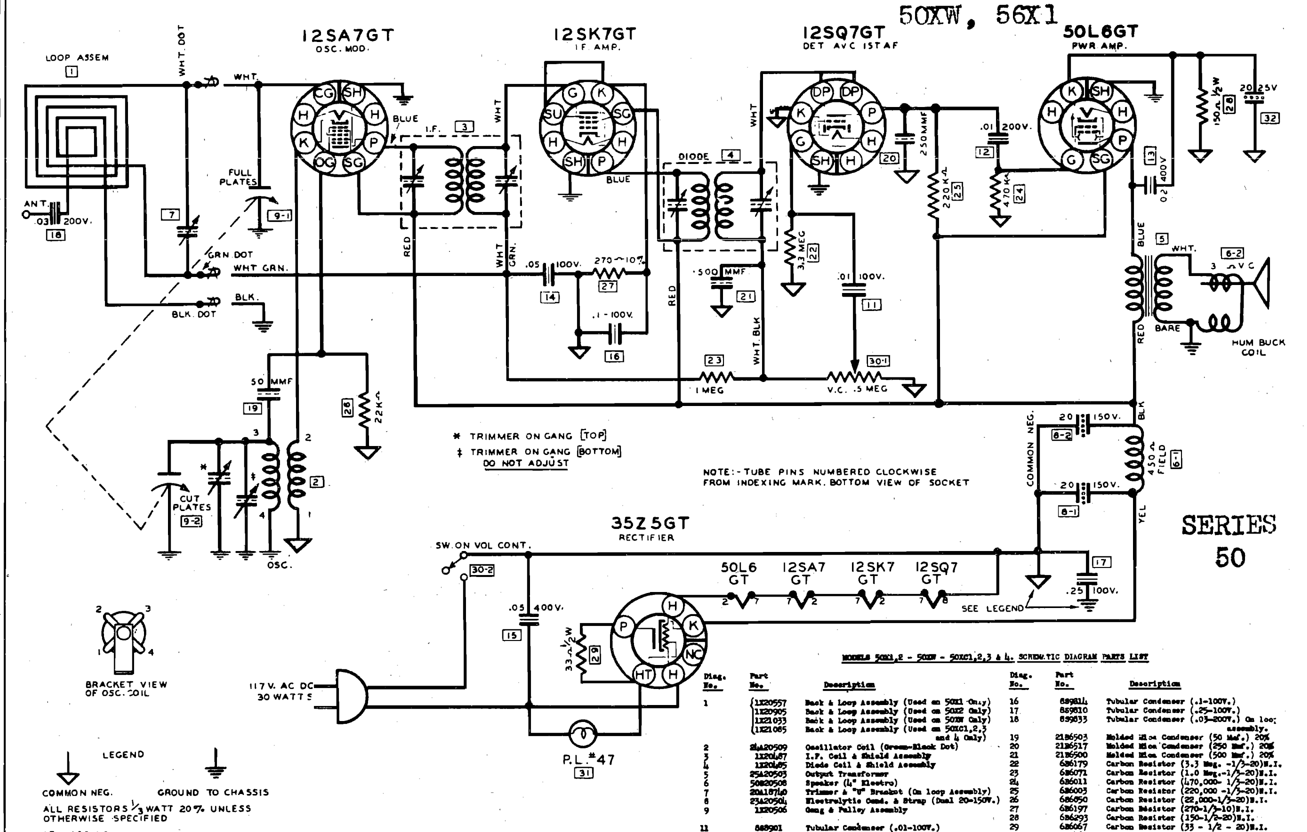
ALIGNMENT CHART

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	545 K.C.	.1 Mfd.	Osc.-Mod. Grid	6	545 K.C.
4	1400 K.C.	*	To Special Dummy	7	1400 K.C.
5	1400 K.C.	*	To Special Dummy	8	1400 K.C.
6	600 K.C.	*	To Special Dummy	9	600 K.C.

* Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24K26751 in series with a 35 Mmf. Condenser.

GALVIN MFG. CO.

MODELS 50X1, 50X2, 50XC1, 50XC2, 50XC3, 50XC4, 50XW, 56X1

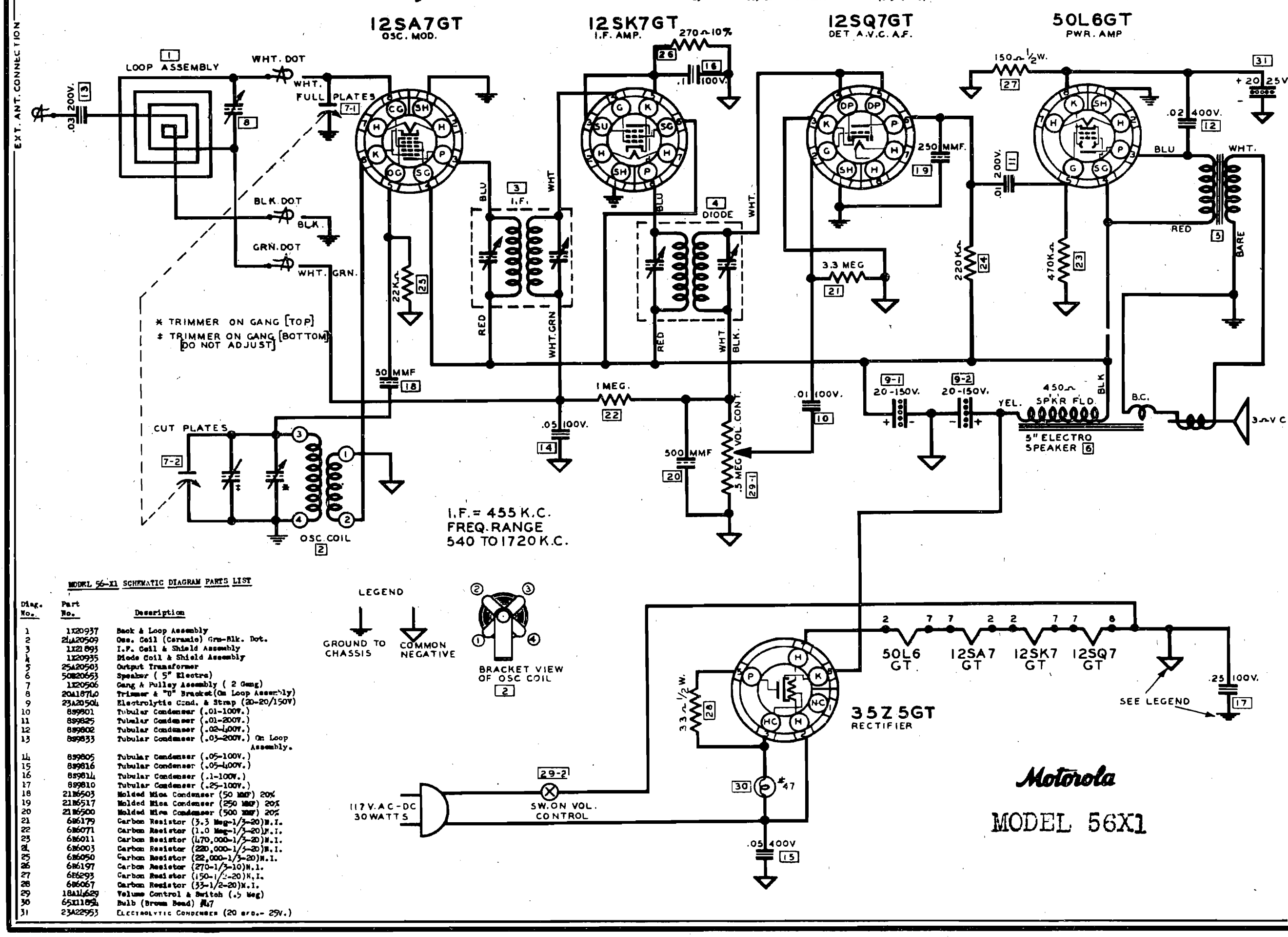


SERIES 50

MODELS 50X1,2 - 50XW - 50XC1,2,3 & 4. SCHEMATIC DIAGRAM PARTS LIST

Diag. No.	Part No.	Description
1	1X20557	Back & Loop Assembly (Used on 50X1 Only)
	1X20905	Back & Loop Assembly (Used on 50X2 Only)
	1X21033	Back & Loop Assembly (Used on 50XW Only)
	1X21065	Back & Loop Assembly (Used on 50XC1,2,3 and 4 Only)
2	24A20509	Oscillator Coil (Green-Black Dot)
3	1X20487	I.F. Coil & Shield Assembly
4	1X20485	Diode Coil & Shield Assembly
5	25A20503	Output Transformer
6	50B20508	Speaker (4" Electro)
7	20A18740	Trimmer & "U" Bracket (On loop Assembly)
8	23A20504	Electrolytic Cond. & Strap (Dual 20-150V.)
9	1X20506	Gang & Pulley Assembly
11	8S9801	Tubular Condenser (.01-100V.)
12	8S9825	Tubular Condenser (.01-200V.)
13	8S9802	Tubular Condenser (.02-400V.)
14	8S9805	Tubular Condenser (.05-100V.)
15	8S9816	Tubular Condenser (.05-400V.)
16	8S9814	Tubular Condenser (.1-100V.)
17	8S9810	Tubular Condenser (.25-100V.)
18	8S9833	Tubular Condenser (.03-200V.) On loop assembly.
19	21B6503	Molded Mica Condenser (50 Mmf.) 20%
20	21B6517	Molded Mica Condenser (250 Mmf.) 20%
21	21B6500	Molded Mica Condenser (500 Mmf.) 20%
22	6B6179	Carbon Resistor (3.3 Meg. -1/3-20)N.I.
23	6B6071	Carbon Resistor (1.0 Meg.-1/3-20)N.I.
24	6B6011	Carbon Resistor (470,000- 1/3-20)N.I.
25	6B6003	Carbon Resistor (220,000 -1/3-20)N.I.
26	6B6050	Carbon Resistor (22,000-1/3-20)N.I.
27	6B6197	Carbon Resistor (270-1/3-10)N.I.
28	6B6293	Carbon Resistor (150-1/2-20)N.I.
29	6B6067	Carbon Resistor (33 - 1/2 - 20)N.I.
30	18A14629	Volume Control & Switch (.5 Meg.)
31	65X11954	Bulb (6.3V.-.15Amp. Tub. Bay. Clear)#47
32	23A22953	Electrolytic Cond. (20 Mfd.-25V.)

FOR OTHER DATA, SEE INDEX



MODEL 56-X1 SCHEMATIC DIAGRAM PARTS LIST

Diag. No.	Part No.	Description
1	1X20937	Back & Loop Assembly
2	24A20509	Osc. Coil (Ceramic) Grn-Blk. Dot.
3	1X21893	I.F. Coil & Shield Assembly
4	1X20935	Diode Coil & Shield Assembly
5	25A20503	Output Transformer
6	50B20653	Speaker (5" Electro)
7	1X20506	Gang & Pulley Assembly (2 Gang)
8	20A18740	Trimmer & "U" Bracket(On Loop Assembly)
9	23A20504	Electrolytic Cond. & Strap (20-20/150V)
10	8S9801	Tubular Condenser (.01-100V.)
11	8S9825	Tubular Condenser (.01-200V.)
12	8S9802	Tubular Condenser (.02-400V.)
13	8S9833	Tubular Condenser (.03-200V.) On Loop Assembly.
14	8S9805	Tubular Condenser (.05-100V.)
15	8S9816	Tubular Condenser (.05-400V.)
16	8S9814	Tubular Condenser (.1-100V.)
17	8S9810	Tubular Condenser (.25-100V.)
18	21B6503	Molded Mica Condenser (50 MMF) 20%
19	21B6517	Molded Mica Condenser (250 MMF) 20%
20	21B6500	Molded Mica Condenser (500 MMF) 20%
21	6B6179	Carbon Resistor (3.3 Meg-1/3-20)N.I.
22	6B6071	Carbon Resistor (1.0 Meg-1/3-20)N.I.
23	6B6011	Carbon Resistor (470,000-1/3-20)N.I.
24	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
25	6B6050	Carbon Resistor (22,000-1/3-20)N.I.
26	6B6197	Carbon Resistor (270-1/3-10)N.I.
27	6B6293	Carbon Resistor (150-1/2-20)N.I.
28	6B6067	Carbon Resistor (33-1/2-20)N.I.
29	18A14629	Volume Control & Switch (.5 Meg)
30	65X11854	Bulb (Brown Bead) #47
31	23A22953	Electrolytic Condenser (20 mfd.- 25V.)

Motorola

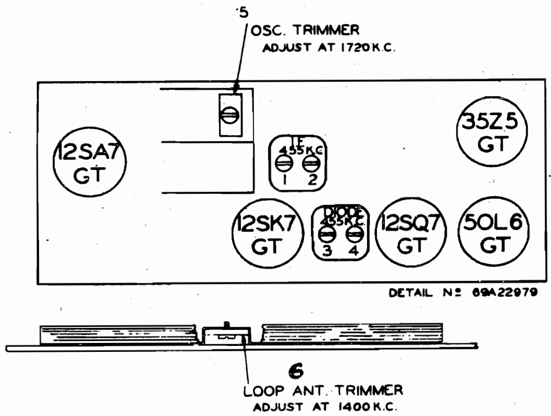
MODEL 56X1

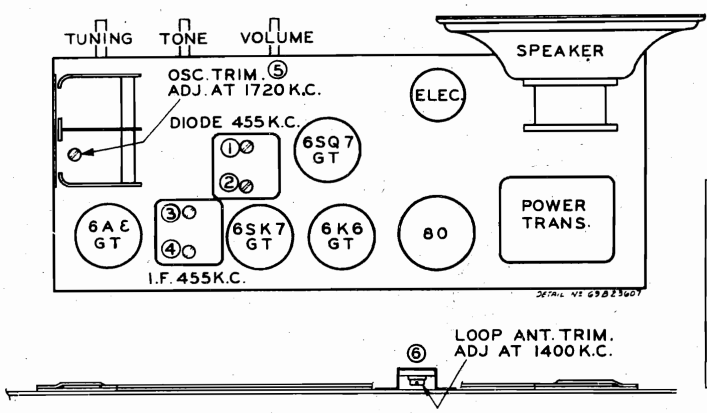
FOR MODELS, See Below

GALVIN MFG. CO.

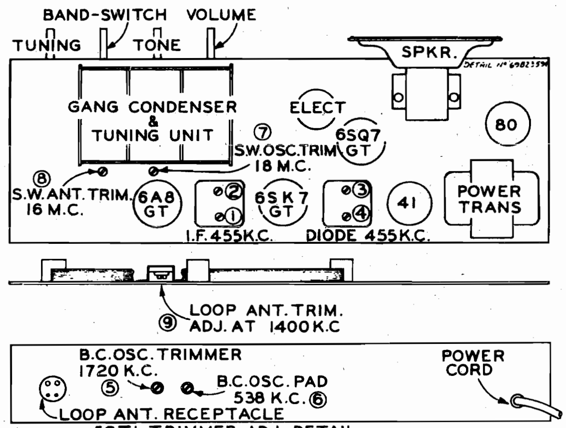
— Model 50X1 — — Model 50X2 — — Model 50XW —

— Model 50XC -1 and 2 — — Model 50XC -3 and 4 —

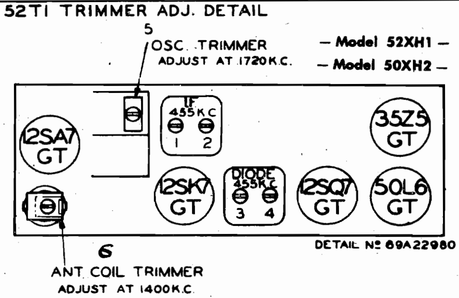


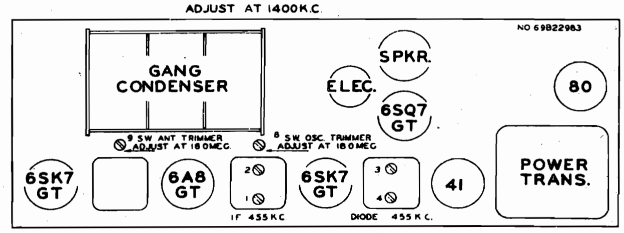


TRIMMER ADJ. DETAIL FOR 50W, 40-50W.

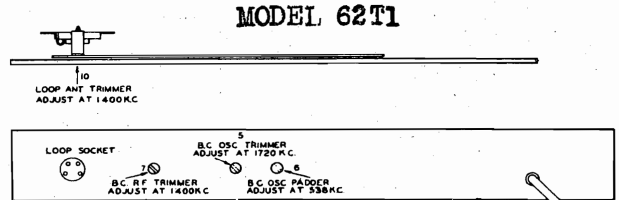


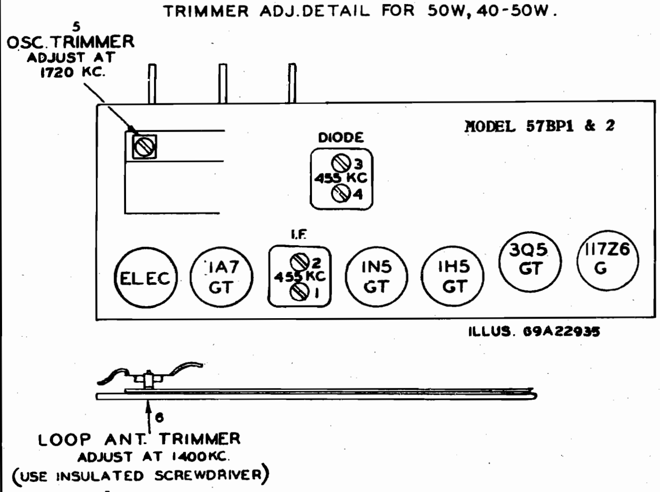
52T1 TRIMMER ADJ. DETAIL

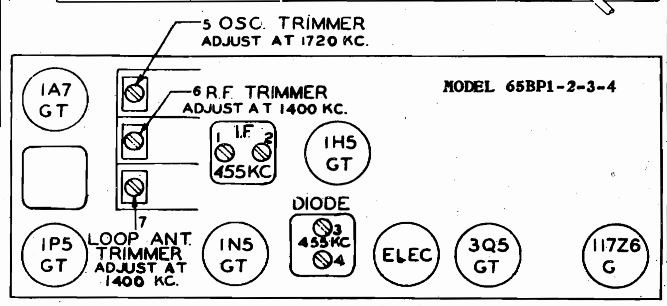


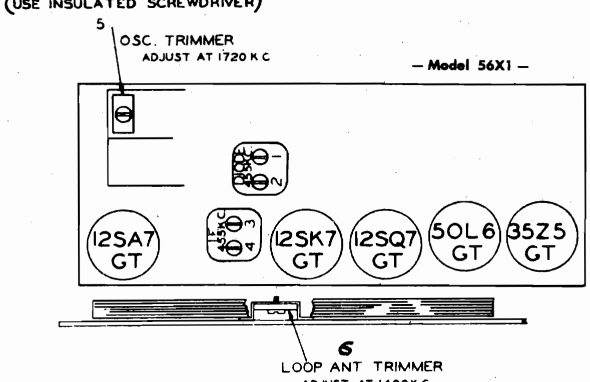


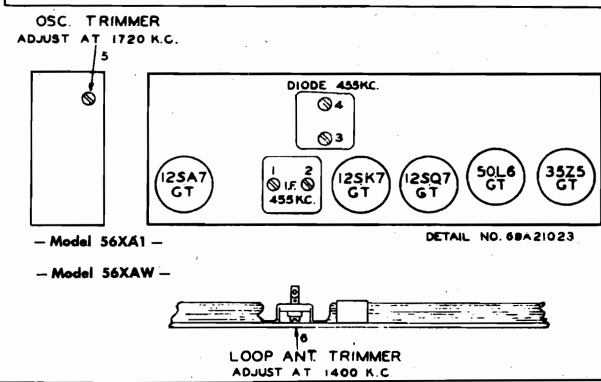
MODEL 62T1





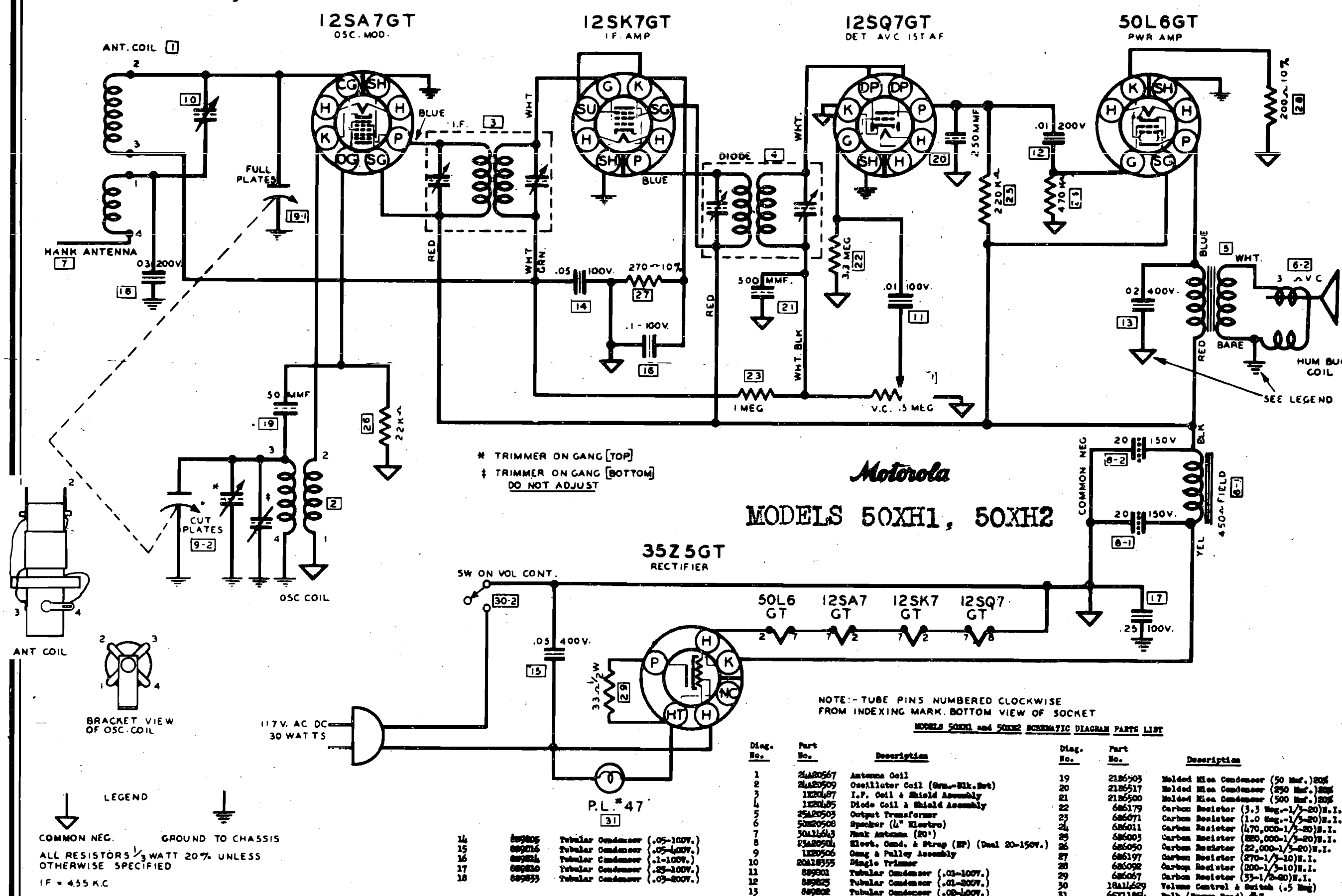






MODELS 50XH1, 50XH2
MODELS 56XA1, 56XAW

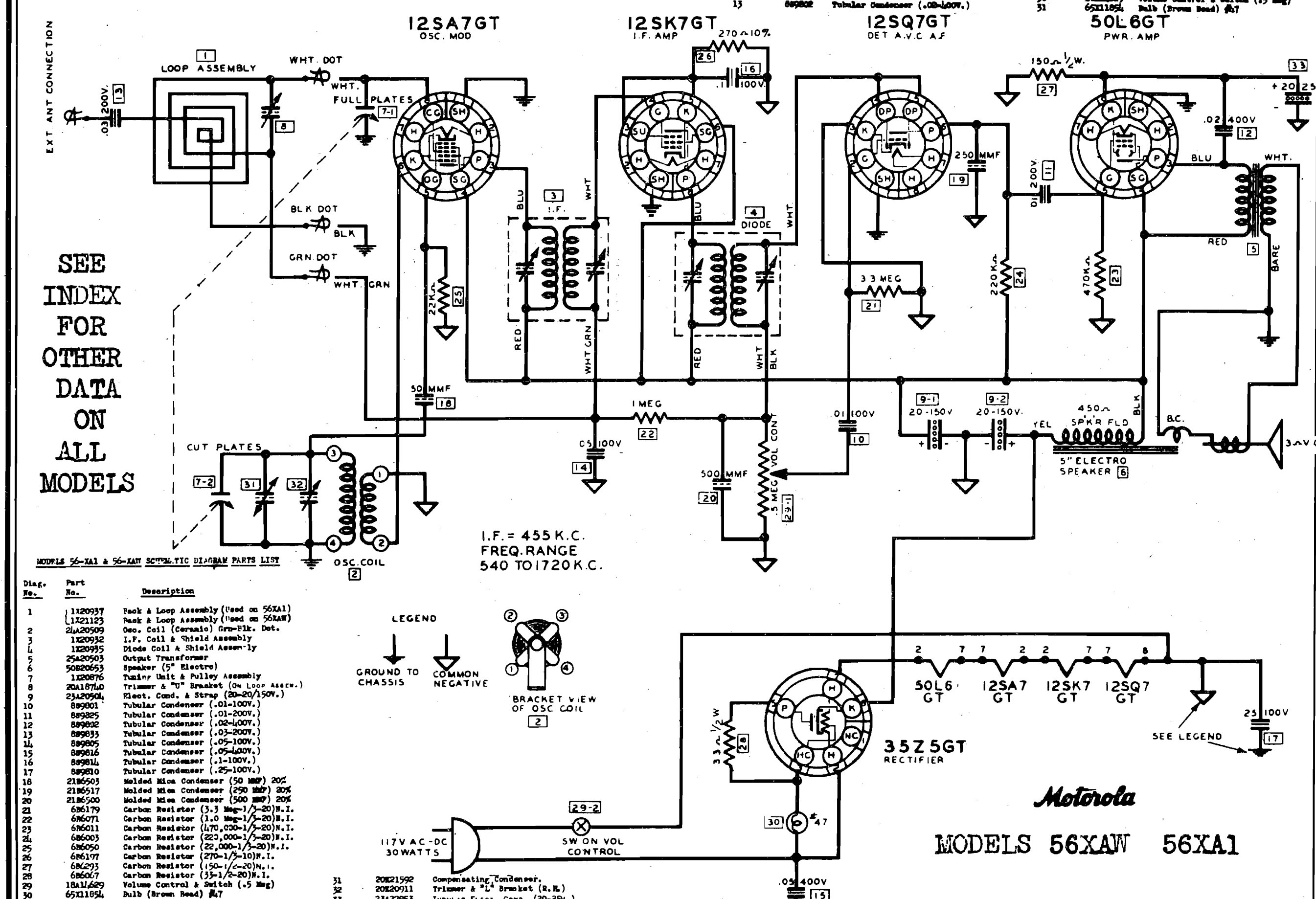
GALVIN MFG. CO.



NOTE:- TUBE PINS NUMBERED CLOCKWISE FROM INDEXING MARK. BOTTOM VIEW OF SOCKET

MODELS 50XH1 and 50XH2 SCHEMATIC DIAGRAM PARTS LIST

Diag. No.	Part No.	Description
1	24A20567	Antenna Coil
2	24A20509	Oscillator Coil (Grn.-Blk.Dot)
3	1X20487	I.F. Coil & Shield Assembly
4	1X20485	Diode Coil & Shield Assembly
5	25A20503	Output Transformer
6	50B20508	Speaker (4" Electro)
7	30A21643	Hank Antenna (20')
8	23A20504	Elect. Cond. & Strap (HP) (Dual 20-150V.)
9	1X20506	Gang & Pulley Assembly
10	20A18355	Single Trimmer
11	889801	Tubular Condenser (.01-100V.)
12	889825	Tubular Condenser (.01-200V.)
13	889802	Tubular Condenser (.02-400V.)
14	889805	Tubular Condenser (.05-100V.)
15	889816	Tubular Condenser (.05-400V.)
16	889814	Tubular Condenser (.1-100V.)
17	889810	Tubular Condenser (.25-100V.)
18	889833	Tubular Condenser (.03-200V.)
19	21B6503	Molded Mica Condenser (50 Mmf.)20%
20	21B6517	Molded Mica Condenser (250 Mmf.)20%
21	21B6500	Molded Mica Condenser (500 Mmf.)20%
22	6B6179	Carbon Resistor (3.3 Meg.-1/3-20)N.I.
23	6B6071	Carbon Resistor (1.0 Meg.-1/3-20)N.I.
24	6B6011	Carbon Resistor (470,000-1/3-20)N.I.
25	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
26	6B6050	Carbon Resistor (22,000-1/3-20)N.I.
27	6B6197	Carbon Resistor (270-1/3-10)N.I.
28	6B6092	Carbon Resistor (200-1/3-10)N.I.
29	6B6067	Carbon Resistor (33-1/2-20)N.I.
30	18A11629	Volume Control & Switch (.5 Meg)
31	65X11854	Bulb (Brown Bead) #47



SEE INDEX FOR OTHER DATA ON ALL MODELS

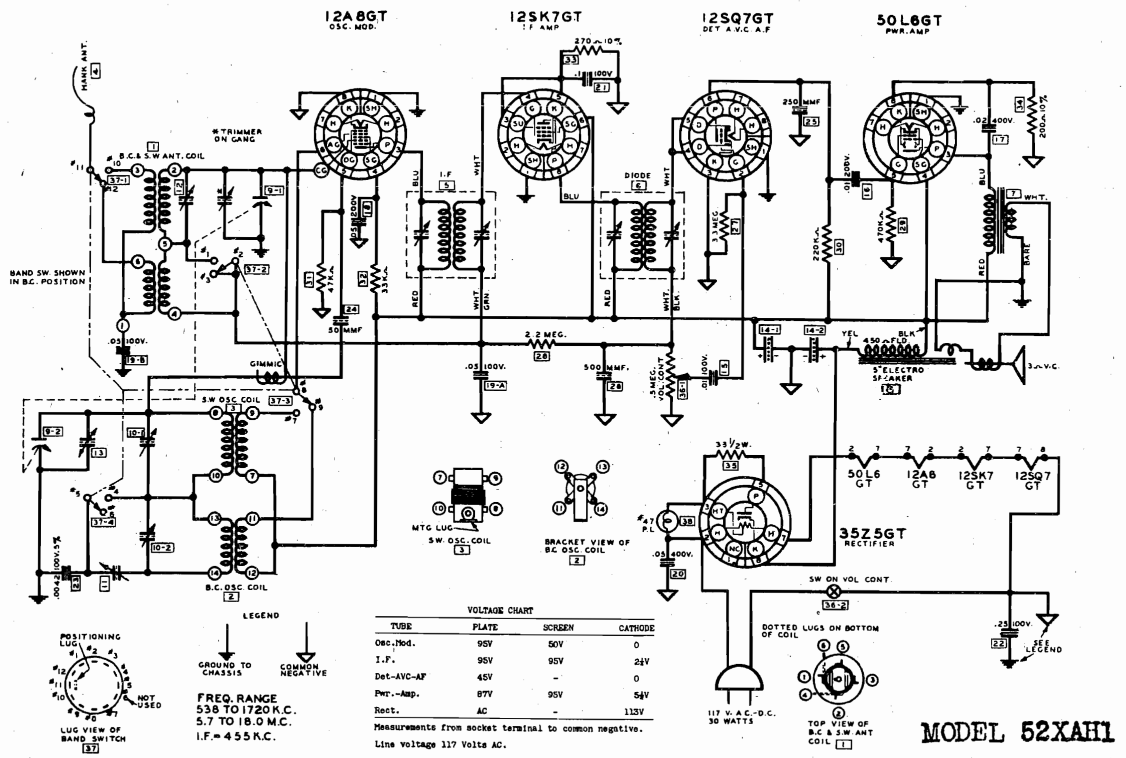
MODELS 56-XA1 & 56-XAW SCHEMATIC DIAGRAM PARTS LIST

Diag. No.	Part No.	Description
1	1X20937	Pack & Loop Assembly (Used on 56XA1)
	1X21123	Pack & Loop Assembly (Used on 56XAW)
2	24A20509	Osc. Coil (Ceramic) Grn-Blk. Dot.
3	1X20932	I.F. Coil & Shield Assembly
4	1X20935	Diode Coil & Shield Assembly
5	25A20503	Output Transformer
6	50B20653	Speaker (5" Electro)
7	1X20876	Tuning Unit & Pulley Assembly
8	20A18740	Trimmer & "U" Bracket (On Loop Assem.)
9	23A20504	Elect. Cond. & Strap (20-20/150V.)
10	889801	Tubular Condenser (.01-100V.)
11	889825	Tubular Condenser (.01-200V.)
12	889802	Tubular Condenser (.02-400V.)
13	889833	Tubular Condenser (.03-200V.)
14	889805	Tubular Condenser (.05-100V.)
15	889816	Tubular Condenser (.05-400V.)
16	889814	Tubular Condenser (.1-100V.)
17	889810	Tubular Condenser (.25-100V.)
18	21B6503	Molded Mica Condenser (50 MMF) 20%
19	21B6517	Molded Mica Condenser (250 MMF) 20%
20	21B6500	Molded Mica Condenser (500 MMF) 20%
21	6B6179	Carbon Resistor (3.3 Meg-1/3-20)N.I.
22	6B6071	Carbon Resistor (1.0 Meg-1/3-20)N.I.
23	6B6011	Carbon Resistor (470,000-1/3-20)N.I.
24	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
25	6B6050	Carbon Resistor (22,000-1/3-20)N.I.
26	6B6197	Carbon Resistor (270-1/3-10)N.I.
27	6B6293	Carbon Resistor (150-1/2-20)N.I.
28	6B6067	Carbon Resistor (33-1/2-20)N.I.
29	18A11629	Volume Control & Switch (.5 Meg)
30	65X11854	Bulb (Brown Bead) #47
31	20X21592	Compensating Condenser.
32	20X20911	Trimmer & "L" Bracket (R.H.)
33	23A22953	Tubular Elect. Cond. (20-25V.)

MODELS 52XAH1, B-150

Model B-150

GALVIN MFG. CO.



VOLTAGE CHART

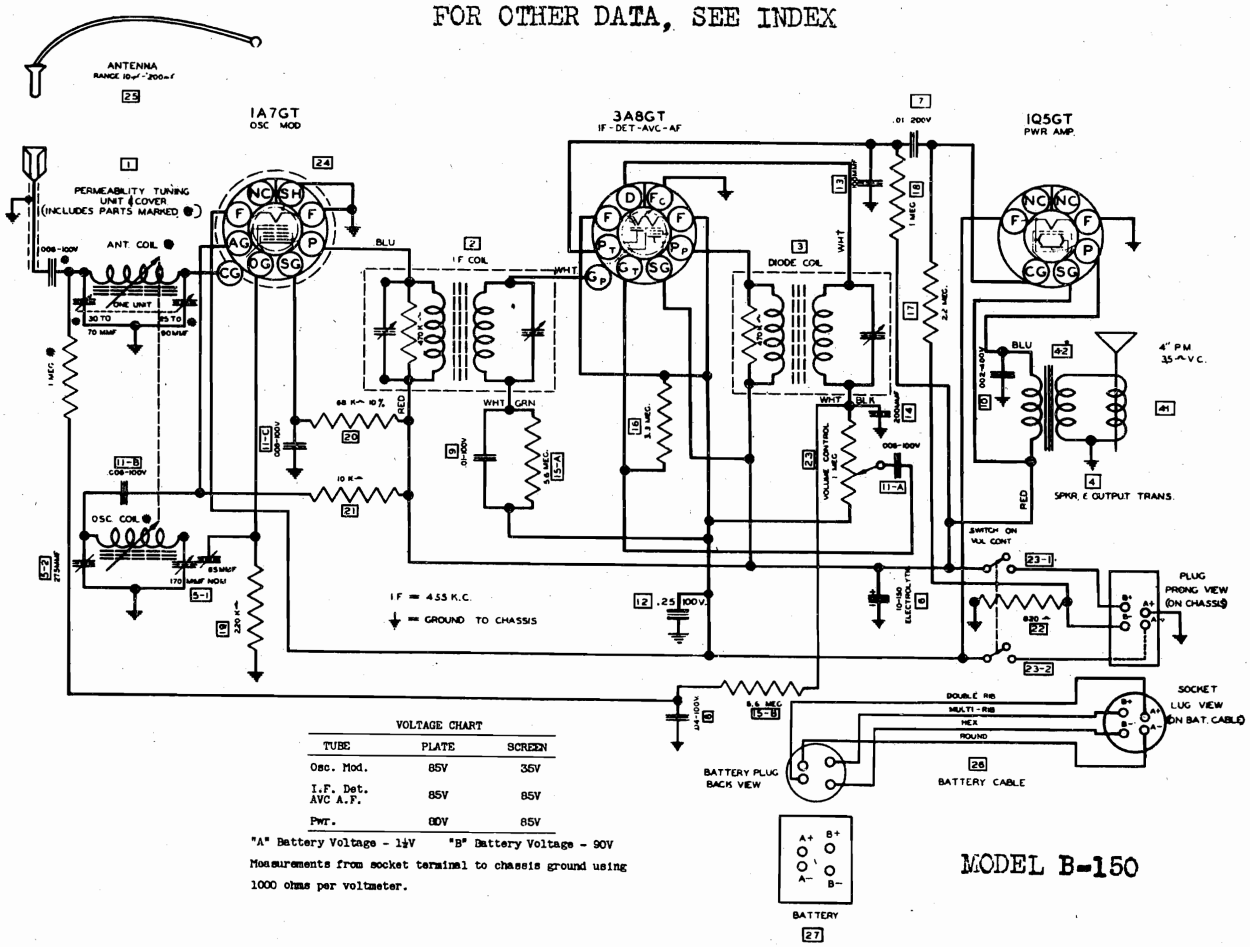
TUBE	PLATE	SCREEN	CATHODE
Osc.Mod.	95V	50V	0
I.F.	95V	95V	2¼V
Det-AVC-AF	45V	-	0
Pwr.-Amp.	87V	95V	5¼V
Rect.	AC	-	113V

Measurements from socket terminal to common negative.

Line voltage 117 Volts AC.

MODEL 52XAH1

FOR OTHER DATA, SEE INDEX



VOLTAGE CHART

TUBE	PLATE	SCREEN
Osc. Mod.	85V	35V
I.F. Det. AVC A.F.	85V	85V
Pwr.	80V	85V

"A" Battery Voltage - 1½V   "B" Battery Voltage - 90V

Measurements from socket terminal to chassis ground using 1000 ohms per voltmeter.

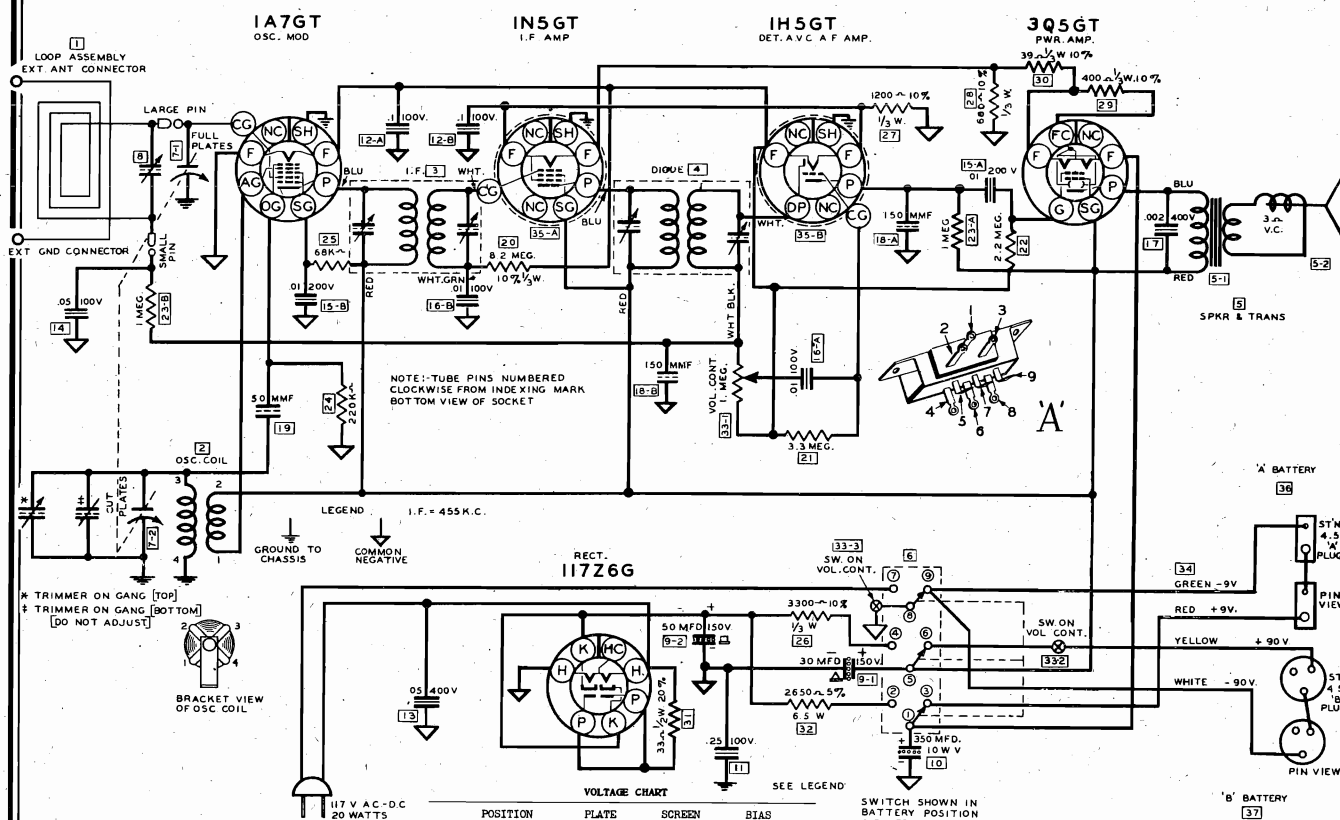
MODEL B-150

GALVIN MFG. CO.

MODELS 65BP1, 65BP2, 65BP3, 65BP4

MODELS 57BP1, 57BP2

CIRCUIT DIAGRAM MODELS 57BP1 & 2



Line Voltage - 117 Volts A.C.

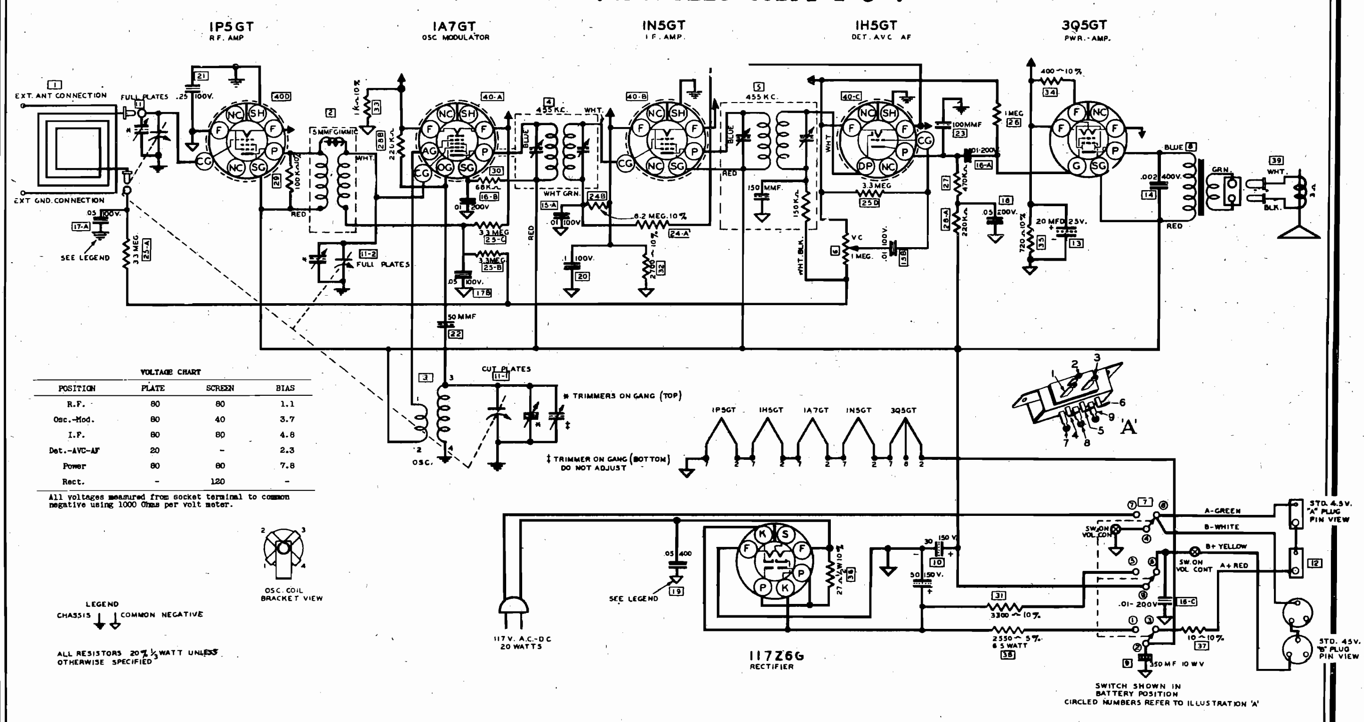
All voltages measured from socket terminal to common negative using 1000 Ohms per volt meter.

VOLTAGE CHART

POSITION	PLATE	SCREEN	BIAS
Osc.-Mod.	85	42	1.1
I.F.	85	85	3.7
Det.AVC.-AF	15	-	2.3
Power	85	87	8.5
Rect.	-	123	-

FOR OTHER DATA, SEE INDEX

CIRCUIT DIAGRAM MODELS 65BP1-2-3-4



VOLTAGE CHART

POSITION	PLATE	SCREEN	BIAS
R.F.	80	80	1.1
Osc.-Mod.	80	40	3.7
I.F.	80	80	4.8
Det.-AVC-AF	20	-	2.3
Power	80	80	7.8
Rect.	-	120	-

All voltages measured from socket terminal to common negative using 1000 Ohms per volt meter.

MODELS 57BP1,57BP2,60X1,60X2
60XA1,60XA2,60XW,61XW

GALVIN MFG. CO.

ALIGNMENT CHART MODELS 57BP1 & 2

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	Minimum 1720 K.C.	.1	Osc-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	200 Mmf.	External Antenna	5	1720 K.C.
3	1400 K.C.	200 Mmf.	External Antenna	6	1400 K.C.

Volume Control Set at Maximum

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 57BP1 & 2

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
4200	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
85	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
95	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
26	600	Ant. Terminal	400 Ohms	None	.38

Volume Control set at maximum.
* .05 Watts = .38 Volts.
** Output meter connected across voice coil.

ALIGNMENT CHART MODELS 65BP1-2-3-4

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	Minimum 1720 K.C.	.1	Osc-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	200 Mmf.	External Antenna	5	1720 K.C.
3	1400 K.C.	200 Mmf.	External Antenna	6	1400 K.C.
4	1400 K.C.	200 Mmf.	External Antenna	7	1400 K.C.

Volume Control Set at Maximum

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 65BP1-2-3-4

Average Microvolt Input *	Generator Set at	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
7100	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
185	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
200	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
11	600	R.F. Grid	.1 Mfd.	.5 Meg	.38
2	600	Ant. Terminal	400 Ohms	None	.38

Volume Control set at maximum.
* .05 Watts = .38 Volts.
** Output meter connected across voice coil.

ALIGNMENT CHART

MODELS 60X1 - 60X2 - 60XW - 60XA1 - 60XA2

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected to	Adjust Trimmer No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	Osc-Mod Grid	1-2-3-4-	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	Osc-Mod Grid	5	455 K.C.
3	Minimum 1720 K.C.	.1 Mfd.	Osc-Mod Grid	6	1720 K.C.
4	1400 K.C.	200 Mmf.	External Antenna Terminal	7	1400 K.C.

Volume Control set at Maximum
NOTE: Wave Trap adjustment set for minimum deflection on output meter.

ALIGNMENT CHART

MODEL 61XW

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected to	Adjust Trimmer No.	Generator Set At
1	Minimum 1600 K.C.	.1 Mfd.	B.C.	Osc-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum 1600 K.C.	.1 Mfd.	B.C.	Osc-Mod. Grid	5	455 K.C.
3	Minimum 1600 K.C.	.1 Mfd.	B.C.	Osc-Mod. Grid	6	1600 K.C.
4	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	7	1400 K.C.
5	3.2 M.C.	400 ohms	S.W.	External Antenna Terminal	8	3.2 M.C.

Volume Control set at Maximum
NOTE: Wave Trap adjustment set for minimum deflection on output meter.

VOLTAGE CHART

TUBE	PLATE	SCREEN	CATHODE
R.F.	80V	80V	2.2
Osc.-Mod.	80V	80V	0.0
I.F.	80V	80V	2.0
Det-AVC-A.F.	45V	-	0.0
Output	75V	80V	4.5
Rect.	AC	-	100V.

All voltages measured from common negative with 1000 ohm per volt meter.
Line voltage 117 Volts AC

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
6800	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
155	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
170	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
35	600	R.F. Grid	.1 Mfd.	.5 Meg	.38
6	600	Ant. Terminal	200 Mmf.	None	.38

Volume Control set at Maximum * .05 Watts = .38 Volts ** Output meter connected across voice coil.

ALIGNMENT CHART MODEL 83K1

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	5	1720 K.C.
3	600 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	6	600 K.C.
4	1400 K.C.	400 Ohms	B.C.	External Antenna Terminal	7	1400 K.C.
5	5.8 M.C.	.1 Mfd.	Pol.	Osc.-Mod.Grid	8	5.8 M.C.
6	4.1 M.C.	400 Ohms	Pol.	External Antenna Terminal	9	4.1 M.C.
7	18 M.C.	.1 Mfd.	S.W.	Osc.-Mod.Grid	10	18 M.C.
8	16 M.C.	400 Ohms	S.W.	External Antenna Terminal	11	16 M.C.

Volume Control Set at Maximum. Tone Control Set in Treble Position.

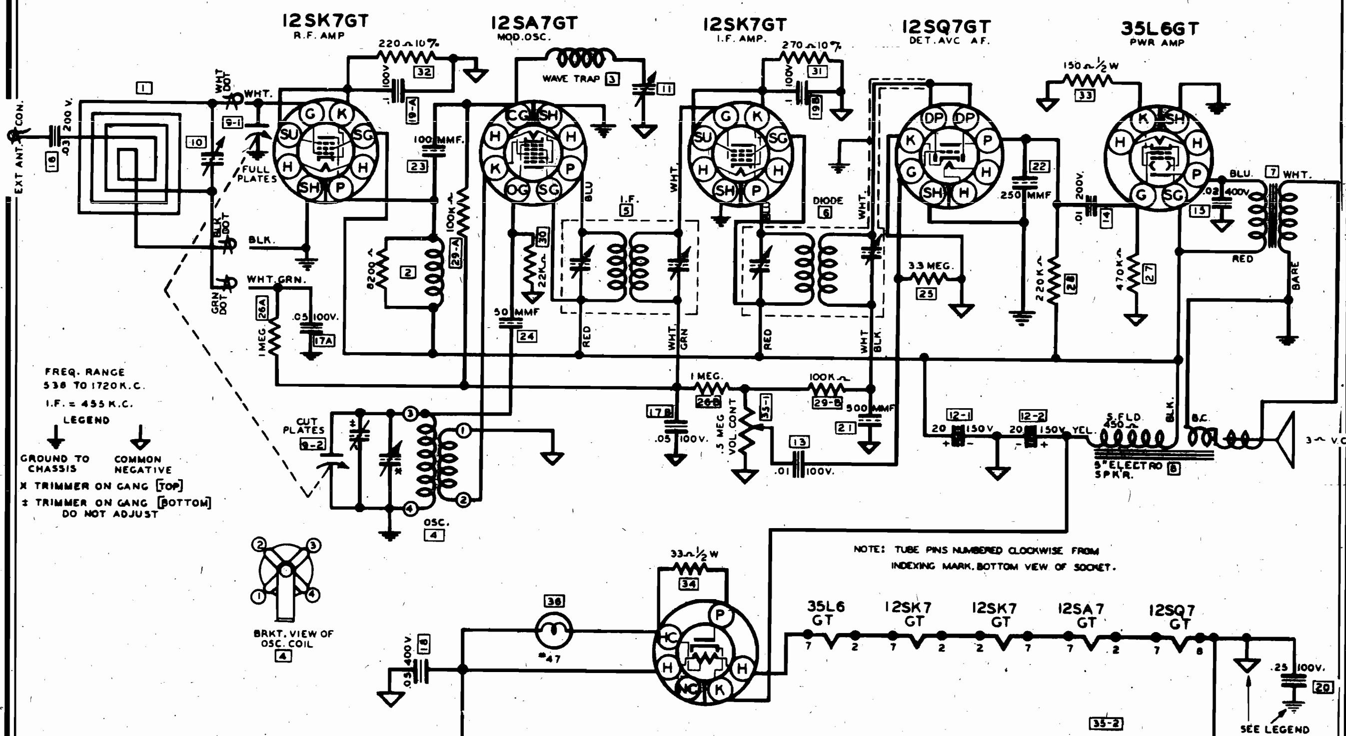
SENSITIVITY AND STAGE GAIN MEASUREMENTS MODEL 83K1

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3500	455	I.F. Grid	.1 Mfd.	.5 Meg.	.63
40	455	Mod. Grid	.1 Mfd.	.5 Meg.	.63
45	600	Mod. Grid	.1 Mfd.	.5 Meg.	.63
4	600	R.F. Grid	.1 Mfd.	.5 Meg.	.63
3	600	Antenna Terminal	400 Ohms	None	.63

Volume Control Set at Maximum. ** Output meter connected across voice coil.
* .05 Watts = .63 Volts

MODELS 60X1, 60X2, 60XW

GALVIN MFG. CO.



MODELS 60X1, 60X2, and 60XW

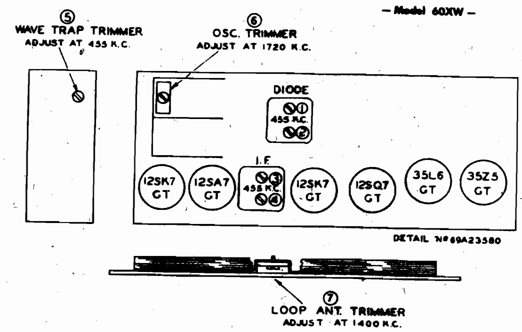
I.F. PEAK 455 KC

FOR OTHER DATA, SEE INDEX

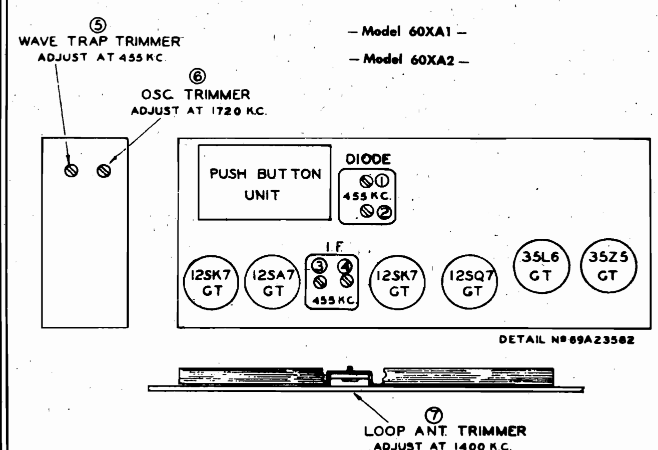
MODELS 60X1, 60X2 & 60XW SCHEMATIC DIAGRAM PARTS LIST

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
1	1X20674	Back & Loop Assembly (Used on 60X1 Only)	19-B	889814	Tubular Condenser (.1-100V.)
	1X20922	Back & Loop Assembly (Used on 60X2 Only)	20	889810	Tubular Condenser (.25-100V.)
	1X21129	Back & Loop Assembly (Used on 60XW Only)	21	21B6500	Molded Mica Condenser (500 Mmf.) 20%
2	24A20559	R.F. Coupling Coil (Gray-Red)	22	21B6517	Molded Mica Condenser (250 Mmf.) 20%
3	24A21858	Wave Trap Coil	23	21B6511	Molded Mica Condenser (100 Mmf.) 20%
4	24A20509	Oscillator Coil (Green-Black Dot)	24	21B6503	Molded Mica Condenser (50 Mmf.) 20 %
5	1X20646	I.F. Coil & Shield Assembly	25	6B6179	Carbon Resistor (3.3 Meg.-1/3-20)N.I.
6	1X20643	Diode Coil & Shield Assembly	26-A	6B6071	Carbon Resistor (1.0 Meg.-1/3-20)N.I.
7	25A20503	Output Transformer	26-B	6B6071	Carbon Resistor (1.0 Meg.-1/3-20)N.I.
8	50B20653	Speaker (5" Electro)	27	6B6011	Carbon Resistor (470,000-1/3-20)N.I.
9	1X20506	Gang & Pulley Assembly	28	6B6005	Carbon Resistor (220,000-1/3-20)N.I.
10	20A18740	Trimmer & "U" Bracket (on loop assembly)	29-A	6B6029	Carbon Resistor (100,000-1/3-20)N.I.
11	20X21878	Trimmer Condenser	29-B	6B6029	Carbon Resistor (100,000-1/3-20)N.I.
12	23A20504	Elect. Cond. & Strap (20-20 MFD/150V.)	30	6B6050	Carbon Resistor (22,000-1/3-20)N.I.
13	889801	Tubular Condenser (.01-100V.)	31	6B6197	Carbon Resistor (270-1/3-10)N.I.
14	889825	Tubular Condenser (.01-200V.)	32	6B6295	Carbon Resistor (220-1/3-10)N.I.
15	889802	Tubular Condenser (.02-400V.)	33	6B6293	Carbon Resistor (150-1/2-20)N.I.
16	889833	Tubular Condenser (.03-200V.)(On loop assem.)	34	6B6067	Carbon Resistor (33-1/2-20)N.I.
17-A	889805	Tubular Condenser (.05-100V.)	35	18A14629	Volume Control & Switch (.5 Meg.)
17-B	889805	Tubular Condenser (.05-100V.)	36	65X11854	Bulb (Brown Bead) #47
18	899816	Tubular Condenser (.05-400V.)			
19-A	889814	Tubular Condenser (.1-100V.)			

— Model 60X1 —
— Model 60X2 —
— Model 60XW —



— Model 60XA1 —
— Model 60XA2 —



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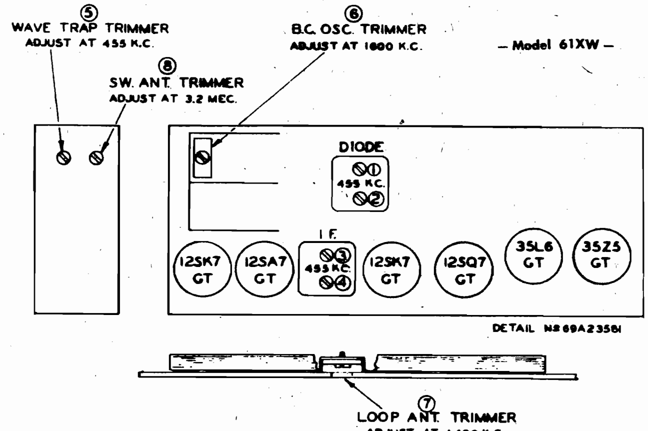
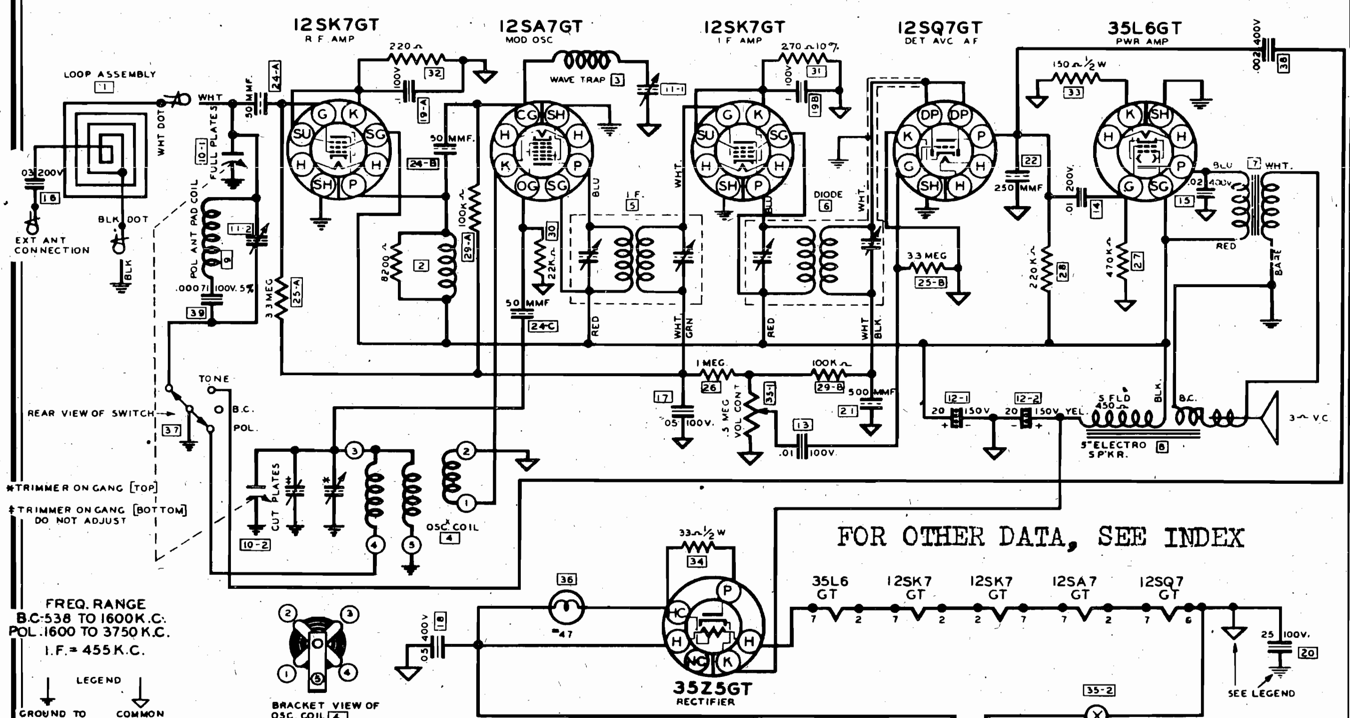


MODELS 60XA1, 60XA2, 61XW

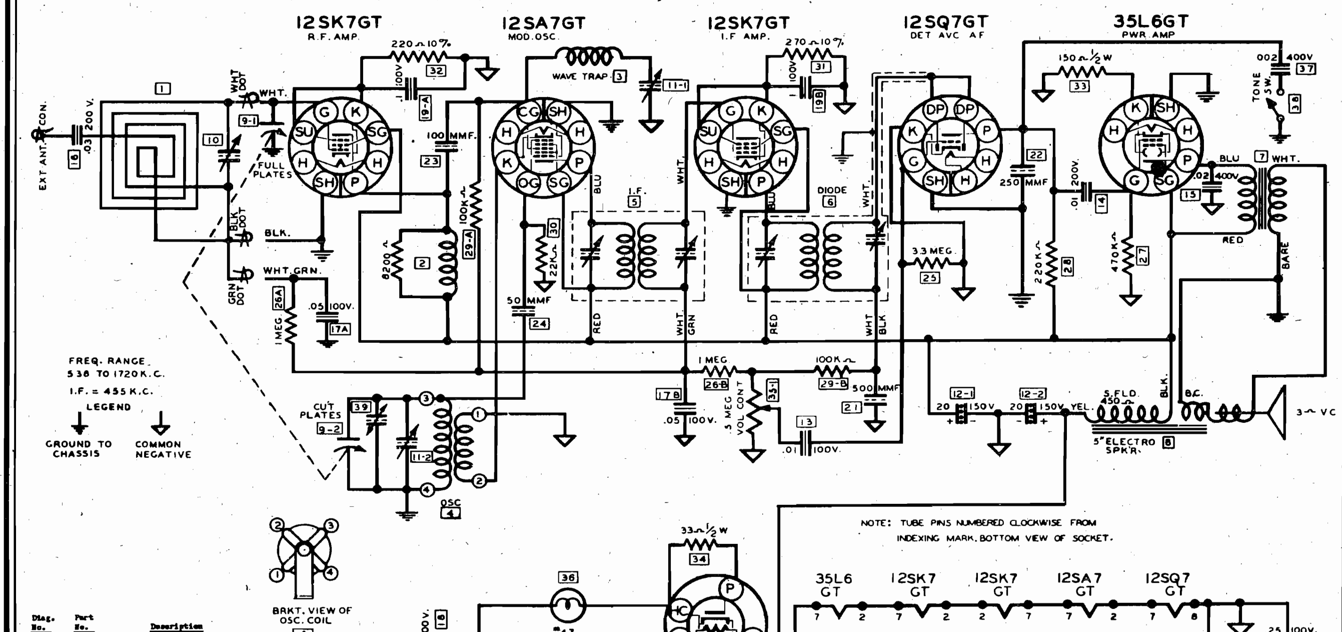
GALVIN MFG. CO.



Diag. No.	Part No.	Description
1	1X20757	Back & Loop Assembly
2	24A20559	R.F. Coupling Coil (Gray-Red)
3	24A21858	Wave Trap Coil
4	24A19644	Osc. Coil (Ceramic)(Yel-Blue Dot)
5	1X20646	I.F. Coil & Shield Assembly
6	1X20643	Diode Coil & Shield Assembly
7	25A20503	Output Transformer
8	50B20653	Speaker (5" Electro)
9	24A19645	Police Ant. Padder Coil
10	1X20506	Gang & Pulley Assembly
11	20A14870	Double Trimmer & "L" Bracket
12	23A20504	Elect. Cond. & Strap (20-20/150V.)
13	8S9801	Tubular Condenser (.01-100V.)
14	8S9825	Tubular Condenser (.01-200V.)
15	8S9802	Tubular Condenser (.02-400V.)
16	8S9833	Tubular Condenser (.03-200V.) On Loop Assembly.
17	8S9805	Tubular Condenser (.05-100V.)
18	8S9816	Tubular Condenser (.05-400V.)
19-A	8S9814	Tubular Condenser (.1-100V.)
19-B	8S9814	Tubular Condenser (.1-100V.)
20	8S9810	Tubular Condenser (.25-100V.)
21	21B6500	Molded Mica Cond. (500 MMF) 20%
22	21B6517	Molded Mica Cond. (250 MMF) 20%
24-A	21B6503	Molded Mica Cond. (50 MMF) 20%
24-B	21B6503	Molded Mica Cond. (50 MMF) 20%
24-C	21B6503	Molded Mica Cond. (50 MMF) 20%
25-A	6B6179	Carbon Resistor (3.3 Meg-1/3-20)N.I.
25-B	6B6179	Carbon Resistor (3.3 Meg-1/3-20)N.I.
26	6B6071	Carbon Resistor (1.0 Meg-1/3-20)N.I.
27	6B6011	Carbon Resistor (470,000-1/3-20)N.I.
28	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
29-A	6B6029	Carbon Resistor (100,000-1/3-20)N.I.
29-B	6B6029	Carbon Resistor (100,000-1/3-20)N.I.
30	6B6050	Carbon Resistor (22,000-1/3-20)N.I.
31	6B6197	Carbon Resistor (270-1/3-10)N.I.
32	6B6292	Carbon Resistor (220-1/3-20)N.I.
33	6B6293	Carbon Resistor (150-1/2-20)N.I.
34	6B6067	Carbon Resistor (33-1/2-20)N.I.
35	18A14629	Volume Control & Switch (.5 Meg.)
36	65X11854	Bulb (Brown Bead) #47
37	40A19633	Band Switch (3 Pos. Rotary)
38	8S9824	Tubular Condenser (.002-400V.)
39	8A19661	Poly. Tub. Cond. (.00071-100V.) 5%

Motorola

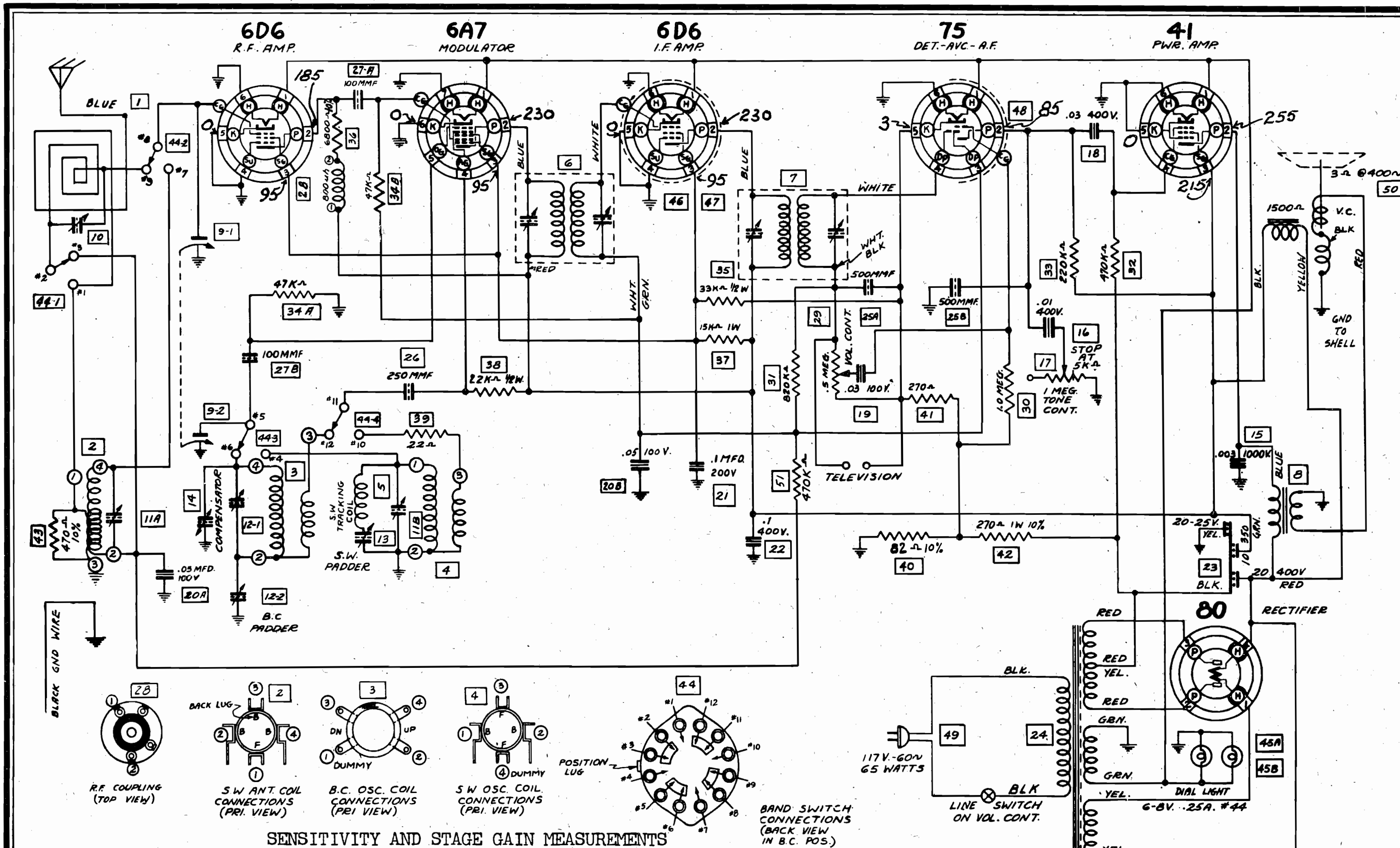
MODEL 61XW



Diag. No.	Part No.	Description
1	1X20674	Back & Loop Assembly (Used on 60XA1 Only)
	1X20922	Back & Loop Assembly (Used on 60XA2 Only)
	1X21129	Back & Loop Assembly (Used on 60XAW Only)
2	24A20559	R.F. Coupling Coil (Gray-Red)
3	24A21858	Wave Trap Coil
4	24A20509	Oscillator Coil (Green-Black Dot)
5	1X21940	I.F. Coil & Shield Assembly
6	1X20643	Diode Coil & Shield Assembly
7	25A20503	Output Transformer
8	50B20653	Speaker (5" Electro)
9	1X20876	Tuning Unit & Pulley Assembly
10	20A18740	Trimmer & "U" Bracket (On loop assembly)
11	20A14870	Double Trimmer & "L" Bracket
12	23A20504	Elect. Cond. & Strap (20-20Mfd./150V.)
13	8S9801	Tubular Condenser (.01-100V.)
14	8S9825	Tubular Condenser (.01-200V.)
15	8S9802	Tubular Condenser (.02-400V.)
16	8S9833	Tubular Condenser (.03-200V.) On loop Assem.)
17-A	8S9805	Tubular Condenser (.05-100V.)
17-B	8S9805	Tubular Condenser (.05-100V.)
18	8S9816	Tubular Condenser (.05-400V.)
19-A	8S9814	Tubular Condenser (.1-100V.)
19-B	8S9814	Tubular Condenser (.1-100V.)
20	8S9810	Tubular Condenser (.25-100V.)
21	21B6500	Molded Mica Condenser (500 MMF) 20%
22	21B6517	Molded Mica Condenser (250 MMF) 20%
23	21B6511	Molded Mica Condenser (100 MMF) 20%
24	21B6503	Molded Mica Condenser (50 MMF) 20%
25	6B6179	Carbon Resistor (3.3 Meg-1/3-20)N.I.
26-A	6B6071	Carbon Resistor (1.0 Meg-1/3-20)N.I.
26-B	6B6071	Carbon Resistor (1.0 Meg-1/3-20)N.I.
27	6B6011	Carbon Resistor (470,000-1/3-20)N.I.
28	6B6003	Carbon Resistor (220,000-1/3-20)N.I.
29-A	6B6029	Carbon Resistor (100,000-1/3-20)N.I.
29-B	6B6029	Carbon Resistor (100,000-1/3-20)N.I.
30	6B6050	Carbon Resistor (22,000-1/3-20)N.I.
31	6B6197	Carbon Resistor (270-1/3-10)N.I.
32	6B6295	Carbon Resistor (220-1/3-10)N.I.
33	6B6293	Carbon Resistor (150-1/2-20)N.I.
34	6B6067	Carbon Resistor (33-1/2-20)N.I.
35	18A14629	Volume Control & Switch (.5 Meg)
36	65X11854	Bulb (Brown Bead) #47
37	8S9824	Tubular Condenser (.002-400V.)
38	40A16939	Tone Switch
39	20K21592	Compensator

MODELS 60XA1, 60XA2

GALVIN MFG. CO.



SENSITIVITY AND STAGE GAIN MEASUREMENTS

AVERAGE MICROVOLTS INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
2800	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
30	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
35	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
7	600	R.F. Grid	.1 Mfd.	.5 Meg	.38
2	600	Ant. Terminal	400 Ohms	None	.38

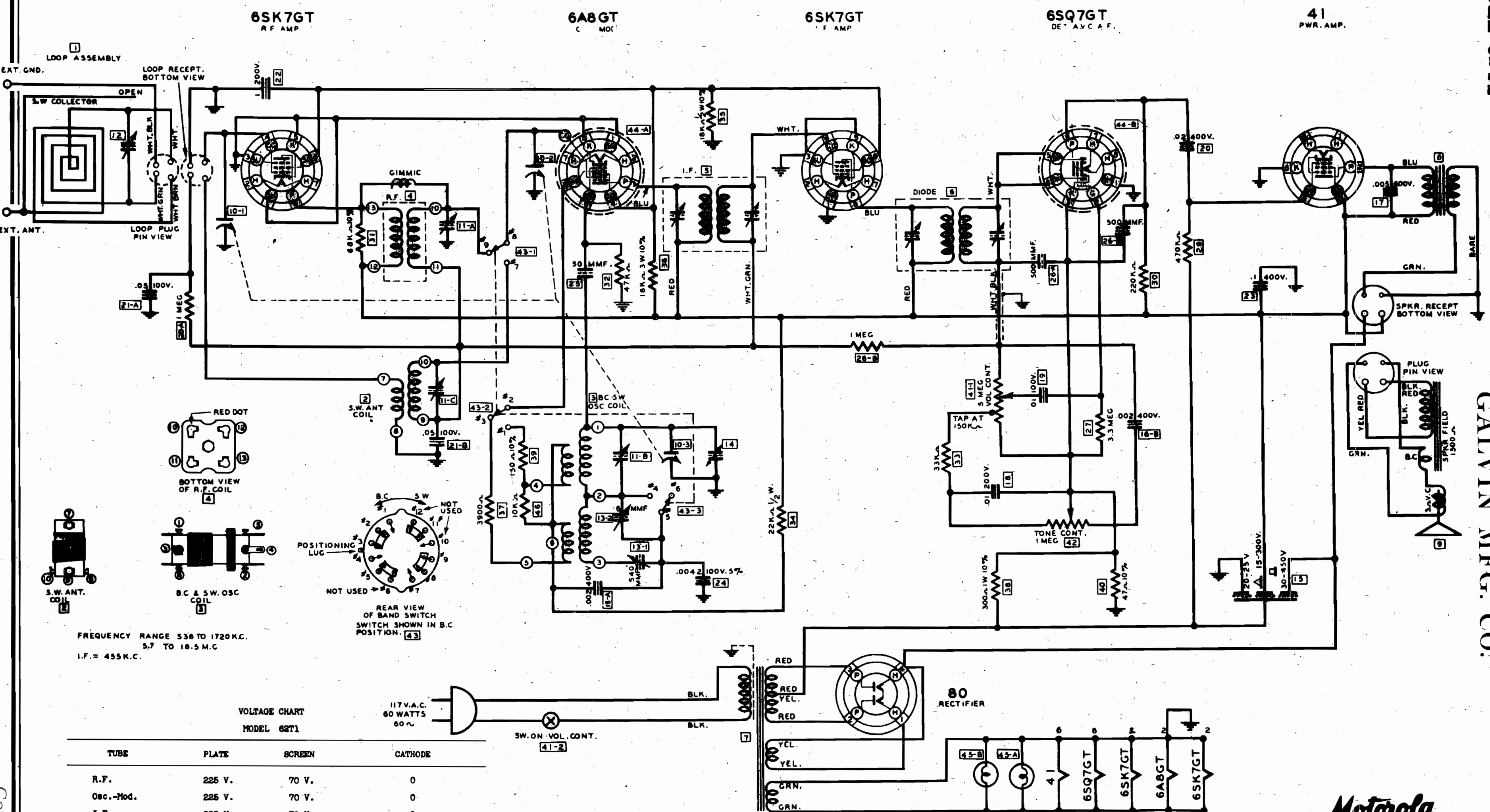
Volume Control set at maximum. * .05 Watts = .38 Volts ** Output meter connected across voice coil.
Tone Control set in treble position.

VOLTAGE
Measurements from socket terminal to chassis ground using 1000 ohms per volt meter.
Line Voltage - 117 Volts.

FOR ALIGNMENT, SEE MODEL 61D (with loop) Vol. XI

MODEL 62 T1

GALVIN MFG. CO.



VOLTAGE CHART

MODEL 62T1

TUBE	PLATE	SCREEN	CATHODE
R.F.	225 V.	70 V.	0
Osc.-Mod.	225 V.	70 V.	0
I.F.	225 V.	70 V.	0
Det.-AVC-AF	80 V.	-	-2.5 V.
Pwr.-Amp.	215 V.	225 V.	0
Rectifier	A.C.	-	300 V. (From fil.)

Measurements from socket terminal to chassis ground using 1000 ohms per volt meter.
Line Voltage - 117 Volts A.C.

Motorola MODEL 62T1

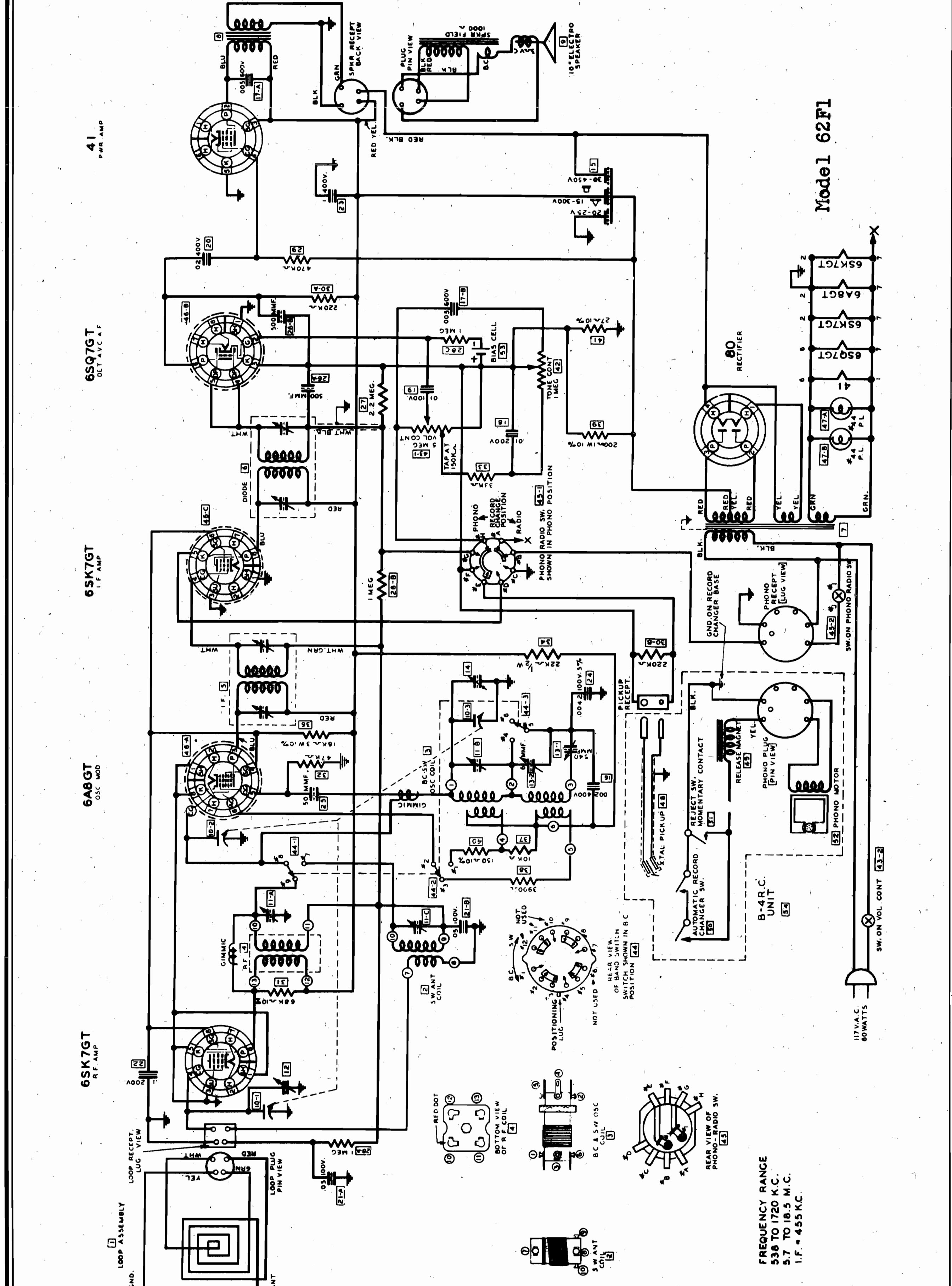
455 KC

I.F. PEAK

FOR OTHER DATA SEE INDEX

MODEL 62F1

GALVIN MFG. CO.



MODELS 62F1,83F1

GALVIN MFG. CO.

ALIGNMENT CHART MODEL 62F1

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	5	1720 K.C.
3	538 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	6	538 K.C.
4	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	7	1400 K.C.
5	18 M.C.	.1 Mfd.	S.W.	Osc-Mod.Grid	8	18 M.C.
6	16 M.C.	400 Ohms	S.W.	External Antenna Terminal	9	16 M.C.
7	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	10	1400 K.C.

Volume Control Set at Maximum.

ALIGNMENT CHART MODEL 83F1

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	B.C.	Osc.Mod. Grid	1-2-3-4	455 K.C.
2	1720 K.C.	400 Ohms	B.C.	Ext. Ant. Con. Clip	5	1720 K.C.
3	1400 K.C.	400 Ohms	B.C.	Ext. Ant. Con. Clip	6	1400 K.C.
4	* 600 K.C.	400 Ohms	B.C.	Ext. Ant. Con. Clip	7	600 K.C.
5	5.8 M.C.	400 Ohms	Pol.	S.W. Collector Clip on Loop	8	5.8 M.C.
6	4.1 M.C.	400 Ohms	Pol.	S.W. Collector Clip on Loop	9	4.1 M.C.
7	18.0 M.C.	400 Ohms	S.W.	S.W. Collector Clip on Loop	10	18.0 M.C.
8	16.0 M.C.	400 Ohms	S.W.	S.W. Collector Clip on Loop	11	16.0 M.C.

Volume Control Set at Maximum.
* Rock condenser until a combination is found which gives the highest output reading.

VOLTAGE CHART MODEL 62F1

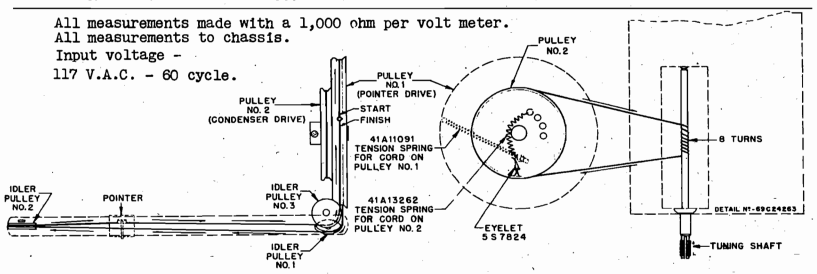
POSITION	PLATE	SCREEN	CATHODE
R.F.	220 V.	80 V.	0
Osc.-Mod.	220 V.	80 V.	0
I.F. Amp.	220 V.	80 V.	0
Det.-AVC.-A.F.	85 V.	-	-1.5 V.
Pwr. Amp.	210 V.	220 V.	0
Rect.	AC	-	280 V. from filament

All measurements made with a 1000 ohm per volt meter.
All measurements to chassis. Input voltage - 117 V. A.C. - 60 cycle.

VOLTAGE CHART MODEL 83F1

POSITION	PLATE	SCREEN	CATHODE
R.F. Amp.	225 V.	90 V.	0
Osc. Mod.	225 V.	90 V.	0
I.F. Amp.	225 V.	90 V.	0
Det. AVC. AF	125 V.	-	-4 V.
Phase Inv.	125 V.	-	-4 V.
Pwr. Amp.	225 V.	235 V.	12 V.
Pwr. Amp.	225 V.	235 V.	12 V.
Rectifier	330 V. AC	-	325 V. from filament

All measurements made with a 1,000 ohm per volt meter.
All measurements to chassis.
Input voltage -
117 V.A.C. - 60 cycle.



MODEL 62F1 SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2500	455 K.C.	I.F. Grid	.1	.5 Meg.	.38 Volts
35	455 K.C.	Mod. Grid	.1	.5 Meg.	.38 Volts
40	600 K.C.	Mod. Grid	.1	.5 Meg.	.38 Volts
4	600 K.C.	R.F. Grid	.1	.5 Meg.	.38 Volts
3	600 K.C.	Ant. Terminal	200 Mmf.	None	.38 Volts

Volume Control Set at Maximum. Tone Control set at Treble position.
* .05 Watts = .38 Volts. ** Output meter connected across voice coil.

MODEL 83F1 SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3500	455 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	.63 Volts
40	455 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	.63 Volts
45	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	.63 Volts
4	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	.63 Volts
3	600 K.C.	Ant. Terminal	400 Ohms	None	.63 Volts

Volume Control Set at Maximum. Tone Control set at Treble position.
* .05 Watts = .63 Volts. ** Output meter connected across voice coil.

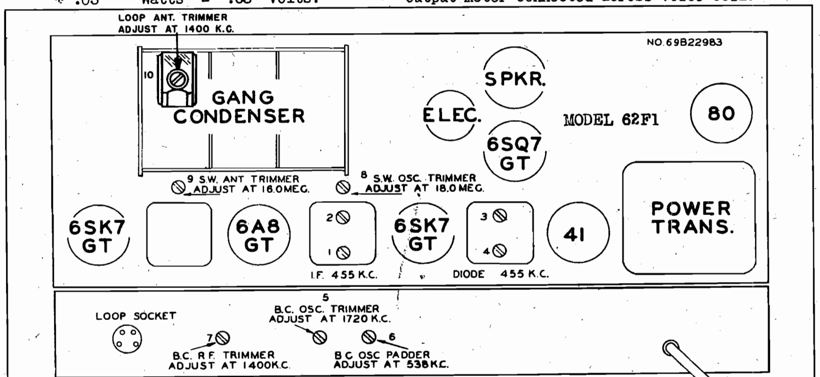


Fig. 1

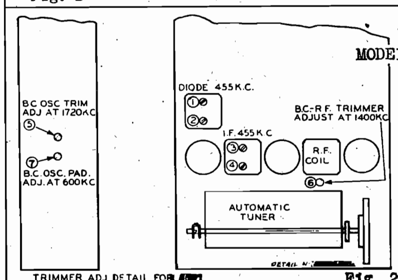


Fig. 2

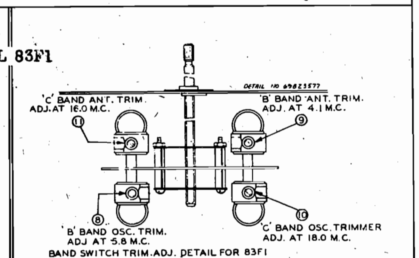
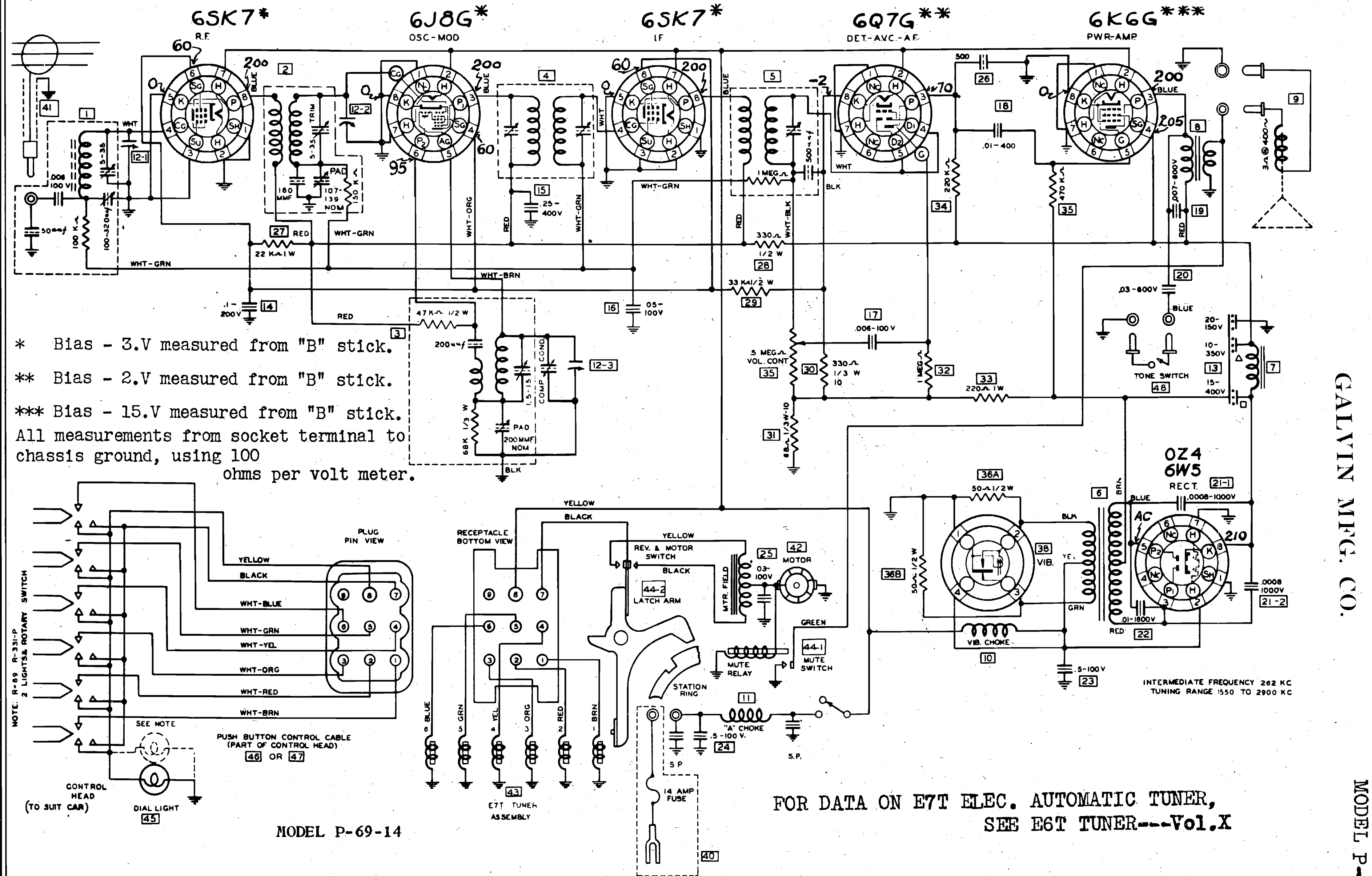


Fig. 3

MODEL P-69-14

GALVIN MFG. CO.

Battery voltage 6.3 V. Current consumption 5.1 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 100 ohms per volt meter.

FOR DATA ON E7T ELEC. AUTOMATIC TUNER, SEE E6T TUNER---Vol.X

MODEL P-69-14

Model P-69-14 is a variable frequency receiver, designed to cover the Police Bands between 1550 K.C. and 2900 K.C. It is equipped with a 6-button electric automatic tuner so that any of six pre-selected police transmitters can be tuned in automatically..

MODEL P-69-14

GALVIN MFG. CO.

POLICE CRUISER Model P-69-14

ANTENNA ADJUSTMENT

Proceed as follows:

1. Turn the receiver to maximum volume.

2. Turn the dial to a spot near 1600 K.C. that is entirely free from stations.

3. With a screw driver, adjust the antenna trimmer screw for maximum noise level.

4. After first trimming on noise level, tune in a weak station near 1600 K.C. and check the accuracy of the adjustment by readjusting the trimmer for maximum volume.

The antenna trimmer screw may be reached through a small hole in the receiver housing. Replace the plug button after adjustment.

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 be run at any time during the "setting up" procedure.

1. Loosen the AUTOMATIC LOCKING SCREW which can be reached by removing a plug button in the receiver housing. This screw should be turned counter-clockwise four or five revolutions - far enough to assure plenty of looseness.

2. Turn the dial all the way to the low frequency end (1550 K.C.)

3. Press the first button and hold it down. A faint "click" should be heard, indicating that the tuning magnet has attracted the latch bar.

4. Holding the magnet energized, turn the dial manually all the way to the high frequency end (2900 K.C.) and then all the way back to the low frequency end (1550 K.C.).

5. Still pressing on the button, tune in the station to be set on that button.

6. Proceed to set the remaining five stations. For each station follow steps 2, 3, 4, and 5, as outlined above. AT NO TIME IN THE SETTING UP PROCEDURE SHOULD THE TUNING MOTOR BE PERMITTED TO RUN.

7. 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.

8. Replace the plug button, making sure the spring contact in it touches the locking screw. This is essential for motor noise reasons.

9. Push the plug all the way into the receptacle on the receiver housing so the short motor pin will also make contact.

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 R.F. coil can that is covered with Scotch Tape. The original adjustment, made in the factory, should not be tampered with. (Fig. 3 below, shows all trimmer locations.)

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6J8G) 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. 2). 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 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 adjustment several times for maximum accuracy.

R.F. ALIGNMENT

1. Connect the signal generator to the antenna terminal through a 150 MMF condenser.

2. Set the signal generator at 2900 K.C. and with the condenser gang completely out of mesh adjust the 2900 K.C. trimmer in the oscillator coil can to the point showing the highest output reading.

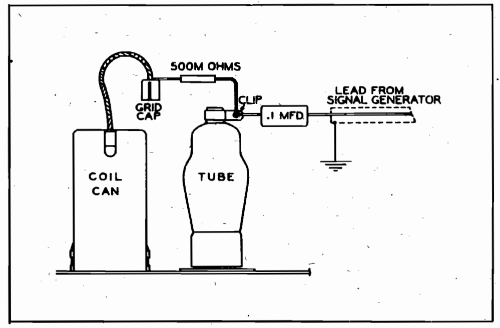


Figure 2

3. Set the signal generator at 1550 K.C. Turn the condenser gang completely in mesh and adjust the 1600 K.C. padder 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.

4. Set the signal generator at 1600 K.C. and turn the condenser gang until the signal is heard. Adjust the 1600 K.C. padder on the antenna coil can for the maximum output reading.

5. Set the signal generator at 2800 K.C. Turn the condenser gang until the signal is heard. Adjust the 2800 K.C. trimmer in the antenna coil can, for maximum output reading.

6. Adjust the 2800 K.C. trimmer in the R.F. coil can for maximum output reading.

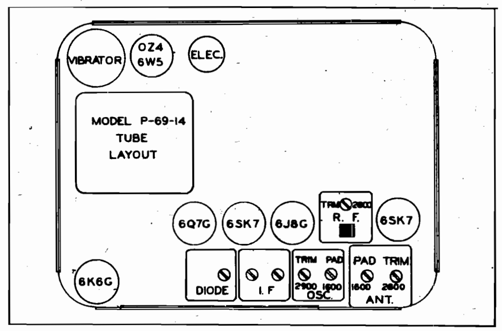
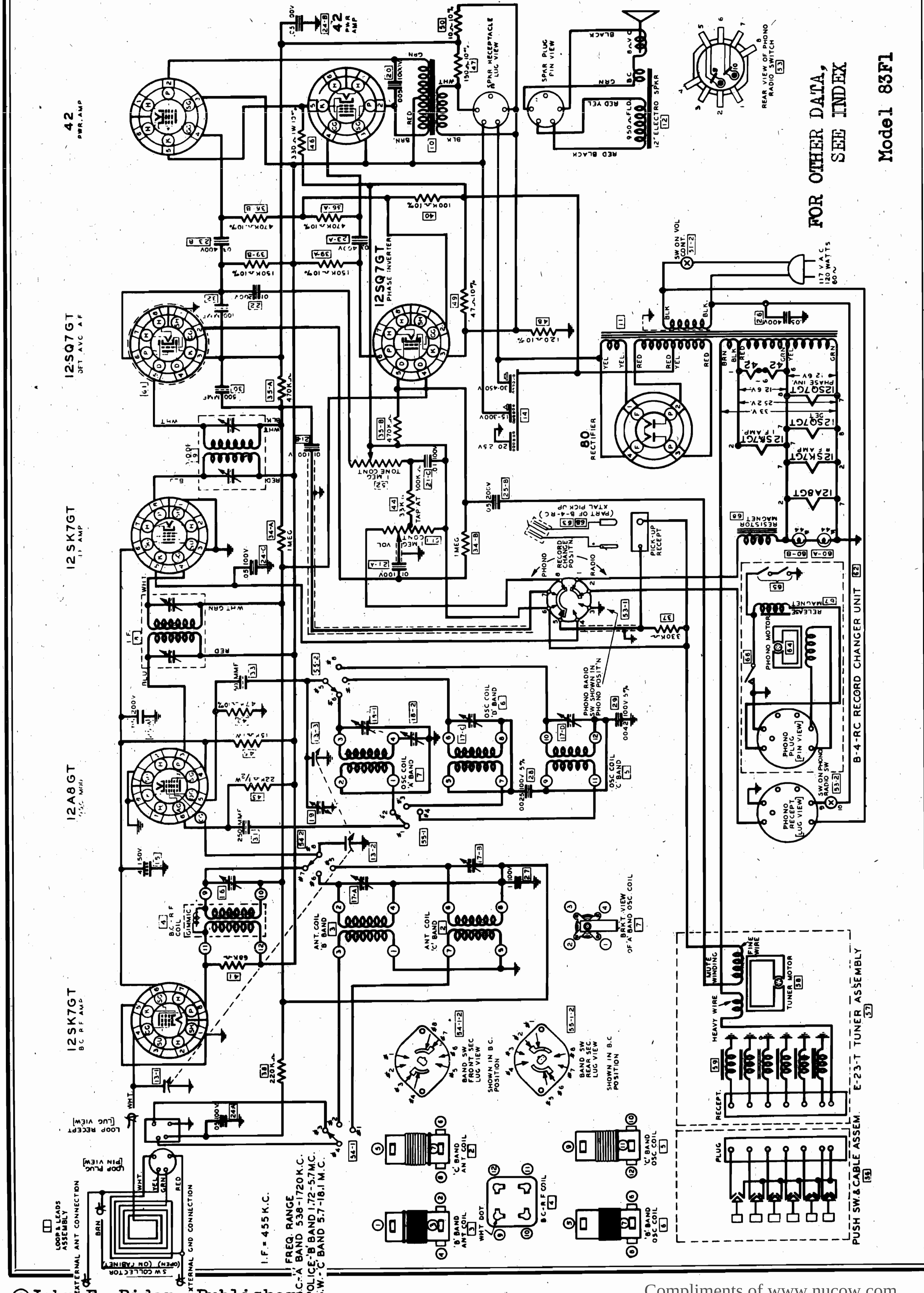


Figure 3

GALVIN MFG. CO.

MODEL 83F1



MODELS 83K1
103K1. 103CK2

GALVIN MFG. CO.

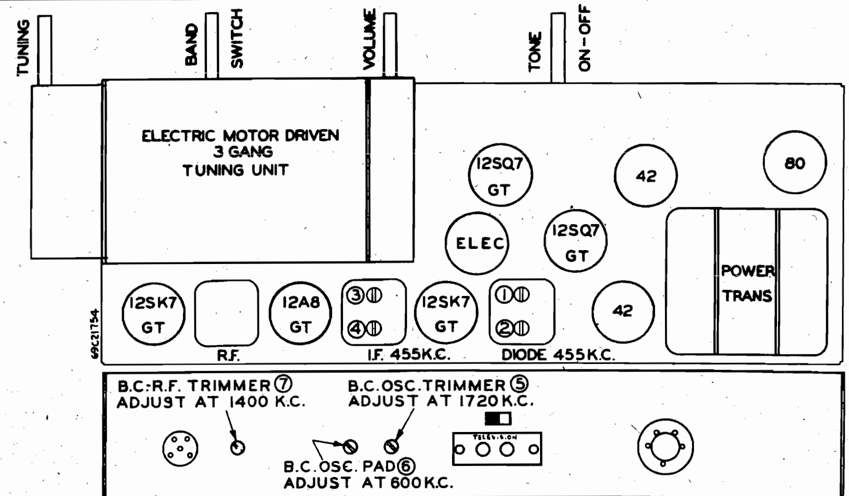
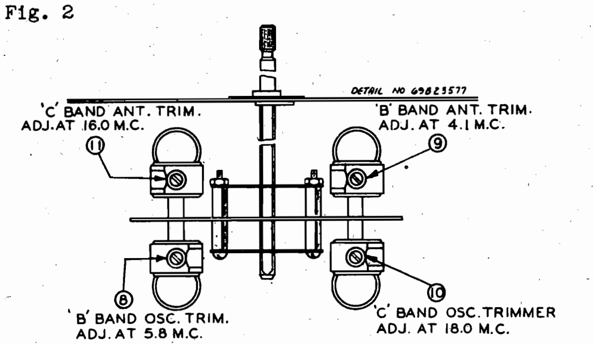


Fig. 1

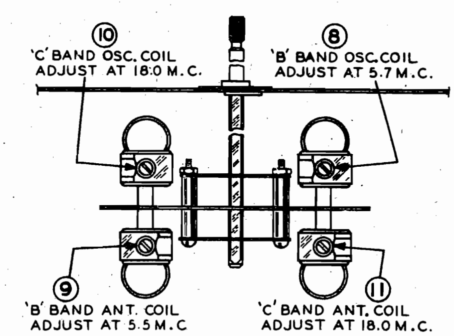
TRIMMER ADJ. DETAIL FOR 83K1

Fig. 2



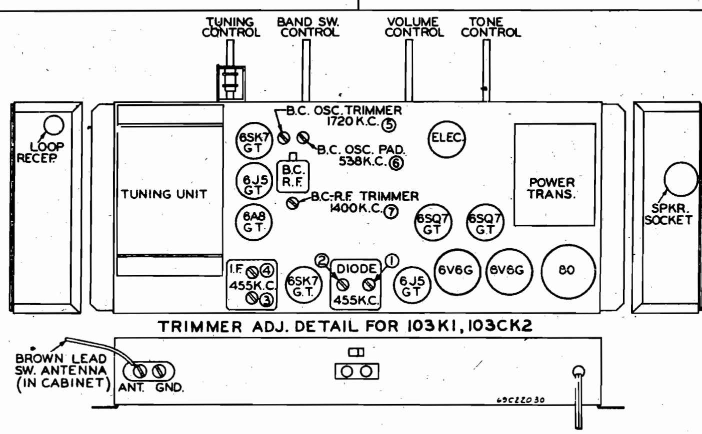
BAND SWITCH TRIM. ADJ. DETAIL FOR MODEL 83K1

Fig. 3



BAND SWITCH TRIMMER ADJ. FOR 103K1, 103CK2

Fig. 4



TRIMMER ADJ. DETAIL FOR 103K1, 103CK2

VOLTAGE CHART

MODEL 83K1

POSITION	PLATE	SCREEN	CATHODE
R.F. Amp.	235 V.	95 V.	0
Osc.-Mod.	235 V.	95 V.	0
I.F. Amp.	235 V.	95 V.	0
Det.AVC.A.F.	135 V.	--	-5.5 V.
Phase Inv.	135 V.	--	-5.5 V.
Pwr. Amp.	225 V.	235 V.	9.0 V.
Pwr. Amp.	225 V.	235 V.	9.0 V.
Rectifier	325 V. AC	--	320 V.(from filament)

Measurements from socket terminal to chassis ground using 1000 Ohms per volt meter.
Line Voltage - 117 Volts.

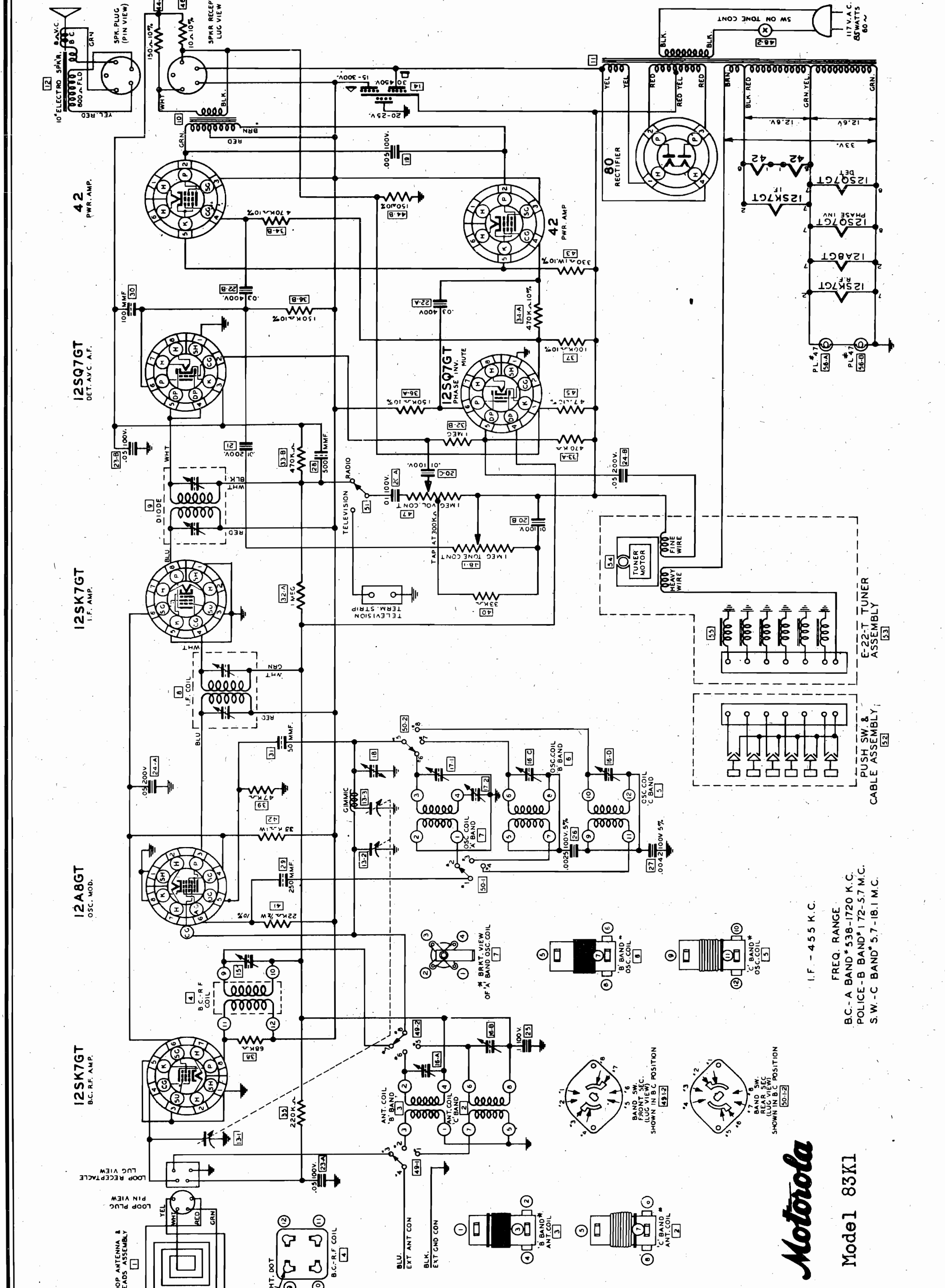
VOLTAGE CHART MODELS 103K1 AND 103CK2

POSITION	PLATE	SCREEN	CATHODE
R.F. Amp.	200 V.	80 V.	1.5 V.
Mixer	265 V.	80 V.	1.5 V.
Osc.	130 V.	-	0
I.F. Amp.	265 V.	80 V.	1.5 V.
Det. AVC.	-	-	-
A.F. Amp.	135 V.	-	0
Phase Inv.	100 V.	-	0
Pwr. Amp.	300 V.	265 V.	15. V.
Pwr. Amp.	300 V.	265 V.	15. V.
Rectifier	355 V. A.C.	-	380 V.(from filament)

Measurements from socket terminal to chassis ground using 1000 Ohms per volt meter.
Line Voltage - 117 Volts.

GALVIN MFG. CO.

MODEL 83K1



MODELS 83K1
103K1, 103CK2

GALVIN MFG. CO.

TO RESTRING DIAL DRIVE CORDS
Model 83K1

TUNING CORD

1. Cut a length of 24 lb. test silk fish cord 40" long.
2. Turn gang to fully meshed position.
3. Thread end of cord through hole in Gang Drive Pulley. Fasten temporarily in place with an ordinary paper clip. ("A" START.) See Fig. 5.
4. Run cord down to Tuning Shaft.
5. Wind cord counter-clockwise six full turns around Tuning Shaft.
6. Bring end of cord up to Gang Drive Pulley.
7. Wind cord counter-clockwise 1½ turns around Gang Drive Pulley and thread cord through hole. ("A" FINISH)
8. Tie end of cords securely to one end of the Tension Spring (Part No. 41A13262).
9. Hook other end of Tension Spring through center hole in pulley.

POINTER CORD

1. Cut a length of 24 lb. test silk fish cord 40" long.
2. Thread end of cord through hole in Pointer Drive Pulley. ("B" START.) Fasten temporarily in place with an ordinary paper clip.
3. Run cord around Idler Pulley No. 1.
4. Continue cord across top of dial and counter-clockwise around Idler Pulley No. 2.
5. Continue cord across back of dial scale to Idler Pulley No. 3.
6. Continue cord around Idler Pulley No. 3 to Pointer Drive Pulley.
7. Wind cord 1½ turns around Pointer Drive Pulley. (Counter-clockwise)
8. Thread cord through hole in pulley. ("B" FINISH)
9. Tie both ends securely to hook on Tension Spring (Part No. 41A11091).
10. Hook other end of spring to center hole in pulley.
11. Replace Dial Pointer.
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 or a good grade of household cement.

PLACE A DROP OF SHELLAC OR A GOOD GRADE OF HOUSEHOLD CEMENT ON ALL CORD KNOTS.

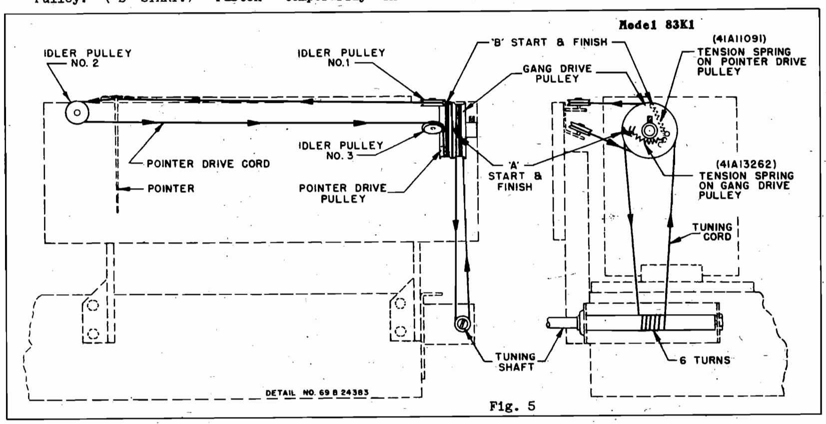


Fig. 5

MODEL 103K1

TUNING CORD

1. Turn gang to fully meshed position.
2. Thread end of Tuning Drive Cord (Part No. 1X24246) through hole in Dial Cord Raceway ("A" START).
3. Wind 9½ turns (clockwise) on Dial Cord Raceway and bring end up to Gang Drive Pulley.
4. Thread end of cord through slot in Gang Drive Pulley ("A" FINISH). Fasten temporarily with an ordinary paper clip.
5. Thread end of second tuning drive cord (Part No. 1X24246) through hole in Dial Cord Raceway ("B" START).
6. Wind 1½ turns (counter-clockwise) on Dial Cord Raceway and bring end up to gang drive pulley.
7. Wind cord 1-2/3 turns in a counter-clockwise direction on gang drive pulley and thread through slot in gang drive pulley ("B" FINISH).
8. Tie ends of tuner drive cords securely to springs (Part No. 41A14759) and hook other ends of springs through center hole of gang drive pulley.
9. Slip the two split lead "B-B-S-" over the cord as shown in the illustration. Clamp tightly with a pair of pliers.

POINTER CORD

1. Take the Pointer Drive Cord (Part No. 1X24248) and thread both ends through the hole in the Pointer Drive Pulley. Use the hole shown in the illustration.
2. Wind long end of the Pointer Cord counter-clockwise on Pointer Drive Pulley.
3. Run cord over idler Pulley No. 1.
4. Continue to Idler Pulley No. 2. (See illustration).
5. Continue across the dial to Idler Pulley No. 3.
6. Continue cord counter-clockwise around Idler Pulley No. 3.
7. Fasten one end of the tension spring (Part No. 41A19231) securely to the cord in the position shown in illustration.
8. Wind other end of Pointer cord clockwise 2 turns and tie securely to the other end of the tension spring. Do not make the pointer cord too tight.
9. Replace dial pointer.
10. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
11. Secure pointer to string with a drop of shellac or a good grade of household cement.

PLACE A DROP OF SHELLAC OR HOUSEHOLD CEMENT ON ALL KNOTS.

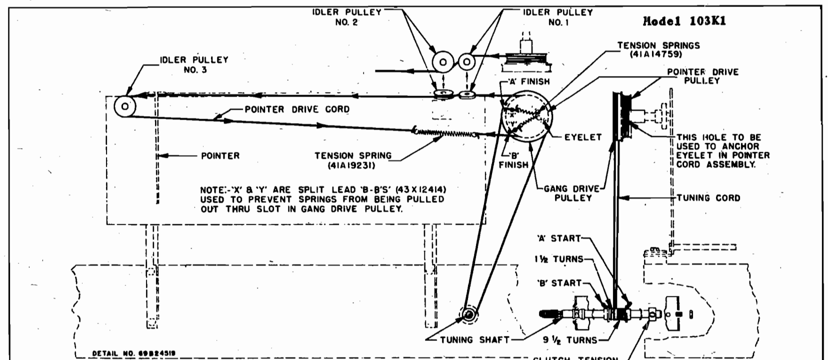


Fig. 6

MODEL 103CK2

TUNING CORD

1. Turn gang to fully meshed position.
2. Thread end of Tuning Drive Cord (Part No. 1X24246) through hole in Dial Cord Raceway ("A" START).
3. Wind 9½ turns (clockwise) on Dial Cord Raceway and bring end up to Gang Drive Pulley.
4. Thread end of cord through slot in Gang Drive Pulley ("A" FINISH). Fasten temporarily with an ordinary paper clip.
5. Thread end of second tuning drive cord (Part No. 1X24246) through hole in Dial Cord Raceway ("B" START).
6. Wind 1½ turns (counter-clockwise) on Dial Cord Raceway and bring end up to gang drive pulley.
7. Wind cord 1-2/3 turns in a counter-clockwise direction on gang drive pulley and thread through slot in gang drive pulley ("B" FINISH).
8. Tie ends of tuner drive cords securely to springs (Part No. 41A14759) and hook other ends of springs through center hole of gang drive pulley.
9. Slip the two split lead "B-B-S-" over the cord as shown in the illustration. Clamp tightly with a pair of pliers.

POINTER CORD

1. Take the Pointer Drive Cord (Part No. 1X24247) and thread both ends through the hole in the Pointer Drive Pulley. Use the hole shown in the illustration.
2. Wind long end of the Pointer Cord counter-clockwise on Pointer Drive Pulley, to Idler Pulley No. 1.
3. Run cord over Idler Pulley No. 1.
4. Continue down and clock-wise around Idler Pulley No. 2.
5. Continue across the dial to Idler Pulley No. 3.
6. Continue cord clock-wise around Idler Pulley No. 3.
7. Fasten one end of the tension spring (Part No. 41A19231) securely to the cord in the position shown in illustration.
8. Wind other end of Pointer cord clockwise 2 turns around Pointer Drive Pulley and tie securely to the other end of the tension spring. Do not make the pointer cord too tight.
9. Replace dial pointer.
10. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
11. Secure pointer to string with a drop of shellac or a good grade of household cement.

PLACE A DROP OF SHELLAC OR HOUSEHOLD CEMENT ON ALL KNOTS.

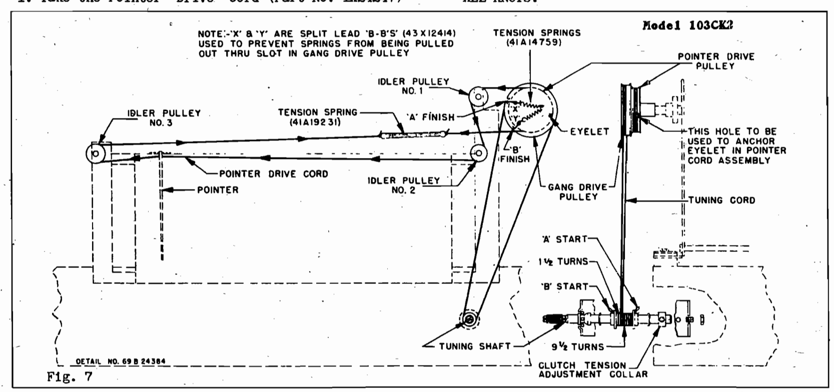
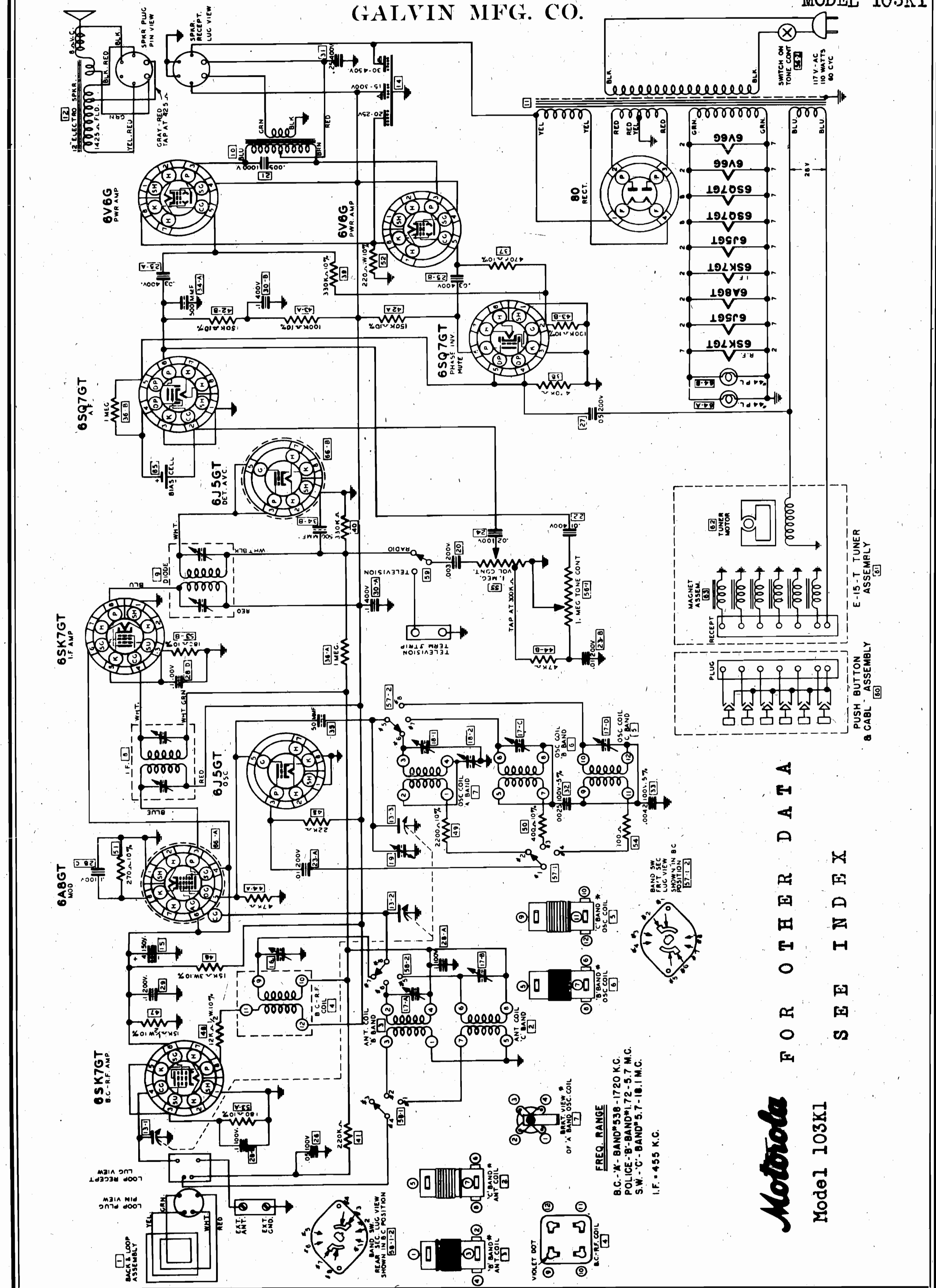


Fig. 7

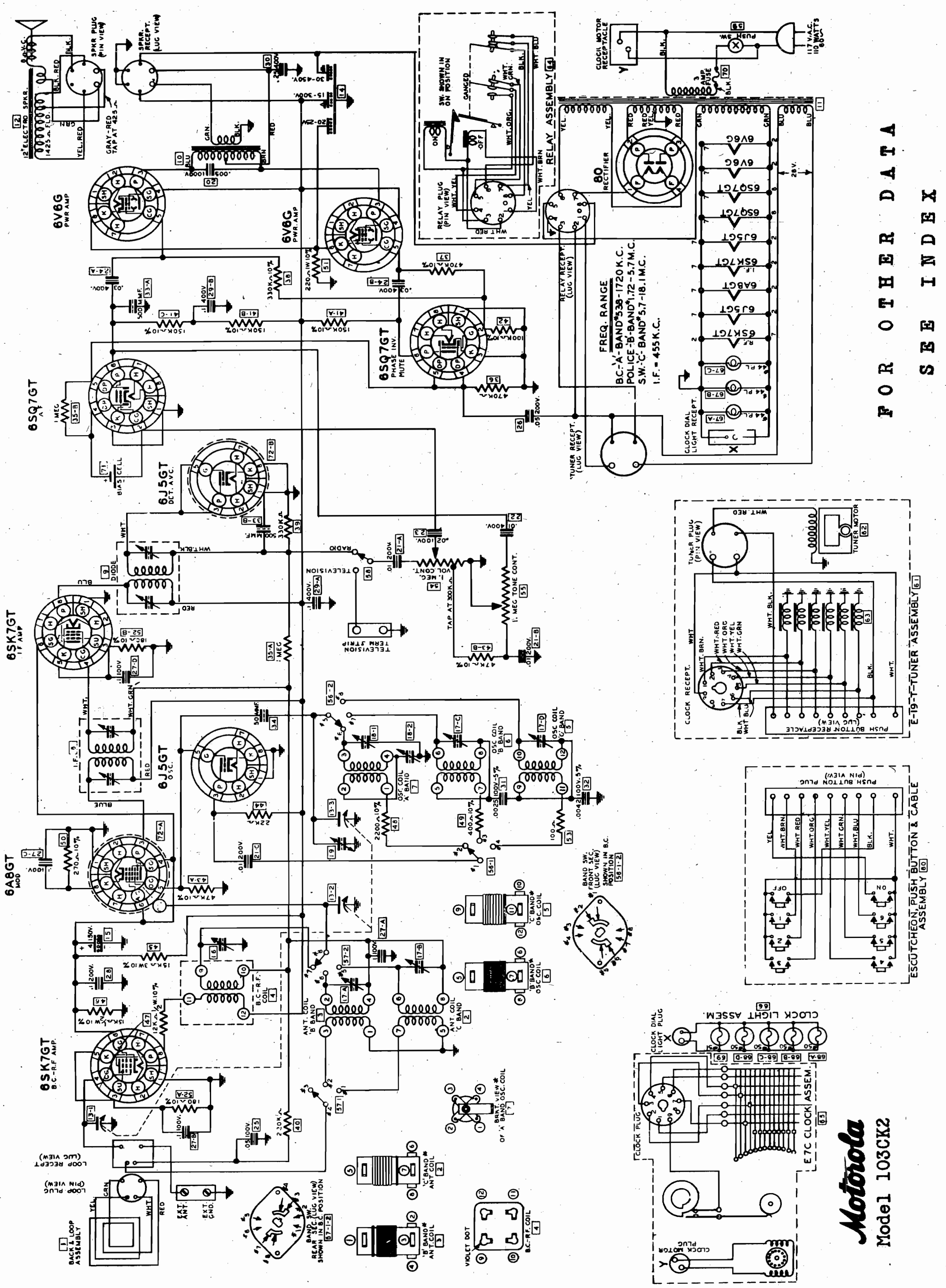
MODEL 103K1

GALVIN MFG. CO.



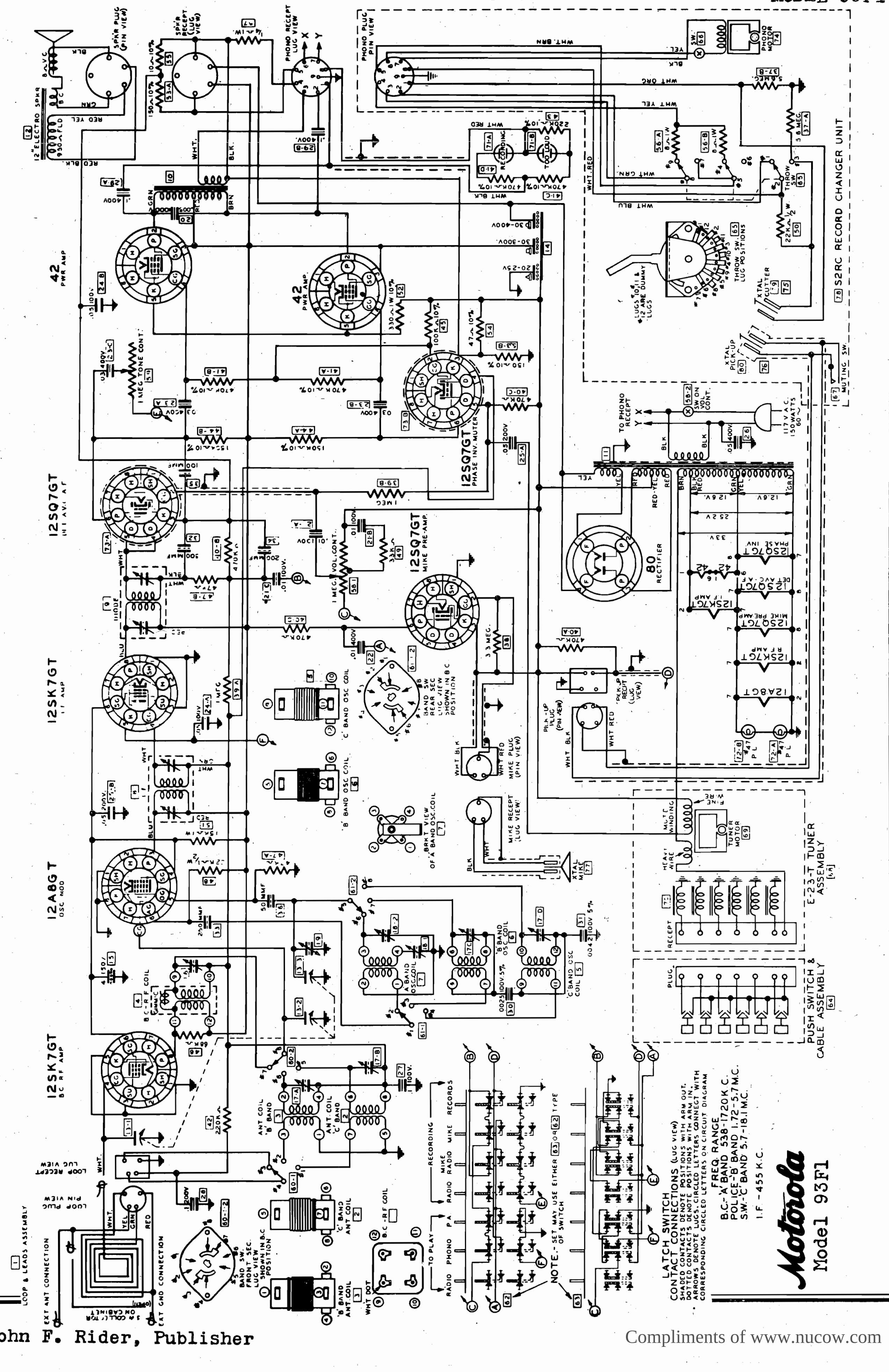
MODEL 103CK2

GALVIN MFG. CO.



GALVIN MFG. CO.

MODEL 93F1



MODELS 93F1; 103F1, 103F2 103K1, 103CK2

GALVIN MFG. CO.

ALIGNMENT CHART MODELS 93F1 - 103F1 - 103F2

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	B.C.	Osc.-Mod.Grid	1-2-3-4-	455 K.C.
2	1720 K.C.	.1 Mfd.	B.C.	R.F. Grid	5	1720 K.C.
3	1400 K.C.	.1 Mfd.	B.C.	R.F. Grid	6	1400 K.C.
4	* 600 K.C.	.1 Mfd.	B.C.	R.F. Grid	7	600 K.C.
5	5.8 M.C.	400 Ohm	Police	Ant.	8	5.8 M.C.
6	4.1 M.C.	400 Ohm	Police	Ant.	9	4.1 M.C.
7	18 M.C.	400 Ohm	S.W.	Ant.	10	18 M.C.
8	16 M.C.	400 Ohm	S.W.	Ant.	11	16 M.C.

* Rock condenser until a combination is found which gives the highest output reading.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODEL 93F1

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3500	455 K.C.	I.F. Grid	.1 Mfd.	.5 Meg	.63 Volts
40	455 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	.63 Volts
45	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	.63 Volts
4	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg	.63 Volts
3	600 K.C.	Ant. Terminal	400 Ohms	None	.63 Volts

Volume Control Set at Maximum
* .05 Watts = .63 Volts

Tone Control Set At Treble Position.
** Output meter connected across voice coil.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 103F1 - 103F2

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2850	455 K.C.	I.F. Grid	.1 Mfd.	.5 Meg	2.83
40	455 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	2.83
45	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	2.83
3	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg	2.83
2	600 K.C.	Ant. Terminal	400 Ohms	None	2.83

Volume Control Set at Maximum
* 1 Watt = 2.83 Volts

Tone Control Set At Treble Position.
** Output meter connected across voice coil.

VOLTAGE CHART MODEL 93F1

POSITION	PLATE	SCREEN	CATHODE
R.F. Amp.	245 V.	110 V.	0
Osc. Mod.	245 V.	110 V.	0
I.F. Amp.	245 V.	110 V.	0
Det.-AVC.-A.F.	125 V.	-	-4.5 V.
Phase Inv.	125 V.	-	-4.5 V.
Pwr. Amp.	240 V.	245 V.	12 V.
Pwr. Amp.	240 V.	245 V.	12 V.
Mike Pre-Amp.	50 V.	-	-5.5 V.
Rectifier	330 V. A.C.	-	335 V. (from filament)

Measurements from socket terminal to chassis ground using 1000 ohm per volt meter.
Line Voltage 117 V. A.C.

VOLTAGE CHART MODEL 103F1 & 103F2

POSITION	PLATE	SCREEN	CATHODE
R.F. Amp.	290 V.	80 V.	2.5 V.
Osc. Mod. (103F1 Only)	290 V.	80 V.	2.5 V.
Osc. (103F2 Only)	150 V.	-	-
I.F. Amp.	290 V.	80 V.	2.75 V.
Det. AVC	0	0	0
A.F. Amp.	155 V.	-	0
Phase Inv.	100 V.	-	0
Pwr. Amp.	325 V.	290 V.	20 V.
Pwr. Amp.	325 V.	290 V.	20 V.
Mike Pre-Amp. (103F1 Only)	70 V.	-	0
Rectifier	350 V.	-	375 V. (from filament)

Measurements from socket terminal to chassis ground using 1000 ohms per volt meter.
Line Voltage 117 V. A.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS MODELS 103K1 AND 103CK2

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2800	455	I.F. Grid	.1 Mfd.	.5 Meg.	.63
40	455	Mod. Grid	.1 Mfd.	.5 Meg.	.63
45	600	Mod. Grid	.1 Mfd.	.5 Meg.	.63
3	600	R.F. Grid	.1 Mfd.	.5 Meg.	.63
2	600	Antenna Terminal	200 Mmf.	None	.63

Volume Control Set at Maximum.
* .05 Watts = .63 Volts

** Output meter connected across voice coil.

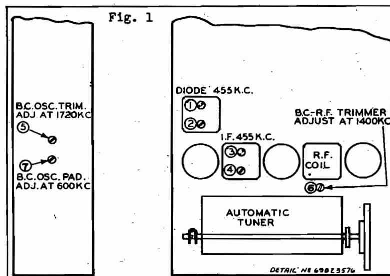
ALIGNMENT CHART MODELS 103K1 AND 103CK2

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	5	1720 K.C.
3	538 K.C.	.1 Mfd.	B.C.	Osc.-Mod.Grid	6	538 K.C.
4	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	7	1400 K.C.
5	5.7 M.C.	.1 Mfd.	Pol.	Osc.-Mod.Grid	8	5.7 M.C.
6	5.5 M.C.	400 Ohms	Pol.	External Antenna Terminal	9	5.5 M.C.
7	18. M.C.	.1 Mfd.	S.W.	Osc.-Mod.Grid	10	18 M.C.
8	18. M.C.	400 Ohms	S.W.	Osc.-Mod.Grid	11	18 M.C.

Volume Control Set at Maximum.

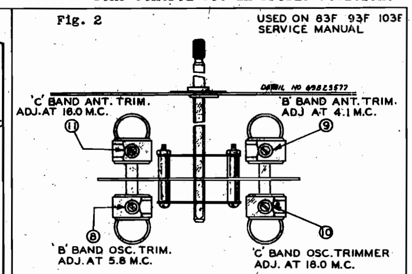
Tone Control Set in Treble Position.

Fig. 1



TRIMMER ADJ. DETAIL FOR 93F1,103F1 & 103F2.

Fig. 2



BAND SWITCH TRIM. ADJ. DETAIL FOR 93F1,103F1 & 103F2.

TO RESTRING DIAL DRIVE CORDS
93F1, 103F1 and 103F2

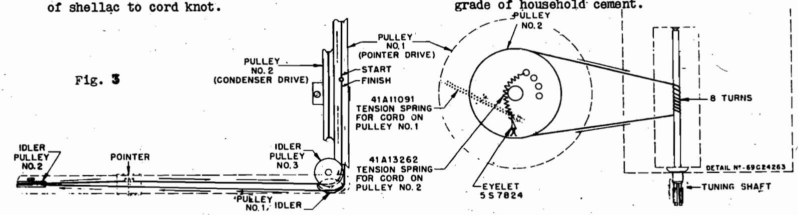
TUNING CORD

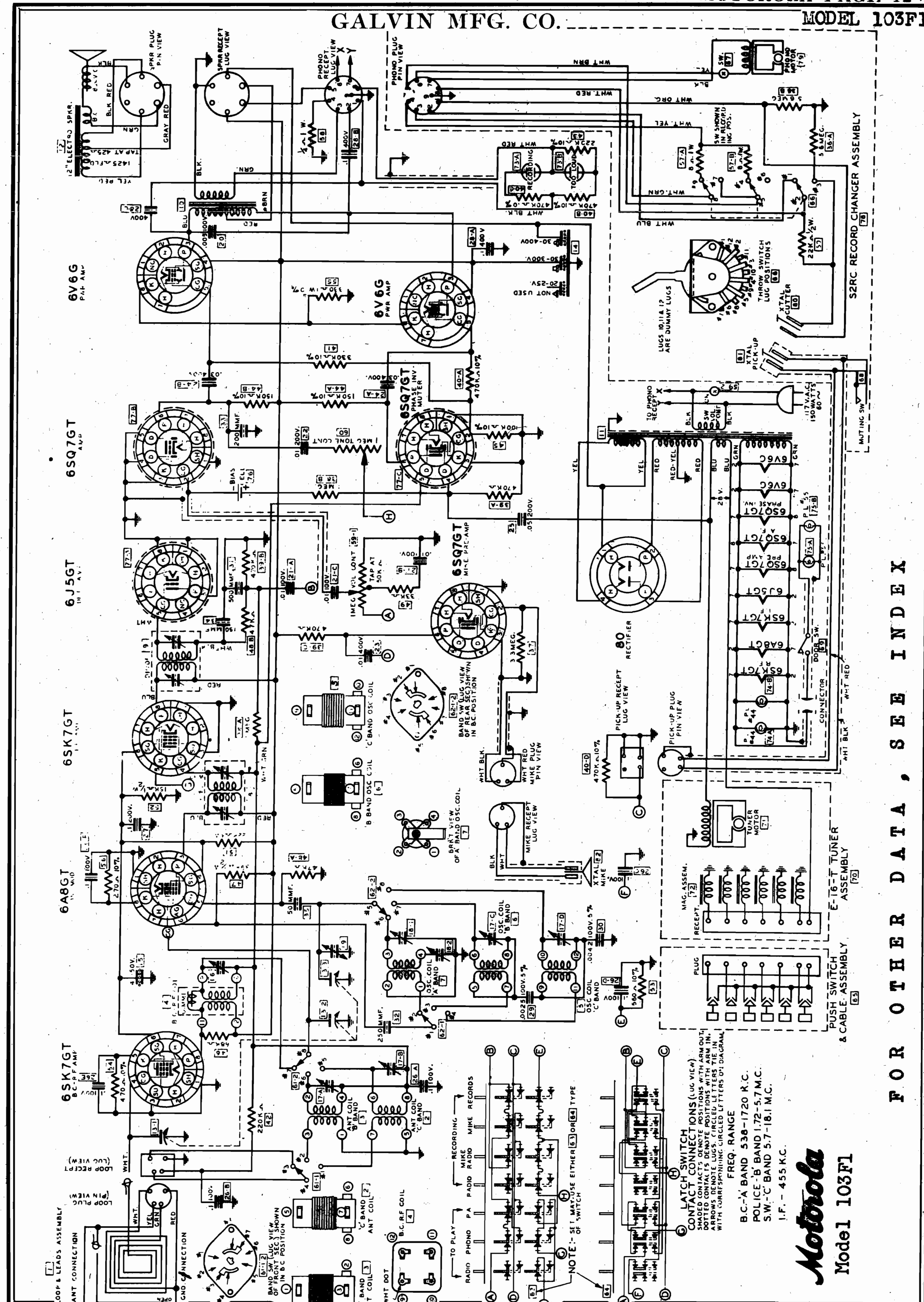
1. Remove the large pulley.
2. Cut a length of 24 lb. test silk fish cord 29 inches long.
3. Turn the gang to fully meshed position.
4. Thread end of cord through hole in rim of small pulley.
5. With an ordinary paper clip fasten cord to pulley to hold in place.
6. Wind cord in a clockwise direction around the condenser pulley and down to the tuning shaft.
7. Wind cord in a clockwise direction eight times around the tuning shaft and up to the condenser pulley.
8. Thread end of cord through hole in condenser pulley.
9. Slip both ends of cord through eyelet (Part No. 5S7824) and knot both ends of cord together securely.
10. Hook one end of tension spring (Part No.41A13262) to cord.
11. Connect the other end of the spring to the hole in the condenser pulley as shown in drawing. (See Fig. 3)
12. Pinch the eyelet tightly on cord and apply drop of shellac to cord knot.

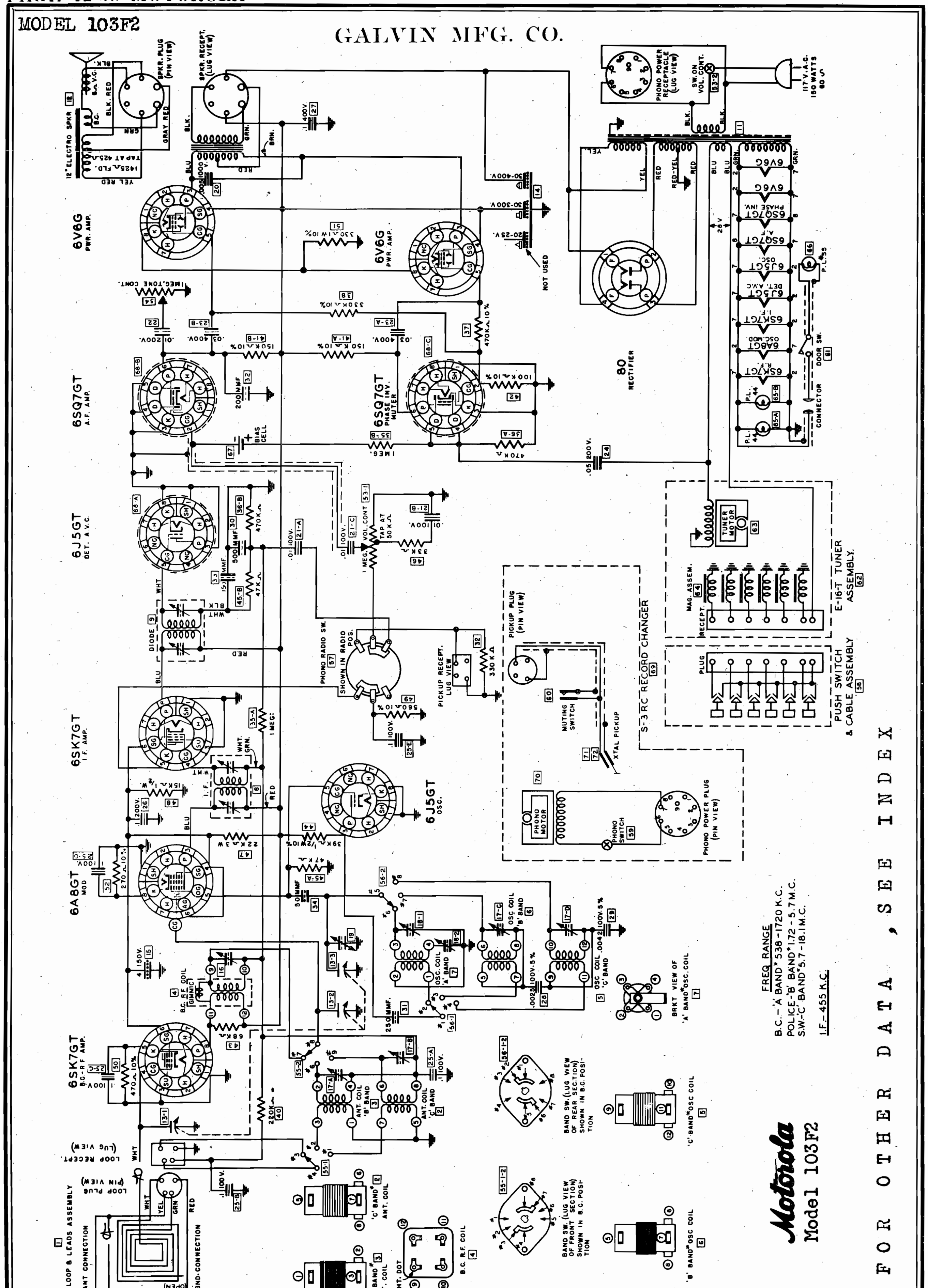
POINTER CORD

1. Place large pointer pulley in position on shaft as shown in Fig. 3. Tighten set screws securely.
2. Cut a length of 24 lb. test silk fish cord 35 inches long.
3. Thread end of cord through hole in rim of large pulley.
4. With an ordinary paper clip fasten cord to pulley to hold in place.
5. Wind cord in a clockwise direction around the pointer pulley and up to idler pulley No.1.
6. Continue cord clockwise (as seen from front) around idler pulley No. 2 and around idler pulley No. 3 to pointer pulley.
7. Thread end of cord through hole in pointer pulley and knot both ends together securely.
8. Hook one end of tension spring (Part No.41A11091) to cord.
9. Connect other end or spring to hook on pointer pulley.
10. Replace dial pointer.
11. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
12. Clamp pointer on string with a pair of pliers and secure with a drop of shellac or a good grade of household cement.

Fig. 3

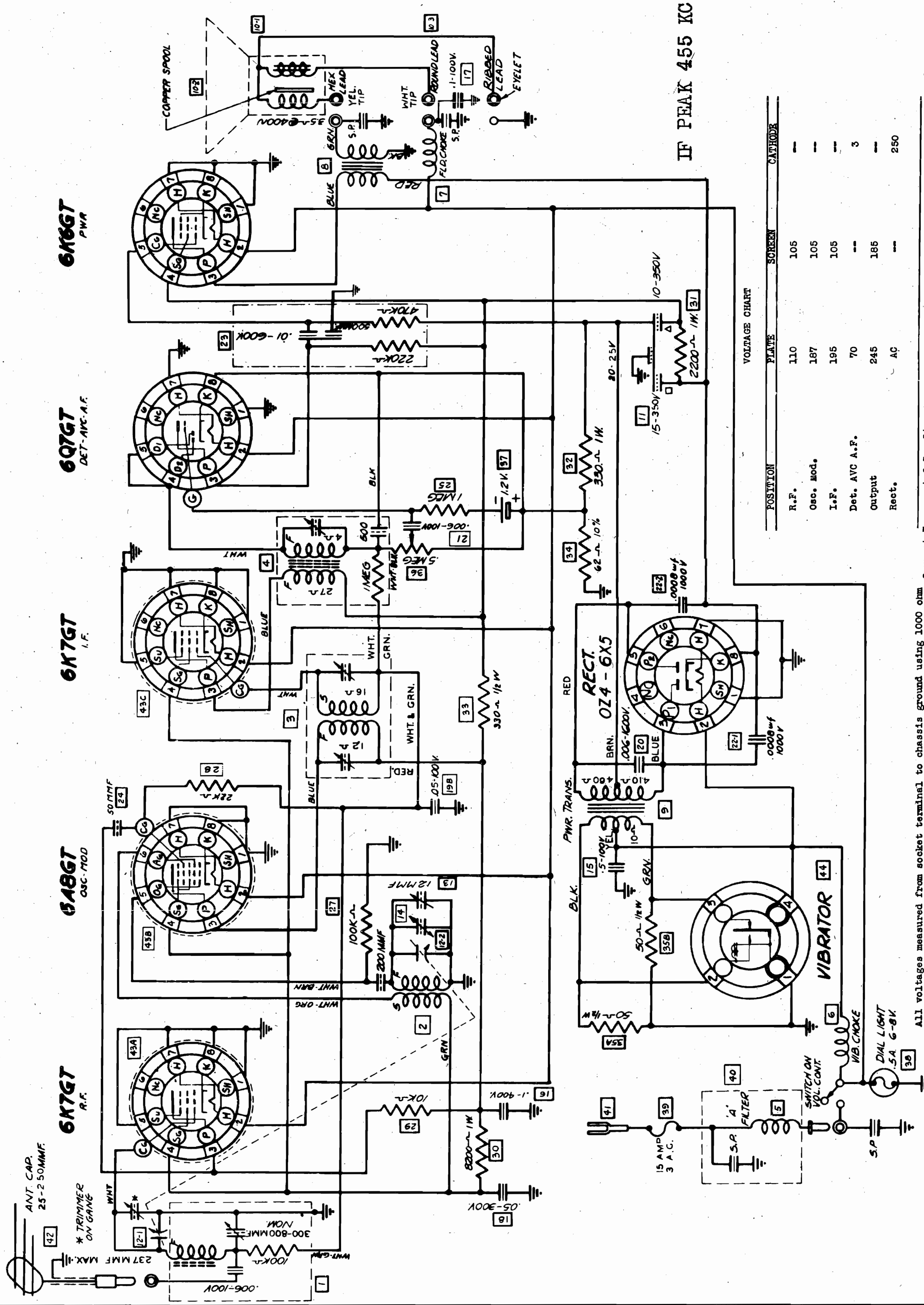



GALVIN MFG. CO.
MODEL 103F1
FOR OTHER DATA, SEE INDEX
Motorola
Model 103F1
FREQ. RANGE
B.C.-'A' BAND 538-1720 K.C.
POLICE-'B' BAND 1.72-5.7 M.C.
S.W.-'C' BAND 5.7-18.1 M.C.
I.F. - 455 K.C.
6V6G PWR AMP
6SQ7GT AMP
6SQ7GT PHASE INV. MUTER
6SQ7GT MIKE PRE-AMP
6J5GT
6SK7GT
6A8GT
6SK7GT B.C.-R.F. AMP
80 RECTIFIER
S2RC RECORD CHANGER ASSEMBLY
E-16-T TUNER ASSEMBLY
PUSH SWITCH & CABLE ASSEMBLY
LATCH SWITCH CONTACT CONNECTIONS (LUG VIEW)


MODEL 103F2
GALVIN MFG. CO.
6V6G PWR. AMP.
6V6G PWR. AMP.
6SQ7GT A.F. AMP.
6SQ7GT PHASE INV. MUTER
6J5GT DET. A.V.C.
6SK7GT I.F. AMP.
6J5GT OSC.
6A8GT MOD
6SK7GT B.C.-R.F. AMP.
80 RECTIFIER
E-16-T TUNER ASSEMBLY
PUSH SWITCH & CABLE ASSEMBLY
S-3 RC RECORD CHANGER
FREQ RANGE
B.C.-'A' BAND" 538-1720 K.C.
POLICE-'B' BAND" 1.72-5.7 M.C.
SW-'C' BAND" 5.7-18.1 M.C.
I.F.-455 K.C.
Motorola Model 103F2
FOR OTHER DATA, SEE INDEX

MODEL 250

GALVIN MFG. CO.



IF PEAK 455 KC

VOLTAGE CHART

POSITION	PLATE	SCREEN	CATHODE
R.F.	110	105	—
Osc. Mod.	187	105	—
I.F.	195	105	—
Det. AVC A.F.	70	—	3
Output	245	185	—
Rect.	AC	—	250

Maximum power output 3 watts.

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter. Current 7 amps at 6.3 volts

MODEL 250

GALVIN MFG. CO.

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.

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.) See Fig. 1.
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.

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna, Motorola Part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.
2. Set the 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.
3. 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.
4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. 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.
5. Recheck step No. 3.

NOTE: The antenna padder is reached through a hole in the bottom of the chassis base, directly under the antenna coil can.

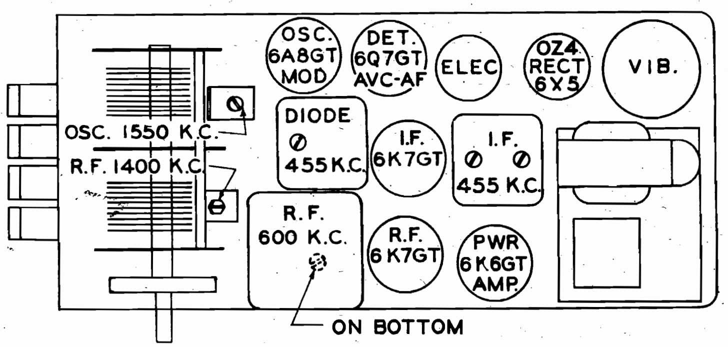
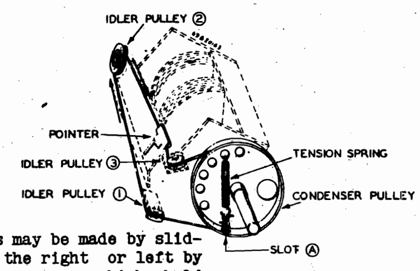


FIGURE 1

POINTER CORD INSTRUCTIONS

1. Remove the chassis from the housing.
2. Remove the broken string.
3. Set the condenser gang to fully opened position.
4. Cut a length of 24 lb. dial cord 24 inches long.
5. Thread one end of the cord through slot "A" in the condenser pulley, and with an ordinary paper clip fasten it to the idler pulley bracket to hold it in place. (See Fig. 2).
6. Run the cord over to idler pulley No. 1, and around it in a clockwise direction.
7. Route string across chassis to idler pulley No. 2, and around it in a clockwise direction.
8. Route cord back across chassis and around idler pulley No.3, in a counter-clockwise direction.
9. Route cord around condenser pulley three-quarters turn to slot "A".
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of pulley. Fasten one end of the tension spring (41A11091) to the cord and the other end to hole in the condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency, preferably one between five and six hundred K.C. and attach the pointer to the cord so that the proper frequency is indicated, because the pointer cannot be slid on the cord.



NOTE: Minor corrections may be made by sliding the dial scale to the right or left by loosening the self-tapping screws which hold it in position.

FIGURE 2

SENSITIVITY DATA - Model 250

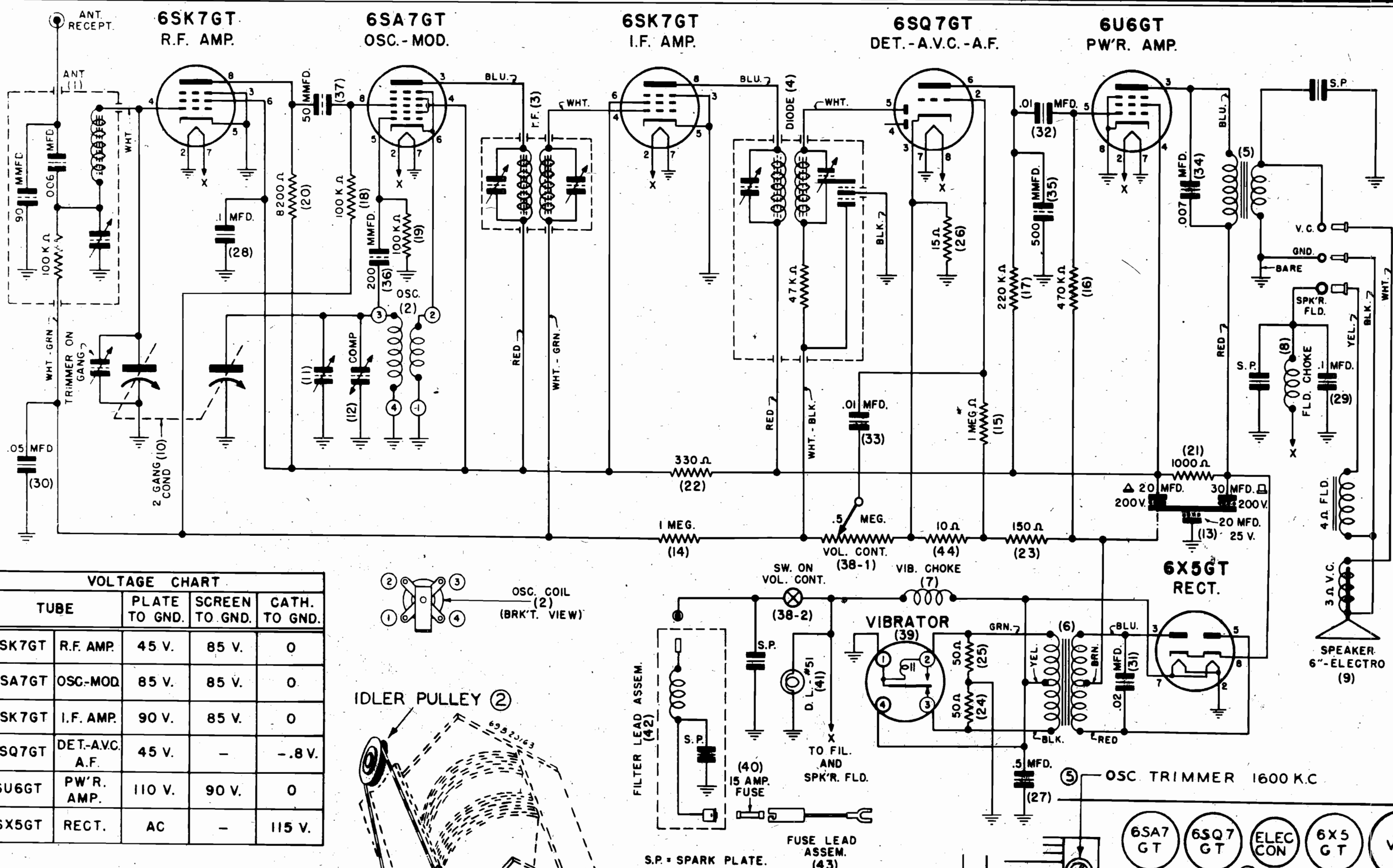
Microvolt Input *	Generator Set at	Generator connected to	Dummy Ant. Capacity	Leak Resistance	Output Meter Reading **
8900	455 K.C.	I.F. Grid	.1	.5 Meg	1.76
185	455 K.C.	Mod. Grid	.1	.5 Meg	1.76
220	600 K.C.	Mod. Grid	.1	.5 Meg	1.76
80	600 K.C.	R.F. Grid	.1	.5 Meg	1.76
7	600 K.C.	Ant. Lead	40 MMF	None	1.76

* For one watt output
** Meter connected across voice coil
1.76 volts equals 1 watt output for 3 ohm voice coil

NOTE: If a Motorola Booster antenna is used substitute a Special Motorola dummy part No. 1X18018 or M434B Booster coil No.17908 in series with a 25 MMF condenser in place of the 40 MMF condenser.

MODEL 251

GALVIN MFG. CO.



VOLTAGE CHART				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SK7GT	R.F. AMP.	45 V.	85 V.	0
6SA7GT	OSC.-MOD.	85 V.	85 V.	0
6SK7GT	I.F. AMP.	90 V.	85 V.	0
6SQ7GT	DET.-A.V.C. A.F.	45 V.	–	-.8 V.
6U6GT	PW'R. AMP.	110 V.	90 V.	0
6X5GT	RECT.	AC	–	115 V.

I.F. = 455 KC

FREQUENCY RANGE
545 KC TO 1600 KC

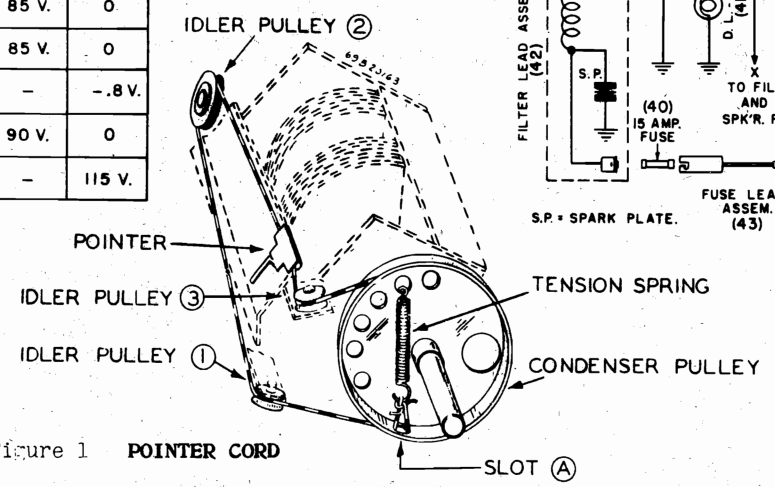


Figure 1 **POINTER CORD**

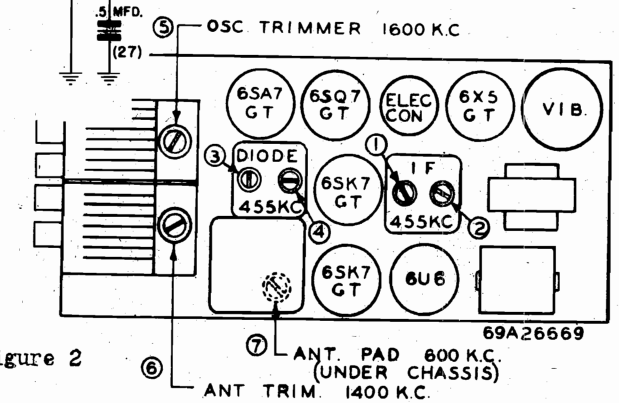


Figure 2

MODEL 251 MODEL 451
MODEL 301 MODEL 501
MODEL 351 MODEL 551
MODEL 401 MODEL 701

GALVIN MFG. CO.

MODEL 251

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
10,000	455 K.C.	I.F. Grid	.1 Mfd.	.5 Meg	1.74
600	455 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	1.74
250	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	1.74
90	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg	1.74
15	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

ALIGNMENT CHART MODEL 251

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	455 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	1400 K.C.	*	To Special Dummy	6	1400 K.C.
4	600 K.C.	*	To Special Dummy	7	600 K.C.

* Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

MODEL 501

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
12,250	262 K.C	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
335	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
425	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
7	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
2	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

Tone Control Set At Voice
Sensitivity Control Set at Country
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

MODEL 401

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2,800	262 K.C.	I.F. Grid	.1 Mfg.	.5 Meg.	1.74
420	262 K.C.	Mod. Grid	.1 Mfg.	.5 Meg.	1.74
510	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
8	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
2	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

Tone Control Set At Voice
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

MODEL 451

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
34,000	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
640	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
677	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
11	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg	1.74
3	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

Tone Control Set At Voice
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

MODEL 301

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
9,300	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg	1.74
330	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	1.74
355	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg	1.74
8	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg	1.74
4	600 K.C.	Ant. Lead	***	None	1.74

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

ALIGNMENT CHART MODELS 301,351,501,551,701

Operations In Order	Gang Condenser Set	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	545 K.C.	.1 Mfd.	Osc.-Mod. Grid	6	545 K.C.
4	1400 K.C.	*	To Special Dummy	7	1400 K.C.
5	1400 K.C.	*	To Special Dummy	8	1400 K.C.
6	600 K.C.	*	To Special Dummy	9	600 K.C.

* Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

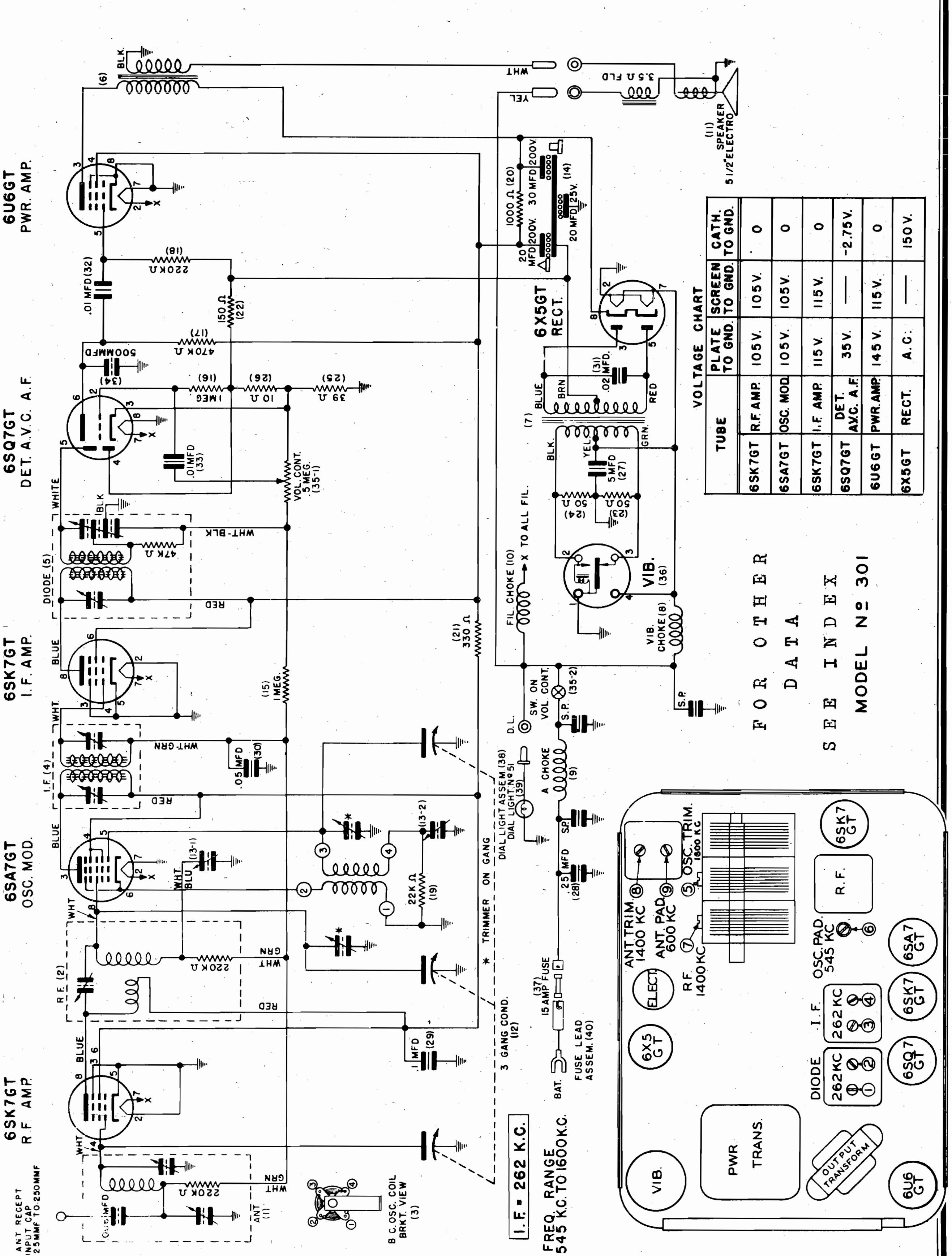
ALIGNMENT CHART MODELS 401,451

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	262 K.C.
2	1600 K.C.	.1 Mfd.	Osc.-Mod. Grid	5	1600 K.C.
3	600 K.C.	.1 Mfd.	Osc.-Mod. Grid	6	600 K.C.
4	1400 K.C.	*	To Special Dummy	7	1400 K.C.
5	1400 K.C.	*	To Special Dummy	8	1400 K.C.
6	600 K.C.	*	To Special Dummy	9	600 K.C.

* Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

MODEL 301

GALVIN MFG. CO.



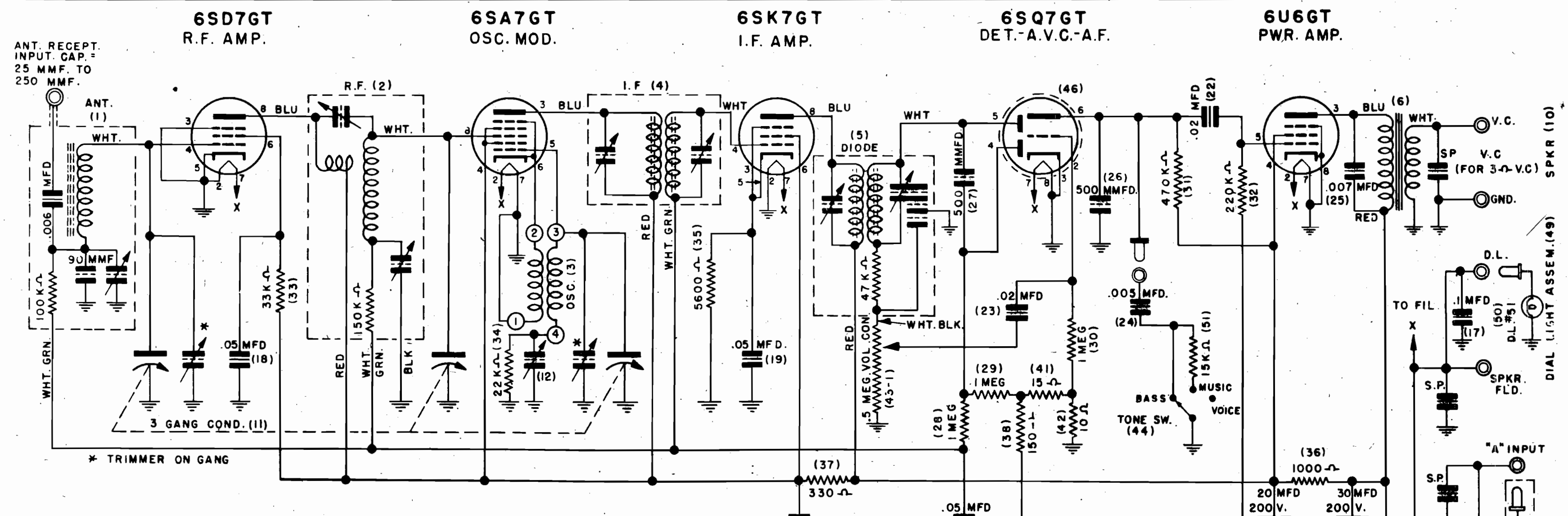
VOLTAGE CHART

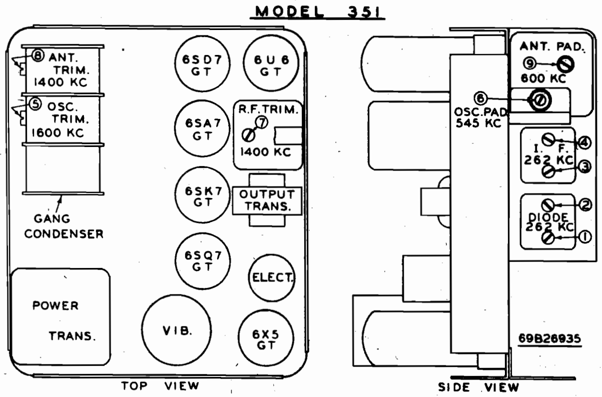
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SK7GT	R.F. AMP.	105 V.	105 V.	0
6SA7GT	OSC. MOD.	105 V.	105 V.	0
6SK7GT	I.F. AMP.	115 V.	115 V.	0
6SQ7GT	DET. AVC. A.F.	35 V.	—	-2.75 V.
6U6GT	PWR. AMP.	145 V.	115 V.	0
6X5GT	RECT.	A.C.	—	150 V.

FOR OTHER DATA SEE INDEX MODEL Nº 301

MODEL 351

GALVIN MFG. CO.





Tone Control Set At Voice
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

MODEL 351

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
48,500	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
1,100	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
1,300	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
10	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
2	600 K.C.	Ant. Lead	***	None	1.74

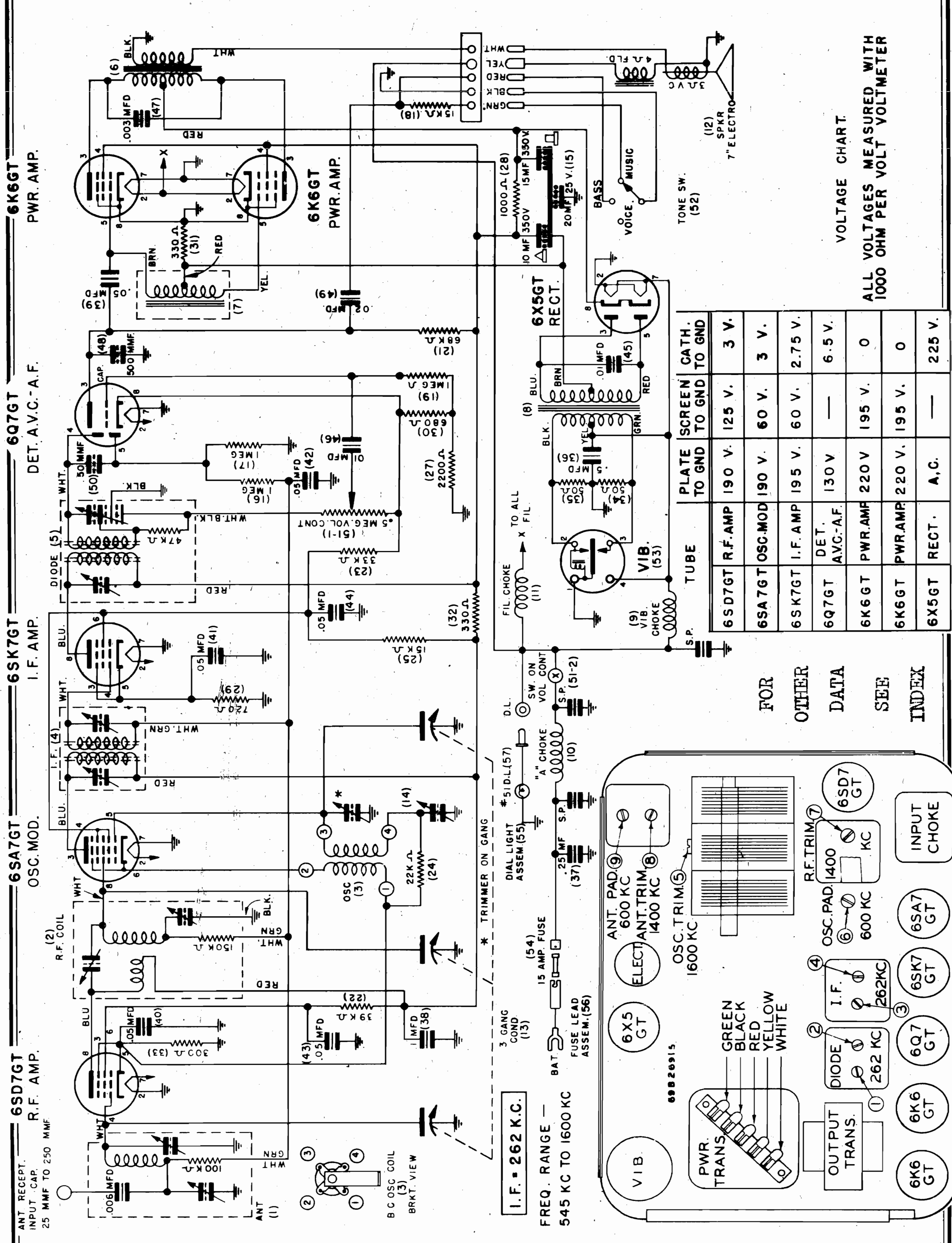
FOR ALIGNMENT DATA, SEE INDEX

VOLTAGE CHART

TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	RF AMP	110 V.	40 V.	0
6SA7GT	OSC.MOD	110 V.	110 V.	0
6SK7GT	IF AMP.	115 V	110 V.	8.5 V.
6SQ7GT	DET. AVC-AF	40 V.	—	0
6U6GT	PWR AMP	130 V.	115 V.	0
6X5GT	RECT.	AC	—	140

MODEL 401

GALVIN MFG. CO.



I.F. = 262 K.C.

FREQ. RANGE — 545 KC TO 1600 KC

VOLTAGE CHART

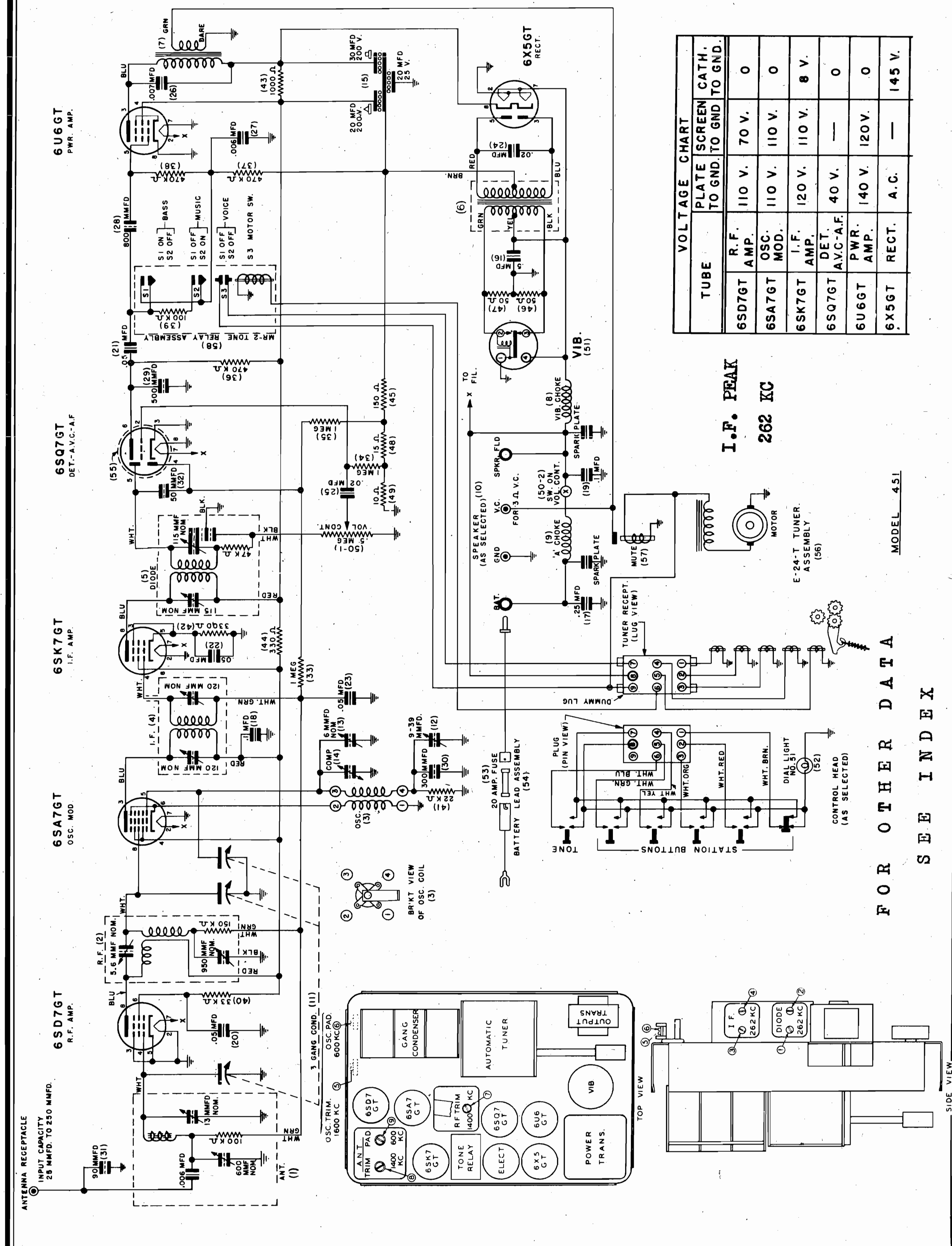
ALL VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER

TUBE		PLATE TO GND	SCREEN TO GND	CATH. TO GND
6SD7GT	R.F. AMP	190 V.	125 V.	3 V.
6SA7GT	OSC. MOD	190 V.	60 V.	3 V.
6SK7GT	I.F. AMP	195 V.	60 V.	2.75 V.
6Q7GT	DET. A.V.C.-A.F.	130 V	—	6.5 V.
6K6GT	PWR. AMP	220 V	195 V.	0
6K6GT	PWR. AMP.	220 V.	195 V.	0
6X5GT	RECT.	A.C.	—	225 V.

FOR OTHER DATA SEE INDEX

MODEL 451

GALVIN MFG. CO.



VOLTAGE CHART

TUBE		PLATE TO GND.	SCREEN TO GND	CATH. TO GND.
6SD7GT	R.F. AMP.	110 V.	70 V.	0
6SA7GT	OSC. MOD.	110 V.	110 V.	0
6SK7GT	I.F. AMP.	120 V.	110 V.	8 V.
6SQ7GT	DET. A.V.C.-A.F.	40 V.	—	0
6U6GT	PWR. AMP.	140 V.	120 V.	0
6X5GT	RECT.	A.C.	—	145 V.

I.F. PEAK 262 KC

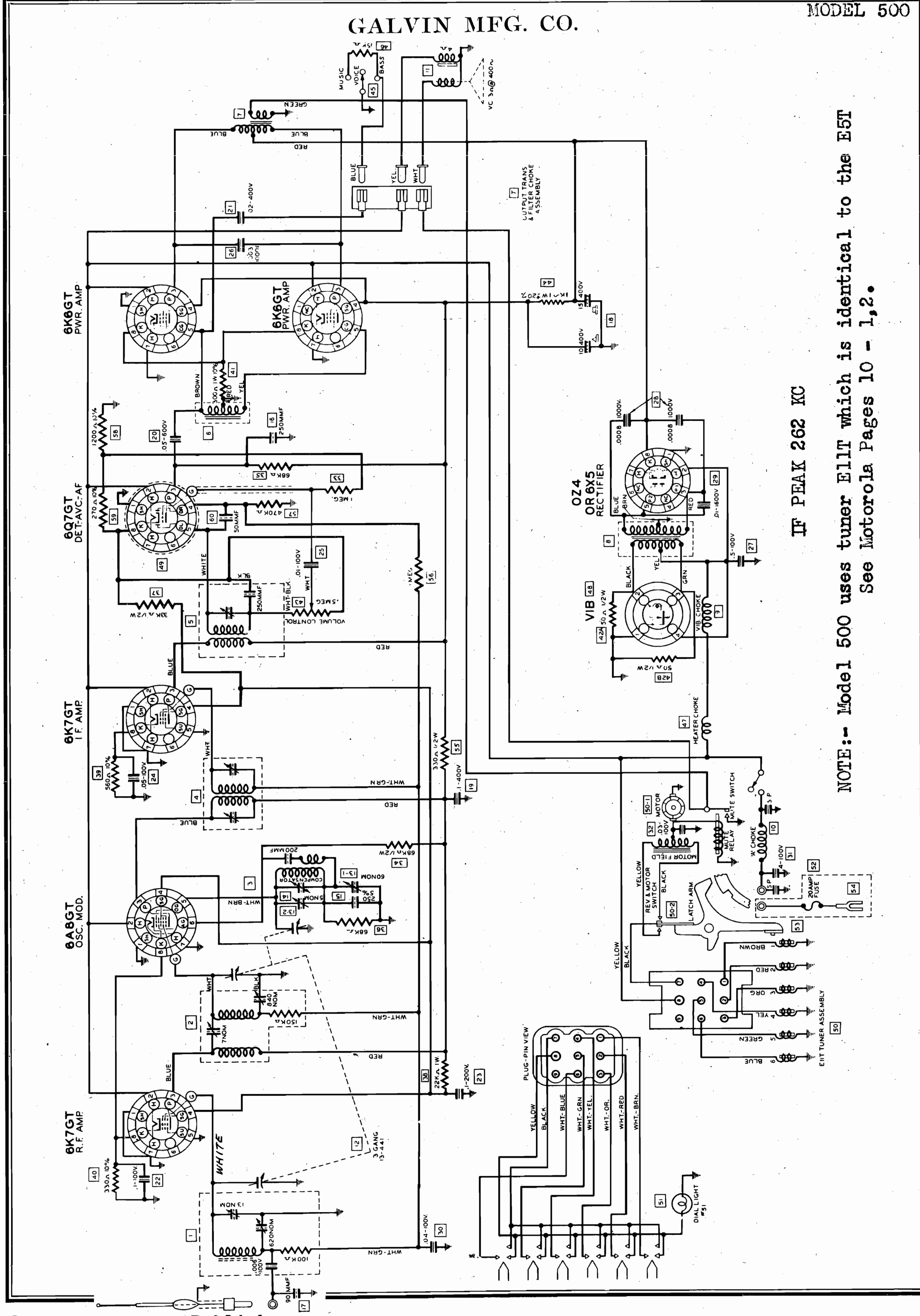
MODEL 451

FOR OTHER DATA

SEE INDEX

MODEL 500

GALVIN MFG. CO.



IF PEAK 262 KC

NOTE:- Model 500 uses tuner E11T which is identical to the E5T
See Motorola Pages 10 - 1,2.

MODEL 500

GALVIN MFG. CO.

ALIGNMENT PROCEDURE

Place the chassis on the service bench 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 R.F. coil can that is covered with Scotch Tape. The original adjustment, made in the factory should not be tampered with. (Fig. 1 below, shows all trimmer locations.)

I.F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6A8GT) 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. 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 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 adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6K7GT) 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 1550 K.C. oscillator trimmer 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. Oscillator padder 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

NOTE: If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola Part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.

1. Set the signal generator at 1400 K.C. Turn the condenser gang until the signal is heard. Adjust the 1400 K.C. antenna trimmer in the antenna coil can for maximum output reading.
2. Adjust the 1400 K.C. RF trimmer in the RF coil can for maximum output reading.
3. 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 the maximum output reading.
4. Recheck steps 1, 2, and 3, for accuracy.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

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 **
26,000	262 K.C.	I.F. Grid	.1 MF	.5 Meg	1.76 Volts
565	262 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
565	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
30	600 K.C.	R.F. Grid	.1 MF	.5 Meg	1.76 Volts
4	600 K.C.	Ant. Lead	40 MMF***	None	1.76 Volts

* For one watt output.
** Meter connected across voice coil.
1.76 volts equals 1 watt output for 3 ohm voice coil.
*** Use special dummy part No. 1X18018 or M434B Booster Coil No. 17908 in series with a 25 MMF condenser.

NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

VOLTAGE CHART - MODEL 500

POSITION	PLATE	SCREEN	CATHODE
RF	195	72	2.7
Osc.-Mod.	195	72	2.7
I.F.	195	72	2
Det. Avc. AF	110	-	0
Output	205	200	13
Output	205	200	13
Rect.	AC	-	210

All voltages measured from socket terminal to chassis ground using 1000 Ohms per volt meter.
Current 6.5 amps at 6.3 volts. Maximum power output 5 watts.

MODEL 500 PARTS PRICE LIST

(Note: Numbers in first column refer to squared numbers on circuit diagram)

DRAWING NO.	PART NO.	DESCRIPTION	LIST
		MAJOR PARTS	
48	48A5067	Vibrator (3333)	$2.50
18	23A17190	Electrolytic Condenser (FP)	1.00
50	1K18718	E11T Tuner Assembly	16.00
	15C18947	Bottom cover	.75
	62D18952	Housing Overlay (Plated)	3.00
1	1X18981	Ant. Coil & Shield Assembly	2.40
8	25B19058	Power Transformer (Shielded)	2.55
7	25A19061	Output Transformer	1.00
45	40A19065	Tone Switch	.40
4	1X19076	I.F. Coil & Shield Assembly	1.40
2	1X19078	R.F. Coil & Shield Assembly	1.80
3	1X19080	Osc. Coil & Leads Assembly	.75
	1B19084	Spark Plate Assembly	.40
	1X19094	Housing Assembly	3.50
	24X19103	Heater Choke	.10
	1X19110	Input Choke & Bracket Assembly	2.00
	18A19341	Vol. Cont. & Switch. (.5 Meg.)	.75
43	1K19343	Vol. Control & Shaft Assembly	.85
10	1K19475	"A" Choke Assembly	.35
11	50B20197	Speaker 7 1/2" Electro	3.75
		Speaker Exchange	2.20
11	50B20198	Speaker 8" Electro	3.75
		Speaker Exchange	2.20
5	1X20267	Diode Coil & Shield Assembly	1.10
9	24A20549	Vibrator Choke (4 Double Pie Wnd.)	.35
		RESISTORS	
34	6B6001	Carbon Resistor 68000-1/2-20 .DOZ.	.60
42	6B6005	Carbon Resistor 50-1/2-20 .DOZ.	.60
55	6B6009	Carbon Resistor 330-1/2-20 .DOZ.	.60
57	6B6011	Carbon Resistor 470,000-1/3-20 .DOZ.	.60
37	6B6012	Carbon Resistor 33,000-1/2-20 .DOZ.	.60
38	6B6016	Carbon Resistor 22,000-1-20 N.I.	.10
40	6B6042	Carbon Resistor 330-1/3-10 .DOZ.	.60
	6B6070	Carbon Resistor 150,000-1/3-20 N.I .DOZ.	.60
33	6B6071	Carbon Resistor 1 MEG.-1/3-20 N.I .DOZ.	.60
36	6B6125	Carbon Resistor 68,000-1/3-20 N.I. .DOZ.	.60
56	6B6159	Carbon Resistor 1 MEG.1/3-20 INS .DOZ.	.60
44	6B6184	Carbon Resistor 1000-1-20 N.I.	.10
41	6B6187	Carbon Resistor 300-1-10 N.I	.10
58	6B6198	Carbon Resistor 1200-1/3-10 N.I. .DOZ.	.60
39	6B6224	Carbon Resistor 560-1/3-10 N.I .DOZ.	.60
35	6B6256	Carbon Resistor 68,000-1/3-20 Ins. .DOZ.	.60
59	6B6272	Carbon Resistor 270-1/3-10 Ins .DOZ.	.60
46	6B6284	Carbon Resistor 15,000-1/3-20 Ins. .DOZ.	.60
		CONDENSERS	
25	8A1400	Tubular Condenser .01-100V	.15
22	8A3302	Tubular Condenser .1-100V	.15
23	8A3310	Tubular Condenser .1-200V	.15
27	8A4588	Tubular Condenser .5-100V	.30
		CONDENSERS CONT'D.	
17	21A4807	Molded Mica Condenser 90 MMF 10%	$ .20
28	8A4925	Dual Tub. Condenser .0008-0008-1000V	.25
	21B6501	Molded Mica Condenser 200 MMF-20%	.15
60	21B6503	Molded Mica Condenser 50 MMF-20%	.15
16	21B6517	Molded Mica Cond. 250 MMF-20%	.15
32	8A10306	Tubular Condenser & Strap .03-100V	.15
29	8A10432	Tubular Condenser .01-1600V	.35
30	8A12898	Tubular Condenser & Strap .04-100V	.20
	8A13014	Condenser Res. .006-100V-100K	.25
26	8K13165	Tubular Condenser .003-1000V	.15
24	8A13514	Tubular Condenser .05-100V	.15
31	8A14095	Tubular Condenser .4-100V	.30
	21A16369	Ceramic Condenser 10 MMF 1% MMF	.25
20	8A17336	Tubular Condenser & Strap .05-600V	.25
14	20A18179	Compensating Condenser	.25
13	20A18391	Osc. Trimmer & Padder	.35
19	8A19072	Tubular Condenser & Strap .1-400	.25
15	21A19088	Ceramic Condenser 250 MMF. 5%	.20
21	8A19940	Tubular Condenser & Strap .02-400V	.15

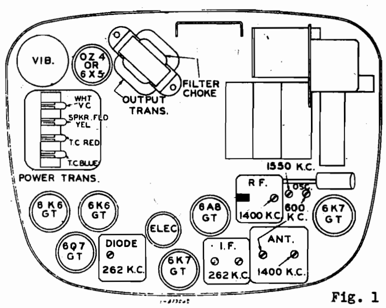
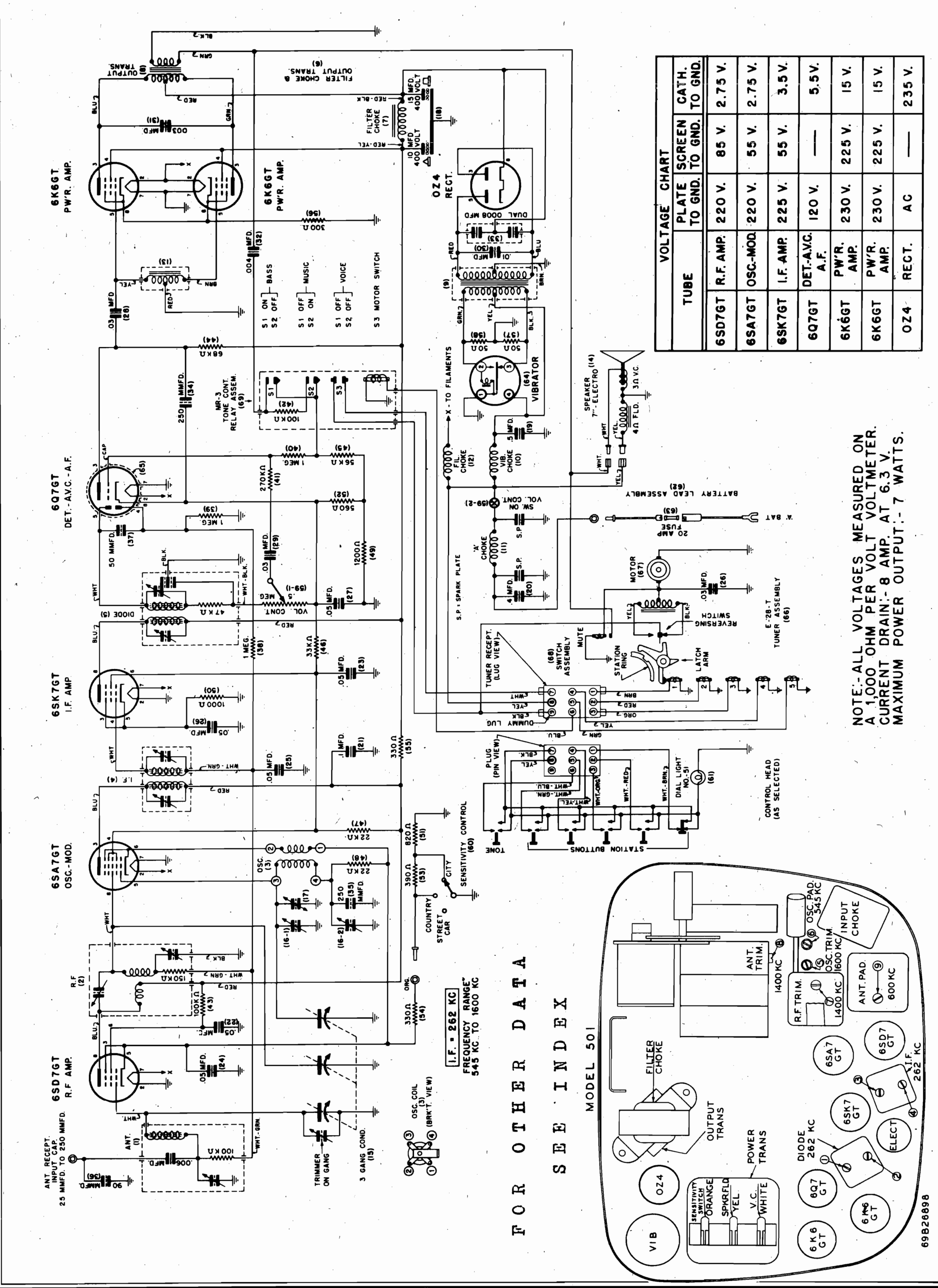


Fig. 1

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 501

GALVIN MFG. CO.



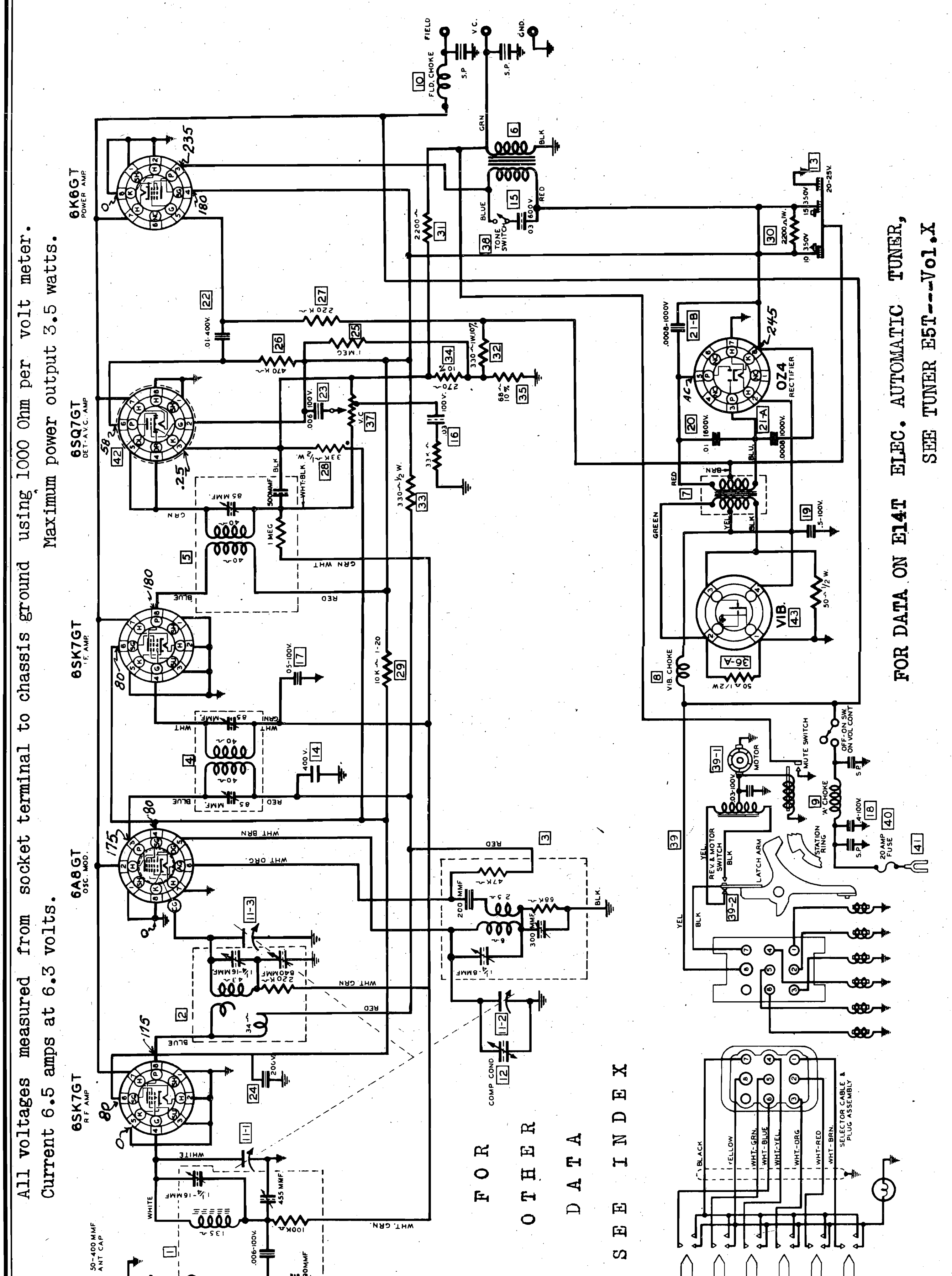
VOLTAGE CHART			
TUBE	PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT R.F. AMP.	220 V.	85 V.	2.75 V.
6SA7GT OSC.-MOD.	220 V.	55 V.	2.75 V.
6SK7GT I.F. AMP.	225 V.	55 V.	3.5 V.
6Q7GT DET.-A.V.C. A.F.	120 V.	—	5.5 V.
6K6GT PW'R. AMP.	230 V.	225 V.	15 V.
6K6GT PW'R. AMP.	230 V.	225 V.	15 V.
OZ4 RECT.	AC	—	235 V.

NOTE:- ALL VOLTAGES MEASURED ON A 1,000 OHM PER VOLT VOLTMETER.
CURRENT DRAIN:- 8 AMP. AT 6.3 V.
MAXIMUM POWER OUTPUT:- 7 WATTS.

FOR OTHER DATA SEE INDEX MODEL 501

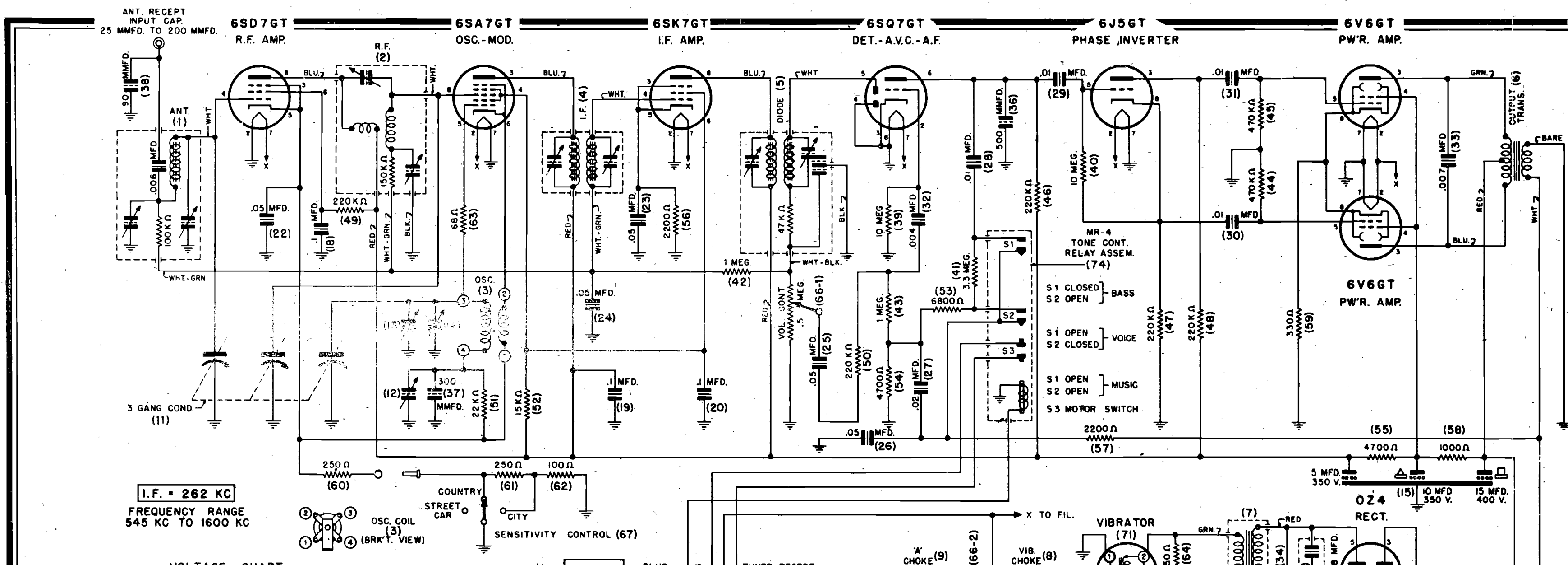
MODEL 550

GALVIN MFG. CO.



MODEL 551

GALVIN MFG. CO.



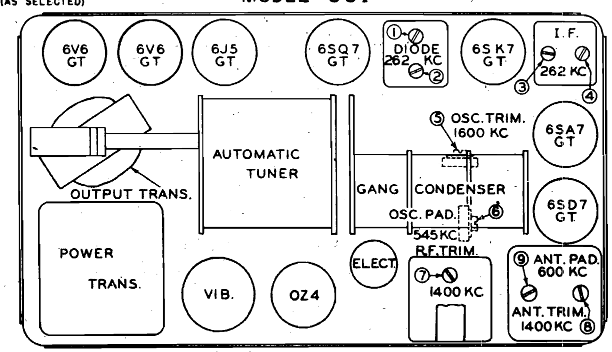
FOR OTHER DATA, SEE INDEX

VOLTAGE CHART

TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	175 V.	65 V.	2.5 V.
6SA7GT	OSC.-MOD.	175 V.	75 V.	2.5 V.
6SK7GT	I.F. AMP.	175 V.	75 V.	6.0 V.
6SQ7GT	DET.-A.V.C. A.F.	70 V.	—	0
6J5GT	PHASE INVERT.	70 V.	—	65 V.
6V6GT	PW'R. AMP.	260 V.	245 V.	16 V.
6V6GT	PW'R. AMP.	260 V.	245 V.	16 V.
0Z4	RECT.	AC	—	265 V.

NOTE:- ALL VOLTAGES MEASURED ON A 1,000 OHM PER VOLT VOLTMETER. SENSITIVITY CONTROL IN COUNTY POSITION.
CURRENT 7.0 AMPS. AT 6.3 VOLTS.
MAXIMUM POWER OUTPUT 9 WATTS.

MODEL 551



SENSITIVITY AND STAGE GAIN MEASUREMENTS

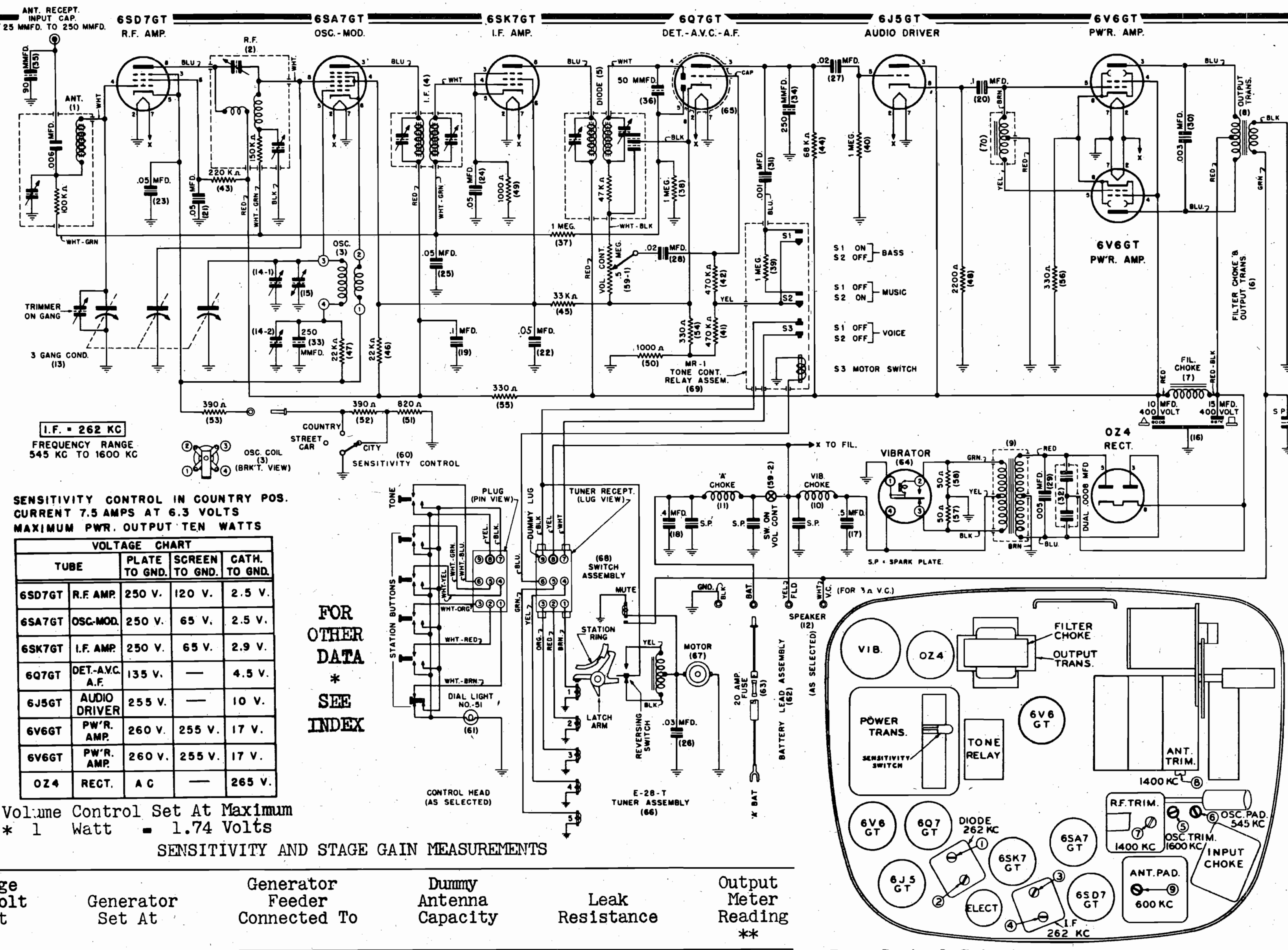
Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
34,000	262 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	1.74
590	262 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
677	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	1.74
11	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	1.74
3	600 K.C.	Antenna	***	None	1.74

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

Tone Control Set At Music
Sensitivity Control Set At Country
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or Booster Coil Part No. 24A26751 in series with a 35 Mmf. Condenser.

MODEL 701

GALVIN MFG. CO.



SENSITIVITY CONTROL IN COUNTRY POS.
CURRENT 7.5 AMPS AT 6.3 VOLTS
MAXIMUM PWR. OUTPUT TEN WATTS

VOLTAGE CHART				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SD7GT	R.F. AMP.	250 V.	120 V.	2.5 V.
6SA7GT	OSC.-MOD.	250 V.	65 V.	2.5 V.
6SK7GT	I.F. AMP.	250 V.	65 V.	2.9 V.
6Q7GT	DET.-A.V.C. A.F.	135 V.	—	4.5 V.
6J5GT	AUDIO DRIVER	255 V.	—	10 V.
6V6GT	PW'R. AMP.	260 V.	255 V.	17 V.
6V6GT	PW'R. AMP.	260 V.	255 V.	17 V.
0Z4	RECT.	A C	—	265 V.

FOR OTHER DATA * SEE INDEX

Volume Control Set At Maximum
* 1 Watt = 1.74 Volts

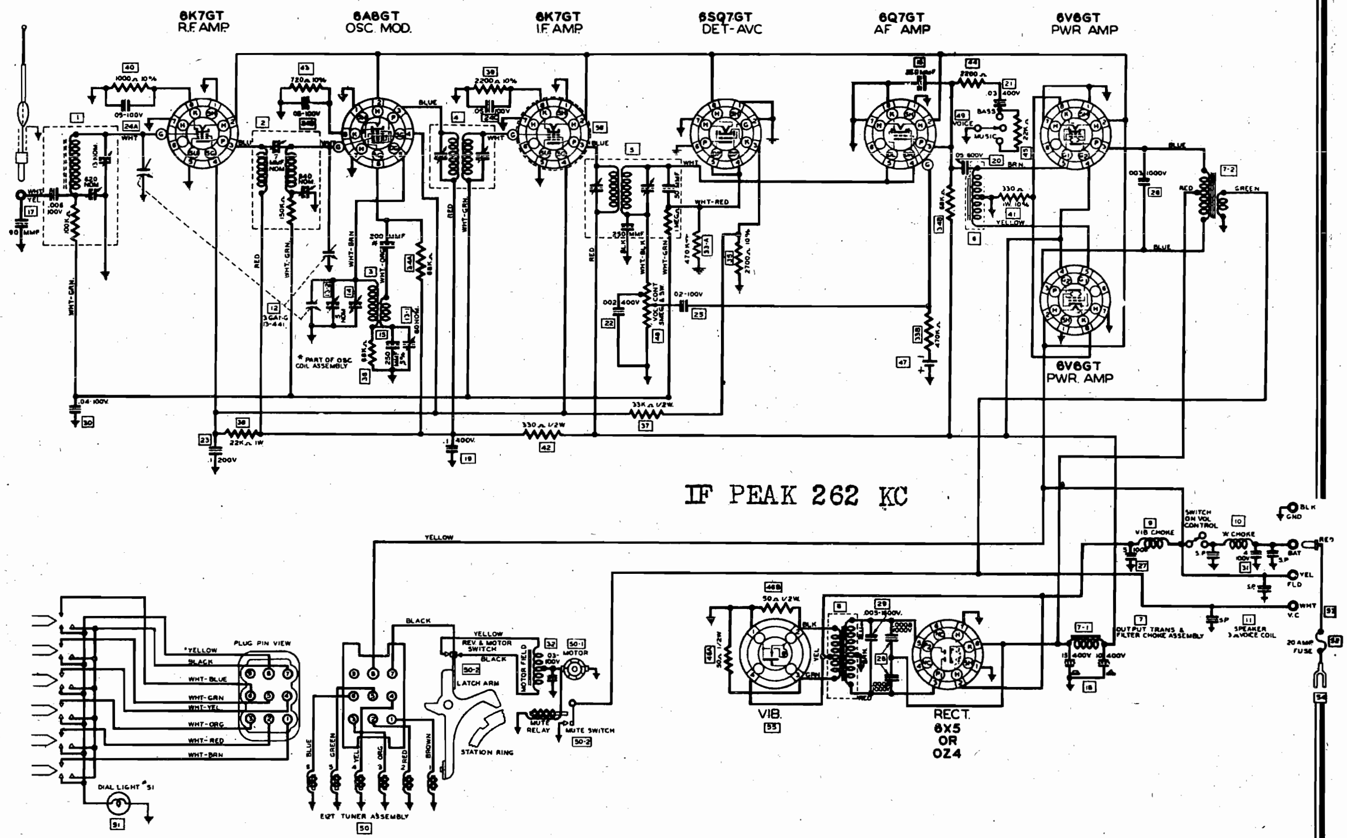
SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
10,000	262 K.C.	I.F. Grid	.1	.5 Meg.	1.74
360	262 K.C.	Mod. Grid	.1	.5 Meg.	1.74
385	600 K.C.	Mod. Grid	.1	.5 Meg.	1.74
8	600 K.C.	R.F. Grid	.1	.5 Meg.	1.74
2	600 K.C.	Ant. Lead	***	None	1.74

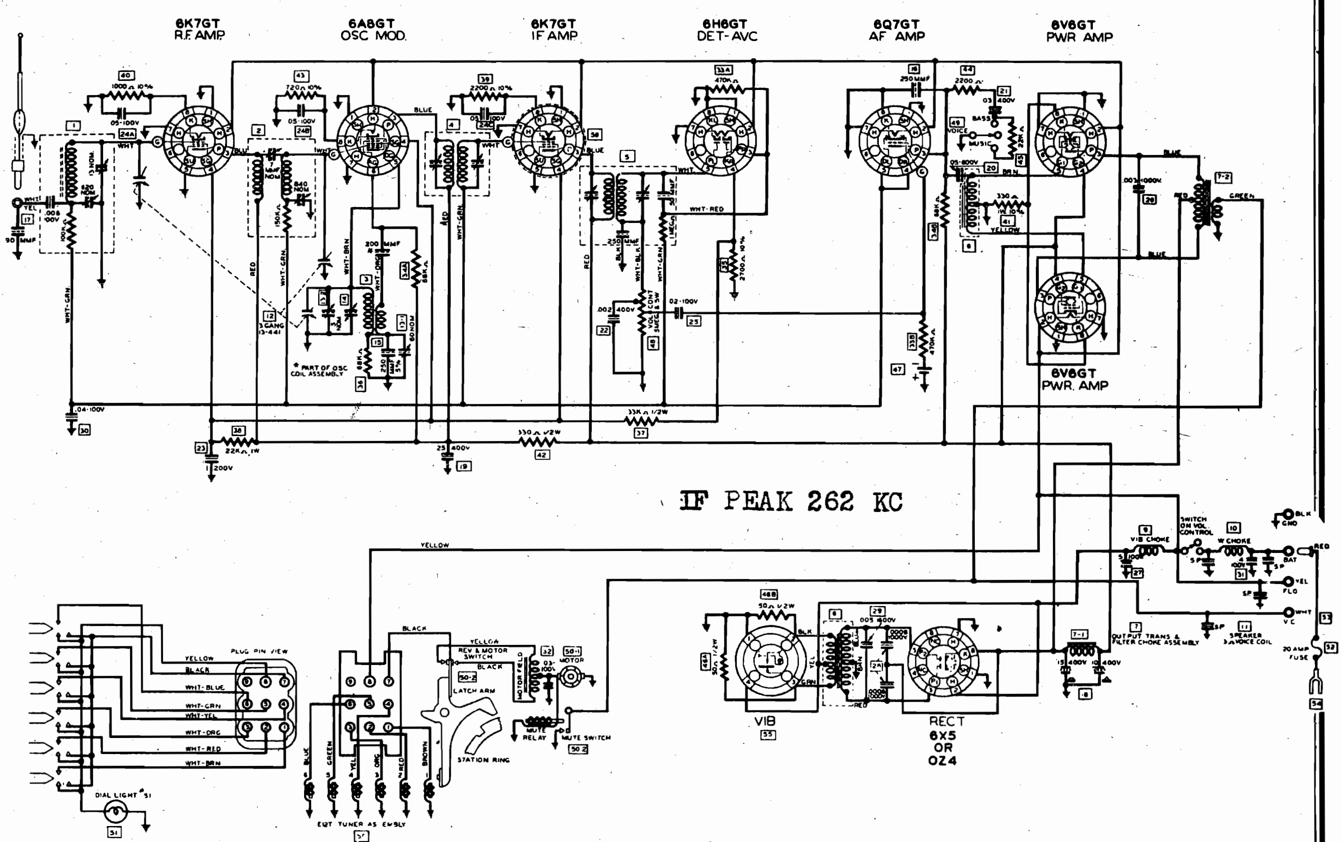
Tone Control Set At Voice
Sensitivity Control In Country Position
** Output meter connected across voice coil.
*** Use Special Dummy Part No. 1X26767 or
Booster Coil Part No. 24A26751 in series
with a 35 Mmf. Condenser

MODEL 700
Early, Late

GALVIN MFG. CO.



NOTE:- Model 700 uses tuner E12T which is identical to the E5T
See Motorola Pages 10 - 1,2.



MODEL 700
Early, Late

GALVIN MFG. CO.

ALIGNMENT PROCEDURE

Place the chassis on the service bench 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: Fig. 1 below shows all trimmer locations.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6A8GT) 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. 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 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 adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6K7GT) 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 1550 K.C. oscillator trimmer 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. oscillator padder 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. S. AND ANTENNA ALIGNMENT

NOTE: If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 should be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.
1. Set the signal generator at 1400 K.C. Turn the condenser gang until the signal is heard. Adjust the 1400 K.C. antenna trimmer in the antenna coil can for maximum output reading.
2. Adjust the 1400 K.C.R.F. trimmer in the R.F. coil can for maximum output reading.
3. 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 the maximum output reading.
4. Recheck steps 1, 2, and 3, for accuracy.

SENSITIVITY AND STAGE GAIN MEASUREMENT

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 special dummy part #1X18018 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 **
11,500	262 K.C.	I.F. Grid	.1 MF	.5 Meg	1.76 Volts
255	262 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
14	600 K.C.	Mod. Grid	.1 MF	.5 Meg	1.76 Volts
12	600 K.C.	R.F. Grid	.1 MF	.5 Meg	1.76 Volts
1.5	600 K.C.	Ant. Lead	***	None	1.76 Volts

* For one watt output
** Meter connected across voice coil
1.76 Volts equals 1 watt output for 3 ohm voice coil
*** Use special dummy part No. 1X18018.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF. condenser for the special dummy.

VOLTAGE CHART

TUBE POSITION	PLATE	SCREEN	CATHODE
R.F.	235	80	3.8
Osc. Mod.	235	80	3.8
I.F.	235	80	4
Det. AVC	-	-	50
A.F.	130	-	0
Output	242	235	16
Output	242	235	16
Rect.	AC	-	250

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt meter.

Current 8 amps. at 6.3 volts. Maximum power output 10 watts.

Model 700 PARTS PRICE LIST

NOTE: Numbers in first column refer to squared numbers on circuit diagram.

Drawing No.	Part No.	Description	List
		MAJOR PARTS	
6	25B10954	Input Choke	$1.75
55	48K11026	Vibrator (3333)	2.50
18	23A17190	Electrolytic Condenser (FP)	1.00
	62D18954	Housing Overlay. - Chrome	3.00
1	1X18981	Ant. Coil & Shield Assembly	2.40
9	24A19055	Vibrator Choke (8 Pie)	.35
49	40A19065	Tone Switch	.40
4	1X19076	I.F. Coil & Shield Assembly	1.40
2	1X19078	R.F. Coil & Shield Assembly	1.80
3	1X19080	Osc. Coil & Leads Assembly	.75
48	1K19085	Vol. Control & Coupling Assembly	.95
8	25B19243	Power Transformer	3.50
7	25B19246	Output Trans. & Filter Choke	2.30
7-2	35K19247	Output Trans. Only	1.50
7-1	25K19248	Filter Choke Only	.80
5	1X19252	Diode Coil & Shield Assembly	1.80
	1B19257	Spark Plate Assembly	.75
	1K19265	Housing Assembly	3.25
10	1K19475	"A" Choke Assembly	.35
		CONDENSERS	
25	8A1697	Tubular Condenser (.02-100V.)	.15
23	8A3310	Tubular Condenser (.1-200V)	.15
	8A4383	Tubular Condenser & Strap (.25-400.)	.35
27	8A4588	Tubular Condenser (.5-100.)	.30
22	8A4736	Tubular Condenser (.002-400.)	.15
17	21A4807	Molded Mica Condenser (90 MMF) 10%	.20
28	8A4925	Dual Tub. Cond. (.0008-1000V)	.25
	21B6501	Molded Mica Condenser (200 MMF-20%)	.15
	21B6503	Molded Mica Condenser (50 MMF-20%)	.16
16	21B6517	Molded Mica Condenser. (250-MMF-20%)	.15
32	8A10306	Tubular Cond. & Strap .03-100V	.15
21	8A11968	Special Condenser .03-400	.25
30	8A12898	Tubular Condenser & Strap (.04-100V)	.20
	8A13014	Condenser Res. (.006-100V-100K)	.25
26	8K13165	Tubular Condenser (.003-100V.)	.15
24	8A13514	Tubular Condenser (.05-100V.)	.15
31	8A14095	Flat Tubular Condenser (.4-100V.)	.30
29	8A15370	Tubular Condenser (.005-1600V.)	.35
	21A18120	Molded Mica Condenser (90 MMF-10%)	.20
14	20A18179	Compensating Condenser	.25
13	20A18391	Osc. Trimmer & Padder	.35
15	21A19088	Ceramic Condenser (250 MMF) 5%	.20
20	8K19242	Ceramic Condenser & Strap. (.05-600V)	.25

Drawing No.	Part No.	Description		List
		RESISTORS		
46	6B6005	Carbon Resistors (50-1/2-20)	DOZ.	$ .60
42	6B6010	Carbon Resistor (330-1/2-20 INS)	DOZ.	.60
33	6B6011	Carbon Resistor (470,000-1/3-20)	DOZ.	.60
37	6B6012	Carbon Resistor (33000-1/2-20)	DOZ.	.60
38	6B6016	Carbon Resistor (22000-1-20. N.I.)		.10
44	6B6072	Carbon Resistor (2200-1/3-20. N.I.)	DOZ.	.60
40	6B6086	Carbon Resistor (1000-1/3-10. N.I.)	DOZ.	.60
41	6B6103	Carbon Resistor (330-1-10. N.I.)		.10
36	6B6125	Carbon Resistor (68000-1/3-20. N.I.)	DOZ.	.60
	6B6159	Carbon Resistor (1 MEG-1/3-20 INS)	DOZ.	.60
39	6B6198	Carbon Resistor (1200-1/3-10 N.I.)	DOZ.	.60
45	6B6212	Carbon Resistor (22000-1/3-20. INS)	DOZ.	.60
43	6B6224	Carbon Resistor (560-1/3-10. N.I.)	DOZ.	.60
34	6B6256	Carbon Resistor (68000-1/3-20 INS)	DOZ.	.60
35	6B6275	Carbon Resistor (2700-1/3-10. INS)	DOZ.	.60

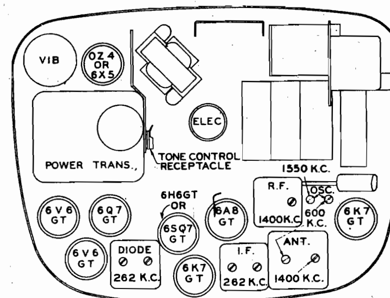


Fig. 1

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 609

GAMBLE-SKOGMO, INC.

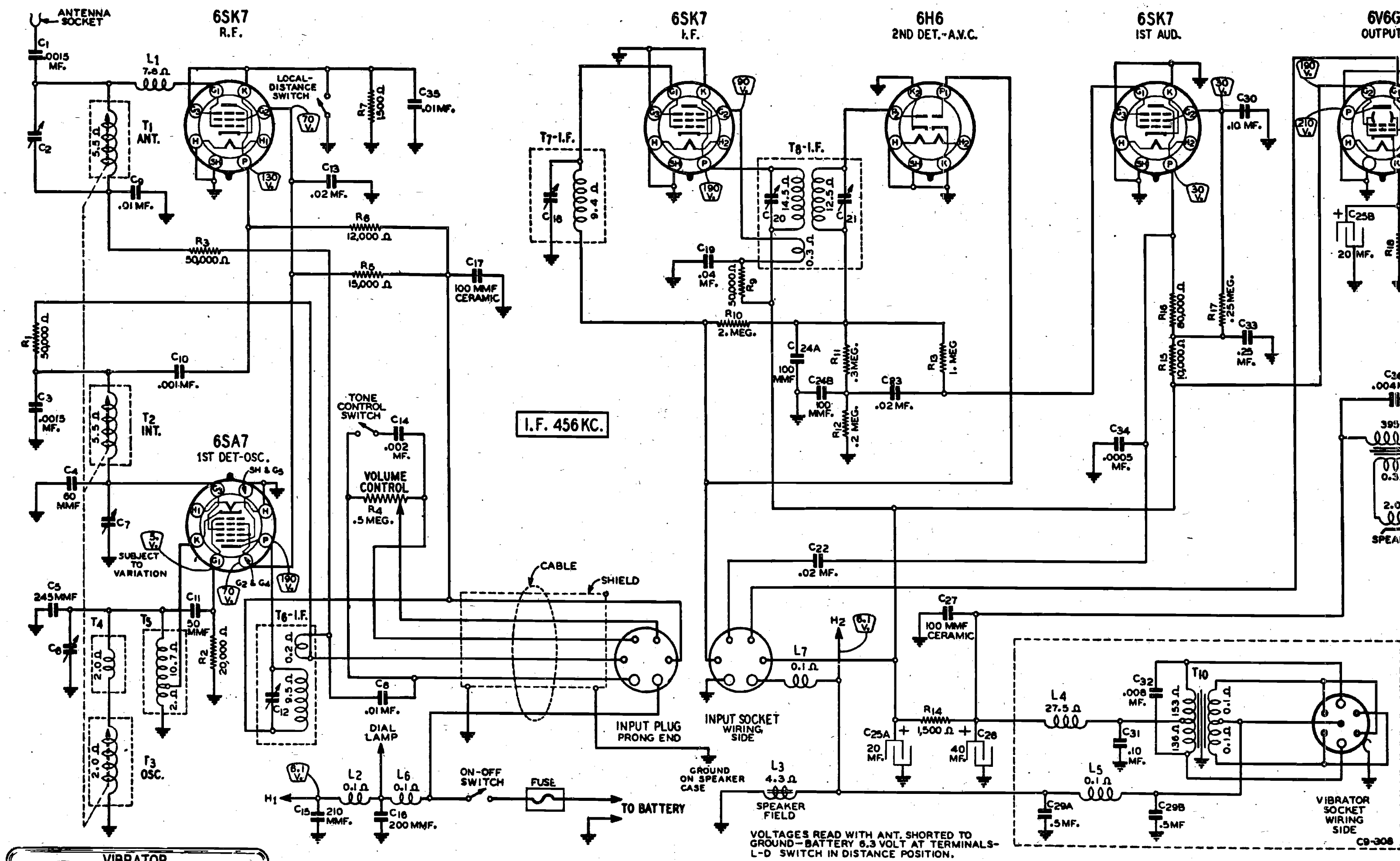


Fig. 5—Schematic Circuit Diagram

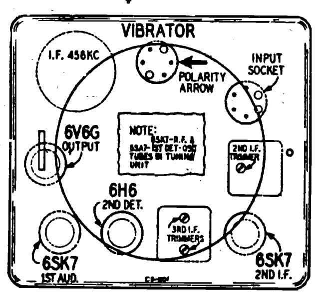


Fig. 2—Tube and Vibrator Location

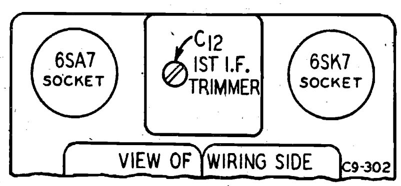


Fig. 6—Location of 1st I.F. Trimmer in Tuning Unit

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

GAMBLE-SKOGMO, INC.

Procedure for Setting the Station Buttons

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.

Make a list of your favorite stations, those which you tune in regularly.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

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 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.

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 mav 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 a screwdriver, as shown in Fig. 1, in the locking screw opening and turning the locking screw in a clockwise direction until it is tight.

Insert a celluloid reinforcement tab half-way in the slot at the front of station button No. 1—See Fig. 3.

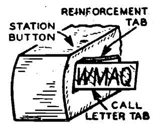


Fig. 3—Inserting Station Tab

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.

Alignment Procedure

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.

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.

Antenna

A shielded antenna cable with bayonet connector plug is required.

The plug on the antenna cable is inserted in the socket at the bottom of the tuning unit case as shown in Fig. 1. The wire at the other end of the cable is connected to the antenna.

LOW CAPACITY ANTENNA

This radio is designed for a low capacity car antenna. The total capacity of antenna and shielded cable should be 35 to 60 mmf.

Types of Low Capacity Antennas —Door hinge; fishpole; over-the-roof types which are mounted quite a distance from the metal roof of the car.

The antenna should be mounted on the same side of the car as the tuning unit.

HIGH CAPACITY ANTENNA

If this radio is to be installed with a high capacity car antenna (200 mmf. total capacity of antenna and shielded cable) an adapter must be used. The adapter is inserted in the socket at the bottom of the tuning unit case. Then the antenna plug is inserted in the adapter.

MODEL 6C9

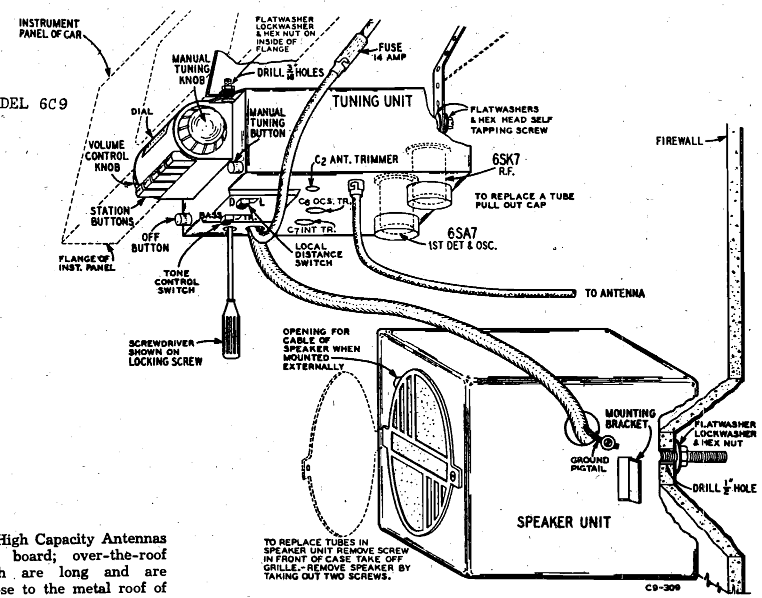


Fig. 1—Details of Mounting Tuning and Speaker Units

Types of High Capacity Antennas — Running board; over-the-roof types which are long and are mounted close to the metal roof of the car; ordinary built in roof antennas (not metal roof).

ANTENNA CABLE

The total capacity of antenna and shielded cable should be 35 to 60 mmf.

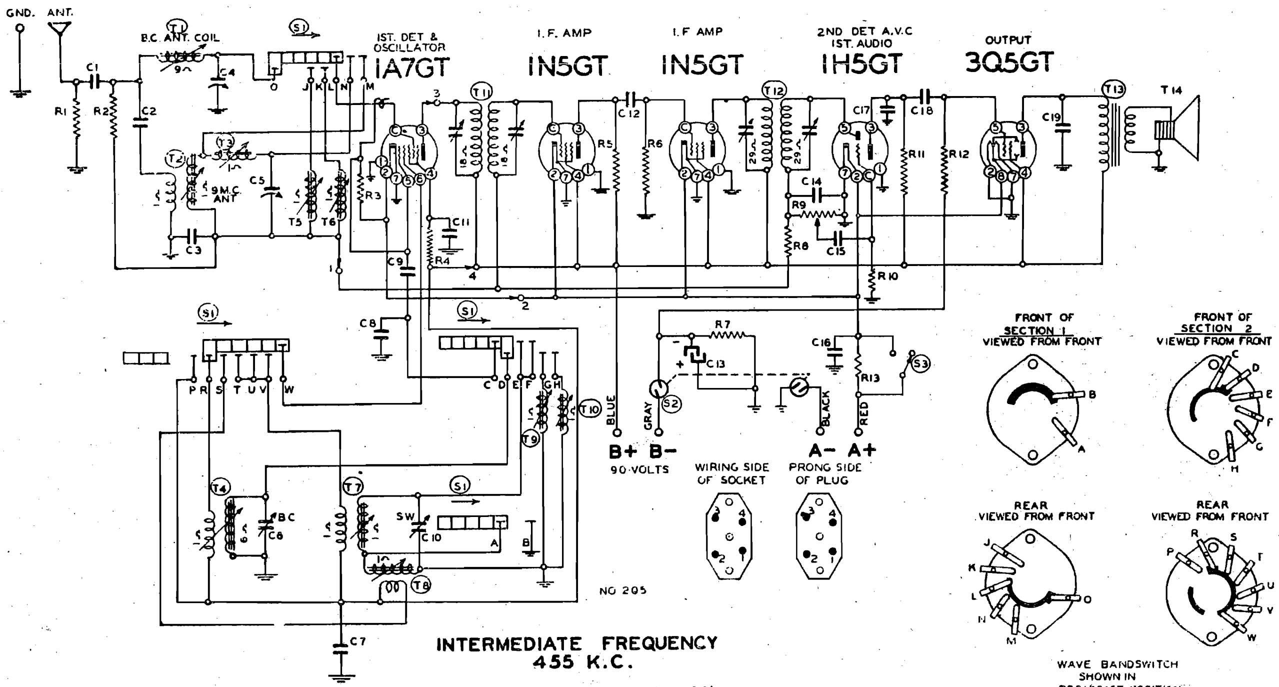
Keep the antenna cable as far away from car wiring as possible and ground the pigtail of the antenna cable shield at the antenna end, otherwise ignition noise may be picked up. The length of the pigtail from the grounding point to the end of the antenna cable should be kept as short as possible, preferably not over one inch.

For the door hinge and over-the-roof type antennas, the antenna lead must be shielded the entire distance from the radio to the point where the lead goes through the car body to the outside. In the case of a running board antenna, the antenna lead **shielding must extend all the way to the antenna.**

When the antenna cable is connected to an antenna lead coming down the pillar post, the shielded cable should be pushed SEVERAL **inches up into the** PILLAR POST.

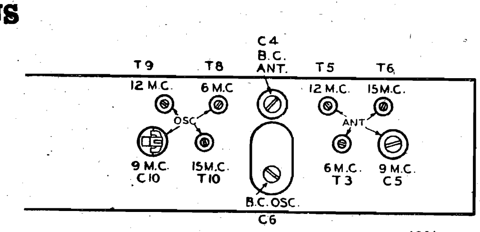
MODEL C509

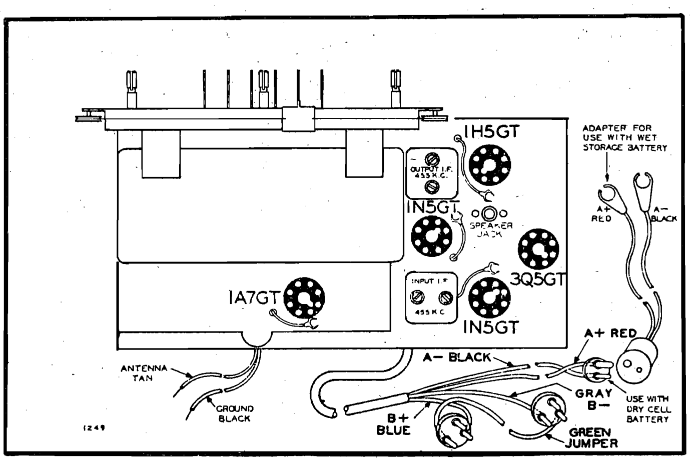
GAMBLE SKOGMO, INC.

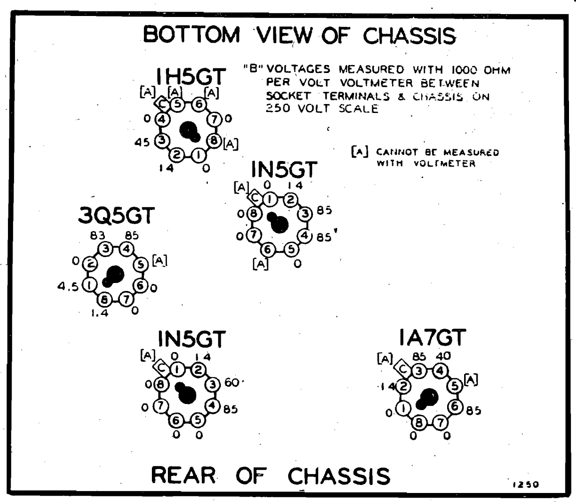


INTERMEDIATE FREQUENCY
455 K.C.

Code No.	Part No.	Description
		RESISTORS
R1	13012	50M ohm—⅓ w. 20%
R2	13020	100M ohm—⅓ w. 20%
R3	1309	200M ohm—⅓ w. 20%
R4	13094	50M ohm—⅓ w. 10%
R5	130176	20M ohm—⅓ w. 10%
R6	13019	1 megohm—⅓ w. 20%
R7	13079	400 ohm—⅓ w. 10%
R8	13038	2 megohm—⅓ w. 20%
R9	101236	Volume Control
R10	130223	10 megohm—⅓ w. 20%
R11	13011	250M ohm—⅓ w. 20%
R12	13019	1 megohm—⅓ w. 20%
R13	130325	1 ohm—⅓ w. 10%
	130326	2.3 ohm—1½ Watt 10% in "A" Cable Adapter
		CONDENSERS
C1	129158	.0002 mica 10%
C2	100112	.001 x 200 volt
C3	1009	.05 x 200 volt
C4	124138	B.C. ant. trimmer
C5	124138	9 mc. ant. trimmer
C6	124139	B.C. osc. trimmer
C7	10064	.25 x 200 volt
C8	129170	.00009 mica 3%
C9	1295	.0001 mica 20%
C10	124145	9 mc. osc. trimmer
C11	100124	.1 x 200 volt
C12	100112	.001 x 200 volt
C13	119116	20 mfd. x 25 volt lytic
C14	12912	.00025 mica 20%
C15	10025	.002 x 600 volt
C16	100104	.5 x 100 volt
C17	1295	.0001 mica 20%
C18	10026	.02 x 400 volt
C19	10012	.003 x 600 volt
		MISCELLANEOUS
T1	111216	B.C. ant. coil
T2	111213	9 mc. ant. coil
T3	111212	6 mc. ant. coil
T4	110168	B.C. osc. coil
T5	111214	12 mc. ant. coil
T6	111215	15 mc. ant. coil
T7	110165	9 mc. osc. coil
T8	110164	6 mc. osc. coil
T9	110166	12 mc. osc. coil
T10	110167	15 mc. osc. coil
T11	108177C	Input I.F. complete
T12	108185B	Output I.F. complete
T13	105119	Output transformer
T14	114220	P.M. speaker
S1	125138	Band switch
S2		On-off switch on volume control
S3	12588B	Battery switch







MODEL 509
MODEL C800

GAMBLE SKOGMO, INC.

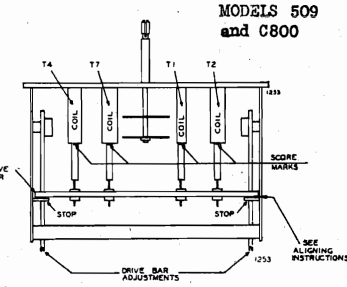
Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a gauge). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

MODELS 509 and C800



IRON CORE ADJUSTMENT VIEW

Setting the Pushbuttons MODELS 509 and C800

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place, (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.

MODEL 509

Power Consumption
A Battery - - - 300 MA
B Battery - - - 13.5 MA
Power Output - - - - - 210 MW Undistorted
Sensitivity for 50 Milliwatt Output: 10 Microvolts Average
Selectivity - 38 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 535 to 1730 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - - 6 in. PM Dynamic

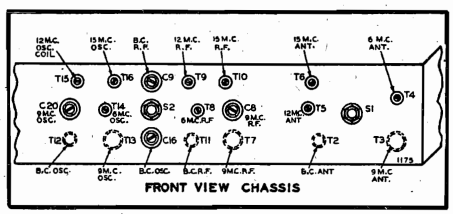
- Tone control—Treble
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal 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	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 1N5 (I.F.)	Broadcast	Set Dial at 1730 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 1A7	Broadcast	Set Dial at 1730 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C10 (See Trimmer on Top) C5	Osc. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T8 (See Trimmer View) T3	Osc. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T9 (See Trimmer View) T5	Osc. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T10 (See Trimmer View) T6	Osc. Ant.	Adjust to maximum output
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1730 Kc.	(See Trimmer View) C6 ((See Trimmer View) C4	Osc. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Tune to Generator Sig.	Rotate Core T1 (See Iron Core Adjustment View)	Ant.	Adjust to maximum output

MODEL C800

Power Consumption - - - - - - 100 Watts
Power Output - - - - - 5 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - 10 in. Electro Dynamic



TRIMMER VIEW

- Tone control—Treble
- 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.

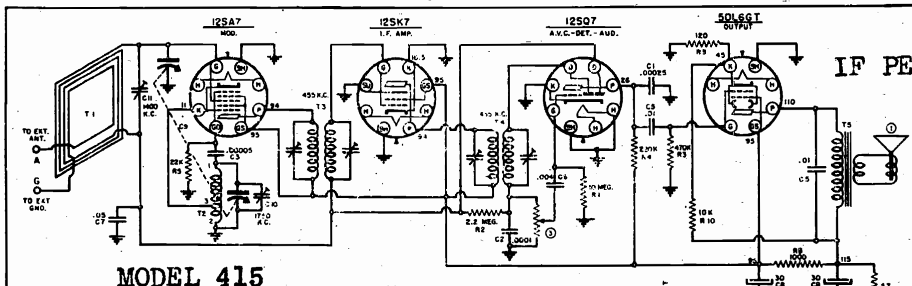
The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

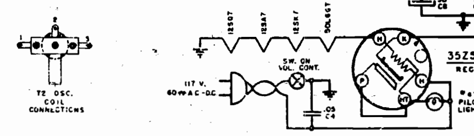
GAMBLE-SKOGMO, INC.

Model 415 is a 5-tube superheterodyne radio receiver for operation on a 117 volt A.C., 60 cycle or 117 volt D.C. supply.

This receiver covers a frequency range from 540 Kilocycles to 1750 Kilocycles (K.C.)

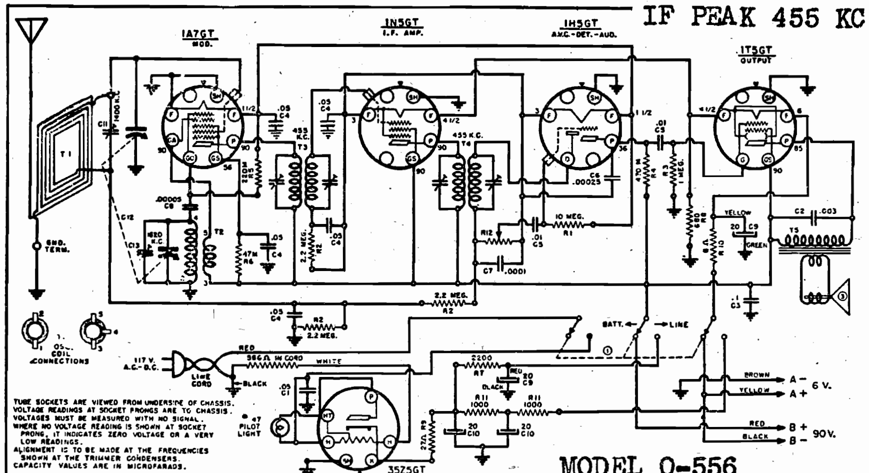


MODEL 415



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 1-51
R 1	60-153	10 MEGOHM 1/4 WATT RESISTOR	C 1	1504	.00025 MFD. MICA CONDENSER	T 1	82-22	LOOP ANTENNA
R 2	60-179	2.2 " - -	C 2	1501	.0001 - - -	T 2	10-371	OSCILLATOR COIL
R 3	60-178	470K OHM - -	C 3	1503	.00005 - - -	T 3	10-369	1ST. I.F. TRANSFORMER
R 4	60-180	220K - - -	C 4	16-107	.05 MFD. 400 V TUBULAR CONDENSER	T 4	10-370	2ND. I.F TRANSFORMER
R 5	60-185	22K - - -	C 5	16-119	.01 - - - -	T 5	60-205	OUTPUT TRANSFORMER (ON SPKR.)
R 6	60-189	4700 - - -	C 6	16-125	.004 - - - -			
R 7	60-220	27 - - -	C 7	1822	.05 200 V.	1	79-307	5" P.M. SPEAKER
R 8	60-198	1000 - 1/2 WATT -	C 8	18-266	30 X 30 MFD. 150 W.V. ELECTROLYTIC	2	69-152	TONE SWITCH
R 9	60-648	120 - - -	C 9	19-171	2 GANG VARIABLE CONDENSER (ALSO C10)	3	24-153	500K OHM VOLUME CONTROL (WITH SW.)
R 10	60-547	10K - 1 WATT -	C 11	20-129	TRIMMER (ON LOOP)			

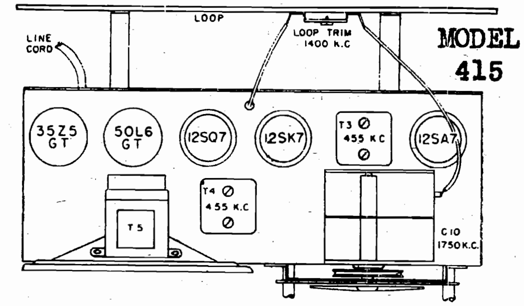


IF PEAK 455 KC

MODEL 0-556

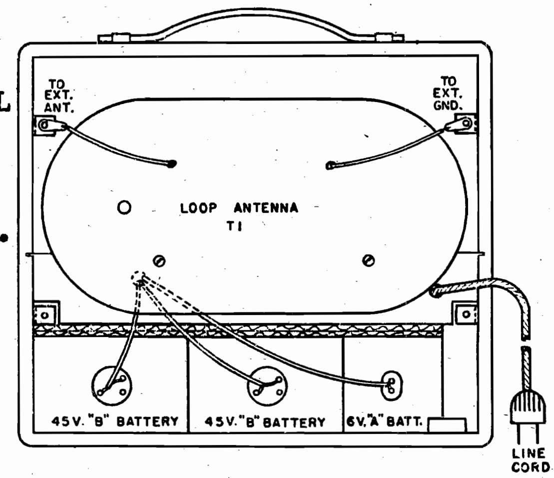
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READINGS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 0-55
C 1	1607	.05 MFD. 400 V. TUBULAR COND.	R 1	60-193	10 MEGOHM 1/4 W. RESISTOR	T 1	82-20	LOOP ANTENNA
C 2	16-139	.003 " - - -	R 2	60-179	2.2 " - -	T 2	10-310	OSCILLATOR COIL
C 3	16-115	.1 " 200 V. - -	R 3	60-195	1 " - -	T 3	10-355	1 ST. I.F. TRANSFORMER
C 4	1622	.05 " - - -	R 4	60-178	470 M OHM - -	T 4	10-343	2 ND. - -
C 5	16-121	.01 " - - -	R 5	60-180	220 M - - -	T 5	80-204	OUTPUT TRANSFORMER
C 6	1504	.00025 MFD. MICA CONDENSER	R 6	60-177	47 M - - -			
C 7	1501	.0001 - - -	R 7	60-383	2200 - - -	1	69-151	POWER SWITCH
C 8	1503	.00005 - - -	R 8	60-379	680 - - -	3	79-303	5" P.M. SPEAKER } ALTERNATIVE
C 9	16-263	20 X 20 - 150 W.V. ELECTROLYTIC	R 9	60-220	27 - - -	3	79-304	5" P.M. SPEAKER } ALTERNATIVE
C 10	18-262	20 X 20 130 W.V. - -	R 10	60-128	8 - 1/2 W. -			
C 11	20-129	TRIMMER ON LOOP.	R 11	60-644	1000 - 3 W. -			
C 12	19-167	2 GANG VARIABLE COND. ALSO C13	R 12	24-150	1 MEGOHM VOLUME CONTROL			

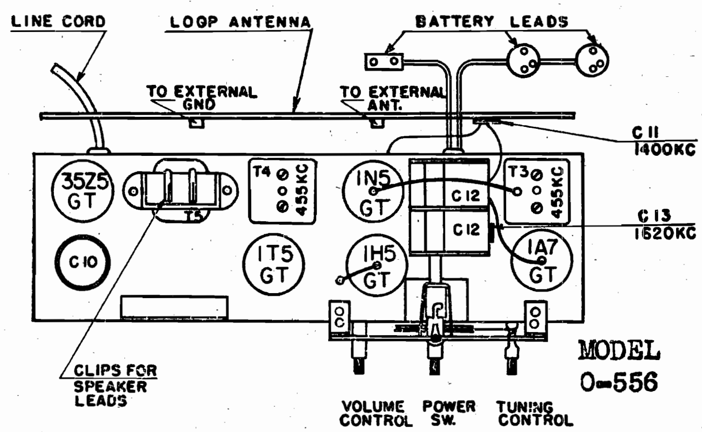


LOCATION OF PARTS ON TOP OF CHASSIS

CONVENTIONAL ALIGNMENT. SEE SPECIAL SECTION OF VOLUME VIII.



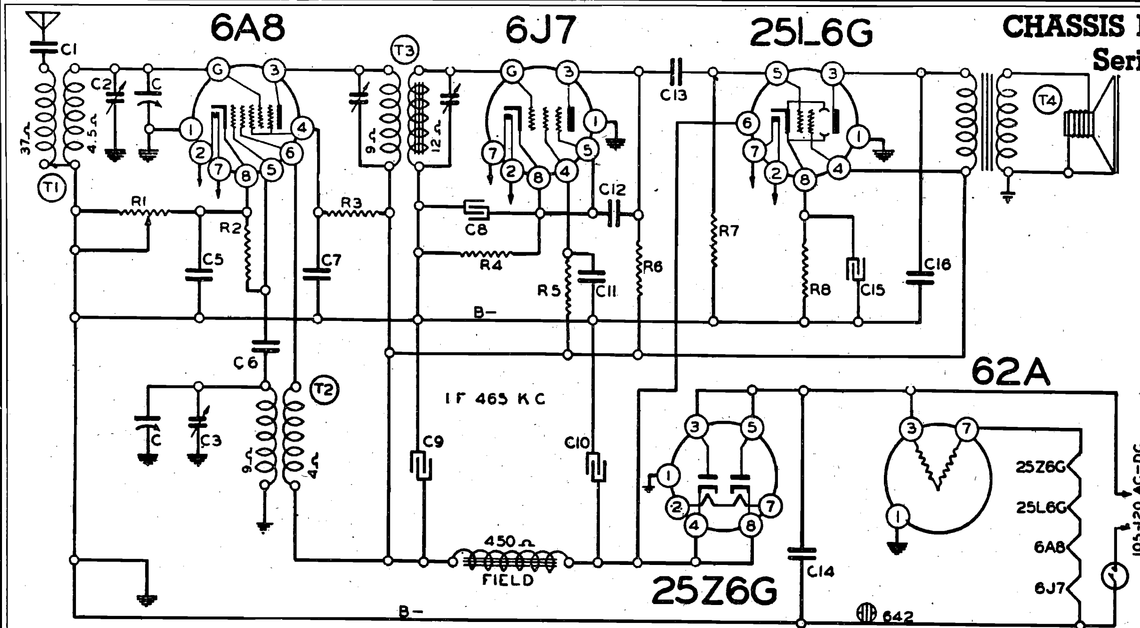
LOCATION OF PARTS IN CABINET



MODEL 520

GAMBLE SKOGMO, INC.

CHASSIS MODEL 520
Series A



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

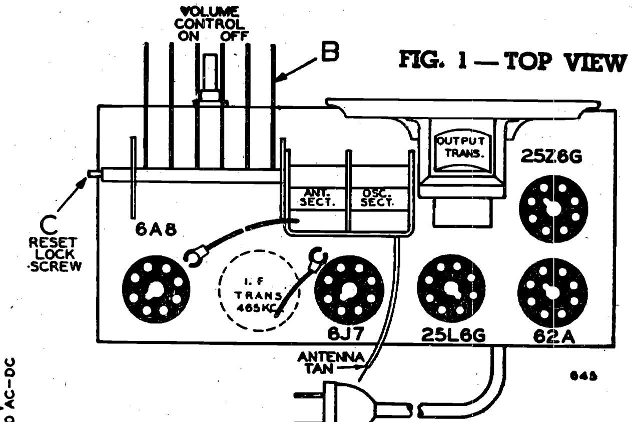


FIG. 1—TOP VIEW

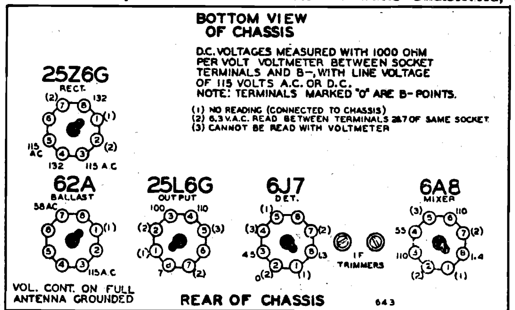


FIG. 3

Code No.	Part No.	Description
		RESISTORS
R1	101138	20M ohm volume control
R2	13012	50M ohm—⅓ w.
R3	130194	35M ohm—⅓ w.
R4	13082	10M ohm—⅓ w.
R5	13038	2 megohm—⅓ w.
R6	13045	250M ohm—⅓ w.
R7	1303	500M ohm—⅓ w.
R8	130251	160 ohm—⅓ 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

Broadcast Band A. C.-D. C.
Superheterodyne Receiver
Frequency Range 530-1720 Kilocycles

I. F. Frequency 465 K. C.

ALIGNMENT PROCEDURE

FREQUENCY RANGE
530 to 1720 K.C.

- 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 (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

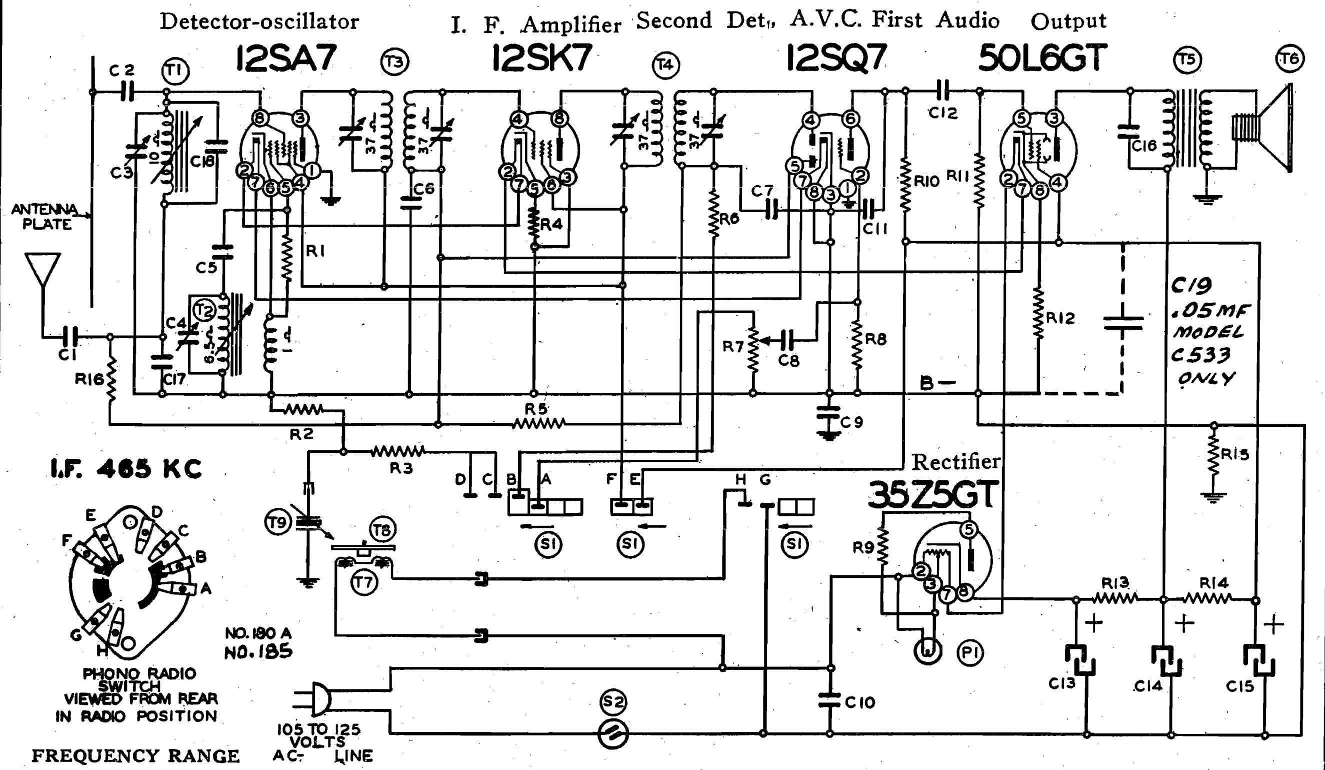
The tube complement of this chassis consists of the following octal base glass and metal tubes.
The type and function of each tube is as follows:

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.

FOR
TUNER ADJUSTMENTS
SEE
GAMBLE-SKOGMO
MODEL 527-A, VOLUME X
PAGE 10-8

GAMBLE SKOGMO, INC.

MODEL 533, Series B
Ser. No. OC371605B up,
MODEL C533, Series C



FREQUENCY RANGE
535 to 1690 K.C.

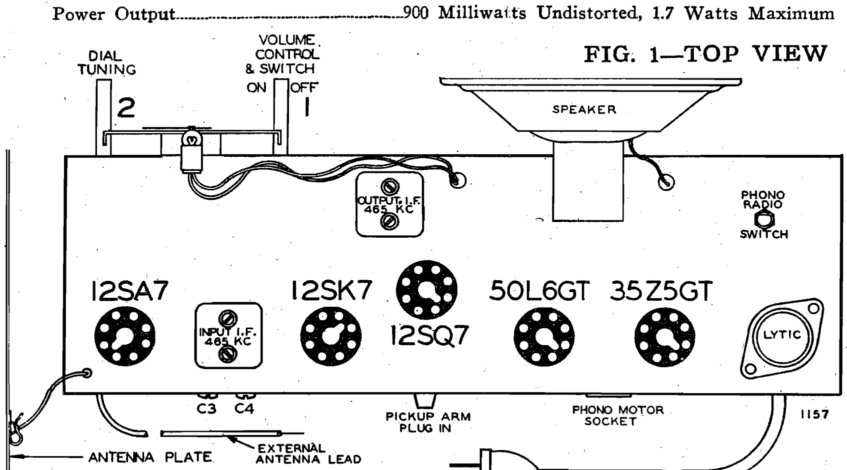
MODEL 533 Series B (Serial No. OC371605B and up)

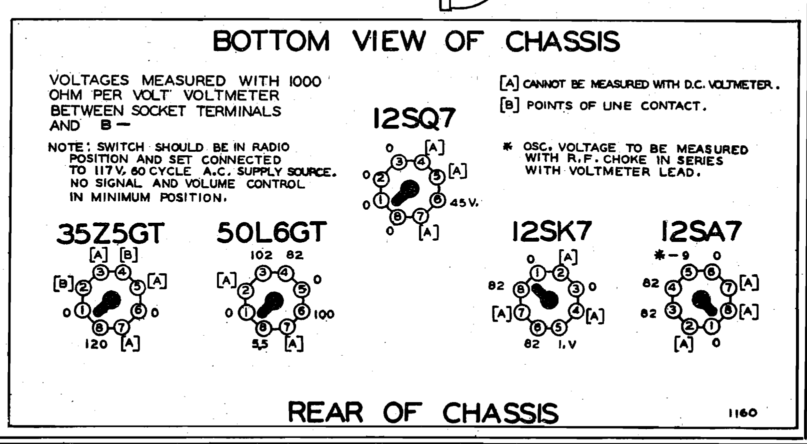
Power Consumption........Radio Only 30 Watts
Power Output........900 Milliwatts Undistorted, 1.7 Watts Maximum

3-40

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	130176	20M ohm—1/3 w.
R2	130118	600M ohm—1/3 w.
R3	130118	600M ohm—1/3 w.
R4	13056	100 ohm—1/3 w.
R5	130170	3 megohm—1/3 w.
R6	13012	50M ohm—1/3 w.
R7	101217	1/2 megohm—volume control
R8	130257	5 megohm—1/3 w.
R9	130215	25 ohm—1/2 w.
R10	1309	200M ohm—1/3 w.
R11	13037	750M ohm—1/3 w.
R12	130166	150 ohm—1/3 w.
R13	13097	200 ohm—1/3 w.
R14	130287	1200 ohm—1 watt
R15	1309	200M ohm—1/3 w.
R16	1309	200M—1/3 w.
		CONDENSERS
C1	1295	.0001 Mica Condenser
C2	129114	.0003 mfd. mica
C3	124136	Antenna Trimmer
C4	124136	Oscillator Trimmer
C5	1295	.0001 mica
C6	1009	.05 x 200 v.
C7	1295	.0001 mica
C8	10025	.002 x 600 v.
C9	100119	.1 x 400 v.
C10	1001	.1 x 400 v.
C11	12912	.00025 mica
C12	10019	.006 x 600 v.
C13	11994	40 mfd. lytic—150 w. v.
C14	11994	20 mfd. lytic—150 w. v.
C15	11994	20 mfd. lytic—150 w. v.
C16	10011	.01 x 400 v.
C17	129162	.0008 Mica Condenser
C18	129163	.000025 Ceramicon Condenser
		C3 and C4 in same unit
		C13, C14 and C15 are in same unit
		PARTS
T1	112767	Antenna Coil—Permeability tuning assembly complete
T2	112767	Oscillator Coil
T3	108140F	Input I. F. Coil—465 kc.
T4	108145D	Output I. F. Coil—465 kc.
T5	105108	Output Transformer
T6	114193	5" P.M. Speaker
T7	104206	Phono Motor
T8	12228	Turntable
T9	114194	Phono pick up arm
S1	125113	Phono Switch
S2		Switch on volume control
P1	107249	Pilot light T47
		T1 and T2 in same unit

FIG. 1—TOP VIEW





MODEL 533, Series B
Ser. No. 0C371605B up
MODEL C533, Series C

GAMBLE SKOGMO, INC.

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions

- 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-metallic screwdriver.
- Dummy antennas—.1 Mfd., and 200 Mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "A" (See Fig. 1)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "A" (See Fig. 1)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROADCAST BAND	1690 Kc.	.1 MFD.	Connect to Terminal "A" (See Fig. 1)	Iron Cores All the way out	Trimmer (C4) (See Fig. 1)	Oscillator	Adjust to maximum output
	1690 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 1)	Iron Cores All the way out	Trimmer (C3) (See Fig. 1)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 1)	Turn Dial to 1400 Kc.	Adjust position of antenna coil right or left. (See Fig. 3)	Antenna Coil Adjustment	(See Note "A") Adjust to maximum output
	1690 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 1)	Turn Dial to 1690 Kc.	Adjust trimmer (C3) (See Fig. 1)	Antenna	Check for tracking (See Note "B")

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 radio, the chassis should be removed from the cabinet.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control at minimum, 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 117 volt 60 cycle A.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.

NOTE "A"—The antenna coil assembly is made so that it is movable right or left. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1690 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1690 Kc.

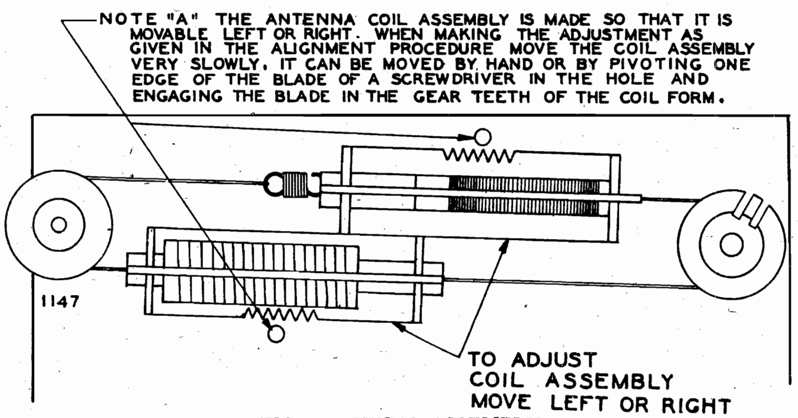
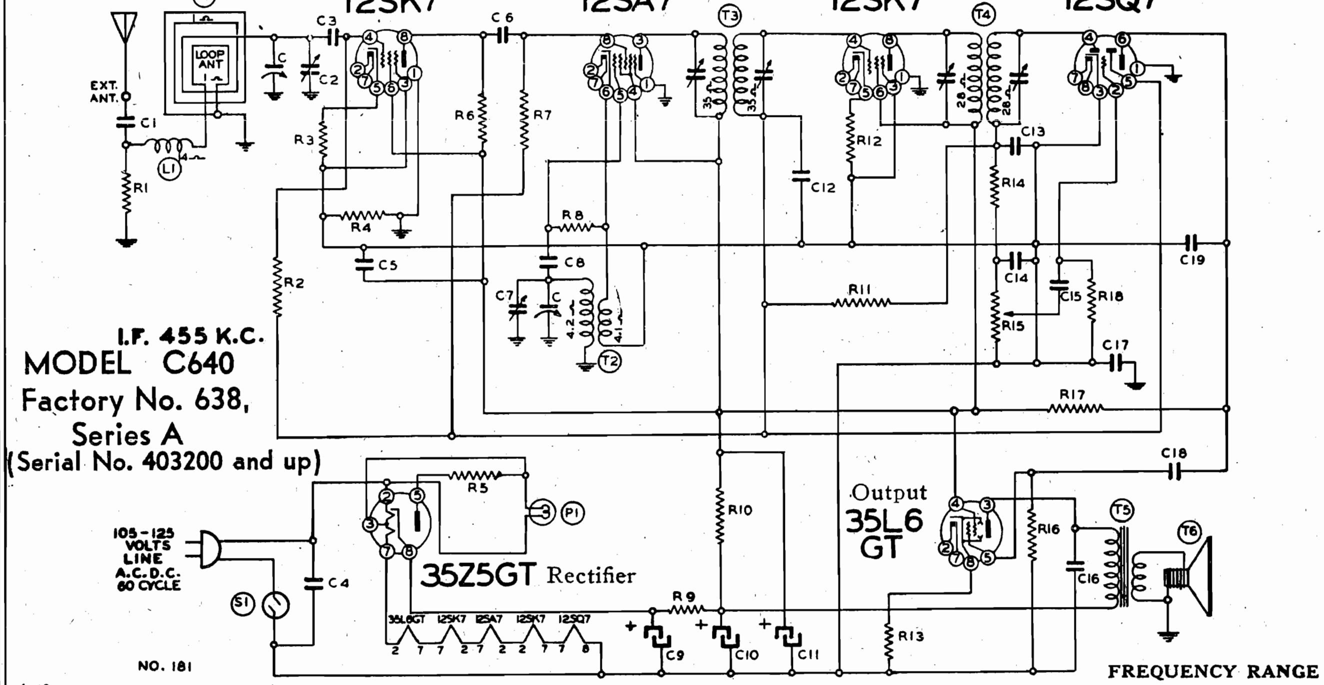


FIG. 3.—TUNING ASSEMBLY

GAMBLE SKOGMO, INC.

MODEL C640

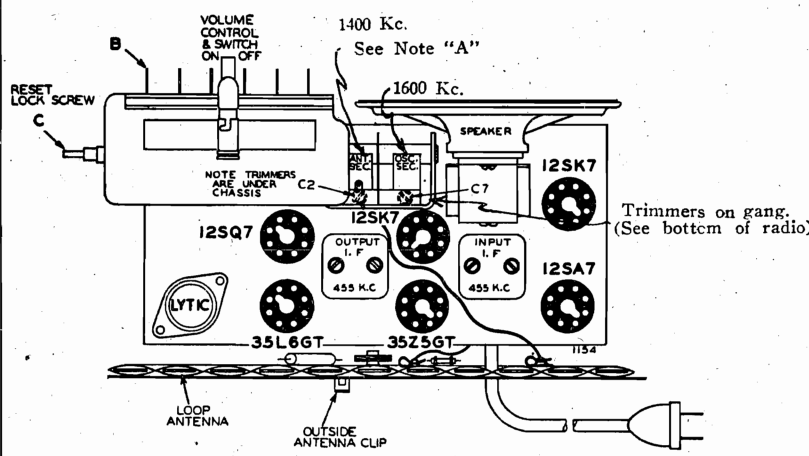


4-40

FREQUENCY RANGE
540 to 1600 K.C.

Power Consumption .... 35 Watts

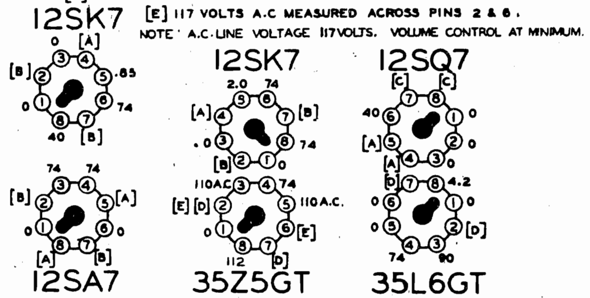
Power Output .... 1 Watt Undistorted, 1.5 Watts Maximum



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B—

[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] 12 VOLTS A.C MEASURED ACROSS PINS 2 & 7.
[C] 12 VOLTS A.C MEASURED ACROSS PINS 7 & 8.
[D] 30 VOLTS A.C MEASURED ACROSS PINS 2 & 7.
[E] 117 VOLTS A.C MEASURED ACROSS PINS 2 & 6.
NOTE A.C. LINE VOLTAGE 117 VOLTS. VOLUME CONTROL AT MINIMUM.



REAR OF CHASSIS

Code No.	Part No.	Description
		RESISTORS
R1	13018	4M ohm—1/3 w.
R2	13019	1 megohm—1/3 w.
R3	130168	100 ohm—1/3 w.
R4	130100	150M ohm—1/3 w.
R5	130215	25 ohm—1/2 w.
R6	130218	5M ohm—1/3 w.
R7	13020	100M ohm—1/3 w.
R8	13012	50M ohm—1/3 w.
R9	130296	200 ohm—1 w.
R10	130287	1200 ohm—1 w.
R11	130170	3 megohm—1/3 w.
R12	13024	400 ohm—1/3 w.
R13	130166	150 ohm—1/3 w.
R14	13012	50M ohm—1/3 w.
R15	101218	1 megohm volume control
R16	1303	500M ohm—1/3 w.
R17	1309	200M ohm—1/3 w.
R18	130257	5 megohm—1/3 w.
		CONDENSERS
C	102116	2 gang variable condenser
C1	10025	.002 x 600 v.
C2		B. C. Antenna Trimmer on Gang Con.
C3	1292	.0005 Mica
C4	1001	.1 x 400 v.
C5	1006	.25 x 200 v.
C6	1295	.0001 mica
C7		B. C. Oscillator Trimmer on Gang Con.
C8	1295	.0001 mica
C9	11994	40 mfd. lytic x 150 w. v.
C10	11994	20 mfd. lytic x 150 w. v.
C11	11994	20 mfd. lytic x 150 w. v.
C12	1009	.05 x 200 v.
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10025	.002 x 600 v.
C16	10026	.02 x 400 v.
C17	100110	.2 x 400 v.
C18	100106	.004 x 600 v.
C19	1295	.0001 mica
		C9, C10, C11 are in same unit
		C13, C14 are in same unit
		PARTS
T1	111180	Loop Antenna complete
T2	110152	Oscillator Coil
T3	108140H	Input I. F. Coil—455 Kc.
T4	108145	Output I. F. Coil—455 Kc.
T5	105104	Output Transformer
T6	114197	5" P. M. Speaker
L1	12310	Loading Coil
S1		On-off switch on volume control
P1	107249	T47 Pilot light bulb

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.

MODEL C640,
MODEL 678, Issue C,
MODEL 796, Series A

GAMBLE-SKOGMO, INC.

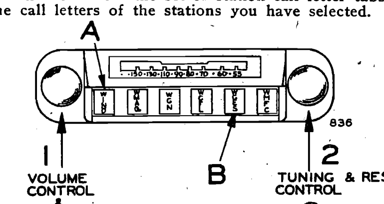
MODEL 678, Issue C

PROCEDURE FOR SETTING THE AUTOMATIC PUSHBUTTONS:

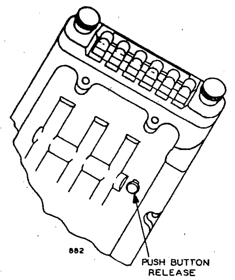
There are six pushbuttons on the Remote Tuner Unit by means of which six stations may be set up for automatic tuning (see B, Fig. 2).

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.



678, Issue C
Fig. 2—Front View of Remote Tuner Unit



678, Issue C
Fig. 2A—
Bottom View of Remote Tuner Unit Showing Push Button Release Pin.

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 the **pushbutton release pin** on the bottom of the tuner unit. This will trip the latching mechanism and all the **pushbuttons** will be **released** to **out position,** (See Fig. 2A).
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** press **the pushbutton release pin** on the bottom of the tuner unit.
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.)

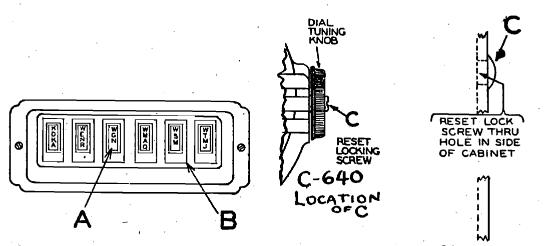


FIG. 2.

PROCEDURE FOR SETTING THE AUTOMATIC TUNER PUSH BUTTONS

MODEL C640 Model 796

1. Make a list of six stations you tune in regularly. There are six push buttons on the front of the radio by means of which six stations may be tuned automatically. (See "B," Fig. 2.)

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

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 push buttons.

3. Stations may be set up in any sequence desired. Press any one of the automatic tuner push buttons down all the way.

4. Hold the push button down **firmly,** and tune set **very carefully** to station desired, until station is heard clearly **and** with maximum volume.

Release the push button.

5. Press down another automatic tuner push button. **Hold** it down FIRMLY and carefully tune in next station **desired.** Release this push button.

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

6. Now rotate the tuning knob to the right (clockwise) as far as it will turn, and with a coin (quarter), 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 push buttons. (Note: Locking screw "C" is loose when radio is shipped from factory.)

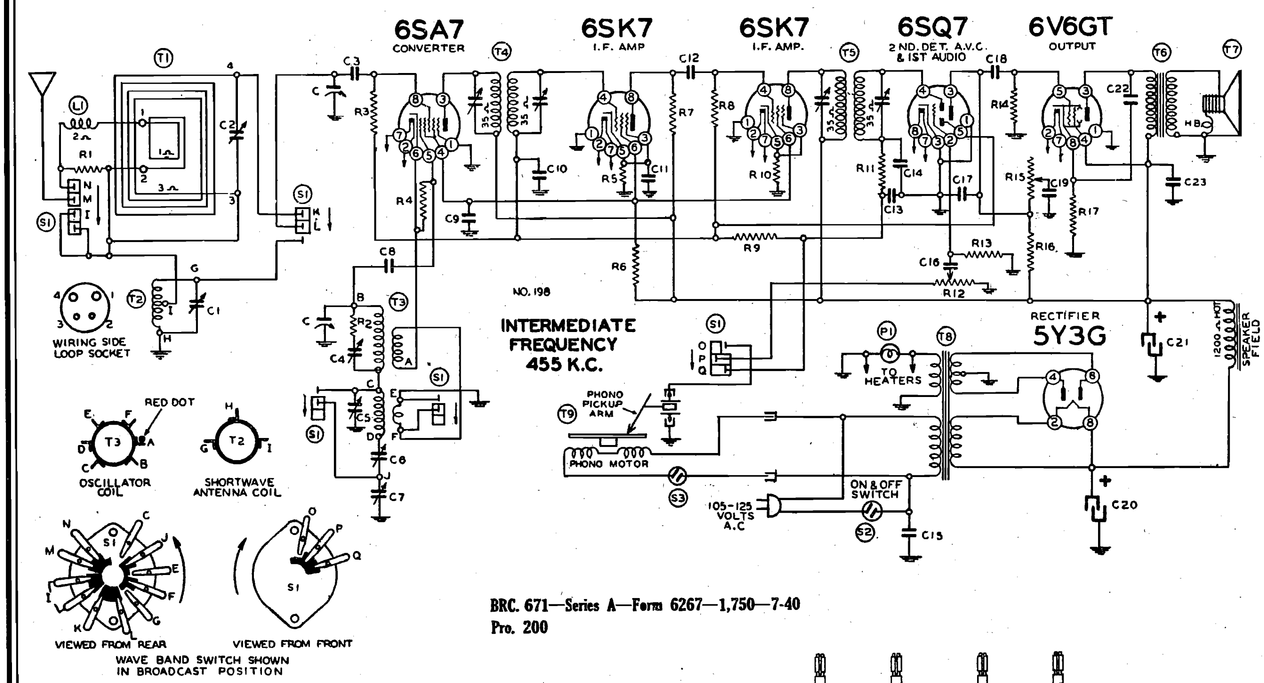
CHANGING STATIONS:

If you should desire to change any station you have selected to another, loosen the locking screw "C" one or two turns. Hold in push button on which the station is to be changed and tune in new station desired. Release the push button. (Note: If the dial mechanism works hard when setting up a new station for one of the automatic tuner buttons it is due to the locking screw being too tight. Loosen the locking screw "C" until the dial mechanism works freely with the tuner push button pressed in.

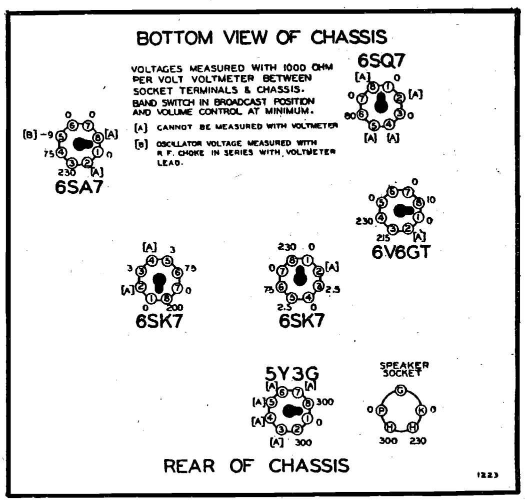
Be sure to retighten the locking screw, otherwise the stations you have previously selected will not stay adjusted to the push buttons.

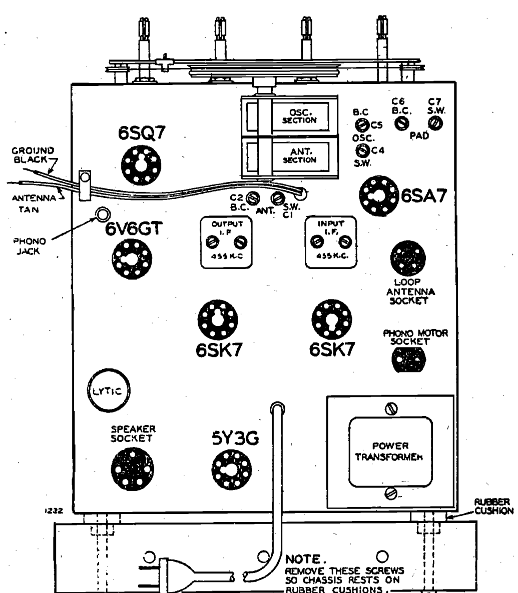
The set is now set up for automatic tuning.

GAMBLE SKOGMO, INC.



BRC. 671—Series A—Form 6267—1,750—7-40
Pro. 200





Code No.	Part No.	Description
		RESISTORS
R1	13071	4000 ohm—1/3 w.
R2	130128	20 ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130236	30M ohm—1/3 w.
R5	130283	750 ohm—1/3 w.
R6	130324	18M ohm—1 watt
R7	130218	5M ohm—1/3 w.
R8	13020	100M ohm—1/3 w.
R9	130170	3 megohm—1/3 w.
R10	130222	350 ohm—1/3 w.
R11	13012	50M ohm—1/3 w.
R12	101232	1 megohm volume control
R13	130223	10 megohm—1/3 w.
R14	1303	500M ohm—1/3 w.
R15	101231	1 megohm tone control
R16	130172	250M ohm—1/3 w.
R17	130323	270 ohm—1 watt
		CONDENSERS
C	102137	Two gang variable condenser
C1	124149	S. W. Antenna trimmer
C2	124149	B. C. Antenna trimmer
C3	1292	.0005 mica
C4	124142	S. W. Oscillator trimmer
C5	124142	B. C. Oscillator trimmer
C6	124146	B. C. Padding Condenser
C7	124146	S. W. Padding Condenser
C8	12960	150 mmfd. mica
C9	10013	.05 x 400 v.
C10	10022	.05 x 200 v.
C11	1009	.05 x 200 v.
C12	1292	.0005 mica
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10061	.02 x 600 v.
C16	10025	.002 x 600 v.
C17	12912	.00025 mica
C18	10026	.02 x 400 v.
C19	10071	.004 x 600 v.
C20	119115	16 mfd. x 400 w. v. lytic
C21	119115	16 mfd. x 400 w. v. lytic
C22	10019	.006 x 600 v.
C23	1001	.1 x 400 v.

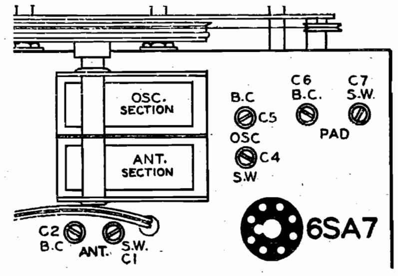
C1 and C2 are in same unit C4 and C5 in same unit
C6 and C7 are in same unit C13 and C14 in same unit
C20 and C21 are in same unit

Code No.	Part No.	Description
		PARTS
T1	111208	Loop antenna assembly
T2	111184	S. W. Antenna Coil
T3	110154	B. C. and S. W. Oscillator Coil
T4	108169E	Input I. F. Coil—455 kc.
T5	108106U	Output I.F. Coil—455 kc.
T6	105118	Output Transformer
T7	114216	8" Electro Dynamic Speaker
T8	104225B	60 cycle power transformer
and	104238B	25 cycle power transformer
T9	104228	60 cycle Seeburg Record Changer and Phono Assembly
and	104229	25 cycle Seeburg Record Changer and Phono Assembly
S1	125132	Phono-band switch
S2		Switch on volume control
S3		Switch on record changer
L1	12312	R. F. Choke coil
P1	10794	Pilot light bulb No. T-44

GAMBLE-SKOGMO, INC.

TECHNICAL DATA—Model No. C671

Power Consumption	Radio Only	70 Watts
	Motor Only	20 Watts
Power Output		2.1 Watts Undistorted
Sensitivity for 500 Milliwatt Output:		15 Microvolts Average
Selectivity		51 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range	Broadcast Band	530 to 1600 KC
	Shortwave Band	5.46 to 18.3 MC
Intermediate Frequency		455 KC
Speaker		8 in. Electro Dynamic



TRIMMER VIEW

Band and Phono Switch

This knob switches the tuning from the broadcast stations to the shortwave band, and also to the "Phono" position. Turn the knob to "Broadcast" for broadcast stations and to "Phono" to play records. The points marked 49M-31M-25M-20M-19M-16M on the dial scale are shortwave broadcast channels—The 49M and 31M channels are best during darkness—The other channels are best in daylight. Tune short waves very slowly.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground 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., 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.	455 Kc.	.1 MFD	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Trimmers on top (See Top View)	Input and Output I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	530 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C6	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External. Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C6 (See Top View)	Broadcast oscillator series pad	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND" leads when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1600 and 530 K. C.).

The loop antenna should be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." leads.

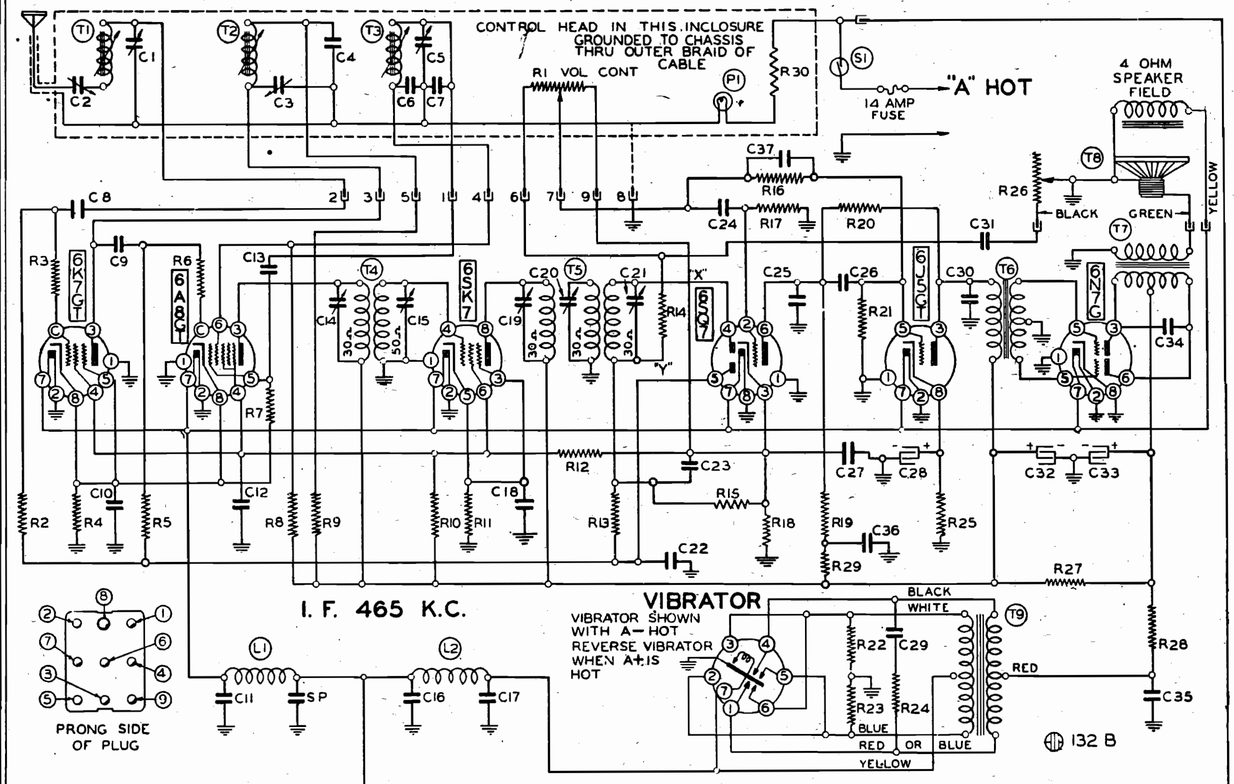
NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

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.

GAMBLE-SKOGMO, INC.

MODEL 678, Issue C
Ser. No. 14302 up



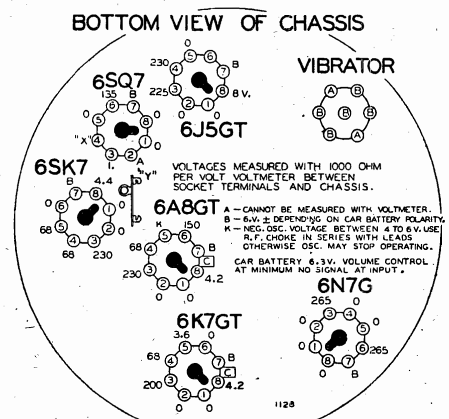


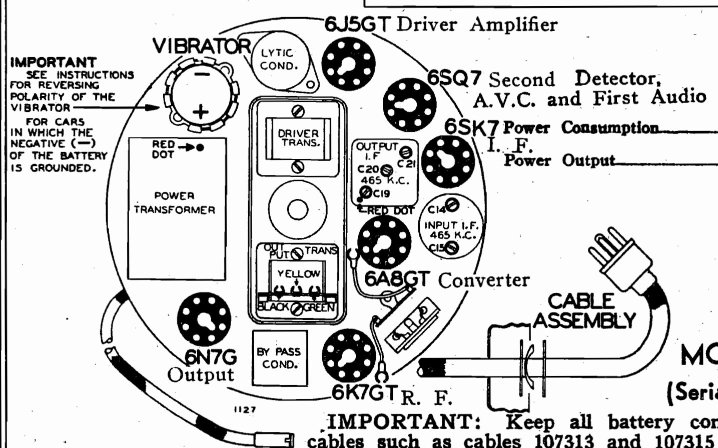
FIG. 5

CONDENSERS

C1	12483	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 Ceramicon—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	10026	.02 x 400 v.
C28	11988	20 mfd.—25 w. v. lytic
C29	100101	.0055 x 1600
C30	129114	.0003 Mica
C31	10047	.002 x 600 v.
C32	11988	15 mfd.—450 w. v. lytic
C33	11988	15 mfd.—450 w. v. lytic
C34	100103	.004 x 800 v.
C35	1001	.1 x 400 volt
C36	10013	.05 x 400 v.
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	10797	6-8 v. Pilot Light T51
S1		Off-on Switch on volume control
	1269	Vibrator (130 cycle synchronous)



IMPORTANT SEE INSTRUCTIONS FOR REVERSING POLARITY OF THE VIBRATOR FOR CARS IN WHICH THE NEGATIVE (—) OF THE BATTERY IS GROUNDED.

Fig. 3—Top View of Chassis

IMPORTANT: Keep all battery connecting wires and cables such as cables 107313 and 107315 as far away from the R.F. connector cable (107231) as possible. This will reduce any interference which may be present in these battery wires from being radiated back into the R.F. connector cable 107231.

Power Consumption.........7.7 Amperes at 6.3 Volts
Power Output.........7 Watts Undistorted, 9 Watts Maximum

FREQUENCY RANGE
535 to 1565 Kc.

MARCH 1940
MODEL 678, Issue C
(Serial No. 14302 and up)

RESISTORS

R1	101161	1.2 megohm volume control
R2	13019	1 megohm—⅓ w.
R3	130275	500 ohm—⅓ w.
R4	13079	400 ohm—⅓ w.
R5	13019	1 megohm—⅓ w.
R6	130275	500 ohm—⅓ w.
R7	13012	50M ohm—⅓ w.
R8	13012	50M ohm—⅓ w.
R9	13021	20M ohm—⅓ w.
R10	130196	30M ohm—1 watt
R11	130235	1500 ohm—⅓ w.
R12	1307	40M ohm—⅓ w.
R13	13019	1 megohm—⅓ w.
R14	13020	100M ohm—⅓ w.
R15	130118	600M ohm—⅓ w.
R16	130257	5 megohm—⅓ w.
R17	13019	1 megohm—⅓ w.
R18	130101	600 ohm—⅓ w.
R19	13011	250M ohm—⅓ w.
R20	13038	2 megohm—⅓ w.
R21	1303	500M ohm—⅓ w.
R22	130269	100 ohm—⅓ w.
R23	130269	100 ohm—⅓ w.
R24	13071	4M ohm—⅓ w.
R25	13092	1M ohm—⅓ w.
R26	101162	1 megohm tone control
R27	130199	1500 ohm Resistor—1 watt
R28	130231	75 ohm—⅓ w.
R29	13020	100M ohm—⅓ w.
R30	130299	10 ohm—⅓ w.

MODEL 678, Issue C
Ser. No. 14302 up

GAMBLE-SKOGMO, INC.

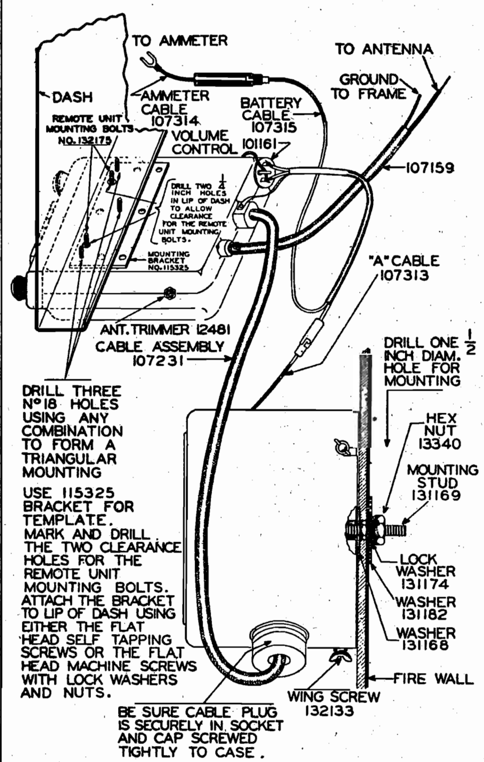
ALIGNMENT PROCEDURE

- 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., 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 6A8GT	Set dial at 1400 Kc.	Trimmers C14, C15 (See Fig. 3)	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.

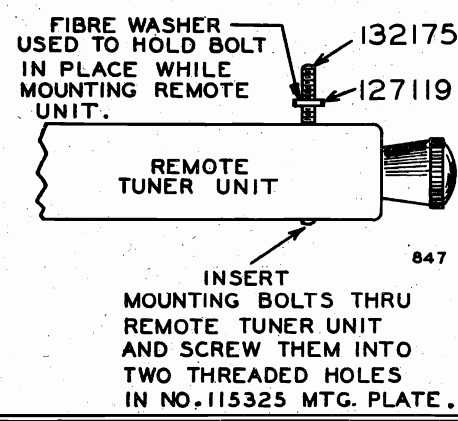
For alignment of the output I. F. transformer using a cathode ray oscillograph the 10M ohm resistor is not used.

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," page 3.

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.



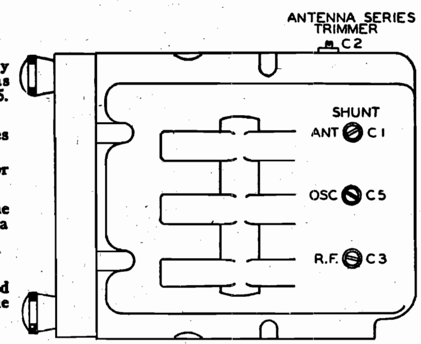


Fig. 4.—Bottom View of Remote Tuner

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, Page 7).

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.

MODEL 796, Series A
Ser. No. OC362500 up

GAMBLE-SKOGMO, INC.

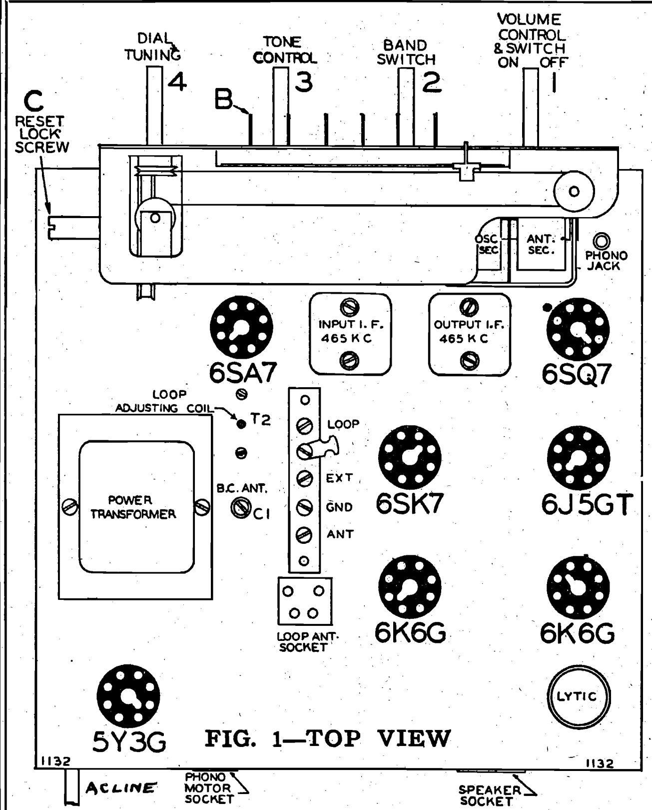
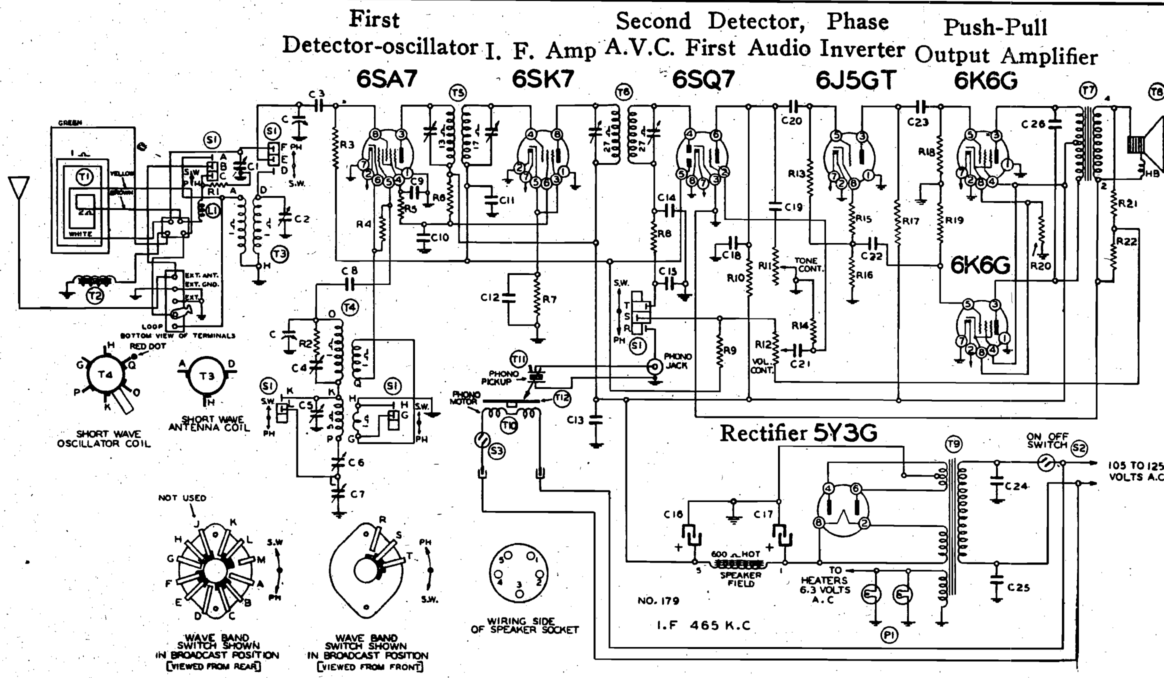


FIG. 1—TOP VIEW



FOR OTHER DATA
SEE INDEX

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.4 to 18.3 MC.
Center Position	Broadcast	532 to 1570 KC.

Power Consumption (Radio Chassis only, less Phono Motor) 85 Watts
Power Output 4.5 Watts Undistorted, 6 Watts Maximum
Intermediate Frequency 465 K.C.

Model 796

Series A

(Serial No. OC362500 and up)

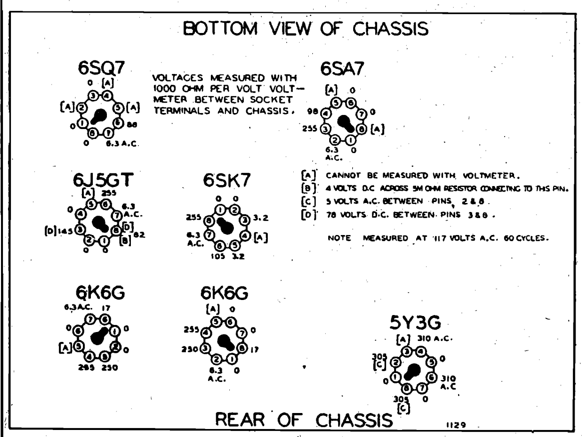


FIG. 3

RESISTORS

Circuit Diagram Ref. No.	Part No.	Description
R1	13018	4M ohm—1/3 w.
R2	130197	20 ohm—1/3 w.
R3	1304	3 megohm—1/3 w.
R4	130236	30M ohm—1/3 w.
R5	13092	1000 ohm—1/3 w.
R6	130116	15M ohm—1½ watt
R7	13083	300 ohm—1/3 w.
R8	130103	100M ohm—1/3 w.
R9	1304	3 megohm—1/3 w.
R10	13011	250M ohm—1/3 w.
R11	101216	1 megohm—tone control
R12	101215	1 megohm volume control
R13	1303	500M ohm—1/3 w.
R14	130257	5 megohm—1/3 w.
R15	130218	5M ohm—1/3 w.
R16	130103	100M ohm—1/3 w.
R17	130103	100M ohm—1/3 w.
R18	1303	500M ohm—1/3 w.
R19	1303	500M ohm—1/3 w.
R20	130227	250 ohm—1 watt
R21	130168	100 ohm—1/3 w.
R22	130197	20 ohm—1/3 w.

CONDENSERS

Ref. No.	Part No.	Description
C	102131	2 gang variable condenser
C1	124117	B.C. Antenna Trimmer
C2	124116	S.W. Antenna Trimmer
C3	1292	.0005 Mica
C4	124112	S.W. Oscillator Trimmer
C5	124112	B.C. Oscillator Trimmer
C6	124134	B.C. Series Pad
C7	124134	S.W. Series Pad
C8	12991	.00015 Mica
C9	10013	.05 x 400 v.
C10	1001	.1 x 400 v.
C11	1009	.05 x 200 v.
C12	1009	.05 x 200 v.
C13	1001	.1 x 400 v.
C14	129161	.0001 mica
C15	129161	.0001 mica
C16	119108	Lytic—16 mfd. 450 w.v.
C17	119108	Lytic—16 mfd. 450 w.v.
C18	12940	.0001 Mica
C19	100118	.008 x 600 v.
C20	10026	.02 x 400 v.
C21	10025	.002 x 600 v.
C22	10013	.05 x 400 v.
C23	10013	.05 x 400 v.
C24	10061	.02 x 600 v.
C25	10061	.02 x 600 v.
C26	10019	.006 x 600 v.

C4 and C5 are in same unit
C6 and C7 are in same unit
C14 and C15 are in same unit
C16 and C17 are in same unit

3-40

PARTS

Ref. No.	Part No.	Description
T1	111165E	Loop Antenna Assembly
T2	111153	Loop Adjustable Coil
T3	111163	Short Wave Antenna Coil
T4	110150	B.C. S.W. Oscillator Coil
T5	108162B	Input I.F. Coil—465 kc.
T6	108132D	Output I.F. Coil—465 kc.
T7	10554E	Output Transformer
T8	114192	10" Electrodynamic speaker
T9	104170B	Power Transformer
S1	125112	Band Switch
S2		On-off Switch on Volume Control
P1	10794	(2) Pilot light Bulbs T44
L1	1239	R. F. Choke Coil
S3		Phono Motor Switch
T10, T11	104174	Phono Motor; Phono Pickup Arm Record Changer Complete
T12		Phono Turntable

MODEL 796, Series A
Ser. No. 0C362500 up

GAMBLE-SKOGMO, INC.

IMPORTANT: See Aligning Instructions.

ALIGNMENT PROCEDURE

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 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 6SA7 Mixer	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 (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1570 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	532 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Set Dial at 532 K.C.	Trimmer C6 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 5)	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1570 and 532 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal. (See Fig. 1).

NOTE "C"—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.

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.

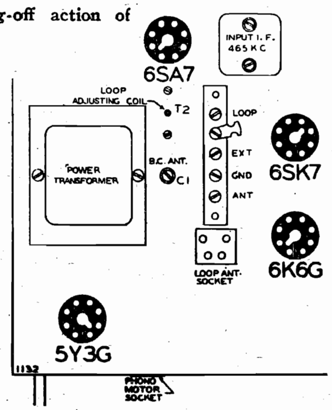


FIG. 5—TOP VIEW

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 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.

It is important during loop alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

To remove the chassis from the cabinet, pull off the knobs and take out the 4 bolts holding the chassis flange to the control panel.

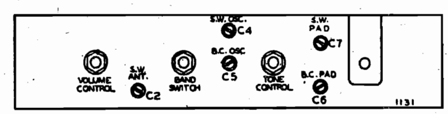


FIG. 4

MODEL C800

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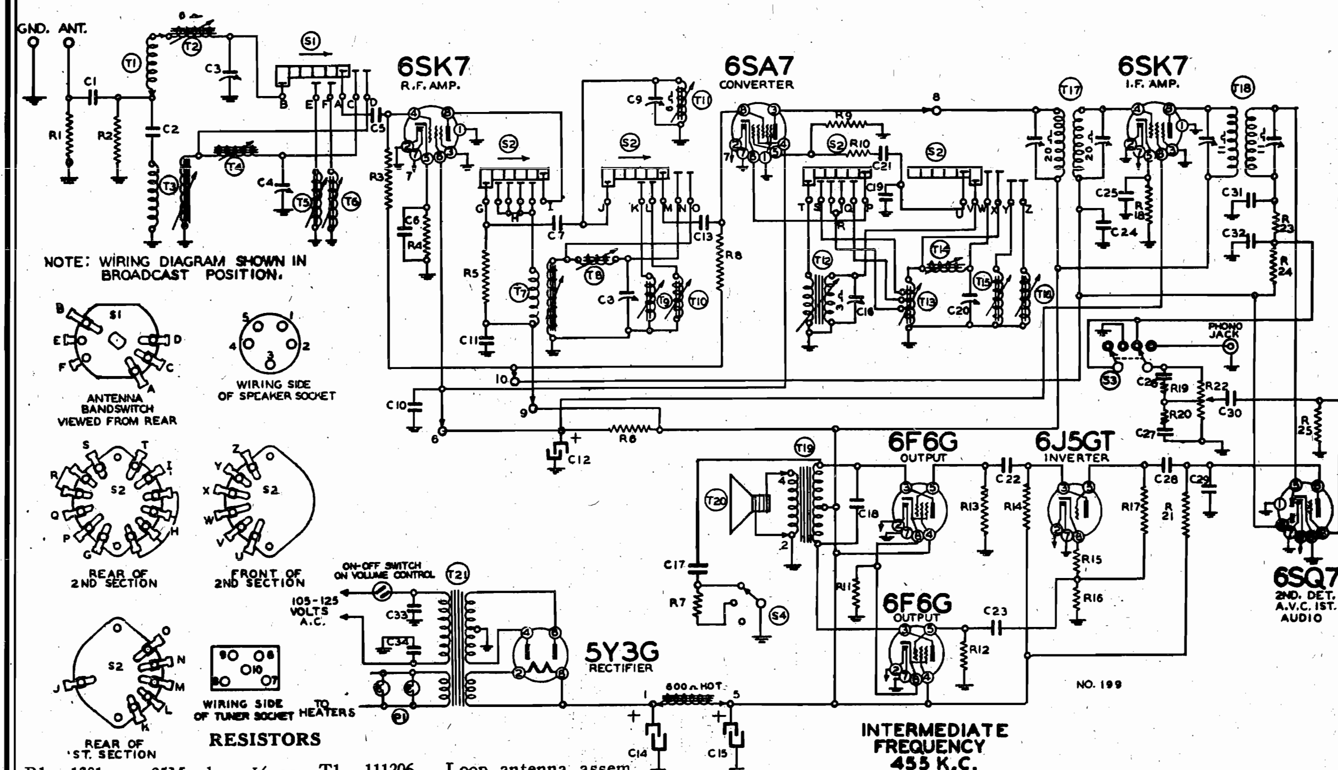


RESISTORS

R1	1301	25M ohm—1/3 w.
R2	1301	25M ohm—1/3 w.
R3	13019	1 megohm—1/3 w
R4	130239	250 ohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	10662	12,500 ohm—3 w.
R7	13064	3500 ohm—1/3 w.
R8	13019	1 megohm—1/3 w.
R9	130232	25M ohm—1/3 w.
R10	130174	50 ohm—1/3 w.
R11	130220	300 ohm—1 w.
R12	1303	500M ohm—1/3 w.
R13	1303	500M ohm—1/3 w.
R14	130103	100M ohm—1/3 w
R15	130218	5M ohm—1/3 w.
R16	130103	100M ohm—1/3 w
R17	13019	1 megohm—1/3 w.
R18	13070	500 ohm—1/3 w.
R19	13011	250M ohm—1/3 w.
R20	130149	15M ohm—1/3 w.
R21	13011	250M ohm—1/3 w
R22	101233	Volume Control
R23	13012	50M ohm—1/3 w.
R24	1304	3 megohm—1/3 w.
R25	130257	5 megohm—1/3 w.

T1	111206	Loop antenna assem
T2	111195	B.C. Antenna Coil
T3	111190	9 mc. Antenna Coil
T4	111189	6 mc. Antenna Coil
T5	111191	12 mc. Antenna Coil
T6	111192	15 mc. Antenna Coil
T7	10959	9 mc. R.F. Coil
T8	10958	6 mc. R.F. Coil
T9	10960	12 mc. R.F. Coil
T10	10961	15 mc. R.F. Coil
T11	10962	B.C. R.F. Coil
T12	110161	B.C. Oscillator Coil
T13	110157	9 mc. Oscillator Coil
T14	110156	6 mc. Oscillator Coil
T15	110158	12 mc. Oscillator Coil
T16	110159	15 mc. Oscillator Coil
T17	108177	Input I.F. Coil—455 kc.
T18	108176	Output I.F. Coil—455 kc.
T19	105111	Output Transformer
T20	114206	10" Dynamic Speaker
T21	104202B	Power Transformer—For 50-60 Cycle
or	104203B	Power Transformer—For 25 Cycle
S1	125118	Antenna Bandswitch
S2	125117	R.F. & Osc. Bandswitch
S3	125129	Radio-Phono Switch
S4	125130	Tone Control Switch
P1	10794	(2) 6-8 Volt Pilot Lights—T44

CONDENSERS

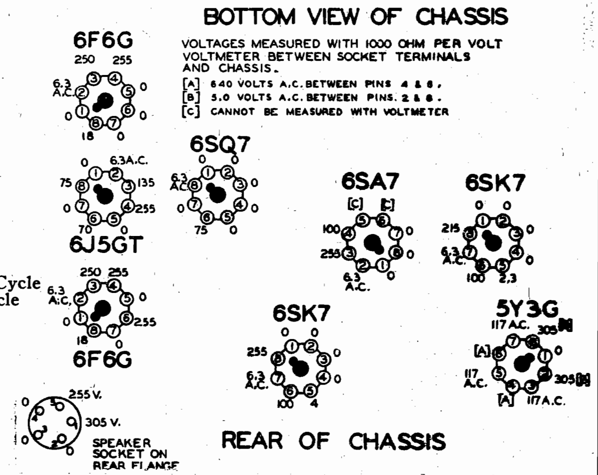
C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. Antenna Trimmer
C4	124143	9 mc. Ant. Trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v.
C7	129168	.00001 mica
C8	124138	9 mc. R.F. Trimmer
C9	124139	B.C. R.F. Trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	119109	10.0 mfd. x 350 w.v. lytic
C13	1292	.0005 mica
C14	119109	15.0 mfd. x 450 w.v. lytic
C15	119109	15.0 mfd. x 450 w.v. lytic
C16	124144	B.C. Oscillator Trimmer
C17	10013	.05 x 400 v.
C18	10071	.004 x 600 v.
C19	129167	.0002 silver mica
C20	124145	9 mc. Oscillator Trimmer
C21	12938	.00005 mica
C22	10013	.05 x 400 v.
C23	1009	.05 x 200 v.
C24	10026	.02 x 400 v.
C25	10020	.1 x 200 v.
C26	129114	.0003 mica
C27	100122	.03 x 200 v.
C28	10026	.02 x 400 v.
C29	12921	.0002 mica
C30	10019	.006 x 600 v.
C31	129165	.00005 mica
C32	129165	.00005 mica
C33	10061	.02 x 600 v.
C34	10061	.02 x 600 v.

C12 and C14 and C15 in same unit
C31 and C32 in same unit

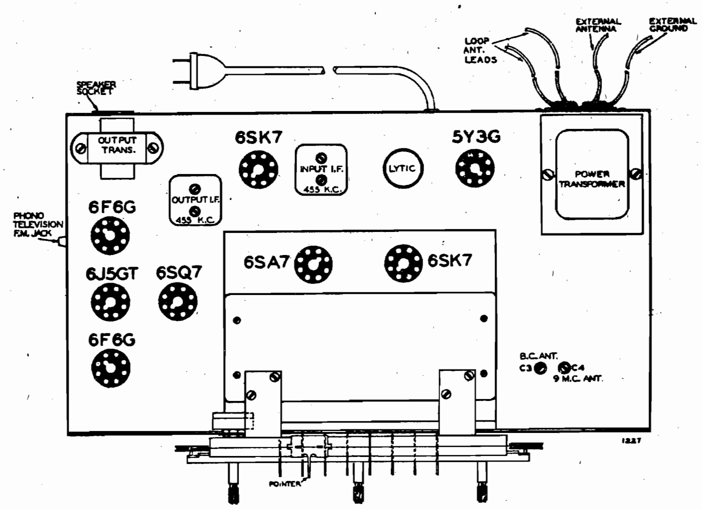
FOR ALIGNMENT AND TUNER DATA, SEE INDEX

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
[A] 640 VOLTS A.C. BETWEEN PINS 4 & 6.
[B] 5.0 VOLTS A.C. BETWEEN PINS 2 & 8.
[C] CANNOT BE MEASURED WITH VOLTMETER



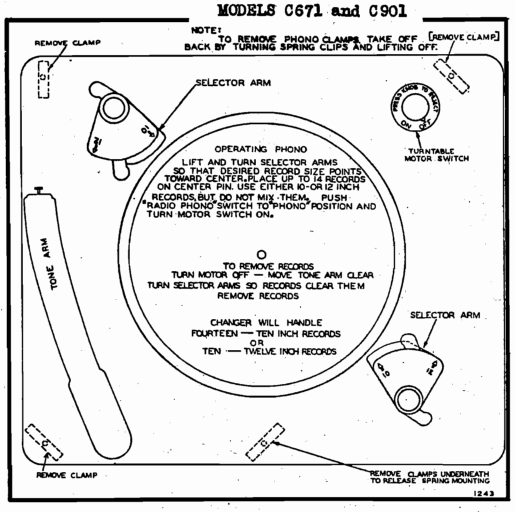
REAR OF CHASSIS



GAMBLE-SKOGMO, INC.

Automatic Record Changer--Operating Instructions

MODELS C671 and C901



Setting for Size of Record

The Changer plays up to fourteen 10" or ten 12" records at one loading. **All records must be the same size for each loading.**

On each post you will see selecting arms. The position of these arms determines the setting for different size records. To set for 10 or 12 inch records, it is merely necessary to grasp the posts by the knobs at the top, lift, and turn until the 10" or 12" arrows are pointing toward the center of the turntable. When in either the 10" or 12" position, the posts will snap into place except when they are lifted by hand. Be sure to set both posts for the same size record.

Loading

See that the selecting arms of both posts are turned toward the center of the turntable as indicated by the engraved arrows, and that both sets of arms are set for the same size (10" or 12") records as described in the preceding paragraph.

Place the stack of records (up to fourteen 10" or ten 12") over the center pin so that they will rest on the selecting arms.

Starting the Changer

1. Turn on the radio (allowing approximately 30 seconds for the tubes to warm up) and turn the phonograph-radio knob, to the phonograph position.

2. Turn the switch knob on the Record Changer panel to "ON". The motor will then start and the record changer will go into automatic operation of its own accord.

How to Reject a Record

Merely press the switch knob on the Changer panel. You can do it any time after the needle has come into contact with that record.

Playing Individual Records

Should it be desired to play an individual record merely set up the machine as described above for the proper size (10" or 12" as indicated on the selecting arms), place the record on top of the arms as described under "Loading," and set the machine in operation by means of the switch knob described under "Starting the Changer." In other words, play an individual record in the same manner as you would play a stack of that size.

Unloading

First switch off the motor. Grasp each post by its knob at the top and turn them out of the way.

Lift the played records from the turntable. Then return the posts to the proper playing position as indicated by the arrows on the selecting arms.

The Changer may then be loaded with a new stack of records according to the size shown on the selecting arms.

Turning Off Changer

Throw Changer switch knob to "OFF" position.

Lift tone arm and place it in the rest position. (If you happen to turn off the Changer switch while the mechanism is going through a "change cycle," you will notice that it does not stop until the cycle has been completed, and the tone arm is again in playing position, at which point it is ready to be lifted to the rest position. If you prefer to turn off your Changer with the radio switch, be sure to turn it off while needle is resting upon a record; otherwise, the selecting arms cannot be correctly reset.

To avoid warping of records, never leave records resting on posts.

If Changer is Left Running

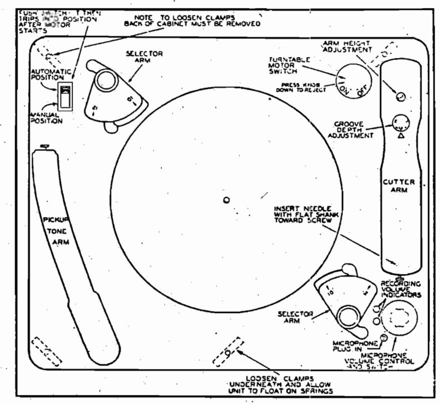
No damage will be done if you forget to turn off Changer after it has played its entire load of records. It will simply repeat the last record until stopped or reloaded.

Phonograph Needles

In general there are two types of needles which can be satisfactorily used on an Automatic Record Changer: those which require changing after approximately 12 records, and the so-called permanent type needles which are rated in terms of "hours of service." In no case should the manufacturers' claims for these needles be exceeded, since in all probability the needles are rated in terms of their maximum life.

Operating the Recorder

MODEL C901



NOTE—Some radios of this model are equipped with a recording arm on the record changer with which you can make your own records. If your radio has the recording unit follow the instructions below for making records.

The Mike volume control must be turned off (all the way left) except when recording with the microphone.

The two volume indicator lights along side the microphone volume control are used for setting the proper recording level. When recording radio programs the radio volume control should be adjusted so that the red indicator light remains off while the white continues to flicker. When recording with the microphone the lights should be adjusted in the same manner but using the microphone volume control.

Operating the Phono on Home Recordings

Turn radio on. Put phono switch in "Phono" position.

Push manual switch toward manual side to play home recordings.

Put your record on turntable and start motor. Place playback arm on record and control tone and volume with the radio volume and tone control knobs.

Be sure mike control is turned off when playing records.

Recording Radio Programs

Turn the radio on and tune in the program you wish to record. Put manual switch in manual position. Start motor and then gently lower cutting needle onto blank record, about ¼" from outer edge. Radio Volume will drop—Adjust volume control so red volume indicator light is off and white indicator light continues to flicker.

Microphone Recording

Turn the mike volume control well up. Phono pushbutton should be in "Phono" position. Put manual switch in manual position. Start motor, and set cutting needle gently on start of record. Adjust volume indicator lights the same as in recording radio programs.

NOTE: The cutting arm must be raised about three inches to move it freely across the record.

How to Make Perfect Recordings

Cutting Needle

The cutting stylus is razor sharp and must not be dropped on the record or allowed to rest on the turntable.

For best operation, the instrument should be level in all directions. To check this, place a small level, if you have one, on the turntable. If you do not have a level, a marble will do. If the marble rolls off the turntable, it is low in the direction in which it rolls. Place something under the cabinet until the machine is reasonably level.

Shavings

The cutting stylus cuts out a fine shaving that is just a little thicker than a human hair. These shavings should not be allowed to gather under the cutting stylus.

While cutting, gently brush the shavings from the left side of the record in, toward the center pin, allowing them to collect there until the recording is completed.

Do Not Use Too Much Volume

The most frequent cause of poor recordings is too much volume or overloading. If some passages of your recording are smooth and clear while others are raspy, rough and distorted, you are probably using too much volume. Overloading occurs most often on strong passages. The remedy is to reduce the volume slightly and watch the volume indicator lights.

Too little volume will show up when you play the record back. The volume control on playbacks will have to be turned up quite high and needle scratch will be excessive.

Cutting Arm Adjustments

The cutting arm is adjusted at the factory for proper operation, however, with various types of blanks this adjustment may sometimes have to be altered. With a blank record on the table, the height adjustment on the cutter arm should be adjusted so that the needle screw is centered in the slot when the needle rests on a blank record.

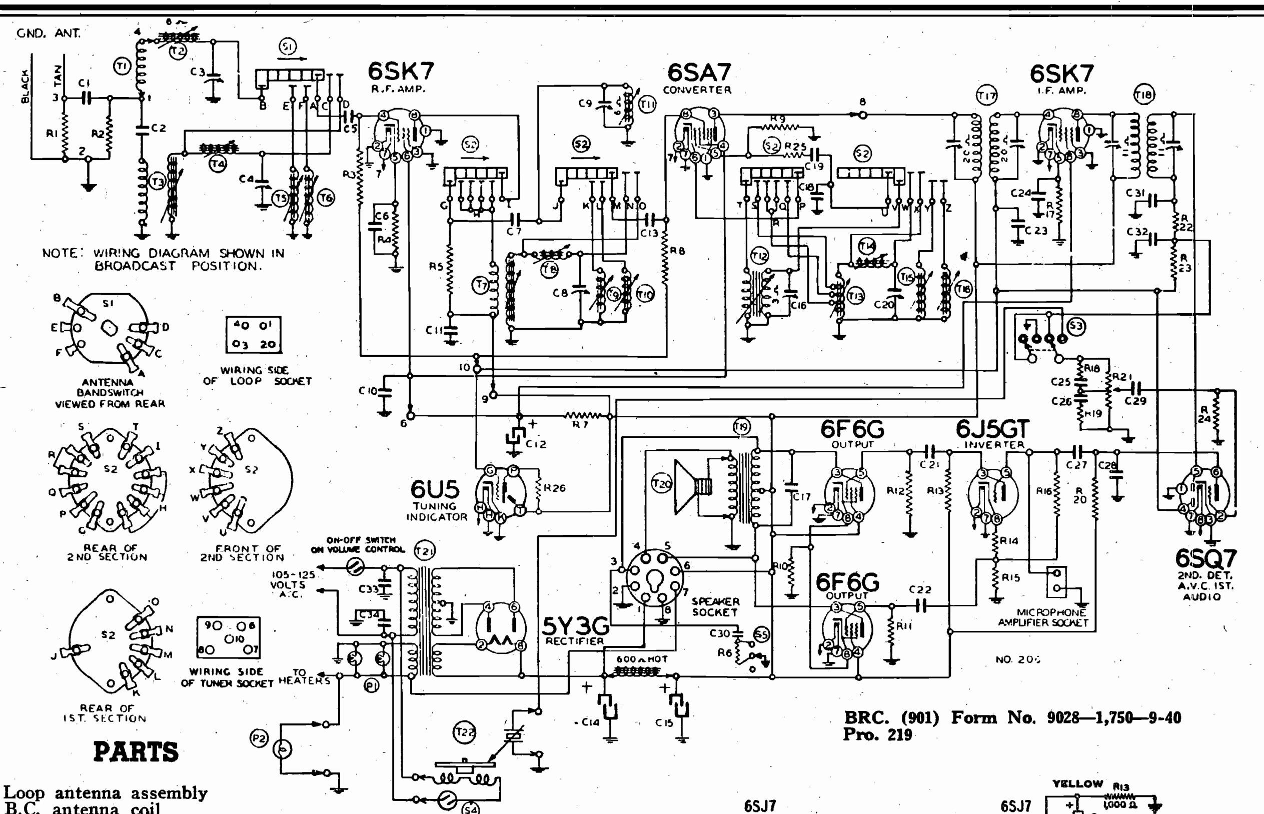
Several blank grooves should now be cut to see if the groove is the proper depth. The depth adjustment screw on the cutter arm will increase the depth of the groove if turned to the letter "H" and will decrease the groove if turned to the letter "L"—For a medium groove turn to "M".

If the groove is too shallow, the playback needle will not stay in the groove. If it is too deep, not enough wall will be left between grooves and the playback needle will break through from one track to the next after a few playings.

A properly cut groove will leave a shaving just a little heavier than a human hair.

GAMBLE SKOGMO, INC.

MODEL C901



BRC. (901) Form No. 9028—1,750—9-40
Pro. 219

Radio Set Schematic Ref. No. | Part No. | Description

RESISTORS

Ref. No.	Part No.	Description
R1	1301	25M ohm—1/3 w.
R2	1301	25M ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130239	250 ohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	13064	3500 ohm—1/3 w.
R7	10662	12,500 ohm—3 w.
R8	13019	1 megohm—1/3 w.
R9	130232	25M ohm—1/3 w.
R10	130220	300 ohm—1 w.
R11	1303	500M ohm—1/3 w.
R12	1303	500M ohm—1/3 w.
R13	130103	100M ohm—1/3 w.
R14	130218	5M ohm—1/3 w.
R15	130103	100M ohm—1/3 w.
R16	13019	1 megohm—1/3 w.
R17	13070	500 ohm—1/3 w.
R18	13011	250M ohm—1/3 w.
R19	130149	15M ohm—1/3 w.
R20	13011	250M ohm—1/3 w.
R21	101233	1/2 megohm volume control and on-off switch.
R22	13012	50M ohm—1/3 w.
R23	1304	3 megohm—1/3 w.
R24	130257	5 megohm—1/3 w.
R25	130174	50 ohm—1/3 w.
R26	130110	1 megohm—1/10 w. in tuning indicator cable.

CONDENSERS

Ref. No.	Part No.	Description
C1	1292	.0005 mica
C2	10047	.002 x 600 v.—10%
C3	124143	B.C. antenna trimmer
C4	124143	9 mc. antenna trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v. tubular
C7	129168	.00001 mica
C8	124138	9 mc. R.F. trimmer
C9	124139	B.C. R.F. trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	119109	10.0 x 350 w.v.
C13	1292	.0005 mica
C14	119109	15.0 x 450 w.v.
C15	119109	15.0 x 450 w.v.
C16	124144	B.C. oscillator trimmer
C17	10071	.004 x 600 v.
C18	129167	.0002 silver mica
C19	12938	.00005 mica
C20	124145	9 mc. oscillator trimmer
C21	10013	.05 x 400 v.
C22	1009	.05 x 200 v.
C23	10026	.02 x 400 v.
C24	10020	.1 x 200 v.
C25	129114	.0003 mica
C26	100122	.03 x 200 v.
C27	10026	.02 x 400 v.
C28	12921	.0002 mica
C29	10019	.006 x 600 v.
C30	10013	.05 x 400 v.
C31	129165	.00005 mica
C32	129165	.00005 mica
C33	10061	.02 x 600 v. bakelite
C34	10061	.02 x 600 v. bakelite

C12, C14 and C15 in same unit.
C31 and C32 in same unit.

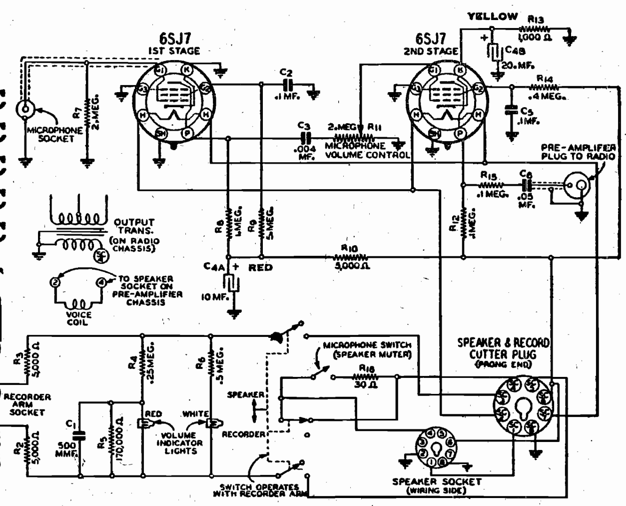
PARTS

Ref. No.	Part No.	Description
T1	111210	Loop antenna assembly
T2	111195	B.C. antenna coil
T3	111190	9 mc. antenna coil
T4	111189	6 mc. antenna coil
T5	111191	12 mc. antenna coil
T3	111190	9 mc. antenna coil
T7	10959	9 mc. R.F. coil
T8	10958	6 mc. R.F. coil
T9	10960	12 mc. R.F. coil
T10	10961	15 mc. R.F. coil
T11	10962	B.C. R.F. coil
T12	110161	B.C. osc. coil
T13	110157	9 mc. oscillator coil
T14	110156	6 mc. oscillator coil
T15	110158	12 mc. oscillator coil
T16	110159	15 mc. oscillator coil
T17	108177	Input I.F. coil—455 kc.
T18	108176	Output I.F. coil—455 kc.
T19	105111	Output transformer
T20	114208	Speaker—Dynamic
T21	104202B	Power transformer—50-60 cycle
	104203B	Power transformer—25 cycle
T22	104234	Automatic record changer—60 cycle
	104232	Automatic record changer—25 cycle
	104233	Automatic record changer—50 cycle
S1	125118	Antenna bandswitch
S2	125117	R.F. & osc. bandswitch
S3	125129	Radio-phono switch
S4		Switch on record changer
S5	125130	Tone control switch
P1	10794	(2) 6-8 volt pilot lights T44
P2	10794	Indicator light T-44

Tuning Frequency Range

Broadcast Band	540 to 1600 KC
49M Band	5.9 to 6.1 MC
31M Band	9.1 to 10 MC
25M Band	11.4 to 12.1 MC
19M Band	14.9 to 15.4 MC

INTERMEDIATE FREQUENCY 455 K.C.

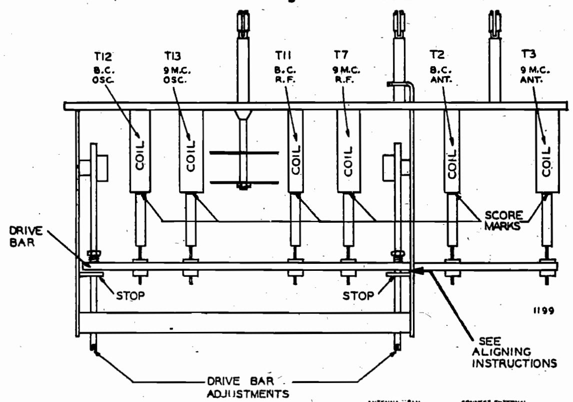


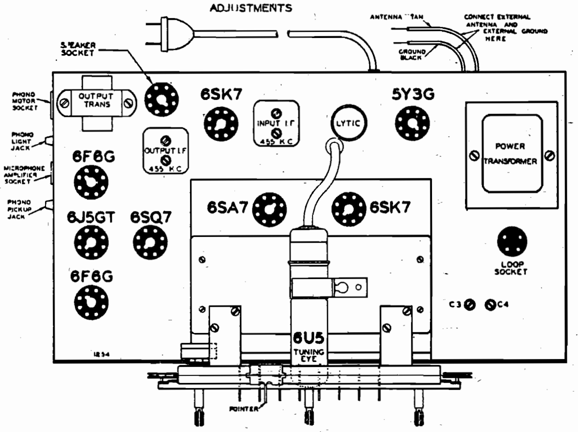
CIRCUIT DIAGRAM OF MICROPHONE AMPLIFIER

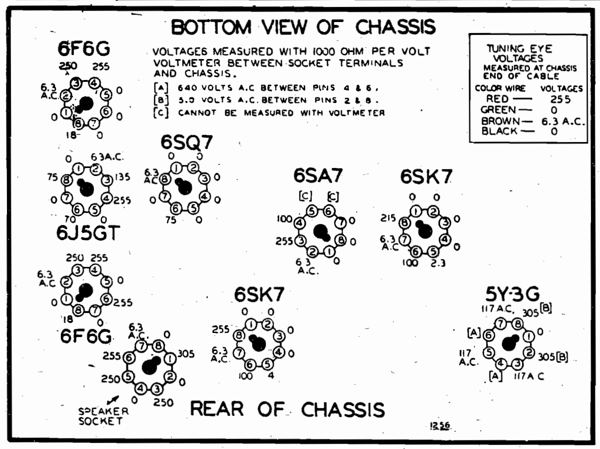
MODEL C901

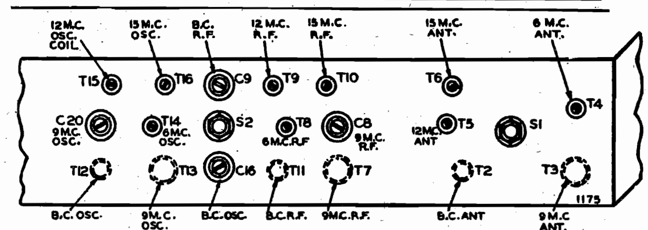
GAMBLE-SKOGMO, INC.

IRON CORE ADJUSTMENT VIEW









FRONT VIEW CHASSIS

Power Consumption, Radio only - - - - 100 Watts
Power Output - - - - - 5 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a gauge). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

Television and Fm. Jack

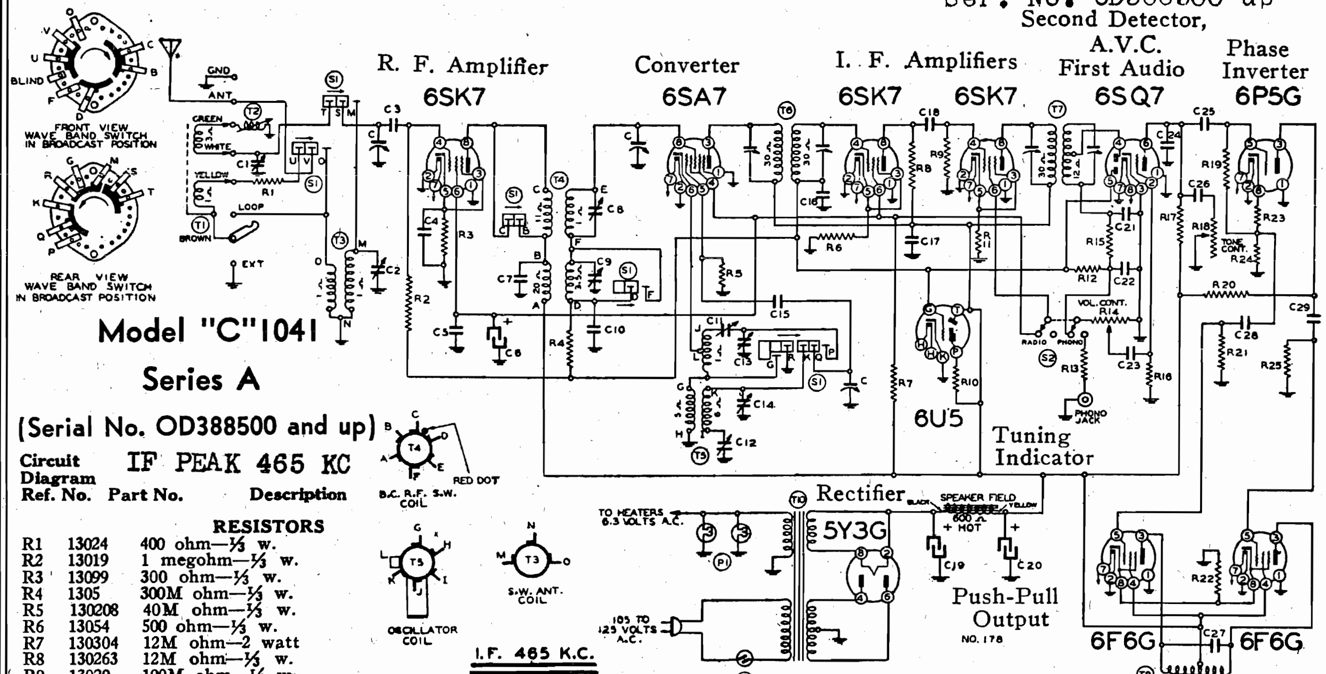
If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-pickup jack in the chassis view will accommodate either the Phono or a television or FM converter. **Speaker 10 in. Electro Dynamic**

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted in Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

GAMBLE SKOGMO, INC.

MODEL "C"1041, Series A
Ser. No. OD388500 up



Model "C"1041 Series A

(Serial No. OD388500 and up)

Circuit Diagram IF PEAK 465 KC

Ref. No.	Part No.	Description
		RESISTORS
R1	13024	400 ohm—1/3 w.
R2	13019	1 megohm—1/3 w.
R3	13099	300 ohm—1/3 w.
R4	1305	300M ohm—1/3 w.
R5	130208	40M ohm—1/3 w.
R6	13054	500 ohm—1/3 w.
R7	130304	12M ohm—2 watt
R8	130263	12M ohm—1/3 w.
R9	13020	100M ohm—1/3 w.
R10		1 megohm—in eye socket
R11	13054	500 ohm—1/3 w.
R12	130170	3 megohm—1/3 w.
R13	13019	1 megohm—1/3 w.
R14	101214	Volume Control (500M ohm)
R15	13012	50M ohm—1/3 w.
R16	130225	15 megohm—1/3 w.
R17	13011	250M ohm—1/3 w.
R18	101213	Tone Control—(1 Megohm)
R19	13019	1 megohm—1/3 w.
R20	13020	100M ohm—1/3 w.
R21	1303	500M ohm—1/3 w.
R22	130311	300 ohm—1 watt
R23	13022	5M ohm—1/3 w.
R24	13020	100M ohm—1/3 w.
R25	1303	500M ohm—1/3 w.
		CONDENSERS
C	102129	Three Gang Variable Condenser
C1	124132	B.C. Ant. Trimmer
C2	124117	SW Antenna Trimmer
C3	1292	.0005 Mica
C4	10020	.1 x 200 v.
C5	100117	.25 x 400 v.
C6	119106	10 mfd. lytic—350 w. v.
C7	129160	.0004 mica
C8	124131	S.W. R.F. Trimmer
C9	129131	B.C. R.F. Trimmers
C10	10026	.02 x 400 v.
C11	129156	.0024 Compression S.W. Pad
C12	129157	.000525 Compression B.C. Pad
C13	124130	S.W. Oscillator trimmer
C14	124130	B.C. Oscillator trimmer
C15	12939	.00005 Mica
C16	10026	.02 x 400 v.
C17	100117	.25 x 400 v.
C18	1292	.0005 mica
C19	119106	10 mfd. lytic—450 w. v.
C20	119106	15 mfd. lytic—450 w. v.
C21	1295	.0001 mica
C22	1295	.0001 mica
C23	10025	.002 x 600 v.
C24	12912	.00025 mica
C25	10026	.02 x 400 v.
C26	10011	.01 x 400 v.
C27	10071	.004 x 600 v.
C28	1009	.05 x 200 v.
C29	10013	.05 x 400 v.

C6, C19 and C20 in one unit
C8 and C9 in one unit
C13 and C14 in one unit

Ref. No.	Part No.	Description
		PARTS
T1	111154D	Loop Antenna Assembly
T2	111153	Loop Adjustable Coil
T3	111176	S.W. Antenna Coil
T4	10957	B.C. S.W. R.F. Coil
T5	110149	B.C. S.W. Oscillator Coil
T6	108169C	Input I.F.—465 kc.
T7	108130C	Output I.F.—465 kc.
T8	10554B	Output Transformer
T9	114136	10" Dynamic Speaker (600 Ohm Field)
T10	104202	Power Transformer
S1	125111	Wave Band Switch
S2	12570	Phono Switch
S3		On-off switch on volume control
P1	10794	(2) Pilot light bulbs T-44

Power Consumption 110 Watts (At 117 Volts 60 Cycles)

Power Output - - - - - 5 Watts Undistorted
7 Watts Maximum

Selectivity 35 KC Broad at 1000 Times Signal at 1000 KC

Sensitivity (for .5 Watts Output) - - - -
Broadcast Band—10 Microvolts Average
Shortwave Band—10 Microvolts Average

Tuning Frequency Range
540 to 1580 KC
5.5 to 18.5 MC

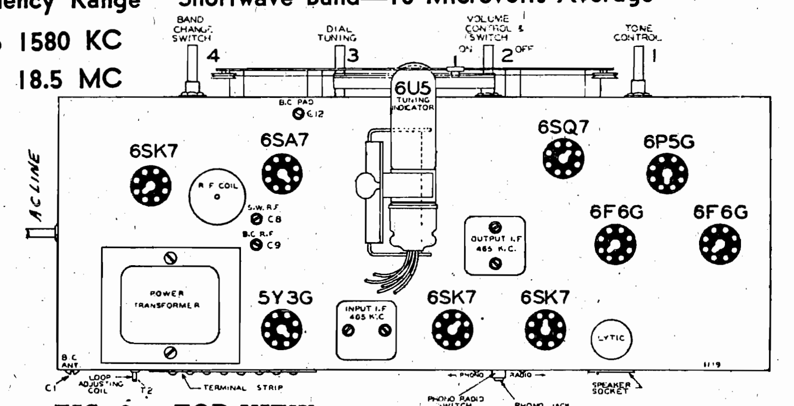
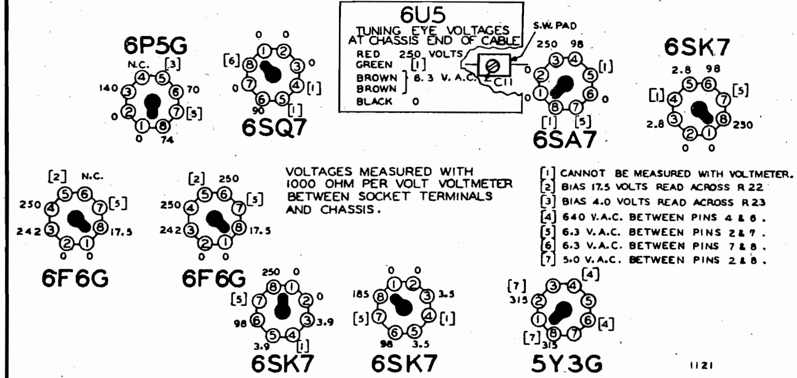


FIG. 2.—TOP VIEW

FIG. 6—BOTTOM VIEW OF CHASSIS



4-40 REAR OF CHASSIS

MODEL "C" 1041, Series A
Ser. No. OD388500

GAMBLE-SKOGMO, INC.

IMPORTANT: SEE ALIGNING INSTRUCTIONS.

ALIGNMENT PROCEDURE

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 I. F.	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 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C13 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmers C8, C2 (See Figs. 2 & 4)	Short Wave R. F. and S. W. Antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C11 (See Fig. 6)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1580 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C14 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 540 Kc. (Plates in Mesh)	Trimmer C12 (See Fig. 2)	Broadcast oscillator series pad	Adjust to maximum output
	1400 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 1400 Kc.	Trimmer C9 (See Fig. 2)	Broadcast R. F.	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 2)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 2)	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6SK7 R.F. Tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1580 and 540 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal. (See Fig. 1).

NOTE "C"—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.

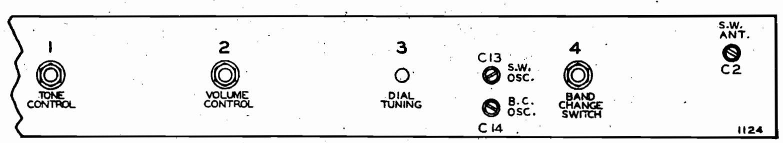


FIG. 4—FRONT OF CHASSIS

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.**

It is important during **loop alignment** that the loop antenna and the chassis be installed in the cabinet.

To remove the chassis from the cabinet, remove the two chassis mounting bolts which are used to hold the chassis to the cabinet shelf; take the knobs off their shafts and disconnect the loop antenna.

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 117 volts A. C. 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.

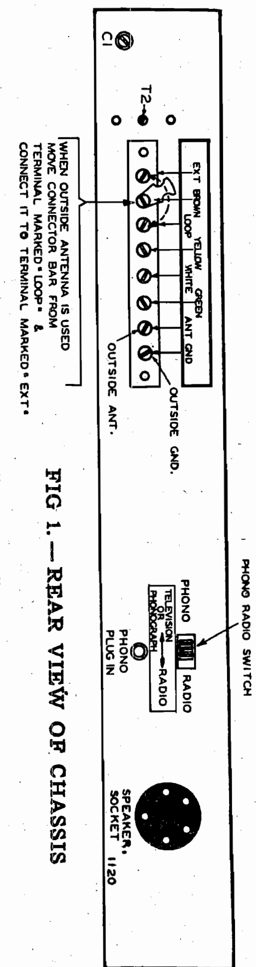


FIG 1.—REAR VIEW OF CHASSIS

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.

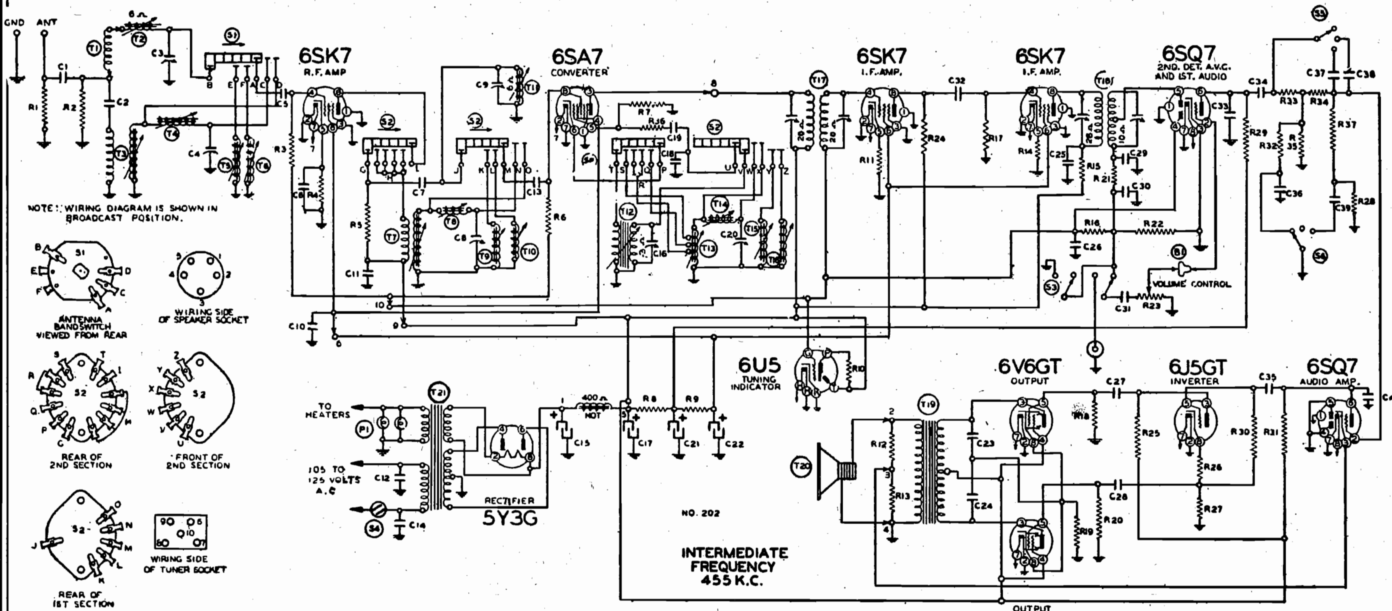
Volume and tone may be controlled by using the controls on the front of the radio.

TELEVISION CONNECTIONS:

Television will not be available for nation wide use for some time to come; however, Television audio connections are provided on this radio for the reception of Television sound. Connect audio output leads of television receiver to connector provided on rear of receiver chassis as shown in above illustration and snap switch to "Television" position.

MODEL C1100

GAMBLE-SKOGMO, INC.



C39	10037	.003 x 600 v.
C40	12912	.00025 mica

C3 and C4 in same unit
C15, C17 and C21 in same unit
C29 and C30 in same unit

BRC (C1100) Series A Form No. 1129-2750—8-40

Pro. 203

C33	12912	.00025 mica
C34	1001	.1 x 400 v.
C35	10013	.05 x 400 v.
C36	100118	.008 x 600 v.
C37	12936	.0003 mica
C38	129166	.000125 mica

RESISTORS

Code No.	Part No.	Description
R1	130232	25M ohm—1/3 w.
R2	130232	25M ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130239	250 ohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	13019	1 megohm—1/3 w.
R7	130232	25M ohm—1/3 w.
R8	130318	6M ohm—2 watt
R9	130319	10M—2 watt
R10		1 megohm in tuning indicator cable
R11	130200	700 ohm—1/3 w.
R12	13082	10M ohm—1/3 w.
R13	130235	1500 ohm—1/3 w.
R14	130235	1500 ohm—1/3 w.
R15	130192	2M ohm—1/3 w.
R16	13019	1 megohm—1/3 w.
R17	13020	100M ohm—1/3 w.
R18	1303	500M ohm—1/3 w.
R19	130317	250 ohm—2 watt
R20	1303	500M ohm—1/3 w.
R21	13020	100M ohm—1/3 w.
R22	130238	400M ohm—1/3 w.
R23	101234	500M ohm volume control and line switch (S4)
R24	13073	15M ohm—1/3 w.
R25	13094	50M ohm—1/3 w.
R26	130218	5M ohm—1/3 w.
R27	13094	50M ohm—1/3 w.
R28	1303	500M ohm—1/3 w.
R29	130172	250M ohm—1/3 w.
R30	1303	500M ohm—1/3 w.
R31	130172	250M ohm—1/3 w.
R32	1307	40M ohm—1/3 w.
R33	13080	150M ohm—1/3 w.
R34	130309	350M ohm—1/3 w.
R35	130172	250M ohm—1/3 w.
R36	130174	50 ohm—1/3 w.
R37	13080	150M ohm—1/3 w.

CONDENSERS

C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. Antenna Trimmer
C4	124143	9 mc. Antenna Trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v. Tubular
C7	129168	.00001 mica
C8	124138	9 mc. R.F. Trimmer
C9	124139	B.C. R.F. Trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	10061	.02 x 600 v.
C13	1292	.0005 mica
C14	10061	.02 x 600 v.
C15	119112	30.0 mfd. lytic
C16	124144	B.C. Oscillator Trimmer
C17	119112	30.0 mfd. lytic x 450 w.v.
C18	129167	.0002 silver mica
C19	12938	.00005 mica
C20	124145	9 mc. Oscillator Trimmer
C21	119112	10.0 mfd. lytic
C22	11969	16 mfd. x 350 w.v.
C23	10065	.015 x 600 v.
C24	10065	.015 x 600 v.
C25	1001	.1 x 400 v.
C26	10022	.05 x 200 v.
C27	10013	.05 x 400 v.
C28	1009	.05 x 200 v.
C29	129161	.0001 mica
C30	129161	.0001 mica
C31	10020	.1 x 200 v.
C32	1292	.0005 mica

PARTS

T1	111207	Loop Antenna Assembly
T2	111195	B.C. Antenna Coil
T3	111190	9 mc. Antenna Coil
T4	111189	6 mc. Antenna Coil
T5	111191	12 mc. Antenna Coil
T6	111192	15 mc. Antenna Coil
T7	10959	9 mc. R.F. Coil
T8	10958	6 mc. R.F. Coil
T9	10960	12 mc. R.F. Coil
T10	10961	15 mc. R.F. Coil
T11	10962	B.C. R.F. Coil
T12	110161	B.C. Oscillator Coil
T13	110157	9 mc. Oscillator Coil
T14	110156	6 mc. Oscillator Coil
T15	110158	12 mc. Oscillator Coil
T16	110159	15 mc. Oscillator Coil
T17	108177B	Input I.F. Coil—455 Kc.
T18	108130E	Output I.F. Coil—455 Kc.
T19	105115	Output Transformer
T20	114207	12" Dynamic Speaker
T21	104217	Power Transformer—50-60 cycles
S1	125118	Antenna Bandswitch
S2	125117	R.F. Oscillator Bandswitch
S3	125133	Radio-phono Switch
S4		On-off Switch on volume control
S5	125130	Treble Switch
S6	125131	Bass Switch
P1	10794	2 6-8 Volts Pilot Lights T44
B1	11622	1.25 Volt Bias Cell

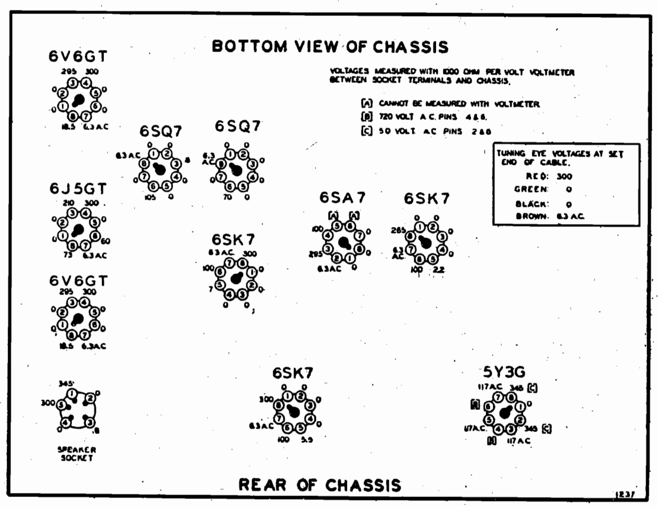
11 TUBE A. C.

5 BAND

BUILT-IN AERIAL

PUSHBUTTON

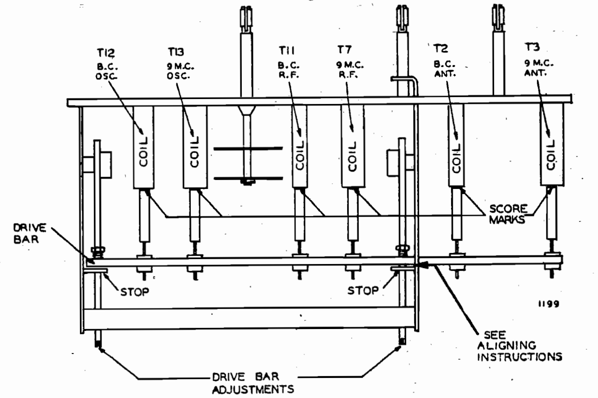
TUNING

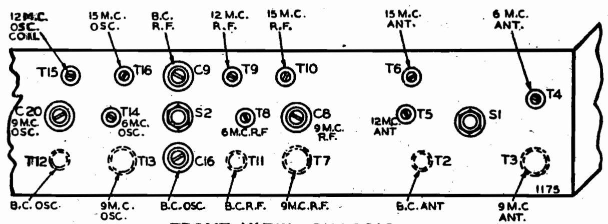


MODEL C1100

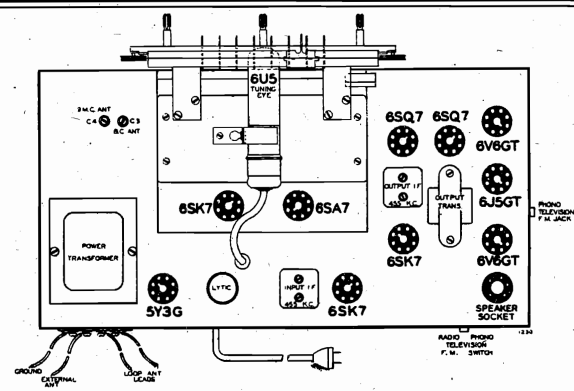
GAMBLE-SKOGMO, INC.

IRON CORE ADJUSTMENT VIEW





FRONT VIEW CHASSIS



Power Consumption - - - - - - 120 Watts
Power Output - - - - - 10 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 27 KC Broad at 1000 Times Signal at 1000 KC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - - 12 in. Electro Dynamic

- Tone control—Treble
- 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.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

Tuning Frequency Range

Broadcast Band - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC

Phonograph-Television and Fm. Jack

Should you wish to use an external phonograph it should be plugged into the phono jack shown in the chassis view—The radio-phono switch on the chassis will then switch from radio to phono operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-television-FM in the chassis view will accommodate either the Phono or a television or FM converter.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

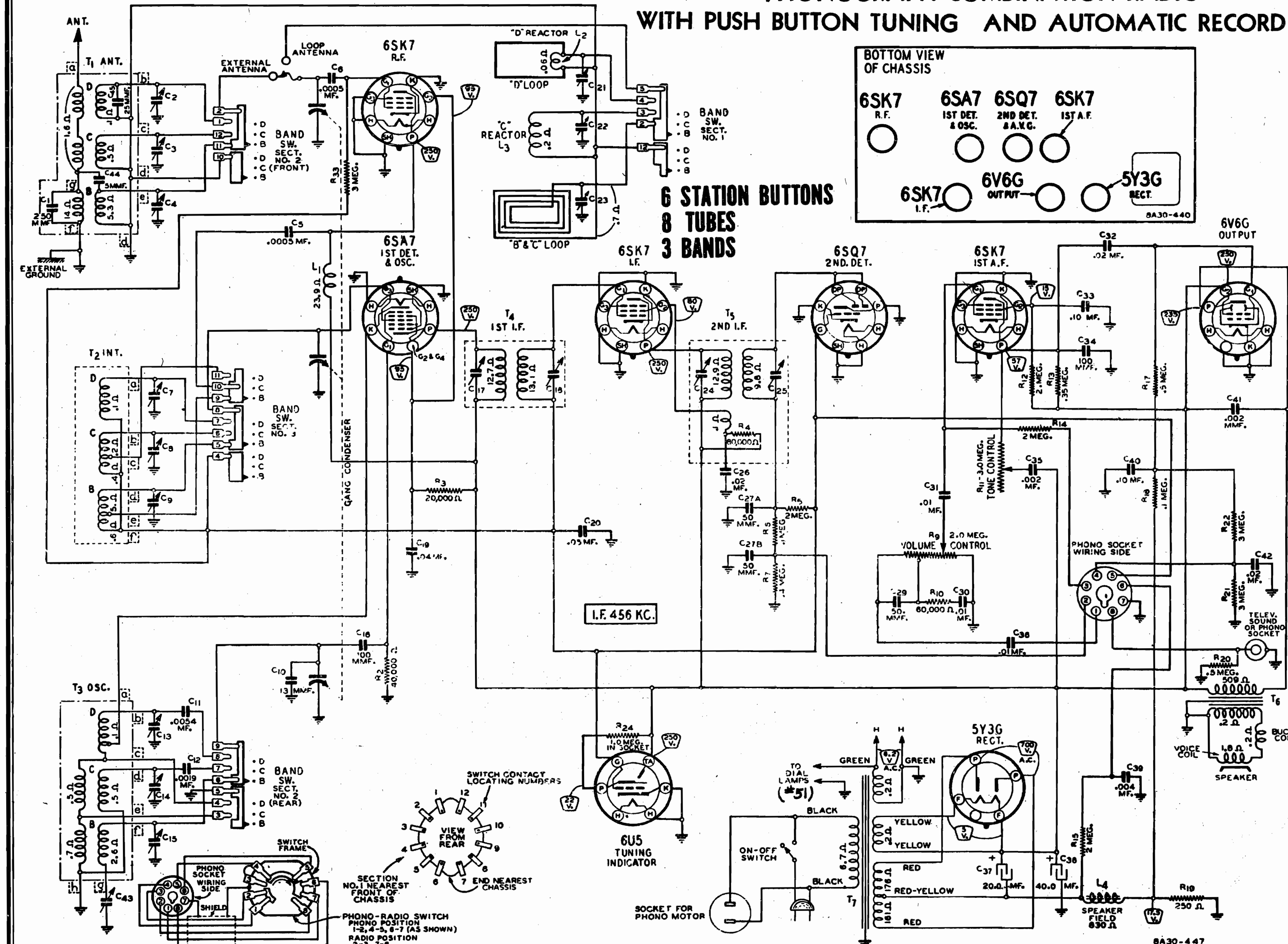
First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a guage). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

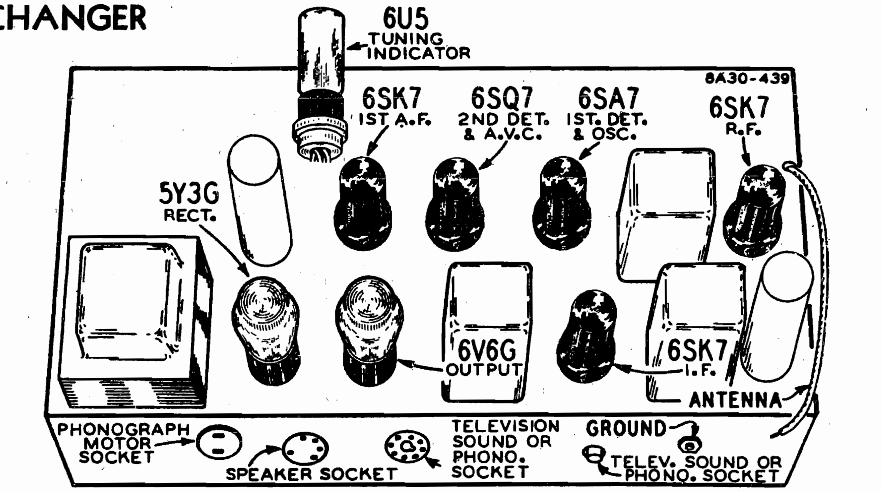
Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

GAMBLE-SKOGMO, INC.

PHONOGRAPH COMBINATION RADIO WITH PUSH BUTTON TUNING AND AUTOMATIC RECORD CHANGER





Antenna and Ground

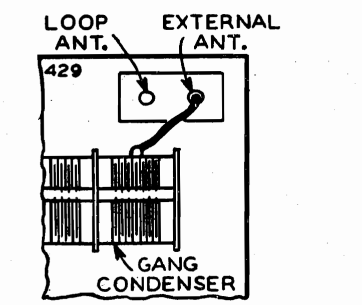
Two loop antennas are incorporated in the speaker chamber and may be used for broadcast band and short wave reception. For the reception of local or nearby stations, an outside antenna is usually not required. The use of the loop antenna may, in some locations, provide best broadcast band operation.

In general, however, more stations will be heard and noise will sometimes be reduced by using an outside antenna.

For best reception of short wave stations, an outside antenna is recommended.

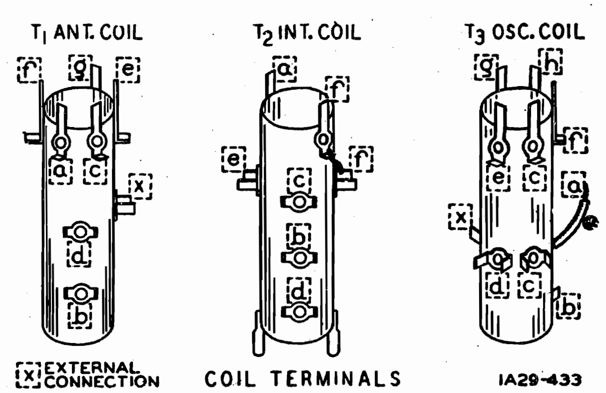
A white wire will be found coming out of the chassis. Connect this wire to the outside antenna lead.

On the back panel of the chassis base is a screw (marked GND) under which the ground wire should be fastened.



ANTENNA SELECTION SOCKET

ANTENNA SELECTION SOCKET—At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas, the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis. The socket may be reached after removing the four wing nuts holding the cover over the opening in the cabinet back.



SPECIFICATIONS

Power Consumption — 71 Watts (At 117 volts 60 cycles); 88 Watts (Phonograph Operating)

Power Output - - - - - - 4.0 Watts Undistorted; 5.0 Watts Maximum

Selectivity - - 30 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - 10" Electro-Dynamic

Receivers of this model which are to be used on 25 cycle, 230 volt, or other service are so marked on label.

Tuning Frequency Range

B Range	528 to	1730 KC
C Range	2200 to	7000 KC
D Range	7000 to	22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt	Average
C Range	1.0 Microvolt	Average
D Range	3.0 Microvolts	Average

FOR OTHER DATA SEE INDEX

Important—A good antenna and ground are essential for best operation of this radio. Connections should be clean and tight. Do not use an old outside antenna as in most cases it will be unsatisfactory.

Voltages at Sockets

Line Voltage—117.
Volume Control—Maximum.
Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

GAMBLE-SKOGMO, INC.

MODEL 4956

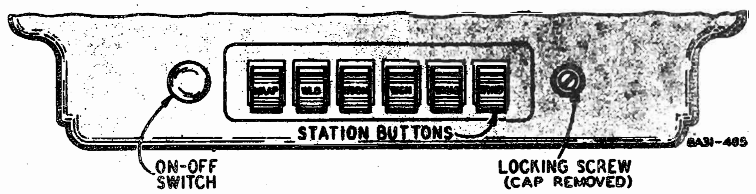
MODULATION HUM

Dec.8,1939.

In case modulation hum (hum with signal) is encountered on the above model , the trouble may be due to the 6SK7 1st A.F. tube. Interchange this tube with the 6SK7 R.F and 6SK7 I.F. tubes. Note the results. The 6SK7 1st A.F. tube may be left in either the R.F. or I.F. tube sockets if the arrangement reduces the hum.

If the hum is still appreciable after the above procedure try out several new 6SK7 1st A.F. tubes. Use the one which reduces the hum to a minimum.

Setting the Station Buttons



There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers decrease from left to right.

Setting a Station Button

Turn the manual tuning knob so that the pointer moves toward 1700 KC until the stop is reached.

At the right side of the escutcheon (from the front) will be seen a cap which covers a hole in the escutcheon —See illustration. Pull off this cap.

At the end of the tube in back of the hole in the escutcheon is the locking screw. Using a small handle screwdriver, unlock the mechanism by turning this screw several turns in a counter-clockwise direction.

Select the first station from the list you have prepared, and carefully tune in this station by means of the manual tuning knob using the tuning eye as a guide.

With one hand, hold the manual tuning knob to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration *all the way down*. It will go down easily at first and then a firm gentle pressure must be applied to push it down the rest of the way. It is better to start with the left hand button.

Hold *this* button all the way down. With the other hand, see whether or not this station is still accurately tuned in by moving the tuning knob a slight amount back and forth while observing the tuning eye. *Be sure to hold the button all the way down.*

Release the button after the station is tuned in.

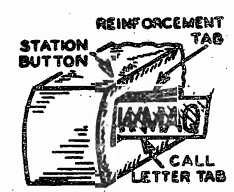
Carefully tune in the second station on your list. Then hold the tuning knob and push the second button slowly and firmly all the way down. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Turn the manual tuning knob so that the pointer moves toward 1700 KC until the stop is reached. Then, with the SMALL HANDLE screwdriver, turn the locking screw in a clockwise direction until it is tight. Tighten the locking screw firmly but not excessively to avoid stripping the threads. Replace the cap over the hole.

Insert a celluloid reinforcement tab half way in the slot at the front of the first station button.

Remove the correct station call letter tab for this button 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.

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.

Television Sound Connections

If Television programs ever become available in your community, the audio amplifier and speaker of this radio may be used to reproduce Television sound in conjunction with any "Television Picture Receiver and Sound Converter."

On the back panel of the chassis base is a socket to which is connected the phono cable shielded pin tip. Upon removal of this pin tip, the connector on the cable from a television receiver can be inserted in the socket. (The cable connector must be a single shielded pin tip type, part No. **M93.**)

When Television sound reproduction is desired, the knob located above the dial of the radio should be turned to the Phonograph (P) position. For radio reception, the knob should be in the Radio (R) position.

MODEL 4956

GAMBLE-SKOGMO, INC.

ALIGNMENT PROCEDURE

SIGNAL GENERATOR					
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range See Note A	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 2nd I.F. (C24) & (C25)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C15)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note B	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C43) (C16 ON 1A29) Rock Rotor—See Note C
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C14)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C13)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C7) Rock Rotor—See Note C
LOOP RANGE B					
1500 KC See Note D	None—See Note D		B Range	Turn Rotor to Max. Output	Loop Trimmer (C23) See Note E
LOOP RANGE C					
6000 KC See Note D	None—See Note D		C Range	Turn Rotor to Max. Output	Loop Trimmer (C22) See Note E
LOOP RANGE D					
21,000 KC See Note D	None—See Note D		D Range	Turn Rotor to Max. Output	Loop Trimmer (C21) Rock Rotor—See Note C

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—For all adjustments, with the exception of the 3 loop range adjustments, the pin tip should be in the external antenna hole of the Antenna Selection Socket—See illustration on page one.

NOTE B—If the pointer is not at 1500 KC on the dial remove pointer from drive cord. Tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet. Insert pin tip in loop antenna hole of Antenna Selection Socket—See illustration on schematic page.

Note E (CONSOLE MODELS)—Turn knob of loop until output is maximum.

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.

Drive Cord Replacement

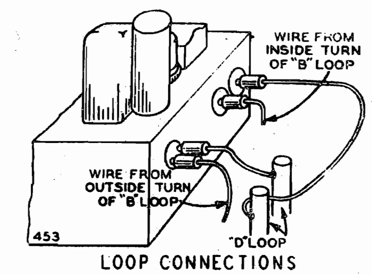
Use a drive cord approximately 70 inches in length. Tie a large knot with a small loop at one end of the new drive cord. Thread other end of cord up through hole in rim of condenser drive pulley. Pull cord through hole until large knot is flush against pulley rim.

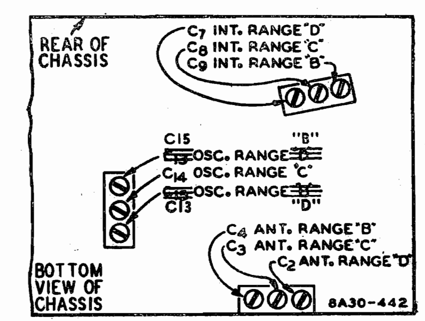
Turn gang condenser to completely closed position. Remove guide arm from front of chassis—See illustration.

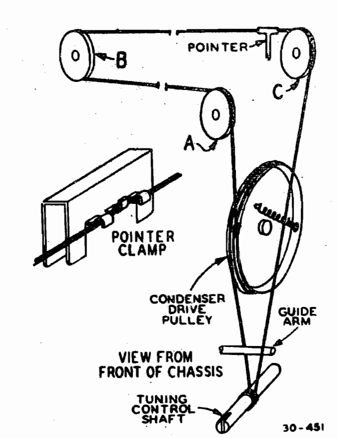
Wind ¼ turn in a clockwise direction (from right side of chassis) around condenser drive pulley. Wind cord over pulleys A, B, and C as shown. Wind 4½ turns in a clockwise direction (from front of chassis) around tuning control shaft. Turns should progress toward the chassis.

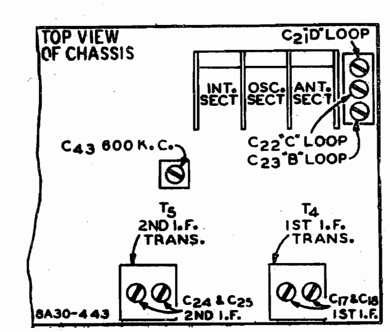
Wind 1¾ turns in a clockwise direction (from right side of chassis) around condenser drive pulley. This turn should be at left side (from front of chassis) of pulley groove. Pass cord through hole in pulley rim. Secure tension spring to cord loop. Knot other end of cord to spring. Stretch spring and secure free end to hook on drive pulley. Replace guide arm.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.



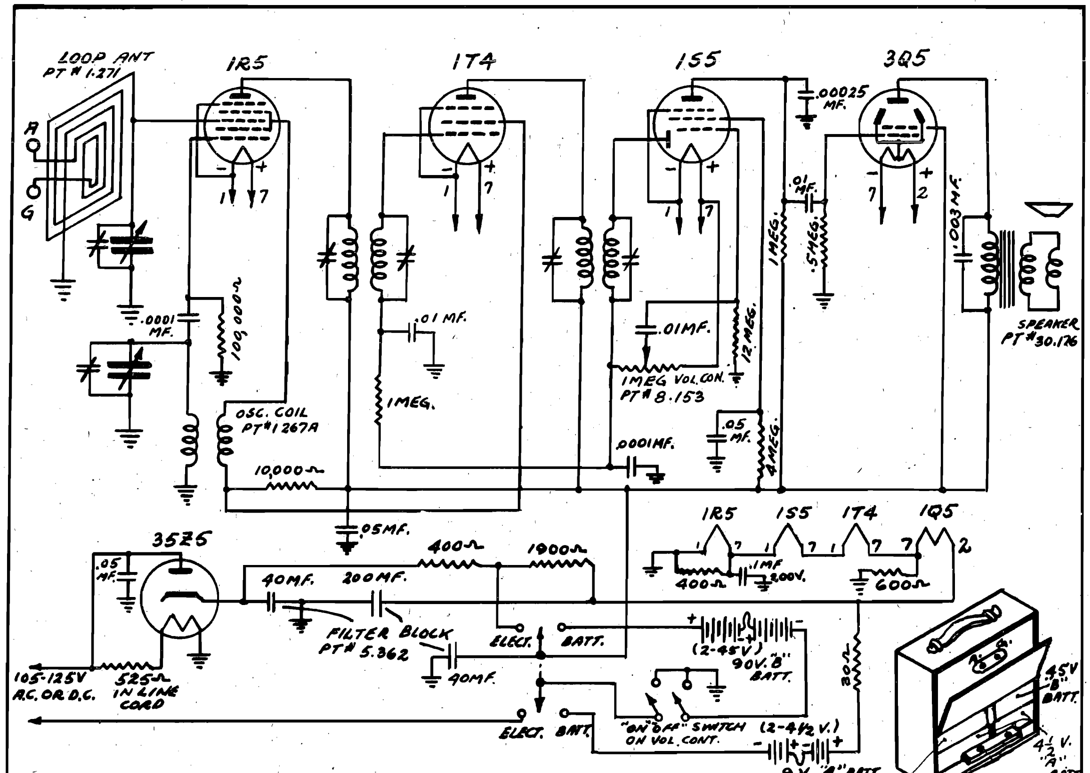






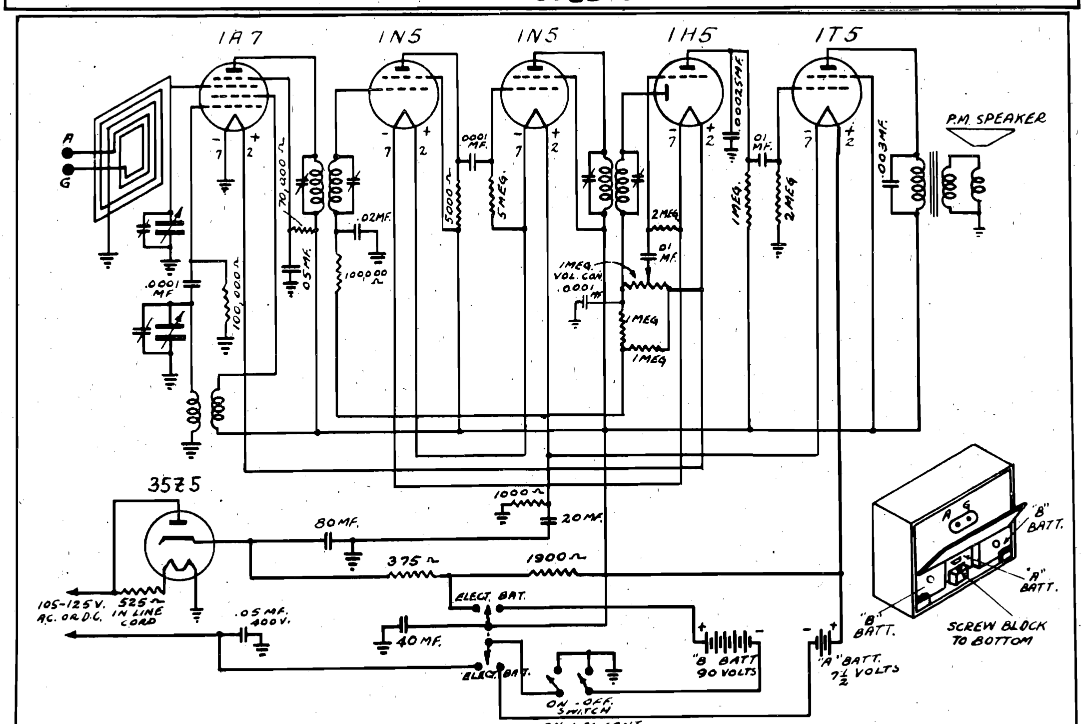
GAROD RADIO CORP.

MODEL BP11
MODELS BP12,
BP12A, BP12B



I.F. = 455 K.C.

SCHEMATIC CIRCUIT DIAGRAM
MODEL BP-11

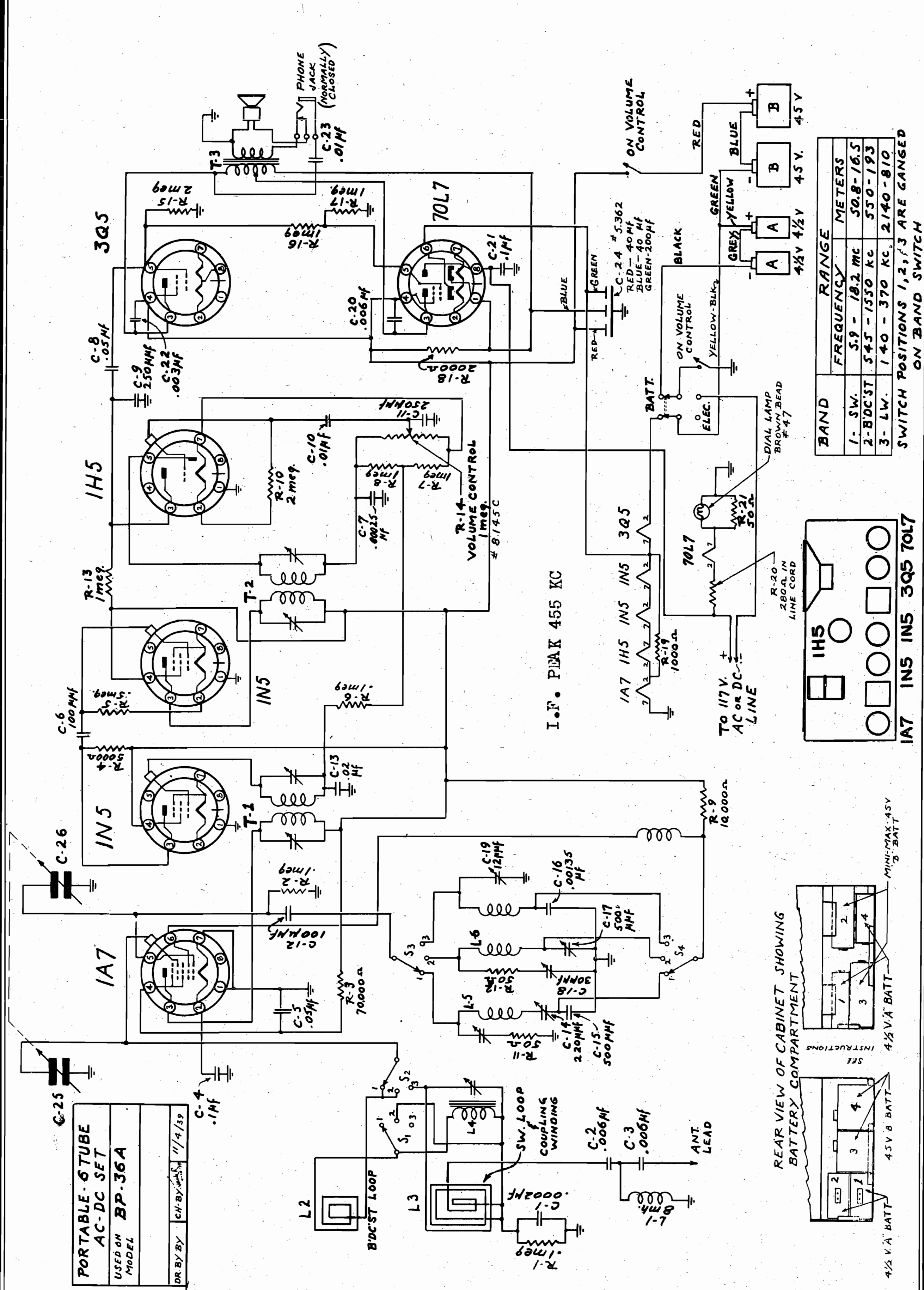


I.F. = 455 K.C.

SCHEMATIC CIRCUIT DIAGRAM
MODEL BP-12

MODEL BP36A

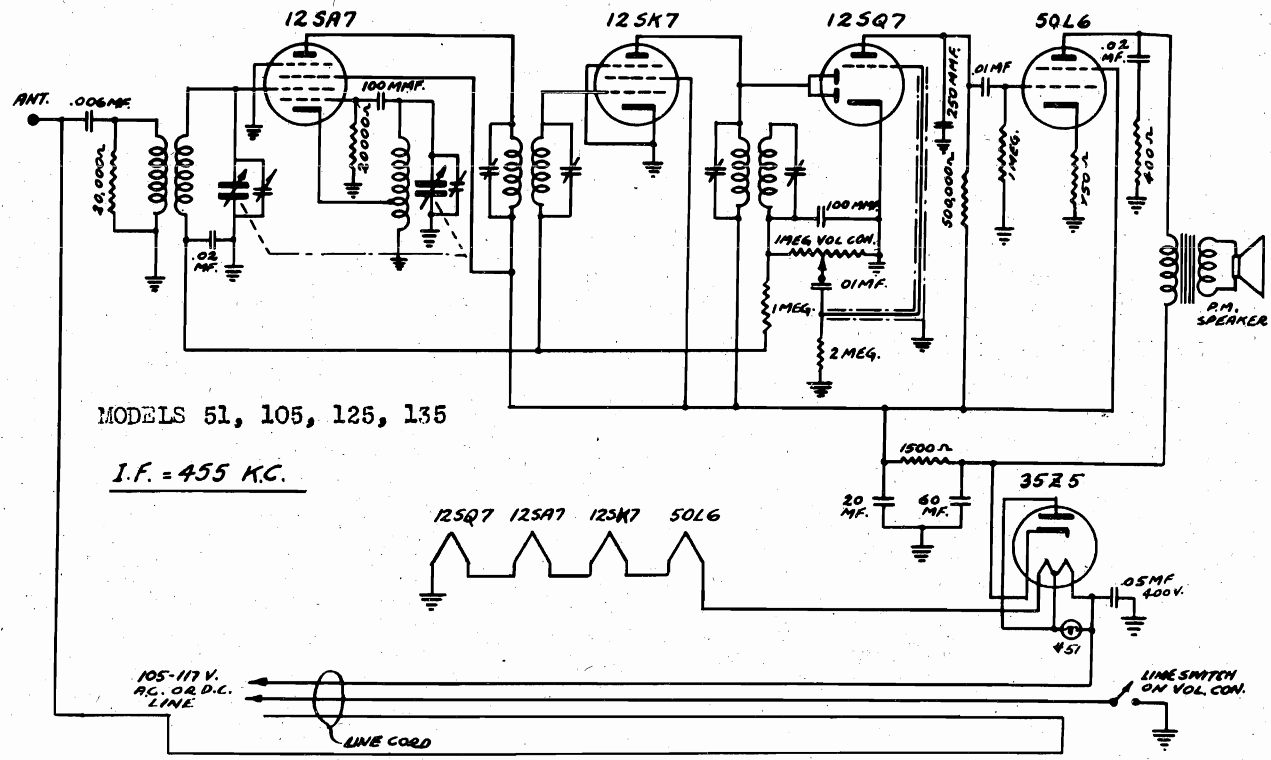
GAROD RADIO CORP.



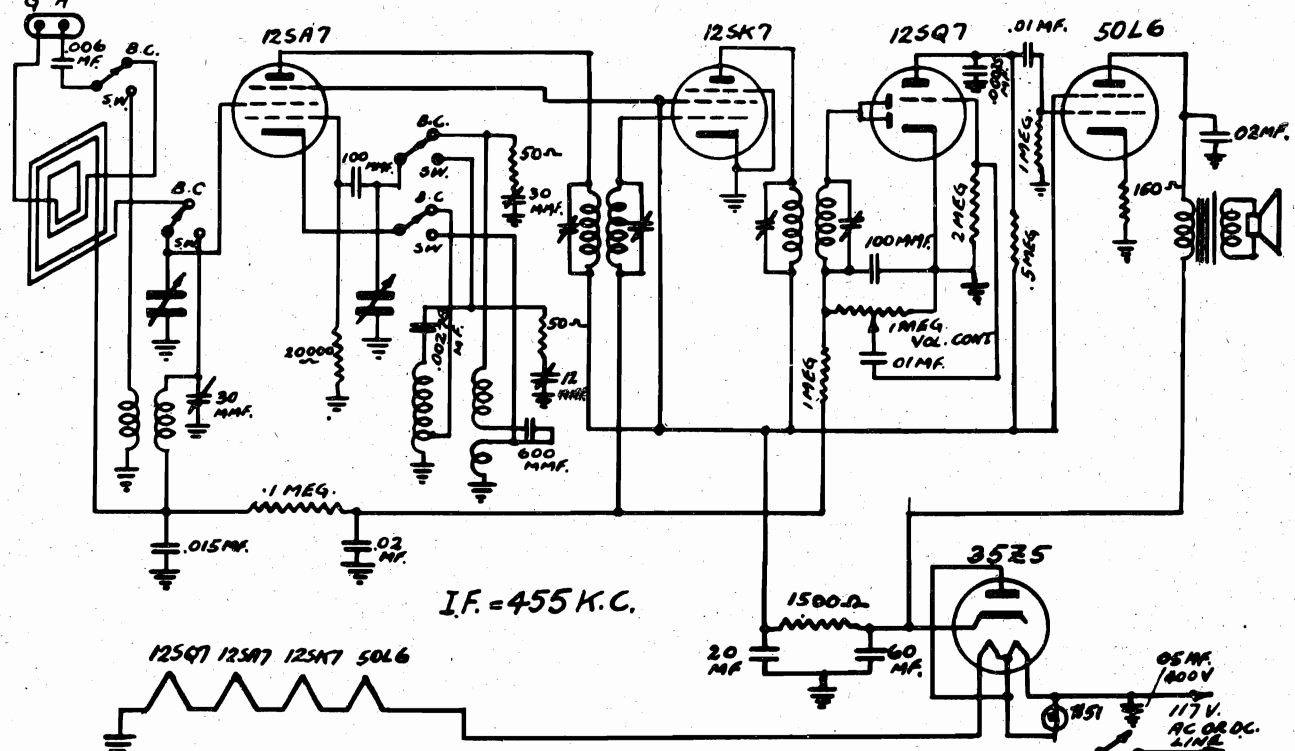
MODELS 225A, 225B, 245, 255, 265, 275, 285

GAROD RADIO CORP.

MODELS 51, 105, 125, 135



Alignment: Peak i-f transformers at 455 kc. Set generator to 1500 kc and tune in with OSC trimmer on gang, front section. Adjust ANT trimmer for maximum output.

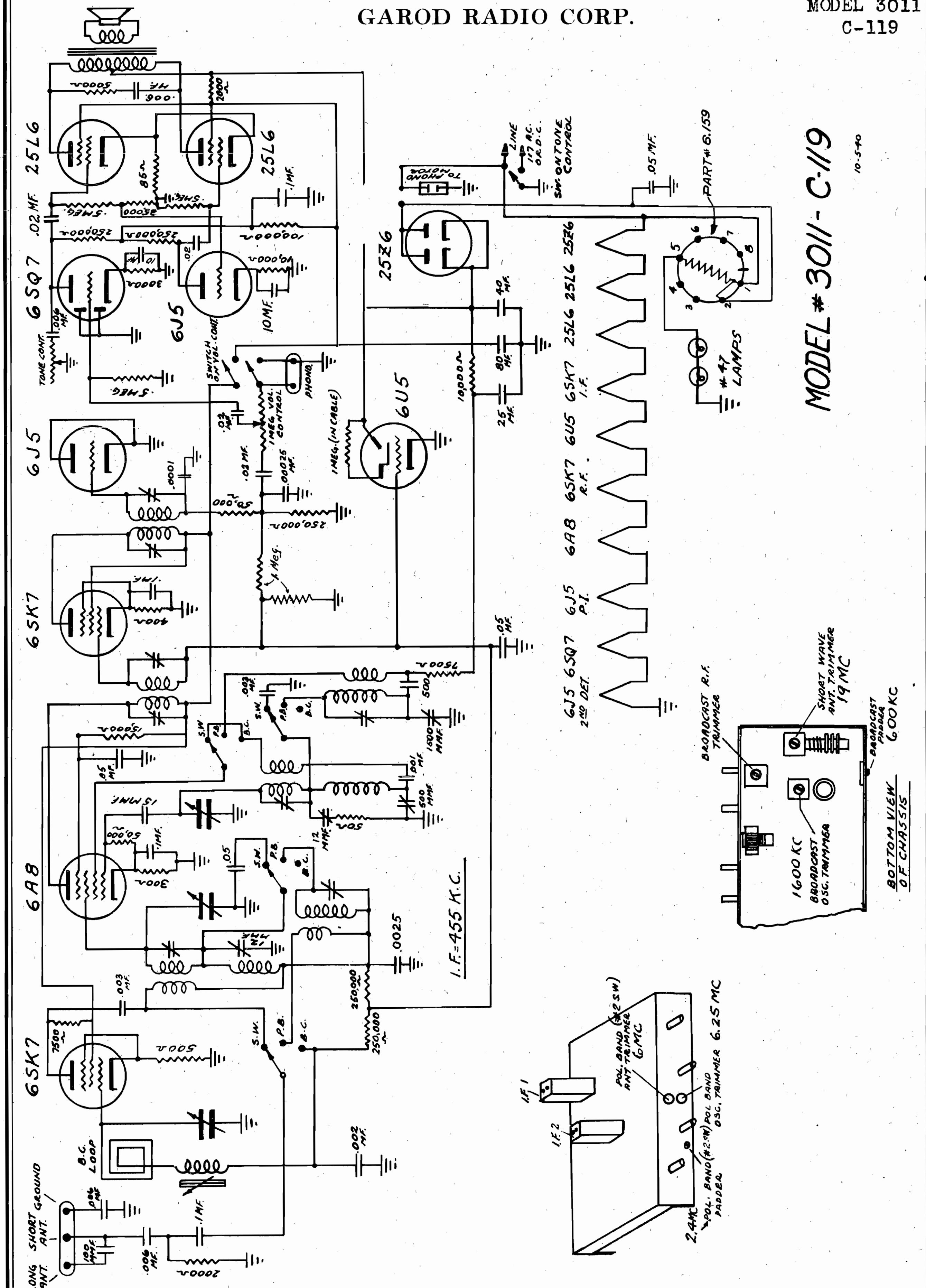


Alignment: Peak i.f. at 455 kc. Adjust B-C OSC trimmer (under chassis on apron) to 1500 kc. Adjust B-C padder (rear apron) to 600 kc. Set generator to 15 mc. Tune in. Set s-w OSC trimmer so that dial points to this frequnecy. Align s-w ANT trimmer (top of chassis on s-w ANT coil to right of gang condenser.)

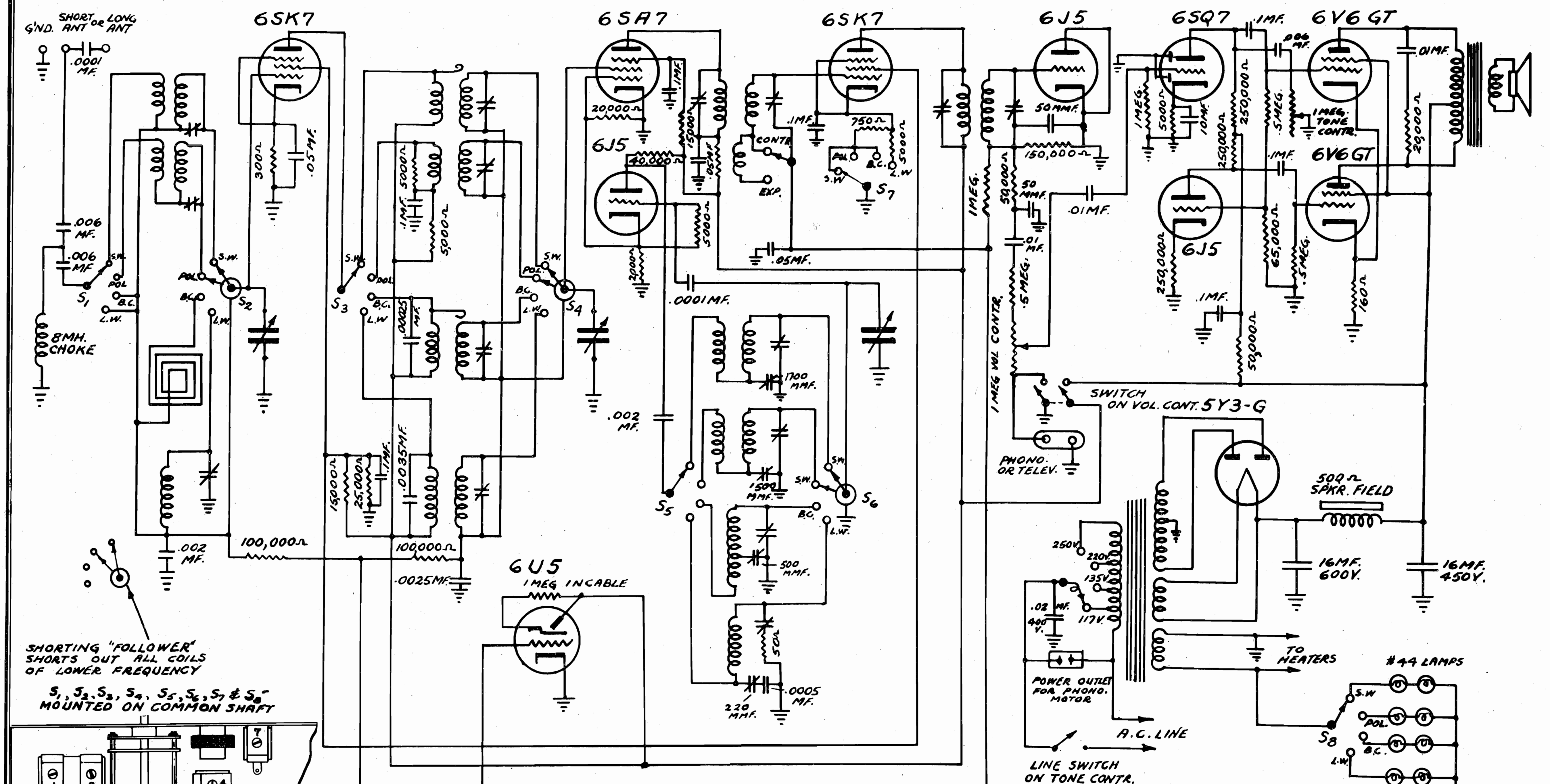
SCHEMATIC WIRING DIAGRAM
MODELS 225A, 225B
245, 255, 265, 275, 285

GAROD RADIO CORP.

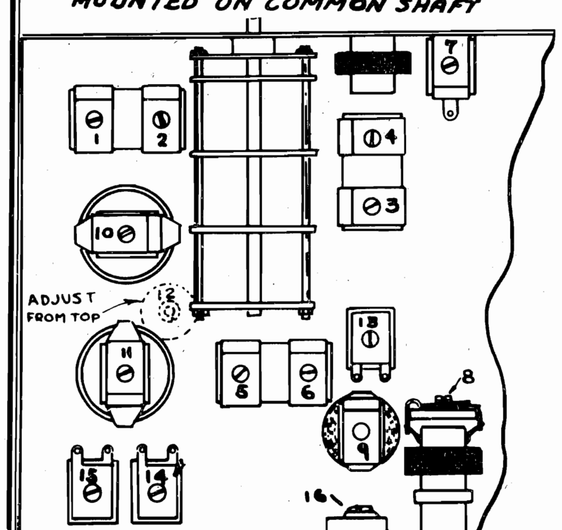
MODEL 3011
C-119



GAROD RADIO CORP.



$S_1, S_2, S_3, S_4, S_5, S_6, S_7$ & S_8 — MOUNTED ON COMMON SHAFT



BOTTOM VIEW OF CHASSIS SHOWING LOCATION OF TRIMMERS & PADDERS

I.F. 455 K.C.

BAND	RANGE	
	FREQUENCY	WAVE LENGTH
SHORT WAVE	22.5-7.2 MC.	13-41.75 METERS
POLICE	7.4-23 MC.	40.5-128 METERS
BROADCAST	545-1620 KILOCYCLES	550-185 METERS
LONG WAVE	140-370 KILOCYCLES	2140-813 METERS

ALIGNMENT CHART

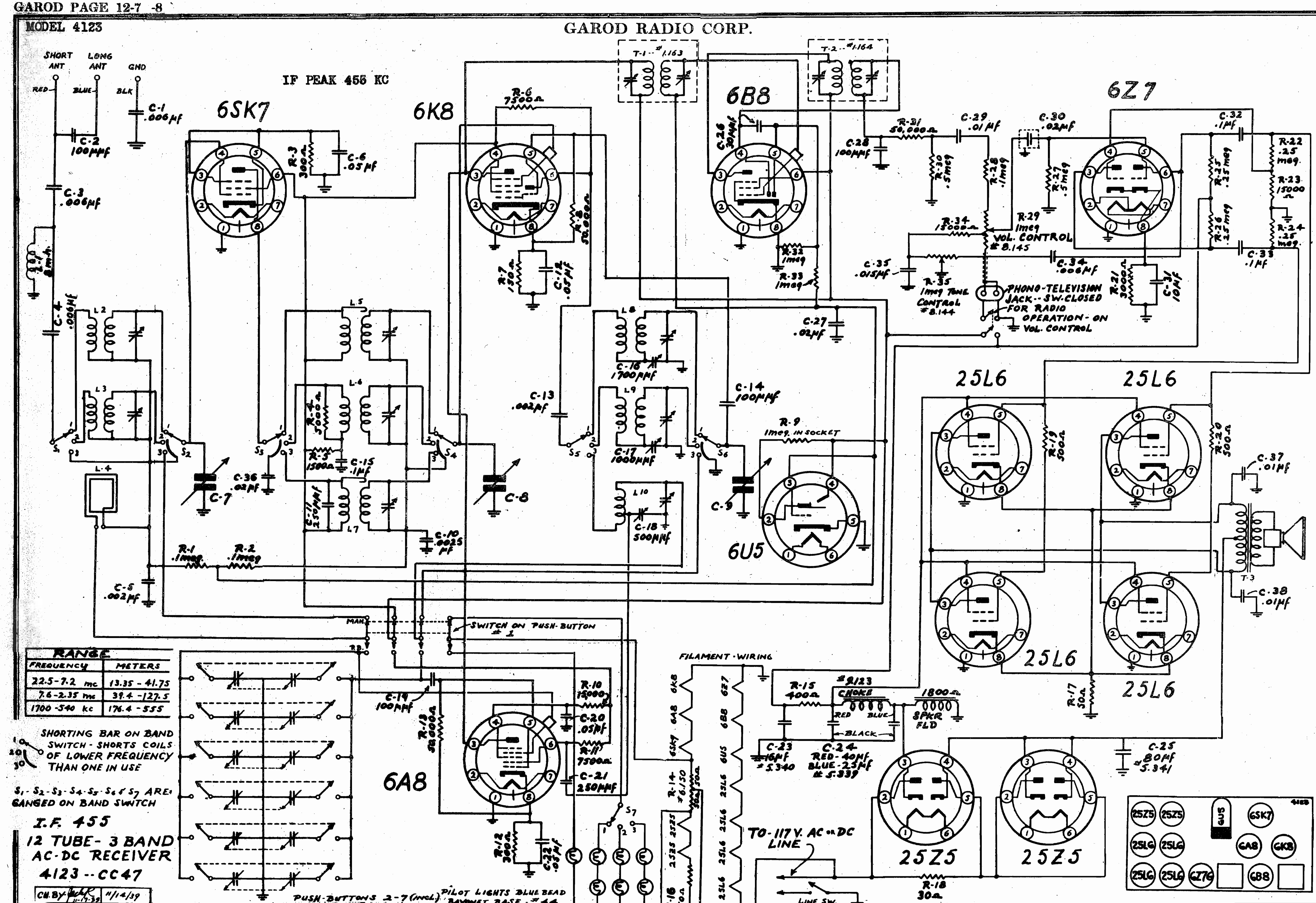
NUMBER (SEE DIAGRAM)	FUNCTION	ALIGNMENT FREQUENCY
1	2ND. S.W. ANT. TRIMMER	19 M.C.
2	1ST. S.W. ANT.	7 M.C.
3	2ND. S.W. INTER. (1ST. DET.)	19 M.C.
4	1ST. S.W. " "	7 M.C.
5	2ND. S.W. OSC	22.5 M.C.
6	1ST. S.W. "	7.6 M.C.
7	L.W. ANT.	300 K.C.
8	L.W. INTER (1ST. DET.)	300 K.C.
9	L.W. OSC.	300 K.C.
10	B.C. INTER. (1ST. DET.)	1400 K.C.
11	B.C. OSC	1620 K.C.
12	B.C. LOOP PADDER	600 K.C.
13	2ND. S.W. "	8 M.C.
14	1ST. S.W. "	2.5 M.C.
15	B.C. "	600 K.C.
16	L.W. "	150 K.C.
	I.F. FREQUENCY	455 K.C.

11 TUBE A.C. RECEIVER
MODEL #4011

9-25-40

MODEL 4123

GAROD RADIO CORP.



RANGE	
FREQUENCY	METERS
22.5-7.2 mc	13.35 - 41.75
7.6-2.35 mc	39.4 - 127.5
1700-540 kc	176.4 - 555

SHORTING BAR ON BAND SWITCH - SHORTS COILS OF LOWER FREQUENCY THAN ONE IN USE

S1-S2-S3-S4-S5-S6 & S7 ARE GANGED ON BAND SWITCH

I.F. 455

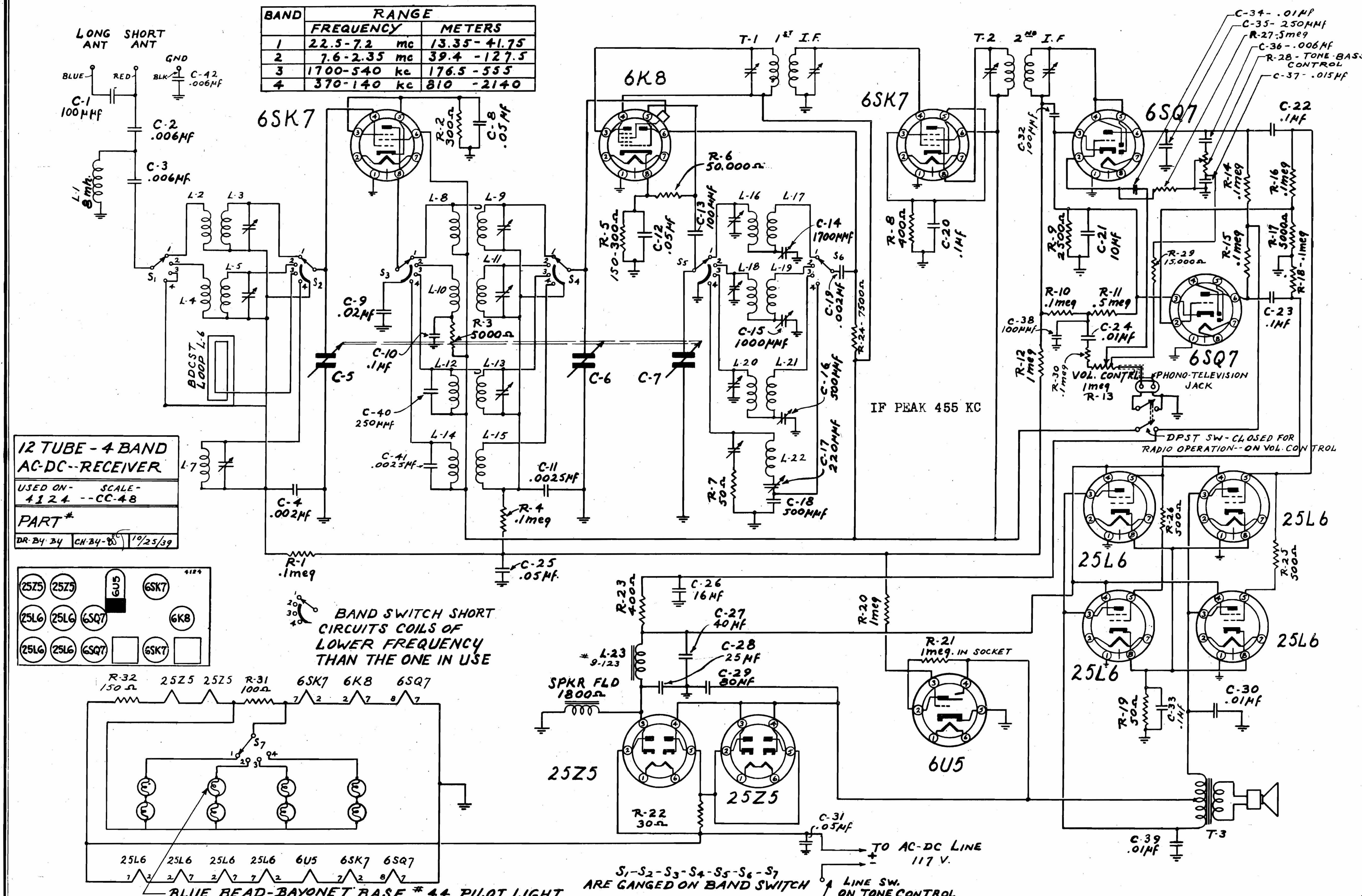
12 TUBE- 3 BAND AC-DC RECEIVER

4123--CC47

CH. BY 11/14/39

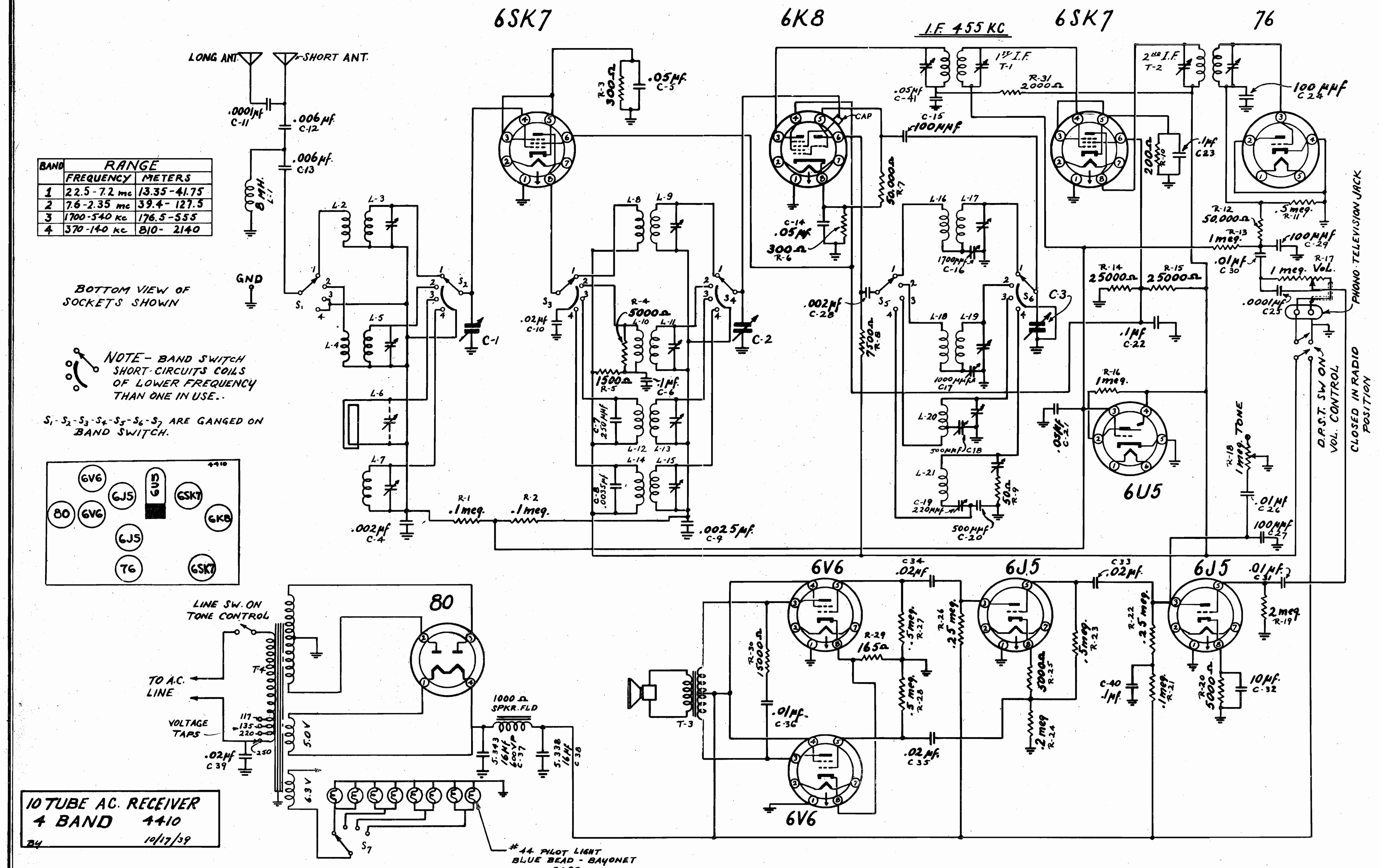
GAROD RADIO CORP.

BAND	RANGE	
	FREQUENCY	METERS
1	22.5-7.2 mc	13.35-41.75
2	7.6-2.35 mc	39.4 -127.5
3	1700-540 kc	176.5 -555
4	370-140 kc	810 -2140



MODEL 4410

GAROD RADIO CORP.



BAND	RANGE	
	FREQUENCY	METERS
1	22.5 - 7.2 mc	13.35 - 41.75
2	7.6 - 2.35 mc	39.4 - 127.5
3	1700 - 540 kc	176.5 - 555
4	370 - 140 kc	810 - 2140

10 TUBE AC. RECEIVER
4 BAND 4410
BY 10/17/39

GAROD RADIO CORP.

MODELS 399, 4990; 1039, 1049; 1540; 3109; 4123; 4124; 4410

GAROD MODELS 399,4990; 1039,1049; 1540; 3109; 4123; 4124; 4410

ALIGNMENT

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 at①455 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 24②megacycles. 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 to③19 MC and the variable condenser turned until a response is obtained. The pointer should coincide with the③19 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 7.6④mc 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 runing 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 7.6⑤mc 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 1620⑥kc, 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 (1620kc)⑥ 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.⑦
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.

MODELS 1049, 1540, 4124, 4410 and 4990. (ONLY)

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.

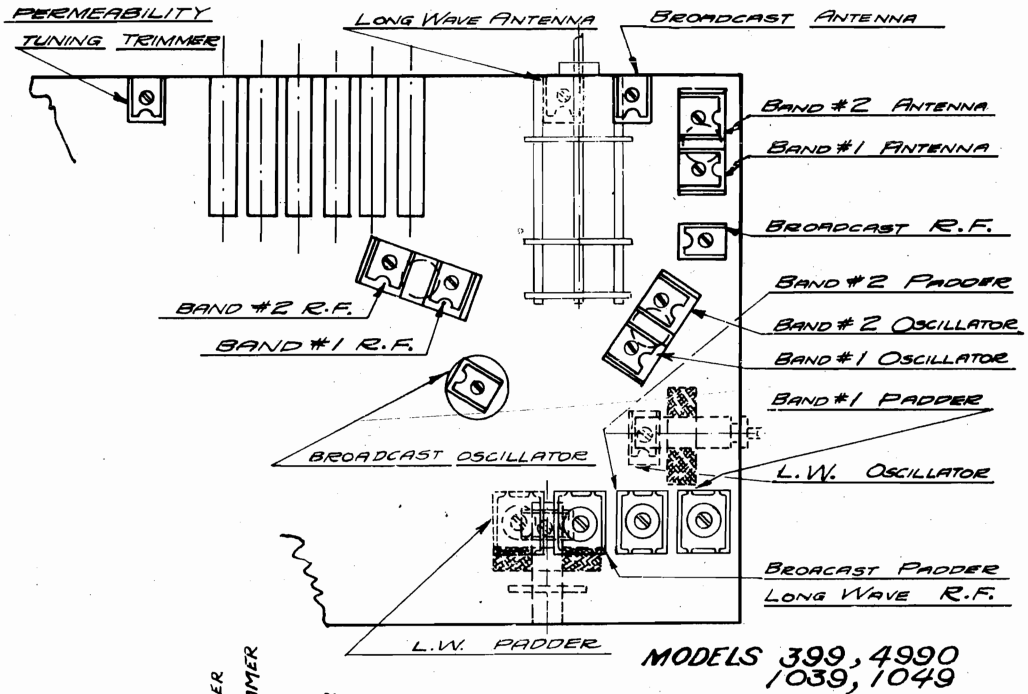
THIS NOTE REFERS TO MODELS 399,4990; 1039,1049; 1540; and 3109.

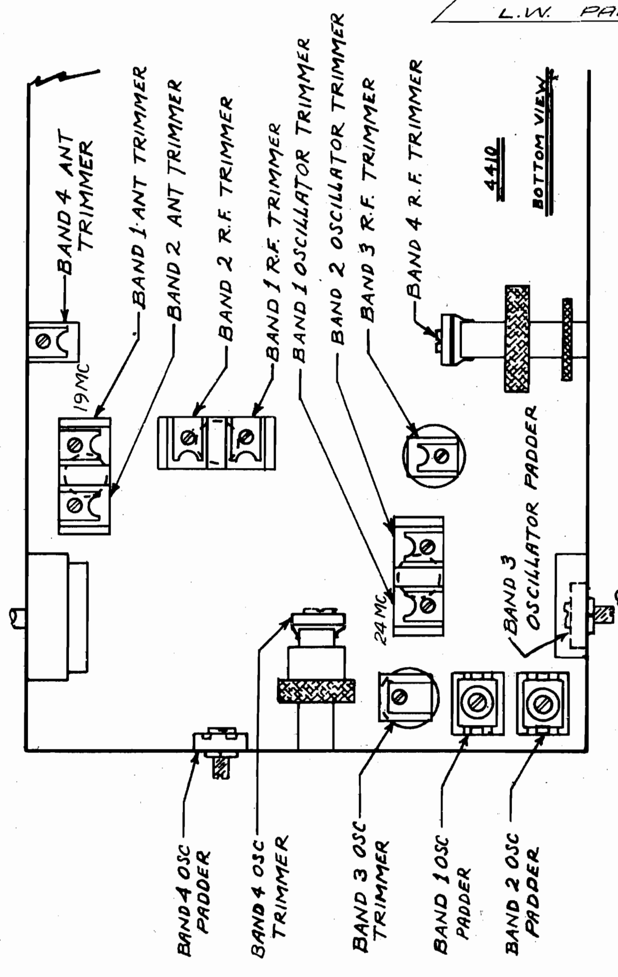
① 456KC ② 23MC ③ 21 MC ④ 7.2 MC ⑤ 7.4 MC ⑥ 1720 KC

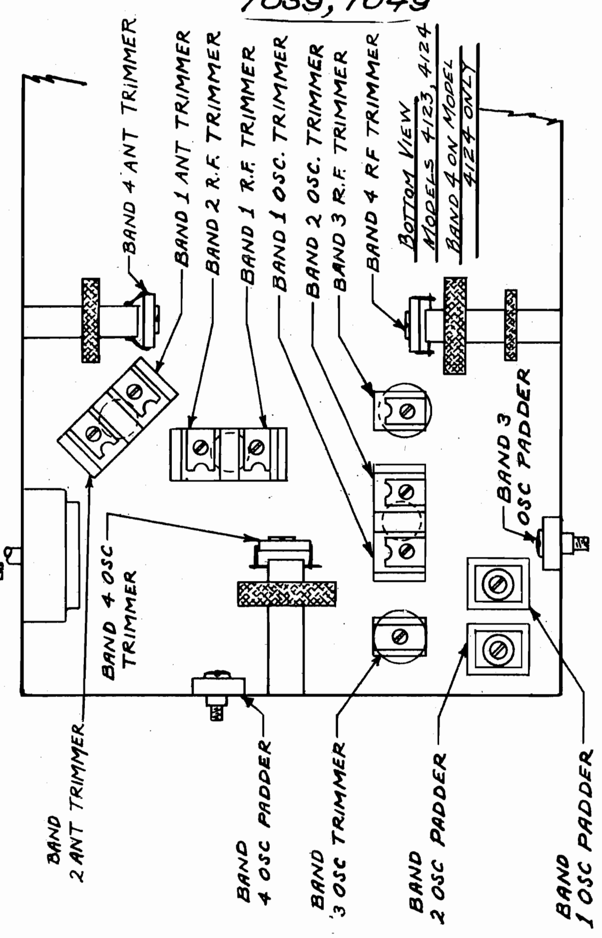
⑦ REFERS TO MODELS 1039,1049; 1540; 3109:-
Then adjust the antenna and detector trimmers in the order indicated for maximum output.

MODELS 399, 1039, 1049, 4990; 4123, 4124; 4410

GAROD RADIO CORP.



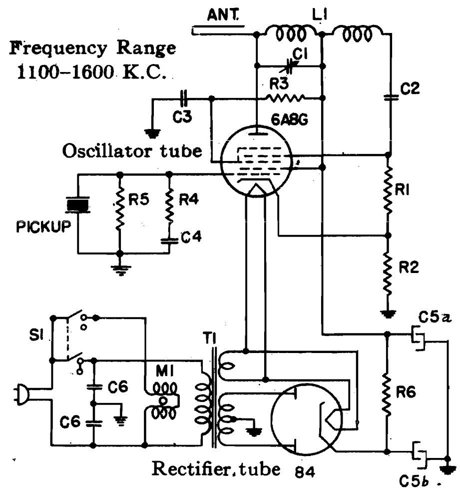




MODEL JM-23

GENERAL ELECTRIC CO.

MODELS HE-100, HE-100-H, HE-100L, HE-100LH, HE-105, HE-105L



3-40

C-1	300–850 mmf. tuning trimmer	M-1	Motor
C-2	100 mmf. mica capacitor	R-1	120,000 ohms carbon resistor
C-3	0.1 mfd. paper capacitor	R-2	1200 ohms carbon resistor
C-4	.005 mfd. paper capacitor	R-3	47,000 ohms carbon resistor
C-5a	10 mfd. dry electrolytic	R-4	47,000 ohms carbon resistor
C-5b	10 mfd. dry electrolytic	R-5	1.0 megohm carbon resistor
C-6	.01–.01 mfd. line capacitor	R-6	6800 ohms carbon resistor
L-1	Oscillator coil	S-1	Power switch
		T-1	Power transformer

SPECIFICATIONS

Overall Dimensions

Model....................JM-23
Height....................$6\frac{1}{16}$ inches
Width....................$14\frac{5}{8}$ inches
Depth....................$11\frac{1}{16}$ inches

Electrical Specifications

Rating	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
A6	115–125	60	30
A5	115–125	50	30

Phonograph Mechanism

Motor....................Constant-speed, self-starting
Pickup....................Crystal
Turntable Speed..........78 R.P.M.

GENERAL INFORMATION

The Model JM-23 Wireless Record Player is a two-tube transmitter using a type 84 tube as a rectifier and a type 6A8G as an oscillator. Audio modulation is applied to the control grid of the 6A8G from a properly loaded crystal pickup circuit. The oscillator operates over a range of 1100–1600 kilocycles and the frequency is adjusted by the tuning trimmer (C-1). This trimmer is set to operate at approximately 1500 K.C. at the factory.

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.

The power control is a three-position switch. When this control is turned to the extreme counterclockwise position, all power is removed from the record player. When switched to the center position, power is applied to both the motor and the transmitter. When turned to the extreme clockwise position, power is still supplied to the transmitter but is removed from the motor. This last position provides a means of stopping turntable rotation without letting the tubes cool down from operating temperature.

FREQUENCY ADJUSTMENT

To adjust the frequency of the oscillator turn the tuning trimmer which is accessible through a hole in the bottom cover near the power control knob. This is a screwdriver control. Clockwise rotation of the trimmer raises the frequency while counterclockwise rotation lowers the frequency. Since the electrical capacity of the hand may detune the transmitter somewhat if rested on the record player during adjustment, it is best to rest the record player on the edge of a table or bench with the tuning trimmer side of the record player just far enough out from the edge to allow screwdriver adjustment of the tuning trimmer.

REPLACEMENT PARTS LIST
MODEL JM-23

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
RB-941	BOTTOM COVER—Cabinet bottom cover	$0.30
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-4)	.25
*RC-059	CAPACITOR—.01-.01 mfd. line capacitor (C-6)	.55
*RC-096	CAPACITOR—0.1 mfd. 200 V. paper (C-3)	.30
*RC-319	CAPACITOR—100 mmf. mica (C-2)	.25
*RC-2002	CLAMP—Crystal clamp	.10
RC-2016	CLIP—Oscillator coil mounting clip (Pkg. 5)	.10
RC-2017	CATCH—Tone arm catch for securing to rest	.10
*RC-5150	CAPACITOR—10 mfd., 10 mfd. 200 V. dry electrolytic (C-5)	.70
*RC-6529	CAPACITOR—Trimmer capacitor (C-1)	.40
RC-8174	CORD—Power cord	.40
*RF-016	FOOT—Rubber foot for cabinet (Pkg. 3)	.05
*RG-016	GRID CAP—6A8G control grid cap (Pkg. 5)	$0.10
*RH-114	HAIRPIN COTTER—Swivel retaining cotter	.10
*RK-073	KNOB—Power switch control knob	.10
*RL-2019	COIL—Oscillator coil (L-1)	.40
RN-007	NUT—Speed nut for mounting motor assembly (Pkg. 3)	.10
RN-008	NUT—Power switch clamping nut (Pkg. 5)	.10
*RN-102	NEEDLE CUP—Rubber needle cup	.10
*RP-506	PICK-UP—Crystal pick-up	4.75
*RP-801	POST—Tone arm swivel post	.15
*RQ-1261	RESISTOR—1200 ohms ½ W. carbon (R-2) (Pkg. 5)	.70
*RQ-1279	RESISTOR—6800 ohms ½ W. carbon (R-6) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms ½ W. carbon (R-3, 4) (Pkg. 5)	.70
*RQ-1309	RESISTOR—120,000 ohms ½ W. carbon (R-1) (Pkg. 5)	.70
*RQ-1331	RESISTOR—1.0 megohm ½ W. carbon (R-5) (Pkg. 5)	$0.70
*RR-940	REST—Tone arm rest	.15
*RS-200	SOCKET—6A8G tube socket (Pkg. 5)	.75
*RS-224	SOCKET—Type 84 tube socket (Pkg. 5)	.50
*RS-888	SCREW—Needle clamping screw	.10
RS-896	SCREW—Crystal clamp and catch screw (Pkg. 5)	.05
*RS-938	SWIVEL—Tone arm swivel assembly	.15
*RS-3058	SWITCH—Power control switch	.50
*RT-020	TRANSFORMER—Power transformer, 60 cycles (T-1)	2.20
RT-021	TRANSFORMER—Power transformer, 50 cycles	2.85
*RT-912	TONE ARM—Crystal tone arm	.65
*RW-114	WEIGHT—Tone arm weight	.05

Voltage Chart

Tubes	Plate to Gnd. Volts	Sreen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
6SK7 (R.F.)	215	98	4.7	6.3
6K8	Conv—230 Osc—105	98	4.7	6.3
6SK7 (I.F.)	215	98	3	6.3
6H6				6.3
6SF5	110		1	6.3
6J5G	100		4	6.3
6V6G	290	230	11.8	6.3
5U4G	277 a-c		300	5.1
6U5	170			6.3

HE-100,HE-100H,HE-100L,HE-100LH.HE-105,HE,105L

MODEL HE-64L

GENERAL ELECTRIC CO.

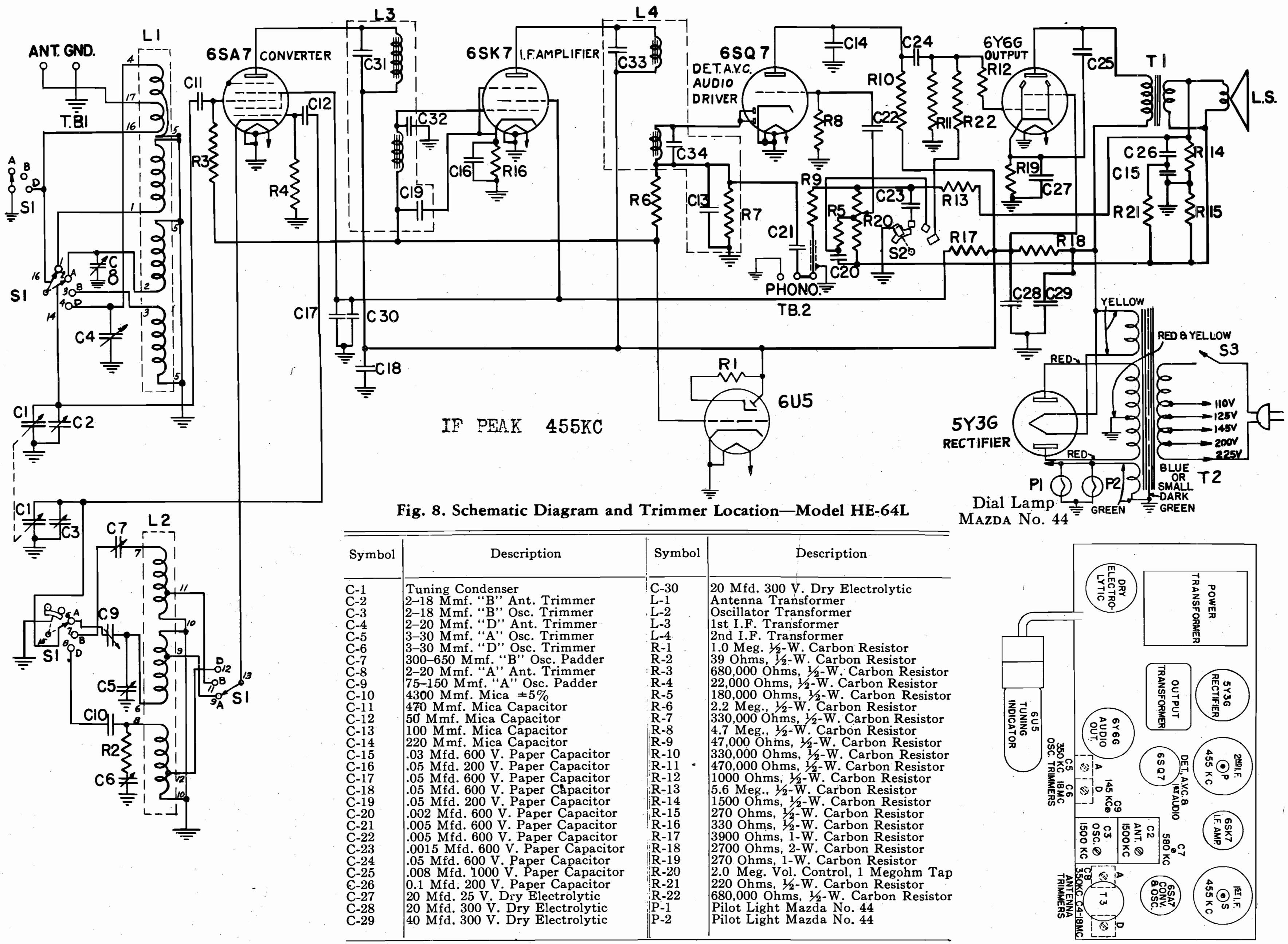
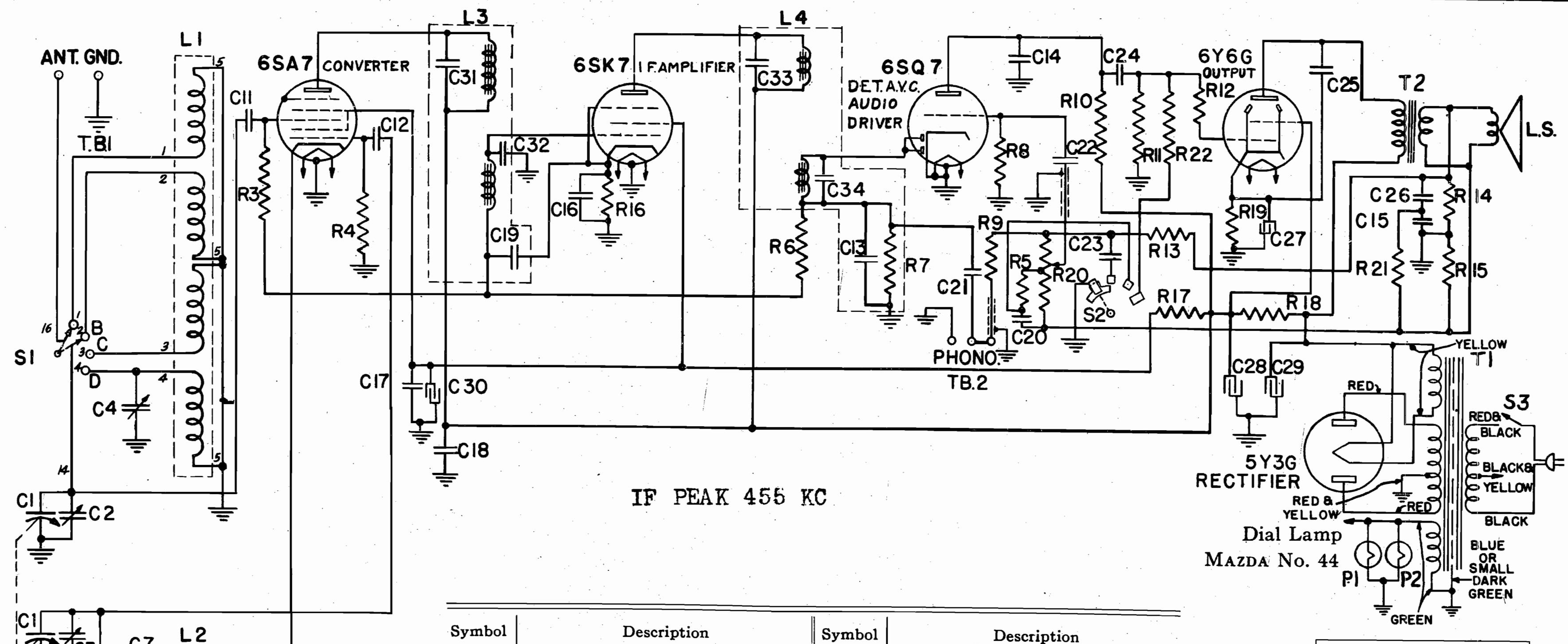


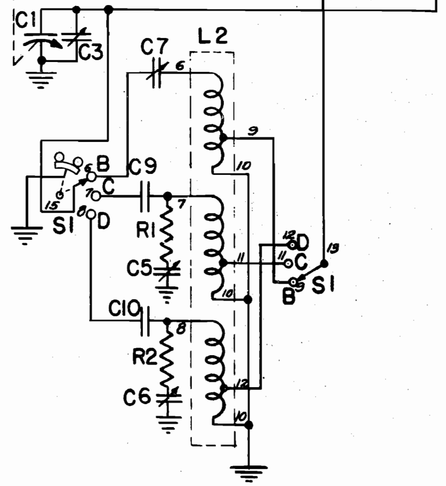
Fig. 8. Schematic Diagram and Trimmer Location—Model HE-64L

Symbol	Description	Symbol	Description
C-1	Tuning Condenser	C-30	20 Mfd. 300 V. Dry Electrolytic
C-2	2–18 Mmf. "B" Ant. Trimmer	L-1	Antenna Transformer
C-3	2–18 Mmf. "B" Osc. Trimmer	L-2	Oscillator Transformer
C-4	2–20 Mmf. "D" Ant. Trimmer	L-3	1st I.F. Transformer
C-5	3–30 Mmf. "A" Osc. Trimmer	L-4	2nd I.F. Transformer
C-6	3–30 Mmf. "D" Osc. Trimmer	R-1	1.0 Meg. ½-W. Carbon Resistor
C-7	300–650 Mmf. "B" Osc. Padder	R-2	39 Ohms, ½-W. Carbon Resistor
C-8	2–20 Mmf. "A" Ant. Trimmer	R-3	680,000 Ohms, ½-W. Carbon Resistor
C-9	75–150 Mmf. "A" Osc. Padder	R-4	22,000 Ohms, ½-W. Carbon Resistor
C-10	4300 Mmf. Mica ±5%	R-5	180,000 Ohms, ½-W. Carbon Resistor
C-11	470 Mmf. Mica Capacitor	R-6	2.2 Meg., ½-W. Carbon Resistor
C-12	50 Mmf. Mica Capacitor	R-7	330,000 Ohms, ½-W. Carbon Resistor
C-13	100 Mmf. Mica Capacitor	R-8	4.7 Meg., ½-W. Carbon Resistor
C-14	220 Mmf. Mica Capacitor	R-9	47,000 Ohms, ½-W. Carbon Resistor
C-15	.03 Mfd. 600 V. Paper Capacitor	R-10	330,000 Ohms, ½-W. Carbon Resistor
C-16	.05 Mfd. 200 V. Paper Capacitor	R-11	470,000 Ohms, ½-W. Carbon Resistor
C-17	.05 Mfd. 600 V. Paper Capacitor	R-12	1000 Ohms, ½-W. Carbon Resistor
C-18	.05 Mfd. 600 V. Paper Capacitor	R-13	5.6 Meg., ½-W. Carbon Resistor
C-19	.05 Mfd. 200 V. Paper Capacitor	R-14	1500 Ohms, ½-W. Carbon Resistor
C-20	.002 Mfd. 600 V. Paper Capacitor	R-15	270 Ohms, ½-W. Carbon Resistor
C-21	.005 Mfd. 600 V. Paper Capacitor	R-16	330 Ohms, ½-W. Carbon Resistor
C-22	.005 Mfd. 600 V. Paper Capacitor	R-17	3900 Ohms, 1-W. Carbon Resistor
C-23	.0015 Mfd. 600 V. Paper Capacitor	R-18	2700 Ohms, 2-W. Carbon Resistor
C-24	.05 Mfd. 600 V. Paper Capacitor	R-19	270 Ohms, 1-W. Carbon Resistor
C-25	.008 Mfd. 1000 V. Paper Capacitor	R-20	2.0 Meg. Vol. Control, 1 Megohm Tap
C-26	0.1 Mfd. 200 V. Paper Capacitor	R-21	220 Ohms, ½-W. Carbon Resistor
C-27	20 Mfd. 25 V. Dry Electrolytic	R-22	680,000 Ohms, ½-W. Carbon Resistor
C-28	20 Mfd. 300 V. Dry Electrolytic	P-1	Pilot Light Mazda No. 44
C-29	40 Mfd. 300 V. Dry Electrolytic	P-2	Pilot Light Mazda No. 44

MODEL HE-50

GENERAL ELECTRIC CO.





Symbol	Description	Symbol	Description
C-1	Tuning Condenser	C-30	20 Mfd. 300 V. Dry Electrolytic
C-2	2–18 Mmf "B" Ant. Trimmer	L-1	Antenna Coil
C-3	2–18 Mmf "B" Osc. Trimmer	L-2	Oscillator Coil
C-4	3–30 Mmf "D" Ant. Trimmer	L-3	1st I.F. Transformer
C-5	3–30 Mmf "C" Osc. Trimmer	L-4	2nd I.F. Transformer
C-6	3–30 Mmf "D" Osc. Trimmer	R-1	330 Ohms, ½-W. Carbon Resistor
C-7	300–650 Mmf "B" Osc. Padder	R-2	39 Ohms, ½-W. Carbon Resistor
C-9	1800 Mmf. Mica Capacitor ±5%	R-3	680,000 Ohms, ½-W. Carbon Resistor
C-10	5600 Mmf. Mica Capacitor	R-4	22,000 Ohms, ½-W. Carbon Resistor
C-11	470 Mmf. Mica Capacitor	R-5	180,000 Ohms, ½-W. Carbon Resistor
C-12	50 Mmf. Treated Mica Capacitor	R-6	2.2 Megohms, ½-W. Carbon Resistor
C-13	100 Mmf. Mica Capacitor	R-7	330,000 Ohms, ½-W. Carbon Resistor
C-14	220 Mmf. Mica Capacitor	R-8	4.7 Megohms, ½-W. Carbon Resistor
C-15	.03 Mfd. 600 V. Paper Capacitor	R-9	47,000 Ohms, ½-W. Carbon Resistor
C-16	.05 Mfd. 200 V. Paper Capacitor	R-10	330,000 Ohms, ½-W. Carbon Resistor
C-17	.05 Mfd. 600 V. Paper Capacitor	R-11	470,000 Ohms, ½-W. Carbon Resistor
C-18	.05 Mfd. 600 V. Paper Capacitor	R-12	1000 Ohms, ½-W. Carbon Resistor
C-19	.05 Mfd. 200 V. Paper Capacitor	R-13	5.6 Megohms, ½-W. Carbon Resistor
C-20	.002 Mfd. 600 V. Paper Capacitor	R-14	1500 Ohms, ½-W. Carbon Resistor
C-21	.005 Mfd. 600 V. Paper Capacitor	R-15	270 Ohms, ½-W. Carbon Resistor
C-22	.005 Mfd. 600 V. Paper Capacitor	R-16	330 Ohms, ½-W. Carbon Resistor
C-23	.0015 Mfd. 600 V. Paper Capacitor	R-17	3900 Ohms, 1-W. Carbon Resistor
C-24	.05 Mfd. 600 V. Paper Capacitor	R-18	2700 Ohms, 2-W. Carbon Resistor
C-25	.008 Mfd. 1000 V. Paper Capacitor	R-19	270 Ohms, 1-W. Carbon Resistor
C-26	0.1 Mfd. 200 V. Paper Capacitor	R-20	2 Megohms Volume Control, 1 Megohm Tap
C-27	20 Mfd. 25 V. Dry Electrolytic		
C-28	20 Mfd. 300 V. Dry Electrolytic	R-21	220 Ohms, ½-W. Carbon Resistor
C-29	40 Mfd. 350 V. Dry Electrolytic	R-22	680,000 Ohms, ½-W. Carbon Resistor

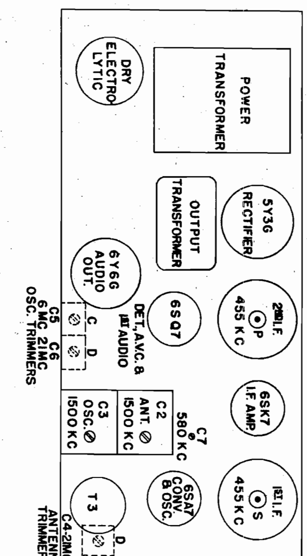


Fig. 4. Schematic Diagram and Trimmer Location—Model HE-50

MODELS HE-50, HE-64L, HE-540, HE-640L

GENERAL ELECTRIC CO.

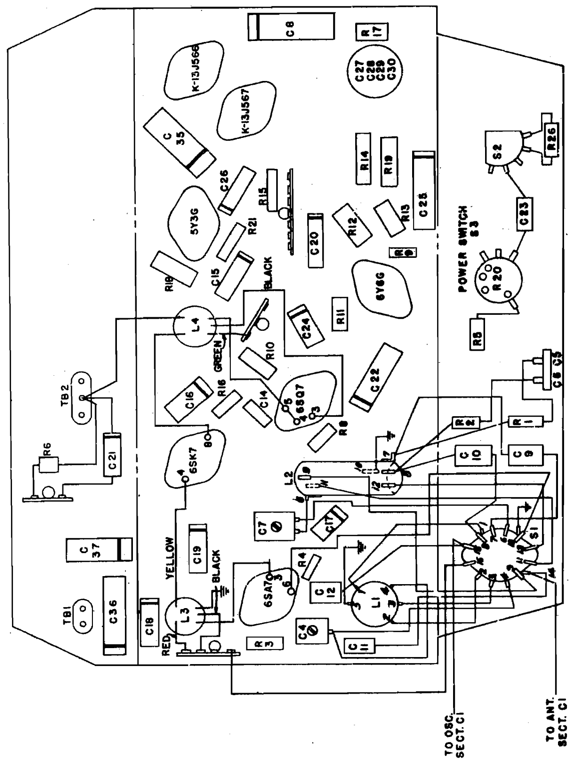


Fig. 7. Chassis Parts Layout—Model HE-540

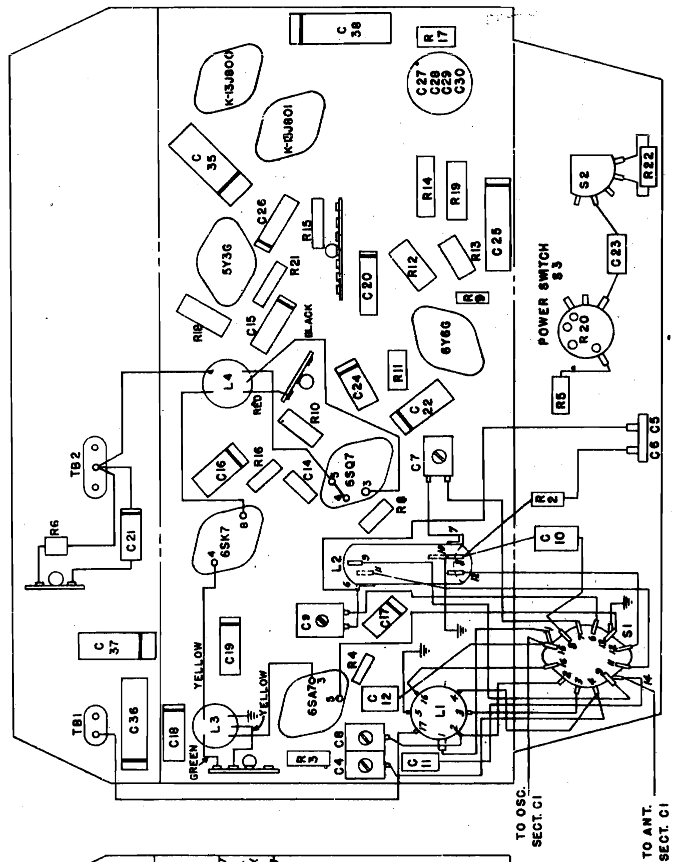


Fig. 11. Chassis Parts Layout—Model HE-640L

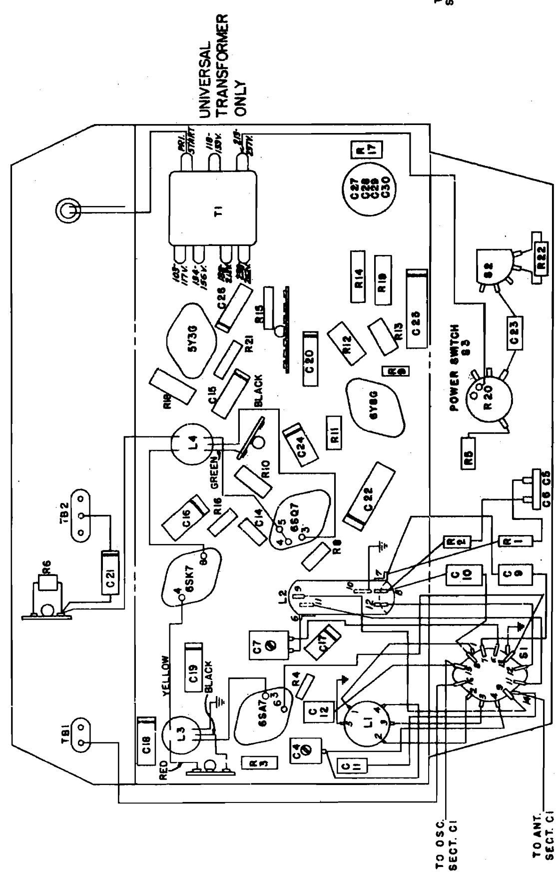


Fig. 6. Chassis Parts Layout—Model HE-50

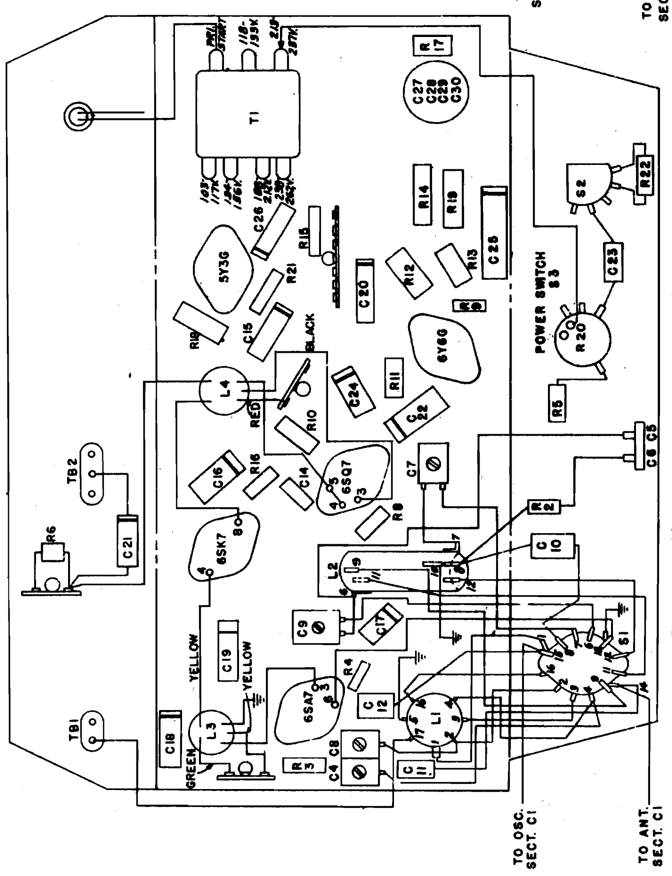


Fig. 10. Chassis Parts Layout—Model HE-64L

GENERAL INFORMATION

Models HE-50 and HE-540 are three-band receivers employing five General Electric Pre-tested Tubes in a superheterodyne circuit. Features of design include "Alnico" magnet dynamic speaker, beampower output, iron core I.F. transformers, single-ended tubes, and degenerative feedback. Model HE-50 is an A-C receiver available in three classes of voltage and frequency rating. Model HE-540 is an AC-DC receiver using an improved rectifier circuit.

Models HE-64L and HE-640L are similar to the above models except for tuning frequency coverage and incorporation of a tuning indicator. Model HE-64L is an A-C receiver while Model HE-640L is an AC-DC receiver.

Coil Data

All antenna and oscillator transformer switch terminals are numbered in Figs. 6, 7, 10, and 11 to facilitate in locating these common points on the schematic diagrams Figs. 4, 5, 8 and 9.

The following tables show the coils in use for the various positions of the band-change switch.

Models HE-50 and HE-540

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid	Oscillator Cathode
Band "B"	Section 1 to 5 of L1	Section 2 to 5 of L1	Section 6 to 10 of L2	Section 9 to 10 of L2
Band "C"	Section 2 to 5 of L1	Section 3 to 5 of L1	Section 7 to 10 of L2	Section 11 to 10 of L2
Band "D"	Section 3 to 5 of L1	Section 4 to 5 of L1	Section 8 to 10 of L2	Section 12 to 10 of L2

Models HE-64L and HE-640L

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid	Oscillator Cathode
Band "A"	Sections 16 to 17 and 1 to 5 of L1	Section 2 to 5 of L1	Section 6 to 10 of L2	Section 9 to 10 of L2
Band "B"	Sections 16 to 17 and 2 to 5 of L1	Section 3 to 5 of L1	Section 7 to 10 of L2	Section 11 to 10 of L2
Band "D"	Section 16 to 17 of L1	Section 4 to 5 of L1	Section 8 to 10 of L2	Section 12 to 10 of L2

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

NOTE:—In no case should the magnet be removed from the assembly position as it will lose magnetism.

Phonograph Connections

Figs. 1a and 1b show simple methods for connecting a crystal or high impedance magnetic pickup into the receiver circuit for the reproduction of phonograph recordings. S-1 is a triple-pole, double-throw switch. A suitable loading circuit composed 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 shield should be connected to the chassis ground.

Remove the jumper between phono-terminals 1 and 2 and make connections as shown in Fig. 1a and 1b.

When the pickup is connected as shown, the regular radio volume and tone controls work for both radio and phonograph reproduction. The following are suggested parts:

COIL RESISTANCE DATA

Coil	Model	Section	Resistance Measured Between Points	Resistance (Ohms)
Antenna	HE-50, 540	B Primary	1 and 5	22
		B Secondary	2 and 5	5
		C Secondary	3 and 5	.9
		D Secondary	4 and 5	.02
Antenna	HE-64L, 640L	A Primary	1 and 5	110
		A Secondary	2 and 5	26
		B Secondary	3 and 5	5
		D Secondary	4 and 5	.03
		D Primary	16 and 17	.2
Oscillator	HE-50, 540	B Band Coil	6 and 10	3
		C Band Coil	7 and 10	.8
		D Band Coil	8 and 10	.02
Oscillator	HE-64L, 640L	A Band Coil	6 and 10	10
		B Band Coil	7 and 10	3
		D Band Coil	8 and 10	.03
1st I.F. Transformer	All Models	Primary		9 to 12
		Secondary		15 to 19
2nd I.F. Transformer	All Models	Primary		14 to 18
		Secondary		7 to 9
Output Transformer	All Models	Primary		265
		Secondary		.4
Power Transformer	HE-50, 64L	Primary		
		110 V. Tap		7
		125 V. Tap		8
		200 V. Tap		9
		225 V. Tap		20
		250 V. Tap		24
		Secondary		
		Red to Red		250
		Green to Green		.5
		Yellow to Yellow		.5

MODELS HE-50, HE-540, HE-64L, HE-640L

GENERAL ELECTRIC CO.

Symbol	Description	Stock No.
S-1	Triple-pole, double-throw switch	RS-366
R-1	330,000 ohm resistor	RQ-1319

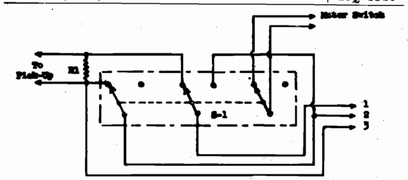


Fig. 1a. Pickup Connections for Models HE-50 and HE-64L

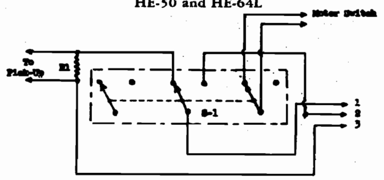


Fig. 1b. Pickup Connections for Models HE-540 and HE-640L

10-39

Alignment Procedure

The alignment is given in table form on this page. Use a standard I.R.E dummy antenna in making all R.F. alignments (see Fig. 2).

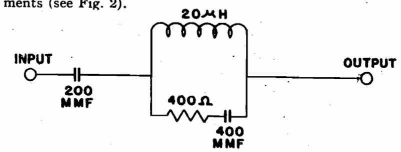


Fig. 2. Standard I.R.E. Dummy Antenna

I.F. transformers are double, permeability tuned with adjusting shafts at top and bottom of shield cans.

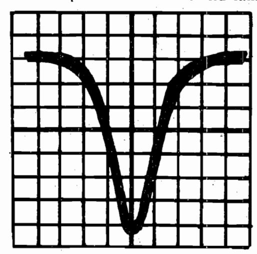


Fig. 3. Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

ALIGNMENT PROCEDURE

I. F. ALIGNMENT — 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. (Bottom of Shield Can) 2nd I.F. Pri. (Top of Shield Can)	Gang condenser plates closed—connect audio input of oscilloscope to ground and to phono terminal No. 2. 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. 3. It may be necessary to retrim 2nd I.F. transformers for final adjustment
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (Top of Shield Can) 1st I.F. Pri. (Bottom of Shield Can)	

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. (Bottom of Shield Can) 2nd I.F. Pri. (Top of Shield Can)	Gang condenser plates closed—connect output meter across voice coil—keep 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. (Top of Shield Can) 1st I.F. Pri. (Bottom of Shield Can)	

R. F. ALIGNMENT—MODELS HE-50 AND HE-540

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. Connect meter output across voice coil.
2. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-3) Ant. (C-2)	Peak trimmer for maximum output with a low input signal.
3. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. padder (C-7)	Adjust padder for maximum output in the vicinity of 580 K.C. while rocking the gang condenser.
4. Band "B"	Repeat Operation 2				
5. Band "C"	6. M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-5)	Peak trimmer for maximum output while rocking the gang condenser. Image—910 K.C. below signal.

Continued

ALIGNMENT PROCEDURE (Continued)

R. F. ALIGNMENT—MODELS HE-50 AND HE-540

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
6. Band "D"	21 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-4)	The image of "D" band signal should be heard 910 K.C. below the input signal when (C-6) is on proper peak. Example: 21 M.C. image is at 20.09 M.C. Peak (C-4) while rocking the gang condenser.

R. F. ALIGNMENT—MODELS HE-64L AND HE-640L

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. Connect output meter across voice coil.
2. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-3) Ant. (C-2)	Peak trimmers for maximum output with a low input signal.
3. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. padder (C-7)	Adjust padder for maximum output in the vicinity of 580 K.C. while rocking the gang condenser.
4. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-3) Ant. (C-2)	Peak trimmers for maximum output with a low input signal.
5. Band "A"	350 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-5) Ant. (C-8)	Peak trimmers for maximum output with a low input signal.
6. Band "A"	145 K.C. with Modulation	Antenna Post	I.R.E.	Osc. padder (C-9)	Adjust padder for maximum output in the vicinity of 145 K.C. while rocking the gang condenser.
7. Band "A"	Repeat Operation 5				
8. Band "D"	18 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-4)	The image of "D" band signal should be heard 910 K.C. below the input signal when (C-6) is on proper peak. Example: 18 M.C. image is at 17.09. M.C. Peak (C-4) while rocking the gang condenser.

Voltage Chart (Models HE-50 and HE-64L)

Tubes	Plate to Gnd Volts	Screen to Gnd Volts	Cathode to Gnd Volts	Filament Volts
6SA7	132	96	0	6.4
6SK7	132	96	3.3	6.4
6SQ7	66*		0	6.4
6Y6G	171	132	13	6.4
5Y3G	198 (AC)		183 (DC)	5.0
6U5**	132			6.4

5Y3G Cathode Current—67 ma.
Above voltages measured at 110 volts line on 103-117 volt tap.
*Use a high resistance voltmeter.
**Used only on HE-64L.

Voltage Chart (Models HE-540 and HE-640L)

Tubes	Plate to Gnd. Volts	Screen to Gnd Volts	Cathode to Gnd Volts	Filament Volts
6SA7	144	100	0	6.5
6SK7	144	100	3	6.5
6SQ7	62*		0	6.5
25C6G	204	144	13. 8	25
25Z6G	216 (AC)		218 (DC)	25
6U5**	144			6.5

25Z6G Cathode Current—71.4 ma.
240 volts line A.C.
*Use a high resistance voltmeter.
**Used only on HE-640L.

Physical Specifications:

Models.........HE-50, HE-540......HE-64L, HE-640L
Height.....10¾ inches..........11½ inches
Width......17⅞ inches..........19 inches
Depth......8 inches.............8 inches

Tuning Frequency Range

Models HE-50 and HE-540
Band "B"......................540-1700 K.C.
Band "C"......................2200-7000 K.C.
Band "D"......................7000-22000 K.C.
Models HE-64L and HE-640L
Band "A"......................140-400 K.C.
Band "B"......................540-1700 K.C.
Band "D"......................5800-18000 K. C.

Intermediate Frequency.............455 K.C.

Electrical Power Output HE-50, HE-64L HE-540, HE-640L
Undistorted...........2.7 watts........3.5 watts
Maximum............5.0 watts........7.0 watts

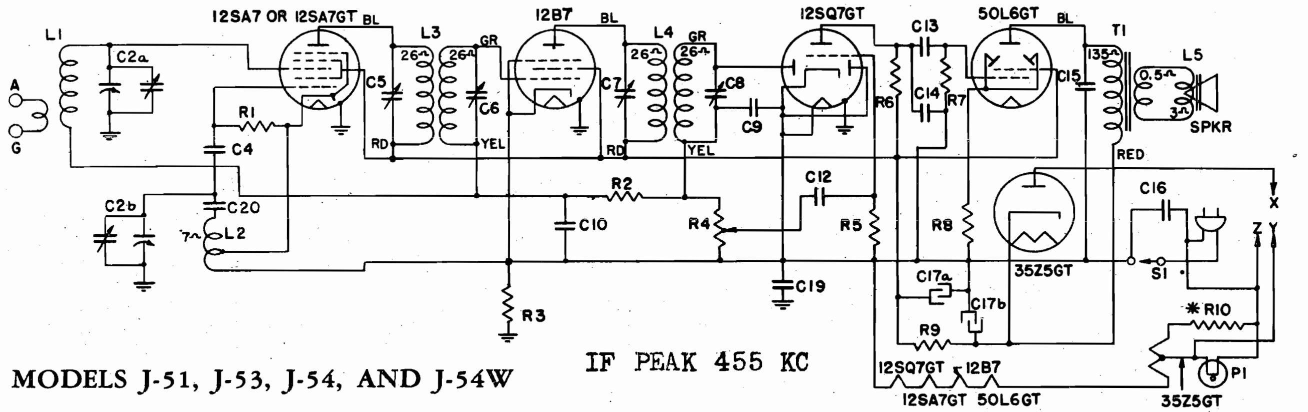
Loud-speaker—"Alnico" Magnet Dynamic
Cone Diameter...................6½ inches
Voice Coil Impedance (400 cycles)...3.5 ohms

Electrical Specifications

Model	Rating	Power Supply (Volts)	Frequency (Cycles on A.C.)	Power Consumption (Watts)
HE-50	A	103-117 118-133	50-60	65
	C	103-117 118-133	25-60	65
	V	103-117 118-133 134-156 188-212 213-237 238-262	50-60	65
HE-540 HE-640L		200-240 A-C or D-C	25-100	100
HE-64L	V	103-117 118-133 134-155 188-212 213-237 238-262	50-60	65

MODELS J-51, J-53, J-54, J-54W

GENERAL ELECTRIC CO.



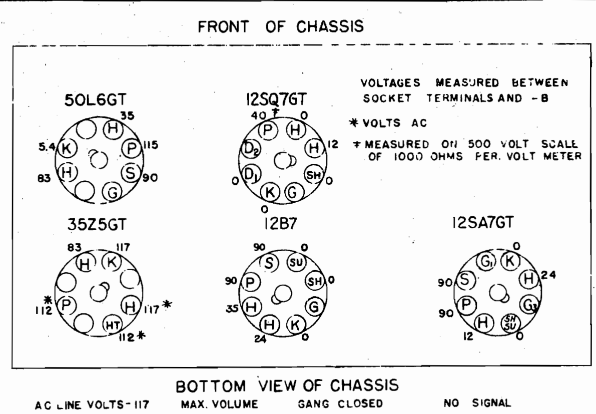
*"A" rated receivers have "X" connected to "Y" and R-10 is shorted. "C" rated receivers have "X" connected to "Z."

PARTS DESCRIPTION LIST

Symbol	Description	Symbol	Description	Symbol	Description
C2a	Antenna section of tuning condenser	C17b	40 mfd. 150 V. dry electrolytic	R4	0.5 megohms volume control
C2b	Oscillator section of tuning condenser	C19	0.2 mfd. paper capacitor	R5	4.7 megohms carbon resistor
C4	47 mmf. mica capacitor	C20	.01 mfd. paper capacitor	R6	470,000 ohms carbon resistor
C9	470 mmf. mica capacitor	L1	Beam-a-Scope	R7	470,000 ohms carbon resistor
C10	.05 mfd. paper capacitor	L2	Oscillator Coil	R8	150 ohms carbon resistor
C12	.005 mfd. paper capacitor	L3	1st. I.F. transformer	R9	1200 ohms 1 W. carbon resistor
C13	.005 mfd. paper capacitor	L4	2nd I.F. transformer	R10	13 ohms carbon resistor
C14	330 mmf. mica capacitor	P1	Dial lamp, MAZDA No. 47	S1	Power switch
C15	.01 mfd. paper capacitor	R1	33,000 ohms carbon resistor	T1	Output transformer
C16	.05 mfd. paper capacitor	R2	2.2 megohms carbon resistor		
C17a	30 mfd. 150 V. dry electrolytic	R3	470,000 ohms carbon resistor		

REPLACEMENT PARTS LIST

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lug)	$0.10
*RB-626	BUSHING—Tuning shaft bushing	.10
RB-945	BACK COVER—Cabinet back cover for Model J-51	.15
RB-946	BACK COVER—Cabinet back cover for Model J-53	.15
RB-947	BACK COVER—Cabinet back cover for Models J-54 and J-54W	.15
*RB-1015	BOARD—Terminal board (1 lug)	.10
*RB-1102	BRACKET—Tuning condenser bracket	.10
RB-1112	BRACKET—Beam-a-Scope bracket	.10
*RC-023	CAPACITOR—.005 mfd. 600 V. paper (C-12, 13)	.25
*RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-15, 20)	.25
*RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-10)	.25
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-16)	.30
RC-130	CAPACITOR—0.2 mfd. 400 V. paper (C-19)	.30
*RC-216	CAPACITOR—47 mmf. mica (C-4)	.25
*RC-274	CAPACITOR—330 mmf. mica (C-14)	.30
*RC-293	CAPACITOR—470 mmf. mica (C-9)	.30
*RC-863	CORD—Power cord	.65
RC-2019	CUSHION—Pointer guide plate spacer cushions (Pkg. 5)	.10
RC-2020	CUSHION—Mounting cushion for dial scale (Pkg. 5)	.10
RC-5163	CAPACITOR—30 mfd. 150 V., 40 mfd. 150 V., dry electrolytic (C-17a, 17b)	.65
RC-7031	CONDENSER—Tuning condenser and drum assembly (Drum pressed on to condenser shaft) (C-2a, 2b)	1.95
RC-7032	CONDENSER—Tuning condenser for use on Models with detachable drum (C-2a, -2b)	1.80
RC-8177	CORD—Tuning drive cord	.20
*RC-9011	CONE ASSEMBLY—Speaker cone assembly	.90
RD-158	DIAL—Dial scale for Models J-51 and J-53	.60
RD-159	DIAL—Dial scale for Models J-54 and J-54W	.40
RD-421	DRUM—Drum, hub and setscrew assembly	.30
RE-086	ESCUTCHEON—Dial escutcheon	.40
*RF-205	FASTENER—Fastener for mounting cabinet back on Models J-54 and J-54W (Pkg. 10)	.10
RF-206	FASTENER—Beam-a-Scope—bracket fastener (Pkg. 5)	.10
RF-207	FASTENER—Cabinet back fastener for Models J-51 and J-53 (Pkg. 5)	.10
*RH-111	HAIRPIN COTTER—Tuning shaft retaining cotter (Pkg. 10)	.05
RK-090	KNOB—Control knob and spring (Model J-54)	.10
RK-091	KNOB—Control knob and spring (Models J-51, J-53)	.10
RK-094	KNOB—Control knob and spring (Model J-54W)	.20
RL-530	BEAM-A-SCOPE—Beam-a-Scope assembly (L-1)	.80
*RL-2025	COIL—Oscillator coil (L-2)	.30
RM-511	MASK—Dial back plate reflector mask	.05
RN-009	NUT—Speed nut for mounting dial scale on Models J-54 and J-54W (Pkg. 5)	.10
RN-010	NUT—Speed nut for mounting dial scale on Models J-51 and J-53 (Pkg. 5)	.10
*RTN-001	NUT—Bushing retaining nut (Pkg. 5)	.10
RP-188	PLATE—Pointer guide plate assembly	.70
RP-189	POINTER—Dial scale pointer	.15
RP-322	PULLEY—Pointer cord pulley and stud (Pkg. 5)	.10
RQ-1214	RESISTOR—13 ohms ¼ W. carbon (R-10) (Pkg. 5)	$0.70
*RQ-1239	RESISTOR—150 ohms ½ W. carbon (R-8) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms ½ W. carbon (R-1) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms ½ W. carbon (R-3, 6, 7) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohms ½ W. carbon (R-2) (Pkg. 5)	.70
*RQ-1347	RESISTOR—4.7 megohms ½ W. carbon (R-5) (Pkg. 5)	.70
*RQ-1460	RESISTOR—1200 ohms 1 W. carbon (R-9)	.20
*RS-238	SOCKET—Octal tube socket	.15
*RS-263	SOCKET—12B7 tube socket	.15
RS-284	SOCKET—Dial light socket assembly	.20
*RS-432	SPRING—Drive cord tension spring (Pkg. 5)	.20
*RS-444	SPRING—Control knob tension spring (Pkg. 10)	.10
RS-1035	SPEAKER—5-inch dynapower speaker and output transformer assembly	2.50
RS-9006	SHAFT—Tuning shaft	.05
*RT-353	TRANSFORMER—2nd I.F. transformer (L-4)	.70
RT-359	TRANSFORMER—1st I.F. transformer (L-3)	.70
*RT-482	TRANSFORMER—Output transformer (T-1)	.90
*RT-955	TERMINAL—Antenna or ground terminal (Pkg. 5)	.10
RV-097	VOLUME CONTROL—0.5-megohm volume control (R-4)	1.45
RZ-174	CABINET—Cabinet for Model J-54	18.00
RZ-175	CABINET—Cabinet for Model J-54W	33.00



Socket Voltages

* Used on previous receivers. (Prices Subject to Change without Notice)

MODELS J-51, J-53, J-54, J-54W

GENERAL ELECTRIC CO.

MODELS J-51, J-53, J-54, and J-54W

SERVICE DATA

Over-all Dimensions

Model	J-51	J-53	J-54, J-54W
Height..........	8 5/16 inches	8 5/16 inches	7½ inches
Width..........	12¼ inches	14½ inches	10⅝ inches
Depth..........	6½ inches	6¾ inches	6 3/16 inches

Electrical Rating

Rating	Power Supply (Volts)	Frequency (Cycles on AC)	Power Con-sumption (Watts)
A	115 AC or DC	40–60	30
C	115 AC or DC	25	30

Tuning Control Drive Ratio.......................14:1

Tuning Frequency Range.................540–1600 KC

Intermediate Frequency.......................455 KC

***Electrical Power Output* (*117 line volts*)**
Undistorted..................................1.5 watts
Maximum.....................................2.5 watts

Loud-speaker—"Alnico" Magnet Dynamic
Outside Cone Diameter......................5 inches
Voice Coil Impedance (400 cycles)...........3.5 ohms

Tubes
Converter and Oscillator..............GE-12SA7GT
I.F. Amplifier.........................GE-12B7
Det., Aud., A.V.C....................GE-12SQ7GT
Audio Output.........................GE-50L6GT
Rectifier............................GE-35Z5GT
Dial Lamp........................MAZDA No. 47

GENERAL INFORMATION

Models J-51, J-53, J-54 and J-54W are compact, five-tube superheterodyne receivers which can be operated from either an AC or DC source of power. Model J-51 and J-53 cabinets are in matched walnut veneers. Model J-54 and J-54W cabinets are plastic in oak and gray-white respectively. All models incorporate the following design features: Built-in Beam-a-Scope, 5-inch dynapower speaker, increased dial length, automatic volume control, and beam power output.

The glass tubes used in the converter and detector stages are interchangeable with metal tubes if the receiver is realigned following the change.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F...455 KC
R.F............................1650 and 1500 KC

The location of all trimmers is shown in Fig. 1.

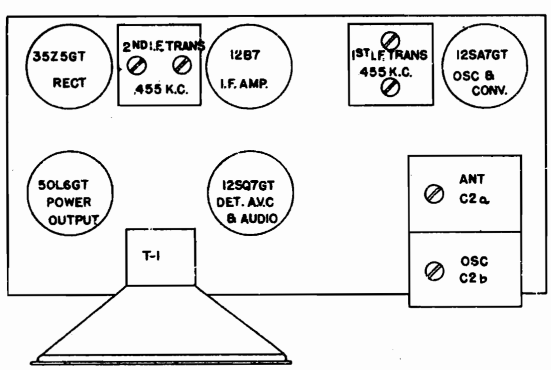


Fig. 1. Trimmer Location

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. Alignment

To insert the R.F. signal use either a standard I.R.E. dummy antenna between the signal generator and the receiver antenna post, or loop-couple the generator signal to the receiver Beam-a-Scope. A distance of two feet between generator loop and receiver Beam-a-Scope will insure freedom from over-coupling. When using an I.R.E. dummy antenna for R.F. alignment, do not connect the signal generator ground to the receiver chassis.

With the gang condenser wide open, align oscillator trimmer (C-2b) to 1650 KC. Change generator signal to 1500 KC, tune receiver to the signal and peak antenna trimmer (C-2a) for maximum output.

Precaution

If the signal generator is AC operated use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains — Gain*
Antenna Post to Converter Grid....4.0 at 1000 KC
R.F. on Converter Grid to I.F. on I.F. Amplifier Grid..................40 at 1000 KC
I.F. on Converter Grid to I.F. on I.F. Amplifier Grid..........50 at 455 KC
I.F. Amplifier Grid to Detector Plate..50 at 455 KC

(2) 0.15-volt, 400-cycle signal across the volume control will give ½-watt speaker output.* (Volume control turned to maximum.)

(3) Average DC voltage developed across oscillator grid resistor (R-1)..........................15 volts

* Variations of ± 20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

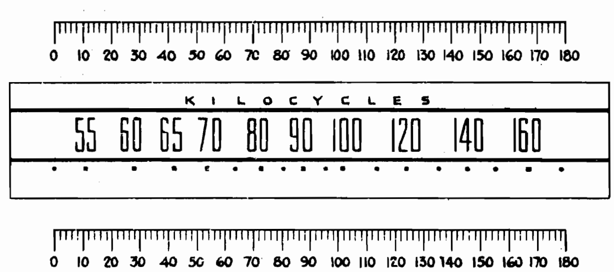


Fig. 2. Frequency-degree Reference Chart

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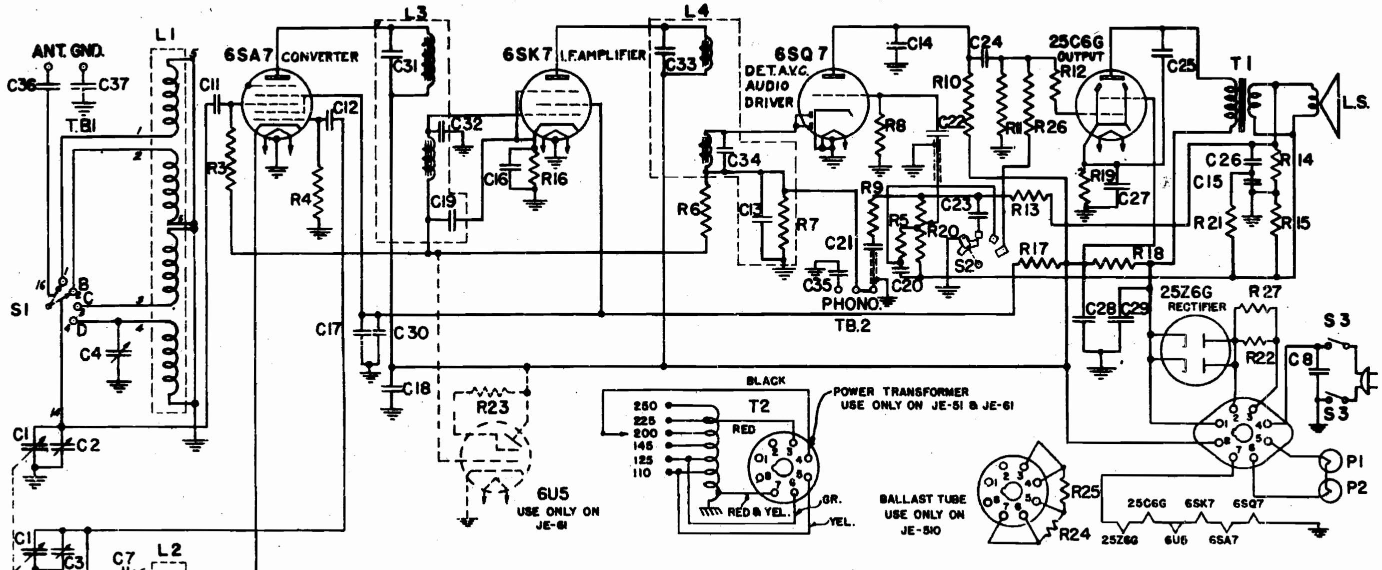
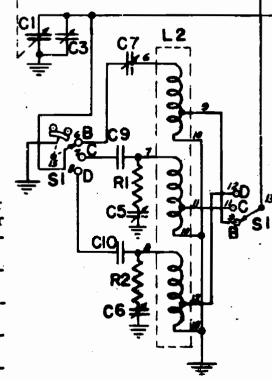
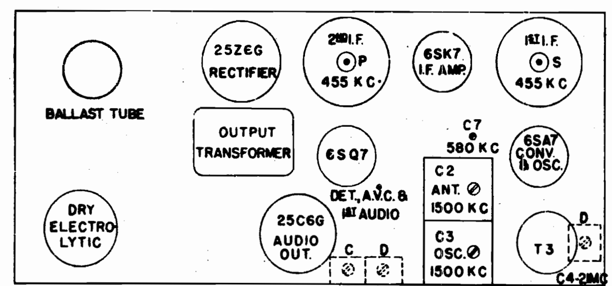
Symbol	Description
C-1	Tuning Condenser
C-2	2-18 Mmf. B Antenna Trimmer
C-3	2-18 Mmf. B Oscillator Trimmer
C-4	3-30 Mmf. D Antenna Trimmer
C-5	3-30 Mmf. C Oscillator Trimmer
C-6	3-30 Mmf. D Oscillator Trimmer
C-7	300-675 Mmf. B Oscillator Padder
C-8	.02 Mfd. 600 V. Paper Capacitor
C-9	1800 Mmf. ±5% Mica Capacitor
C-10	5600 Mmf. ±5% Mica Capacitor
C-11	470 Mmf. Mica Capacitor
C-12	47 Mmf. Mica Capacitor
C-13	100 Mmf. Mica Capacitor
C-14	220 Mmf. Mica Capacitor
C-15	.03 Mfd. 600 V. Paper Capacitor
C-16	.05 Mfd. 200 V. Paper Capacitor
C-17	.05 Mfd. 600 V. Paper Capacitor
C-18	.05 Mfd. 600 V. Paper Capacitor
C-19	.05 Mfd. 200 V. Paper Capacitor
C-20	.002 Mfd. 600 V. Paper Capacitor
C-21	.005 Mfd. 600 V. Paper Capacitor
C-22	.02 Mfd. 600 V. Paper Capacitor
C-23	.0015 Mfd. 600 V. Paper Capacitor
C-24	.05 Mfd. 600 V. Paper Capacitor
C-25	.008 Mfd. 1000 V. Paper Capacitor
C-26	.1 Mfd. 200 V. Paper Capacitor
C-27	20 Mfd. 25 V. Dry Electrolytic
C-28	50 Mfd. 250 V. Dry Electrolytic
C-29	40 Mfd. 300 V. Dry Electrolytic
C-30	20 Mfd. 250 V. Dry Electrolytic
C-35	.25 Mfd. 400 V. Paper Capacitor
C-36	.01 Mfd. 600 V. Paper Capacitor
C-37	.01 Mfd. 600 V. Paper Ccpacitor
L-1	Antenna Coil
L-2	Oscillator Coil
L-3	1st I.F. Transformer
L-4	2nd I.F. Transformer
P-1	Dial Light Mazda No. 44
P-2	Dial Light Mazda No. 44
R-1	330 Ohms ½ W. Carbon Resistor
R-2	39 Ohms ½ W. Carbon Resistor
R-3	680,000 Ohms ½ W. Carbon Resistor
R-4	22,000 Ohms ½ W. Carbon Resistor
R-5	180,000 Ohms ½ W. Carbon Resistor (JE-51, -510 Only)
R-5	330,000 Ohms ½ W. Carbon Resistor (JE-61 Only)
R-6	2.2 Megohms ½ W. Carbon Resistor
R-7	330,000 Ohms ½ W. Carbon Resistor
R-8	4.7 Megohms ½ W. Carbon Resistor
R-9	47,000 Ohms ½ W. Carbon Resistor
R-10	330,000 Ohms ½ W. Carbon Resistor
R-11	470,000 Ohms ½ W. Carbon Resistor
R-12	1000 Ohms ½ W. Carbon Resistor
R-13	5.6 Megohms ½ W. Carbon Resistor
R-14	1500 Ohms ½ W. Carbon Resistor
R-15	270 Ohms ½ W. Carbon Resistor
R-16	330 Ohms ½ W. Carbon Resistor
R-17	3900 Ohms 1 W. Carbon Resistor
R-18	3300 Ohms 2 W. Carbon Resistor
R-19	270 Ohms 1 W. Carbon Resistor
R-20	2 Megohms, 1 Megohm Tap, Volume Control
R-21	220 Ohms ½ W. Carbon Resistor
R-22	330 Ohms 2 W. Carbon Resistor
R-23	1 Megohm ½ W. Carbon Resistor
R-24	160 Ohms 15 W. Ballast Resistor
R-25	463 Ohms 55 W. Ballast Resistor
R-26	680,000 Ohms ½ W. Carbon Resistor
R-27	330 Ohms 2 W. Carbon Resistor
S-1	Band Change Switch
S-2	Tone Control Switch
S-3	Power Switch
T-1	Output Transformer
T-2	Power Transformer

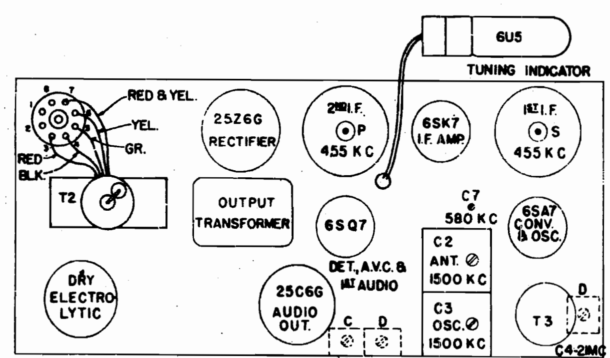




Intermediate Frequency.......455 KC



Model JE-510



Models JE-51 and JE-61

Fig. 4. Schematic Diagram and Trimmer Location Models JE-51, JE-510 and JE-61

Tuning Frequency Range

Models JE-51, JE-510 and JE-61

Band "B"	540-1600 K.C.
Band "C"	2200-7000 K.C.
Band "D"	7000-22000 K.C.

MODELS JE-51, JE-61L, JE-510, JE-61

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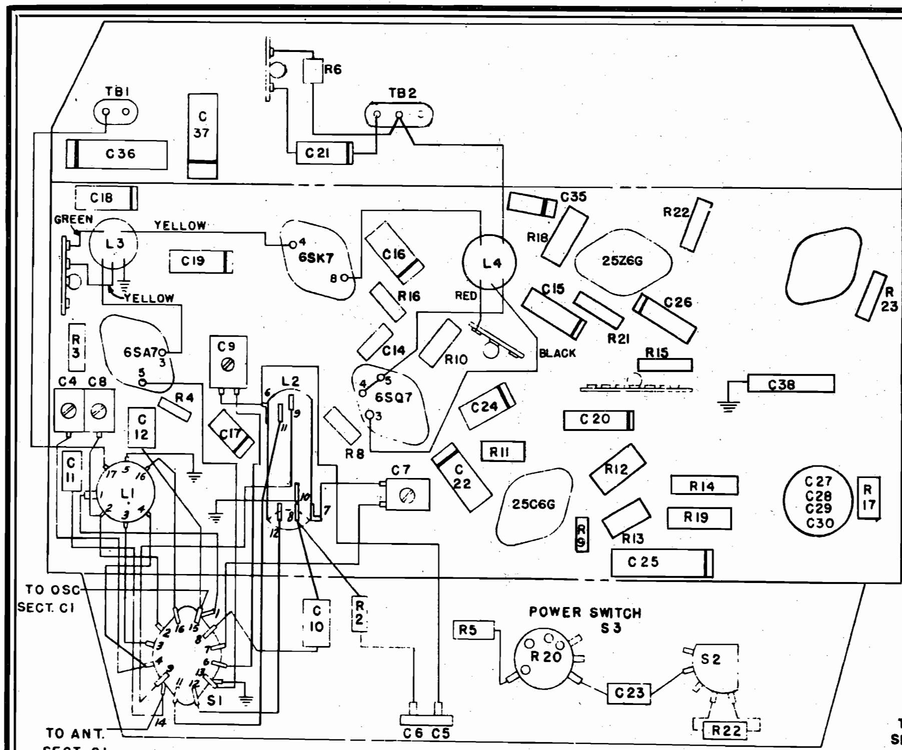

Fig. 7. Chassis Parts Layout
Model JE-61L

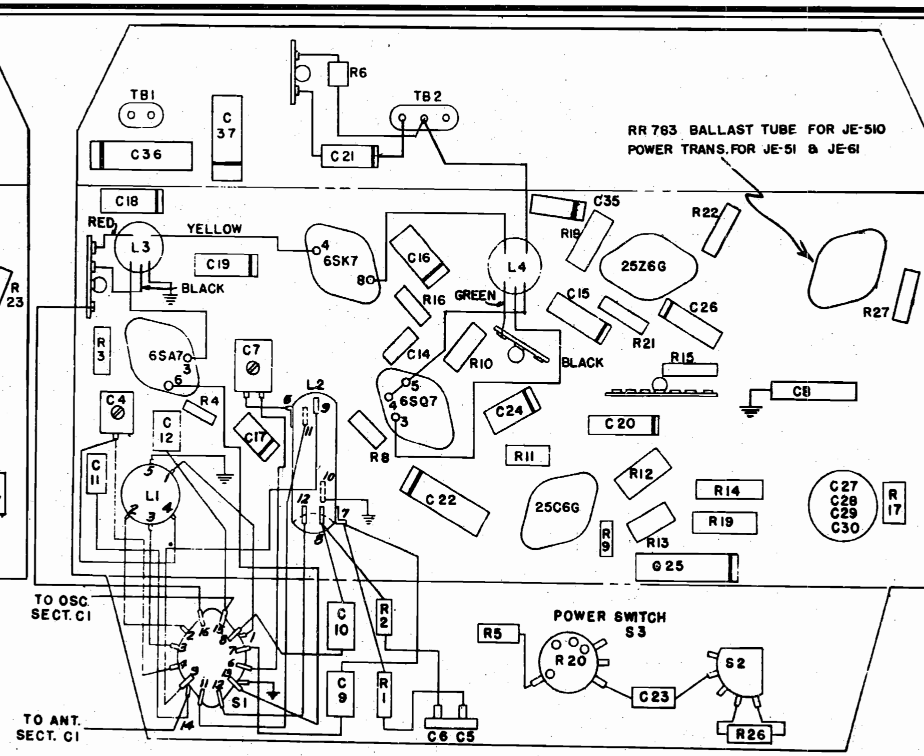

Fig. 6. Chassis Parts Layout
Models JE-51, JE-510 and JE-61

Electrical Specifications

Model	Rating	Power Supply (Voltage Tap)	Power Supply (Voltage Range)	Frequency (Cycles on A.C.)	Power Consumption (Watts)
JE-51 JE-61L	V	110 125 145 200 225 250	103–117 118–133 134–156 188–212 213–237 238–262	50–60*	65
JE-510			200–240 A.C.orD.C.	25–100	100
JE-61	V	110 125 145 200 225 250	103–117 118–133 134–155 188–212 213–237 238–262	50–60*	65
	C	110 125	103–117 118–133	25–60	65

PHYSICAL SPECIFICATIONS

Models............JE-51, JE-510....JE-61, JE-61L
Height............10 1/16 inches......11 5/8 inches
Width............19 3/8 inches......22 1/4 inches
Depth............8 7/8 inches......9 inches

Drive Ratio..........................22:1

Electrical Power Output JE-51, JE-510...JE-61, JE-61L
Undistorted............2.7 watts.......3.0 watts
Maximum..............5.0 watts.......6.0 watts

Tone Control......................3-position

Loud-speaker—"Alnico" Magnet Dynamic

Cone Diameter............JE-51, JE-510—6½ inches
JE-61, JE-61L—8 inches
Voice Coil Impedance (400 cycles)......3.5 ohms

*"V" rated receivers may be operated on 40 cycles provided the power supply voltage is reduced so as not to exceed the following equivalents: 110 volts on the 125-volt tap or 200 volts on the 225-volt tap.

Tubes

Models JE-51, JE-510
- Converter and Oscillator..GE-6SA7
- I.F. Amplifier...........GE-6SK7
- Det., Aud. AVC.........GE-6SQ7
- Power Output...........GE-25C6G
- Rectifier...............GE-25Z6G
- Dial Lamp...............(2) MAZDA No. 44

Models JE-61, JE-61L
- Converter and Oscillator..GE-6SA7
- I.F. Amplifier...........GE-6SK7
- Det., Aud. AVC.........GE-6SQ7
- Power Output...........GE-25C6G
- Rectifier...............GE-25Z6G
- Tuning Indicator........GE-6U5
- Dial Lamp...............(2) MAZDA No. 44

MODELS JE-51, JE-510, JE-61, JE-61L

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VOLTAGE CHART

Tubes	Plate to Gnd Volts	Screen to Gnd Volts	Cathode to Gnd Volts	Filament Volts
6SA7	153	106	0	6.3
6SK7	153	106	3	6.3
6SQ7	62*		0	6.3
25C6G	221	153	14	25
25Z6G	220 (A.C.)		236 (D.C.)	25
6U5**	153			6.3

25Z6G Cathode Current—80 ma.
240 volts line A.C. (225-volt tap on JE-51, JE-61 and JE-61L).

* Use a high resistance voltmeter.

** Used only on Models JE-61 and JE-61L.

SPECIAL SERVICE INFORMATION

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*

(a) Antenna Post to Converter Grid at

250 K.C.	6.0
1000 K.C.	4.0
4000 K.C.	3.2
18000 K.C.	2.4

(b) R.F. on Converter Grid to I.F. on 6SK7 Grid at

250 K.C.	25
1000 K.C.	36
4000 K.C.	30
18000 K.C.	28

(c) I.F. on Converter Grid to I.F. on 6SK7 Grid at

455 K.C. 55

(2) Voltage across the diode load to give ½ watt speaker output at

400 Cycles .066*

(3) DC voltage developed across oscillator grid resistor (R4) at

250 K.C.	9.8*
1000 K.C.	8.6*
4000 K.C.	9.7*
18000 K.C.	7.7*

* Variations of +10%, −20% are permissible.

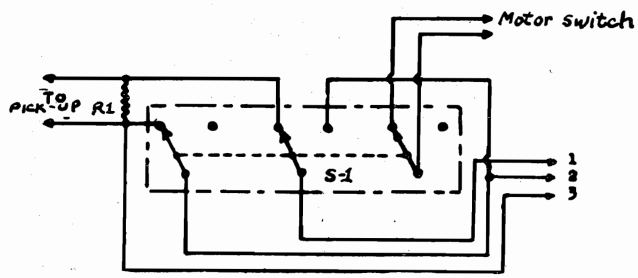

Fig. 1. Pick-up Connections

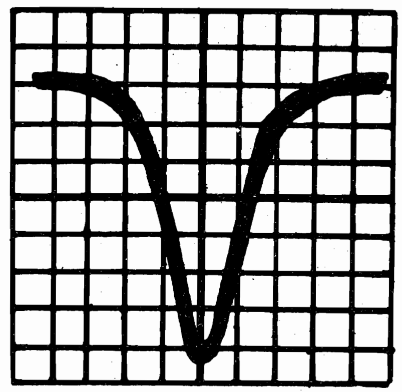

Fig. 3. Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

COIL RESISTANCE DATA

Coil	Model	Section	Resistance Measured Between Points	Resistance (Ohms)
Antenna	JE-51, 510, 61	B Primary	1 and 5	22
		B Secondary	2 and 5	5
		C Secondary	3 and 5	.9
		D Secondary	4 and 5	.02
Antenna	JE-61L	A Primary	1 and 5	110
		A Secondary	2 and 5	26
		B Secondary	3 and 5	5
		D Secondary	4 and 5	.03
		D Primary	16 and 17	.2
Oscillator	JE-51, 510, 61	B Band Coil	6 and 10	3
		C Band Coil	7 and 10	.8
		D Band Coil	8 and 10	.02
Oscillator	JE-61L	A Band Coil	6 and 10	10
		B Band Coil	7 and 10	3
		D Band Coil	8 and 10	.03
1st I.F. Transformer	All Models	Primary		9 to 12
		Secondary		15 to 19
2nd I.F. Transformer	All Models	Primary		14 to 18
		Secondary		7 to 9
Output Transformer	All Models	Primary		265
		Secondary		.4
Power Transformer	JE-51, 61, 61L	Primary		
		110 V. Tap		7
		125 V. Tap		8
		200 V. Tap		9
		225 V. Tap		20
		250 V. Tap		24
		Secondary		
		Red to Red		250
		Green to Green		.5
		Yellow to Yellow		.5

MODELS JE-51, JE-510, JE-61, JE-61L

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GENERAL INFORMATION

Models JE-51 and JE-510 are three-band receivers employing five General Electric Pre-tested Tubes in a superheterodyne circuit. These receivers are equipped with the new inclined "Visualux Dial" and luminescent pointer which assures ease in tuning. Additional design features include phonograph and television sound terminals, Tone Monitor circuit, low volume audio compensation, automatic volume control, iron-core I.F. transformers, anti-drift design, and the new Dynapower speaker.

Models JE-61 and JE-61L are similar to the above models in design except for inclusion of a cathode ray tuning indicator, different audio bass compensation and substitution of an eight-inch Dynapower speaker in place of the six and a half inch speaker. Model JE-61L also is provided with a long-wave band (140 to 400 K.C.) in place of the "C" band on Model JE-61.

CHASSIS REMOVAL

NOTE: Before attempting to slide the chassis out of the cabinet on these models free the drive cord from the dial pointer. A drop or two of cement may have been used to hold the pointer securely to the cord. This can be loosened with the fingernail or a pointed tool. Then press down on the cord until it can be moved to the rear underneath the hook in the pointer.

POWER SUPPLY

The receivers are equipped with the new plug-in type power supply which permits practically instantaneous conversion to DC operation. Simply remove the power transformer and replace with a plug-in type ballast resistor. Refer to the data given under "Conversion for Special Line Voltages."

The new power transformer is provided with 6 voltage taps. Instant tap switching is made by a simple pin plug and jack device. For correct operation measure the power supply voltage. Note which voltage range covers this voltage (see Electrical Specifications) and using the corresponding tap insert the plug in the jack.

PRECAUTION—When using a power transformer with any one of these models be sure a clean solid connection is maintained between transformer frame and chassis. Use of lock-washers between transformer and chassis will assure a clean contact. A poor connection may result in overvoltage on the tube filaments.

CONVERSION FOR SPECIAL LINE VOLTAGES

The JE-51, -510, -61 and -61L can be converted for operation on the following line voltages. In all cases where the power transformer is replaced with a ballast resistor, the power transformer must be removed from the chassis as the radiant heat from the ballast resistor is likely to injure the transformer insulation. When operated with these special resistors, the audio output on lower power-supply voltages will be reduced.

220 Volts Ac/Dc—(range 200-240)

Remove transformer from chassis of JE-51-, -61 and -61L and substitute ballast resistor RR-783 in socket previously occupied by transformer plug. Relabel sets with correct cabinet label supplied with resistor RR-783, as follows:

JE-51 relabel JE-510
JE-61 relabel JE-61-W
JE-61L relabel JE-61L-W.

115 Volts Dc—(range 105-129)

Remove transformer from chassis of JE-51, -61 and -61L or ballast RR-783 from JE-510; insert following respective ballast tubes and relabel sets with correct cabinet label supplied with new ballast resistor.

Model	Remove	Insert Ballast	Relabel
JE-51	Transformer	RR-785	JE-510-Z
JE-510	Ballast RR-783	RR-785	JE-510-Z
JE-61	Transformer	RR-786	JE-61-Z
JE-61L	Transformer	RR-786	JE-61L-Z

180 Volts Dc—(Voltage regulation for fluctuating line volts 145-215)

Remove transformer from chassis of JE-51, -61 and -61L or ballast RR-783 from JE-510; insert following ballast tubes and relabel sets with correct cabinet label supplied with new ballast resistor.

Model	Remove	Insert Ballast	Relabel
JE-51	Transformer	RR-784	JE-510-Y
JE-510	Ballast RR-783	RR-784	JE-510-Y
JE-61	Transformer	RR-787	JE-61-Y
JE-61L	Transformer	RR-787	JE-61L-Y

Coil Data

All antenna and oscillator transformer switch terminals are numbered in Figs. 6 and 7 to facilitate in locating these common points on the schematic diagrams Figs. 4 and 5.

The following tables show the coils in use for the various positions of the band-change switch.

Models JE-51, JE-510 and JE-61

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid	Oscillator Cathode
Band "B"	Section 1 to 5 of L1	Section 2 to 5 of L1	Section 6 to 10 of L2	Section 9 to 10 of L2
Band "C"	Section 2 to 5 of L1	Section 3 to 5 of L1	Section 7 to 10 of L2	Section 11 to 10 of L2
Band "D"	Section 3 to 5 of L1	Section 4 to 5 of L1	Section 8 to 10 of L2	Section 12 to 10 of L2

Model JE-61L

Band Switch Position	Antenna Primary	Antenna Secondary	Oscillator Grid	Oscillator Cathode
Band "A"	Sections 16 to 17 and 1 to 5 of L1	Section 2 to 5 of L1	Section 6 to 10 of L2	Section 9 to 10 of L2
Band "B"	Sections 16 to 17 and 2 to 5 of L1	Section 3 to 5 of L1	Section 7 to 10 of L2	Section 11 to 10 of L2
Band "D"	Section 16 to 17 of L1	Section 4 to 5 of L1	Section 8 to 10 of L2	Section 12 to 10 of L2

Phonograph or Television Sound Connections

Fig. 1 shows a simple method for connecting a crystal or high impedance magnetic pick-up into the receiver circuit for the reproduction of phonograph recordings. S-1 is a triple-pole, double-throw switch. A suitable loading circuit composed 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 shield should be connected to the chassis ground.

Remove the jumper between phono-terminals 1 and 2 and make connections as shown in Fig. 1.

A television sound channel may be connected in place of the crystal pick-up. No loading resistor is required.

When the pick-up or television sound channel is connected as shown, the regular radio volume and tone controls work for both radio and phonograph-television sound reproduction. The following are suggested parts:

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly. Assembly instructions accompany each replacement cone.

NOTE: In no case should the magnet be removed from the assembly position as it will lose magnetism.

Symbol	Description	Stock No.
S-1	Triple-pole, double-throw switch	RS-366
R-1	330,000 ohm resistor	RQ-1319

Alignment Procedure

Use a standard I.R.E. dummy antenna in making all R.F. alignments (see Fig. 2).

I.F. transformers are double, permeability-tuned with adjusting shafts at top and bottom of shield cans.

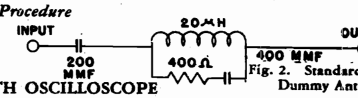


Fig. 2. Standard I.R.E. Dummy Antenna

Band Switch	Input. Freq.	Point of Input	Dummy Antenna	Inductor or Trimmer	Comments
I.F. ALIGNMENT WITH OSCILLOSCOPE					
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Pri. and Sec.	Gang condenser plates closed—connect audio input of oscilloscope to ground and to phono terminal No. 2. Adjust iron-core inductors simultaneously, using two insulated handle screwdrivers, for a single symmetrical curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 3. It may be necessary to retrim 2nd I.F. transformers for final adjustment.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Pri. and Sec.	
I.F. ALIGNMENT WITH OUTPUT METER					
1. Band "B"	455 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Pri. and Sec.	Gang condenser plates closed—connect output meter across voice coil—keep signal low and volume control on as far as possible. Adjust iron-core inductors for maximum output.
2. Band "B"	455 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Pri. and Sec.	
R.F. ALIGNMENT—MODELS JE-51, JE-510, AND JE-61					
1. Band "B"					Close gang condenser plates. A special alignment scale is glued to the back side of pulley frame adjacent to pointer cord. With paper clip or drop of paint mark point on cord which is in line with last thin line on right side of scale (viewed from rear of chassis). The selected edge of the paper clip or the drop of paint will serve as a pointer for performing the following R.F. alignment. Connect meter across voice coil.
2. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-3) Ant. (C-2)	Peak trimmer for maximum output with a low input signal.
3. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. padder (C-7)	Adjust padder for maximum output in the vicinity of 580 K.C. while rocking the gang condenser.
4. Band "B"	Repeat Operation 2				
5. Band "C"	6 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-5)	Peak trimmer for maximum output while rocking the gang condenser. Image—910 K.C. below signal.
6. Band "D"	21 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-4)	The image of "D" band signal should be heard 910 K.C. below the input signal when (C-6) is on proper peak. Example: 21 M.C. image at is 20.09 M.C. Peak (C-4) while rocking the gang condenser.
R.F. ALIGNMENT—MODEL JE-61L					
1. Band "B"					Close gang condenser plates. A special alignment scale is glued to the back side of pulley frame adjacent to pointer cord. With paper clip or drop of paint mark point on cord which is in line with last thin line on right side of scale (viewed from rear of chassis). The selected edge of the paper clip or the drop of paint will serve as a pointer for performing the following R.F. alignment. Connect meter across voice coil.
2. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-3) Ant. (C-2)	Peak trimmers for maximum output with a low input signal.
3. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. padder (C-7)	Adjust padder for maximum output in the vicinity of 580 K.C. while rocking the gang condenser.
4. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-3) Ant. (C-2)	Peak trimmers for maximum output with a low input signal.
5. Band "A"	350 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-5) Ant. (C-8)	Peak trimmers for maximum output with a low input signal.
6. Band "A"	145 K.C. with Modulation	Antenna Post	I.R.E.	Osc. padder (C-9)	Adjust padder for maximum output in the vicinity of 145 K.C. while rocking the gang condenser.
7. Band "A"	Repeat Operation 5				
8. Band "D"	18 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-4)	The image of "D" band signal should be heard 910 K.C. below the input signal when (C-6) is on the proper peak. Example: 18 M.C. image is at 17.09 M.C. Peak (C-4) while rocking the gang condenser.

GENERAL ELECTRIC CO.

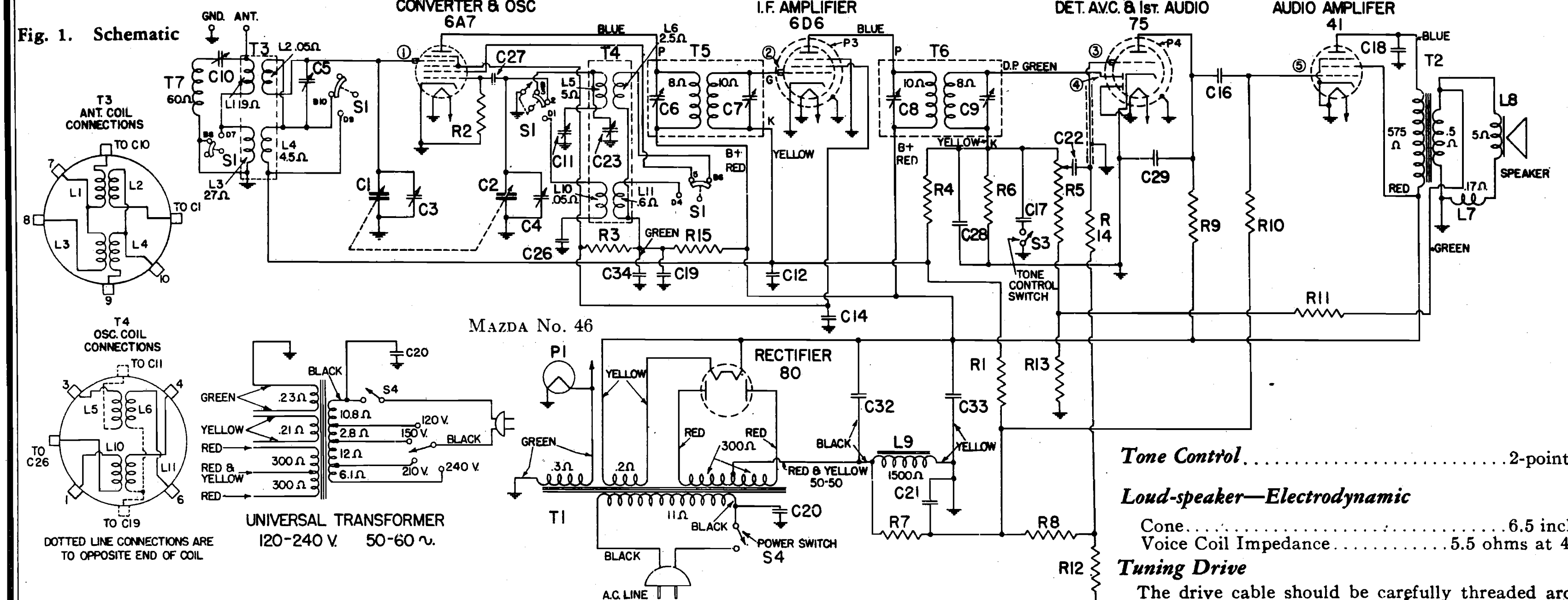


Fig. 1. Schematic

SYMBOL	DESCRIPTION	
C32	DRY ELEC. CAPACITOR	12 MFD.
C33	DRY ELEC. CAPACITOR	8 MFD.
C34	DRY ELEC. CAPACITOR	4 MFD.
R1	CARBON RESISTOR	10 MEG. Ω
R2		47000 Ω
R3		15000 Ω
R4	CARBON RESISTOR	2.2 MEG. Ω
R5	VOLUME CONTROL	2.0 MEG. Ω
R6	CARBON RESISTOR	470000 Ω
R7		1.0 MEG. Ω
R8		220000 Ω
R9		330000 Ω
R10		680000 Ω
R11		220 Ω
R12		15000 Ω
R13		68 Ω
R14		1.5 MEG. Ω
R15	CARBON RESISTOR	4700 Ω

SYMBOL	DESCRIPTION	
C1	TUNING CAPACITOR	R.F.
C2	TUNING	OSC SECTION
C3	TRIMMER	R.F.
C4		OSC
C5		5-40 MMF.
C6		100-230 MMF.
C7		50-135 MMF.
C8		50-135 MMF.
C9		100-230 MMF.
C10	TRIMMER	30-70 MMF.
C11	PADDER	350-550 MMF.
C12	PAPER	.05 MFD.
C14		.05 MFD.
C16		.005 MFD.
C17		.002 MFD.
C18		.008 MFD.
C19		.05 MFD.
C20		.01 MFD.
C21		.5 MFD.
C22	PAPER	.005 MFD.
C23	TRIMMER	5-40 MMF.
C26	MICA	2850 MMF.
C27		50 MMF.
C28		500 MMF.
C29	MICA CAPACITOR	250 MMF.

CONDITIONS OF TEST
POWER SWITCH OFF

APPROX. RESISTANCE MEASUREMENTS

RESIS. TO GROUND	TUBE	SOCKET PRONG
① 2.6 MEG Ω	6A7	GRID CAP
② 2.6 MEG. Ω	6D6	GRID CAP
③ 1.5 MEG. Ω	75	GRID CAP
④ 470000 Ω	75	4
⑤ 870000 Ω	41	4

PRONG NUMBERS
BOTTOM VIEWS

Electrical Output

Undistorted .... 2.3 watts
Maximum .... 3.5 watts

Tone Control 2-point

Loud-speaker—Electrodynamic

Cone .... 6.5 inches
Voice Coil Impedance .... 5.5 ohms at 400 cycles

Tuning Drive

The drive cable should be carefully threaded around the condenser drive drum and pulleys as shown in Fig. 3.

Tuning Frequency Range

Band "B" .... 540–1720 kc.
Band "C" .... 5,800–18,000 kc.

Intermediate Frequency .... 455 kc.

SOCKET VOLTAGES

Tube No.		Plate to Ground Volts—D.C.	Screen Grid to Ground Volts—D.C.	Cathode to Ground Volts—D.C.	Cathode Current M.A.	Heater Volts A.C.
6A7	Oscillator	176	105	0	14.8	6.3
	Converter	230				
6D6 1st I.F. Amp.		230	105	0	10	6.3
75 Det A.V.C. 1st audio		100 *		0	.16	6.3
41 Output		215	230	0	29	6.3
80 Rectifier		300/600 RMS		315 to B-	54	

A-C line voltage 120. No signal input. 1000 ohms per-volt meter. Dial pointer at 530 K.C. *Measured on 500-volt scale.

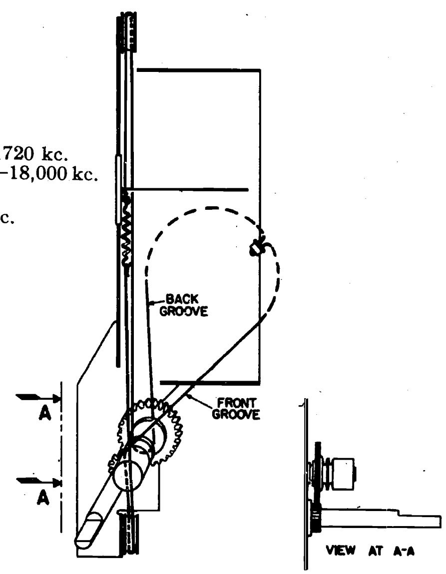


Fig. 3. Dial Mechanism

10-38

MODEL GE-52

GENERAL ELECTRIC CO.

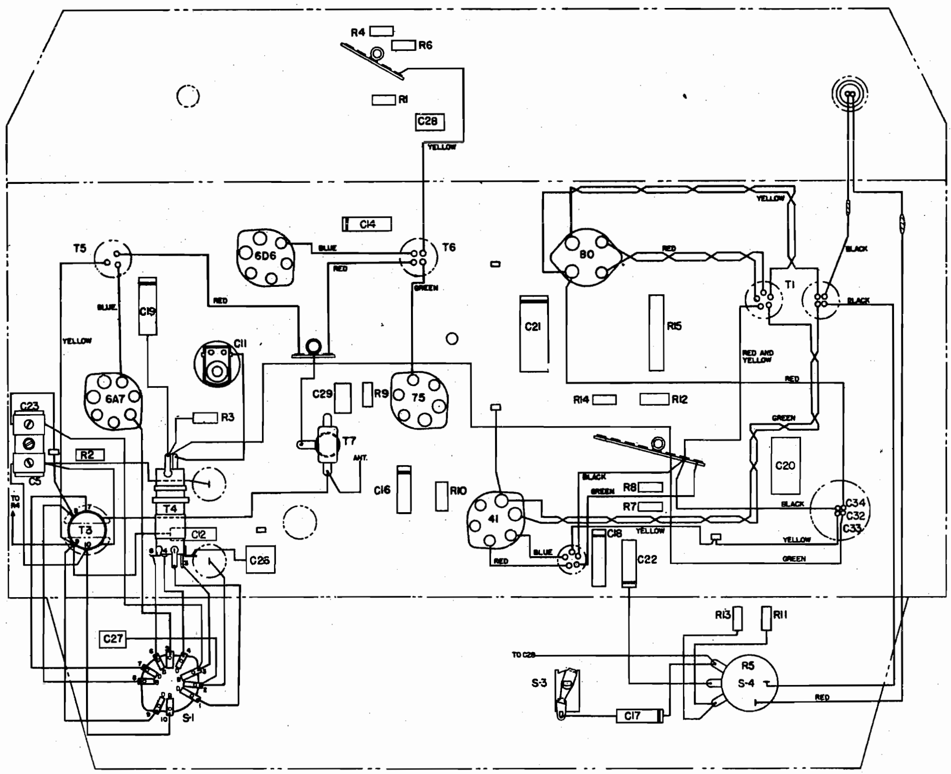


Fig. 4. Chassis Parts Layout

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115–125	50–60	60
V	115–125 140–155 190–220 220–250	40–60	65

NOTE: Rating "V" receivers may be used on 40-cycle circuits provided the voltage does not exceed 110 on the 115–125-volt tap or 200 volts on the 190–220-volt tap.

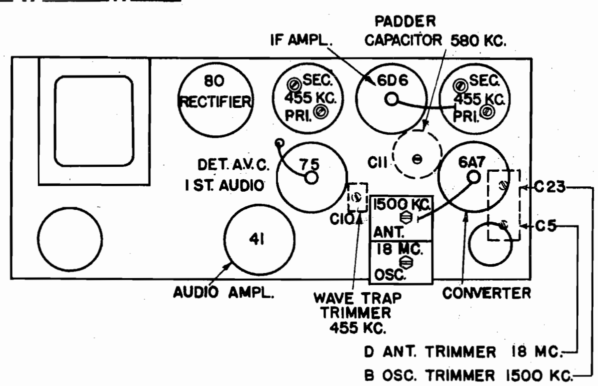


Fig. 2. Trimmer Location

GENERAL INFORMATION

This two-band receiver employs five General Electric Pre-tested tubes in a superheterodyne circuit. The circuit incorporates a wave trap and a two-point tone control.

A signal from the antenna is coupled by the antenna transformer to the control grid of the 6A7 oscillator and converter tube. After conversion to 455 kc. the signal is amplified at this frequency by the intermediate frequency amplifier which employs two double tuned I.F. transformers.

The diode part of the 75 tube is used as a detector and provides the avc voltage. The 75 tube is resistance-coupled to the 41 pentode amplifier output tube.

Minimum bias is supplied for all tubes except the 75 by the voltage drop over the resistance R-8 and R-12. Bias for the 75 tube is supplied by the voltage drop over R-12.

Negative feed back is used to improve the tone of reproduction. In this circuit, voltage is fed back from the voice coil circuit to a tap on the volume control. This feed-back voltage is out of phase with the input voltage to the audio amplifier. Engineers have shown that the resulting degeneration reduces distortion arising in the audio amplifier and extends the tone range.

ALIGNMENT PROCEDURE

I.F. Alignment

Connect an output meter across the voice coil. Set the volume control for maximum.

Set the test oscillator to 455 kc. and connect one output lead to the receiver chassis and the other through a .05 Mfd. condenser to the control grid of the 6A7. Do not remove the grid lead from the 6A7 as this would remove the minimum bias from this tube. Keep the test oscillator output as low as possible to give a readable output. The four I.F. trimmers (see Fig. 2.) should be adjusted in the following sequence for maximum output.

1. Secondary trimmer (C-9) } on second I.F. transformer
2. Primary trimmer (C-8) }
3. Secondary trimmer (C-7) } on first I.F. transformer
4. Primary trimmer (C-6) }

Wave Trap Alignment

Leave the test oscillator set to 455 kc and connect one output lead to the receiver chassis and the other through a 250 Mmf. condenser in series with 400 ohms to the receiver antenna lead. Adjust C-10 for minimum output.

R.F. Alignment

A careful examination of the diagram, Fig. 1, will disclose that the "D" band, oscillator trimmer C-4 must first be set before any adjustment of the broadcast oscillator trimmer C-23 can be made. The image of any signal on "D" band should be tuned in 910 kc. below the input signal when C-4 is on the correct peak. Example: 18 mc. image is at 17.09 mc.

Use the same dummy antenna (250 Mmf. and 400 ohms) as used for the wave-trap alignment.

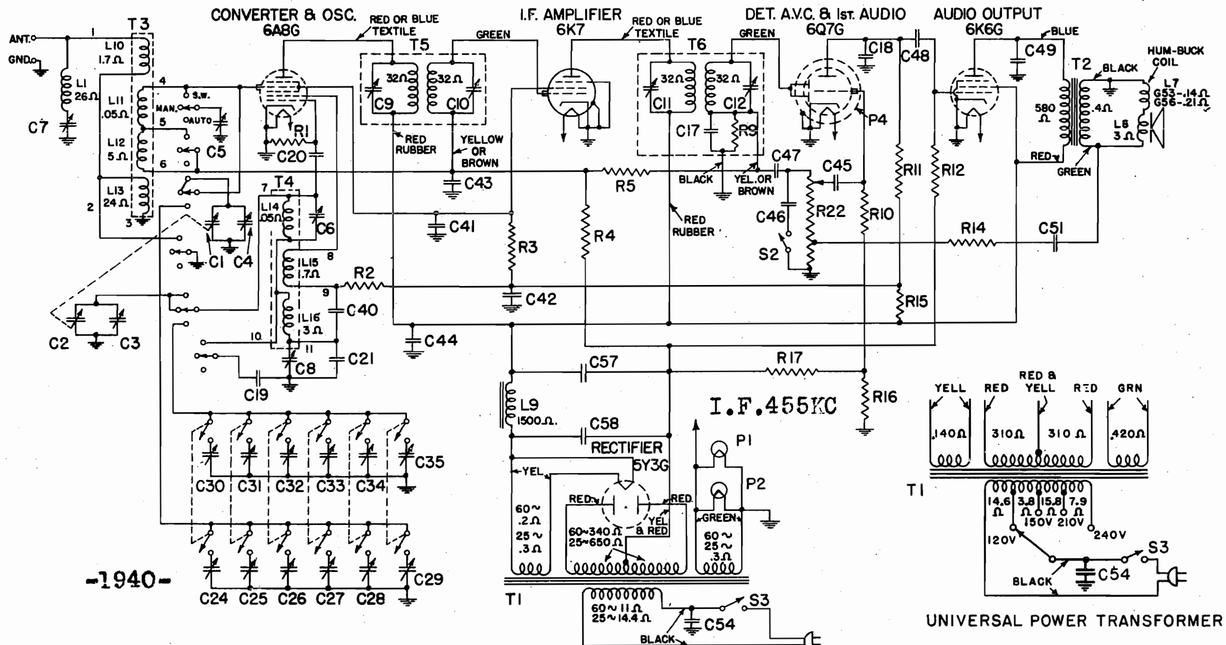
Rock the gang condenser when peaking the trimmers (C-11 or C-5).

	Band Switch	Signal Frequency	Adjust Trimmer
1.	"D"	18 mc.	C-4 (only)
2.	"B"	1500 kc.	C-23 and C-3
3.	"B"	580 kc.	C-11
4.	"B"	1500 kc.	C-23 and C-3
5.	"D"	18 mc.	C-5

NOTE: Be sure that the setting of C-4 made in No. 1 is not disturbed during any other part of the alignment. If it is changed the whole R.F. alignment procedure should be repeated.

MODEL GE-53

GENERAL ELECTRIC CO.



POWER CONSUMPTION (LABEL A) 65 WATTS, (LABEL V) 70 WATTS

Symbol	Description	Symbol	Description	Symbol	Description
C5	R. F. Trimmer Capacitor, "D" Band	C40	Paper Capacitor, 0.001 Mfd.	R10	Carbon Resistor, 2.2 Megohms
C6	Osc. Trimmer Capacitor, "D" Band	C41	Paper Capacitor, 0.05 Mfd.	R11	Carbon Resistor, 330,000 Ohms
C8	Osc. Padder Condenser, "B" Band	C42	Electrolytic Capacitor, 4.0 mfd.	R12	Carbon Resistor, 330,000 Ohms
C17	Mica Capacitor, 470 Mmf.	C43	Paper Capacitor, 0.05 Mfd.	R14	Carbon Resistor, 22,000 Ohms
C18	Mica Capacitor, 330 Mmf.	C44	Paper Capacitor, 0.05 Mfd.	R15	Carbon Resistor, 3900 Ohms
C19	Mica Capacitor, 3900 Mmf.	C45	Paper Capacitor, 0.01 Mfd.	R16	Carbon Resistor, 22 Ohms
C20	Mica Capacitor, 47 Mmf.	C46	Paper Capacitor, 0.001 Mfd.	~~R17~~	Carbon Resistor, 330 Ohms
C21	Mica Capacitor, 370 Mmf.	C47	Paper Capacitor, 0.005 Mfd.	R22	Volume Control, 2 Megohms, tap at 15,000 Ohms
C24	Mica Trimmer, 165-450 Mmf.	C48	Paper Capacitor, 0.005 Mfd.		
C25	Mica Trimmer, 95-345 Mmf.	C49	Paper Capacitor, 0.012 Mfd.	T1	Power Transformers
C26	Mica Trimmer, 80-235 Mmf.	C51	Paper Capacitor, 0.1 Mfd.	T2	Output Transformer
C27	Mica Trimmer, 35-175 Mmf.	C54	Molded Paper Capacitor, 0.01 Mfd.	L8	Speaker, 6½ Inches (G-53)
C28	Mica Trimmer, 30-115 Mmf.	C57	Dry Electrolytic Capacitor, 8 Mfd.		Speaker, 12 Inches (G-56)
C29	Mica Trimmer, 11-60 Mmf.	C58	Dry Electrolytic Capacitor, 8 Mfd.	S1	Band Switch
C30	Mica Trimmer, 165-450 Mmf.	R1	Carbon Resistor, 47,000 Ohms	S2	Tone Control Switch
C31	Mica Trimmer, 95-345 Mmf.	R2	Carbon Resistor, 4700 Ohms	S3	Power Switch (Part of Volume Control)
C32	Mica Trimmer, 80-235 Mmf.	R3	Carbon Resistor, 18,000 Ohms		
C33	Mica Trimmer, 35-175 Mmf.	R4	Carbon Resistor, 10 Megohms	S4	Push-button Switches
C34	Mica Trimmer, 30-115 Mmf.	R5	Carbon Resistor, 1.5 Megohms		
C35	Mica Trimmer, 11-60 Mmf.	R9	Carbon Resistor, 470,000 Ohms		

SOCKET VOLTAGES

Tube No.		Plate to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Cathode to Ground Volts D.C.	Cathode Current M.A. D.C.	Heater Volts A.C.
6A8G	Converter	236	95	0	12.2	6.5
	Oscillator	186	....			
6K7		236	95	0	8.7	6.5
6Q7G		84 *	....	0	0.4	6.5
6K6G		220	236	0	30.1	6.5
5Y3G		....	......	320	51.4	5.3

A-C line voltage—120. No signal input. 1000 ohms per volt meter. Dial pointer at 530 kc. on "B" band.
* Measured on 500-volt scale.

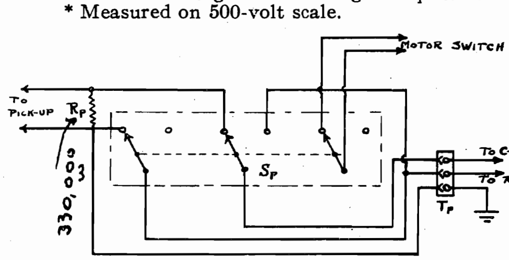
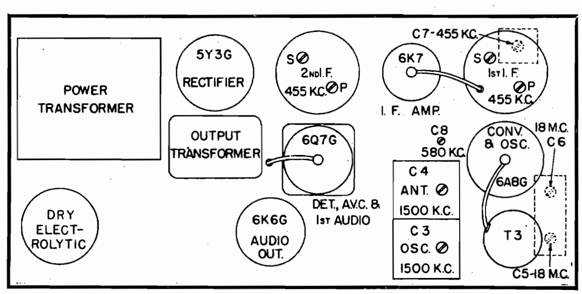


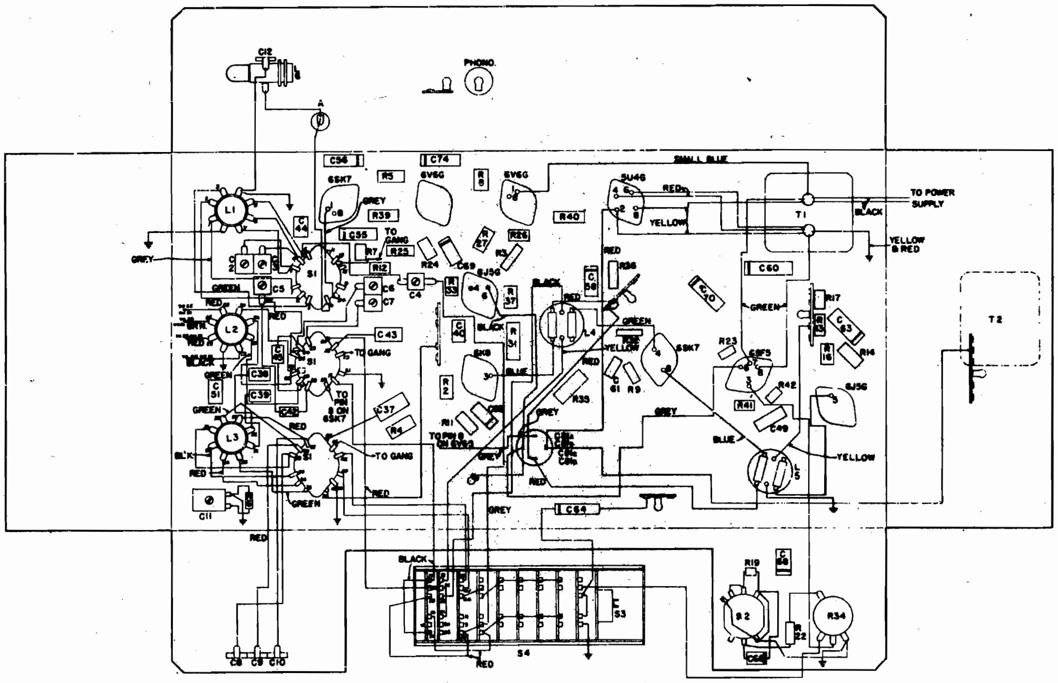
Fig. 1. Pick-up Connections

FOR OTHER DATA SEE INDEX

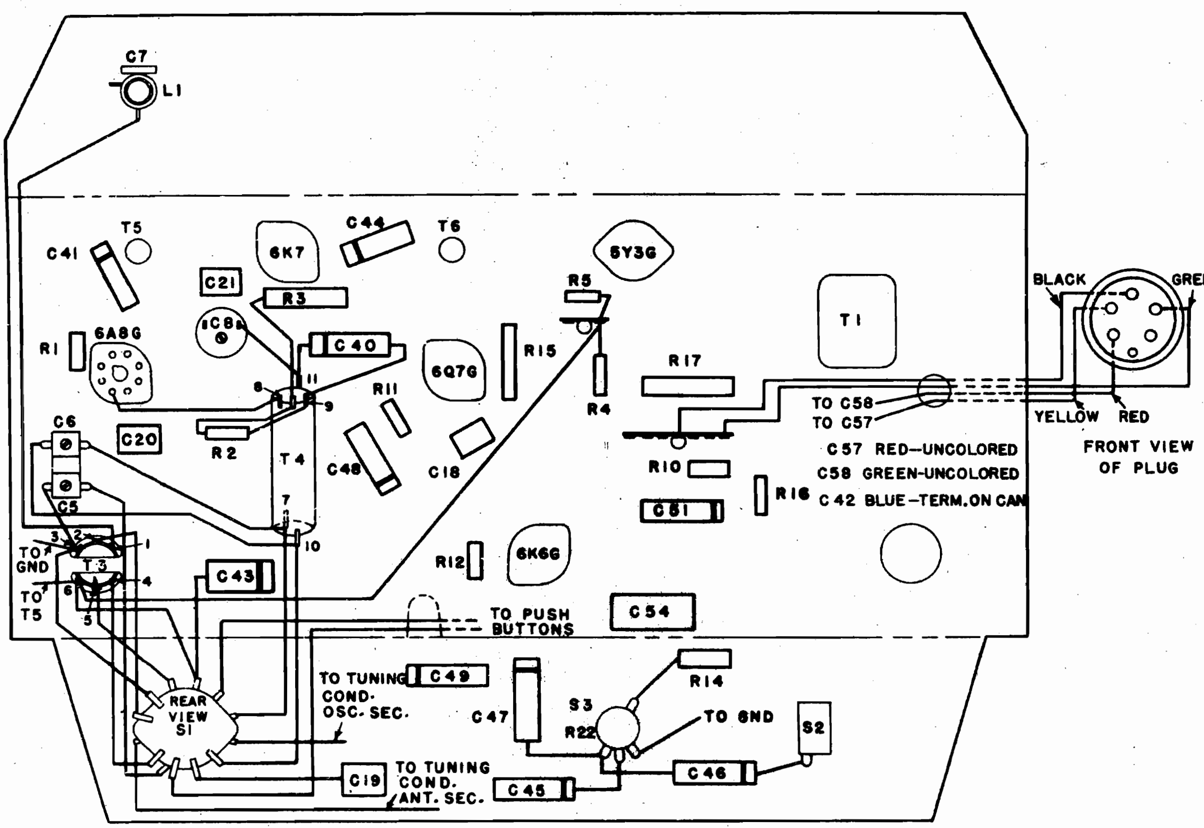


MODELS GE-53,
JE-101, JE-107

GENERAL ELECTRIC CO.



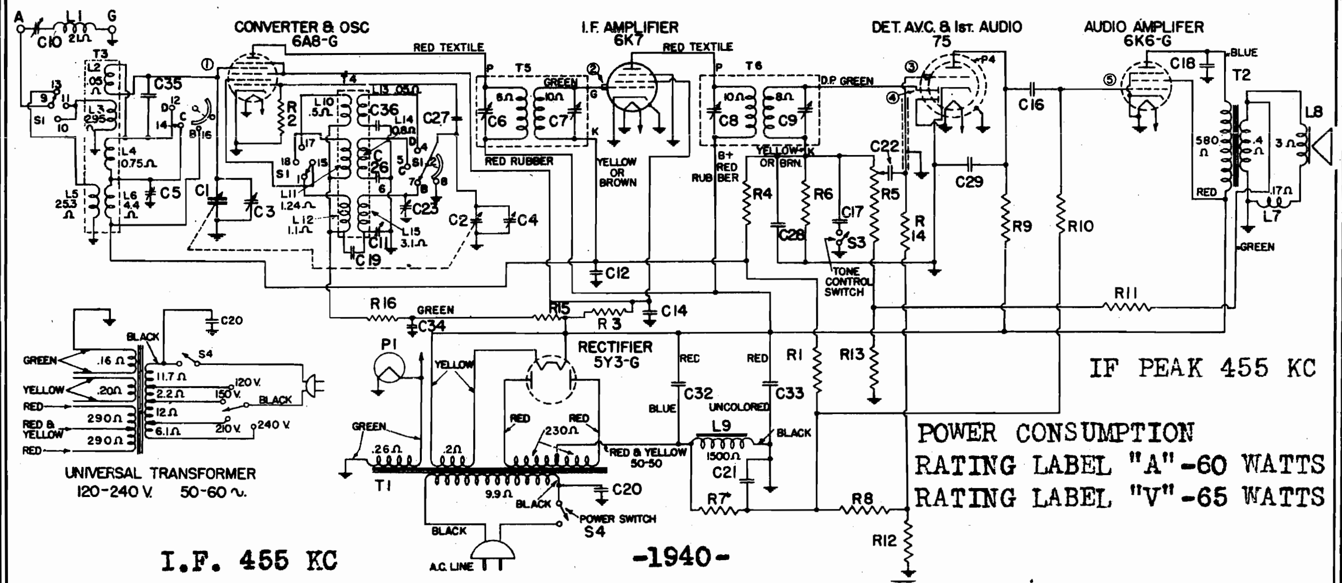
Chassis Parts Layout
Models JE-101 and 107



Chassis Parts Layout
MODEL GE-53

MODEL GE-54

GENERAL ELECTRIC CO.



IF PEAK 455 KC

POWER CONSUMPTION
RATING LABEL "A"-60 WATTS
RATING LABEL "V"-65 WATTS

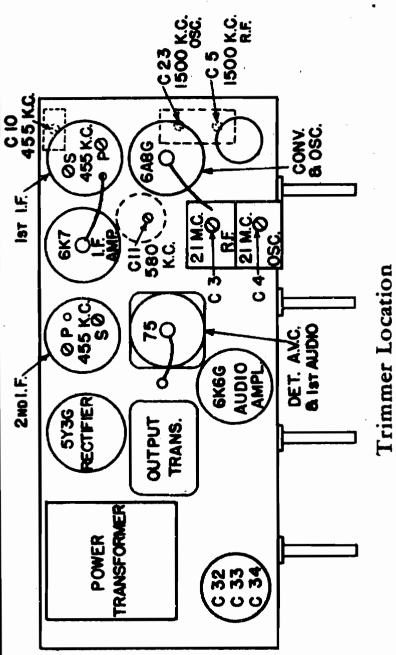
I.F. 455 KC

-1940-

SYMBOL	DESCRIPTION
C-1	Tuning Capacitor R.F. Section
C-2	Tuning Capacitor Osc. Section
C-3	Trimmer Capacitor R.F. Section
C-4	Trimmer Capacitor Osc. Section
C-5	Trimmer Capacitor 5-40 MMF.
C-6	Trimmer Capacitor 80-225 MMF.
C-7	Trimmer Capacitor 45-125 MMF.
C-8	Trimmer Capacitor 45-125 MMF.
C-9	Trimmer Capacitor 80-225 MMF.
C-10	Trimmer Capacitor 45-100 MMF.
C-11	Padder Capacitor 350-550 MMF.
C-12	Paper Capacitor .05 MFD.
C-14	Paper Capacitor .05 MFD.
C-16	Paper Capacitor .005 MFD.
C-17	Paper Capacitor .002 MFD.
C-18	Paper Capacitor .008 MFD.
C-19	Paper Capacitor .01 MFD.
C-20	Paper Capacitor .01 MFD.
C-21	Paper Capacitor .5 MFD.
C-22	Paper Capacitor .005 MFD.
C-23	Trimmer Capacitor 5-40 MMF.
C-26	Mica Capacitor 1800 MMF.
C-27	Mica Capacitor 50 MMF.
C-28	Mica Capacitor 470 MMF.
C-29	Mica Capacitor 220 MMF.
C-32	Dry Elec. Capacitor 12 MFD.
C-33	Dry Elec. Capacitor 8 MFD.
C-34	Dry Elec. Capacitor 4 MFD.
C-35	Mica Capacitor 20 MMF.
C-36	Mica Capacitor 3400 MMF.
R-1	Carbon Resistor 10 Megohms
R-2	Carbon Resistor 47000 Ohms
R-3	Carbon Resistor 33000 Ohms
R-4	Carbon Resistor 2.2 Megohms
R-5	Volume Control 2.0 Megohms
R-6	Carbon Resistor 470000 Ohms
R-7	Carbon Resistor 1.0 Megohms
R-8	Carbon Resistor 220000 Ohms
R-9	Carbon Resistor 330000 Ohms
R-10	Carbon Resistor 680000 Ohms
R-11	Carbon Resistor 220 Ohms
R-12	Carbon Resistor 15000 Ohms
R-13	Carbon Resistor 68 Ohms
R-14	Carbon Resistor 1.5 Megohms
R-15	Carbon Resistor 10000 Ohms
R-16	Carbon Resistor 4700 Ohms
S-1	Band Change Switch
S-3	Tone Control Switch
S-4	Power Switch
L-1	Wave Trap Coil
T-3	Ant. Coil "B-C-D"
T-4	Osc. Coil "B-C-D"
T-5	1st I.F. Transformer
T-6	2nd I.F. Transformer
L-7	Speaker Hum Coil
L-8	Speaker Voice Coil 3 Ohms
L-9	Speaker Field Coil 1500 Ohms Cold
	Loud-speaker 6½ in.
T-1	Power Transformer (60 cycles / Universal)
T-2	Output Transformer
P-1	No. 46 MAZDA Pilot Lamp
P-4	Tube Shield

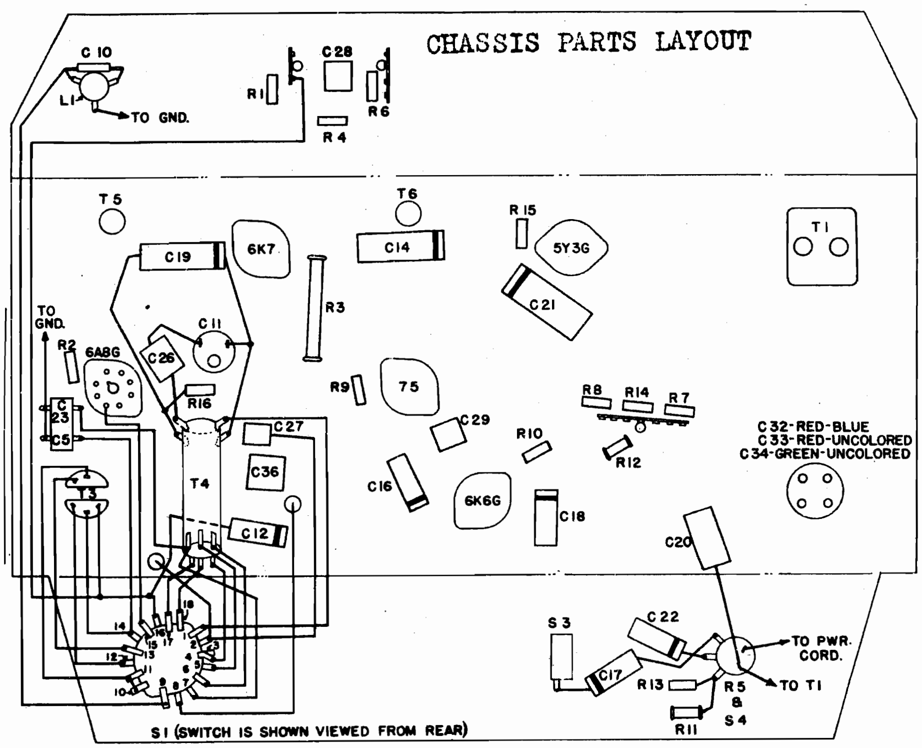
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

FOR OTHER DATA
SEE INDEX



Trimmer Location

CHASSIS PARTS LAYOUT



MODEL JE-61L

GENERAL ELECTRIC CO.

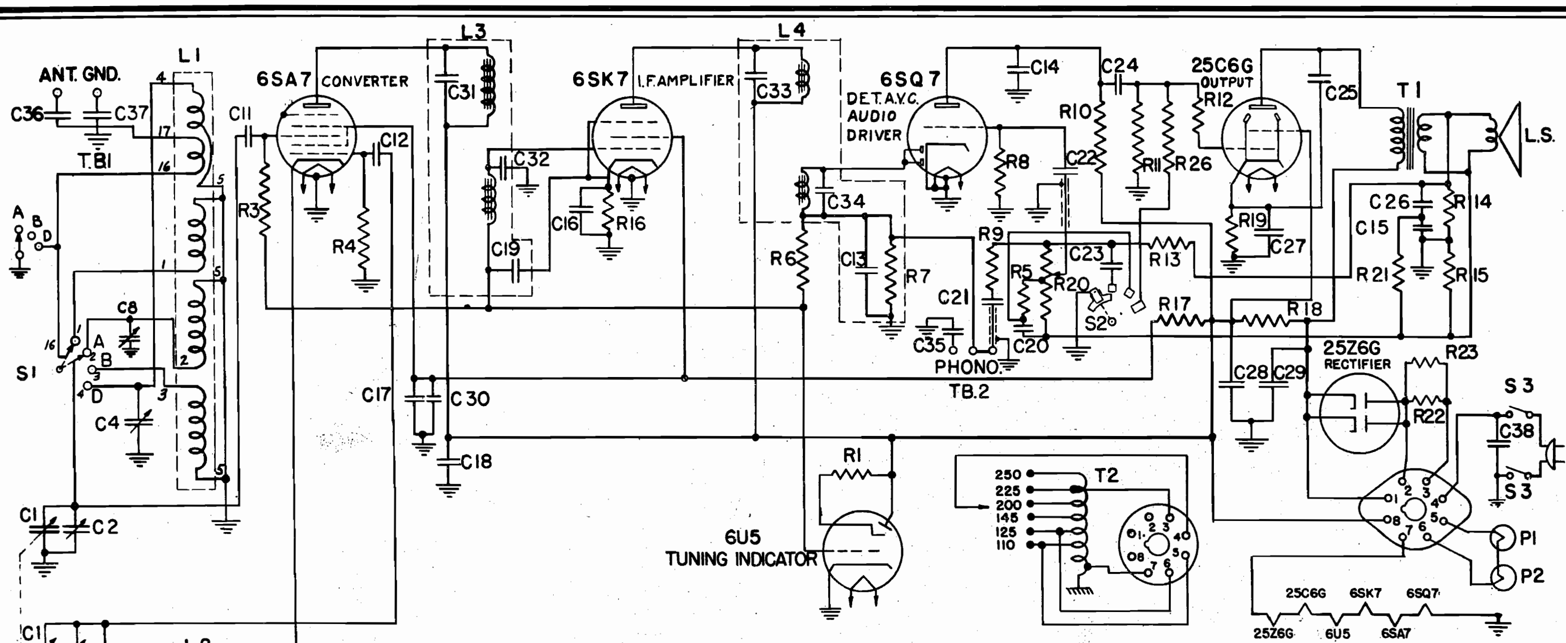
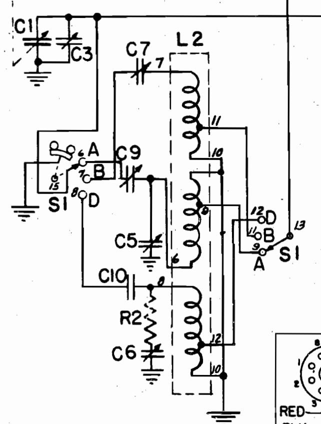
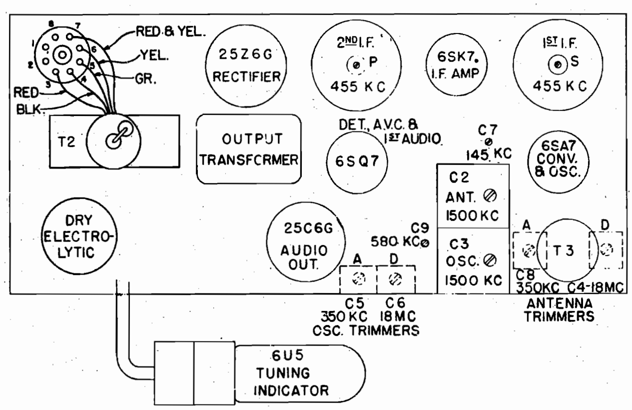



Fig. 5. Schematic Diagram and Trimmer Location Model JE-61L

Tuning Frequency Range

Model JE-61L
Band "A" . . . . 140-400 K.C.
Band "B" . . . . 540-1600 K.C.
Band "D" . . . . 5700-18000 K.C.

Intermediate Frequency . . . . . . 455 K.C.

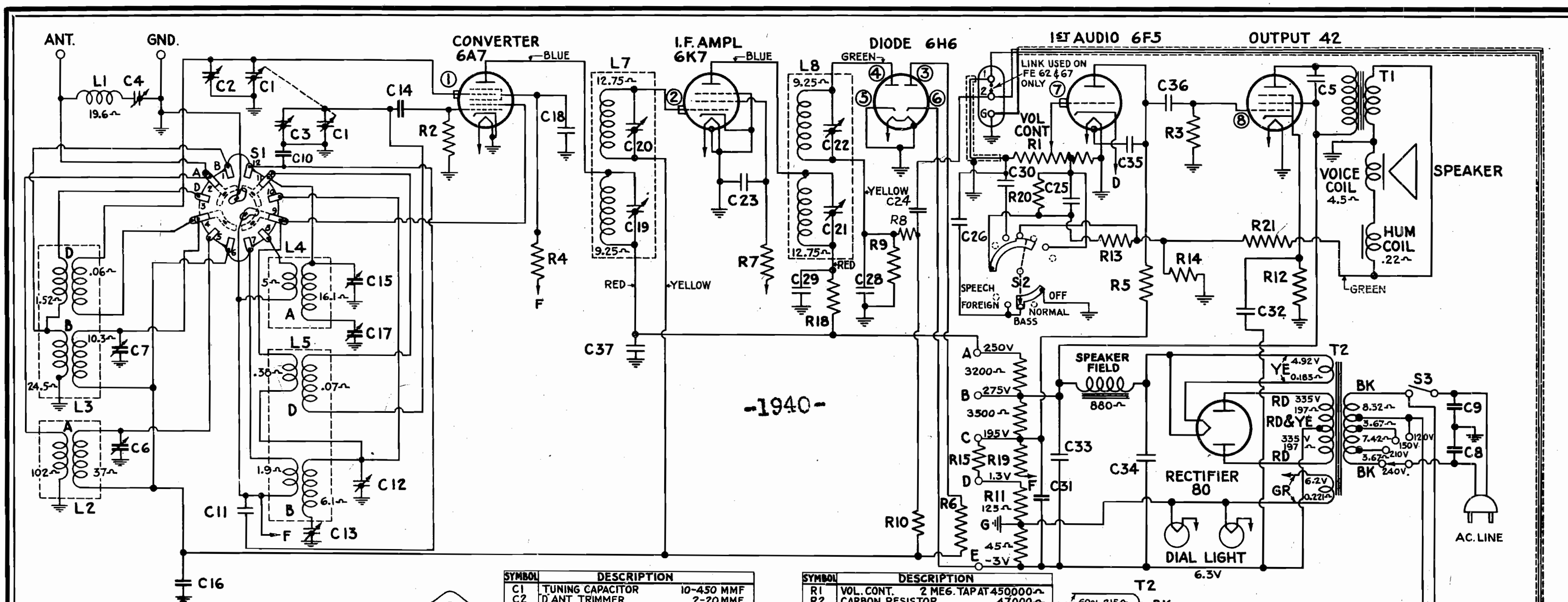


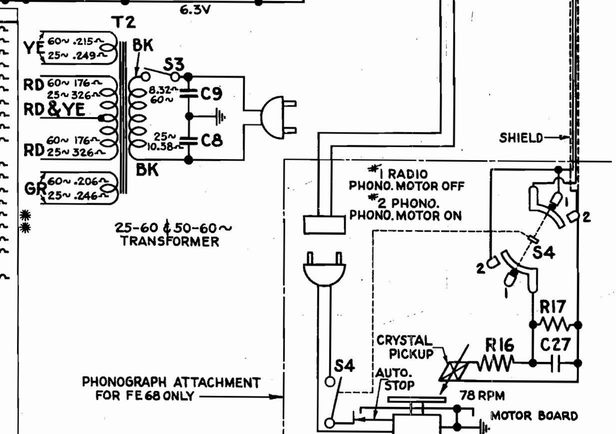
3-40 (4M)

Symbol	Description
C-1	Tuning Condenser
C-2	2-18 Mmf. B Antenna Trimmer
C-3	2-18 Mmf. B Oscillator Trimmer
C-4	2-20 Mmf. D Antenna Trimmer
C-5	5-40 Mmf. A Oscillator Trimmer
C-6	3-30 Mmf. D Oscillator Trimmer
C-7	300-675 Mmf. B Oscillator Padder
C-8	2-20 Mmf. A Antenna Trimmer
C-9	130-190 Mmf. A Oscillator Padder
C-10	4300 Mmf. ±5% Mica Capacitor
C-11	470 Mmf. Mica Capacitor
C-12	47 Mmf. Mica Capacitor
C-13	100 Mmf. Mica Capacitor
C-14	220 Mmf. Mica Capacitor
C-15	.03 Mfd. 600 V. Paper Capacitor
C-16	.05 Mfd. 200 V. Paper Capacitor
C-17	.05 Mfd. 600 V. Paper Capacitor
C-18	.05 Mfd. 600 V. Paper Capacitor
C-19	.05 Mfd. 200 V. Paper Capacitor
C-20	.002 Mfd. 600 V. Paper Capacitor
C-21	.005 Mfd. 600 V. Paper Capacitor
C-22	.02 Mfd. 600 V. Paper Capacitor
C-23	.0015 Mfd. 600 V. Paper Capacitor
C-24	.05 Mfd. 600 V. Paper Capacitor
C-25	.008 Mfd. 1000 V. Paper Capacitor
C-26	.1 Mfd. 200 V. Paper Capacitor
C-27	20 Mfd. 25 V. Dry Electrolytic
C-28	50 Mfd. 250 V. Dry Electrolytic
C-29	40 Mfd. 300 V. Dry Electrolytic
C-30	20 Mfd. 250 V. Dry Electrolytic
C-35	.25 Mfd. 400 V. Paper Capacitor
C-36	.01 Mfd. 600 V. Paper Capacitor
C-37	.01 Mfd. 600 V. Paper Capacitor
L-1	Antenna Coil
L-2	Oscillator Coil
L-3	1st I.F. Transformer
L-4	2nd I.F. Transformer
P-1	Dial Light MAZDA No. 44
P-2	Dial Light MAZDA No. 44
R-1	1 Megohm ½ W. Carbon Resistor
R-2	39 Ohms ½ W. Carbon Resistor
R-3	680,000 Ohms ½ W. Carbon Resistor
R-4	22,000 Ohms ½ W. Carbon Resistor
R-5	330,000 Ohms ½ W. Carbon Resistor
R-6	2.2 Megohms ½ W. Carbon Resistor
R-7	330,000 Ohms ½ W. Carbon Resistor
R-8	4.7 Megohms ½ W. Carbon Resistor
R-9	47,000 Ohms ½ W. Carbon Resistor
R-10	330,000 Ohms ½ W. Carbon Resistor
R-11	470,000 Ohms ½ W. Carbon Resistor
R-12	1000 Ohms ½ W. Carbon Resistor
R-13	5.6 Megohms ½ W. Carbon Resistor
R-14	1500 Ohms ½ W. Carbon Resistor
R-15	270 Ohms ½ W. Carbon Resistor
R-16	330 Ohms ½ W. Carbon Resistor
R-17	3900 Ohms 1 W. Carbon Resistor
R-18	3300 Ohms 2 W. Carbon Resistor
R-19	270 Ohms 1 W. Carbon Resistor
R-20	2 Megohms, 1 Megohm Tap, Volume Control
R-21	220 Ohms ½ W. Carbon Resistor
R-22	330 Ohms 2 W. Carbon Resistor
R-23	330 Ohms 2 W. Carbon Resistor
R-26	680,000 Ohms ½ W. Carbon Resistor
S-1	Band Change Switch
S-2	Tone Control Switch
S-3	Power Switch
T-1	Output Transformer
T-2	Power Transformer

GENERAL ELECTRIC CO.

MODELS FE62, FE67, FE68



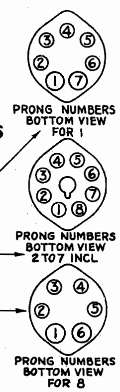


CONDITIONS OF TEST
WAVE SWITCH ON A BAND
POWER SWITCH OFF

APPROXIMATE RESISTANCE MEASUREMENTS

RESISTANCE TO GND.	TUBE	SOCKET PRONG
① 2.4 MEG.~	CONV. GRID	CAP
② 2.4 MEG.~	1ST I.F GRID	CAP
③ 2.5 MEG.~	DIODE PLATE	PRONG-3
④ 220,000~	DIODE PLATE	PRONG-5
⑤ GROUNDED	DIODE CATH.	PRONG-8
⑥ 45~	DIODE CATH.	PRONG-4
⑦ 0-2 MEG.~ VOL. CONT	1ST AUDIO GRID	CAP
⑧ 470,000~	OUTPUT GRID	PRONG-4

ALL VOLTAGES TO GROUND UNLESS OTHERWISE SPECIFIED
ALL VOLTAGES MEASURED WITH ANT. & GND TERMINALS
SHORTED AND 120V ON PRI.



Model FE-68

Rating Label	Power Consumption (Watts)
V6	105
V5	105

Models FE-62 and FE-67

Rating Label	Power Consumption (Watts)
A	75
C	80
V	80

SYMBOL	DESCRIPTION	
C1	TUNING CAPACITOR	10-450 MMF
C2	"D" ANT TRIMMER	2-20 MMF
C3	"D" OSC TRIMMER	2-20 MMF
C4	WAVE TRAP TRIMMER	75 MMF
C5	PAPER CAPACITOR	.01 MF
C6	"A" ANT. TRIMMER	4-30 MMF
C7	"B" ANT. TRIMMER	4-30 MMF
C8	PAPER CAPACITOR	.01 MF
C9	PAPER	.01 MF
C10	MICA	3600 MMF
C11	PAPER CAPACITOR	.001 MF
C12	"B" OSC. TRIMMER	4-30 MMF
C13	"B" PADDER TRIMMER	350-550 MMF
C14	MICA CAPACITOR	50 MMF
C15	"A" OSC. TRIMMER	5-45 MMF
C16	PAPER CAPACITOR	.1 MF
C17	"A" PADDER TRIMMER	100-175 MMF
C18	PAPER CAPACITOR	.01 MF
C19	1ST I.F. PRI. TRIMMER	100-230 MMF
C20	1ST I.F. SEC.	50-135 MMF
C21	2ND I.F. PRI.	50-135 MMF
C22	2ND I.F. SEC. TRIMMER	100-230 MMF
C23	PAPER CAPACITOR	.01 MF
C24	PAPER	.004 MF
C25	PAPER	.002 MF
C26	PAPER	.001 MF
C27	MICA	500 MMF *
C28	MICA	250 MMF
C29	PAPER	.05 MF
C30	MICA	200 MMF
C31	DRY ELECT.	8 MF
C32	DRY ELECT.	10 MF
C33	DRY ELECT.	8 MF
C34	DRY ELECT.	12 MF
C35	MICA	250 MMF
C36	PAPER	.001 MF
C37	PAPER CAPACITOR	.05 MF

SYMBOL	DESCRIPTION	
R1	VOL. CONT. 2 MEG. TAP AT	450000~
R2	CARBON RESISTOR	47000~
R3		470000~
R4		27000~
R5		470000~
R6		100000~
R7		68000~
R8		68000~
R9		220000~
R10	CARBON	2.2 MEG~
R11	CANDOHM	
R12	MOULDED	410~
R13	CARBON	220000~
R14		100000~
R15		20000~
R16		270000~ *
R17		220000~ *
R18		2200~
R19		3900~
R20		1 MEG
R21	CARBON RESISTOR	470000~
L1	WAVE TRAP COIL	
L2	"A" ANT. COIL	
L3	"D-B" ANT. COIL	
L4	"A" OSC. COIL	
L5	"D-B" OSC. COIL	
L7	1ST I.F. TRANS. COIL	
L8	2ND I.F. TRANS. COIL	
S1	BAND CHANGE SWITCH	
S2	TONE CONTROL SWITCH	
S3	POWER SWITCH	
S4	PHONO.-RADIO SWITCH	*
T1	OUTPUT TRANS.	
T2	POWER TRANS.	

* USED ON MODEL FE 68 ONLY

Tuning Frequency Range

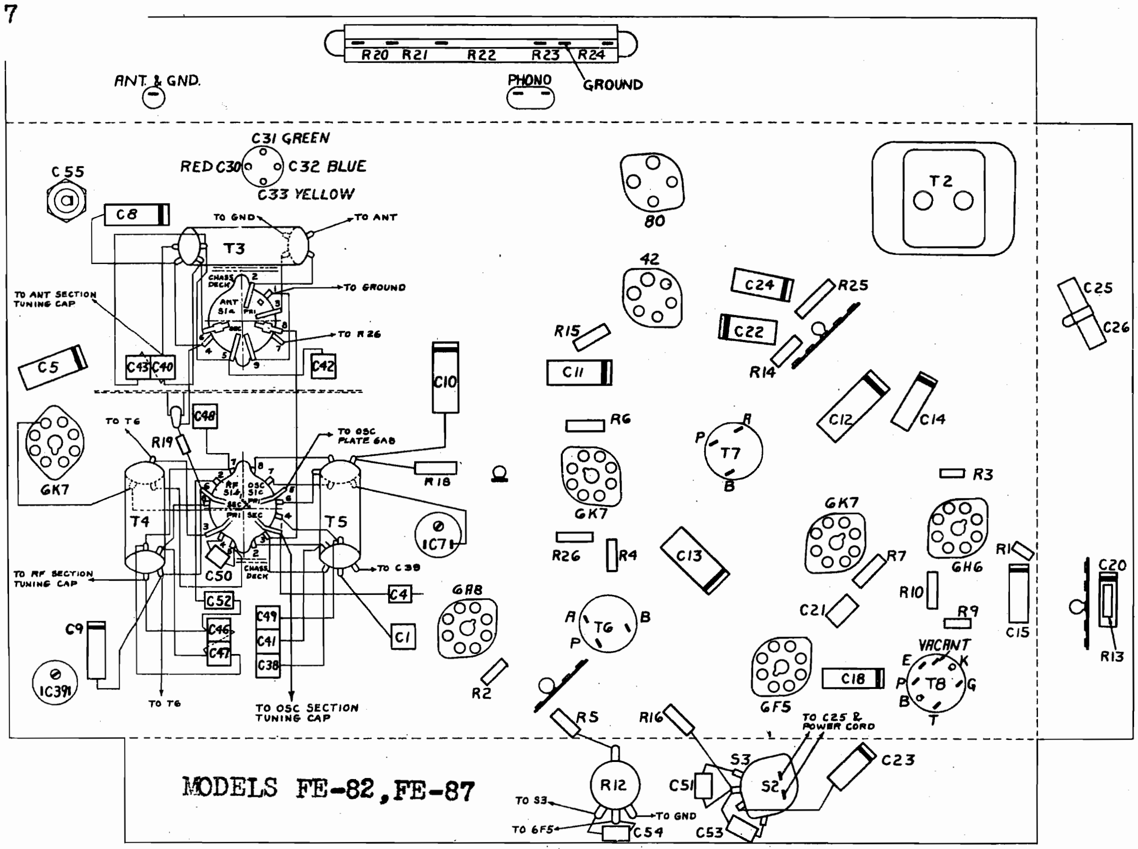
Band "A" . . . . 140-370 kc
Band "B" . . . . 540-1600 kc
Band "D" . . . . 5800-22,000 kc

Intermediate Frequency . . . . 455 kc

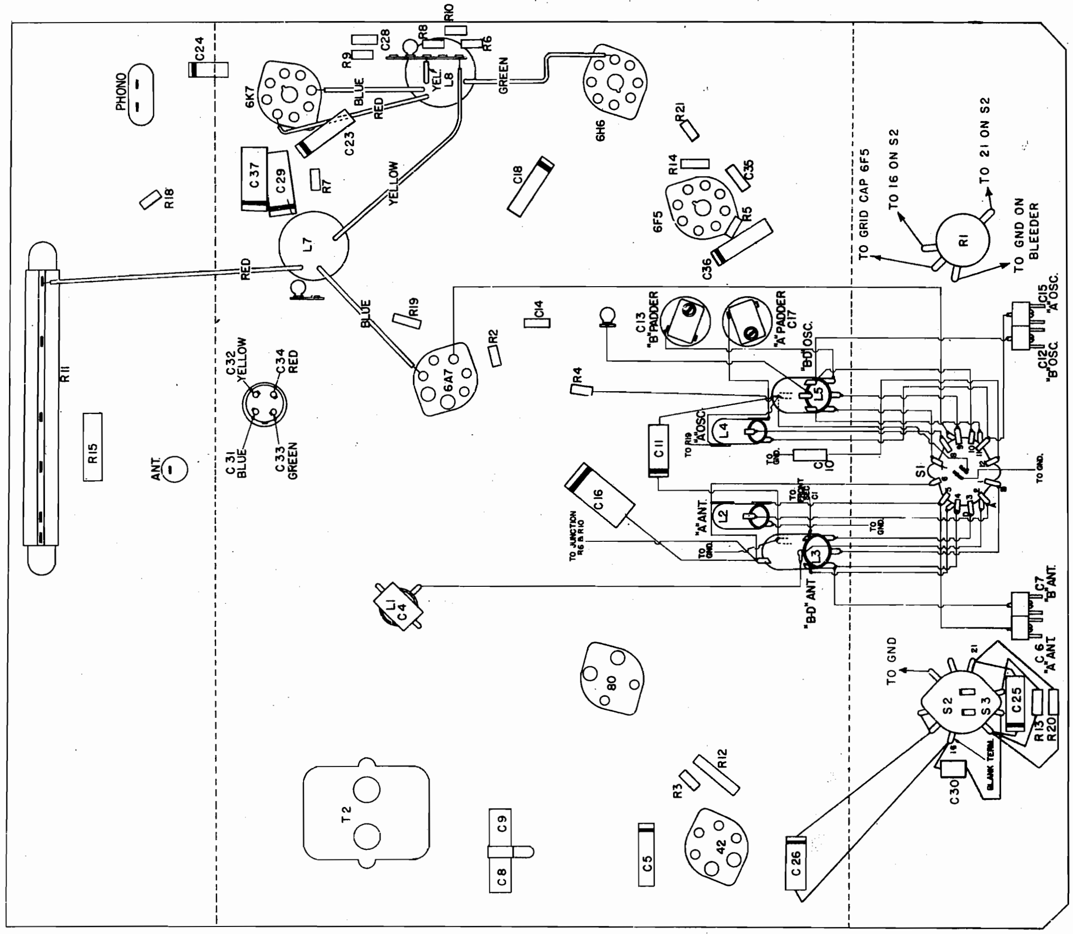
FOR OTHER DATA SEE INDEX

MODELS FE-62,
FE-67, FE-68
MODELS FE-82,
FE-87

GENERAL ELECTRIC CO.



MODELS FE-82, FE-87



Chassis Parts Layout

MODELS FE-62, FE-67, FE-68

MODELS J-62
J-620

GENERAL ELECTRIC CO.

Symbol	Description
C1	Tuning condenser
C2A	"B" band antenna trimmer
C2B	"B" band oscillator trimmer
C2C	"D" band antenna trimmer
C2D	"D" band oscillator trimmer
C3	"B" oscillator padder
C8	6 mmf. mica capacitor
C9	100 mmf. mica capacitor
C10	47 mmf. mica capacitor
C11	3600 mmf. ±5% mica capacitor
C12	220 mmf. mica capacitor
C13	220 mmf. mica capacitor
C14	0.1 mfd. paper capacitor
C15	.05 mfd. paper capacitor
C16	.015 mfd. paper capacitor
C17	.005 mfd. paper capacitor
C18	.005 mfd. paper capacitor
C19	.05 mfd. paper capacitor
C20	.01 mfd. paper capacitor
C21	.05 mfd. paper capacitor
C22	0.1 mfd. paper capacitor
C23	.01 mfd. paper capacitor
C24	0.1 mfd. paper capacitor
C25	.01 mfd. paper capacitor
C26	30 mfd. 250 V. dry electrolytic
C27A	40 mfd. 250 V. dry electrolytic
C27B	20 mfd. 250 V. dry electrolytic
L1	"B" band Beam-a-Scope
L2	"D" band Beam-a-Scope
L3	Oscillator coil
P1	Dial lamp, Mazda No. 44
P2	Dial lamp, Mazda No. 44
R1	0.5 megohm volume control
R2	1000 ohms carbon resistor
R3	1.0 megohm carbon resistor
R4	33,000 ohms carbon resistor
R5	27 ohms carbon resistor
R6	470,000 ohms carbon resistor
R7	2.2 megohms carbon resistor
R8	22,000 ohms carbon resistor
R9	4.7 megohms carbon resistor
R10	100,000 ohms carbon resistor
R11	1.0 megohm carbon resistor
R12	3300 ohms carbon resistor
R13	39,000 ohms carbon resistor
R14	470,000 ohms carbon resistor
R15	220 ohms carbon resistor
R16	3900 ohms 5 W. wire wound resistor
R17	30 ohms 2 W. wire wound resistor
R18	BL42D ballast resistor
S1	Band switch
S2	Power switch
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer

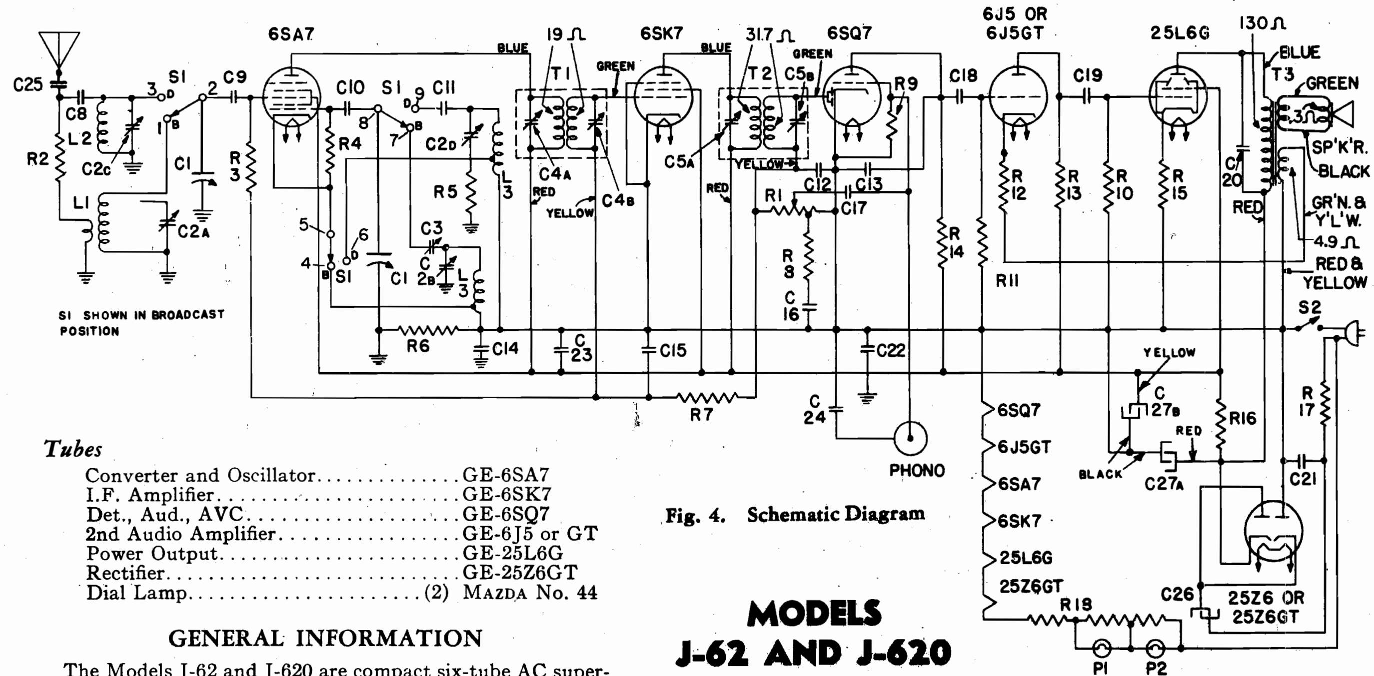


Fig. 4. Schematic Diagram

MODELS J-62 AND J-620

Tubes

Converter and Oscillator	GE-6SA7
I.F. Amplifier	GE-6SK7
Det., Aud., AVC	GE-6SQ7
2nd Audio Amplifier	GE-6J5 or GT
Power Output	GE-25L6G
Rectifier	GE-25Z6GT
Dial Lamp	(2) Mazda No. 44

GENERAL INFORMATION

The Models J-62 and J-620 are compact six-tube AC superheterodyne receivers employing General Electric Pre-tested Tubes. Features of design include dual built-in Beam-a-Scopes, visualux dial, voltage-doubling rectifier system, broadcast and short-wave coverage, and automatic volume control.

Both models are Underwriters' approved and use the same chassis. Model J-62 has a mahogany cabinet. Model J-620 uses a bleached mahogany cabinet.

If an excessive amount of hum is noticed while the receiver is operating, reverse the power plug in the receptacle.

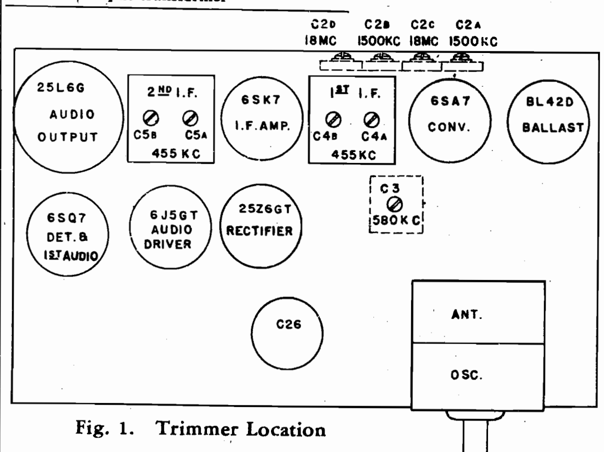


Fig. 1. Trimmer Location

SPECIFICATIONS

Electrical Rating

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
115 AC	25-60	55

Tuning Frequency Range

Band "B" ....540–1600 KC
Band "D" ....5800–18,000 KC

Intermediate Frequency ....455 KC

Electrical Power Output (117 Line Volts)

Undistorted........................ 3 watts
Maximum..........................4.5 watts

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter............... 5 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

SPECIAL SERVICE INFORMATION

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

(1) Stage Gains*

Antenna Post to Converter Grid at 1000 KC	4.3
Converter Grid to 6SK7 Grid at 1000 KC	35
Converter Grid to 6SK7 Grid at 455 KC	42
6SK7 Grid to 6SQ7 Diode Plate at 455 KC	100

(2) Audio Gain
A 400-cycle signal of .06 volts across the volume control will give approximately ½-watt speaker output. (Volume control turned to maximum.)

(3) DC voltage developed across oscillator grid resistor (R-4) averages at

1000 KC	10.5
10,000 KC	8.0

* Variations of +10%, −20% permissible. All readings obtained with enough input signal to give ½-watt speaker output.

MODELS J62, J620

GENERAL ELECTRIC CO.

CHASSIS REMOVAL

NOTE: Care must be exercised in removing either the cabinet back or the chassis to avoid changing the shape of either the short-wave or broadcast loops. These loops are factory formed to give a certain inductance and any alterations in the loops in the field will throw the chassis out of alignment.

To remove the chassis proceed as follows: Pry loose the four fasteners which hold the cabinet back in position. Disconnect the speaker leads from the speaker terminals. Unscrew the woodscrew which secures the short-wave loop to the cabinet. Remove the three chassis bolts and knobs. The chassis is now free from the cabinet.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. .... 455 KC
Band "B" .... 1500 and 580 KC
Band "D" .... 18,000 and 6000 KC

The location of trimmers for the above models is shown in Fig. 1. All R.F. trimmers are accessible through holes in the back cover or through the bottom of the cabinet.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Turn the band switch to "B" band (counterclockwise).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

R.F. Alignment

The use of a standard I.R.E. dummy antenna in making all R.F. alignments is recommended. R.F. alignment can be performed by loop coupling the generator signal to the receiver Beam-a-Scopes if care is exercised not to overcouple the two circuits. Keeping a distance of two feet or more between the generator loop and the receiver Beam-a-Scope will generally insure freedom from overcoupling. The relative position of the Beam-a-Scopes with respect to the chassis materially affects R.F. alignment; therefore, all R.F. alignments should be made with the chassis and Beam-a-Scopes mounted in the cabinet. In keeping with this recommendation all R.F. alignment trimmers are available through holes in the bottom deck and back of the cabinet. Metal objects such as meters, tools, etc., should not be placed near the receiver cabinet. Also the receiver should be kept away from large metal objects such as radiators, metal-top tables, etc.

Set the signal generator to 1500 KC. Align (C-2B) to the signal while the dial pointer is on the 1500 KC mark. Peak (C-2A) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-3) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC.

Turn the band switch to "D" band. Align (C-2D) at 18 MC. Peak (C-2C) while rocking the gang condenser. The image of the 18 MC signal should be heard at 17.09 MC when (C-2D) is on the proper peak. Change signal to 6 MC and retune the receiver. Check the receiver for increased output at the 6 MC point by pinching or separating slightly the turns of wire in the short-wave Beam-a-Scope mounted on the side of the chassis. Retrim at 18 MC.

If the chassis is to be aligned outside of the cabinet it will no longer be possible to use the dial scale as a tuning reference since the dial scale is fastened to the cabinet. Use must be made, therefore, of a 0–180° calibrated scale which is cemented to the back of the dial reflector plate. From the reference chart Fig. 3 the degree readings for corresponding frequency settings may be obtained by laying a straight edge across the chart perpendicular to the line of figures and sliding the straight edge along to the various frequency settings desired. The degree readings will be found on either of the degree scales. To use these degree readings, first completely close the gang condenser plates and then slide pointer along the cord until the inside edge of the right-hand pointer-guide clip is in line with the 0° mark. (See Fig. 2.) By using this edge of the clip as the degree-scale pointer the receiver may be tuned to any frequency. Example: By rotating the tuning control until this edge of the clip is in line with 160° the receiver will be tuned to 1500 KC on the broadcast band. The alignment may now proceed as previously described.

NOTE: After moving the pointer along the cord to use one of the guide clips as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

THIS EDGE OF CLIP USED AS DEGREE-SCALE POINTER.

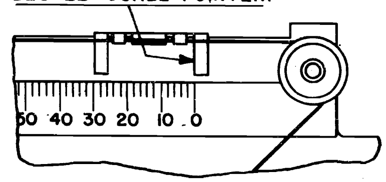


Fig. 2. Pointer-guide-clip Setting with Gang Condenser Closed

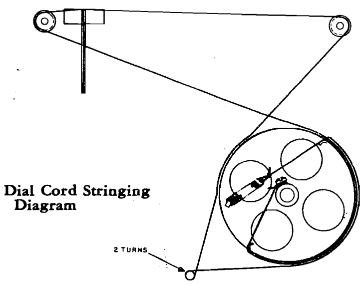


Fig. 7. Dial Cord Stringing Diagram

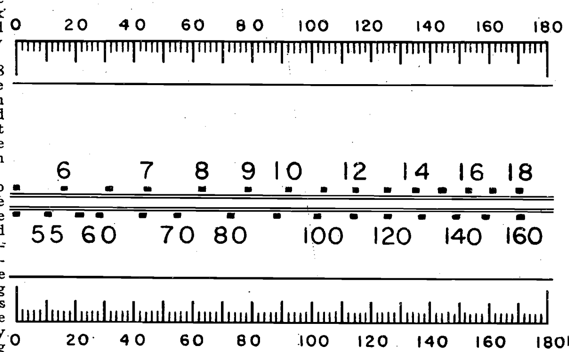


Fig. 3. Frequency-degree Reference Chart

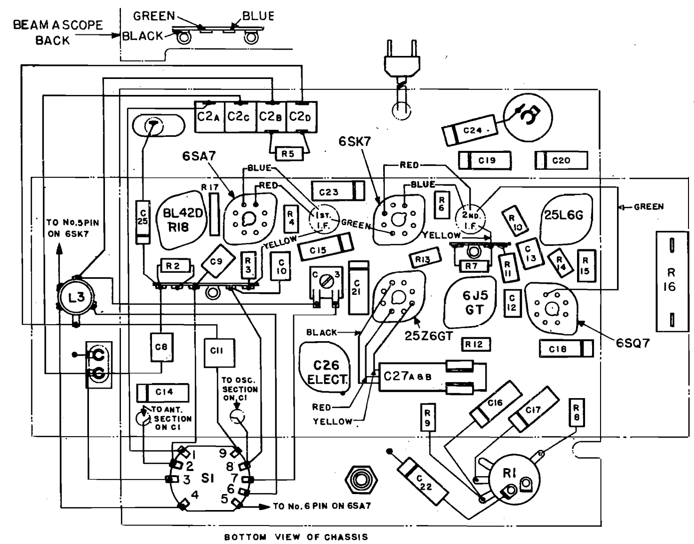
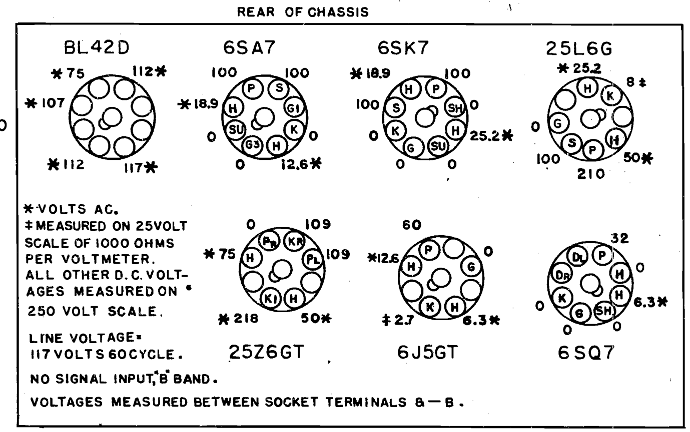


Fig. 5. Chassis Parts Layout

NOTE: The oscillator coil and band-switch terminals are numbered in the Chassis Parts Layout, Fig. 5, to assist in locating the corresponding numbered joints on the Schematic Diagram, Fig. 4. This numbering will also assist in rewiring if the coil or switch is replaced.

REAR OF CHASSIS



BOTTOM VIEW OF CHASSIS

Fig. 6. Socket Voltages

GENERAL ELECTRIC CO.

SOCKET VOLTAGES

MODELS FE-82, FE-87

Tube No.	Plate to Ground Volts D-c	Screen Grid to Ground Volts D-c	Cathode to Ground Volts D-c	Cathode Current M.A.	Heater Volts A-c
6K7 R.F. Amplifier	232	97	0	7.5	6.3
6A8 Oscillator	180	....	0	10.6	6.3
6A8 Converter	232	97	0		
6K7 1st I.F. Amp.	232	95	"A" & "B" band 6 "D" band 3	"A" & "B" band 1.5 "D" band 3.4	6.3
6K7 2nd I.F. Amp.	245	95	3.52	5.7	6.3
6F5 Audio Amplifier	110*	....	1.3	.24	6.3
42 Output	236	252	16	39.0	6.3
80 Power Rectifier	342/684 Rms.	....	345	75	5.0

A-C line voltage 115 on primary 115-volt tap. No signal input. 1000 ohms per voltmeter. Dial pointer at 530 kc.
* Measured on 500-volt scale.

SOCKET VOLTAGES

MODELS FE-112, FE-116, FE-119

Tube No.	Plate to Ground Volts DC	Screen Grid to Ground Volts DC	Cathode to Ground Volts DC	Cathode Current M.A.	Heater Volts AC
6K7 R.F. Amplifier	230	95	0	7.1	6.5
6J5-G Oscillator	195	...	0	11.0	6.5
6L7 Converter	235	90	0	7.7	6.5
6K7 1st I.F. Amp.	230	95	0	6.7	6.5
6K7 2nd I.F. Amp.	205	95	3.3	8.6	6.5
6F5 Audio Amp.	170	...	1.5	0.5	6.5
6L6-G Output	300	240	14.0	59.0	6.5
6U5 Tuning Indicator	...	195 (Target)	0	4.0	6.5
5Z3 Power Rectifier	345 A.C.	...	368	110	5.1

A-C line voltage 125 volts on primary 125-volt tap.
1000 ohms per-voltmeter. Dial pointer 5500 kc. on "D-1" band. No signal.

6

SOCKET VOLTAGES

MODELS FE-62, FE-67, FE-68

Tube No.	Plate to Ground Volts D-C	Screen Grid to Ground Volts D-C	Cathode to Ground Volts D-C	Cathode Current M.A.	Heater Volts A-C
6A7 Oscillator	175	....	0	10.4	6.5
6A7 Converter	236	95	0		
6K7 I.F. Amplifier	220	105	0	10.6	6.5
6H6 Det. and AVC Bias Section	....	....	–3.4	....	6.5
6H6 Det. and AVC Signal Section	....	....	....		
6F5 Audio Amplifier	98 *	....	1.3	0.2	6.5
42 Output	253	272	16.7	39.8	6.5
80 Power Rectifier	680/340 R.M.S.	....	340 D-C	68.3	5.0

A-C line voltage 120—No signal input—1000 ohms per volt meter—dial pointer at 540 K.C.
* Measured on 500-volt scale.

VOLTAGE CHART
Model JE-81

Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
6SK7 (R.F.)	135	95	2.6	6.4
6K8	Conv.—135 Osc.—75	95	2.6	6.4
6SK7 (I.F.)	135	95	3	6.4
6J5G/6J5GT	0		0	6.4
6SQ7	80		1	6.4
6Y6G	210	135	13	6.4
5Y3G	460 V.A.C. Plate to Plate		220	5.1
6U5	135		0	6.4

Line Volts—110 AC on 110-volt tap—Pointer set at 560 KC on "B" band. No signal input.

5Y3G Cathode Current—80 ma.

VOLTAGE CHART
Model JE-810

Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
6SK7 (R.F.)	135	95	2.5	6.4
6K8	Conv.—135 Osc.—75	95	2.5	6.4
6SK7 (I.F.)	135	95	3.2	6.4
6J5G/6J5GT	0		0	6.4
6SQ7	40		1	6.4
25C6G	200	135	13	25.5
25Z6G			210	25.5
6U5	135		0	6.4

Line Volts—240 AC or DC—Pointer set at 560 KC on "B" band.
No signal input.
25Z6G Cathode Current—85 ma.
Filament voltages on Model JE-810 will seldom be equal for same heater ratings, as tubes are in series and heater resistance varies from tube to tube.

VOLTAGE CHART (Model HE-74 and HE-74L)

Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
6SK7	135	90	4	6.5
6K8	Conv.—135 Osc.—95	90	3	6.5
6SK7	125	90	3	6.5
6SQ7	70		1	6.5
6Y6G	190	135	13.5	6.5
5Y3G	460 V. AC Plate to Plate		210	5.1
6U5	135		0	6.5

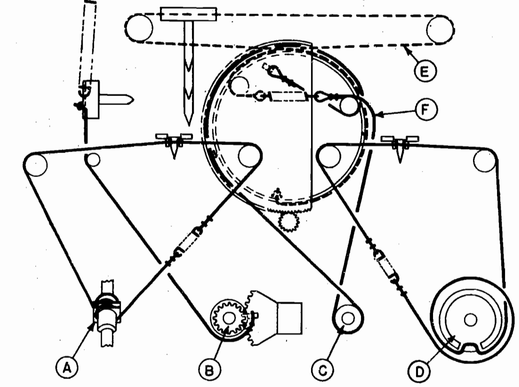
Line Volts—110 AC on 110-volt tap—Pointer set at 560 K.C. on "B" band—No signal input.
5Y36 Cathode Current—98 mils.

VOLTAGE CHART (Models HE-740 and HE-740L)

Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
6SK7	145	95	4.3	6.1
6K8	Conv.—145 Osc.—136	95	2.9	6.1
6SK7	135	95	3.2	6.6
6SQ7	78		1.0	6.6
25C6G	210	145	13	26.5
25Z6G			220	26.5
6U5	145		1.0	6.5

Line Volts—240 AC or DC—Pointer set at 560 K.C. on "B" band—No signal input.
25Z6G Cathode Current—100 mils.

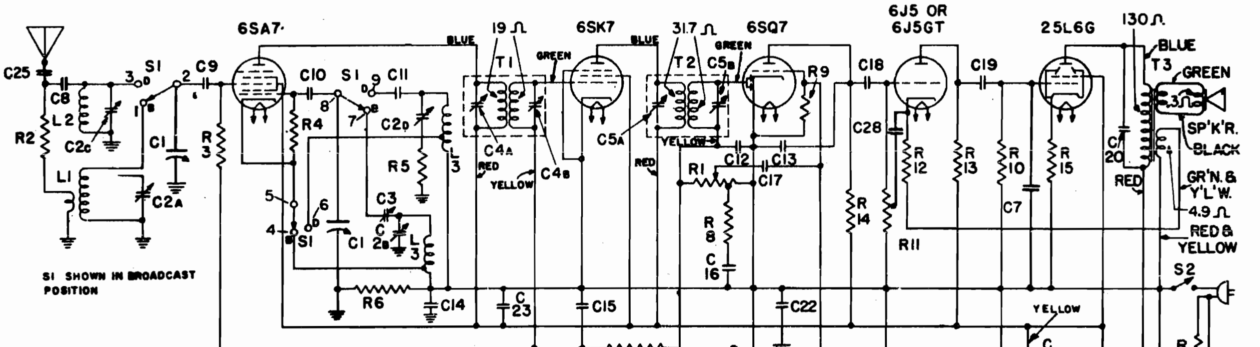
HE-74, HE-74L, HE-740, HE-740L

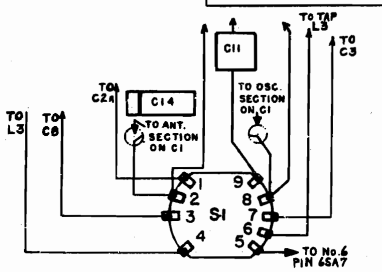


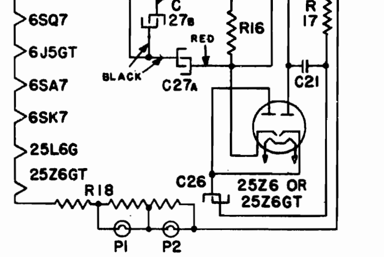
Dial Drive Mechanism

MODEL J63

GENERAL ELECTRIC CO.



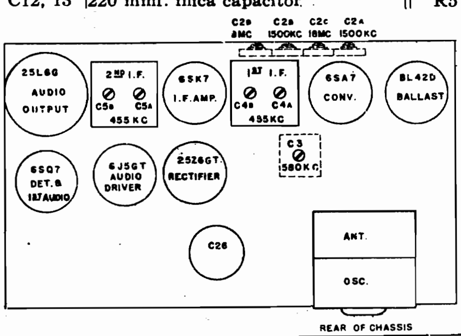


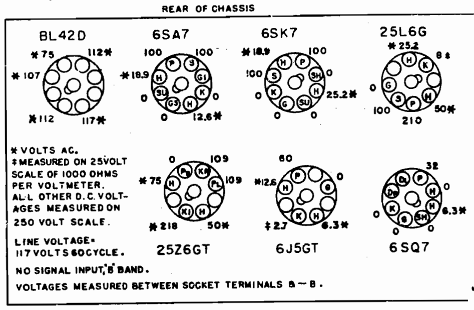


Symbol	Description
C1	Tuning condenser
C2A	"B" band antenna trimmer
C2B	"B" band oscillator trimmer
C2C	"D" band antenna trimmer
C2D	"D" band oscillator trimmer
C3	"B" oscillator padder
C7	220 mmt. mica capacitor
C8	6 mmf. mica capacitor
C9	100 mmf. mica capacitor
C10	47 mmf. mica capacitor
C11	3600 mmf. ±5% mica capacitor
C12, 13	220 mmf. mica capacitor

Symbol	Description
C14	0.1 mfd. paper capacitor
C15	.05 mfd. paper capacitor
C16	.015 mfd. paper capacitor
C17, 18	.005 mfd. paper capacitor
C19	.05 mfd. paper capacitor
C20	.01 mtd. paper capacitor
C21	.05 mfd. paper capacitor
C22	0.1 mtd. paper capacitor
C23	.01 mfd. paper capacitor
C24	0.1 mfd. paper capacitor
C25	.01 mfd. paper capacitor
C26	30 mfd. 250 V. dry electrolytic
C27A	40 mfd. 250 V. dry electrolytic
C27B	20 mfd. 250 V. dry electrolytic
C28	.01 mfd. paper capacitor
L1	"B" band Beam-a-Scope
L2	"D" band Beam-a-Scope
L3	Oscillator coil
R1	0.5 megohm volume control
R2	1000 ohms carbon resistor
R3	1.0 megohm carbon resistor
R4	33,000 ohms carbon resistor
R5	27 ohms carbon resistor

Symbol	Description
R6	470,000 ohms carbon resistor
R7	2.2 megohms carbon resistor
R8	22,000 ohms carbon resistor
R9	4.7 megohms carbon resistor
R10	100,000 ohms carbon resistor
R11	1.0 megohm tone control
R12	3300 ohms carbon resistor
R13	39,000 ohms carbon resistor
R14	470,000 ohms carbon resistor
R15	220 ohms carbon resistor
R16	3900 ohms 5 W. wire wound resistor
R17	30 ohms 2 W. wire wound resistor
R18	BL42D ballast resistor
S1	Band switch
S2	Power switch
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer





Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Max. Output
1	6SK7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C5A & C5B
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4a & C4b
3	Capacity Coupled	580 KC	"BC" Band 580 KC	C3**
4	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2b (Osc.)
5	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2a (Ant.)
6	REPEAT STEP 3			
7	Capacity Coupled	18 MC	"SW" Band 18 MC	C2d * (Osc.)
8	Capacity Coupled	18 MC	"SW" Band 18 MC	C2c** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.

Electrical Rating

115 Volts, 25-60 cycles AC; or 115 volts DC. . . . . .55 watts

Tuning Frequency Range

Broadcast Band. . . . . .540-1600 KC
Short-wave Band. . . . . .5800-18,000 KC

Intermediate Frequency. .455 KC.

Electrical Power Output (*117 line volts*)

Undistorted. . . . . .3 watts
Maximum. . . . . .4.5 watts

Loud-speaker—Alnico Magnet Dynamic

Outside Cone Diameter. . . . . .5 inches
Voice Coil Impedance (400 cycles). . . . .3.5 ohms

Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

(1) Stage gains
Antenna Post to Converter Grid—4.3 at 1000 KC
Converter Grid to 6SK7 Grid—42 at 455 KC
6SK7 Grid to 6SQ7 Diode Plate—100 at 455 KC

(2) Audio gain
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R4) averages 10.5 volts at 1000 KC or 8.0 volts at 10,000 KC.

* Variations of +10 or −20% permissible.

MODEL J64

GENERAL ELECTRIC CO.

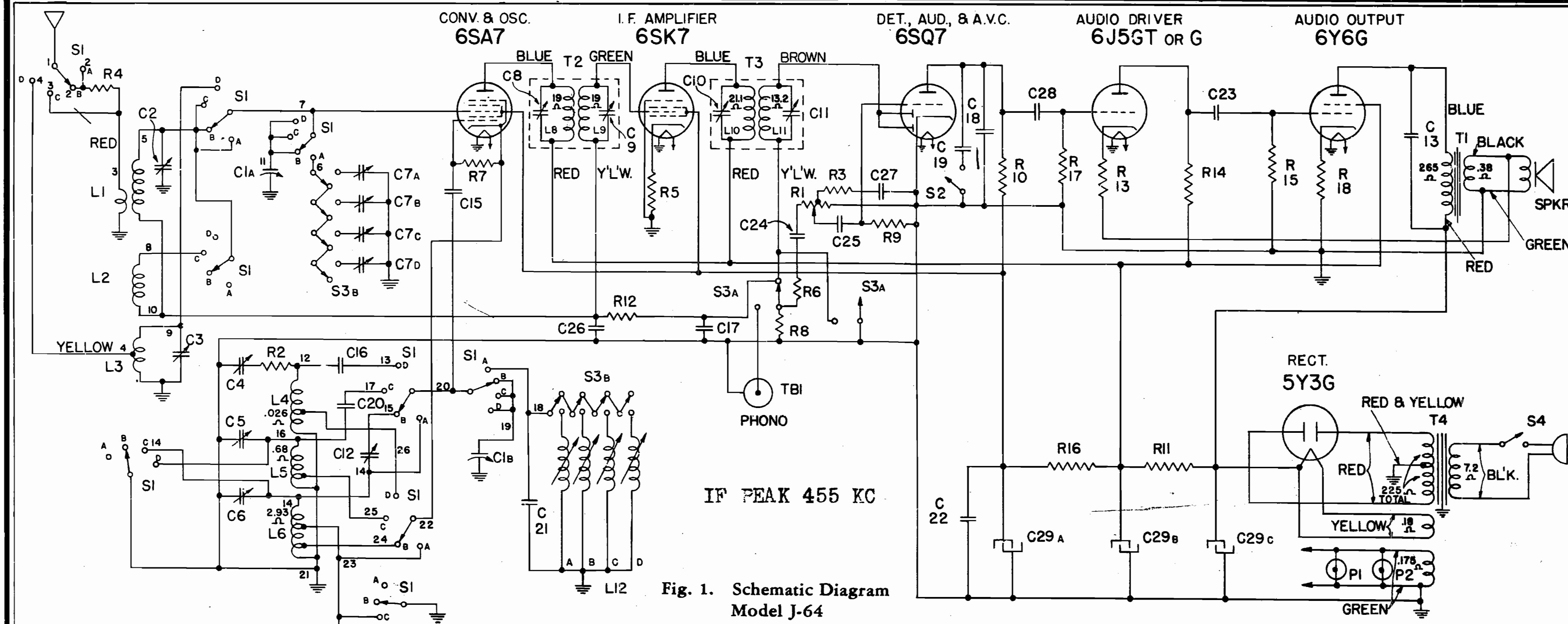
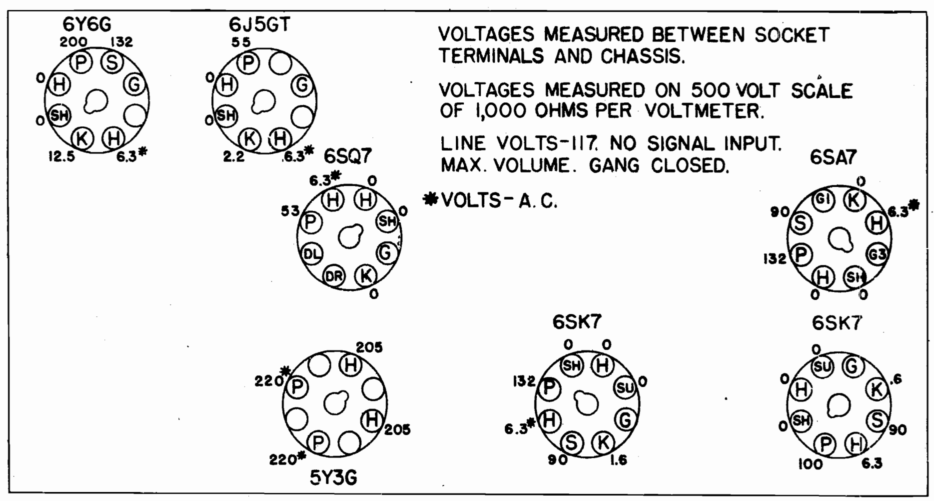


Fig. 1. Schematic Diagram Model J-64

FRONT OF CHASSIS



BOTTOM VIEW OF CHASSIS

Fig. 5. Socket Voltages

Symbol	Description
C1A	Antenna section of tuning condenser
C1B	Oscillator section of tuning condenser
C2	"BC" band antenna trimmer
C3	"SW2" band antenna trimmer
C4	"SW2" band oscillator trimmer
C5	"SW1" band oscillator trimmer
C6	"BC" band oscillator trimmer
C7	Station selector antenna trimmers
C12	"BC" band padding trimmer
C13	.01 mfd. paper capacitor
C15	47 mmf. mica capacitor
C16	.008 mfd. polystyrene capacitor
C17	220 mmf. mica capacitor
C18	150 mmf. mica capacitor
C19	.002 mfd. paper capacitor
C20	2400 mmf. ±5% mica capacitor
C21	750 mmf. ±5% silvered mica capacitor
C22	.01 mfd. paper capacitor
C23	.01 mfd. paper capacitor
C24	.005 mfd. paper capacitor
C25	.02 mfd. paper capacitor
C26	.05 mfd. paper capacitor
C27	.005 mfd. paper capacitor
C28	.005 mfd. paper capacitor
C29A	10 mfd. 250 V. dry electrolytic
C29B	15 mfd. 250 V. dry electrolytic
C29C	30 mfd. 250 V. dry electrolytic
L1	"BC" and "SW1" band Beam-a-Scope
L2	"SW1" band antenna coil
L3	"SW2" band Beam-a-Scope
L4	"SW2" band oscillator coil
L5	"SW1" band oscillator coil
L6	"BC" band oscillator coil
L12	Station selector coil strip
P1	Dial lamp, Mazda No. 44
P2	Dial lamp, Mazda No. 44
R1	2 megohm volume control
R2	18 ohms carbon resistor
R3	100,000 ohms carbon resistor
R4	1000 ohms carbon resistor
R5	150 ohms carbon resistor
R6	47,000 ohms carbon resistor
R7	39,000 ohms carbon resistor
R8	470,000 ohms carbon resistor
R9	4.7 megohms carbon resistor
R10	330,000 ohms, carbon resistor
R11	2700 ohms 2 W carbon resistor
R12	2.2 megohms carbon resistor
R13	3300 ohms carbon resistor
R14	100,000 ohms carbon resistor
R15	330,000 ohms carbon resistor
R16	3300 ohms 1 W carbon resistor
R17	470,000 ohms carbon resistor
R18	270 ohms 1 W carbon resistor
S1	Band switch
S2	Tone control
S3A	Phono-FM-Tel switch
S3B	Touch tuning switches
S4	Power switch on tone control
T1	Output transformer
T2	1st I.F. transformer
T3	2nd I.F. transformer
T4	50-60-cycle power transformer
or T4	25-cycle power transformer

MODEL J64

GENERAL ELECTRIC CO.

SPECIFICATIONS

Electrical Rating

Rating	Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
A	110–125	50–60	75
C	110–125	25	85

Tuning Frequency Range

Broadcast Band........................540–1600 KC
Short-wave Band No. 1..............2300–7000 KC
Short-wave Band No. 2..............7000–22,000 KC

Intermediate Frequency........................455 KC

Electrical Power Output

Undistorted..............................2.85 watts
Maximum..................................4.5 watts

Tone Control..............................3-position

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter....................6½ inches
Voice Coil Impedance......................3.5 ohms

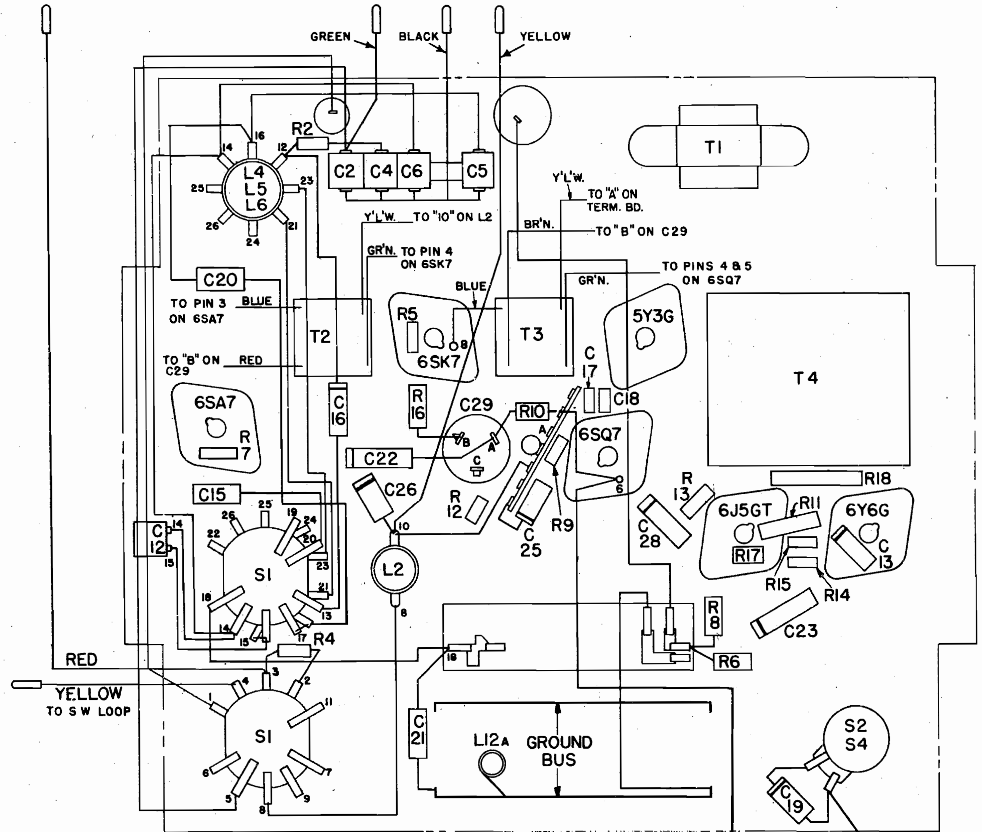


Fig. 6. Chassis Parts Layout

Tubes

Converter and Oscillator............GE-6SA7
I.F. Amplifier.......................GE-6SK7
Det., Aud., AVC....................GE-6SQ7
Audio Driver........................GE-6J5GT
Audio Output.......................GE-6Y6G
Rectifier............................GE-5Y3G
Dial Lamp..........................(2) Mazda No. 44

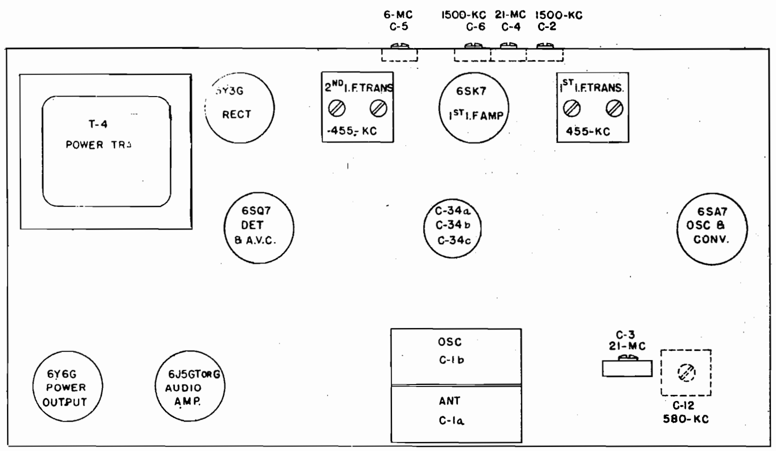


Fig. 4. Tube and Trimmer Location

Note: The oscillator coil and band-switch terminals are numbered in the Chassis Parts Layout, Fig. 6, to assist in locating the corresponding numbered points on the Schematic Diagram, Fig. 1. This numbering will also assist in rewiring if the coil or switch is replaced. I.F. transformer connections are shown as an aid in replacement.

GENERAL ELECTRIC CO.

GENERAL INFORMATION

Model J-64 is a six-tube, superheterodyne receiver designed to operate from an alternating-current power supply. The receiver incorporates the latest developments in radio of which the General Electric Dual Beam-a-Scopes are notable. Broadcast and short-wave No. 1 signals are selected by the Beam-a-Scope which is mounted on the cabinet back. Short-wave No. 2 signals are selected by the Beam-a-Scope which is mounted on the cabinet above the chassis. Additional features include single-ended tubes, iron-core oscillator station-selector coils, four feathertouch tuning station keys, one Phono-Frequency Modulation-Television key, tone monitor circuit and automatic volume control.

Phono-FM-Tel

This receiver is equipped with a pin jack on the rear apron of the chassis and a Phono-FM-Tel key for adapting it to use with record players, frequency modulation converters and television picture receivers with sound converters. General Electric plug, Stock No. RP-145, fits the pin jack.

Setting Up the Receiver

The following remarks will assist the serviceman in correctly setting up this receiver for use:

(1) In order to press the volume or tuning knobs all the way on their respective shafts, the dial reflector plate should be held in place by pressure from the rear.

(2) The black speaker lead should be connected to the speaker terminal which is grounded to the speaker frame.

(3) A method of setting up station keys which will assure driftproof adjustments is to screw the iron core all the way out and then turn slowly inward until the desired station is tuned in.

Chassis or Beam-a-Scope Removal

Note: Care must be exercised in removing either the cabinet back or the chassis to avoid changing the shape of either the short-wave or broadcast loop. These loops are factory formed to give a certain inductance and any alterations in the loops in the field will throw the chassis out of alignment.

When disconnecting the short-wave loop leads from the loop, be sure to support the loop while pulling off the connections. Failure to support the loop may cause the staples to loosen and result in the loop rattling in the cabinet.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

Note—In no case should the magnet be removed from the assembled position.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains *

(a) Antenna Post to Converter Grid at
- 1000 KC 3.7
- 4000 KC 2.8
- 18,000 KC 2.0

(b) R.F. on Converter Grid to I.F. on 1st I.F. Grid at
- 1000 KC 35
- 4000 KC 35
- 18,000 KC 50

(c) I.F. on Converter Grid to I.F. on 1st I.F. Grid at
- 455 KC 45

(d) I.F. Amplifier Grid to Detector Plate at
- 455 KC 65

(2) Voltage across Volume Control to give ½-watt Speaker Output at
- 400 cycles .... 04 volts

(3) DC Voltage Developed across Oscillator Grid Resistor (R-7) at
- 1000 KC 13
- 4000 KC 11
- 18,000 KC 9

* Variations of ± 20 per cent permissible. All readings obtained with enough input signal to give ½-watt speaker output.

ALIGNMENT PROCEDURE

The alignment procedure is given in table form below. The use of a standard I.R.E. dummy antenna in making all R.F. alignments is recommended. R.F. alignment can be performed by loop coupling the generator signal to the receiver Beam-a-Scopes if care is exercised not to over-couple the two circuits. Keeping a distance of two feet or more between the generator loop and the receiver Beam-a-Scope will generally insure freedom from overcoupling. The relative position of the Beam-a-Scopes with respect to the chassis materially affects R.F. alignment; therefore, all R.F. alignments should be made with the chassis and Beam-a-Scopes mounted in the cabinet. In keeping with this recommendation all R.F. alignment trimmers are available through holes in the bottom deck and back of the cabinet as shown in Fig. 3. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet. Also the receiver should be kept away from large metal objects such as radiators, metal-top tables, etc.

R.F. Alignment
With Chassis Outside of Cabinet

R.F. alignment can be performed only on the "BC" and "SW1" bands with the chassis outside of the cabinet. Any alignment attempted on "SW2" band will not be satisfactory. The same relative position between the chassis and "BC" Beam-a-Scope should be maintained when aligning outside the cabinet as these components occupy in the cabinet. Since the glass dial scale is fastened to the cabinet it cannot be used for reference during alignment of the chassis outside of the cabinet. Use must be made, therefore, of a 0–180° calibrated scale which is cemented to the back of the dial reflector plate. From the reference chart Fig. 7 the degree readings for corresponding frequency settings may be obtained by laying a straight edge across the chart perpendicular to the line of figures and sliding the straight edge along to the various frequency settings desired. The degree readings will be found on either of the degree scales. To use these degree readings, first completely close the gang condenser plates and then slide the pointer along the cord until the left-hand edge of the pointer-guide slide lines up with the 0° mark. By using this left-hand edge (as viewed from the rear) of the slide as the degree-scale pointer the receiver may be tuned to any frequency. Example: By setting the left-hand edge of the slide to 158° the receiver will be tuned to 1500 KC on the "BC" band.

The "BC" and "SW1" band alignment procedure is the same as outlined in steps 2 to 6 inclusive of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

After the alignment has been performed or the "BC" and "SW1" bands the chassis should be mounted in the cabinet and "SW2" band alignment checked as described in steps 7 to 9 of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

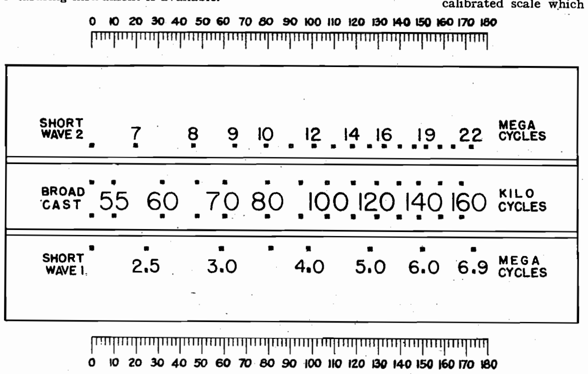


Fig. 7. Frequency-degree Reference Chart

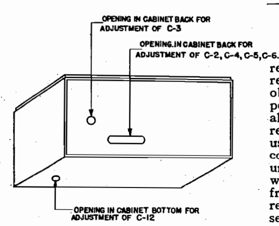


Fig. 3. Cabinet Holes for Trimmer Adjustment

ALIGNMENT CHART

I.F. Alignment with Oscilloscope

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC Sweep	I.F. Grid	.05 mfd. or larger	2nd I.F. Trimmers C-10, 11	Gang condenser plates closed. Depress any station key other than Phono-FM-Tel key. Connect audio input of oscilloscope to chassis ground and junction of R6 and R8. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. Finish by retrimming 2nd I.F. trimmers.
2. "BC" Band	455 KC Sweep	Green lead on cabinet back terminal board and chassis gnd.	.05 mfd. or larger	1st I.F. Trimmers C-8, 9	
I.F. Alignment with Output Meter					
1. "BC" Band	455 KC with Modulation	Green lead on cabinet back terminal board and chassis gnd.	.05 mfd. or larger	2nd I.F. Trimmers C-10, 11 1st I.F. Trimmers C-8, 9	Gang condenser plates closed. Depress any key other than Phono-FM-Tel key. Connect output meter across voice coil. Keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
R.F. Alignment With Chassis Mounted in Cabinet					
1. "BC" Band					Close gang plates, adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil. Tone control set to "Normal" position.
2. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-2)	Set pointer to 1500 KC and tune in signal with (C-6). Peak output with (C-2).
3. "BC" Band	580 KC with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-12)	Set pointer to 580 KC and peak signal while rocking gang condenser.
4. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-2)	Retrim for maximum output.
5. Repeat operation 3 if "BC" band trimmers are badly out of alignment.					
6. "SW 1" Band	6 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-5)	Set pointer to 6 MC and peak signal while rocking gang condenser.
7. "SW 2" Band	21 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-4) Ant. (C-3)	Set pointer to 21 MC and tune in signal with (C-4). Peak output with (C-3) while rocking gang condenser. When (C-4) is on proper peak, image of 21 MC signal should be heard 910 KC below or on 20.09 MC.
8. "SW 2" Band	8 MC with Modulation	Antenna Post	I.R.E.		This operation may or may not be necessary depending on how much the short-wave Beam-a-Scope leads have been moved from their correctly dressed positions. Repositioning will be indicated if an increased output meter reading can be obtained by moving the short-wave Beam-a-Scope phosphor-bronze strap connector closer or farther away from the ground lead. The moving should be done with an insulated rod or stick.
9. Repeat operation 7 if the Beam-a-Scope leads are moved in operation 8.					

Note: After moving the pointer along the cord to use the left-hand edge as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

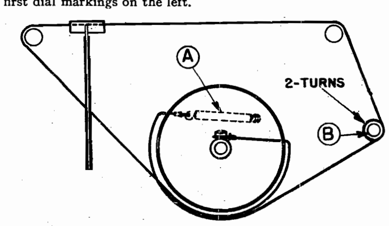


Fig. 2. Dial Drive Stringing Diagram

GENERAL ELECTRIC CO.

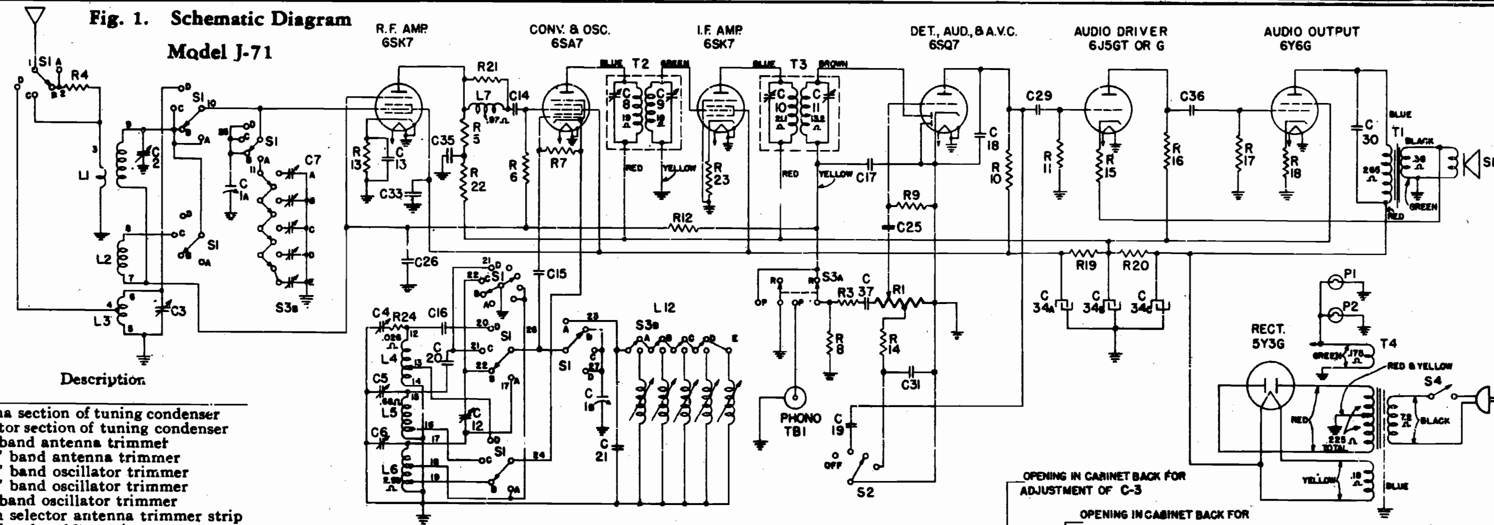


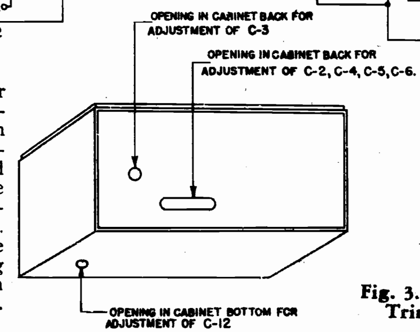
Fig. 1. Schematic Diagram
Model J-71

Symbol	Description
C1A	Antenna section of tuning condenser
C1B	Oscillator section of tuning condenser
C2	"BC" band antenna trimmer
C3	"SW2" band antenna trimmer
C4	"SW2" band oscillator trimmer
C5	"SW1" band oscillator trimmer
C6	"BC" band oscillator trimmer
C7	Station selector antenna trimmer strip
C12	'BC" band padding trimmer
C13	.01 mfd. paper capacitor
C14	100 mmf. mica capacitor
C15	47 mmf. mica capacitor
C16	.008 mfd. paper capacitor
C17	220 mmf. mica capacitor
C18	150 mmf. mica capacitor
C19	.002 mfd. paper capacitor
C20	2400 mmf. ±5% mica capacitor
C21	750 mmf. silvered mica capacitor
C25	.02 mfd. paper capacitor
C26	.05 mfd. paper capacitor
C29	.005 mfd. paper capacitor
C30	.01 mfd. paper capacitor
C31	.005 mfd. paper capacitor
C33	.01 mfd. paper capacitor
C34A	10 mfd. 250 V. dry electrolytic
C34B	15 mfd. 250 V. dry electrolytic
C34C	30 mfd. 250 V. dry electrolytic
C35	.01 mfd. paper capacitor
C36	.01 mfd. paper capacitor
C37	.005 mfd. paper capacitor
L1	"BC" Band Beam-a-Scope
L2	"SW1" band antenna coil
L3	"SW2" band Beam-a-Scope
L4	"SW2" band oscillator coil
L5	"SW1" band oscillator coil
L6	"BC" band oscillator coil
L7	R.F. interstage coil
L12	Station selector oscillator coils
P1	Dial lamp, Mazda No. 44
P2	Dial lamp, Mazda No. 44
R1	2 megohm volume control
R3	47,000 ohms carbon resistor
R4	1000 ohms carbon resistor
R5	3300 ohms carbon resistor
R6	47,000 ohms carbon resistor
R7	22,000 ohms carbon resistor
R8	470,000 ohms carbon resistor
R9	4.7 megohms carbon resistor
R10	330,000 ohms carbon resistor
R11	470,000 ohms carbon resistor
R12	2.2 megohms carbon resistor
R13	47 ohms carbon resistor
R14	100,000 ohms carbon resistor
R15	3300 ohms carbon resistor
R16	100,000 ohms carbon resistor
R17	330,000 ohms carbon resistor
R18	270 ohms 1 W. carbon resistor
R19	3300 ohms 1 W. carbon resistor
R20	1800 ohms 2 W. carbon resistor
R21	10,000 ohms carbon resistor
R22	1000 ohms carbon resistor
R23	150 ohms carbon resistor
R24	27 ohms carbon resistor

Model J-71 is a seven-tube, superheterodyne receiver designed to operate from an alternating current power supply. The receiver incorporates the latest developments in radio, among which are the General Electric Dual Beam-a-Scopes. Broadcast and short-wave No. 1 signals are selected by the Beam-a-Scope which is mounted at one end of the cabinet. Short-wave No. 2 signals are selected by the Beam-a-Scope which is mounted on the cabinet above the chassis. Additional features include single-ended tubes, iron-core oscillator station selector coils, five feathertouch tuning station keys, one Phono-Frequency Modulation-Television key, tone monitor circuit and automatic volume control.

Phono-FM-Tel

This receiver is equipped with a pin jack on the rear apron of the chassis and a Phono-FM-Tel key for adapting it to use with record players, frequency modulation converters, and television picture receivers with sound converters. General Electric plug, Stock No. RP-145, fits the pin jack.



S1	Band switch
S2	Tone control switch
S3A	Phono switch
S3B	Station selector switch
S4	Power switch
T1	Output transformer
T2	1st I.F. transformer
T3	2nd I.F. transformer
T4	Power transformer

Fig. 3. Cabinet Holes for Trimmer Adjustment

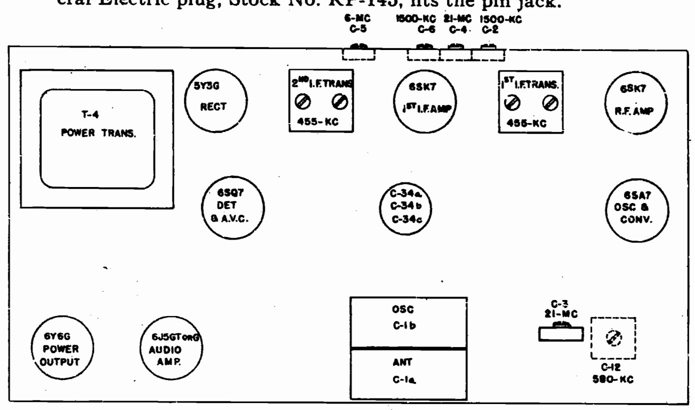


Fig. 4. Tube and Trimmer Location

Electrical Rating

Rating	Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
A	110–125	50–60	75
C	110–125	25	85

Tuning Frequency Range

Broadcast Band....................540–1600 KC
Short-wave Band No. 1..............2300–6900 KC
Short-wave Band No. 2..............6900–22,000 KC

Intermediate Frequency................455 KC

Electrical Power Output

Undistorted.......................2.85 watts
Maximum...........................4.5 watts

Tone Control.........................3-position

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter..............6½ inches
Voice Coil Impedance...............3.5 ohms

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

The alignment procedure is given in table form below. The use of a standard I.R.E. dummy antenna in making all R.F. alignments is recommended. R.F. alignment can be performed by loop coupling the generator signal to the receiver Beam-a-Scopes if care is exercised not to overcouple the two circuits. Keeping a distance of two feet or more between the generator loop and the receiver Beam-a-Scope will generally insure freedom from overcoupling. The relative position of the Beam-a-Scopes with respect to the chassis materially affects R.F. alignment; therefore, all R.F. alignments should be made with the chassis and Beam-a-Scopes mounted in the cabinet. In keeping with this recommendation all R.F. alignment trimmers are available through holes in the bottom deck and back of the cabinet as shown in Fig. 3. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet. Also the receiver should be kept away from large metal objects such as radiators, metal-top tables, etc.

R.F. Alignment
With Chassis Outside of Cabinet

R.F. alignment can be performed only on the "BC" and "SW1" bands with the chassis outside of the cabinet. Any alignment attempted on "SW2" band will not be satisfactory. The same relative position between the chassis and broadcast loop should be maintained when aligning outside the cabinet as these components occupy in the cabinet. Since the glass dial scale is fastened to the cabinet it cannot be used for reference during alignment of the chassis outside of the cabinet. Use must be made, therefore, of a 0-180° calibrated scale which is cemented to the back of the dial reflector plate. From the reference chart Fig. 7 the degree readings for corresponding frequency settings may be obtained by laying a straight edge across the chart perpendicular to the line of figures and sliding the straight edge along to the various frequency settings desired. The degree readings will be found on either of the degree scales. To use these degree readings, first completely close the gang condenser plates and then slide the pointer along the cord until the left-hand edge of the pointer-guide slide lines up with the 0° mark. By using this left-hand edge (as viewed from the rear) of the slide as the degree-scale pointer the receiver may be tuned to any frequency. Example: By rotating the tuning control until the left-hand edge of the slide is in line with 158°, the receiver will be tuned to 1500 KC on the "BC" band.

The "BC" and "SW1" band alignment procedure is the same as outlined in steps 2 to 6 inclusive of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

After the alignment has been performed on the "BC" and "SW1" bands the chassis should be mounted in the cabinet and "SW2" band alignment checked as described in steps 7 to 9 of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

Note: After moving the pointer along the cord to use the left-hand edge as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

Chassis or Beam-a-Scope Removal

Note: Care must be exercised in removing the chassis to avoid changing the shape of either the short-wave or broadcast loops. These loops are factory formed to give a certain inductance and any alterations in the loops in the field will throw the chassis out of alignment.

When disconnecting the short-wave loop leads from the loop, be sure to support the loop while pulling off the connections. Failure to support the loop may cause the staples to loosen and result in the loop rattling in the cabinet.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

Note—In no case should the magnet be removed from the assembled position.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*
- (a) Antenna Post to R.F. Grid at
  - 1000 KC 5.5
  - 4000 KC 2.5
  - 18,000 KC 2.5
- (b) R.F. Grid to Converter Grid at
  - 1000 KC 5.5
  - 4000 KC 3.0
  - 18,000 KC 2.0
- (c) R. F. on Converter Grid to I.F. on 1st I.F. Grid at
  - 1000 KC 50
  - 4000 KC 50
  - 18,000 KC 45
- (d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at 455 KC 60
- (e) I.F. Amplifier Grid to Detector Plate at 455 KC 55

(2) Voltage across Volume Control to Give ½-watt Speaker Output at 400 cycles . . . . . .04 volts

(3) DC Voltage Developed across Oscillator Grid Resistor (R-7) at
- 1000 KC 8.3
- 4000 KC 7.8
- 18,000 KC 4.6

* Variations of ± 20% permissible. All readings obtained with enough input signal to give ½-watt speaker output.

FRONT OF CHASSIS

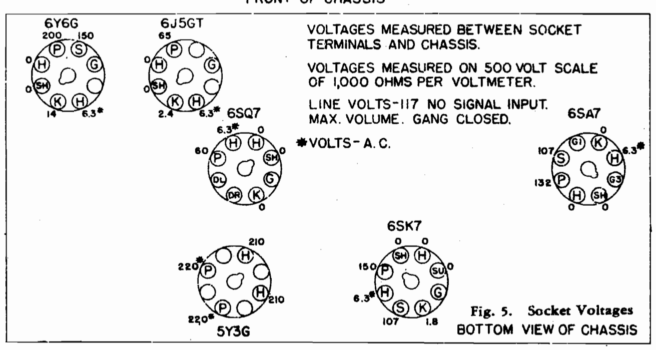


Fig. 5. Socket Voltages BOTTOM VIEW OF CHASSIS

I.F. Alignment with Oscilloscope

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC Sweep	I.F. Grid	.05 mfd. or larger	2nd I.F. Trimmers C-10, 11.	Gang condenser plates closed. Depress any station key other than Phono-FM-Tel key. Connect audio input of oscilloscope to chassis ground and junction of R3 and R8. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. Finish by retrimming 2nd I.F. trimmers.
2. "BC" Band	455 KC Sweep	Green lead on "BC" Beam-a-Scope terminal board and chassis ground.	.05 mfd. or larger	1st I.F. Trimmers C-8, 9	

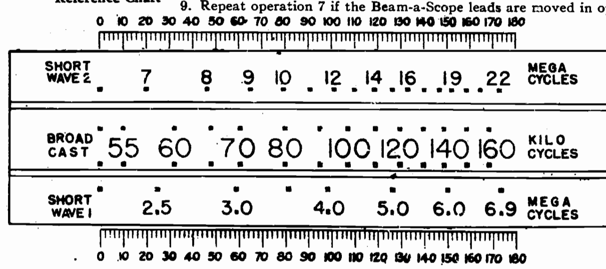
I.F. Alignment with Output Meter

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC with Modulation	Green lead on "BC" Beam-a-Scope terminal board and chassis ground.	.05 mfd. or larger	2nd I.F. Trimmers C-10, 11. 1st I.F. Trimmers C-8, 9	Gang condenser plates closed. Depress any key other than Phono-FM-Tel key. Connect output meter across voice coil. Keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.

R.F. Alignment
With Chassis Mounted in Cabinet

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band					Close gang plates, adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil. Tone control set to "Normal" position.
2. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-2)	Set pointer to 1500 KC and tune in signal with (C-6). Peak output with (C-2).
3. "BC" Band	580 KC with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-12)	Set pointer to 580 KC and peak signal while rocking gang condenser.
4. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-2)	Retrim for maximum output.
5. Repeat operation 3 if "BC" band trimmers are badly out of alignment.					
6. "SW 1" Band	6 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-5)	Set pointer to 6 MC and peak signal while rocking gang condenser.
7. "SW 2" Band	21 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-4) Ant. (C-3)	Set pointer to 21 MC and tune in signal with (C-4). Peak output with (C-3) while rocking gang condenser. When (C-4) is on proper peak, image of 21 MC signal should be heard 910 KC below or on 20.09 MC.
8. "SW 2" Band	8 MC with Modulation	Antenna Post	I.R.E.		This operation may or may not be necessary depending on how much the short-wave Beam-a-Scope leads have been moved from their correctly dressed positions. Repositioning will be indicated if an increased output meter reading can be obtained by moving the short-wave Beam-a-Scope phosphor-bronze lead closer or farther away from the black lead. The moving should be done with an insulated rod or stick.
9. Repeat operation 7 if the Beam-a-Scope leads are moved in operation 8.					

Fig. 7.
Frequency-degree Reference Chart



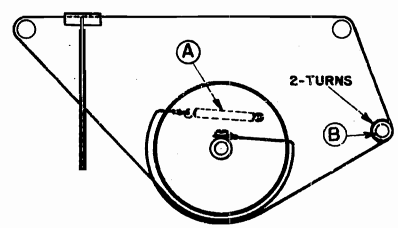
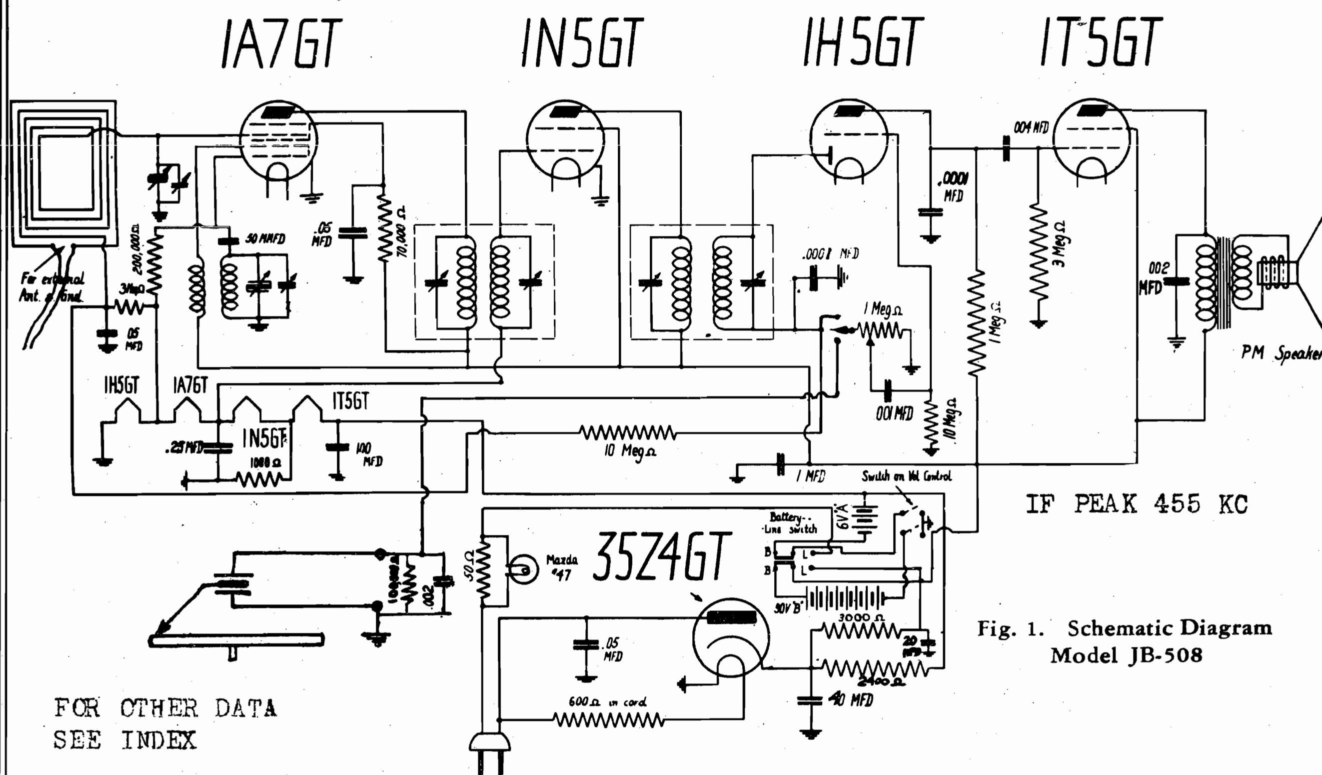


Fig. 2. Dial Drive Stringing Diagram

MODELS J-71, JB-508, JB-513, JB514

GENERAL ELECTRIC CO.



IF PEAK 455 KC

Fig. 1. Schematic Diagram Model JB-508

FOR OTHER DATA SEE INDEX

MODEL J-71

Tubes

R.F. Amplifier GE-6SK7
Converter and Oscillator . . GE-6SA7
I.F. Amplifier GE-6SK7
Det., Aud., AVC GE-6SQ7
Audio Driver GE-6J5GT
Audio Output GE-6Y6G
Rectifier GE-5Y3G
Dial Lamp .... (2) MAZDA No. 44

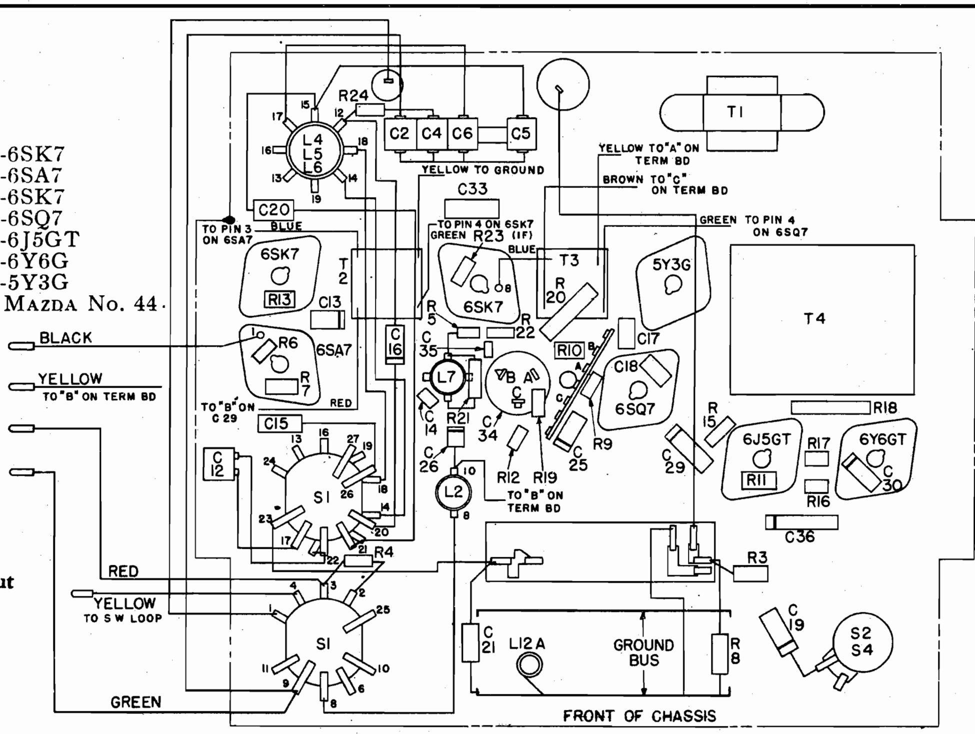


Fig. 6. Chassis Parts Layout

Note: The oscillator coil and band-switch terminals are numbered in the Chassis Parts Layout, Fig. 6, to assist in locating the corresponding numbered points on the Schematic Diagram, Fig. 1. This numbering will also assist in rewiring if the coil or switch is replaced. I.F. transformer connections are shown as an aid in replacement.

SETTING UP THE RECEIVER

The following remarks will assist the serviceman in correctly setting up this receiver for use:

(1) In order to press the volume or tuning knobs all the way on their respective shafts, the dial reflector plate should be held in place by pressure from the rear.

(2) The black speaker lead should be connected to the speaker terminal which is grounded to the speaker frame.

(3) A method of setting up station keys which will assure driftproof adjustments is to screw the iron core all the way out and then turn slowly inward until the desired station is tuned in.

GENERAL ELECTRIC CO.

MODELS JB508, JB-513, JB514

SERVICE DATA

Over-all Dimensions

Model	JB-508	JB-513, JB-514
Height	9½ inches	11 inches
Width	14 inches	14½ inches
Depth	15 inches	5 inches
Wt. with batteries	19½ lbs.	13¾ lbs.

Tuning Control Drive Ratio 6:1

Electrical Specifications

1. AC or DC Power Supply—105-125 Volts—40-60 cycles on AC
2. Battery Power Supply
 6 Volt "A" Supply, 90 Volt "B" supply
 Recommended batteries for 275-hour life (Maximum daily operation—4 hours)
 (a) "A" Battery—one Eveready No. 747 or equivalent
 (b) "B" Batteries—two Eveready No. 482 or equivalent

Tuning Frequency Range ....540—1700 KC

Intermediate Frequency ....455 KC

Maximum Power Output ....200 Milliwatts

Loudspeaker—Alnico Magnet Dynamic

Outside Cone Diameter......................5 inches
Voice Coil Impedance (400 cycles)...........3.5 ohms

Tubes

Converter and Oscillator..............GE-1A7GT
I.F. Amplifier.........................GE-1N5GT
Det:, Aud., AVC.....................GE-1H5GT
Power Output.......................GE-1T5GT

Rectifier
Models JB-508, JB-513..............GE-35Z4GT
Model JB-514......................GE-117Z6GT

GENERAL INFORMATION

The Models JB-513 and JB-514 are portable, five-tube, superheterodyne receivers which are designed to operate on any one of three types of power supplies as listed under electrical specifications. Features of design include power selector switch, built-in Beam-a-Scope, 5-inch dynapower speaker and automatic volume control. Model JB-508 and JB-513 have a dial light which operates when the receiver is connected to an AC or DC power supply.

The Model JB-508 is a portable radio-phonograph combination employing a radio chassis similar to JB-513. The phonograph consists of a spring-wound Swiss motor and crystal pick-up. The Swiss motor will play two 10-inch records with one winding. A speed regulator controls the speed above and below 78 R.P.M.

Model JB-514 has full Underwriters' approval.

To switch these models from battery to external power supply operation, open the small door in the side of the cabinet, slide the button switch to "Line," which is to the right, and insert the cord plug in a power supply of the proper voltage and frequency. The button switch selects the battery or line power supply.

When these models are working on batteries, they will perform as soon as turned "on." However, when operating on an external power supply, sufficient time must be allowed for the tubes to become heated. When operating from a DC source of power, it is necessary to insert the power plug with the 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.

Outside antenna connections may be made to two black leads available in the chassis compartment.

BATTERY AND TUBE INSTALLATION

Models JB-513 and JB-514

The batteries may be installed or replaced without removing the Beam-a-Scope antenna from the chassis. Place the two "B" batteries on the bottom of the cabinet with the terminal sockets facing each other. Place the "A" battery on top of the "B" batteries with its terminal socket toward the left.

To replace tubes it is necessary to detach the Beam-a-Scope from the supporting blocks. Do not strain the two leads connected to the Beam-a-Scope.

Model JB-508

To install or replace batteries remove the five wood screws which hold the motorboard in place, and raise the panel. (NOTE—The motor crank must be removed from the crank socket before the panel can be raised.) The panel can be freed if the two plug connectors are pulled out of the socket terminals in the chassis apron.

Access to the battery compartment having been made, loosen the battery block held by the wing nuts. Place the two "B" batteries in the bottom sections, terminals inward, and insert the two 3-prong plug connectors. The "A" battery is placed on top of the "B" batteries with terminal toward the removable block and the 2-prong plug connector attached. Replace the battery block and tighten the wing nuts.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.....455 KC   Broadcast—1700 and 1500 KC

General Alignment Notes

This receiver must be removed from the carrying case in order to perform the alignment. Special care must be exercised to place the batteries, Beam-a-Scope and chassis in the same relative positions with respect to one another as these components occupied in the case; otherwise, alignment will not be satisfactory. When aligning Model JB-508 the radio-phono switch must be on "radio."

I.F. Alignment

With batteries, Beam-a-Scope and chassis in position for alignment as mentioned above, connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 KC. Attach the test oscillator output leads to the two flexible leads of the Beam-a-Scope antenna. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum output.

R.F. Alignment

Connect the signal generator output leads to the two flexible leads on the receiver Beam-a-Scope. Adjust the signal generator to 1700 KC and set the tuning condenser to minimum capacity. Turn the trimmer screw of the cut section of the tuning condenser (oscillator) until the signal is tuned in on the receiver. Change the signal to 1500 KC, retune the tuning condenser to this frequency and adjust the trimmer screw of the antenna section for maximum output.

VOLTAGE CHART

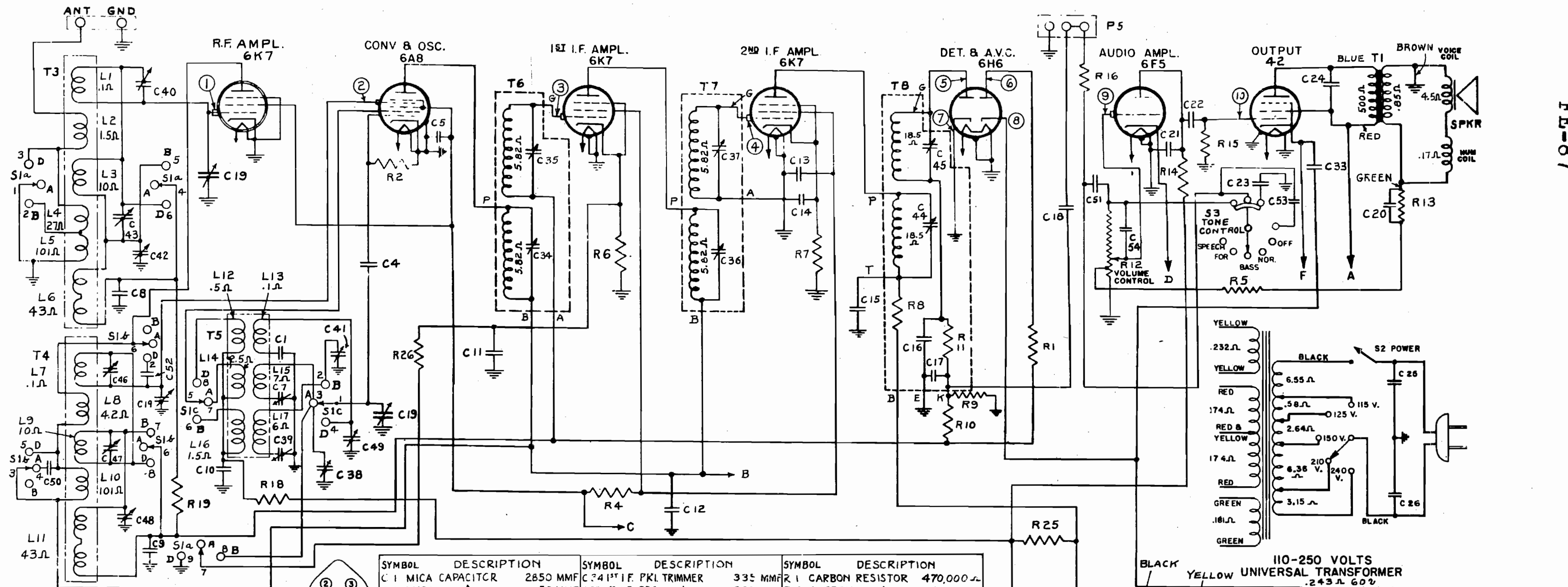
(Receiver connected to 120 Volt AC line)

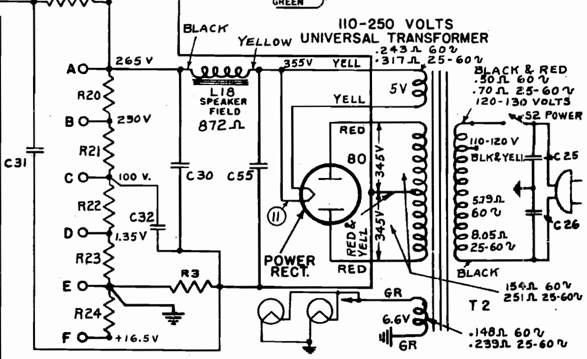
Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Filament to Gnd. Volts	Filament Volts
1A7GT	92	38	3.2	1.6
1N5GT	92	92	4.8	1.6
1H5GT	10		1.6	1.6
1T5GT	88	92	6.4	1.6
35Z4GT*	120 AC		125 Cathode to Gnd.	30
117Z6GT**	120 AC		125 Cathode to Gnd.	120 AC

* Used only in Models JB-513 and JB-508.
**Used only in Model JB-514.
Line—120 Volts AC.
Maximum Volume—Gang Closed—No signal input.
All voltages measured to chassis ground in Models JB-508 and JB-513.
Voltages measured to B minus in Model JB-514.

MODELS FE-82
FE-87

GENERAL ELECTRIC CO.



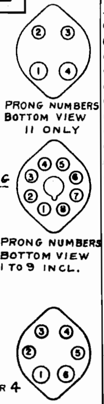


ALL VOLTAGES TO GROUND UNLESS OTHERWISE SPECIFIED
ALL VOLTAGES MEASURED WITH ANT. & GND TERMINALS SHORTED &
120 V. ON 115 V. PRI. TAP

CONDITIONS OF TEST
WAVE SWITCH ON BAND "B"
POWER SWITCH OFF

APPROXIMATE RESISTANCE MEASUREMENTS

RESISTANCE TO GND	TUBE	SOCKET PRONG
(1) 2.47 MEG Ω	R.F. GRID	CAP
(2) 2.42 MEG Ω	CONV. GRID	CAP
(3) 2.42 MEG Ω	1st I.F. GRID	CAP
(4) 6.0 Ω	2nd I.F. GRID	CAP
(5) 288,000 Ω	DIODE PLATE	PRONG 3
(6) 2.89 MEG Ω	DIODE PLATE	PRONG 5
(7) GROUNDED	DIODE CATH.	PRONG 4
(8) 47 Ω	DIODE CATH.	PRONG 8
(9) 0-2 MEG. VOL. CONT.	A.F. GRID	CAP
(10) .5 MEG. Ω	OUTPUT GRID	PRONG 5
(11) 20,125 Ω	80 FILAMENT	PRONG 1 OR 4



PRONG NUMBERS BOTTOM VIEW 11 ONLY

PRONG NUMBERS BOTTOM VIEW 1 TO 9 INCL.

PRONG NUMBERS BOTTOM VIEW 10 ONLY

SYMBOL	DESCRIPTION	
C 1	MICA CAPACITOR	2850 MMF
C 4	MICA	50 MMF
C 5	PAPER CAPACITOR	.25 MF
C 7	'A' PADDER TRIMMER	75-150 MMF
C 8	PAPER CAPACITOR	.05 MF
C 9	PAPER	.05 MF
C 10	PAPER	.1 MF
C 11	PAPER	.05 MF
C 12	PAPER	.1 MF
C 13	PAPER	.25 MF
C 14	PAPER	.05 MF
C 15	PAPER	.02 MF
C 16	MICA	250 MMF
C 17	MICA	75 MMF
C 18	PAPER	.005 MF
C 19	TUNING	10-450 MMF
C 20	PAPER	.05 MF
C 21	MICA	250 MMF
C 22	PAPER	.01 MF
C 23	PAPER	.001 MF
C 24	PAPER	.008 MF
C 25	PAPER	.01 MF
C 26	PAPER	.01 MF
C 30	DRY ELEC.	20 MF
C 31	DRY ELEC.	4 MF
C 32	DRY ELEC.	4 MF
C 33	DRY ELEC. CAPACITOR	10 MF

SYMBOL	DESCRIPTION	
C 34	1st I.F. PRI. TRIMMER	335 MMF
C 35	1st I.F. SEC.	335 MMF
C 36	2nd I.F. PRI.	335 MMF
C 37	2nd I.F. SEC.	335 MMF
C 38	'A' OSC.	20-75 MMF
C 39	'B' PADDER	350-550 MMF
C 40	'D' ANT.	5-30 MMF
C 41	'B' OSC.	5-45 MMF
C 42	'A' ANT.	5-45 MMF
C 43	'B' ANT.	5-30 MMF
C 44	3rd I.F. PRI.	190 MMF
C 45	3rd I.F. SEC.	190 MMF
C 46	'D' R.F.	2-20 MMF
C 47	'B' R.F.	2-20 MMF
C 48	'A' R.F.	5-45 MMF
C 49	'D' OSC. TRIMMER	5-45 MMF
C 50	MICA CAPACITOR	250 MMF
C 51	MICA	500 MMF
C 52	MICA	20 MMF
C 53	MICA	500 MMF
C 54	MICA	35 MMF
C 55	WET ELEC. CAPACITOR	16 MF
S 1	BAND CHANGE SWITCH	
S 2	POWER SWITCH (PART OF S3)	
S 3	TONE CONTROL SWITCH	

SYMBOL	DESCRIPTION	
R 1	CARBON RESISTOR	470,000 Ω
R 2	CARBON	47,000 Ω
R 3	CARBON	47 Ω
R 4	CARBON	2,200 Ω
R 5	CARBON	22,000 Ω
R 6	CARBON	10,000 Ω
R 7	CARBON	680 Ω
R 8	CARBON	4,700 Ω
R 9	CARBON	220,000 Ω
R 10	CARBON	2.2 MEG Ω
R 11	CARBON RESISTOR	68,000 Ω
R 12	VOLUME CONTROL (TAP AT 5000 Ω)	2 MEG. Ω
R 13	CARBON RESISTOR	220,000 Ω
R 14	CARBON	220,000 Ω
R 15	CARBON	470,000 Ω
R 16	CARBON	220,000 Ω
R 18	CARBON	1,500 Ω
R 19	CARBON	47,000 Ω
R 20	CANDOHM	1,500 Ω
R 21	CANDOHM	8,500 Ω
R 22	CANDOHM	10,000 Ω
R 23	CANDOHM	125 Ω
R 24	CANDOHM	410 Ω
R 25	CARBON	18,000 Ω
R 26	CARBON RESISTOR	560 Ω

POWER CONSUMPTION-- 95 WATTS

Tuning Frequency Range
Band "A" .... 140-380 kc.
Band "B" .... 540-1620 kc.
Band "D" .... 5800-18,000 kc.
Intermediate Frequency .... 455 kc.

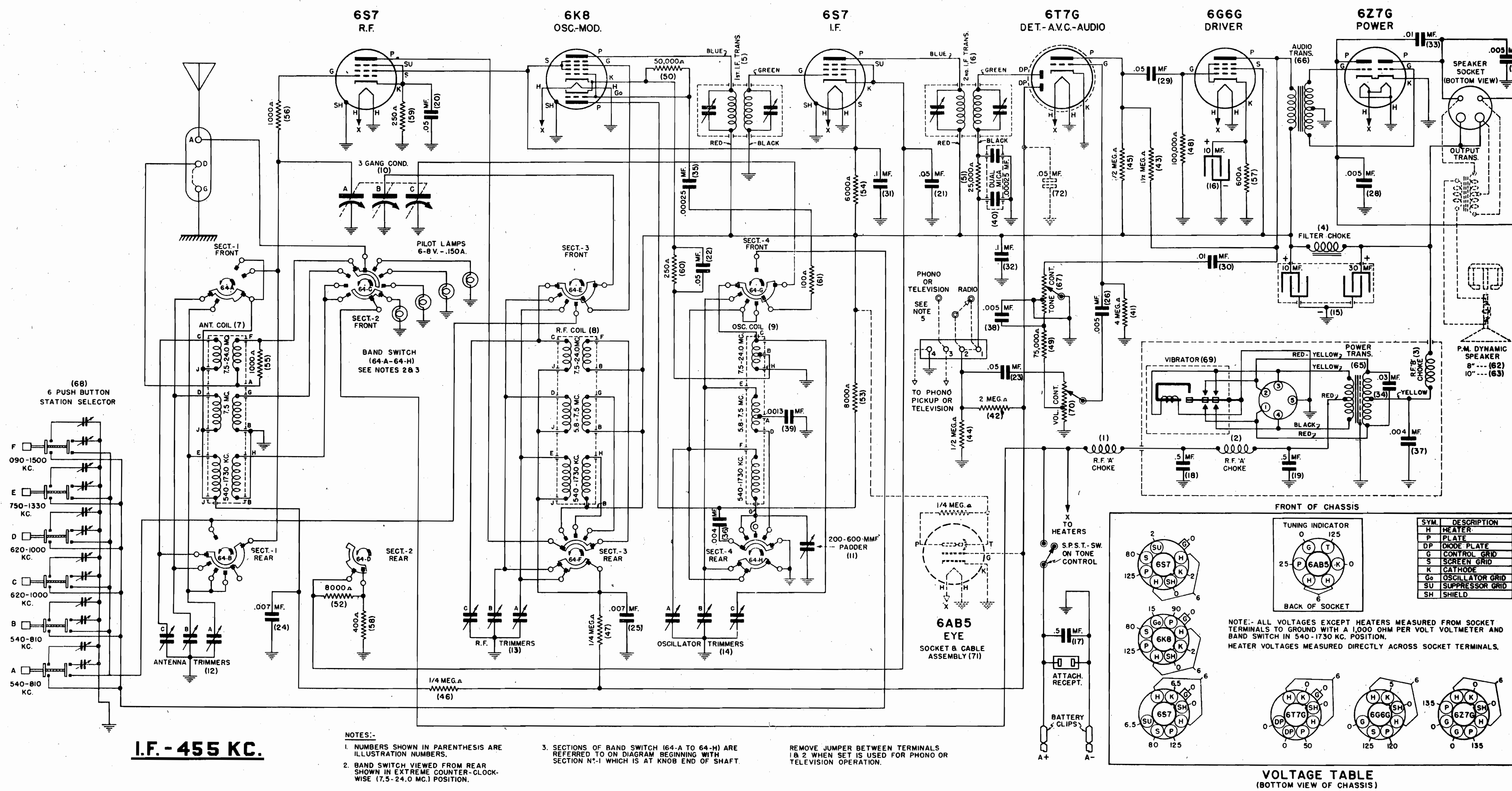
FOR OTHER DATA
SEE INDEX

-1940-

Electrical Output
Undistorted .... 2.5 watts
Maximum .... 5.0 watts

Loud-speaker—Electrodynamic
Cone: Model FE-82 .... 8 inch
Model FE-87 .... 12 inch
Voice Coil Impedance .... 5.5 ohms at 400 cycles

GENERAL ELECTRIC CO.



I.F. - 455 KC.

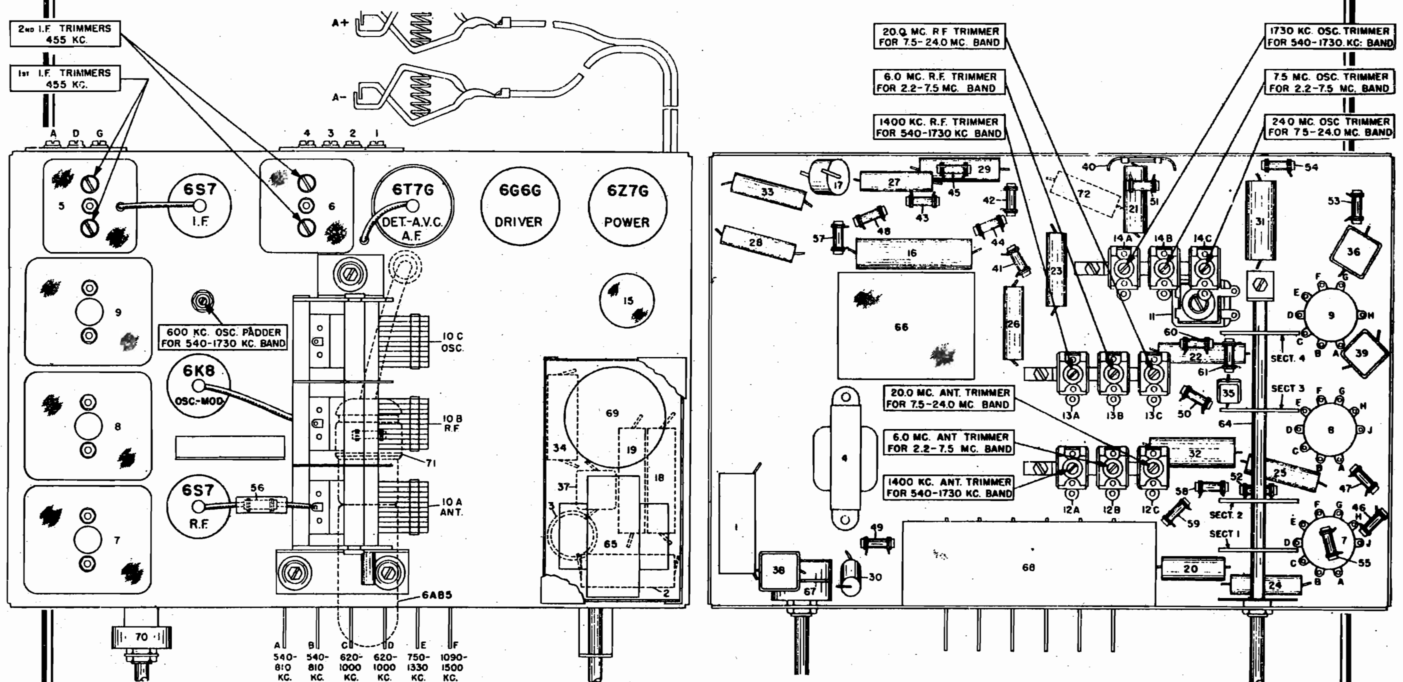
NOTES:-

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH VIEWED FROM REAR SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION.
3. SECTIONS OF BAND SWITCH (64-A TO 64-H) ARE REFERRED TO ON DIAGRAM BEGINNING WITH SECTION Nº-1 WHICH IS AT KNOB END OF SHAFT.

REMOVE JUMPER BETWEEN TERMINALS 1 & 2 WHEN SET IS USED FOR PHONO OR TELEVISION OPERATION.

MODEL JB-72

GENERAL ELECTRIC CO.



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.
(b) Use an accurately calibrated test oscillator with some type of output measuring device.
(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator: consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I.F. ALIGNMENT use any band position		Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 TO 540 K.C. BAND	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna and R.F. trimmers for maximum output
	3	Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
2.2 TO 7.5 M.C. BAND	1	Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer for maximum output.
	2	Approx. 6. M.C.	Exactly 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M.C. antenna and R.F. trimmers for maximum output
7.5 TO 24 M.C. BAND	1	Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. The image of the 24 M. C. Signal should be heard at 24.91 M. C. when the correct peak is used.
	2	Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna and R.F. trimmers for maximum output

THE FOLLOWING DATA WILL BE USEFUL TO SERVICE MEN EQUIPPED WITH VACUUM-TUBE VOLTMETERS OR SIMILAR VOLTAGE MEASURING INSTRUMENTS:

(1) Stage Gains .... Gain †
- Antenna Post to 6S7 R. F. Grid .... 8 at 1000 KC
- 6S7 R. F. Grid to 6K8 Converter Grid .... 12 at 1000 KC
- 6K8 Converter Grid to 6S7 I. F. Grid .... 28 at 455 KC
- 6S7 I. F. Grid to 6T7G Diode Plate .... 50 at 455 KC

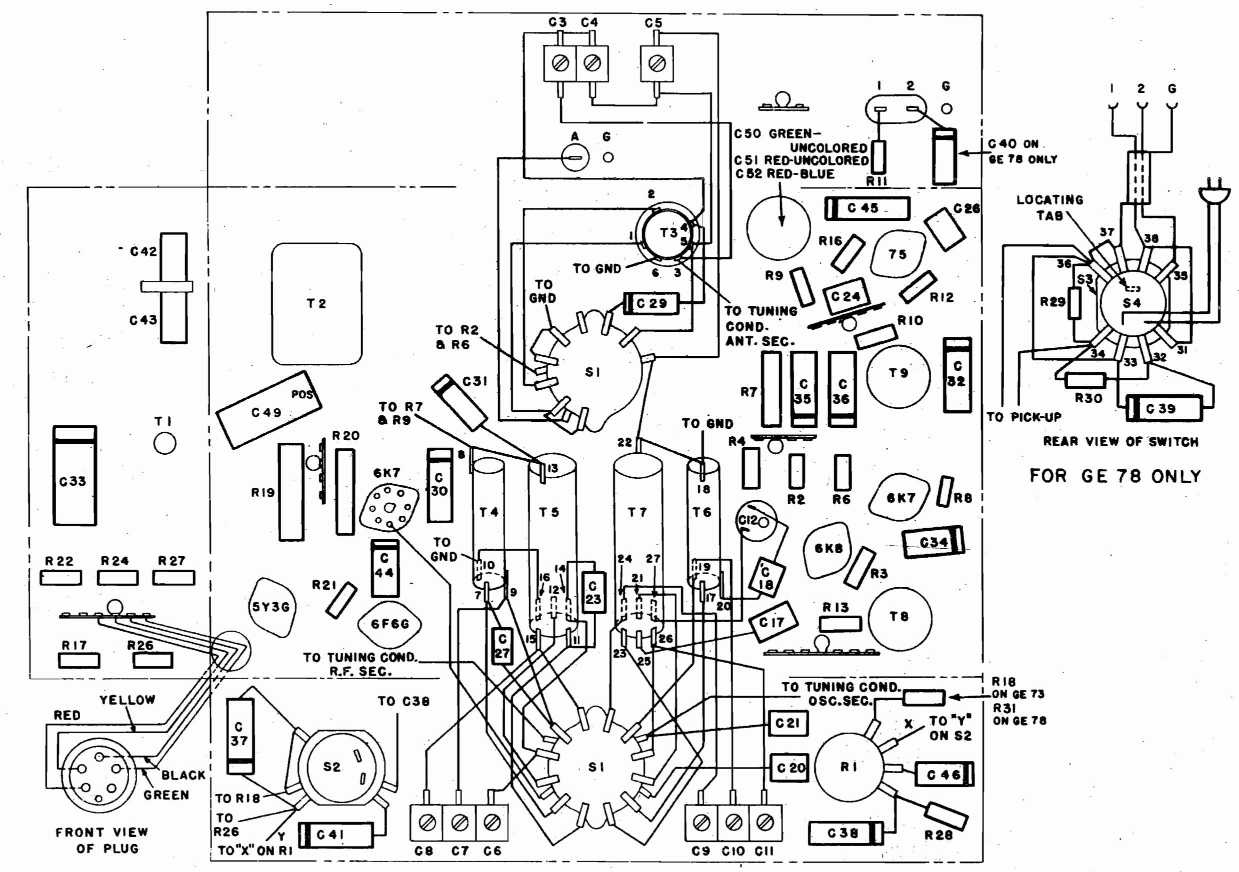
(2) Audio Gain
A 400 cycle signal of .05 volts across volume control will give approximately ½ watt speaker output. Volume control turned to maximum.)

(3) DC voltage developed across oscillator grid resistor (50) averages 15 volts at 1000 KC.

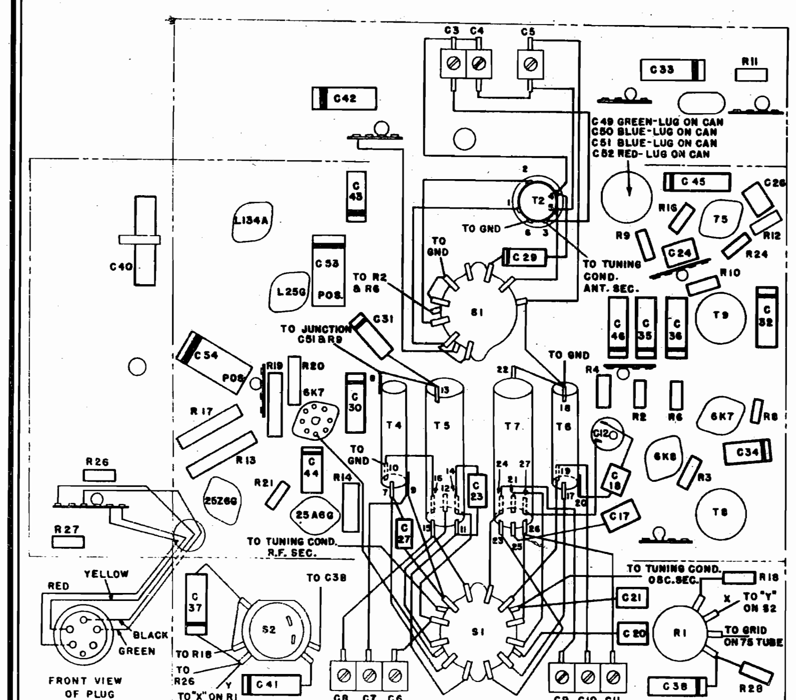
† Variations of +10% —20% permissible.

MODELS GE-73, GE-78
MODEL GDE-73

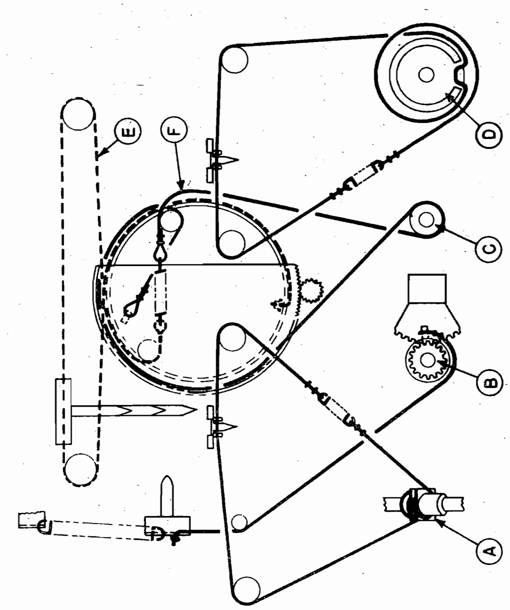
GENERAL ELECTRIC CO.



Chassis Parts Layout (GE-73 and GE-78)



Chassis Parts Layout (GDE-73)

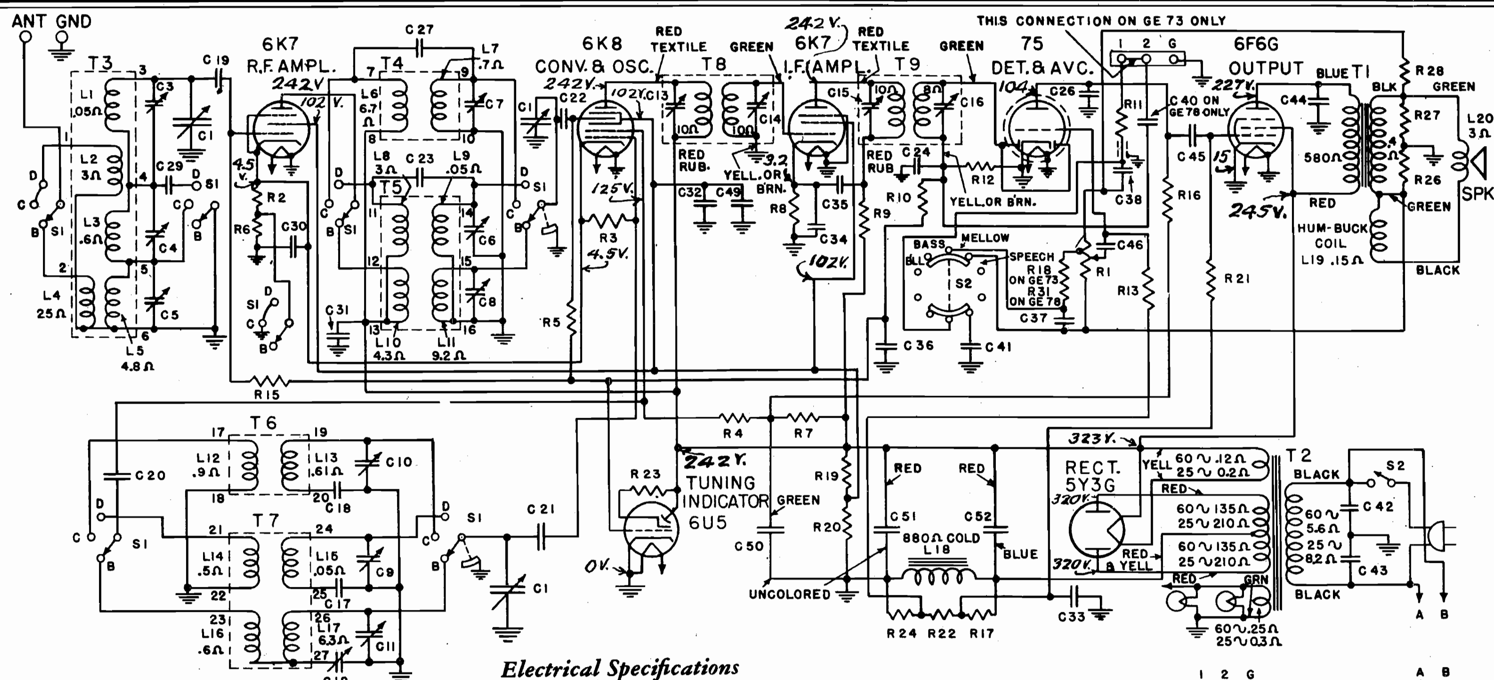


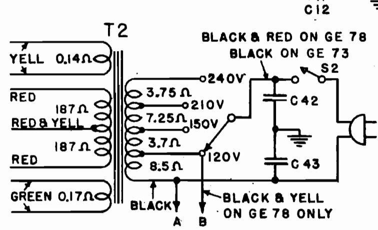
DIAL DRIVE

Models GE-73, GE-78, and GDE-73

MODELS GE-73
GE-78

GENERAL ELECTRIC CO.





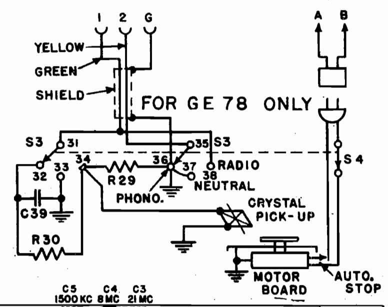
UNIVERSAL POWER TRANSFORMER

Electrical Specifications

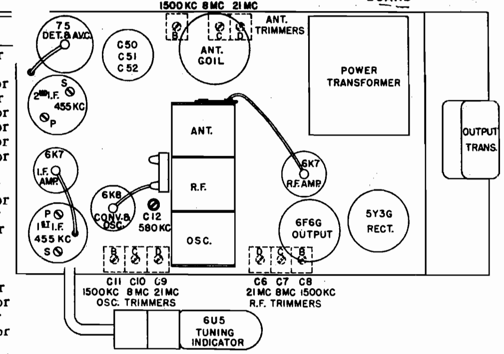
Model GE-73
Rating "A," 115–125 volts, 50–60 cycles, 80 watts
Rating "V," 115–250 volts, 50–60 cycles, 85 watts
Model GE-78
Rating "V-6," 115–250 volts, 60 cycles, 115 watts
Rating "V-5," 115–250 volts, 50 cycles, 115 watts
Rating "C-4," 115–125 volts, 40 cycles, 115 watts

COMPONENTS MARKED WITH (*) ON LIST BELOW ARE USED IN MODEL GE-78 ONLY.

-1940-
I.F. 455 KC
FOR OTHER DATA SEE INDEX

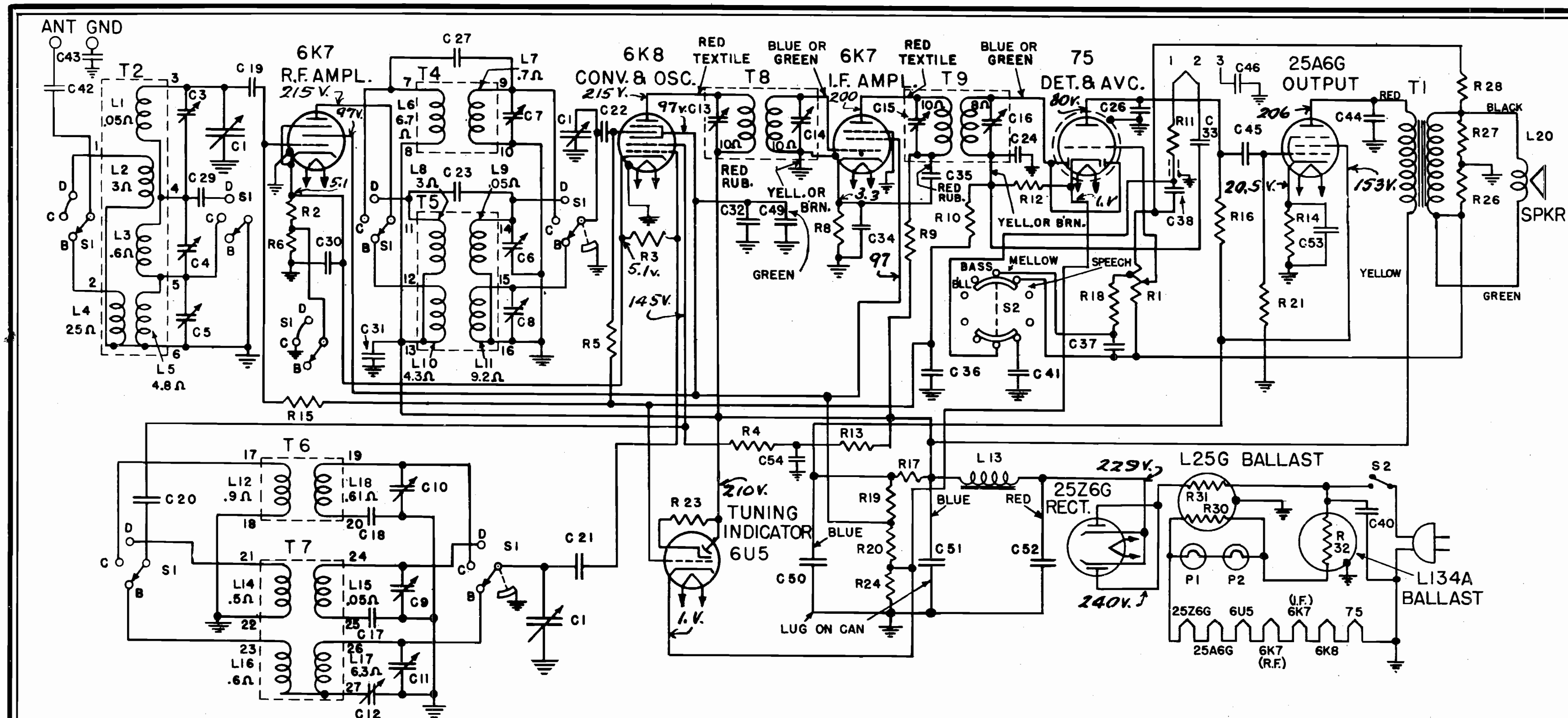


Symbol	Description	Symbol	Description	Symbol	Description
C1	450 Mmf. Tuning Condenser	*C40	.5 Mfd. Paper Capacitor	R10	2.2 Megohm Carbon Resistor
C3, C4, C5	Antenna Trimmer Capacitor	C41	.0015 Mfd. Paper Capacitor	R11	47,000 Ohm Carbon Resistor
C6, C7, C8	R.F. Trimmer Capacitor	C42, C43	.01 Mfd. Paper Capacitor	R12	330,000 Ohm Carbon Resistor
C9, C10, C11	Oscillator Trimmer Capacitor	C44	.008 Mfd. Paper Capacitor	R13	2.2 Megohm Carbon Resistor
C12	400–650 Mmf. Padder Capacitor	C45, C46	.05 Mfd. Paper Capacitor	R15	560,000 Ohm Carbon Resistor
C17	2400 Mmf. Mica Capacitor	C49	8 Mfd. Dry Electrolytic Capacitor	R16	330,000 Ohm Carbon Resistor
C18	1600 Mmf. Mica Capacitor	C50, C51, C52	Filter Dry Electrolytic Capacitor	R17	390,000 Ohm Carbon Resistor
C19 C20	390 Mmf. Mica Capacitor	T1	Output Transformer	R18	100,000 Ohm Carbon Resistor
C21	50 Mmf. Mica Capacitor	T2	Power Transformer	R19	8,200 Ohm Carbon Resistor
C22	390 Mmf. Mica Capacitor	S1	Band Change Switch	R20	15,000 Ohm Carbon Resistor
C23	15 Mmf. Mica Capacitor	S2	Tone and Power Switch	R21	470,000 Ohm Carbon Resistor
C24	100 Mmf. Mica Capacitor	*S3	Phono-Radio Switch	R22	82,000 Ohm Carbon Resistor
C26	220 Mmf. Mica Capacitor	R1	2.0 Megohm Volume Control	R23	1.0 Megohm Carbon Resistor
C27	15 Mmf. Mica Capacitor	R2	120 Ohm Carbon Resistor	R24	8,200 Ohm Carbon Resistor
C29	.0045 Mfd. Paper Capacitor	R3	47,000 Ohm Carbon Resistor	R26	22 Ohm, Carbon Resistor
C30, C31, C32	.05 Mfd. Paper Capacitor	R4	2,200 Ohm Carbon Resistor	R27	100 Ohm Carbon Resistor
C33	.25 Mfd. Paper Capacitor	R5	560,000 Ohm Carbon Resistor	R28	3.3 Megohm Carbon Resistor
C34, C35, C36	.05 Mfd. Paper Capacitor	R6	180 Ohm Carbon Resistor	*R29	100,000 Ohm Carbon Resistor
C37	.003 Mfd. Paper Capacitor	R7	15,000 Ohm Carbon Resistor	*R30	47,000 Ohm Carbon Resistor
C38	.005 Mfd. Paper Capacitor	R8	330 Ohm Carbon Resistor	*R31	220,000 Ohm Carbon Resistor
*C39	.001 Mfd. Paper Capacitor	R9	2200 Ohm Carbon Resistor		



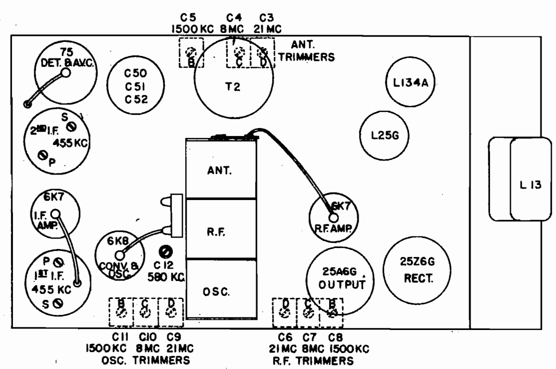
MODEL GDE-73

GENERAL ELECTRIC CO.



Symbol	Description	Symbol	Description
C1	450 Mmf. Tuning Condenser	S1	Band Change Switch
C3, C4, C5	Antenna Trimmer Capacitor	S2	Tone and Power Switch
C6, C7, C8	R.F. Trimmer Capacitor	R1	2.0 Megohm Volume Control
C9, C10, C11	Oscillator Trimmer Capacitor	R2	120 Ohm Carbon Resistor
C12	400–650 Mmf. Padder Capacitor	R3	47,000 Ohm Carbon Resistor
C17	2400 Mmf. Mica Capacitor	R4	2,200 Ohm Carbon Resistor
C18	1600 Mmf. Mica Capacitor	R5	560.000 Ohm Carbon Resistor
C19, C20	390 Mmf. Mica Capacitor	R6	180 Ohm Carbon Resistor
C21	50 Mmf. Mica Capacitor	R8	470 Ohm Carbon Resistor
C22	390 Mmf. Mica Capacitor	R9	2200 Ohm Carbon Resistor
C23	15 Mmf. Mica Capacitor	R10	2.2 Megohm Carbon Resistor
C24	100 Mmf. Mica Capacitor	R11	47,000 Ohm Carbon Resistor
C26	220 Mmf. Mica Capacitor	R12	330,000 Ohm Carbon Resistor
C27	15 Mmf. Mica Capacitor	R13	10,000 Ohm Carbon Resistor
C29	.0045 Mfd. Paper Capacitor	R14	470 Ohm Carbon Resistor
C30, C31, C32	.05 Mfd. Paper Capacitor	R15	560,000 Ohm Carbon Resistor
C33	.01 Mfd. Paper Capacitor	R16	330,000 Ohm Carbon Resistor
C34, C35, C36	.05 Mfd. Paper Capacitor	R17	2,200 Ohm Carbon Resistor
C37	.004 Mfd. Paper Capacitor	R18	100,000 Ohm Carbon Resistor
C38	.005 Mfd. Paper Capacitor	R19	3,300 Ohm Carbon Resistor
C40	.05 Mfd. Paper Capacitor	R20	10,000 Ohm Carbon Resistor
C41	.0015 Mfd. Paper Capacitor	R21	470,000 Ohm Carbon Resistor
C42, C43	.01 Mfd. Paper Capacitor	R23	1.0 Megohm Carbon Resistor
C44	.008 Mfd. Paper Capacitor	R24	82 Ohm Carbon Resistor
C45	.05 Mfd. Paper Capacitor	R26, R27	100 Ohm Carbon Resistor
C46	.25 Mfd. Paper Capacitor	R28	1.2 Megohm Carbon Resistor
C49–C52	Dry Electrolytic Filter Capacitor	R30, R31	Ballast resistance, L25G
C53	10 Mfd. Dry Electrolytic Capacitor	R32	455 Ohm 50 W. W.W. Resistor
C54	8 Mfd. Dry Electrolytic Capacitor		
T1	Output Transformer		

Model GDE-73
220–240 volts A.C., 40–100 cycles, 105 watts
220–240 volts D.C., 105 watts

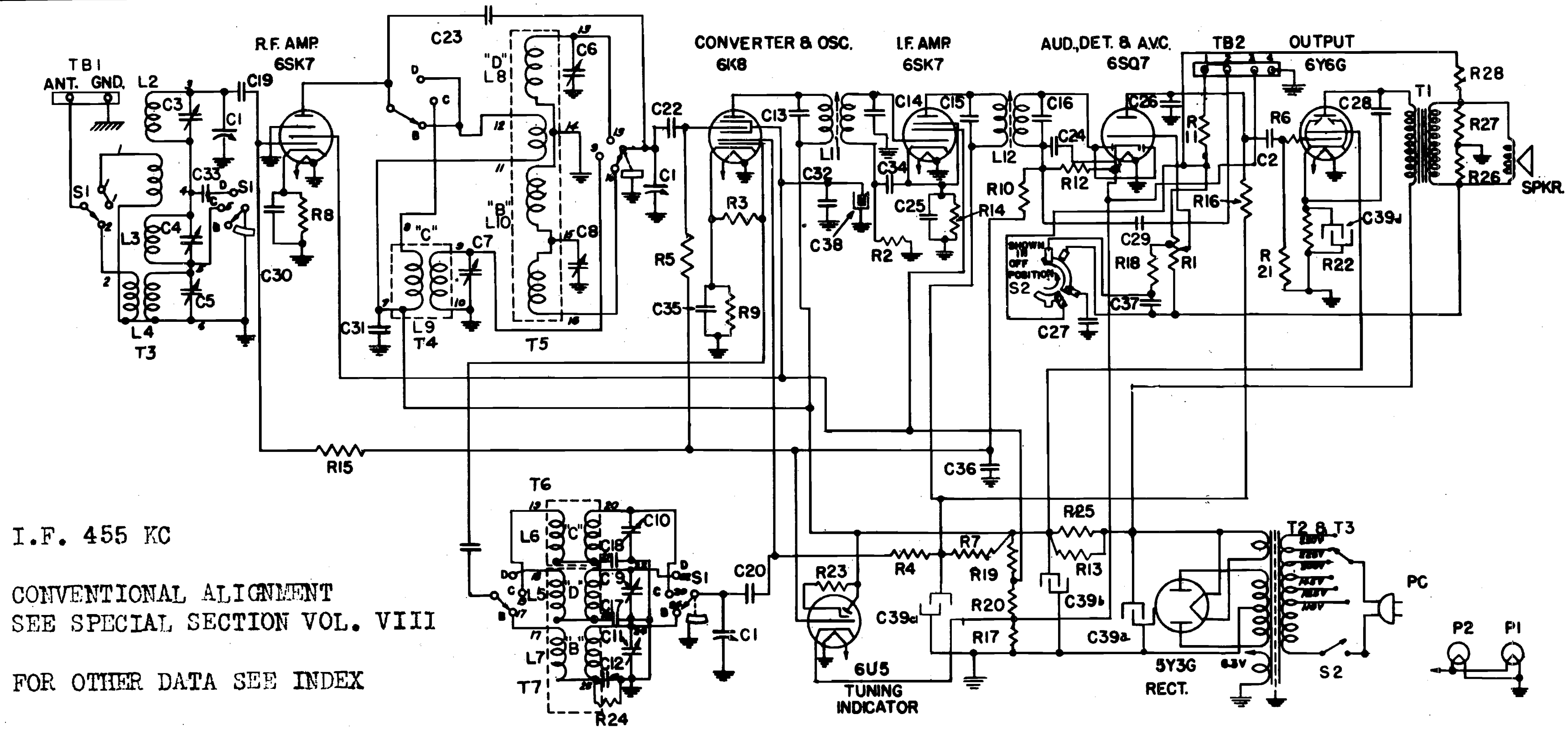


-1940-
I.F. 455 KC

FOR OTHER DATA
SEE INDEX

MODEL HE-74

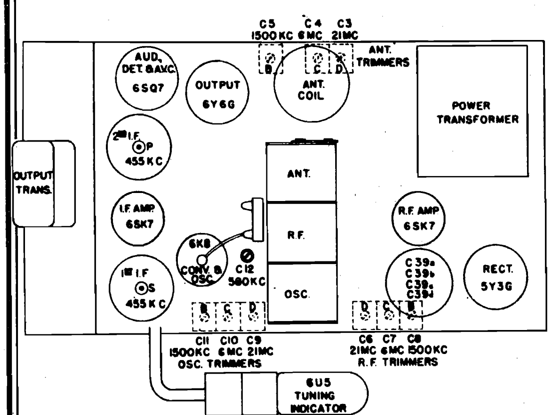
GENERAL ELECTRIC CO.



I.F. 455 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

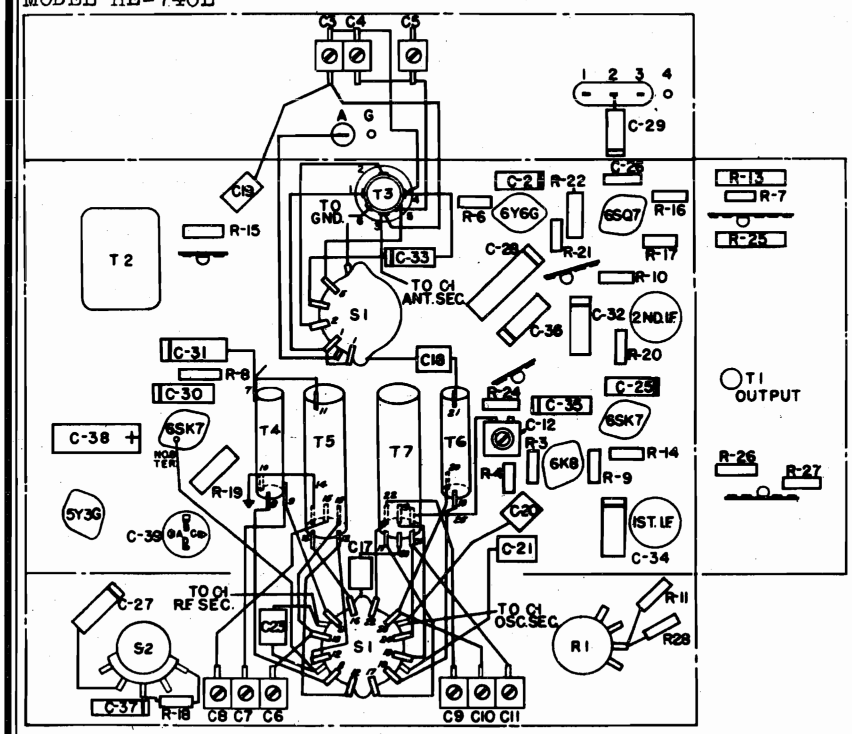
FOR OTHER DATA SEE INDEX



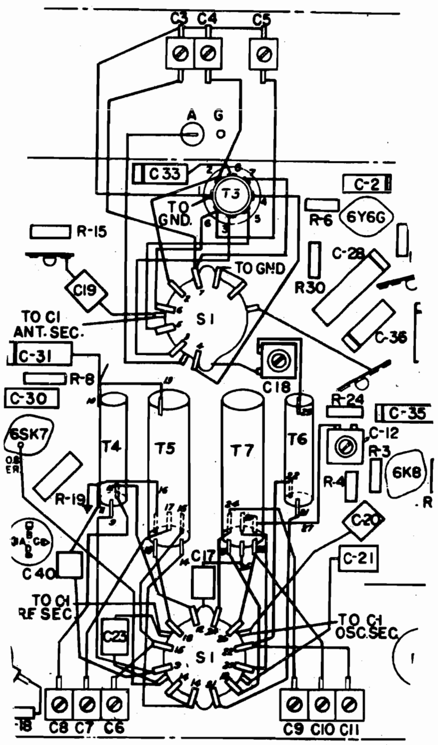
Symbol	Description	Symbol	Description	Symbol	Description
C1	450 Mmf. Tuning Condenser	C28	.03 Mfd. 1500 V. Paper	R7	1,000 Ohms, ½-w. Carbon
C2	.05 Mfd. 600 V. Paper	C29	.002 Mfd. 600 V. Paper	R8	560 Ohms, ½-w. Carbon
C3	5–40 Mmf. "D" Ant. Trimmer	C30	.05 Mfd. 200 V. Paper	R9	220 Ohms, ½-w. Carbon
C4	3–30 Mmf. "C" Ant. Trimmer	C31	.05 Mfd. 600 V. Paper	R10	2.2 Megohms, ½-w. Carbon
C5	2–20 Mmf. "B" Ant. Trimmer	C32	.05 Mfd. 600 V. Paper	R11	47,000 Ohms, ½-w. Carbon
C6	3–30 Mmf. "D" R.F. Trimmer	C33	.006 Mfd. 600 V. Paper ±5%	R12	330,000 Ohms, ½-w. Carbon
C7	3–30 Mmf. "C" R.F. Trimmer	C34	.05 Mfd. 200 V. Paper	R13	3,900 Ohms, 2-w. Carbon
C8	3–30 Mmf. "B" R.F. Trimmer	C35	.05 Mfd. 200 V. Paper	R14	330 Ohms, ½-w. Carbon
C9	3–30 Mmf. "D" Osc. Trimmer	C36	.05 Mfd. 200 V. Paper	R15	560,000 Ohms, ½-w. Carbon
C10	3–30 Mmf. "C" Osc. Trimmer	C37	.003 Mfd. 600 V. Paper	R16	330,000 Ohms, ½-w. Carbon
C11	5–45 Mmf. "B" Osc. Trimmer	C38	8 Mfd. 250 V. Dry Elec.	R17	150 Ohms, ½-w. Carbon
C12	300–650 Mmf. "B" Osc. Padder	C39a	40 Mfd. 350 V. Dry Elec.	R18	220,000 Ohms, ½-w. Carbon
C17	2800 Mmf. Mica ±5%	C39b	20 Mfd. 300 V. Dry Elec.	R19	2,700 Ohms, 2-w. Carbon
C18	1600 Mmf. Mica ±5%	C39c	20 Mfd. 300 V. Dry Elec.	R20	15,000 Ohms, 1-w. Carbon
C19	470 Mmf. Mica	C39d	20 Mfd. 25 V. Dry Elec.	R21	470,000 Ohms, ½-w. Carbon
C20	470 Mmf. Mica	P1	Pilot Light, Mazda No. 44	R22	220 Ohms, 2-w. Carbon ±5%
C21	50 Mmf. Mica	P2	Pilot Light, Mazda No. 44	R23	1.0 Megohms, ½-w. Carbon
C22	470 Mmf. Mica	R1	2.0 Megohms Volume Control	R24	5,600 Ohms, ½-w. Carbon
C23	10 Mmf. Mica	R2	330,000 Ohms, ½-W. Carbon	R25	3,900 Ohms, 2-w. Carbon
C24	100 Mmf. Mica	R3	33,000 Ohms, ½-W. Carbon	R26	22 Ohms, ½-w. Carbon
C25	.04 Mfd. 600 V. Paper	R4	15,000 Ohms, ½-W. Carbon	R27	100 Ohms, ½-w. Carbon
C26	220 Mmf. Mica	R5	560,000 Ohms, ½-W. Carbon	R28	5.6 Megohms, ½-w. Carbon
C27	.00075 Mfd. 600 V. Paper	R6	1,000 Ohms, ½-W. Carbon		

MODEL HE-74
MODEL HE-74L
MODEL HE-740
MODEL HE-740L

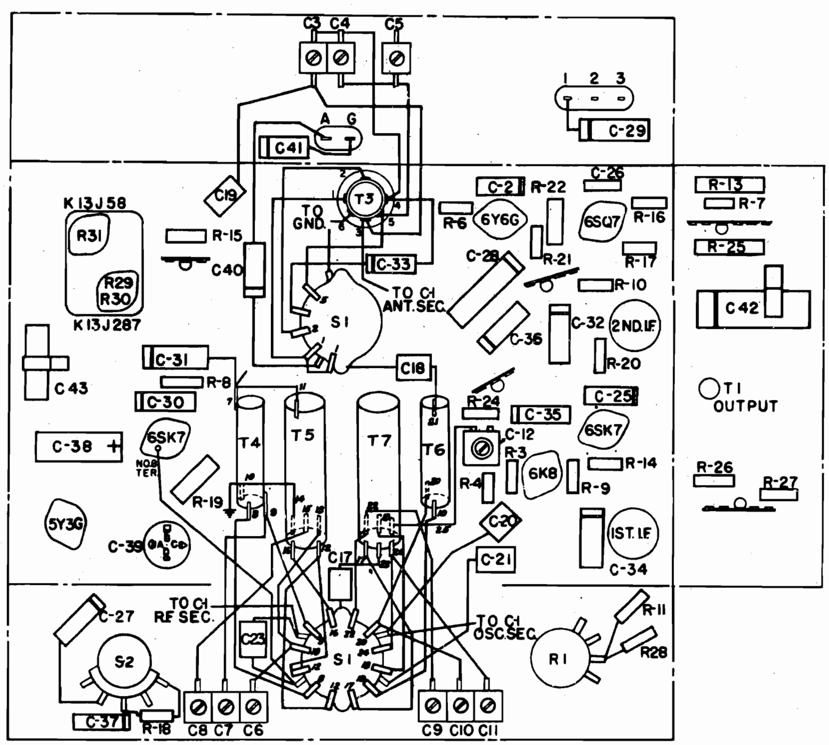
GENERAL ELECTRIC CO.



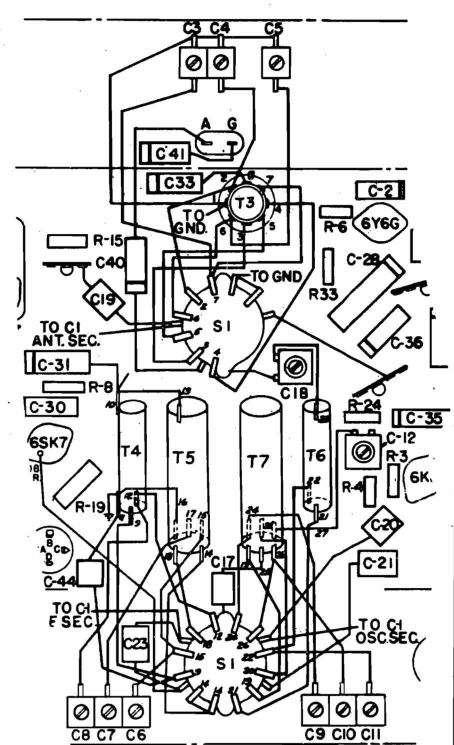
CHASSIS PARTS LAYOUT
MODEL HE-74



CHASSIS PARTS LAYOUT
(PARTIAL)
MODEL HE-74L
BALANCE SAME AS HE-74



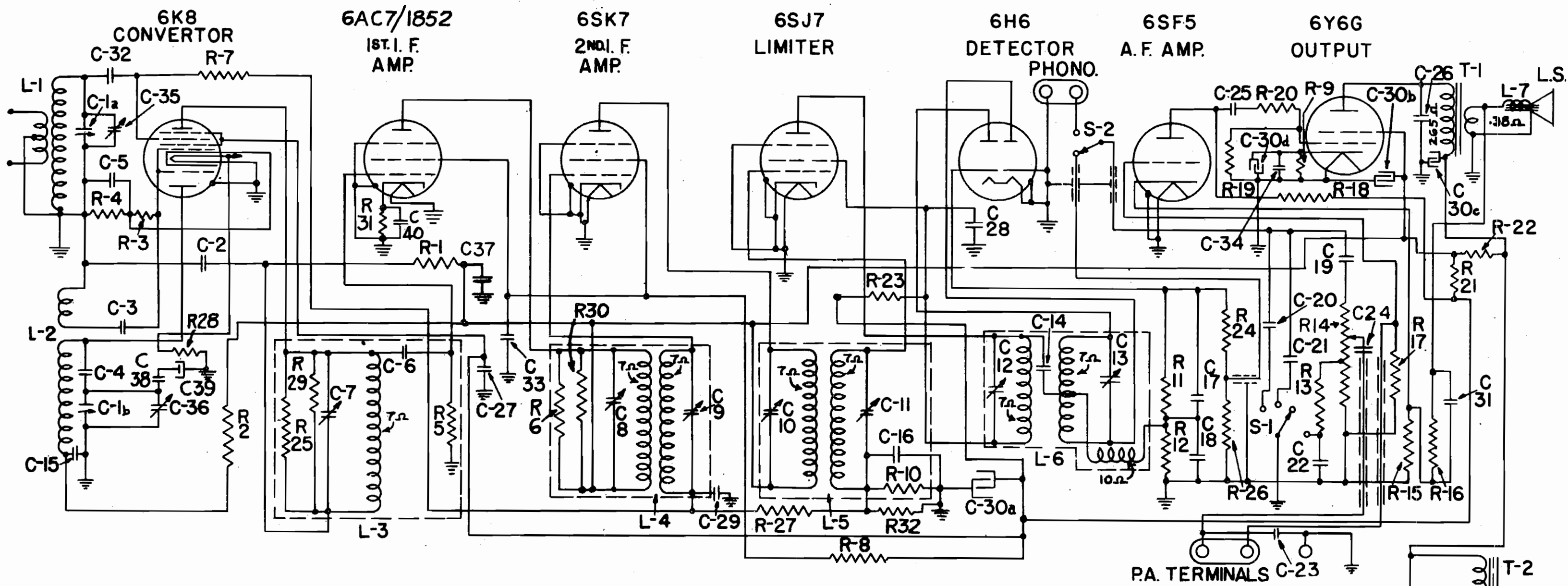
CHASSIS PARTS LAYOUT
MODEL HE-740

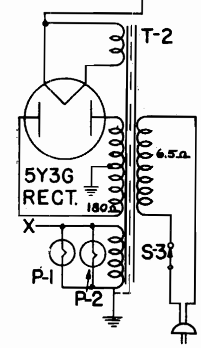


CHASSIS PARTS LAYOUT
MODEL HE-740L
(PARTIAL)
BALANCE SAME AS HE740

MODELS HM-80A
HM-85A

GENERAL ELECTRIC CO.





Models HM-80A and HM-85A

General Electric Frequency Modulation Receivers, Models HM-80A and HM-85A are designed for the reception of ultra-short-wave broadcasting as developed by Major Edward H. Armstrong. These receivers of the superheterodyne type using eight General Electric Pre-tested Tubes are similar to Models HM-80 and HM-85 respectively. Certain circuit changes have been incorporated in the Models HM-80A and HM-85A to increase sensitivity, improve limiter action, and assure greater stability. A revised schematic diagram and additional replacement parts list are incorporated in this sheet.

For specifications, general information and alignment procedure, refer to HM -80 Service Notes. The tube complement is altered by the substitution of a 6AC7/1852 in place of the 6SK7 1st I.F. amplifier tube.

OSCILLATOR DRIFT CORRECTION NETWORK

The placement of the parts comprising this network materially affects the amount of oscillator drift correction. For maximum performance the positions of the 47-ohm, 1-watt resistor (R-28) and the 5-mmf. compensating capacitor (C-39) should be adjusted until they are parallel and separated by exactly $\frac{1}{16}$ inch.

Symbol	Description
C-1	20 mmf. tuning condenser
C-2	.02 mfd. paper capacitor
C-3	47 mmf. mica capacitor
C-4	1200 mmf. mica capacitor ±5%
C-5	.05 mfd. paper capacitor
C-6	500 mmf. trimmer
C-14	47 mmf. mica capacitor
C-15	470 mmf. mica capacitor
C-16	22 mmf. mica capacitor
C-17	100 mmf. mica capacitor
C-18	100 mmf. mica capacitor
C-19	.005 mfd. paper capacitor
C-20	.002 mfd. paper capacitor
C-21	470 mmf. mica capacitor
C-22	.002 mfd. paper capacitor
C-23	220 mmf. mica capacitor
C-24	.005 mfd. paper capacitor
C-25	.05 mfd. paper capacitor
C-26	.005 mfd. paper capacitor
C-27	.005 mfd. paper capacitor
C-28	.05 mfd. paper capacitor
C-29	.05 mfd. paper capacitor
C-30a	20 mfd. 250 V. dry electrolytic
C-30b	20 mfd. 250 V. dry electrolytic
C-30c	40 mfd. 250 V. dry electrolytic
C-30d	20 mfd. 25 V. dry electrolytic
C-31	0.1 mfd. paper capacitor
C-32	470 mmf. mica capacitor
C-33	0.1 mfd. paper capacitor
C-34	.05 mfd. paper capacitor
C-35	2-15 mmf. antenna trimmer
C-36	7-23 mmf. air trimmer
C-37	.05 mfd. paper capacitor
C-38	20 mmf. mica capacitor
C-39	5 mmf. compensating capacitor
C-40	.01 mfd. paper capacitor
R-1	2200 ohms carbon resistor
R-2	6800 ohms carbon resistor
R-3	47,000 ohms carbon resistor
R-4	330 ohms carbon resistor

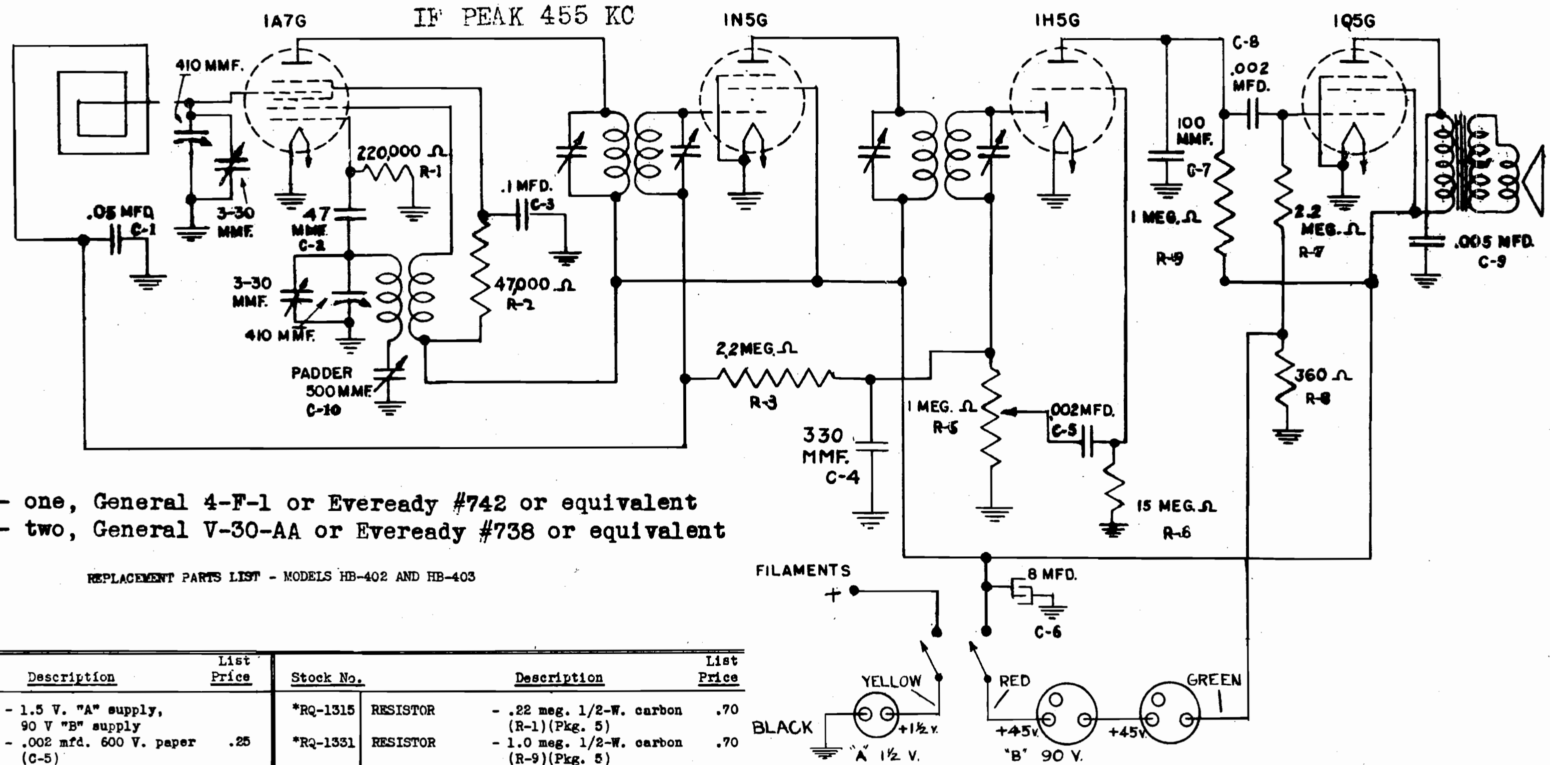
Symbol	Description
R-5	470,000 ohms carbon resistor
R-6	47,000 ohms carbon resistor
R-7	470,000 ohms carbon resistor
R-8	4700 ohms carbon resistor
R-9	220 ohms 2 W. carbon resistor
R-10	330,000 ohms carbon resistor
R-11	100,000 ohms carbon resistor
R-12	100,000 ohms carbon resistor
R-13	120,000 ohms carbon resistor
R-14	2 megohm volume control
R-15	82 ohms carbon resistor
R-16	220 ohms carbon resistor
R-17	15 megohms carbon resistor
R-18	220,000 ohms carbon resistor
R-19	470,000 ohms carbon resistor
R-20	1500 ohms carbon resistor
R-21	2200 ohms 1 W. carbon resistor
R-22	1600 ohms 3½ W. wire wound resistor
R-23	2200 ohms carbon resistor
R-24	100,000 ohms carbon resistor
R-25	33,000 ohms carbon resistor
R-26	220,000 ohms carbon resistor
R-27	2.2 megohms carbon resistor
R-28	47 ohms 1 W. carbon resistor
R-29	33,000 ohms carbon resistor
R-30	47,000 ohms carbon resistor
R-31	150 ohms carbon resistor
R-32	100,000 ohms carbon resistor
S-1	Tone switch
S-2	Phono switch
S-3	Power switch—on S-2
L-1	Antenna transformer
L-2	Oscillator transformer
L-3	1st I.F. transformer
L-4	2nd I.F. transformer
L-5	I.F. limiter
L-6	Discrim. transformer
P-1	Dial lamp, MAZDA No. 44
P-2	Dial lamp, MAZDA No. 44

FOR MODEL HM-80
SEE INDEX

FOR OTHER DATA
SEE INDEX

MODELS HB-402
HB-403

GENERAL ELECTRIC CO.



"A" supply - one, General 4-F-1 or Eveready #742 or equivalent
"B" supply - two, General V-30-AA or Eveready #738 or equivalent

REPLACEMENT PARTS LIST - MODELS HB-402 AND HB-403

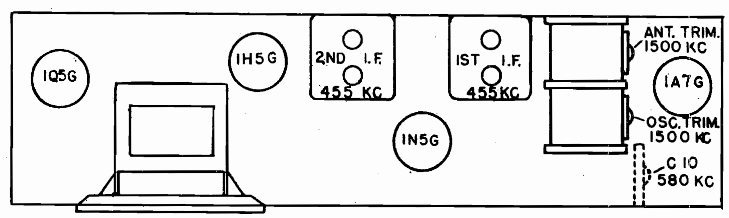
Stock No.		Description	List Price
RB-325	BATTERY	- 1.5 V. "A" supply, 90 V "B" supply	
*RC-011	CAPACITOR	- .002 mfd. 600 V. paper (C-5)	.25
*RC-023	CAPACITOR	- .005 mfd. 600 V. paper (C-9)	.25
*RC-072	CAPACITOR	- .05 mfd. 200 V. paper (C-1)	.25
*RC-102	CAPACITOR	- 0.1 mfd. 100 V. paper (C-3)	.30
RC-232	CAPACITOR	- 47 mmf. mica (C-2)	.25
*RC-235	CAPACITOR	- 100 mmf. mica (C-7)	.25
*RC-274	CAPACITOR	- 330 mmf. mica (C-4)	.30
RC-743	CONDENSER	- Tuning Condenser	2.15
RC-5131	CAPACITOR	- 8 mfd. 150 V. dry electrolytic (C-6)	.55
RC-6508	CAPACITOR	- Oscillator padding capacitor (C-10)	.30
RC-8119	CABLE	- Tuning drive cord and spring	.15
RD-107	DIAL	- Dial scale	.30
RL-286	COIL	- Oscillator coil	.40
RL-503	LOOP	- Antenna loop	1.20
RP-126	POINTER	- Dial pointer	.15
RQ-1248	RESISTOR	- 360 ohms, 1/2-W. carbon (R-8)(Pkg. 5)	.70
*RQ-1299	RESISTOR	- 47,000 ohms, 1/2-W. carbon (R-2)(Pkg. 5)	.70

Stock No.		Description	List Price
*RQ-1315	RESISTOR	- .22 meg. 1/2-W. carbon (R-1)(Pkg. 5)	.70
*RQ-1331	RESISTOR	- 1.0 meg. 1/2-W. carbon (R-9)(Pkg. 5)	.70
*RQ-1339	RESISTOR	- 2.2 meg. 1/2-W. carbon (R-3)(Pkg. 5)	.70
*RQ-1365	RESISTOR	- 15 meg. 1/4 W. carbon (R-6)(Pkg. 5)	.70
*RS-238	SOCKET	- Octal tube socket	.15
RS-874	SCREW	- Ornamental wood screw for cabinet back (Pkg.10)	.15
RS-923	SHAFT	- Tuning drive shaft	.10
RS-1010	SPEAKER	- 4-inch permanent magnet speaker	3.25

Stock No.		Description	List Price
RT-311	TRANSFORMER	- 1st IF transformer	1.80
RT-312	TRANSFORMER	- 2nd IF transformer	1.30
RV-066	VOLUME CONTROL	- 1 meg. volume control (R-5)	.80
RW-036	WINDOW	- Dial scale window	.20

*Used on previous receivers.

(Prices subject to change without notice.)



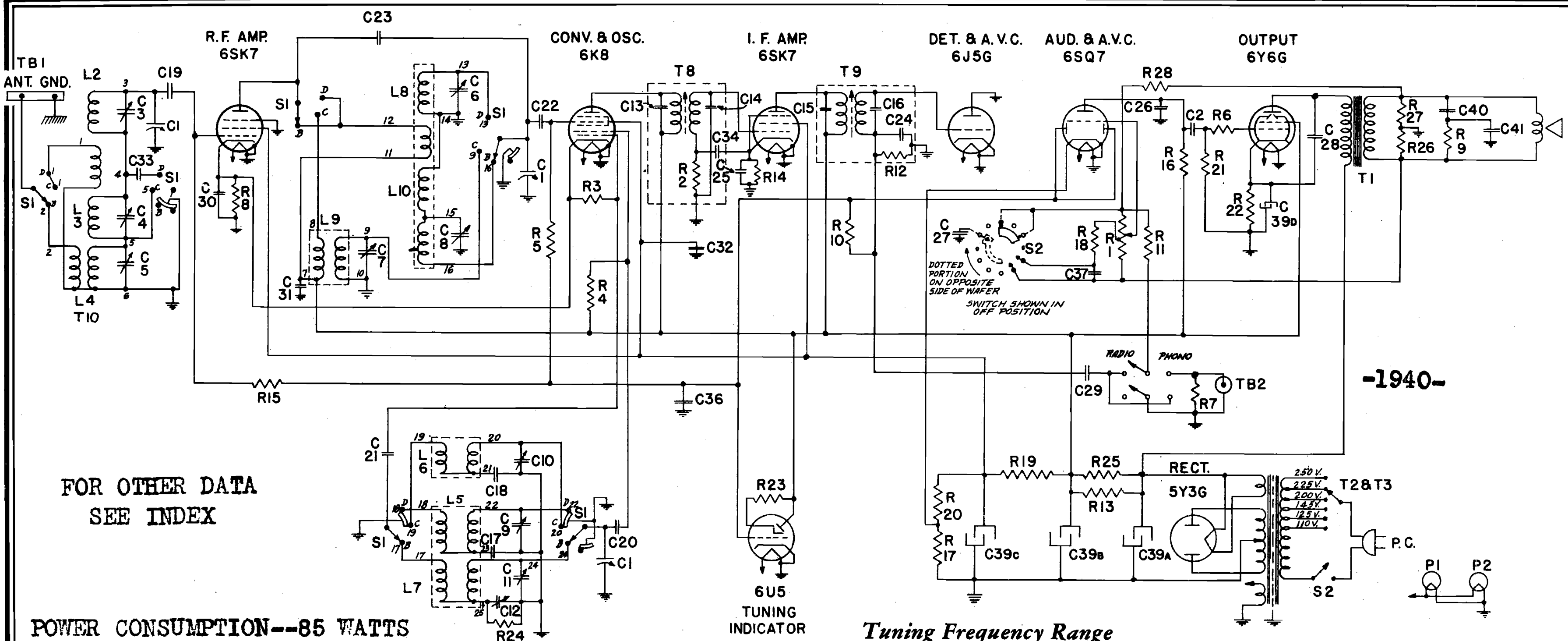
TRIMMER LOCATION FIG. 1

ALIGNMENT FREQUENCIES .... IF - 455 KC Broadcast - 1500 KC and 580 KC

NOTE:- The chassis must be removed from the carrying case when aligning. Since the location of the back cover, loop, chassis and battery affect alignment considerably, the position of these components when aligning should duplicate that found in the carrying case. A non-metallic object should be used to hold the back cover-loop assembly in position during alignment.

GENERAL ELECTRIC CO.

MODELS JE-81
JE-810



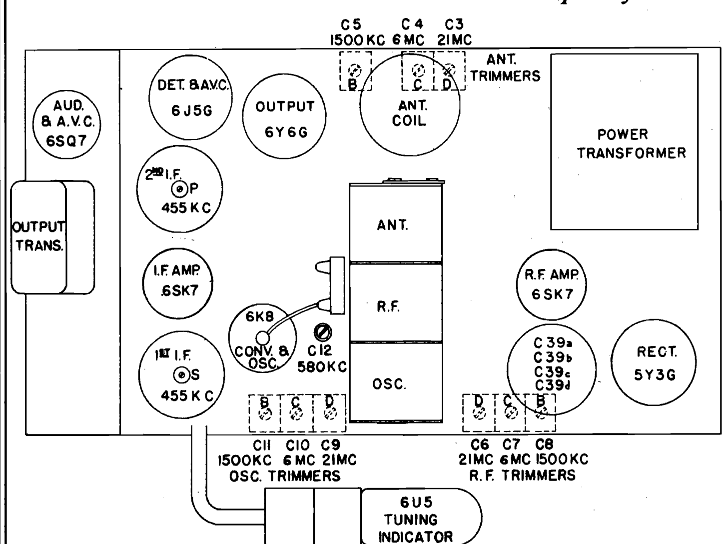
FOR OTHER DATA
SEE INDEX

POWER CONSUMPTION--85 WATTS

Intermediate Frequency......................455 K.C.

Tuning Frequency Range

Band "B"........................ 540–1600 K.C.
Band "C"........................2200-7000 K.C.
Band "D"......................7000–22,000 K.C.

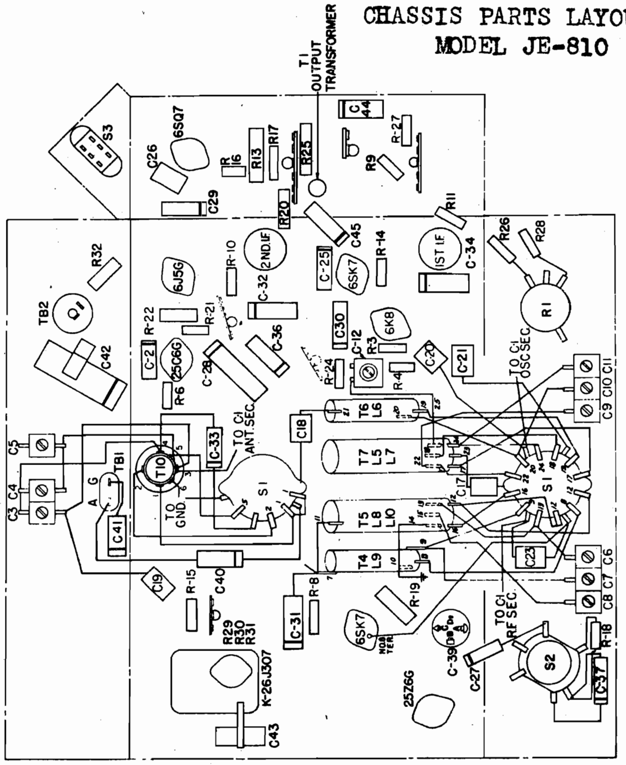


Symbol	Description	Symbol	Description	Symbol	Description
C1	Tuning Condenser	C31	.05 Mfd. 600 V. Paper	R4	22,000 Ohms Carbon
C2	.05 Mfd. 600 V. paper	C32	.05 Mfd. 600 V. Paper	R5	560,000 Ohms Carbon
C3	5–40 Mmf. "D" Ant. Trimmer	C33	.006 Mfd. 600 V. Paper	R6	1000 Ohms Carbon
C4	3–30 Mmf. "C" Ant. Trimmer	C34	.05 Mfd. 200 V. Paper	R7	220,000 Ohms Carbon
C5	2–20 Mmf. "B" Ant. Trimmer	C36	.05 Mfd. 200 V. Paper	R8	120 Ohms Carbon
C6	3–30 Mmf. "D" R.F. Trimmer	C37	.002 Mfd. 600 V. Paper	R9	220 Ohms Carbon
C7	3–30 Mmf. "C" R.F. Trimmer	C39a	40 Mfd. 300 V. Dry Electrolytic	R10	2.2 Megohms Carbon
C8	3–30 Mmf. "B" R.F. Trimmer	C39b	50 Mfd. 250 V. Dry Electrolytic	R11	47,000 Ohms Carbon
C9	3–30 Mmf. "D" Osc. Trimmer	C39c	20 Mfd. 250 V. Dry Electrolytic	R12	330,000 Ohms Carbon
C10	3–30 Mmf. "C" Osc. Trimmer	C39d	20 Mfd. 25 V. Dry Electrolytic	R13	4700 Ohms 2 W. Carbon
C11	5–45 Mmf. "B" Osc. Trimmer	C40	0.1 Mfd. 200 V. Paper	R14	330 Ohms Carbon
C12	300–650 Mmf. "B" Osc. Padder	C41	.05 Mfd. 200 V. Paper	R15	560,000 Ohms Carbon
C17	2800 Mmf. ±5% Mica	L2	"D" Antenna Coil	R16	330,000 Ohms Carbon
C18	1600 Mmf. ±5% Mica	L3	"C" Antenna Coil	R17	150 Ohms Carbon
C19	470 Mmf. Mica	L4	"B" Antenna Coil	R18	120,000 Ohms Carbon
C20	470 Mmf. Mica	L5	"D" Oscillator Coil	R19	2700 Ohms 2 W. Carbon
C21	47 Mmf. Mica	L6	"C" Oscillator Coil	R20	15,000 Ohms 1 W. Carbon
C22	470 Mmf. Mica	L7	"B" Oscillator Coil	R21	470,000 Ohms Carbon
C23	10 Mmf. L.P.F. Mica	L8	"D" R.F. Coil	R22	270 Ohms 2 W. Carbon
C24	100 Mmf. Mica	L9	"C" R.F. Coil	R23	1.0 Megohm Carbon
C25	.05 Mfd. 200 V. Paper	L10	"B" R.F. Coil	R24	5600 Ohms Carbon
C26	220 Mmf. Mica	P1	Dial Lamp, Mazda No. 44	R25	4700 Ohms 2 W. Carbon
C27	.002 Mfd. 600 V. Paper	P2	Dial Lamp, Mazda No. 44	R26	270 Ohms Carbon
C28	.008 Mfd. 1000 V. Paper	R1	2.0 Megohms Volume Control	R27	1500 Ohms Carbon
C29	.002 Mfd. 600 V. Paper	R2	330,000 Ohms Carbon	R28	6.8 Megohms Carbon
C30	.05 Mfd. 200 V. Paper	R3	33,000 Ohms Carbon		

MODELS JE-81
JE-810

GENERAL ELECTRIC CO.

CHASSIS PARTS LAYOUT
MODEL JE-810



SPECIAL SERVICE INFORMATION

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*

(a) Antenna Post to R.F. Amplifier Grid at

1000 KC	4.4
4000 KC	2.6
18,000 KC	2.2

(b) R.F. Amplifier Grid to Converter Grid at

1000 KC	6.0
4000 KC	12.0
18,000 KC	8.2**

(c) R.F. on Converter Grid to I.F. on 1st I.F. Grid at

1000 KC ("B" Manual)	40.0
4000 KC	35.0
18,000 KC	35.0

(d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at 455 KC ("B" Manual—Gang Closed) 42.0

(e) I.F. Amplifier Grid to Detector Grid at 455 KC 117.0

(2) Voltage Across Volume Control to Give ½-watt Speaker Output at 400 Cycles 0.075*

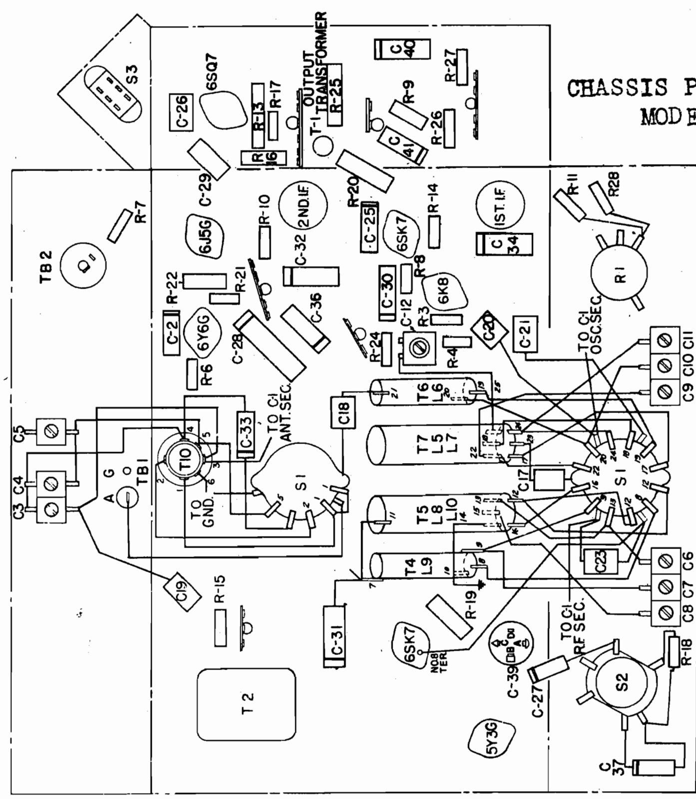
(3) DC voltage developed across oscillator grid resistor (R-3) with the gang closed.

"B" Band	7.6*
"C" Band	6.2*
"D" Band	5.1*

* Variations of +10%, −20% are permissible.

** On "D" band, stray oscillator voltage may upset reading.

CHASSIS PARTS LAYOUT
MODEL JE-81



Chassis Parts Layout
Model JE-81

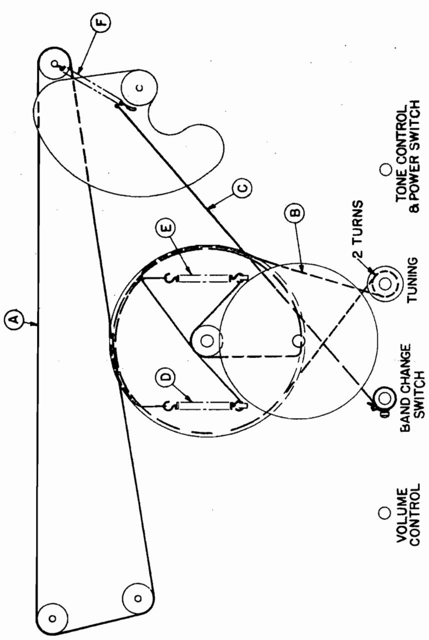
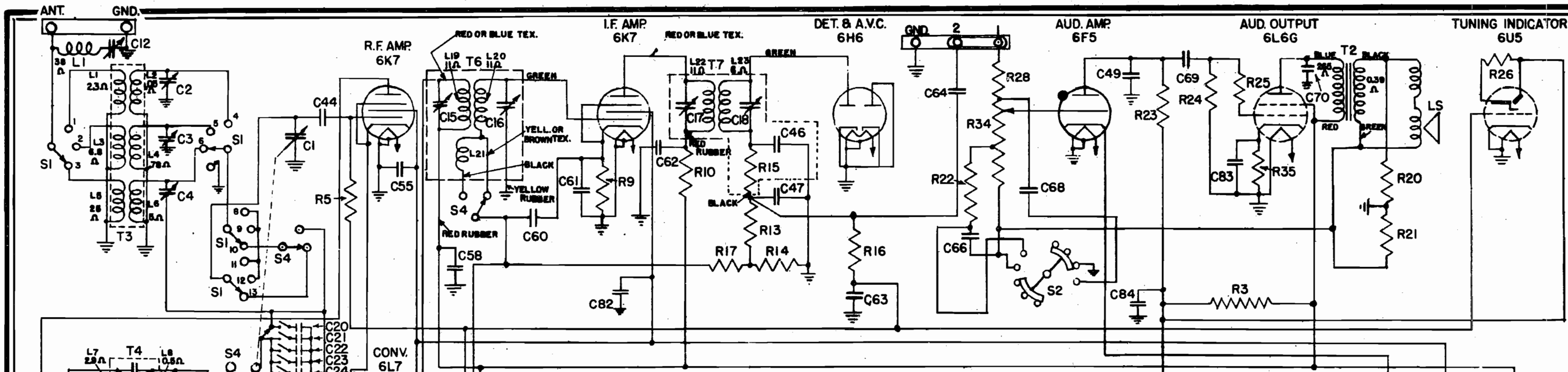
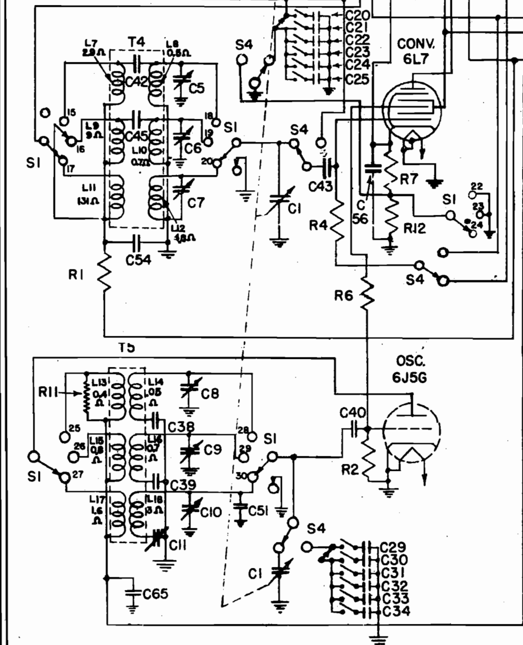


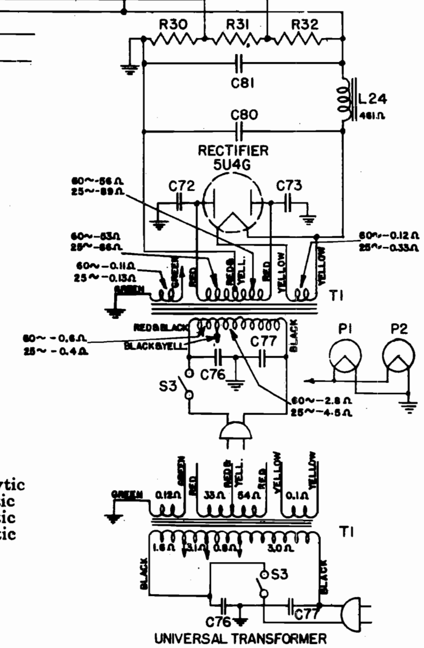
Fig. 7. Dial Cord Stringing Diagram

MODELS GE-93
GE-96

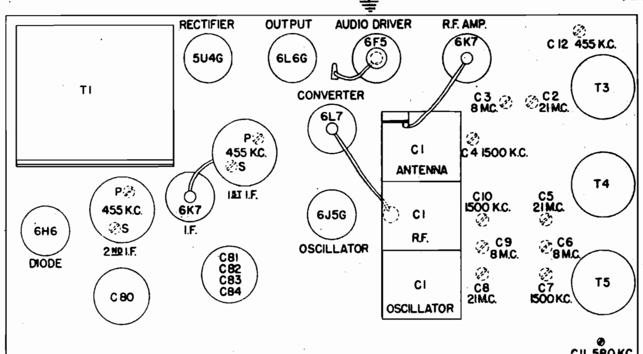
GENERAL ELECTRIC CO.







Symbol	Description	Symbol	Description
R1	2200 Ohm Carbon Resistor	C20–C25	Antenna Trimmer Strip
R2	47000 Ohm Carbon Resistor	C29–C34	Oscillator Trimmer Strip
R3	3900 Ohm Carbon Resistor	C38	3200 Mmf. Mica Capacitor
R4, 5	560,000 Ohm Carbon Resistor	C39	1800 Mmf. Mica Capacitor
R6, 7	220 Ohm Carbon Resistor	C40	50 Mmf. Mica Capacitor
R9	390 Ohm Carbon Resistor	C42	15 Mmf. Mica Capacitor
R10	2200 Ohm Carbon Resistor	C43, C44	390 Mmf. Mica Capacitor
R11	1000 Ohm Carbon Resistor	C45	4 Mmf. Mica Capacitor
R12	470 Ohm Carbon Resistor	C46	220 Mmf. Mica Capacitor
R13, 14	120,000 Ohm Carbon Resistor	C47	150 Mmf. Mica Capacitor
R15	47,000 Ohm Carbon Resistor	C49	330 Mmf. Mica Capacitor
R16	2.2 Megohm Carbon Resistor	C51	10 Mmf. Mica Capacitor
R17	1.5 Megohm Carbon Resistor	C54	.05 Mfd. Paper Capacitor
R20	220 Ohm Carbon Resistor	C55, 56	.05 Mfd. Paper Capacitor
R21	15 Ohm Carbon Resistor	C58, 60, 61	.05 Mfd. Paper Capacitor
R22	150,000 Ohm Carbon Resistor	C62, 63	.05 Mfd. Paper Capacitor
R23, 24	100,000 Ohm Carbon Resistor	C64	.02 Mfd. Paper Capacitor
R25	1000 Ohm Carbon Resistor	C65	.05 Mfd. Paper Capacitor
R26	1 Megohm Carbon Resistor	C66	.004 Mfd. Paper Capacitor
R28	120,000 Ohm Carbon Resistor	C68	.001 Mfd. Paper Capacitor
R30	82 Ohm Carbon Resistor	C69	.05 Mfd. Paper Capacitor
R31	10,000 Ohm Carbon Resistor	C70	.02 Mfd. Paper Capacitor
R32	6800 Ohm Carbon Resistor	C72, 73	.01 Mfd. Paper Capacitor
R34	2 Megohm Volume Control	C76, 77	.01 Mfd. Paper Capacitor
R35	180 Ohm Carbon Resistor	C80	30 Mfd. Wet Electrolytic
C1	10–450 Mmf. Tuning Condenser	C81	20 Mfd. 400 V. Dry Electrolytic
C2, C3	5–40 Mmf. Trimmer Capacitor	C82	4 Mfd. 250 V. Dry Electrolytic
C4	2–20 Mmf. Trimmer Capacitor	C83	25 Mfd. 50 V. Dry Electrolytic
C5, C6, C7	3–30 Mmf. Trimmer Capacitor	C84	4 Mfd. 400 V. Dry Electrolytic
C8, C9, C10	3–30 Mmf. Trimmer Capacitor	T1	Power Transformer
C11	300–650 Mmf. Padder Capacitor	T2	Output Transformer
C12	20–50 Mmf. Wave Trap Trimmer	T3	Antenna Transformer
		T4	R.F. Transformer
		T5	Oscillator Transformer
		S1	Band Change Switch
		S2	Tone Control Switch
		S3	Power Switch



IF PEAK 455 KC

Rating Label	Power Consumption
A	105
C	110
V	110

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I.F. 455 KC

FOR OTHER DATA SEE INDEX

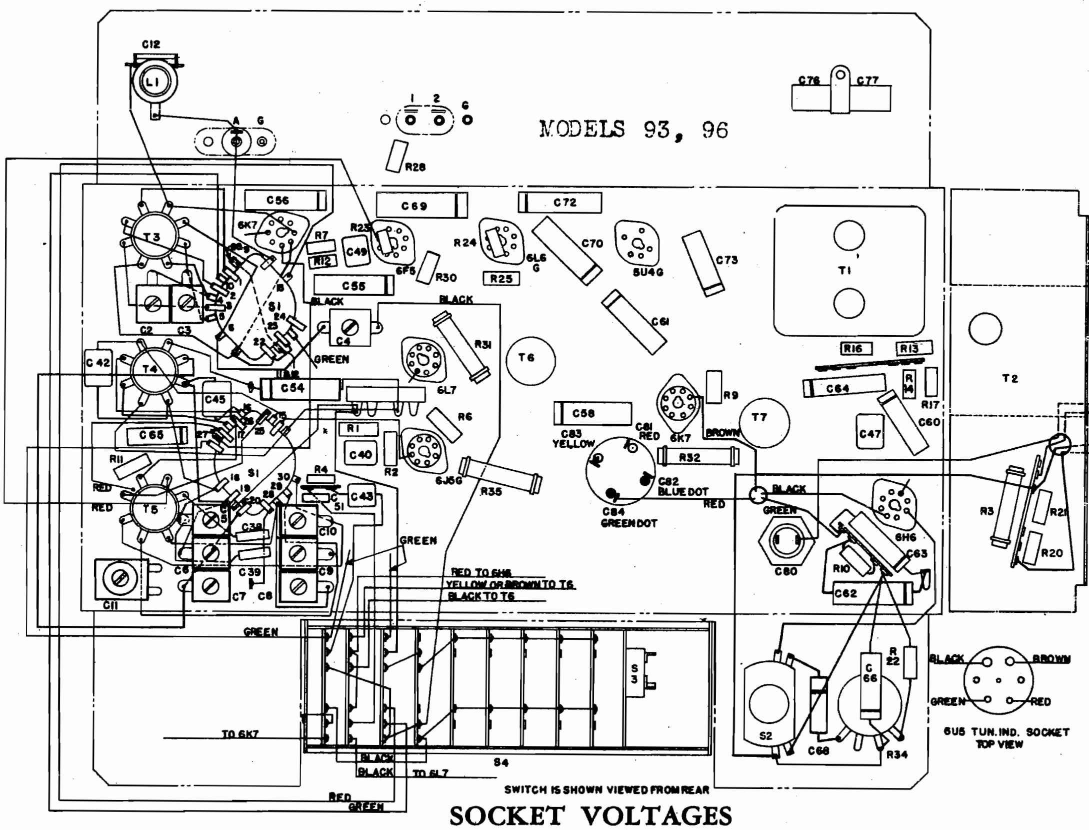
Loud-speaker—Electrodynamic

	GE-93	GE-96
Outside Cone Diameter	8 in.	12 in.
Voice Coil Impedance	3.5 ohms at 400 cycles	
Field Coil Resistance	460 ohms (cold)	

MODELS GE-93, GE-96
MODELS HE-100,
HE-100H, HE-105

GENERAL ELECTRIC CO.

MODELS HE-100L,
HE-100LH, HE-105L



SOCKET VOLTAGES

GE-93, GE-96

Tube No.	Plate to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Cathode to Ground Volts D.C.	Cathode Current M.A.	Heater Volts A.C.
6K7 R.F.	225	105	5.8	3.6	6.4
6L7	235	105	5.8	5.2	6.4
6J5G	190	...	0	10.5	6.4
6K7 I.F.	215	105	3.6	9.5	6.4
6F5	* 120	...	0.9	0.7	6.4
6L6G	220	235	12	70	6.4
6U5	Target 190	...	...	1.5	6.4
5U4G	280/280 A.C. RMS	...	298	110	5.1

A.C. line voltage—125. No signal input. 1000 ohms per volt meter. Dial pointer at 550 K.C. on "B" band.
*Measured on 500-volt scale.

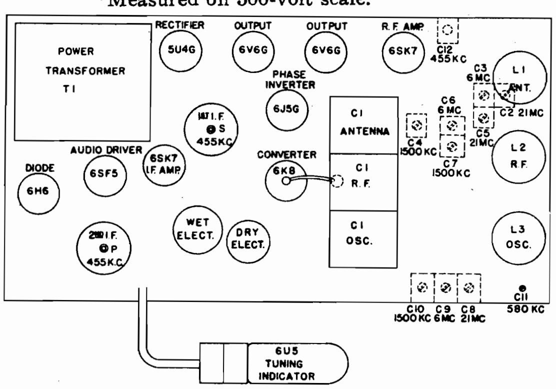


Fig. 4. Trimmer Location
Models HE-100, HE-100H, HE-105

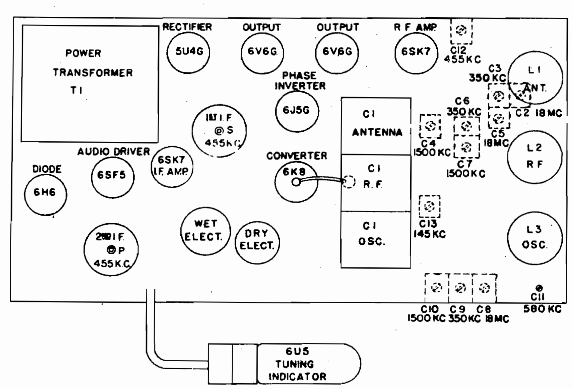
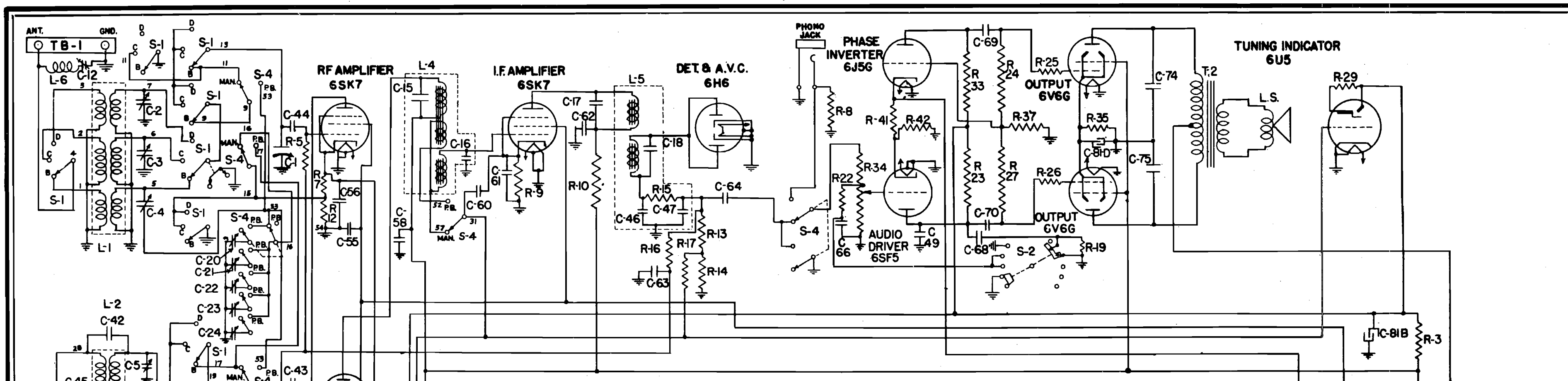
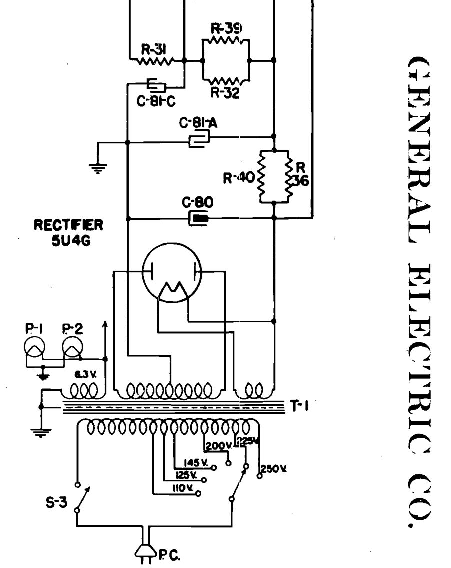


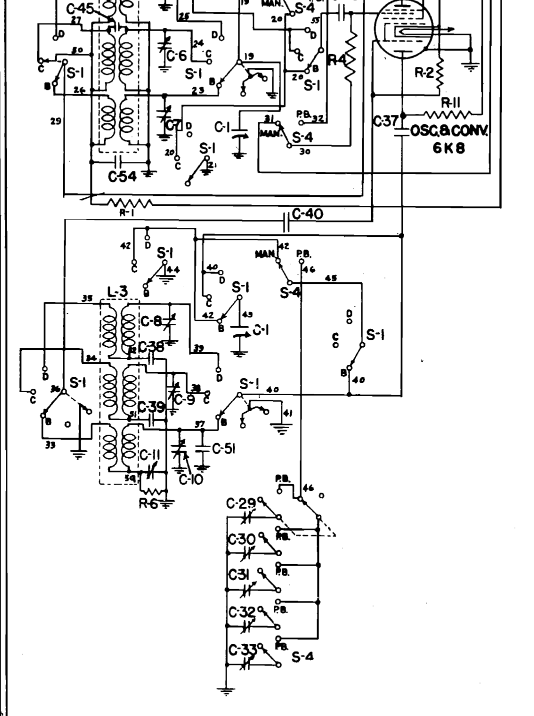
Fig. 5. Trimmer Location
Models HE-100L, HE-100LH, HE-105L

GENERAL ELECTRIC CO.

MODELS HE-100,
HE-100H, HE-105







Symbol	Description
C-1	10–450 Mmf. Tuning Condenser
C-2	5–40 Mmf. "D" Antenna Trimmer
C-3	5–40 Mmf. "C" Antenna Trimmer
C-4	2–20 Mmf. "B" Antenna Trimmer
C-5	2–20 Mmf. "D" R.F. Trimmer
C-6	2–20 Mmf. "C" R.F. Trimmer
C-7	3–30 Mmf. "B" R.F. Trimmer
C-8	3–30 Mmf. "D" Osc. Trimmer
C-9	5–40 Mmf. "C" Osc. Trimmer
C-10	5–40 Mmf. "B" Osc. Trimmer
C-11	300–650 Mmf. "B" Osc. Padder
C-12	20–50 Mmf. Wave Trap Trimmer
C-20	7–65 Mmf. Antenna Trimmer
C-21	20–180 Mmf. Antenna Trimmer
C-22	20–180 Mmf. Antenna Trimmer
C-23	100–490 Mmf. Antenna Trimmer
C-24	100–490 Mmf. Antenna Trimmer
C-29	7–65 Mmf. Osc. Trimmer
C-30	20–180 Mmf. Osc. Trimmer
C-31	20–180 Mmf. Osc. Trimmer
C-32	100–490 Mmf. Osc. Trimmer
C-33	100–490 Mmf. Osc. Trimmer
C-37	470 Mmf. Mica Capacitor
C-38	4300 Mmf. Mica Capacitor ±5%
C-39	1600 Mmf. Mica Capacitor ±5%
C-40	50 Mmf. Mica Capacitor
C-42	22 Mmf. Mica Capacitor
C-43	470 Mmf. Mica Capacitor
C-44	470 Mmf. Mica Capacitor
C-45	6 Mmf. Mica Capacitor
C-46	100 Mmf. Mica Capacitor
C-47	100 Mmf. Mica Capacitor
C-49	330 Mmf. Mica Capacitor
C-51	10 Mmf. Compensator Capacitor
C-54	.05 Mfd. Paper Capacitor
C-55	.05 Mfd. Paper Capacitor
C-56	.05 Mfd. Paper Capacitor
C-58	.05 Mfd. Paper Capacitor
C-60	.05 Mfd. Paper Capacitor
C-61	.05 Mfd. Paper Capacitor ±10%
C-62	.05 Mfd. Paper Capacitor
C-63	.05 Mfd. Paper Capacitor
C-64	.02 Mfd. Paper Capacitor
C-66	.003 Mfd. Paper Capacitor
C-68	.005 Mfd. Paper Capacitor
C-69	.05 Mfd. Paper Capacitor
C-70	.05 Mfd. Paper Capacitor
C-74	.0105 Mfd. 1500 V. Paper Capacitor
C-75	.0105 Mfd. 1500 V. Paper Capacitor
C-80	40 Mfd. 400 V. Wet Electrolytic

Symbol	Description
C-81a	20 Mfd. 400 V. Dry Electrolytic
C-81b	5 Mfd. 400 V. Dry Electrolytic
C-81c	5 Mfd. 300 V. Dry Electrolytic
C-81d	40 Mfd. 25 V. Dry Electrolytic
L-1	Antenna Coil
L-2	R.F. Coil
L-3	Oscillator Coil
L-4	1st I.F. Transformer
L-5	2nd I.F. Transformer
L-6	I.F. Wave Trap Coil
R-1	2200 Ohms, Carbon Resistor
R-2	33,000 Ohms, Carbon Resistor
R-3	8200 Ohms, 1-W. Carbon Resistor
R-4	560,000 Ohms, Carbon Resistor
R-5	560,000 Ohms, Carbon Resistor
R-6	3300 Ohms, Carbon Resistor
R-7	150 Ohms, Carbon Resistor
R-8	220,000 Ohms, Carbon Resistor
R-9	330 Ohms, Carbon Resistor
R-10	2200 Ohms, Carbon Resistor
R-11	22,000 Ohms, Carbon Resistor
R-12	150 Ohms, Carbon Resistor
R-13	120,000 Ohms, Carbon Resistor
R-14	120,000 Ohms, Carbon Resistor
R-15	47,000 Ohms, Carbon Resistor
R-16	2.2 Megohms, Carbon Resistor
R-17	1.5 Megohms, Carbon Resistor
R-19	1.0 Megohms, Carbon Resistor
R-22	150,000 Ohms, Carbon Resistor
R-23	100,000 Ohms, Carbon Resistor
R-24	220,000 Ohms, Carbon Resistor
R-25	1000 Ohms, Carbon Resistor
R-26	1000 Ohms, Carbon Resistor
R-27	150,000 Ohms, Carbon Resistor
R-29	1.0 Megohms, Carbon Resistor
R-31	10,000 Ohms, 2-W. Carbon Resistor
R-32	15,000 Ohms, 2-W. Carbon Resistor
R-33	68,000 Ohms, Carbon Resistor
R-34	2.0 Megohms, Volume Control
R-35	180 Ohms, 2-W. Carbon Resistor
R-36	3300 Ohms, 2-W. Carbon Resistor
R-37	56,000 Ohms, Carbon Resistor
R-39	15,000 Ohms, 2-W. Carbon Resistor
R-40	3300 Ohms, 2-W. Carbon Resistor
R-41	330 Ohms, Carbon Resistor
R-42	82 Ohms, Carbon Resistor
S-1	Band Change Switch
S-2	Tone Control Switch
S-3	Power Switch on S4
S-4	Station Selector Switch

Tuning Frequency Range

Models HE-100, HE-100H, HE-105

Band "B"..........

Band "C"..........

Band "D"..........

FOR OTHER DATA
SEE INDEX

I.F. 455 KC

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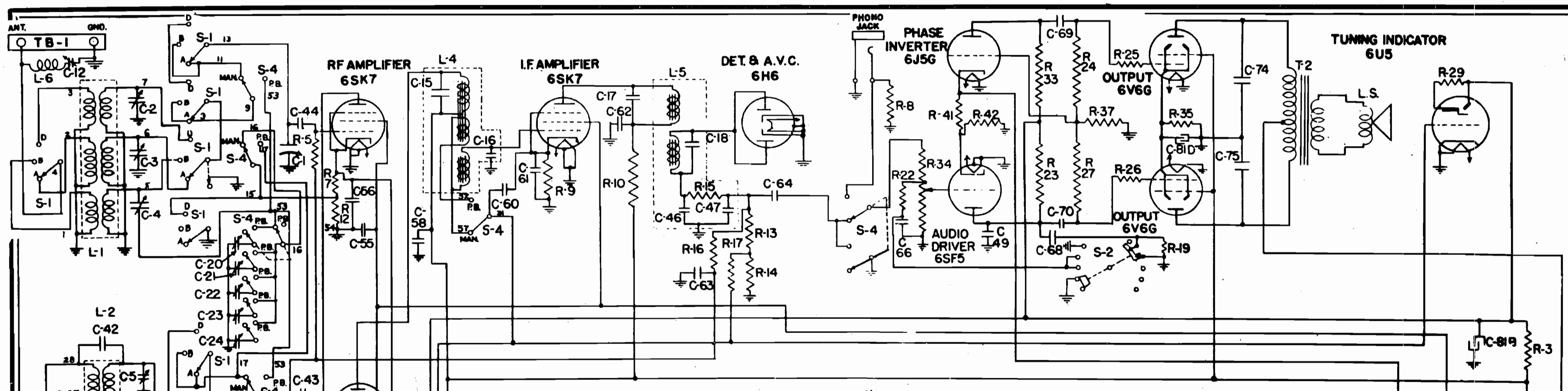
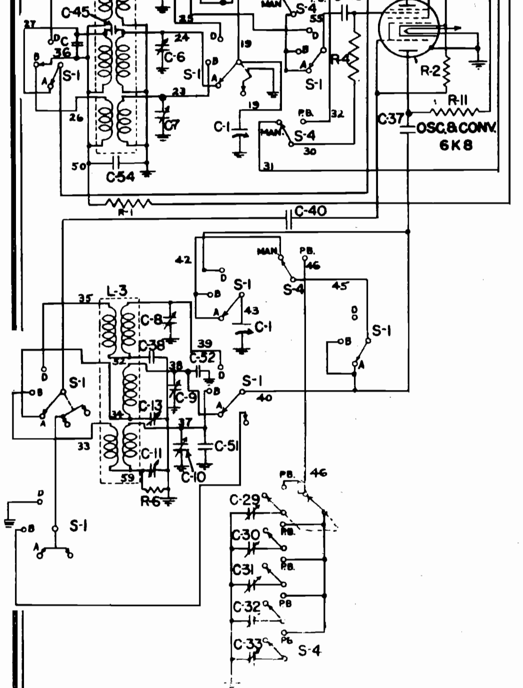
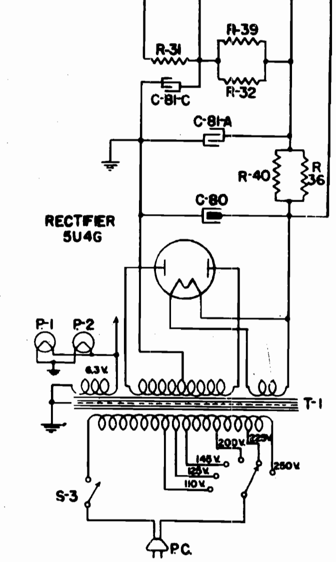
MODELS HE-100L,
HE-100LH, HE-105L

GENERAL ELECTRIC CO.







Symbol	Description	Symbol	Description
C-1	10–450 Mmf. Tuning Condenser	C-80	40 Mfd. 400 V. Wet Electrolytic
C-2	5–40 Mmf. "D" Antenna Trimmer	C-81a	20 Mfd. 400 V. Dry Electrolytic
C-3	5–40 Mmf. "A" Antenna Trimmer	C-81b	5 Mfd. 400 V. Dry Electrolytic
C-4	2–20 Mmf. "B" Antenna Trimmer	C-81c	5 Mfd. 300 V. Dry Electrolytic
C-5	2–20 Mmf. "D" R.F. Trimmer	C-81d	40 Mfd. 25 V. Dry Electrolytic
C-6	2–20 Mmf. "A" R.F. Trimmer	L-1	Antenna Coil
C-7	3–30 Mmf. "B" R.F. Trimmer	L-2	R.F. Coil
C-8	3–30 Mmf. "D" Oscillator Trimmer	L-3	Oscillator Coil
C-9	5–40 Mmf. "A" Oscillator Trimmer	L-4	1st I.F. Transformer
C-10	5–40 Mmf. "B" Oscillator Trimmer	L-5	2nd I.F. Transformer
C-11	300–650 Mmf. "B" Oscillator Padder	L-6	I.F. Wave Trap Coil
C-12	20–50 Mmf. Wave Trap Trimmer	R-1	2200 Ohms, Carbon Resistor
C-13	75–175 Mmf. "A" Oscillator Padder	R-2	33,000 Ohms, Carbon Resistor
C-20	7–65 Mmf. Antenna Trimmer	R-3	8200 Ohms, 1 W. Carbon Resistor
C-21	20–180 Mmf. Antenna Trimmer	R-4	560,000 Ohms, Carbon Resistor
C-22	20–180 Mmf. Antenna Trimmer	R-5	560,000 Ohms, Carbon Resistor
C-23	100–490 Mmf. Antenna Trimmer	R-6	3300 Ohms, Carbon Resistor
C-24	100–490 Mmf. Antenna Trimmer	R-7	150 Ohms, Carbon Resistor
C-29	7–65 Mmf. Oscillator Trimmer	R-8	220,000 Ohms, Carbon Resistor
C-30	20–180 Mmf. Oscillator Trimmer	R-9	330 Ohms, Carbon Resistor
C-31	20–180 Mmf. Oscillator Trimmer	R-10	2200 Ohms, Carbon Resistor
C-32	100–490 Mmf. Oscillator Trimmer	R-11	22,000 Ohms, Carbon Resistor
C-33	100–490 Mmf. Oscillator Trimmer	R-12	150 Ohms, Carbon Resistor
C-36	470 Mmf. Mica Capacitor	R-13	120,000 Ohms, Carbon Resistor
C-37	470 Mmf. Mica Capacitor	R-14	120,000 Ohms, Carbon Resistor
C-38	3000 Mmf. Mica Capacitor ±5%	R-15	47,000 Ohms, Carbon Resistor
C-40	50 Mmf. Mica Capacitor	R-16	2.2 Megohms, Carbon Resistor
C-42	10 Mmf. Mica Capacitor	R-17	1.5 Megohms, Carbon Resistor
C-43	470 Mmf. Mica Capacitor	R-19	1.0 Megohms, Carbon Resistor
C-44	470 Mmf. Mica Capacitor	R-22	150,000 Ohms, Carbon Resistor
C-45	6 Mmf. Mica Capacitor	R-23	100,000 Ohms, Carbon Resistor
C-46	100 Mmf. Mica Capacitor	R-24	220,000 Ohms, Carbon Resistor
C-47	100 Mmf. Mica Capacitor	R-25	1000 Ohms, Carbon Resistor
C-49	330 Mmf. Mica Capacitor	R-26	1000 Ohms, Carbon Resistor
C-51	10 Mmf. Compensator Capacitor	R-27	150,000 Ohms, Carbon Resistor
C-52	20 Mmf. Compensator Capacitor	R-29	1.0 Megohm, Carbon Resistor
C-54	.05 Mfd. Paper Capacitor	R-31	10,000 Ohms, 2 W. Carbon Resistor
C-55	.05 Mfd. Paper Capacitor	R-32	15,000 Ohms, 2 W. Carbon Resistor
C-56	.05 Mfd. Paper Capacitor	R-33	68,000 Ohms, Carbon Resistor
C-58	.05 Mfd. Paper Capacitor	R-34	2.0 Megohms, Volume Control
C-60	.05 Mfd. Paper Capacitor	R-35	180 Ohms, 2 W. Carbon Resistor
C-61	.05 Mfd. Paper Capacitor ±10%	R-36	3300 Ohms, 2 W. Carbon Resistor
C-62	.05 Mfd. Paper Capacitor	R-37	56,000 Ohms, Carbon Resistor
C-63	.05 Mfd. Paper Capacitor	R-39	15,000 Ohms, 2 W. Carbon Resistor
C-64	.02 Mfd. Paper Capacitor	R-40	3300 Ohms, 2 W. Carbon Resistor
C-66	.003 Mfd. Paper Capacitor	R-41	330 Ohms, Carbon Resistor
C-68	.005 Mfd. Paper Capacitor	R-42	82 Ohms, Carbon Resistor
C-69	.05 Mfd. Paper Capacitor	S-1	Band Change Switch
C-70	.05 Mfd. Paper Capacitor	S-2	Tone Control Switch
C-74	.0015 Mfd. 1500 V. Paper Capacitor	S-3	Power Switch on S-4
C-75	.0015 Mfd. 1500 V. Paper Capacitor	S-4	Station Selector Switch

TUNING FREQUENCY RANGE

Models HE-100L, HE-100LH, HE-105L
Band "A" .... 140–400 K.C.
Band "B" .... 540–1600 K.C.
Band "D" .... 5700–18,000 K.C.

FOR OTHER DATA SEE INDEX

I.F. 455 KC

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GENERAL ELECTRIC CO.

MODELS HE-100, HE-100H, HE-105
MODELS HE-100L, HE-100LH, HE-105L

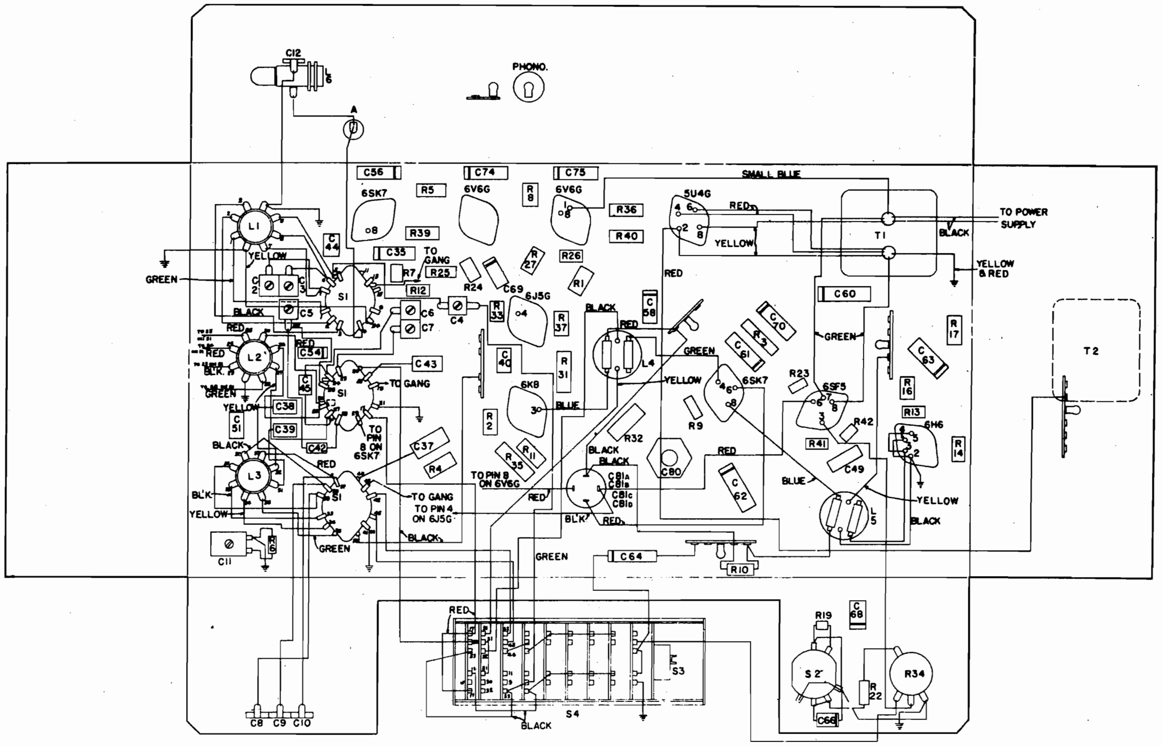


Fig. 8. Chassis Parts Layout
Models HE-100, HE-100H, HE-105

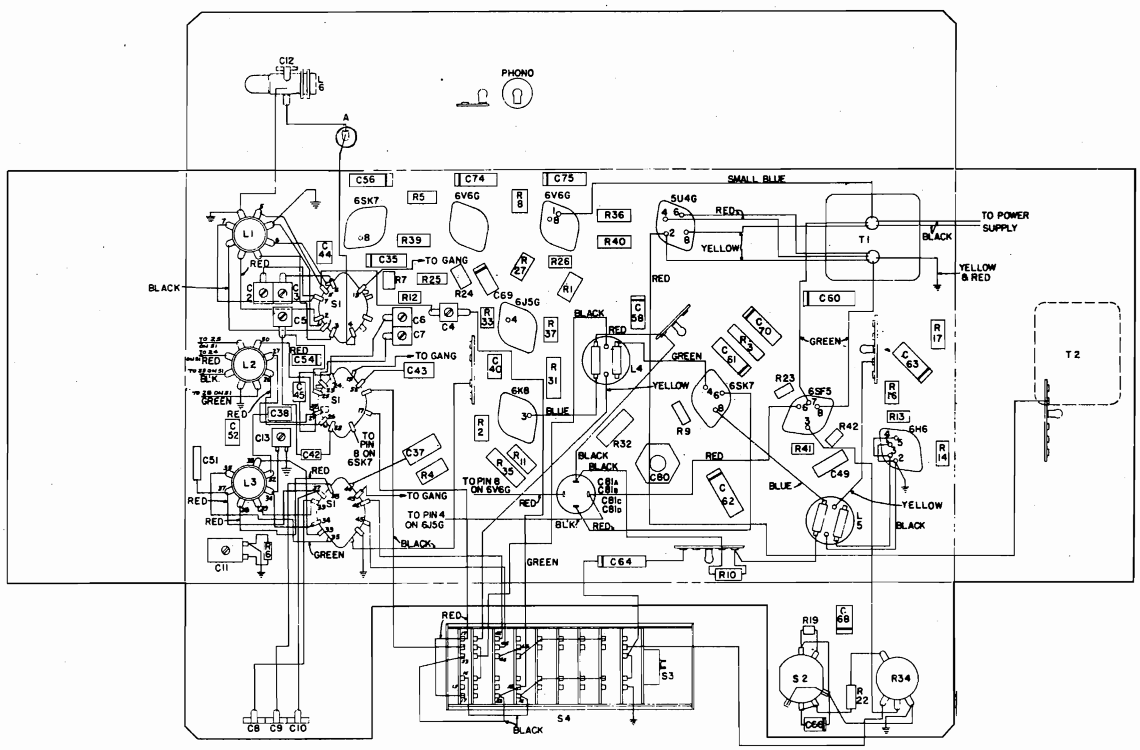
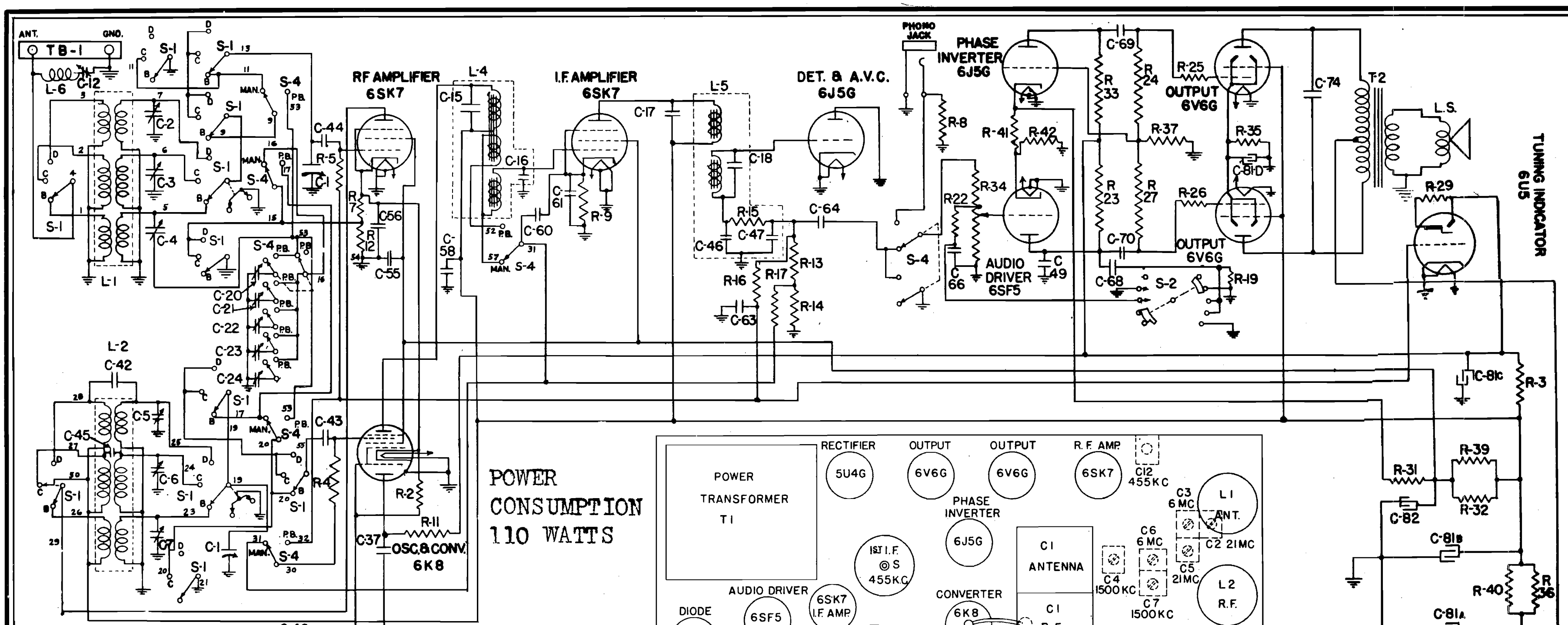
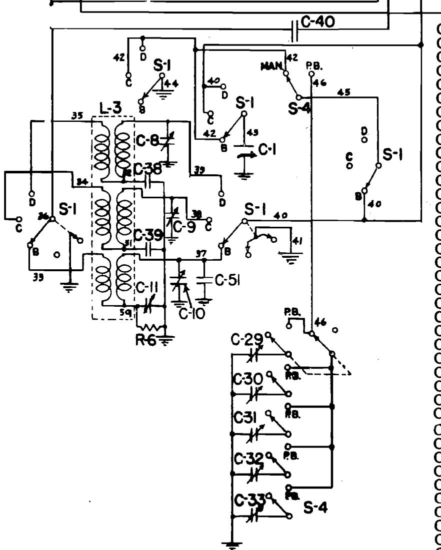


Fig. 9. Chassis Parts Layout
Models HE-100L, HE-100LH, HE-105L

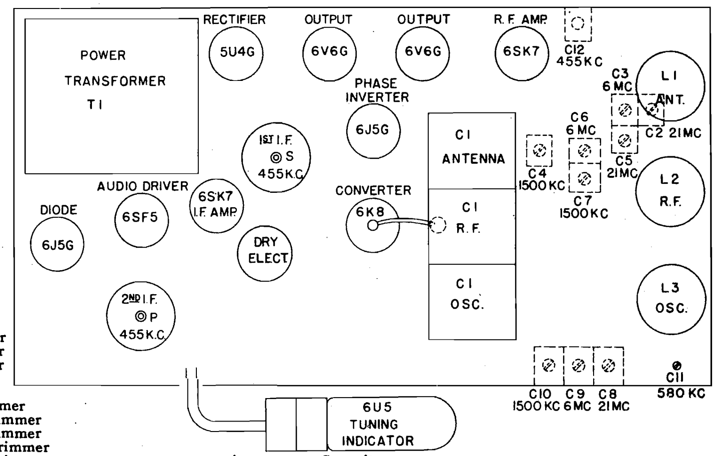
MODELS VE-101
VE-107

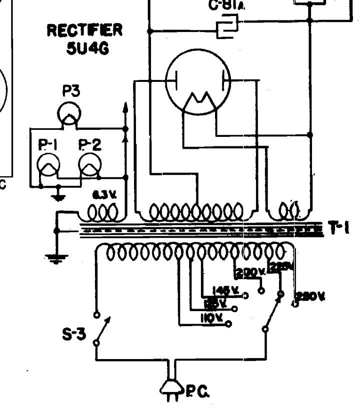
GENERAL ELECTRIC CO.





POWER CONSUMPTION 110 WATTS





C-1	Tuning Condenser
C-2	"D" Band Antenna Trimmer
C-3	"C" Band Antenna Trimmer
C-4	"B" Band Antenna Trimmer
C-5	"D" Band R.F. Trimmer
C-6	"C" Band R.F. Trimmer
C-7	"B" Band R.F. Trimmer
C-8	"D" Band Oscillator Trimmer
C-9	"C" Band Oscillator Trimmer
C-10	"B" Band Oscillator Trimmer
C-11	"B" Band Oscillator Padder
C-12	Wave Trap Trimmer
C-20	7–65 Mmf. Ant. Station Trimmer
C-21	20–180 Mmf. Ant. Station Trimmer
C-22	20–180 Mmf. Ant. Station Trimmer
C-23	100–490 Mmf. Ant. Station Trimmer
C-24	100–490 Mmf. Ant. Station Trimmer
C-29	7–65 Mmf. Osc. Station Selector
C-30	20–180 Mmf. Osc. Station Selector
C-31	20–180 Mmf. Osc. Station Selector
C-32	100–490 Mmf. Osc. Station Selector
C-33	100–490 Mmf. Osc. Station Selector
C-37	470 Mmf. Mica Capacitor
C-38	4300 Mmf. ±5% Mica Capacitor
C-39	1600 Mmf. ±5% Mica Capacitor
C-40	47 Mmf. Mica Capacitor
C-42	22 Mmf. Mica Capacitor L.P.F.
C-43	470 Mmf. Mica Capacitor
C-44	470 Mmf. Mica Capacitor
C-45	6 Mmf. Mica Capacitor L.P.F.
C-46	100 Mmf. Mica Capacitor
C-47	100 Mmf. Mica Capacitor
C-49	330 Mmf. Mica Capacitor
C-51	10 Mmf. Compensating Capacitor
C-55	.05 Mfd. Paper Capacitor
C-56	.05 Mfd. Paper Capacitor
C-58	.05 Mfd. Paper Capacitor
C-60	.05 Mfd. Paper Capacitor
C-61	.05 Mfd. Paper Capacitor
C-63	.05 Mfd. Paper Capacitor
C-64	.02 Mfd. Paper Capacitor
C-66	.003 Mfd. Paper Capacitor
C-68	.008 Mfd. Paper Capacitor
C-69	.05 Mfd. Paper Capacitor
C-70	.05 Mfd. Paper Capacitor
C-74	.001 Mfd. 1600 V. Paper Capacitor
C-81A	40 Mfd. Electrolytic Capacitor
C-81B	20 Mfd. Electrolytic Capacitor
C-81C	5 Mfd. Electrolytic Capacitor
C-81D	40 Mfd. Electrolytic Capacitor
C-82	8 Mfd. Electrolytic Capacitor
L-1	Antenna Coil
L-2	R.F. Coil
L-3	Oscillator Coil
L-4	1st I.F. Transformer
L-5	2nd I.F. Transformer
L-6	I.F. Wave Trap Coil
P-1	Dial Lamp, MAZDA No. 44
P-2	Dial Lamp, MAZDA No. 44
P-3	Dial Lamp, MAZDA No. 44
R-2	33,000 Ohms Carbon Resistor
R-3	8200 Ohms 1W Carbon Resistor
R-4	560,000 Ohms Carbon Resistor
R-5	560,000 Ohms Carbon Resistor
R-6	3300 Ohms Carbon Resistor
R-7	150 Ohms Carbon Resistor
R-8	220,000 Ohms Carbon Resistor
R-9	330 Ohms Carbon Resistor
R-11	22,000 Ohms Carbon Resistor
R-12	150 Ohms Carbon Resistor
R-13	120,000 Ohms Carbon Resistor
R-14	120,000 Ohms Carbon Resistor
R-15	47,000 Ohms Carbon Resistor
R-16	2.2 Megohms Carbon Resistor
R-17	1.5 Megohms Carbon Resistor
R-19	1.0 Megohms Carbon Resistor
R-22	82,000 Ohms Carbon Resistor
R-23	100,000 Ohms Carbon Resistor
R-24	220,000 Ohms Carbon Resistor
R-25	1000 Ohms Carbon Resistor
R-26	1000 Ohms Carbon Resistor
R-27	150,000 Ohms Carbon Resistor
R-29	1.0 Megohms Carbon Resistor
R-31	10,000 Ohms 2W Carbon Resistor
R-32	15,000 Ohms 2W Carbon Resistor
R-33	68,000 Ohms Carbon Resistor
R-34	2 Megohm Volume Control, ½ Megohm Tap
R-35	180 Ohms 2W Carbon Resistor
R-36	3300 Ohms 2W Carbon Resistor
R-37	56,000 Ohms Carbon Resistor
R-39	15,000 Ohms 2W Carbon Resistor
R-40	3300 Ohms 2W Carbon Resistor
R-41	330 Ohms Carbon Resistor
R-42	82 Ohms Carbon Resistor
S-1	Band Change Switch
S-2	Tone Control Switch
S-3	Power Switch
S-4	Touch Tuning Switch
T-1	Power Transformer
T-2	Output Transformer

I.F. 455 KC
-1940-

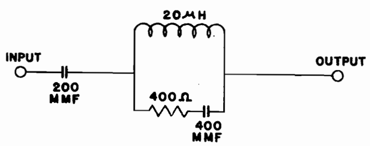
FOR OTHER DATA
SEE INDEX

MODELS, See Below

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

MODELS JE-101, JE-107, HE-100, HE-100H, HE-100L, HE-100LH, HE-105, HE-105L



Standard I.R.E. Dummy Antenna

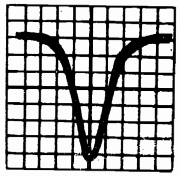


Fig. 2. Sharp Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

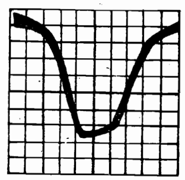


Fig. 3. Broad Over-all I.F. Curve Taken on G-E Oscilloscope OFM-1

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Frequency	Point of Input	Dummy Antenna	Inductor or Trimmer	Comments
1. Band "B"	455 K.C. Sweep	I.F. Grid	.05 mfd. or larger	2nd I.F. pri. and sec.	Gang condenser plates closed—manual key depressed—connect audio input of oscilloscope to ground and to junction of C-64, R-13 and R-16. Adjust two iron-core inductors of each I.F. transformer simultaneously using two insulated screw drivers. The resultant curve should be single and symmetrical as shown in Fig. 2.
2. Band "B"	455 K.C. Sweep	Converter Grid	.05 mfd. or larger	1st I.F. pri. and sec.	
3. Band "B"	455 K.C. Sweep	Converter Grid	.05 mfd. or larger		Check broad I.F. curve by pressing station key. If broad curve is not single and symmetrical (see Fig. 3) readjust I.F. trimmers slightly.
4. Band "B"	455 K.C. Sweep	Antenna Post	I.R.E.	C-12	Align wave trap for minimum amplitude.

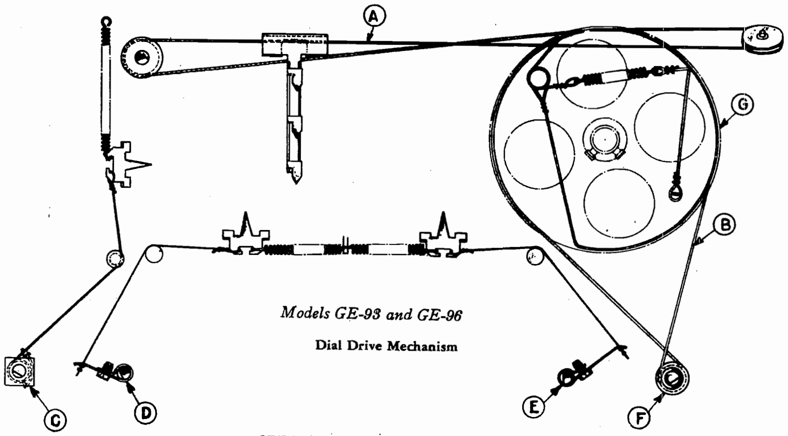
ALIGNMENT PROCEDURE

I.F. ALIGNMENT WITH OUTPUT METER

Band Switch Setting	Input Frequency	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. pri. and sec.	Gang condenser plates closed—manual key depressed—connect output meter across voice coil—keep signal low and volume control on as far as possible. Adjust all iron-core inductors for maximum output.
2. Band "B"	455 K.C. with Modulation	Converter Grid	.05 mfd. or larger	1st I.F. pri. and sec.	
3. Band "B"	455 K.C. with Modulation	Antenna Post	I.R.E.	C-12	Align wave trap for minimum output.

R. F. ALIGNMENT

1. Band "B"					Close gang condenser plates. Adjust pointer to first line at left end of tuning scale. Depress manual key.
2. Band "D"	21 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-8) R.F. (C-5) Ant. (C-2)	Connect output meter across voice coil—peak trimmers for maximum output. The image of any "D" band signal should be heard 910 K.C. below the input signal. EXAMPLE—21 M.C. image is at 20:09 M.C. Peak (C-5) while rocking the gang condenser.
3. Band "C"	6 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-9) R.F. (C-6) Ant. (C-3)	Peak trimmers for maximum output using a low input signal. Image—910 K.C. below signal.
4. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-10) R.F. (C-7) Ant. (C-4)	Peak trimmers for maximum output with a low input signal.
5. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-11)	Adjust padder for maximum output in the vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"		Repeat Operation 4			



Models GE-93 and GE-96

Dial Drive Mechanism

SPECIAL SERVICE INFORMATION

MODELS JE-101, JE-107

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*

(a) Antenna Post to R.F. Amplifier Grid at
- 1000 KC 5.0
- 4000 KC 3.7
- 18,000 KC 2.6

(b) R.F. Amplifier Grid to Converter Grid at
- 1000 KC 14.0
- 4000 KC 10.0
- 18,000 KC 10.0**

(c) R.F. on Converter Grid to IF. on 1st I.F. Grid at
- 1000 KC ("B" Manual) 16.0
- 4000 KC 30.0
- 18,000 KC 34.0

(d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at 455 KC ("B" Manual—Gang Closed) 24.0

(e) I.F. Amplifier Grid to Detector Grid at 455 KC 112.0

(2) Voltage Across Volume Control to Give ½-watt Speaker Output at 400 Cycles 0.05*

(3) D.C. voltage developed across oscillator grid resistor (R-2) with the gang closed.
- "B" Band 6.2*
- "C" Band 7.8*
- "D" Band 4.8*

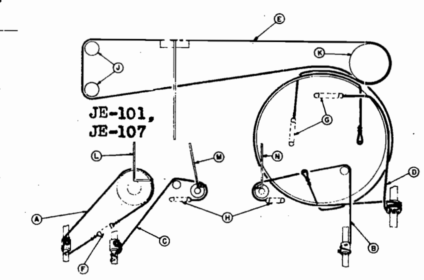
* Variations of +10%, −20% are permissible.
** On "D" band, stray oscillator voltage may upset reading.

MODELS JE-101, JE-107

VOLTAGE CHART*

Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
6SK7 (R.F.)	235	95	4.7	6.3
6K8	Con.—235 Osc.—105	95	4.7	6.3
6SK7 (I.F.)	235	95	3	6.3
6J5G (Det.)	0		0	6.3
6SF5	120		1	6.3
6J5G (Inverter)	90		4	6.3
6V6G	290	230	12.5	6.3
5U4G	277a.c.		300	5.1
6U5	170			6.3

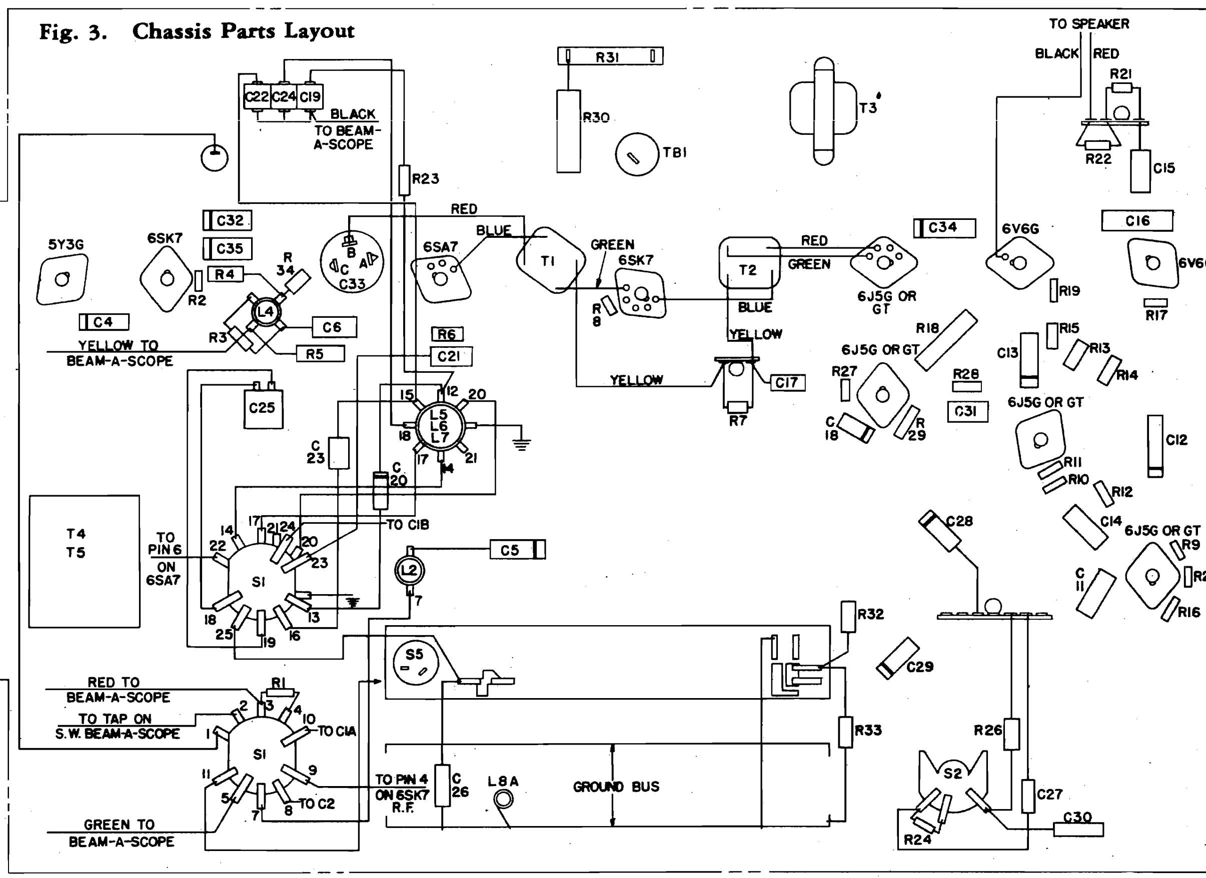
* Voltages measured at rated tap voltage (110 volts on 110 tap, etc.). Receiver tuned to low end of "B" band.



Cord Stringing Diagram

MODEL J-105
(Golden Tone)

GENERAL ELECTRIC CO.



FRONT OF CHASSIS

Note: The oscillator coil and band-switch terminals are numbered in the Chassis Parts Layout, Fig. 3, to assist in locating the corresponding numbered points on the Schematic Diagram, Fig. 2. This numbering will also assist in rewiring if the coil or switch is replaced. I.F. transformer connections are shown as an aid in replacement.

Rating	Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
A	110–125	50–60	115
C	110–125	25–60	120

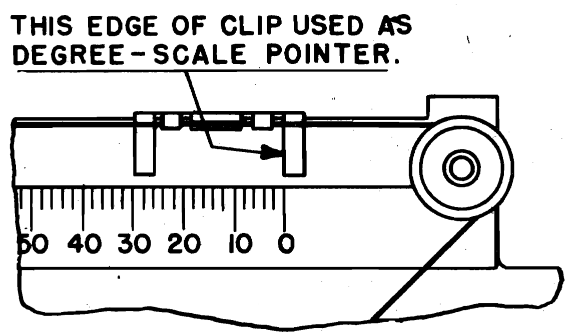


Fig. 6. Pointer-Guide Clip Setting with Gang Condenser Closed (See "R.F. Alignment with Chassis Outside of Cabinet")

Tubes

R.F. AMPLIFIER....................GE-6SK7
CONVERTER AND OSCILLATOR......GE-6SA7
I.F. AMPLIFIER....................GE-6SK7
DET., AVC..........................GE-6J5GT
1st AUDIO DRIVER..................GE-6J5GT
2nd AUDIO DRIVER.................GE-6J5GT
PHASE INVERTER...................GE-6J5GT
POWER OUTPUT..................(2) GE-6V6G
RECTIFIER..........................GE-5Y3G
DIAL LAMP.....................(2) Mazda No. 44

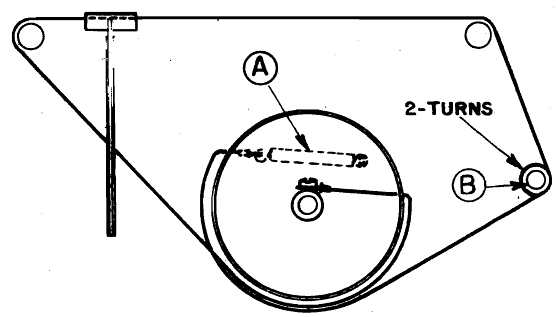


Fig. 7. Dial Cord Stringing Diagram

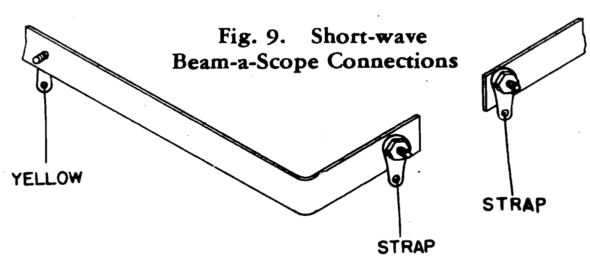
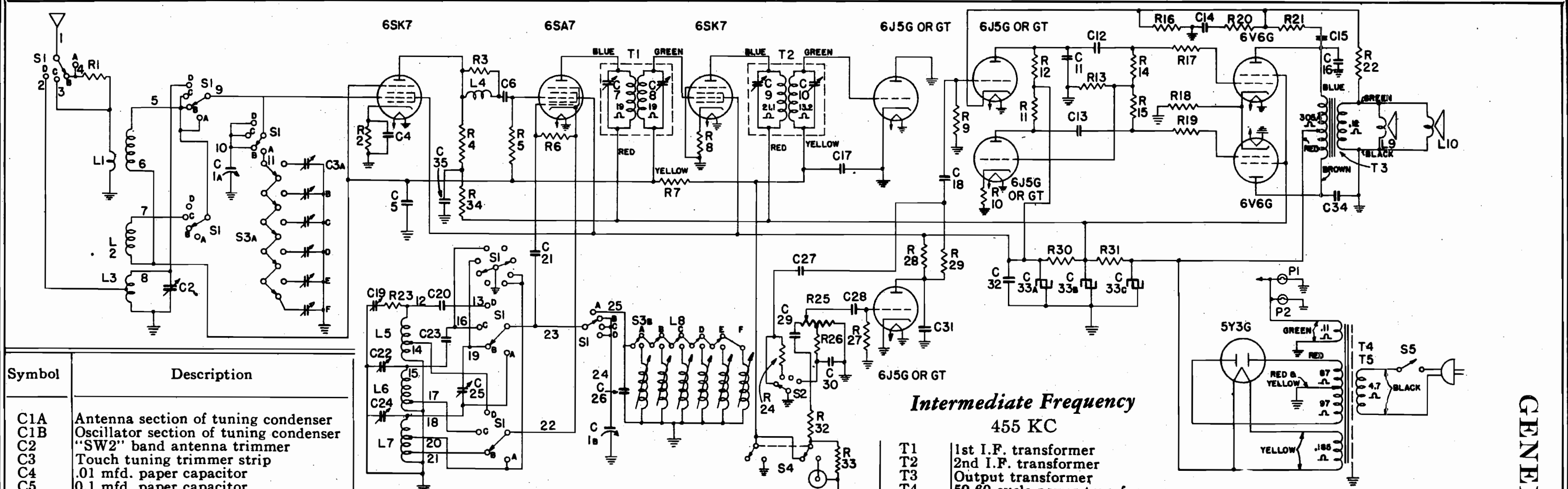


Fig. 9. Short-wave Beam-a-Scope Connections

GENERAL ELECTRIC CO.

MODEL J-105 (Golden Tone)



Intermediate Frequency
455 KC

T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer
T4	50-60-cycle power transformer
T5	25-cycle power transformer

Fig. 2. Schematic Diagram MODEL J-105

Symbol	Description
C1A	Antenna section of tuning condenser
C1B	Oscillator section of tuning condenser
C2	"SW2" band antenna trimmer
C3	Touch tuning trimmer strip
C4	.01 mfd. paper capacitor
C5	0.1 mfd. paper capacitor
C6	100 mmf. mica capacitor
C11	.001 mfd. paper capacitor
C12	.03 mfd. paper capacitor
C13	.03 mfd. paper capacitor
C14	.02 mfd. paper capacitor
C15	100 mmf. 1000 V. mica capacitor
C16	.002 mfd. 1000 V. paper capacitor
C17	220 mmf. mica capacitor
C18	.01 mfd. paper capacitor
C19	"SW2" band oscillator trimmer
C20	.008 mfd. paper capacitor
C21	47 mmf. mica capacitor
C22	"SW1" band oscillator trimmer
C23	2400 mmf. ±5% mica capacitor
C24	"BC" band oscillator trimmer
C25	"BC" band oscillator padder
C26	750 mmf. silvered mica capacitor
C27	.005 mfd. paper capacitor
C28	.05 mfd. paper capacitor
C29	.005 mfd. paper capacitor
C30	.004 mfd. paper capacitor
C31	150 mmf. mica capacitor
C32	.01 mfd. paper capacitor
C33A	10 mfd. 350 V. dry electrolytic
C33B	15 mfd. 400 V. dry electrolytic
C33C	30 mfd. 400 V. dry electrolytic
C34	.002 mfd. 1000 V. paper capacitor
C35	.01 mfd. paper capacitor
L1	"BC" and "SW1" band Beam-a-Scope
L2	"SW1" band antenna coil
L3	"SW2" band Beam-a-Scope
L4	R.F. interstage coil
L5	"SW2" band oscillator coil
L6	"SW1" band oscillator coil
L7	"BC" band oscillator coil
L8	Touch tuning coil strip
P1	Dial lamp, Mazda No. 44
P2	Dial lamp; Mazda No. 44
R1	1000 ohms carbon resistor
R2	47 ohms carbon resistor
R3	10,000 ohms carbon resistor
R4	3300 ohms 1 W. carbon resistor
R5	47,000 ohms carbon resistor
R6	22,000 ohms carbon resistor
R7	2.2 megohms carbon resistor
R8	150 ohms carbon resistor
R9	470,000 ohms carbon resistor
R10	3300 ohms carbon resistor
R11	100,000 ohms carbon resistor
R12	220,000 ohms carbon resistor
R13	220,000 ohms carbon resistor
R14	150,000 ohms carbon resistor
R15	270,000 ohms carbon resistor
R16	4700 ohms carbon resistor
S1	Band switch
S2	Tone control switch
S3	Touch tuning switch
S4	Phono key
S5	Power key
R17	1000 ohms carbon resistor
R18	180 ohms 2 W. carbon resistor
R19	1000 ohms carbon resistor
R20	1800 ohms carbon resistor
R21	47,000 ohms carbon resistor
R22	6800 ohms carbon resistor
R23	27 ohms carbon resistor
R24	47,000 ohms carbon resistor
R25	2 megohms volume control (½ megohm tap)
R26	56,000 ohms carbon resistor
R27	5.6 megohms carbon resistor
R28	220,000 ohms carbon resistor
R29	33,000 ohms carbon resistor
R30	10,000 ohms 3 W. carbon resistor
R31	1600 ohms 4 W. candohm resistor
R32	47,000 ohms carbon resistor
R33	470,000 ohms carbon resistor
R34	1000 ohms carbon resistor

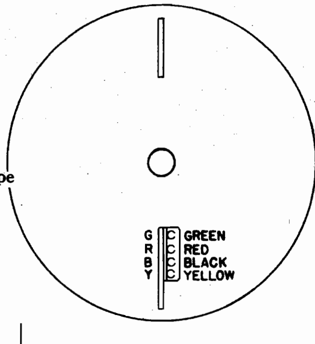
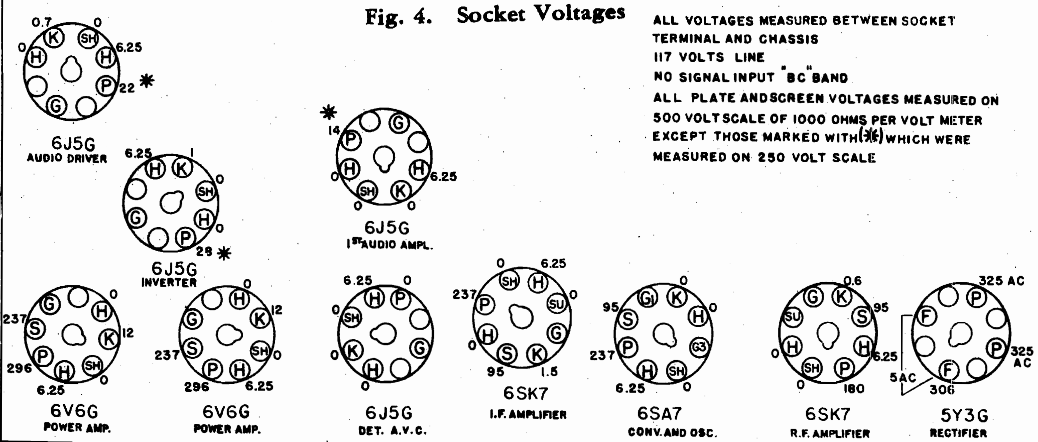


Fig. 8. Cylindrical Beam-a-Scope Connections

FRONT OF CHASSIS

Fig. 4. Socket Voltages

ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINAL AND CHASSIS
117 VOLTS LINE
NO SIGNAL INPUT "BC" BAND
ALL PLATE AND SCREEN VOLTAGES MEASURED ON 500 VOLT SCALE OF 1000 OHMS PER VOLT METER EXCEPT THOSE MARKED WITH (✱) WHICH WERE MEASURED ON 250 VOLT SCALE



BOTTOM VIEW OF CHASSIS

MODEL J-105
(Golden Tone)

GENERAL ELECTRIC CO.

Tuning Frequency Range

Broadcast Band.................... 540–1700 KC
Short-wave Band No. 1............ 2400–7000 KC
Short-wave Band No. 2............ 7000–22,000 KC

Electrical Power Output

Undistorted............................10 Watts
Maximum.............................12 Watts

Tone Control...............................4 positions

Loud-speakers—"Alnico" Magnet Dynamic

Speaker Diameters.......14 inches and 6½ inches
Voice Coil Impedances....3.5 ohms   3.5 ohms

GENERAL INFORMATION

Model J-105 is a ten tube superheterodyne receiver designed to operate from an alternating current power supply. The receiver incorporates the latest developments in radio among which are the General Electric Dual Beam-a-Scopes. Broadcast and short-wave No. 1 signals are selected by the cylindrical Beam-a-Scope. Short-wave No. 2 signals are selected by the Beam-a-Scope which is mounted on the cabinet above the chassis. Additional features include single-ended tubes, iron-core oscillator station selector coils, six Feathertouch Tuning station keys, one Phono-Frequency Modulation-Television key, an "Off" key, a "Manual" key, Dual Dynapower speakers, tone monitor circuit and automatic volume control.

Phono-FM-Tel

This receiver is equipped with a pin jack on the rear apron of the chassis and a Phono–FM–Tel key for adapting it to use with record players, frequency modulation converters and television picture receivers with sound converters. General Electric plug, Stock No. RP-145, fits the pin jack.

SETTING UP THE RECEIVER

The following remarks will assist the serviceman in correctly setting up this receiver for use:

(1) In order to press the volume or tuning knobs all the way on their respective shafts, the dial reflector plate should be held in place by pressure from the rear.

(2) After releasing the shipping screws the position of the chassis should be checked to insure accurate tuning. Close the gang condenser plates and push the chassis one way or the other until the pointer lines up with the first markings on the left side of the dial.

(3) The black speaker leads should be connected to the speaker terminals which are grounded to the speaker frame.

(4) A method of setting up station keys which will assure driftproof adjustments is to screw the iron core all the way out and then turn slowly inward until the desired station is tuned in.

CHASSIS OR BEAM-A-SCOPE REMOVAL

Before either the chassis or Beam-a-Scope can be removed the leads between them must be disconnected. The cylindrical Beam-a-Scope leads are disconnected by pulling the pin plugs out of the Beam-a-Scope terminals. The short-wave Beam-a-Scope leads are disconnected by unscrewing the nuts which clamp the terminals on the two phosphor-bronze straps and the screw which clamps the terminal of the yellow lead. Figs. 8 and 9 show the correct location of the Beam-a-Scope leads when reconnecting. The cylindrical Beam-a-Scope leads must be threaded down through the slot in the cabinet shelf which is immediately below the antenna–ground terminal board. The leads can then be brought out to the position of the cutout in the back of the cabinet shelf where they can be inserted in the Beam-a-Scope terminals.

To remove the cylindrical Beam-a-Scope the following procedure is recommended: Disconnect the four Beam-a-Scope leads. Unscrew the long self-tapping screw which prevents the Beam-a-Scope from rotating continuously in one direction. This screw is located in the cabinet shelf. Pry loose the cardboard strap which is stapled to the bottom of the cabinet and which holds the bottom of the Beam-a-Scope in place. The Beam-a-Scope can now be rotated from right to left until it comes loose. Note: The upper pivot bolt by which the Beam-a-Scope is supported should never be loosened or removed.

When replacing the cylindrical Beam-a-Scope it should be screwed on approximately five turns from the position where the bolt first takes hold. The self-tapping screw in the cabinet shelf should then be screwed down until it acts as a stop for the projection next to the terminals. The screw should not be run down so far that it contacts the projection on the opposite side from the terminals as this will limit rotation to only 180 degrees. The cardboard strap should be placed over the bottom Beam-a-Scope pivot and stapled to the cabinet in such a position that the Beam-a-Scope hangs vertically and is free to turn without rubbing on the strap.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

Note—In no case should the magnet be removed from the assembled position.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*

(a) Antenna Post to R.F. Grid at		
	1000 KC	6.5
	4000 KC	3.0
	18,000 KC	2.0
(b) R.F. Grid to Converter Grid at		
	1000 KC	5.0
	4000 KC	3.0
	18,000 KC	2.0
(c) R.F. on Converter Grid to I.F. on 1st I.F. Grid at		
	1000 KC	50
	4000 KC	50
	18,000 KC	40
(d) Converter Grid to 1st I.F. Grid at		
	455 KC	55
(e) I.F. Amplifier Grid to Detector Grid at		
	455 KC	75

(2) Voltage across Volume Control to Give ½-watt Speaker Output at

	400 cycles	.04 volts

(3) DC Voltage Developed Across Oscillator Grid Resistor (R-6) at

	1000 KC	8.5
	4000 KC	8.5
	18,000 KC	7.5

* Variations of ±20% permissible. All readings obtained with enough input signal to give ½-watt speaker output.

Alignment Procedure

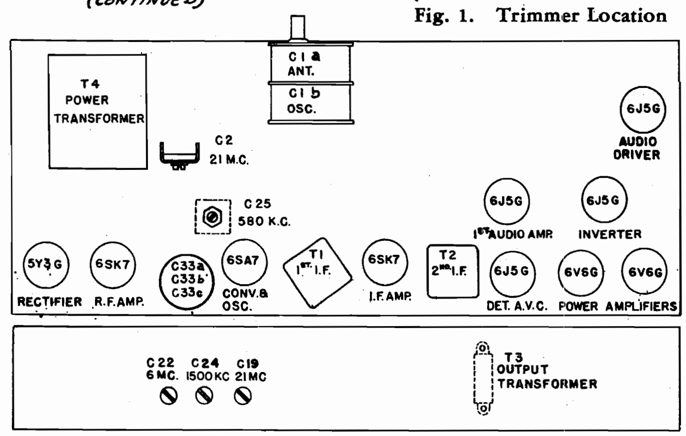
The alignment procedure is given in table form. The use of a standard I.R.E. dummy antenna in making all R.F. alignments is recommended. R.F. alignment can be performed by loop coupling the generator signal to the receiver Beam-a-Scopes if care is exercised not to overcouple the two circuits. Keeping a distance of two feet or more between the generator loop and receiver Beam-a-Scope will generally insure freedom from overcoupling. The relative position of the Beam-a-Scopes with respect to the chassis materially affects R.F. alignment; therefore, all R.F. alignments should be made with the chassis and Beam-a-Scopes mounted in the cabinet. In keeping with this recommendation all R.F. alignment trimmers are accessible through holes in the back apron of the chassis or from the top of the chassis (refer to the Trimmer Location diagram, Fig. 1). Metal objects such as meters, tools, etc. should not be placed on top of the receiver cabinet. Also the receiver should be kept away from large metal objects such as radiators, metal-top tables, etc.

R.F. ALIGNMENT
WITH CHASSIS OUTSIDE OF CABINET

R.F. alignment can be performed only on the "BC" and "SW-1" bands with the chassis outside the cabinet. Any alignment attempted on "SW-2" band will not be satisfactory. The same relative position between the chassis and cylindrical Beam-a-Scope should be maintained when aligning outside the cabinet as these components occupy in the cabinet. Since the glass dial scale is fastened to the cabinet it cannot be used for reference during alignment of the chassis outside of the cabinet. Use must be made, therefore, of a 0–180° calibrated scale which is cemented to the back of the dial reflector plate. From the reference chart the degree readings for corresponding frequency settings may be ob-

(CONTINUED)

Fig. 1. Trimmer Location



MODEL J-105
(Golden Tone)

GENERAL ELECTRIC CO.

(CONTINUED)
tained by laying a straight edge across the chart perpendicular to the line of figures and sliding the straight edge along to the various frequency settings desired. The degree readings will be found on either of the degree scales above or below the dial scale. To use these degree readings, first completely close the gang condenser plates and then slide the pointer along the cord until the inside edge of the right-hand pointer-guide clip is in line with the 0° mark. (See Fig. 6.) By using this edge of the clip as the degree-scale pointer the receiver may be tuned to any frequency. Example: By rotating the tuning control until this edge of the clip is in line with 154°, the receiver will be tuned to 1500 KC on the "BC" band.

The "BC" and "SW-1" band alignment procedure is the same as outlined in steps 2 to 5 inclusive of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

After the alignment has been performed on the "BC" and "SW-1" bands the chassis should be mounted in the cabinet and "SW-2" band alignment checked as described in steps 6 to 8 of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

Note: After moving the pointer along the cord to use one of the guide clips as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

ALIGNMENT CHART

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC Sweep	I.F. Grid	.05 mfd. or larger	2nd I.F. trimmers, C-9, C-10	Gang condenser plates closed. Depress any station key other than Phono–FM–Tel key. Connect audio input of oscilloscope to chassis ground and junction of R-32 and R-33. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. Finish by retrimming 2nd I.F. trimmers.
2. "BC" Band	455 KC Sweep	Converter Grid	.05 mfd. or larger	1st I.F. trimmers, C-7, C-8	

I.F. Alignment with Output Meter

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC with Modulation	Converter Grid	.05 mfd. or larger	2nd I.F. trimmers, C-9, C-10	Gang condenser plates closed. Depress any key other than Phono–FM–Tel key. Connect output meter across voice coil. Keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
				1st I.F. trimmers, C-7, C-8	

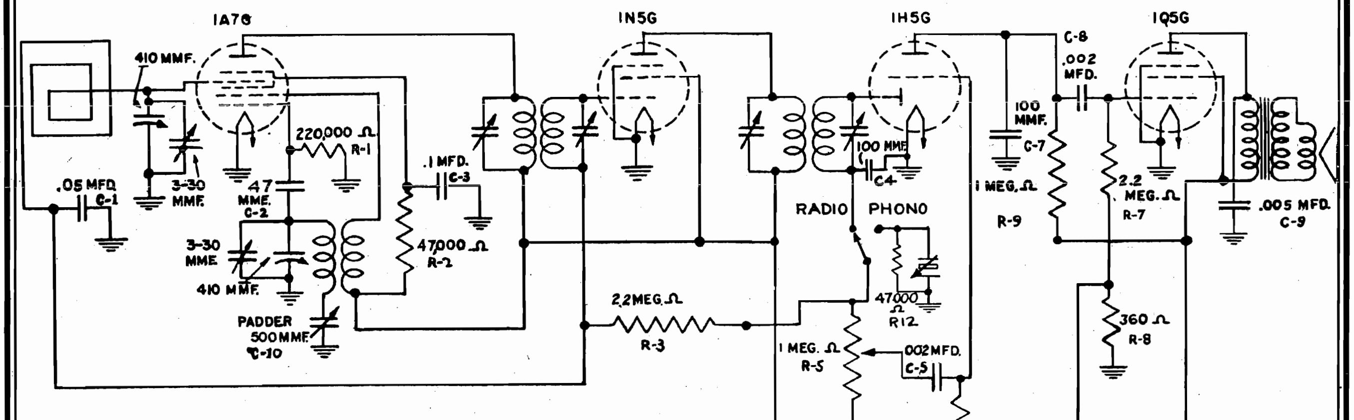
R.F. Alignment With Chassis Mounted in Cabinet

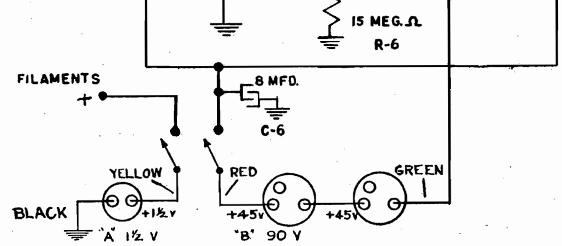
Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band					Close gang plates, adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil. Tone control set to "Normal."
2. "BC" Band	580 KC with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-25)	Set dial pointer to 580 KC and tune in signal with (C-25) while rocking gang condenser.
3. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-24)	Set dial pointer to 1500 KC and peak trimmer for maximum output while rocking the gang condenser.
4. "BC" Band	580 KC with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-25)	Realign for maximum output with a low input signal rocking the gang condenser.
5. "SW-1" Band	6 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-22)	Set pointer to 6 MC and peak signal while rocking gang condenser.
6. "SW-2" Band	21 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-19) Ant. (C-2)	Set pointer to 21 MC and tune in signal with (C-19). Peak output with (C-2) while rocking gang condenser. When (C-19) is on proper peak, image of 21 MC signal should be heard 910 KC below or on 20.09 MC.
7. "SW-2" Band	8 MC with Modulation	Antenna Post	I.R.E.		This operation may or may not be necessary depending on how much the short-wave Beam-a-Scope leads have been moved from their correctly dressed positions. Repositioning will be indicated if an increased output meter reading can be obtained by moving the short-wave Beam-a-Scope strap leads closer or farther apart. The moving should be done with an insulated rod or stick.

8. Repeat Operation 6 if the short-wave Beam-a-Scope leads are moved appreciably in Operation 7.

MODEL HB-408

GENERAL ELECTRIC CO.





Physical Specifications

Model.............................HB-408
Height............................9½ inches
Width.............................14⅛ inches
Depth.............................13⅛ inches
Weight............................19½ lbs.

Tuning Control Drive Ratio.............5.5 : 1

Battery Specifications

"A" BATTERY
1—General 8-F-1 or 1—Eveready No. 741
"B" BATTERY
2—General V-30-B or 2—Eveready No. 762

Battery Life

Using the above recommended batteries a battery life from 200 to 250 hours can be expected providing the daily operation does not exceed four hours. If the daily operation exceeds four hours the battery life will be reduced due to the fact that the batteries do not have sufficient time to revitalize themselves.

Tuning Frequency Range................550–1600 K.C.

Intermediate Frequency.................455 K.C.

Loud-speaker—Permanent Magnet

Outside Cone Diameter...............4 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

Tubes

Converter and Oscillator.............1A7G
I.F. Amplifier.......................1N5G
Detector-Amplifier...................1H5G
Output...............................1Q5G

SERVICE INFORMATION

On later production models the 360-ohm output biasing resistor (R-8) was changed to 430 ohms. This change reduced battery drain while not appreciably affecting power output.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.—455 K.C. Broadcast—1500 K.C. and 580 K.C The location of all trimmers is shown in Fig. 1.

I.F. Alignment

In order to align this receiver for I.F. the four wood screws holding the motorboard to the cabinet will have to be removed. Raise the front edge of the motorboard being careful not to let the cabinet cover swing back and place a strain on the hinges. The phono-switch cable will limit the amount which the front edge of the motorboard can be opened. Prop the motorboard in the opened position and proceed with I.F. alignment. (NOTE—Do not let the phono-switch cable come near the 1N5G grid leads. Standard dressing is to force the cable down in the space between the 1H5G tube and the 2nd I.F. transformer.)

Connect an output meter across the voice coil. Set the volume control for maximum. With the test oscillator set to 455 K.C. apply signal to the control grid of the 1A7G converter tube through a .05-mfd. capacitor. Do not remove the grid leads from the tubes. Keep the test oscillator output as low as possible to give a readable output. Adjust all four I.F. trimmers for maximum output.

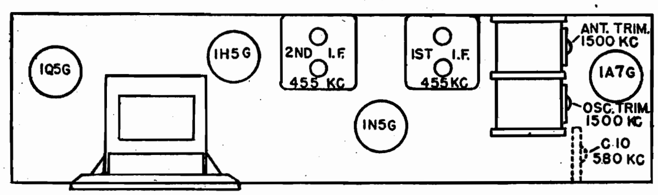


Fig. 1. Trimmer Location

R.F. Alignment

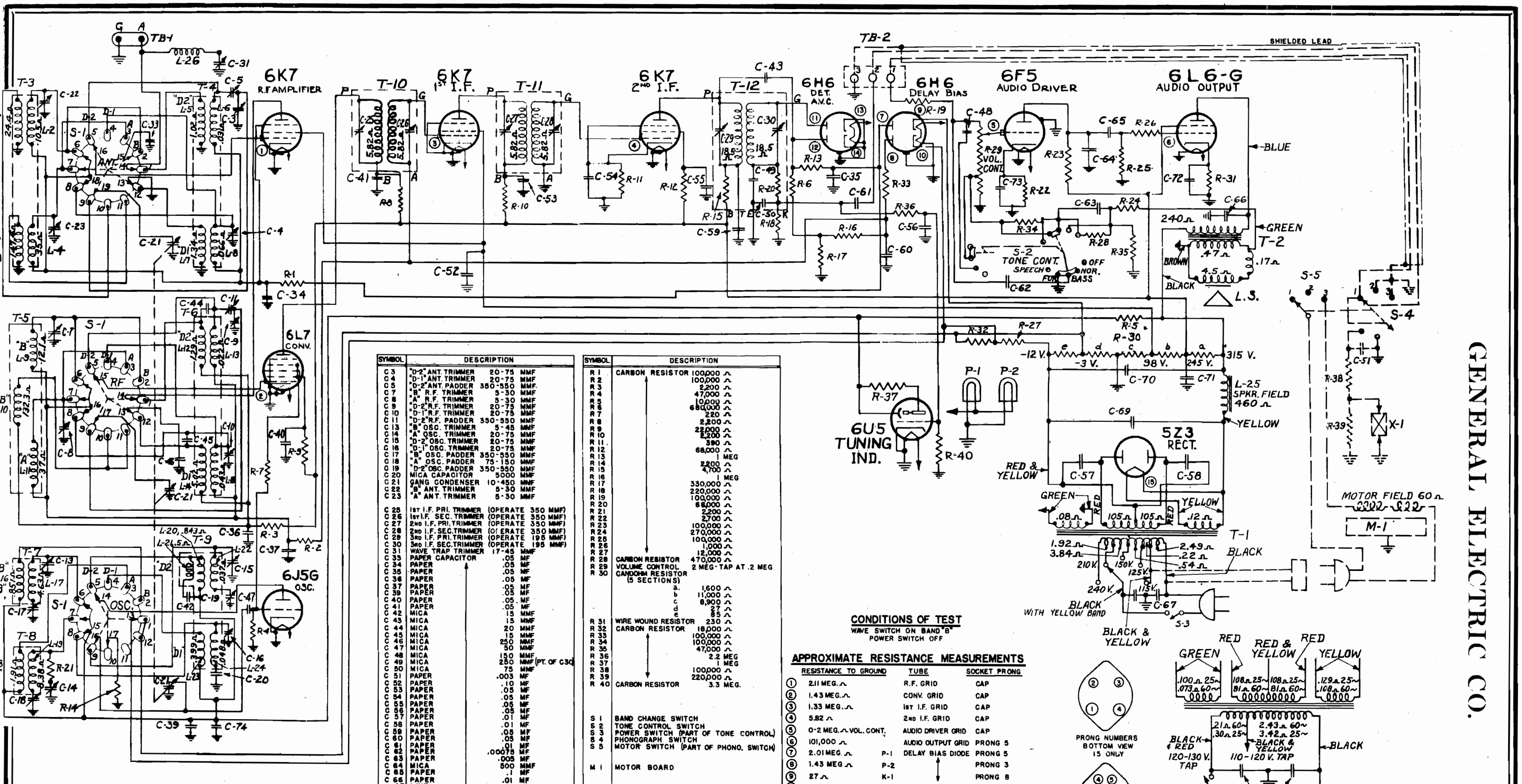
Return the motorboard to its normal cabinet position. (NOTE—Before R.F. alignment be sure that all parts are in their normal positions in the cabinet.) It is not necessary to screw the motorboard to the cabinet as it may be convenient to raise the motorboard slightly from time to time to locate the heads of the trimmer screws. It must be remembered however, that R.F. trimmer adjustments should only be made when the motorboard is down in position.

Access to the R.F. trimmers is made possible by removing the three snap fasteners on the right side of the cabinet. The upper left-hand trimmer is the 1500-K.C. oscillator trimmer. The upper right-hand trimmer is the 1500-K.C. antenna trimmer. The lower trimmer is the 580-K.C. padder.

The test signal may be applied by connecting across the test oscillator terminals a loop of ten turns of wire approximately one foot in diameter. Place the loop parallel to the plane of the back panel of the cabinet and not closer than one foot. With 1500 K.C. input adjust the oscillator and antenna trimmers for maximum output. Change input signal to 580 K.C. and peak the 580-K.C. (C-10) padder by rocking the gang condenser.

GENERAL ELECTRIC CO.

MODELS FE-112, FE-116, FE-119



SYMBOL	DESCRIPTION
C 3	"D-2" ANT. TRIMMER 20-75 MMF
C 4	"D-1" ANT. TRIMMER 20-75 MMF
C 5	"D-2" ANT. PADDER 350-550 MMF
C 7	"B" R.F. TRIMMER 5-30 MMF
C 8	"A" R.F. TRIMMER 5-30 MMF
C 9	"D-2" R.F. TRIMMER 20-75 MMF
C 10	"D-1" R.F. TRIMMER 20-75 MMF
C 11	"D-2" R.F. PADDER 350-550 MMF
C 13	"B" OSC. TRIMMER 5-45 MMF
C 14	"A" OSC. TRIMMER 20-75 MMF
C 15	"D-2" OSC. TRIMMER 20-75 MMF
C 16	"D-1" OSC. TRIMMER 20-75 MMF
C 17	"B" OSC. PADDER 350-550 MMF
C 18	"A" OSC. PADDER 75-150 MMF
C 19	"D-2" OSC. PADDER 350-550 MMF
C 20	MICA CAPACITOR 5000 MMF
C 21	GANG CONDENSER 10-450 MMF
C 22	"B" ANT. TRIMMER 5-30 MMF
C 23	"A" ANT. TRIMMER 5-30 MMF
C 25	1ST I.F. PRI. TRIMMER (OPERATE 350 MMF)
C 26	1ST I.F. SEC. TRIMMER (OPERATE 350 MMF)
C 27	2ND I.F. PRI. TRIMMER (OPERATE 350 MMF)
C 28	2ND I.F. SEC. TRIMMER (OPERATE 350 MMF)
C 29	3RD I.F. PRI. TRIMMER (OPERATE 195 MMF)
C 30	3RD I.F. SEC. TRIMMER (OPERATE 195 MMF)
C 31	WAVE TRAP TRIMMER 17-45 MMF
C 33	PAPER CAPACITOR .05 MF
C 34	PAPER .05 MF
C 35	PAPER .05 MF
C 36	PAPER .05 MF
C 37	PAPER .05 MF
C 39	PAPER .05 MF
C 40	PAPER .05 MF
C 41	PAPER .05 MF
C 42	MICA 15 MMF
C 43	MICA 15 MMF
C 44	MICA 20 MMF
C 45	MICA 15 MMF
C 46	MICA 250 MMF
C 47	MICA 50 MMF
C 48	MICA 150 MMF
C 49	MICA 250 MMF (PT. OF C30)
C 50	MICA 75 MMF
C 51	PAPER .003 MF
C 52	PAPER .10 MF
C 53	PAPER .05 MF
C 54	PAPER .05 MF
C 55	PAPER .05 MF
C 56	PAPER .05 MF
C 57	PAPER .01 MF
C 58	PAPER .01 MF
C 59	PAPER .05 MF
C 60	PAPER .05 MF
C 61	PAPER .01 MF
C 62	PAPER .00075 MF
C 63	PAPER .005 MF
C 64	MICA 500 MMF
C 65	PAPER .1 MF
C 66	PAPER .01 MF
C 67	LINE .01-.01 MF
C 69	WET ELECT. 30 MF
C 70	WET ELECT. 30 MF
C 71	DRY ELECT. 10 MF
C 72	DRY ELECT 25 MF
C 73	DRY ELECT. 10 MF
C 74	DRY ELECT. CAPACITOR 4 MF

SYMBOL	DESCRIPTION
R 1	CARBON RESISTOR 100,000 Ω
R 2	100,000 Ω
R 3	2,200 Ω
R 4	47,000 Ω
R 5	10,000 Ω
R 6	680,000 Ω
R 7	220 Ω
R 8	2,200 Ω
R 9	22,000 Ω
R 10	2,200 Ω
R 11	390 Ω
R 12	68,000 Ω
R 13	1 MEG
R 14	2,200 Ω
R 15	4,700 Ω
R 16	1 MEG
R 17	330,000 Ω
R 18	220,000 Ω
R 19	100,000 Ω
R 20	68,000 Ω
R 21	2,200 Ω
R 22	2,700 Ω
R 23	100,000 Ω
R 24	270,000 Ω
R 25	100,000 Ω
R 26	1,000 Ω
R 27	12,000 Ω
R 28	CARBON RESISTOR 470,000 Ω
R 29	VOLUME CONTROL 2 MEG-TAP AT .2 MEG
R 30	CANDOHM RESISTOR (5 SECTIONS)
	a. 1,600 Ω
	b 11,000 Ω
	c 8,900 Ω
	d 27 Ω
	e 85 Ω
R 31	WIRE WOUND RESISTOR 230 Ω
R 32	CARBON RESISTOR 18,000 Ω
R 33	100,000 Ω
R 34	100,000 Ω
R 35	47,000 Ω
R 36	2.2 MEG
R 37	1 MEG
R 38	100,000 Ω
R 39	220,000 Ω
R 40	CARBON RESISTOR 3.3 MEG.
S 1	BAND CHANGE SWITCH
S 2	TONE CONTROL SWITCH
S 3	POWER SWITCH (PART OF TONE CONTROL)
S 4	PHONOGRAPH SWITCH
S 5	MOTOR SWITCH (PART OF PHONO. SWITCH)
M 1	MOTOR BOARD
X 1	CRYSTAL PICKUP

CONDITIONS OF TEST

WAVE SWITCH ON BAND "B"
POWER SWITCH OFF

APPROXIMATE RESISTANCE MEASUREMENTS

	RESISTANCE TO GROUND		TUBE	SOCKET PRONG
1	2.11 MEG. Ω		R.F. GRID	CAP
2	1.43 MEG. Ω		CONV. GRID	CAP
3	1.33 MEG. Ω		1ST I.F. GRID	CAP
4	5.82 Ω		2ND I.F. GRID	CAP
5	0-2 MEG. Ω VOL. CONT.		AUDIO DRIVER GRID	CAP
6	101,000 Ω		AUDIO OUTPUT GRID	PRONG 5
7	2.01 MEG. Ω	P-1	DELAY BIAS DIODE	PRONG 5
8	1.43 MEG. Ω	P-2		PRONG 3
9	27 Ω	K-1		PRONG 8
10	7200 Ω	K-2	DELAY BIAS DIODE	PRONG 4
11	288,000 Ω	P-2	DET. & A.V.C. DIODE	PRONG 3
12	1.01 MEG. Ω	P-1		PRONG 5
13	GROUNDED	K-2		PRONG 4
14	GROUNDED	K-1	DET. & A.V.C. DIODE	PRONG 8
15	22,000 Ω		RECT. FILAMENT	PRONG 1 OR 4

Tuning Frequency Range

Band "A" . . . . . 140-380 kc.
Band "B" . . . . . 540-1600 kc.
Band "D-1" . . . . . 5500-14,000 kc.
Band "D-2" . . . . . 13,000-23,000 kc.

Intermediate Frequency . . 455 kc.

Electrical Output

Undistorted . . . . . 6 watts
Maximum . . . . . 10 watts

MOTOR AND PICKUP CONNECTIONS SHOWN IN DOTTED LINES APPLY TO MODEL FE-119 ONLY.

TERMINALS 1 AND 2 ON TB-2 JOINED IN MODELS FE-112 AND FE-116.

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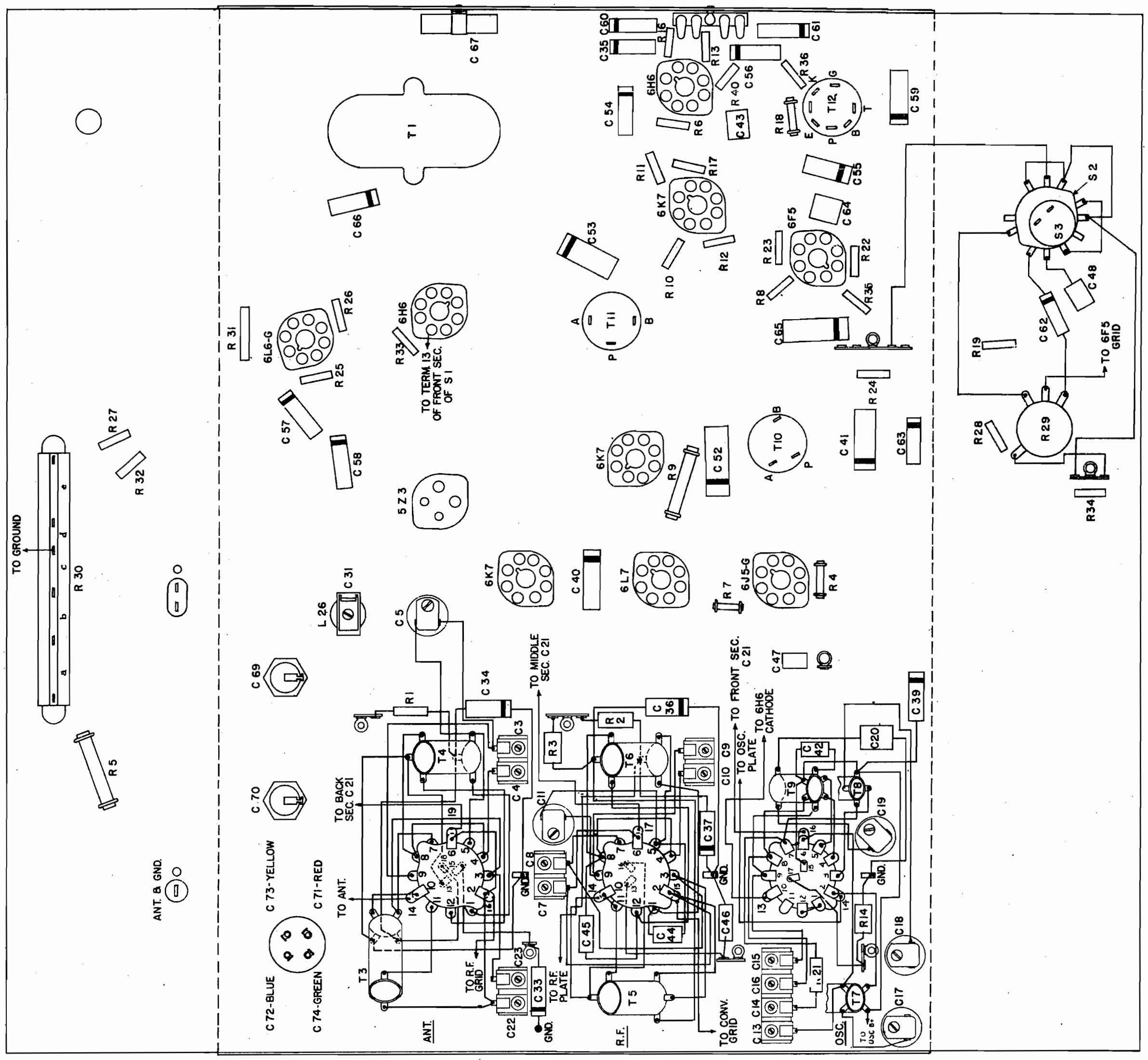
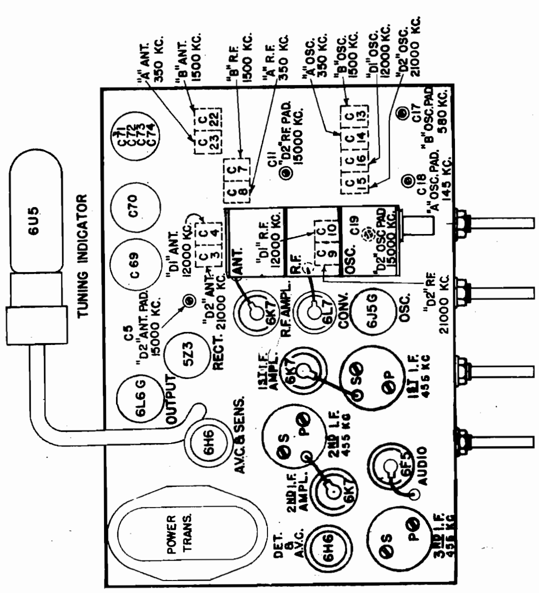
FOR OTHER DATA SEE INDEX

MODELS FE-62, FE-67, FE-68
MODELS FE-112, FE-116, FE-119

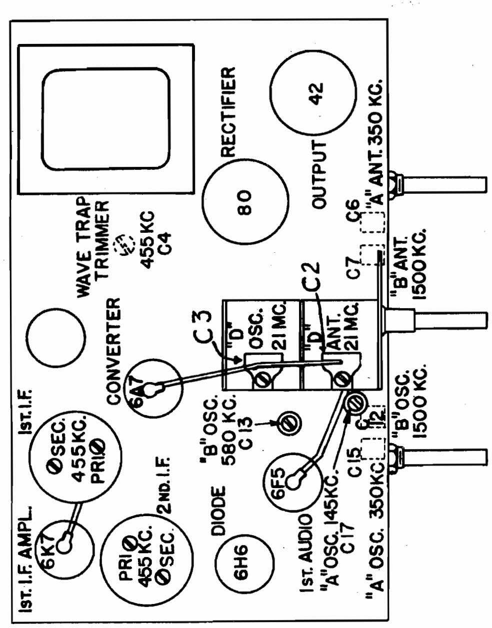
GENERAL ELECTRIC CO.



CHASSIS PARTS LAYOUT
MODELS FE-112, FE-116, FE-119



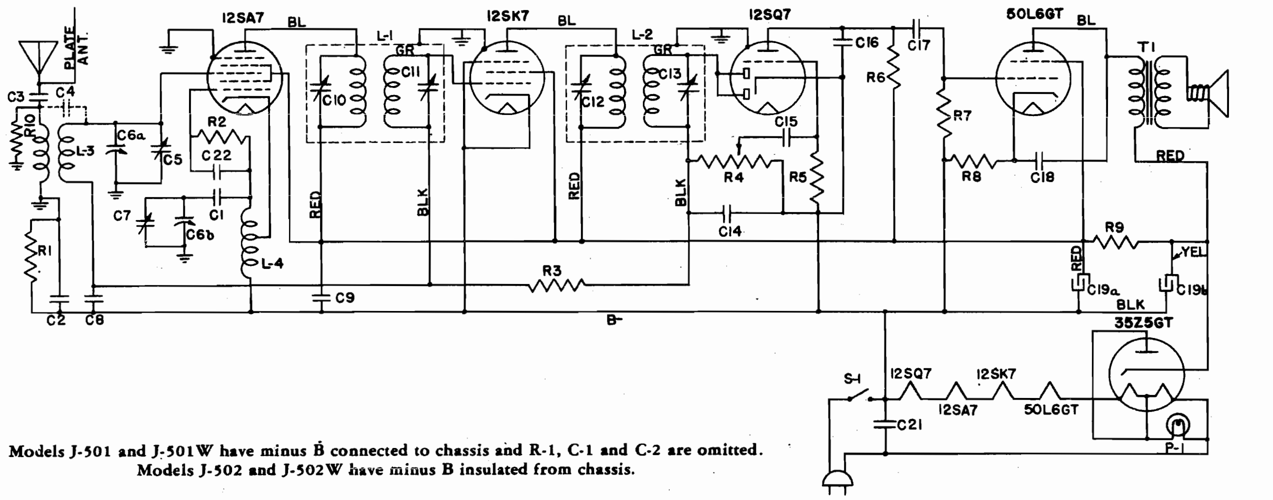
Chassis Layout and Trimmer Location
MODELS FE-112, FE-116, FE-119



Chassis Layout and Trimmer Location
MODELS FE-62, FE-67, FE-68

GENERAL ELECTRIC CO.

MODELS J-501, J-501W, J-502, J-502W



Models J-501 and J-501W have minus B connected to chassis and R-1, C-1 and C-2 are omitted.
Models J-502 and J-502W have minus B insulated from chassis.

Symbol	Description	Symbol	Description	Symbol	Description
C-1	.02 mfd. paper (Used only in J-502, 502W)	C-16	100 mmf. mica	R-2	20,000 ohms carbon
C-2	.2 mfd. paper (Used only in J-502, 502W)	C-17	.01 mfd. paper	R-3	2.2 megohms carbon
C-3	.01 mfd. paper	C-18	.02 mfd. paper	R-4	0.5 megohm volume control
C-5	Antenna trimmer	C-19A	16 mfd. dry electrolytic	R-5	5.1 megohms carbon
C-6A	Antenna section of tuning condenser	C-19B	24 mfd. dry electrolytic	R-6	250,000 ohms carbon
C-6B	Oscillator section of tuning condenser	C-21	.05 mfd. paper	R-7	750,000 ohms carbon
C-7	Oscillator trimmer	C-22	100 mmf. mica	R-8	150 ohms carbon
C-8	.05 mfd. paper	L-3	Antenna coil	R-9	2800 ohms 1 W. carbon
C-9	.05 mfd. paper	L-4	Oscillator coil	R-10	10,000 ohms carbon
C-14	250 mmf. mica	P-1	Dial lamp, Mazda No. 47	S-1	Power switch
C-15	.01 mfd. paper	R-1	250,000 ohms carbon (Used only in J-502, 502W)		

GENERAL INFORMATION

Models J-501, J-501W, J-502 and J-502W are five-tube, AC-DC superheterodyne receivers. Models J-502 and J-502W are Underwriters' approved versions of the Models J-501 and J-501W. The Models J-501 and J-502 use rich brown plastic cabinets. Models J-501W and J-502W are identical to Models J-501 and J-502, respectively, except for white plastic cabinet.

These receivers incorporate the following features: Single-ended tubes, automatic volume control, plate antenna, dynapower speaker, beam power output and a dial lamp.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. .... 455 KC
R.F. .... 1750 and 1500 KC

The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. Alignment

Apply the R.F. alignment signals through a standard I.R.E. dummy antenna to the receiver antenna post. With the gang condenser wide open, align the oscillator trimmer (C-7) to 1750 KC. Change the generator signal to 1500 KC, tune the receiver to the signal and peak antenna trimmer (C-5) for maximum output.

Precaution

If the signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

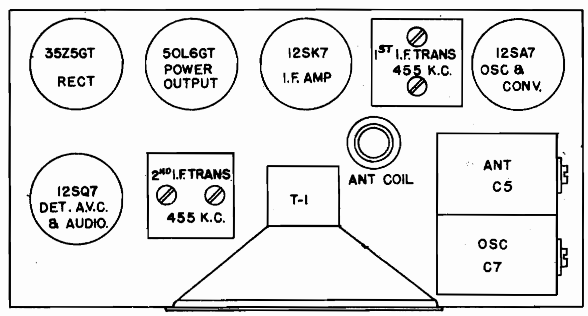


Fig. 1. Trimmer Location

Over-all Dimensions

Height .... 6 inches
Width .... 9¼ inches
Depth .... 5½ inches

Tuning Control Drive Ratio 6:1

Electrical Specifications

Models	VOLTAGE RATING (AC or DC)	FREQUENCY (Cycles per Second)	POWER CONSUMPTION (Watts)
J-501, 501W	105–125	40–60	30
J-502, 502W	105–117	40–60	30

Tuning Frequency Range .... 550–1750 KC

Intermediate Frequency .... 455 KC

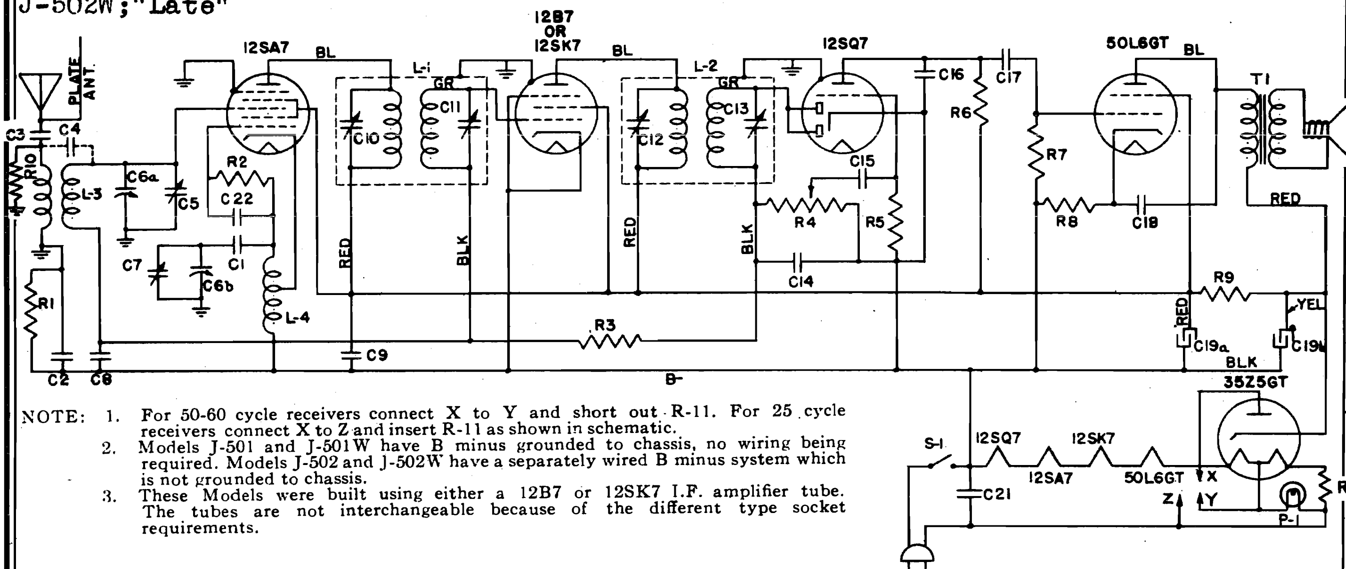
Maximum Power Output .... 1.5 Watts

Loud-speaker—"Alnico" Magnet Dynamic

Outside cone diameter .... 4 inches
Voice coil impedance (400 cycles) .... 3.1 ohms

MODELS J-501, J-501W, J-502, J-502W; "Late"

GENERAL ELECTRIC CO.



NOTE: 1. For 50-60 cycle receivers connect X to Y and short out R-11. For 25 cycle receivers connect X to Z and insert R-11 as shown in schematic.
2. Models J-501 and J-501W have B minus grounded to chassis, no wiring being required. Models J-502 and J-502W have a separately wired B minus system which is not grounded to chassis.
3. These Models were built using either a 12B7 or 12SK7 I.F. amplifier tube. The tubes are not interchangeable because of the different type socket requirements.

Symbol	Description	Symbol	Description	Symbol	Description
C-1	.05 mfd. paper capacitor (Used only in J-502 and J-502W)	C-16	330 mmf. mica capacitor	R-2	22,000 ohms carbon resistor
C-2	0.2 mfd. paper capacitor (Used only in J-502 and J-502W)	C-17	.01 mfd. paper capacitor	R-3	2.2 megohms carbon resistor
C-3	.01 mfd. paper capacitor	C-18	.02 mfd. paper capacitor	R-4	0.5 megohm volume control
C-4	5 to 7 mmf. (part of L-3)	C-19a	20 mfd. 150 V. dry electrolytic	R-5	4.7 megohms carbon resistor
C-5	Antenna trimmer on gang	C-19b	30 mfd. 150 V. dry electrolytic	R-6	270,000 ohms carbon resistor
C-6a	Antenna section of tuning condenser	C-21	.05 mfd. paper capacitor	R-7	470,000 ohms carbon resistor
C-6b	Oscillator section of tuning condenser	C-22	100 mmf. mica capacitor	R-8	150 ohms carbon resistor
C-7	Oscillator trimmer on gang	L-1	1st I.F. transformer	R-9	2700 ohms 1 W. carbon resistor
C-8	.05 mfd. paper capacitor	L-2	2nd I.F. transformer	R-10	10,000 ohms carbon resistor
C-9	.05 mfd. paper capacitor	L-3	Antenna coil	R-11	13 ohms carbon resistor (Used on 25 cycle sets only)
C-14	330 mmf. mica capacitor	L-4	Oscillator coil	T-1	Output transformer
C-15	.005 mfd. paper capacitor	P-1	Dial lamp, MAZDA No. 47		
		R-1	330,000 ohms carbon resistor (Used only in J-502 and J-502W)		

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POWER CONSUMPTION-30 WATTS

Tuning Frequency Range..............550–1720 KC

Intermediate Frequency.....................455 KC

Maximum Power Output.................1.5 Watts

Loud-speaker—"Alnico" Magnet Dynamic

Outside cone diameter..................4 inches
Voice coil impedance (400 cycles).........3.1 ohms

Tubes

Converter and Oscillator.......GE-12SA7
I.F. Amplifier................GE-12SK7 or 12B7
Det., Aud., AVC............GE-12SQ7
Power Output...............GE-50L6GT
Rectifier.....................GE-35Z5GT
Dial Lamp..................MAZDA No. 47

VOLTAGE CHART

Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
12SA7	73	73	0	12
12SK7	73	73	0	12
12SQ7	40		0	12
50L6GT	120	73	12	50
35Z5GT	112 AC		122	31

Precaution

If the signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII

Alignment Frequencies

I.F.......................................455 KC
R.F......................................1500 KC

The location of all trimmers is shown in Fig. 1.

R.F. Alignment

Close the gang condenser by rotating the tuning control. Slide the pointer along the cord until it lines up with the first dial marking on the left. Now rotate the tuning control until the pointer is over the 1500 KC dial mark. Apply a 1500 KC signal to the receiver antenna post through a standard I.R.E. dummy antenna. Align the oscillaton trimmer (C-7) to bring in the signal and peak the signal by adjusting the antenna trimmer (C-5). (See Fig. 1 for trimmer locations.)

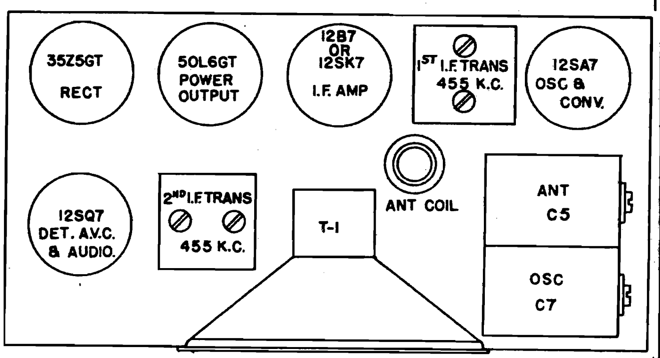
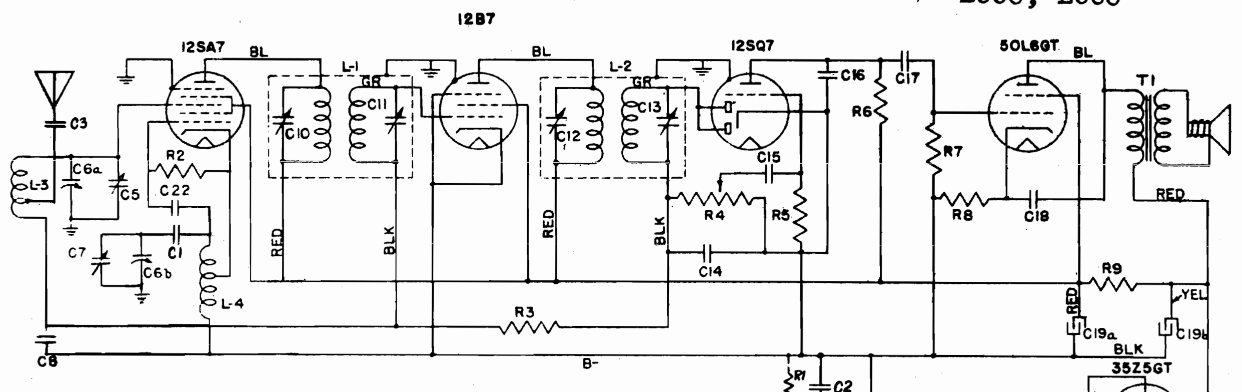
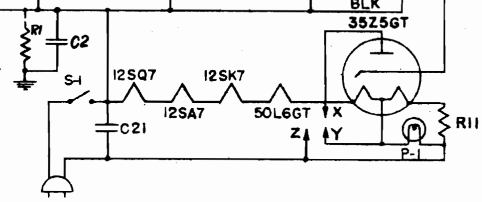


Fig. 1. Trimmer Location

GENERAL ELECTRIC CO.

MODELS L500, L510, L550, L560





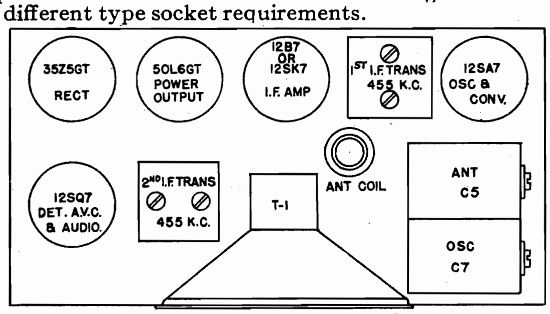
NOTE: 1. For 50-60 cycle receivers connect X to Y and short out R-11. For 25 cycle receivers connect X to Z and insert R-11 as shown in schematic.

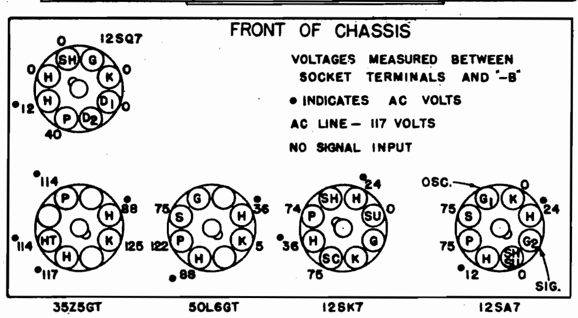
2. Models L500 and L550 have B minus grounded to chassis omitting R1 and C2; also a jumper is used in place of C1. Models L510 and L560 have a separately wired B minus system which is not grounded to chassis except through R1 and C2.

*RC-072	C1	CAPACITOR—.05 mfd., 200 V. paper
*RC-130	C2	CAPACITOR—.20 mfd., 400 V. paper
*RC-293	C3	CAPACITOR—470 mmf., mica
*RC-7039	C6a, 6b	CONDENSER—Tuning condenser
*RC-072	C8	CAPACITOR—.05 mfd., 200 V. paper
*RC-274	C14	CAPACITOR—330 mmf., mica
*RC-023	C15	CAPACITOR—.005 mfd., 600 V. paper
*RC-274	C16	CAPACITOR—330 mmf., mica
*RC-039	C17	CAPACITOR—.01 mfd., 600 V. paper
*RC-048	C18	CAPACITOR—.02 mfd., 600 V. paper
*RC-5174	C19a	CAPACITOR—20 mfd., 150 V. electrolytic
*RC-5174	C19b	CAPACITOR—30 mfd., 150 V. electrolytic
*RC-092	C21	CAPACITOR—.05 mfd., 600 V. paper
*RC-235	C22	CAPACITOR—100 mmf., mica
*RQ-1319	R1	RESISTOR—330,000 ohms, ½ W. carbon
*RQ-1291	R2	RESISTOR—22,000 ohms, ½W. carbon
*RQ-1339	R3	RESISTOR—2.2 megohms, ½W. carbon
*RV-108	R4	VOL. CONTROL—0.5 megohm control
*RQ-1347	R5	RESISTOR—4.7 megohms, ½W. carbon
*RQ-1317	R6	RESISTOR—270,000 ohms, ½W. carbon
*RQ-1323	R7	RESISTOR—470,000 ohms, ½W. carbon
*RQ-1239	R8	RESISTOR—150 ohms, ½W. carbon
*RQ-1469	R9	RESISTOR—2,700 ohms, 1W. carbon
*RQ-1214	R11	RESISTOR—13 ohms, ½W. carbon
*RT-375	L1	TRANSFORMER—1st I.F. transformer
*RT-376	L2	TRANSFORMER—2nd I.F. transformer
RL-1011	L3	COIL—antenna coil
RL-2047	L4	COIL—oscillator coil
RT-4004	T1	TRANSFORMER—output transformer

Models L500, L510, L550 and L560 are five tube AC-DC superheterodyne receivers. Models L510 and L560 are Underwriters' approved versions of the Models L500 and L550. The models L500 and L510 use rich mahogany plastic cabinets. Models L550 and L560 are identical to Models L500 and L510, respectively, except for ivory plastic cabinets.

These models are built using either a 12B7 or 12SK7 I.F. amplifier tube. The tubes are not interchangeable because of the different type socket requirements.





BOTTOM VIEW OF CHASSIS

Intermediate Frequency . . . . 455 KC

Maximum Power Output . . . . 1.5 watts

Loud-speaker—PM Dynamic

Outside Cone Diameter . . . . 4 inches
Voice Coil Impedance (400 Cycles) . . . . 3.5 ohms

I.F Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. Alignment

Close the gang condenser by rotating the tuning control. Slide the pointer along the cord until it lines up with the first dial marking on the left. Now rotate the tuning control until the pointer is over the 1500 KC dial mark. Apply a 1500 KC signal to the receiver antenna post through a standard I.R.E. dummy antenna. Align the oscillator trimmer (C-7) to bring in the signal and peak the signal by adjusting the antenna trimmer (C-5). (See Fig. 1 for trimmer locations.)

Precaution

If the signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*
Antenna Post to Converter Grid . . . . . 4.0 at 1000 KC
I.F. on Converter Grid to I.F. on I.F. Amplifier Grid . . . . 50 at 455 KC
I.F. Amplifier Grid to Diode Plate . . . 45 at 455 KC

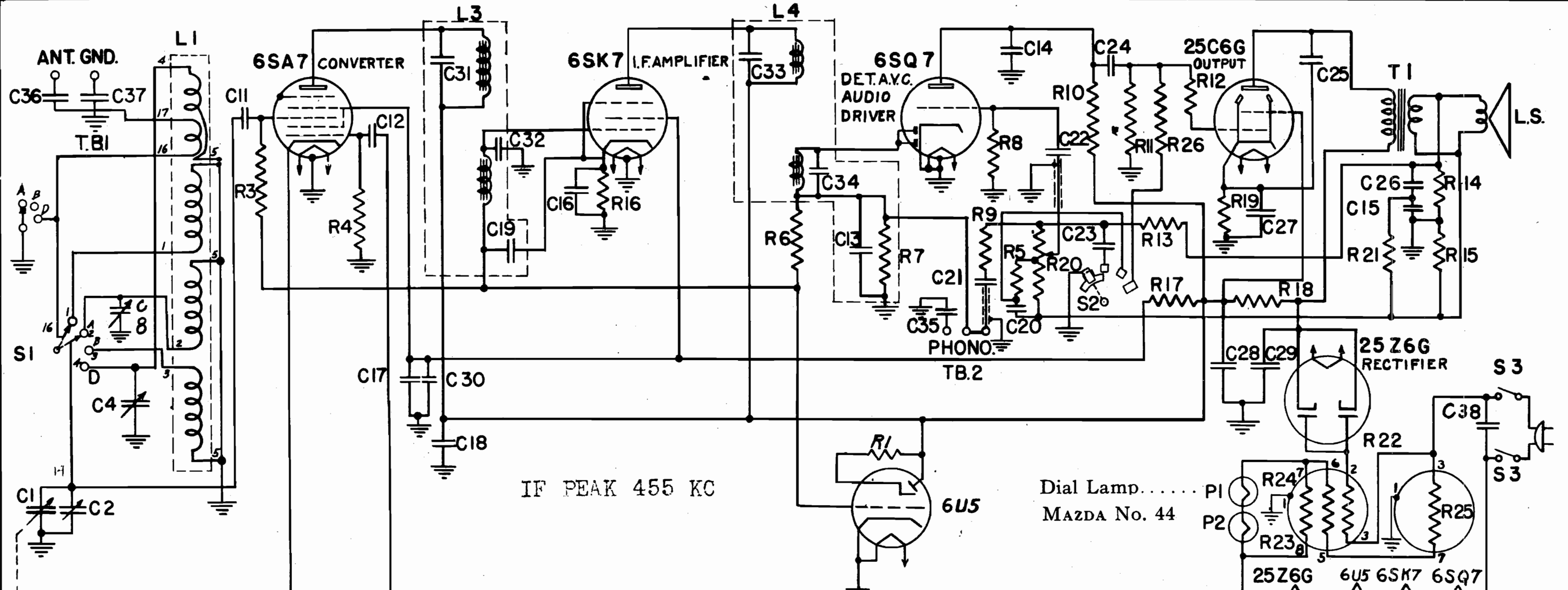
(2) 0.20-volt, 400-cycle signal across the volume control will give ½-watt speaker output.* (Volume control turned to maximum.)

(3) Average DC voltage developed across oscillator grid leak . . . . 6 volts

* Variations of ±20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

MODEL HE-640L

GENERAL ELECTRIC CO.



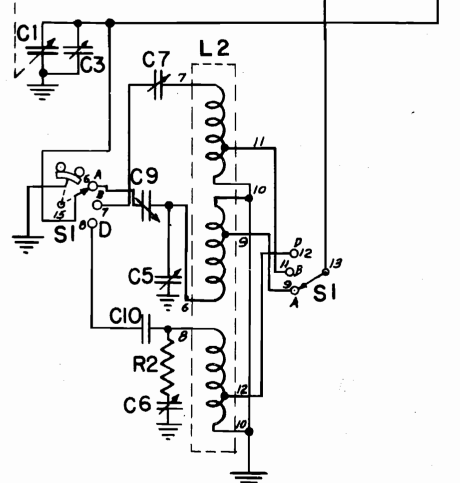
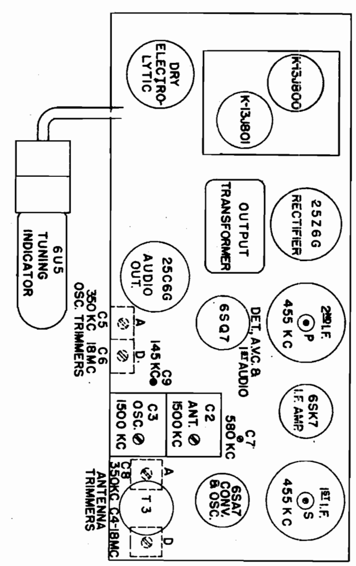


Fig. 9. Schematic Diagram and Trimmer Location—Model HE-640L

Symbol	Description	Symbol	Description
C-1	Tuning Condenser	C-38	.05 Mfd. 600 V. Paper Capacitor
C-2	2–18 Mmf. "B" Ant. Trimmer	L-1	Antenna Transformer
C-3	2–18 Mmf. "B" Osc. Trimmer	L-2	Oscillator Transformer
C-4	2–20 Mmf. "D" Ant. Trimmer	L-3	1st I.F. Transformer
C-5	3–30 Mmf. "A" Osc. Trimmer	L-4	2nd I.F. Transformer
C-6	3–30 Mmf. "D" Osc. Trimmer	P-1	Pilot Light Mazda No. 44
C-7	300–675 Mmf. "B" Osc. Padder	P-2	Pilot Light Mazda No. 44
C-8	2–20 Mmf. "A" Ant. Trimmer	R-1	1.0 Meg., ½-W. Carbon Resistor
C-9	75–150 Mmf. "A" Osc. Padder	R-2	39 Ohms, ½-W. Carbon Resistor
C-10	4300 Mmf. Mica ±5%	R-3	680,000 Ohms, ½-W. Carbon Resistor
C-11	470 Mmf. Mica Capacitor	R-4	22,000 Ohms, ½-W. Carbon Resistor
C-12	50 Mmf. Mica Capacitor	R-5	180,000 Ohms, ½-W. Carbon Resistor
C-13	100 Mmf. Mica Capacitor	R-6	2.2 Meg., ½-W. Carbon Resistor
C-14	220 Mmf. Mica Capacitor	R-7	330,000 Ohms, ½-W. Carbon Resistor
C-15	.03 Mfd. 600 V. Paper Capacitor	R-8	4.7 Meg., ½-W. Carbon Resistor
C-16	.05 Mfd. 200 V. Paper Capacitor	R-9	47,000 Ohms, ½-W. Carbon Resistor
C-17	.05 Mfd. 600 V. Paper Capacitor	R-10	330,000 Ohms, ½-W. Carbon Resistor
C-18	.05 Mfd. 600 V. Paper Capacitor	R-11	470,000 Ohms, ½-W. Carbon Resistor
C-19	.05 Mfd. 200 V. Paper Capacitor	R-12	1000 Ohms, ½-W. Carbon Resistor
C-20	.002 Mfd. 600 V. Paper Capacitor	R-13	5.6 Meg., ½-W. Carbon Resistor
C-21	.005 Mfd. 600 V. Paper Capacitor	R-14	1500 Ohms, ½-W. Carbon Resistor
C-22	.005 Mfd. 600 V. Paper Capacitor	R-15	270 Ohms, ½-W. Carbon Resistor
C-23	.0015 Mfd. 600 V. Paper Capacitor	R-16	330 Ohms, ½-W. Carbon Resistor
C-24	.05 Mfd. 600 V. Paper Capacitor	R-17	3900 Ohms, 1-W. Carbon Resistor
C-25	.008 Mfd. 1000 V. Paper Capacitor	R-18	3300 Ohms, 2-W. Carbon Resistor
C-26	0.1 Mfd. 200 V. Paper Capacitor	R-19	270 Ohms, 1-W. Carbon Resistor
C-27	20 Mfd. 25 V. Dry Electrolytic	R-20	2.0 Meg. Vol. Control, 1 Megohm Tap
C-28	50 Mfd. 250 V. Dry Electrolytic	R-21	220 Ohms, ½-W. Carbon Resistor
C-29	40 Mfd. 300 V. Dry Electrolytic	R-22	240 Ohms, 10-W. Ballast (K13J801)
C-30	20 Mfd. 250 V. Dry Electrolytic	R-23	110 Ohms, 20-W. Ballast (K13J801)
C-35	.25 Mfd. 400 V. Paper Capacitor	R-24	160 Ohms, 20-W. Ballast (K13J801)
C-36	.01 Mfd. 600 V. Paper Capacitor	R-25	370 Ohms, 50-W. Ballast (K13J800)
C-37	.01 Mfd. 600 V. Paper Capacitor	R-26	680,000 Ohms ½-W Carbon Resistor



GENERAL ELECTRIC CO.

MODEL JB-513
MODEL JB-514

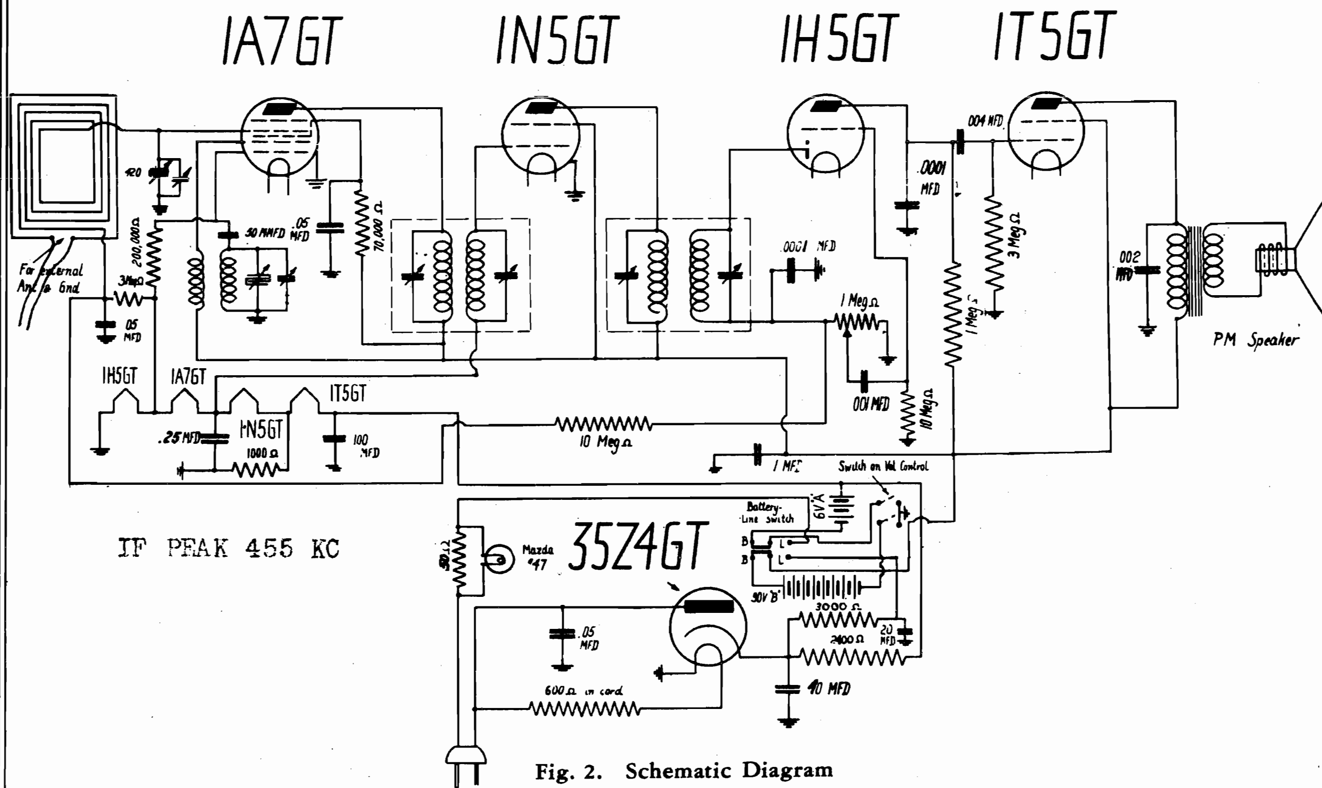


Fig. 2. Schematic Diagram
Model JB-513

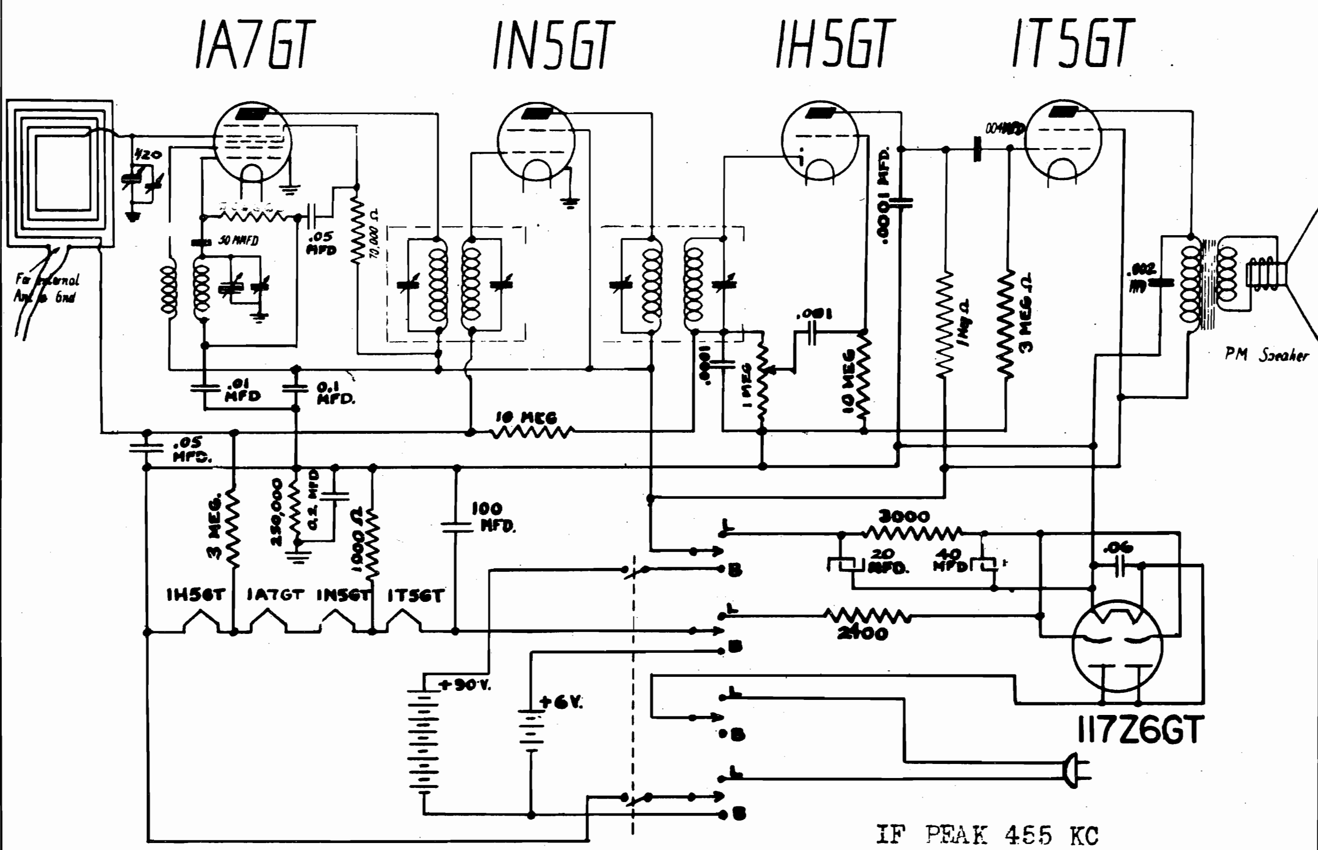
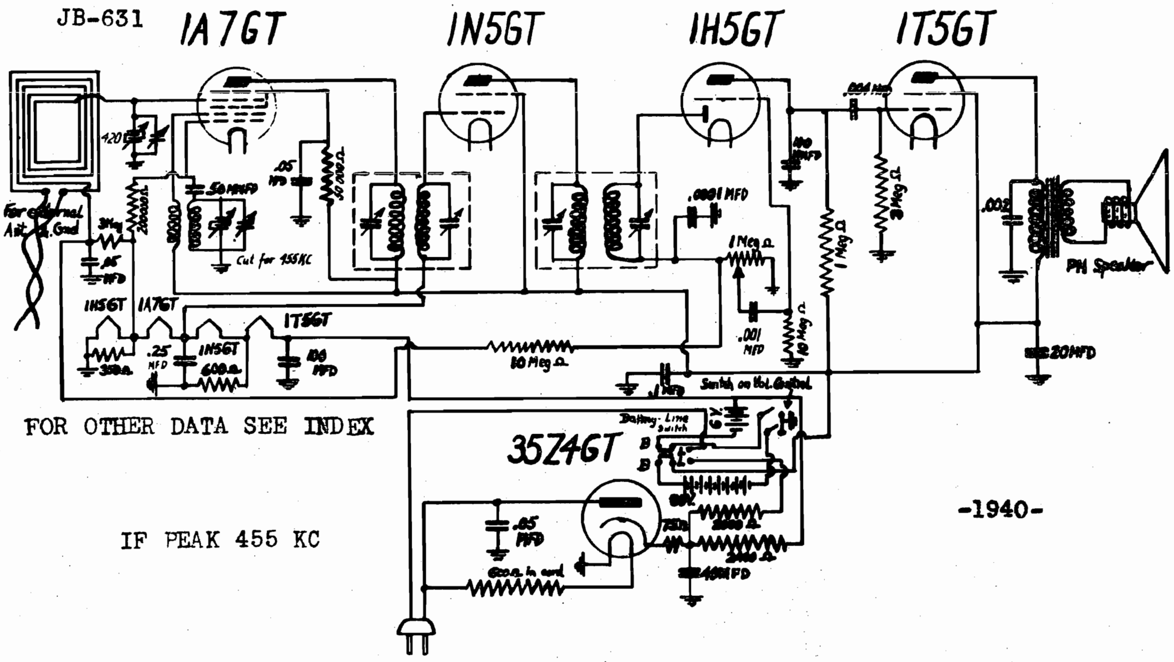


Fig. 3. Schematic Diagram
Model JB-514

MODEL JB-523
MODEL JB-524

MODELS JB-630
JB-631

GENERAL ELECTRIC CO.



FOR OTHER DATA SEE INDEX

IF PEAK 455 KC

-1940-

Fig. 1. Schematic Diagram—Model JB-523

ALIGNMENT AND VOLTAGES

MODELS JB-523, JB-524, JB-630, JB-631

VOLTAGE CHART
(117 line volts)

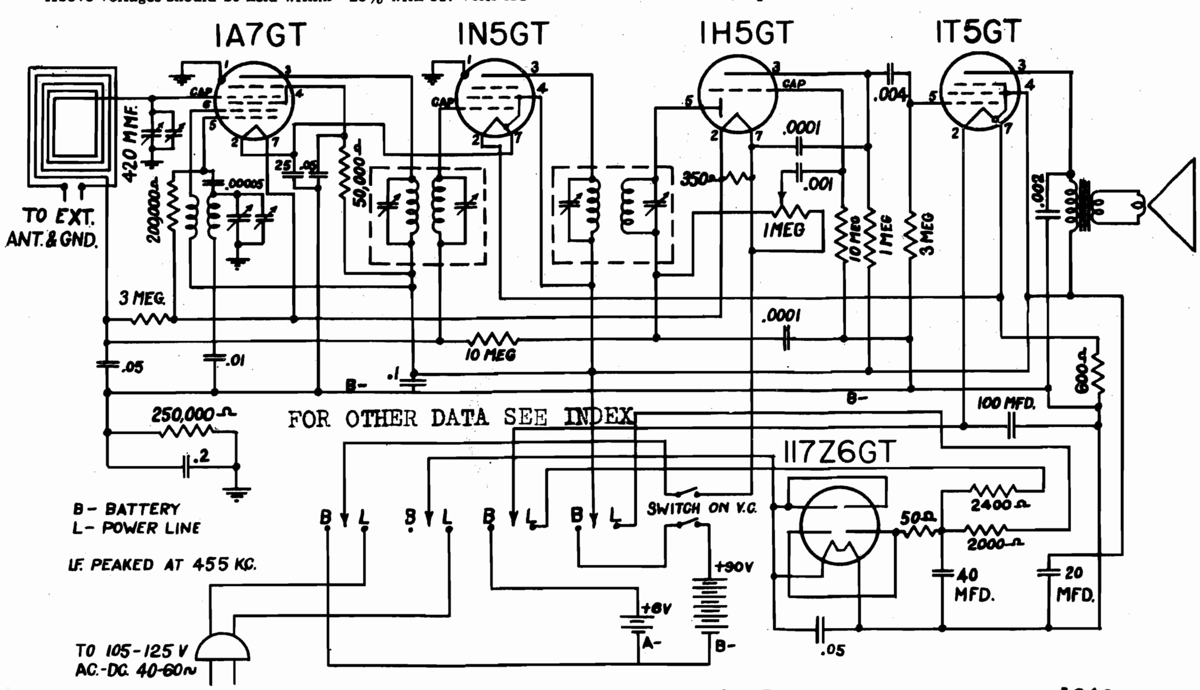
Tubes	Plate to Gnd. Volts	Screen to Gnd. Volts	Cathode to Gnd. Volts	Filament Volts
1A7GT	90 (conv.) 90 (osc.)	60 *		1.2 to 1.5
1N5GT	90	90		1.2 to 1.5
1H5GT	54 *			1.2 to 1.5
1T5GT	85	90		1.2 to 1.5
3Q5GT	85	90		2.5 to 3.3
35Z4GT	117 AC		122	35
117Z6GT	117 AC		122	117

* Voltages are operating voltages in circuits with high series resistance. The actual voltages will be lower depending on the voltmeter loading. Above voltages should be held within ±20% with 117 volts AC line.

I.F ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII

R.F. Alignment

Connect high side of signal generator to one of Beam-a-Scope primary leads and ground side to other primary lead. Turn tuning condenser completely out of mesh (open). Set generator to 1700 KC. Adjust oscillator trimmer (cut section of tuning condenser) until generator signal is heard through speaker. Then reset generator to 1500 KC and tune receiver to signal. Peak antenna trimmer on tuning condenser for maximum output.



FOR OTHER DATA SEE INDEX

Fig. 2. Schematic Diagram—Model JB-524

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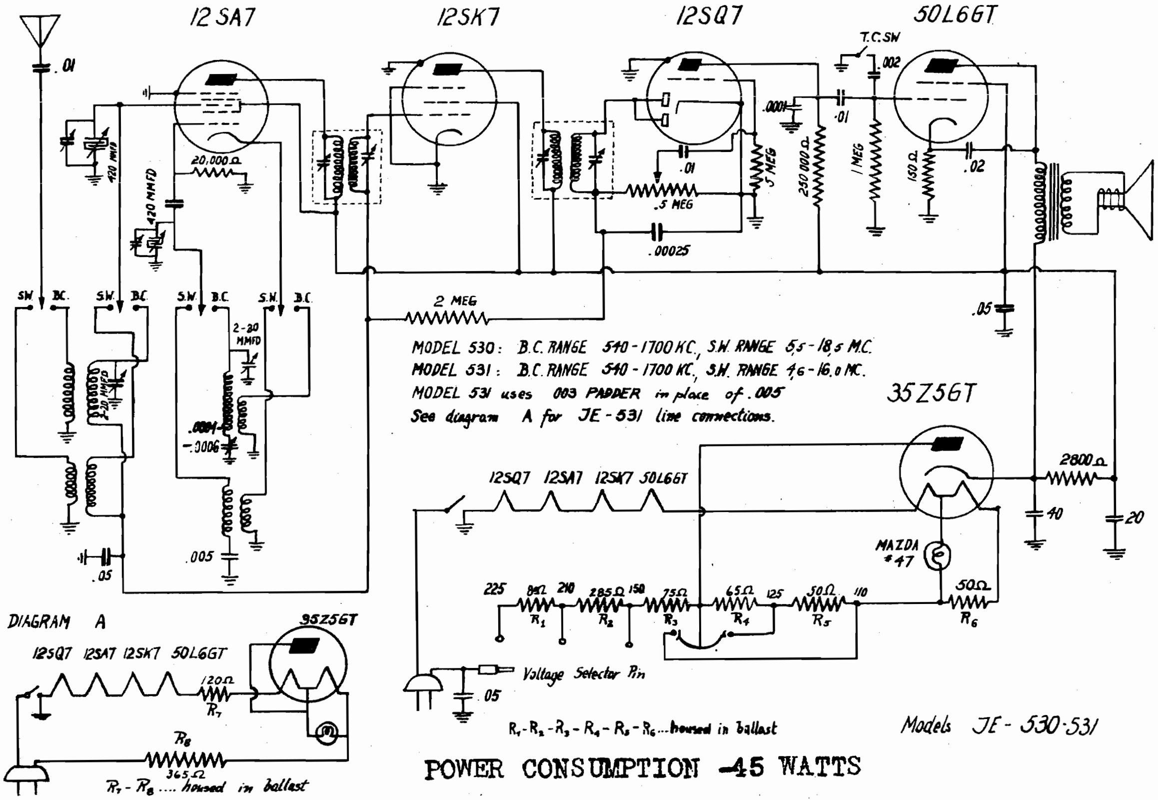
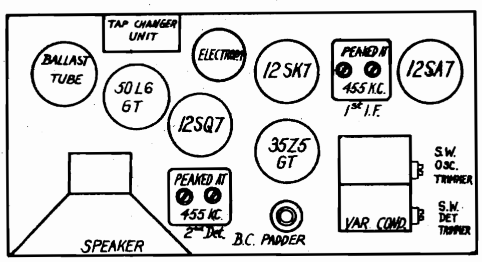
GENERAL ELECTRIC CO.

MODELS JE-530,
JE-531, JE-531X



POWER CONSUMPTION -45 WATTS

-1940-

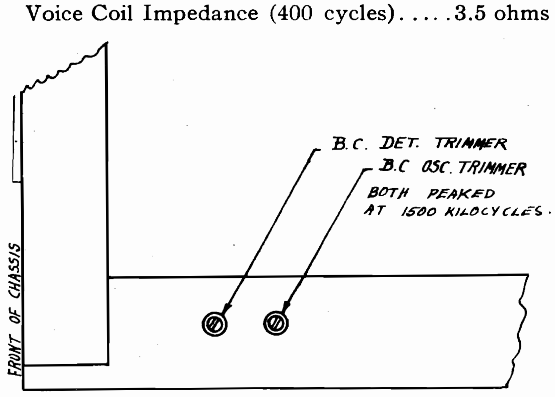


Electrical Power Output

Undistorted........................1.2 watts
Maximum.........................2 watts

Loud-speaker—Permanent Magnet

Outside Cone Diameter...............5 inches
Voice Coil Impedance (400 cycles).....3.5 ohms



TRIMMER LOCATION

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.................................455 Kc.
Broadcast R.F......................1500 and 600 Kc.
Short Wave
JE530...........................17,000 Kc.
JE531X.........................15,000 Kc.

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 Kc. and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 12SK7 through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure applying the 455 Kc. signal to the control grid of the 12SA7 and aligning the 1st I.F. transformer. Do not remove the grid leads from the tubes. Finish alignment by over-all adjustments.

R.F. Alignment

Refer Sketch **"Trimmer Location."** Apply R.F. signals through a standard IRE dummy to the antenna terminal.

"C" Band (Model JE530—5500–18,500 Kc.)

Rotate band switch to clockwise position and set dial pointer and signal generator to 17 megacycles. Align by rotating S.W. osc. trimmer located on rear section of variable condenser. Peak the S.W. detector trimmer located on front section of variable condenser for maximum signal while rocking the gang condenser. The image of 17 Mc. should be heard at 16.09 Mc.

"C" Band (Models JE531, JE531X—4600–16,000 Kc.)

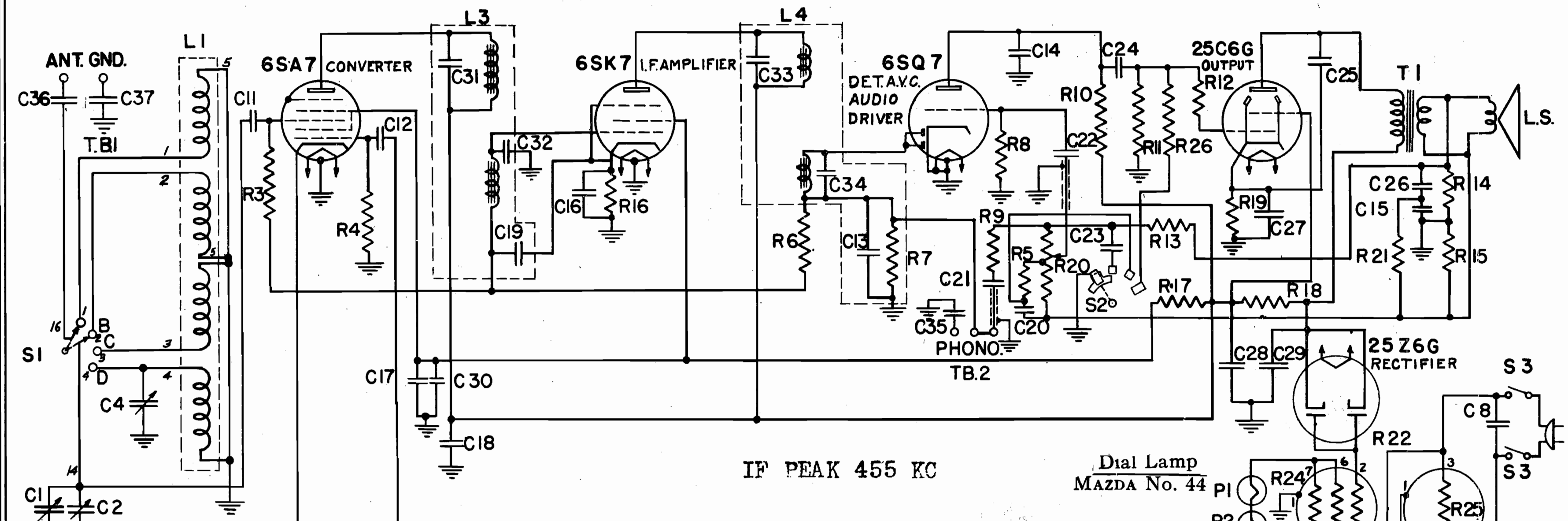
Same procedure as above, but align osc. trimmer at 15 megacycles. Image will be heard at 14.09 Mc.

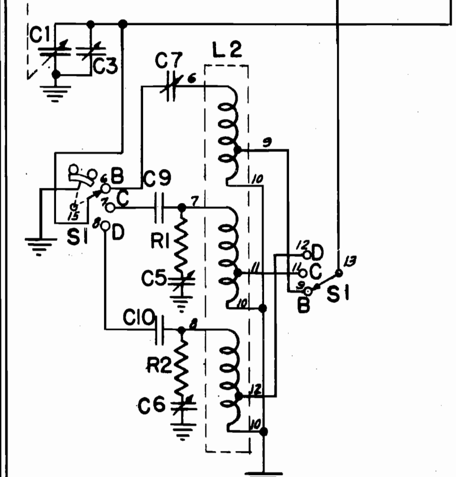
"B" Band (All models—540–1700 Kc.)

Rotate band switch to counterclockwise position and set dial pointer and signal generator to 1500 Kc. Align by turning the broadcast oscillator trimmer screw. Peak broadcast detector screw for maximum signal. Set screw for maximum signal. Set receiver dial and signal generator to 600 Kc. and adjust the broadcast padder for maximum signal while rocking the gang condenser. Retrim at 1500 Kc.

MODEL HE-540

GENERAL ELECTRIC CO.





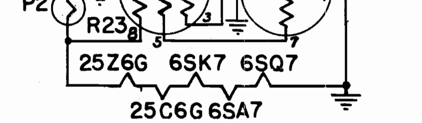
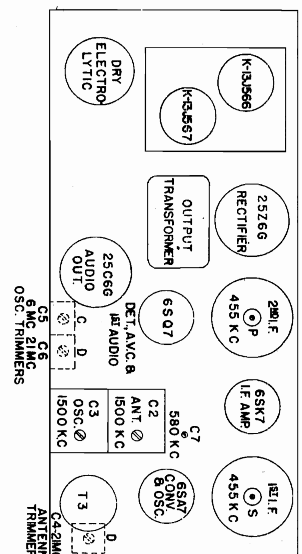


Fig. 5. Schematic Diagram and Trimmer Location—Model HE-540

Symbol	Description	Symbol	Description
C-1	Tuning Condenser	L-1	Antenna Transformer
C-2	2–18 Mmf. "B" Ant. Trimmer	L-2	Oscillator Transformer
C-3	2–18 Mmf. "B" Osc. Trimmer	L-3	1st I.F. Transformer
C-4	3–30 Mmf. "D" Ant. Trimmer	L-4	2nd I.F. Transformer
C-5	3–30 Mmf. "C" Osc. Trimmer	P-1	Pilot Light Mazda No. 44
C-6	3–30 Mmf. "D" Osc. Trimmer	P-2	Pilot Light Mazda No. 44
C-7	300–650 Mmf. "B" Osc. Padder	R-1	330 Ohms, ½-W. Carbon Resistor
C-8	.05 Mfd. 600 V. Paper	R-2	39 Ohms, ½-W. Carbon Resistor
C-9	1800 Mmf. Mica ±5%	R-3	680,000 Ohms, ½-W. Carbon Resistor
C-10	5600 Mmf. Mica ±5%	R-4	22,000 Ohms, ½-W. Carbon Resistor
C-11	470 Mmf. Mica Capacitor	R-5	180,000 Ohms, ½-W. Carbon Resistor
C-12	50 Mmf. Mica Capacitor	R-6	2.2 Meg., ½-W. Carbon Resistor
C-13	100 Mmf. Mica Capacitor	R-7	330,000 Ohms, ½-W. Carbon Resistor
C-14	220 Mmf. Mica Capacitor	R-8	4.7 Meg., ½-W. Carbon Resistor
C-15	.03 Mfd. 600 V. Paper Capacitor	R-9	47,000 Ohms, ½-W. Carbon Resistor
C-16	.05 Mfd. 200 V. Paper Capacitor	R-10	330,000 Ohms, ½-W. Carbon Resistor
C-17	.05 Mfd. 600 V. Paper Capacitor	R-11	470,000 Ohms, ½-W. Carbon Resistor
C-18	.05 Mfd. 600 V. Paper Capacitor	R-12	1000 Ohms, ½-W. Carbon Resistor
C-19	.05 Mfd. 200 V. Paper Capacitor	R-13	5.6 Meg., ½-W. Carbon Resistor
C-20	.002 Mfd. 600 V. Paper Capacitor	R-14	1500 Ohms, ½-W. Carbon Resistor
C-21	.005 Mfd. 600 V. Paper Capacitor	R-15	270 Ohms, ½-W. Carbon Resistor
C-22	.005 Mfd. 600 V. Paper Capacitor	R-16	330 Ohms, ½-W. Carbon Resistor
C-23	.0015 Mfd. 600 V. Paper Capacitor	R-17	3900 Ohms, 1-W. Carbon Resistor
C-24	.05 Mfd. 600 V. Paper Capacitor	R-18	3300 Ohms, 2-W. Carbon Resistor
C-25	.008 Mfd. 1000 V. Paper Capacitor	R-19	270 Ohms, 1-W. Carbon Resistor
C-26	0.1 Mfd. 200 V. Paper Capacitor	R-20	2 Meg. Volume Control, 1 Meg. Tap
C-27	20 Mfd. 25 V. Dry Electrolytic	R-21	220 Ohms, ½-W. Carbon Resistor
C-28	50 Mfd. 250 V. Dry Electrolytic	R-22	240 Ohms, 10-W. Ballast (K13J567)
C-29	40 Mfd. 300 V. Dry Electrolytic	R-23	110 Ohms, 20-W. Ballast (K13J567)
C-30	20 Mfd. 250 V. Dry Electrolytic	R-24	160 Ohms, 20-W. Ballast (K13J567)
C-35	.25 Mfd. 400 V. Paper Capacitor	R-25	390 Ohms, 50-W. Ballast (K13J566)
C-36	.01 Mfd. 600 V. Paper Capacitor	R-26	680,000 Ohms, ½-W. Carbon Resistor
C-37	.01 Mfd. 600 V. Paper Capacitor		



GENERAL ELECTRIC CO.

MODELS HP-558, HP-559, HP-560, HP-561

One side of the power line is connected directly to the chassis, therefore, caution should be exercised when servicing.

Power Supply (Volts)	Frequency (Cycles on A-C)	Power Consumption (Watts)
105–125 AC 105–125 DC	50–60	30

Electrical Power Output

Undistorted........................1.0 watt
Maximum........................1.7 watts

Loud-speaker—Permanent Magnet Type

Outside Cone Diameter..............5 inches
Voice Coil Impedance (400 cycles)...3.8 ohms
D.C. Coil Resistance...............3.4 ohms

ALIGNMENT PROCEDURE

The location of alignment trimmers is shown in Figs. 1 and 2.

I.F. Alignment*

Connect an output meter across the voice coil. Turn the volume control to maximum. Set signal generator to 455 K.C. and keep the generator output as low as a readable meter reading will permit.

Apply signal to the grid of the 12SA7GT through a .05 capacitor. Align all I.F. trimmers (C-14, 15 and 16) for a maximum meter reading.

R.F. Alignment*

Set the signal generator to 1730 K.C. and connect the output to the blue antenna lead through a 100 mmf. mica capacitor. Rotate the gang condenser to wide open and align the oscillator trimmer. Readjust signal generator output to 1400 K.C. and after tuning in signal by rotating the gang condenser, peak the antenna trimmer. The alignment is now complete unless the gang condenser plates have been bent out of shape. In case of bent plates, set the signal generator and receiver to 600 K.C. and bend the plates into position of maximum output.

*Precaution—If signal generator is A-C operated use an isolating transformer between the power supply and the radio receiver power output. The use of an isolating capacitor is not recommended as A-C current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

SERVICE INFORMATION

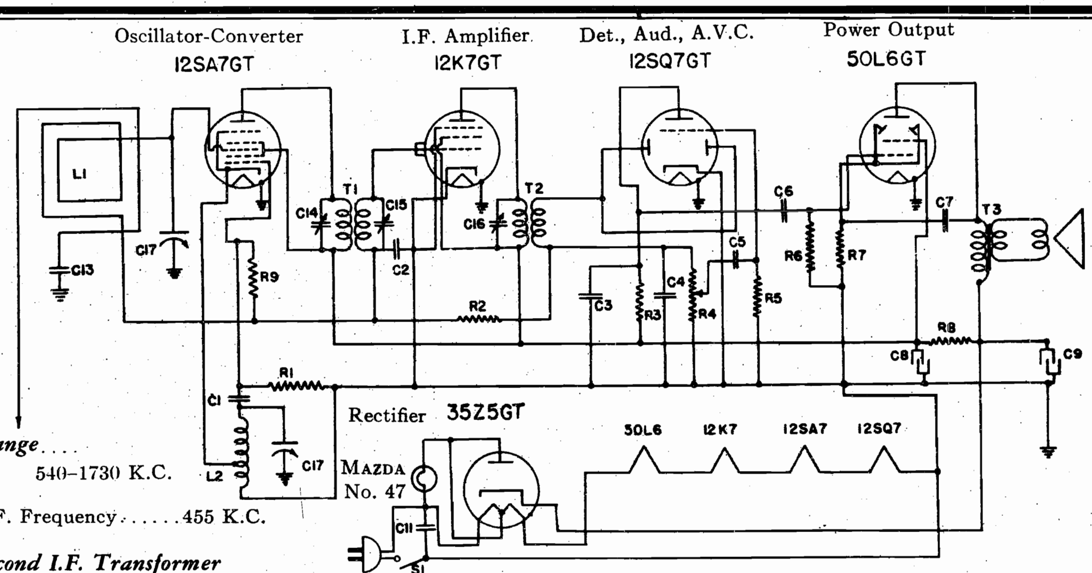
Oscillator Coil

Looking at connection end in clockwise direction starting at chassis the terminals are No. 1, end of winding; No. 2, start of winding; No. 3, tap.

No. 1 to No. 2........................4.8 ohms
No. 1 to No. 3........................4.2 ohms

First I.F. Transformer

Primary—Blue, plate; red, B+..........32.1 ohms
Secondary—White, grid; black, AVC.....33.2 ohms



Range....
540–1730 K.C.

I.F. Frequency......455 K.C.

Second I.F. Transformer

Primary—Blue, plate; red, B+..........24.2 ohms
Secondary—White, grid; black, AVC.....24.1 ohms

Electrolytic Condenser

Red, 30 mfd., 150 volts; green, 20 mfd., 150 volts; black, common terminal.

SOCKET VOLTAGES

Tube	Plate To Gnd (Volts)	Screen To Gnd (Volts)	Cathode To Gnd (Volts)	Filament Voltage
12SA7GT	80	82		11
12K7GT	80	82	0	11
12SQGT	40*		0	11
50L6GT	97	82	5.5	48
35Z5GT	115 AC		102	34

Line—115 Volts AC, Volume Control Maximum.
Antenna shorted to ground.
*Measured on 250 volt scale of 1000 ohms per volt voltmeter.

Symbol	Description	Symbol	Description
C-1	100 mmf. mica capacitor	C-13	.001 mfd. paper capacitor
C-2	.02 mfd. paper capacitor	R-1	20,000 ohms carbon resistor
C-3	500 mmf. mica capacitor	R-2	2.2 megohms carbon resistor
C-4	250 mmf. mica capacitor	R-3	250,000 ohms carbon resistor
C-5	.01 mfd. paper capacitor	R-4	500,000 ohms volume control
C-6	.002 mfd. paper capacitor	R-5	5.6 megohms carbon resistor
C-7	.01 mfd. paper capacitor	R-6	510,000 ohms carbon resistor
C-8	20 mfd. 150 V. dry electrolytic	R-7	150 ohms carbon resistor
C-9	30 mfd. 150 V. dry electrolytic	R-8	1000 ohms 1 W. carbon resistor
C-11	.05 mfd. paper capacitor	R-9	15 megohms carbon resistor

Fig. 1. Trimmer Location
Models HP-558 and HP-561

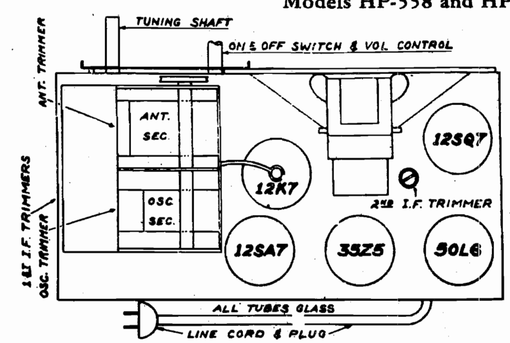
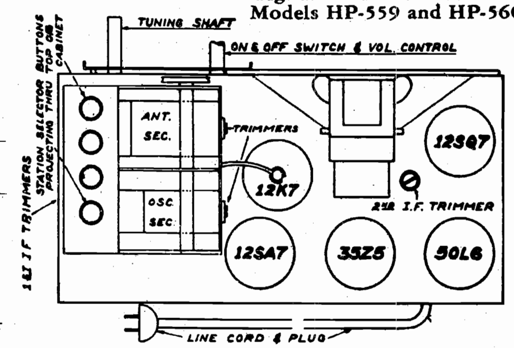
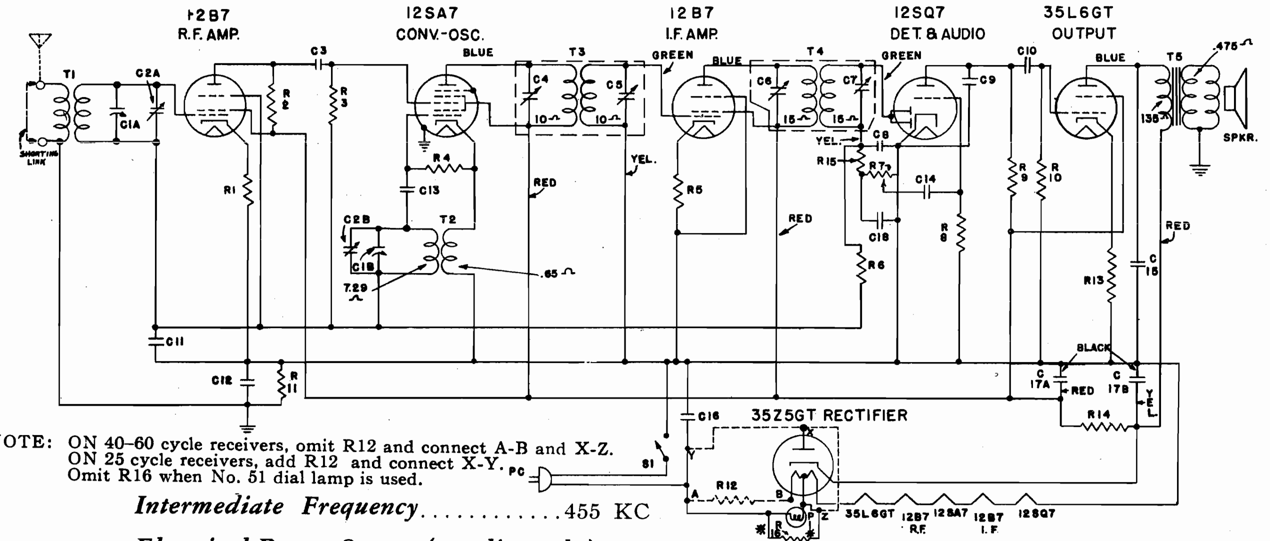


Fig. 2. Trimmer Location
Models HP-559 and HP-560



MODELS J-602
J-603

GENERAL ELECTRIC CO.



NOTE: ON 40–60 cycle receivers, omit R12 and connect A-B and X-Z.
ON 25 cycle receivers, add R12 and connect X-Y.
Omit R16 when No. 51 dial lamp is used.

Intermediate Frequency............455 KC

Electrical Power Output (117 line volts)
Undistorted......................1.0 watts
Maximum..........................1.5 watts

Loudspeaker—PM Dynamic
Outside Cone Diameter...........5 inches
Voice Coil Impedance (400 cycles).3.5 ohms

IF Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the 12SA7 converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st IF transformers.

RF Alignment

When making the following alignment the loop antenna must be bolted to the chassis by the screw and spacer mounting. The RF signal should be capacity coupled to the receiver loop by placing a two-foot piece of wire for an antenna on the test oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed in close proximity to the loop when making this alignment.

With the gang condenser plates completely closed, the pointer should line up with the first mark on the left of the scale. Set the signal generator to 1500 KC. Align (C-1b) to the signal while the pointer is on the 1500 KC mark. Peak (C-1a) for maximum output.

Special Service Information

The following information will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains
Antenna post to RF grid—3.8 at 1000 KC
RF grid to converter grid—6.0 at 1000 KC
Converter grid to IF grid—46 at 455 KC
IF grid to 12SQ7 diode plate—75 at 455 KC

(2) Audio Gain
.14 volts, 400 cycles signal across volume control with control set at maximum, will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R4) averages 10.0 volts at 1000 KC.
Variations of ±20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

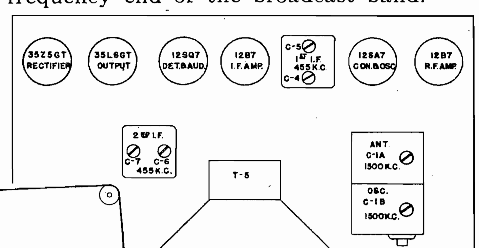
Stock No.	Symbol	Description
RC-7049	C-1a, 1b, 2a, 2b	CONDENSER—Tuning condenser
*RC-235	C-3	CAPACITOR—100 Mmf., mica
*RC-242	C-8	CAPACITOR—150 Mmf., mica
*RC-274	C-9	CAPACITOR—330 Mmf., mica
*RC-039	C-10	CAPACITOR—.01 Mfd., 600 V. paper
*RC-072	C-11	CAPACITOR—.05 Mfd., 200 V. paper
*RC-104	C-12	CAPACITOR—0.1 Mfd., 600 V. paper
*RC-216	C-13	CAPACITOR—47 Mmf., mica
*RC-023	C-14	CAPACITOR—.005 Mfd., 600 V. paper
*RC-039	C-15	CAPACITOR—.01 Mfd., 600 V. paper
*RC-092	C-16	CAPACITOR—.05 Mfd., 600 V. paper
RC-5183	C-17a, 17b	CAPACITOR—50 Mfd., 60 Mfd., electrolytic
*RC-235	C-18	CAPACITOR—100 Mmf., mica
*RQ-1227	R-1	RESISTOR—47 ohm, ½ W. carbon
*RQ-1275	R-2	RESISTOR—4700 ohm, ½ W. carbon
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½ W. carbon
*RQ-1295	R-4	RESISTOR—33,000 ohm, ½ W. carbon
*RQ-1235	R-5	RESISTOR—100 ohm, ½ W. carbon
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½ W. carbon
RV-120	R-7, S-1	VOLUME CONTROL—0.5 megohm, combined with power switch
*RQ-1349	R-8	RESISTOR—5.6 megohm, ½ W. carbon
*RQ-1323	R-9, 10, 11	RESISTOR—470,000 ohm, ½ W. carbon
*RQ-1213	R-12	RESISTOR—12 ohm, ½ W. carbon
*RQ-1239	R-13	RESISTOR—150 ohm, ½ W. carbon
RQ-651	R-14	RESISTOR—1000 ohm, 2 W. carbon
*RQ-1299	R-15	RESISTOR—47,000 ohm, ½ W. carbon
*RQ-1255	R-16	RESISTOR—680 ohm, ½ W. carbon

*Used in previous receivers.

Models J602 and J603 are six-tube AC-DC superheterodyne receivers with Underwriters' Approval listing. The Model J602 is housed in a mahogany plastic cabinet, while the Model J603 has an ivory plastic cabinet.

Both the Mazda No. 47 and No. 51 dial lamps were used during production. When lamp No. 51 is used, the resistor R16 should be omitted.

Either the metal or glass type 12B7 tube may be used in the RF or IF stage. However when the glass tube is used in the IF stage, a tube shield must be used to prevent oscillation at the low frequency end of the broadcast band.



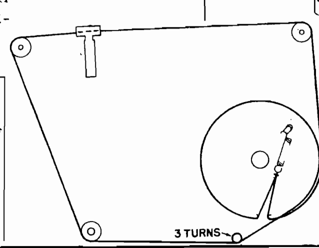
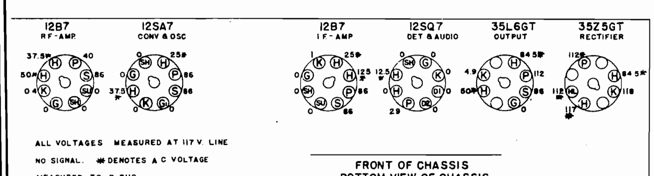
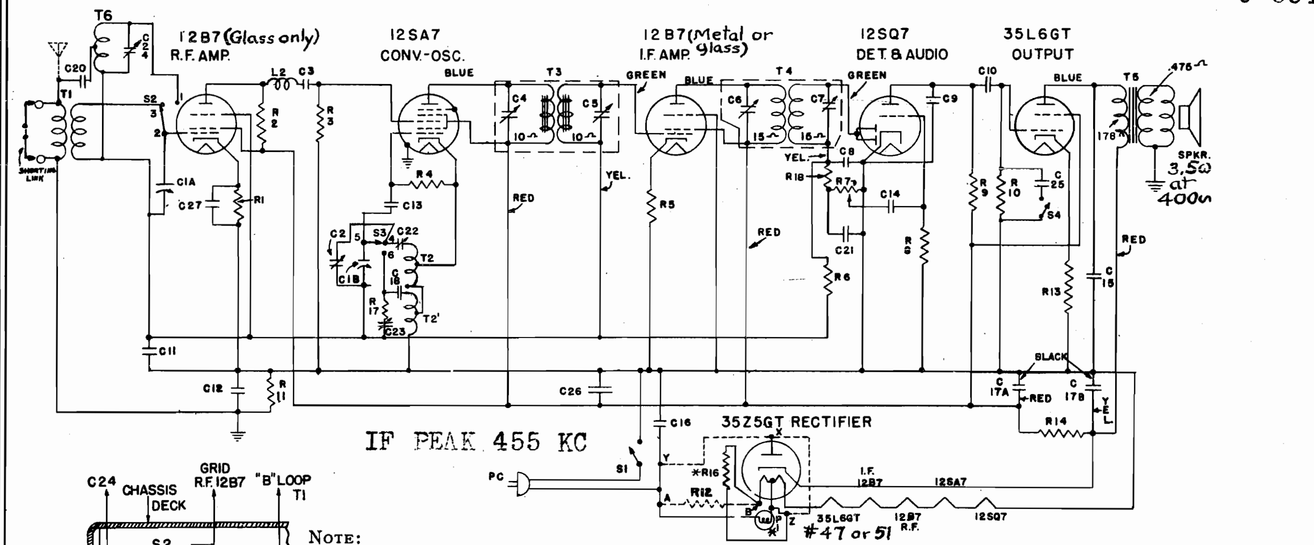


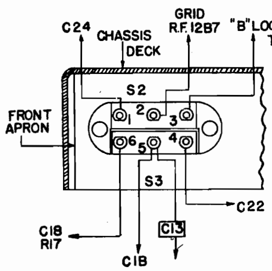
Fig. 1. Dial Stringing Diagram



GENERAL ELECTRIC CO.

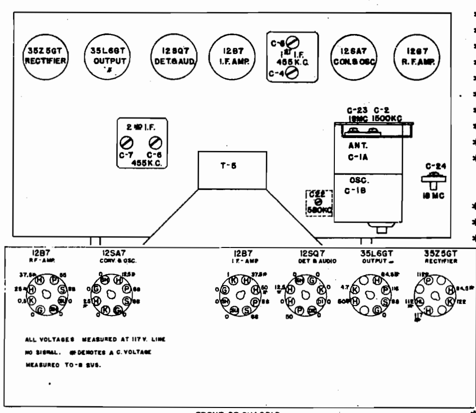
MODELS J-614
J-664





Band Switch Wiring

NOTE:
On 40-60 cycle receivers, omit R12 and connect A-B & X-Z.
On 25 cycle receivers, add R12 and connect X-Y.
* Omit R16 when No. 51 Mazda dial lamp is used.



FRONT OF CHASSIS
BOTTOM VIEW OF CHASSIS

RC-7050	C-1a, 1b	CONDENSER—Tuning condenser
RC-6547	C-2, 23	CAPACITOR—"BC" and "SW" osc. trimmer assembly
*RC-235	C-3	CAPACITOR—100 Mmf., mica
*RC-274	C-8	CAPACITOR—330 Mmf., mica
*RC-242	C-9	CAPACITOR—150 Mmf., mica
*RC-039	C-10	CAPACITOR—.01 Mfd., 600 V. paper
*RC-072	C-11	CAPACITOR—.05 Mfd., 200 V. paper
*RC-104	C-12	CAPACITOR—0.1 Mfd., 600 V. paper
*RC-216	C-13	CAPACITOR—47 Mmf., mica
*RC-023	C-14	CAPACITOR—.005 Mfd,. 600 V. paper
*RC-039	C-15	CAPACITOR—.01 Mfd., 600 V. paper
*RC-092	C-16	CAPACITOR—.05 Mfd., 600 V. paper
RC-5183	C-17a, 17b	CAPACITOR—50 Mfd., 60 Mfd., 150 V. electrolytic
*RC-391	C-18	CAPACITOR—4300 Mmf., mica
*RC-209	C-20	CAPACITOR—39 Mmf., mica
*RC-235	C-21	CAPACITOR—100 Mmf., mica
RC-6548	C-22	CAPACITOR—"B" padder
RC-6547	C-23, 2	CAPACITOR—"SW" and "BC" osc. trimmer assembly
RC-6546	C-24	CAPACITOR—"SW" band antenna trimmer
RC-053	C-25	CAPACITOR—.0032 Mfd., 600 V. paper
RC-039	C-26, 27	CAPACITOR—.01 Mfd., 600 V. paper
RQ-1227	R-1	RESISTOR—47 ohm, ½ W. carbon
RQ-1275	R-2	RESISTOR—4700 ohm, ½ W. carbon
RQ-1299	R-3	RESISTOR—47,000 ohm, ½ W. carbon
*RQ-1295	R-4	RESISTOR—33,000 ohm, ½ W. carbon
*RQ-1235	R-5	RESISTOR—100 ohm, ½ W. carbon
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½ W. carbon
RV-120	R-7, S-1	VOLUME CONTROL — 0.5 megohm with power switch
*RQ-1349	R-8	RESISTOR—5.6 megohm, ½ W. carbon
*RQ-1315	R-9	RESISTOR—220,000 ohm, ½ W. carbon
RQ-1323	R10, 11	RESISTOR—470,000 ohm, ½ W. carbon
*RQ-1213	R-12	RESISTOR—12 ohm, ½ W. carbon
*RQ-1239	R-13	RESISTOR—150 ohm, ½ W. carbon
RQ-651	R-14	RESISTOR—1000 ohm, 2 W. carbon
*RQ-1255	R-16	RESISTOR—680 ohm, ½ W. carbon
*RQ-1231	R-17	RESISTOR—68 ohm, ½ W. carbon
*RQ-1299	R-18	RESISTOR—47,000 ohm, ½ W. carbon
RL-1012	L-2	COIL—R.F. choke coil

*** Used in previous receivers.**

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However the RF alignments are made with the chassis and loop antennas securely bolted in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet.

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Max. Output
1	12B7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C6 & C7
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4 & C5
3	Capacity Coupled	580 KC	"BC" Band 580 KC	C22**
4	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2 (Osc.)
5	REPEAT STEP 3			
6	Capacity Coupled	18 MC	"SW" Band 18 MC	C23* (Osc.)
7	Capacity Coupled	18 MC	"SW" Band 18 MC	C24** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.

"A" rating—115 Volts AC or DC, 40-60 cycles, 35 watts
"C" rating—115 Volts AC or DC, 25 cycles, 35 watts

Tuning Frequency Range

Broadcast Band . . . . 540-1720 kilocycles
Short-wave Band . . . . 5600-18,300 kilocycles

Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

(1) Stage gains
Antenna post to RF grid—3.0 at 1000 KC
RF grid to converter grid—6.0 at 1000 KC
Converter grid to IF grid—50 at 455 KC
IF grid to 12SQ7 diode plate—75 at 455 KC

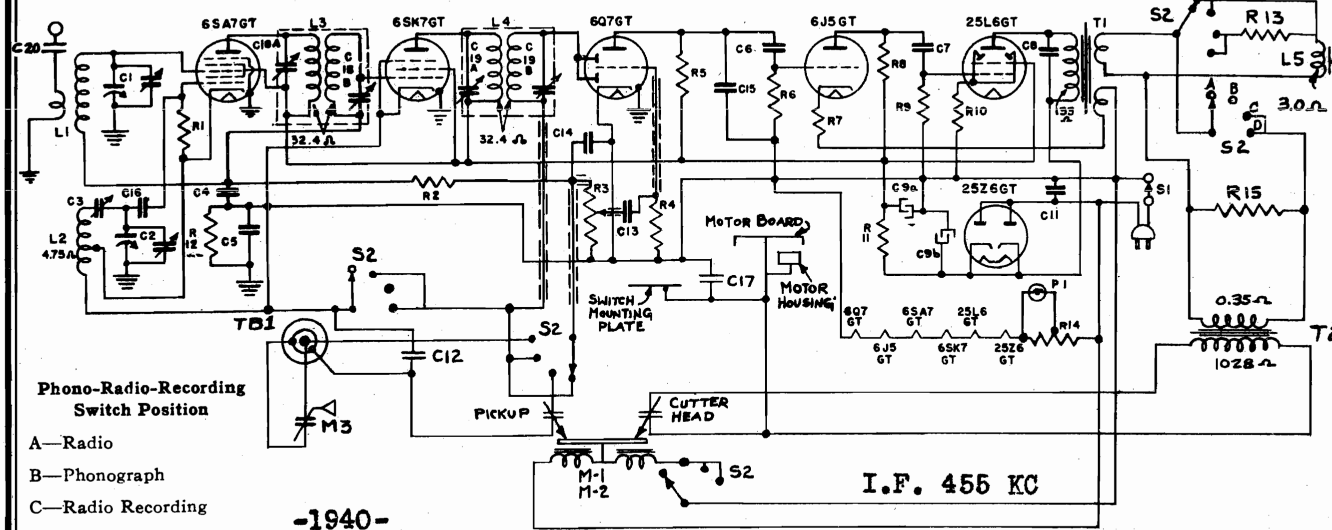
(2) Audio gains
.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R4) averages 9.0 volts at 1000 KC or 8.0 volts at 10,000 KC.

* Variations of ±20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

MODEL J-629

GENERAL ELECTRIC CO.



Phono-Radio-Recording Switch Position

A—Radio

B—Phonograph

C—Radio Recording

D—Microphone Recording

Symbol	Description	Symbol	Description	Symbol	Description
	RADIO CHASSIS	C-14	470 mmf. mica capacitor	R-6	1.0 megohm carbon resistor
C-1	Antenna section of tuning condenser	C-15	220 mmf. mica capacitor	R-7	3300 ohms carbon resistor
C-2	Oscillator section of tuning condenser	C-16	47 mmf. mica capacitor	R-8	39,000 ohms carbon resistor
C-3	"B" band padder	C-17	.01 mfd. paper capacitor	R-9	470,000 ohms carbon resistor
C-4	.05 mfd. paper capacitor	C-20	.002 mfd. paper capacitor	R-10	150 ohms carbon resistor
C-5	.20 mfd. paper capacitor	L-1	Beam-a-Scope	R-11	1000 ohms 1 W. carbon resistor
C-6	.005 mfd. paper capacitor	L-2	Oscillator coil	R-12	470,000 ohms carbon resistor
C-7	.005 mfd. paper capacitor	L-3	1st I.F. transformer	R-13	3.9 ohm W. W. resistor
C-8	.01 mfd. paper capacitor	L-4	2nd I.F. transformer	R-14	BL-42-B ballast resistor
C-9a	30 mfd. 150 V. dry electrolytic	P-1	Pilot lamp MAZDA No. 44	R-15	7.0 ohm W. W. resistor
C-9b	50 mfd. 150 V. dry electrolytic	R-1	33,000 ohms carbon resistor	S-1	Power switch (comb. with R-3)
C-11	.05 mfd. paper capacitor	R-2	2.2 megohms carbon resistor	S-2	Radio-phono-record switch
C-12	.08 mfd. paper capacitor	R-3	0.5 megohm volume control	T-1	Output transformer
C-13	.03 mfd. paper capacitor	R-4	15 megohms carbon resistor	T-2	Cutter transformer
		R-5	470,000 ohms carbon resistor	TB-1	Microphone jack

Outside Cone Diameter.................................6.5 inches
Voice Coil Impedance (400 cycles)..........................3.5 ohms

ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII
TRIM ANT, OSC, 1500 KC; PAD 580 KC
POWER CONSUMPTION-75 WATTS

Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

(1) Stage Gains
Antenna Post to Converter Grid—6 at 1000 KC‡
Converter Grid to 6SK7GT Grid—30 at 455 KC‡
6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC‡

(2) Audio Gains
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

‡ Variations of +10, −20% permissible.

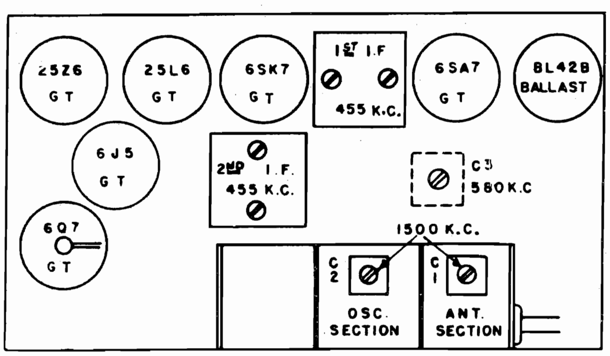


Fig. 1. Trimmer Location

RECORDING ADJUSTMENTS

Cutting Head Pressure

The pressure is controlled by means of the adjustment screw located midway back on top of the recording arm.

The pressure should be adjusted so that by inspection with a magnifying glass, the uncut portion of the record between the grooves is the same width as the groove. At no time should pressure be great enough to cut through the acetate surface enough to show the metal base of the record.

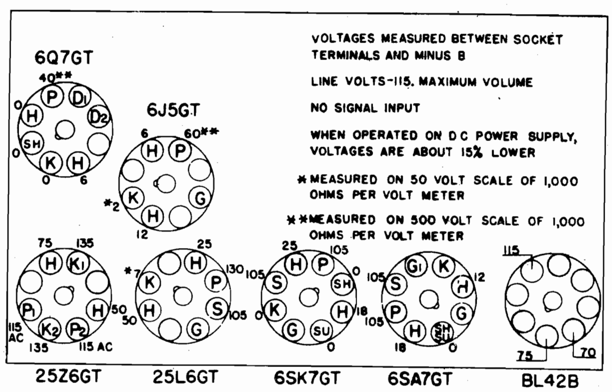
A clockwise rotation of the setscrew increases pressure.

Cutting Arm Adjustment

The adjustment at the rear and underneath the cutting arm, controls the height above the record blank at which the cutting arm rides. This should be adjusted so that when resting in the recording position on the record, the setscrew of the cutting head rides halfway down in the needle screw gap.

Lead Screw Follower Arm Pressure Adjustment

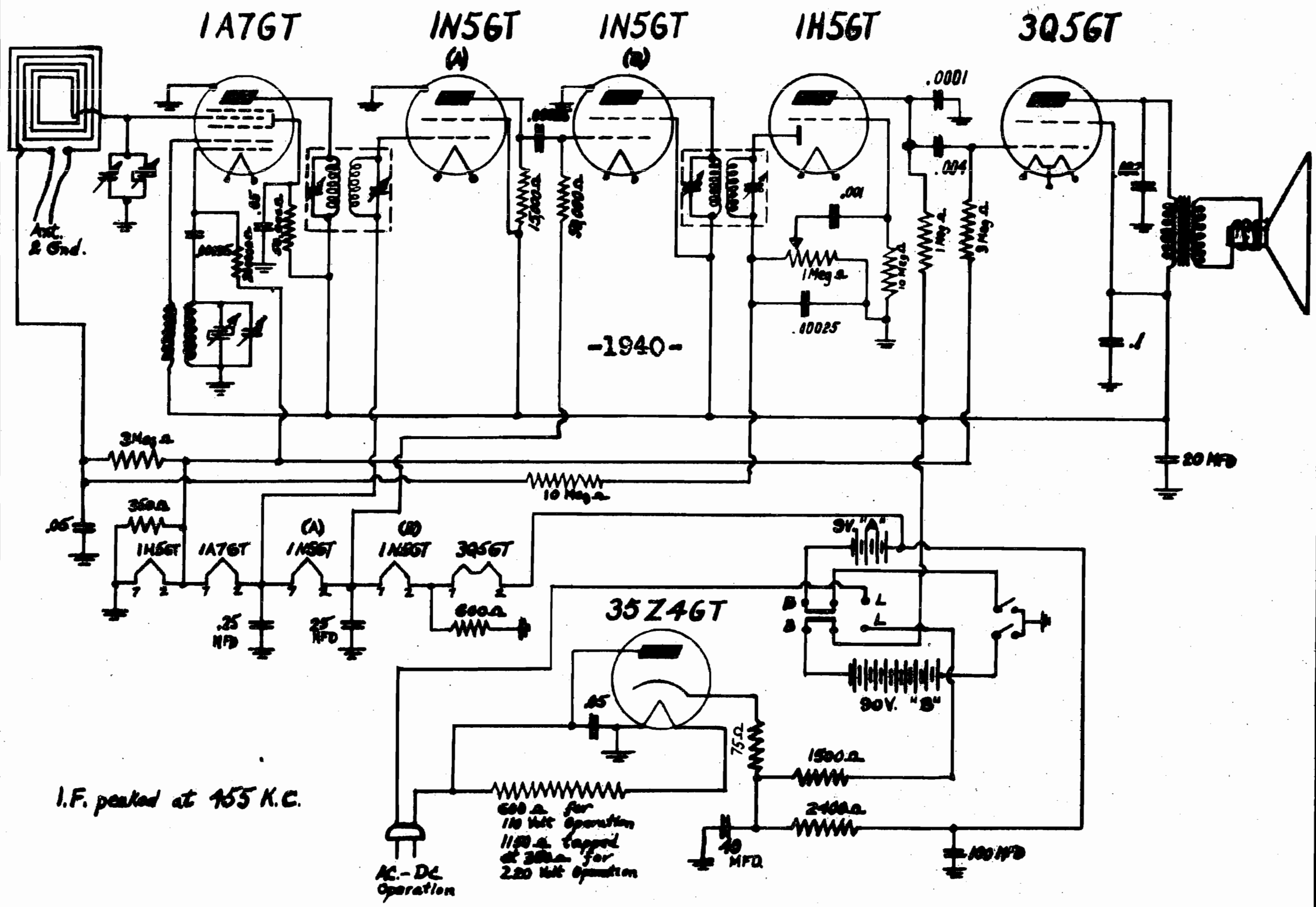
The pressure is varied by the phosphor bronze spring adjustment underneath the phono assembly on the follower arm. The pressure should be great enough so that when the recording head is in the recording position, this phosphor bronze spring should rest at the bottom of the lead screw groove. Too great pressure will cause binding, while too little pressure is liable to cause overlapping of the grooves.



BOTTOM VIEW OF CHASSIS

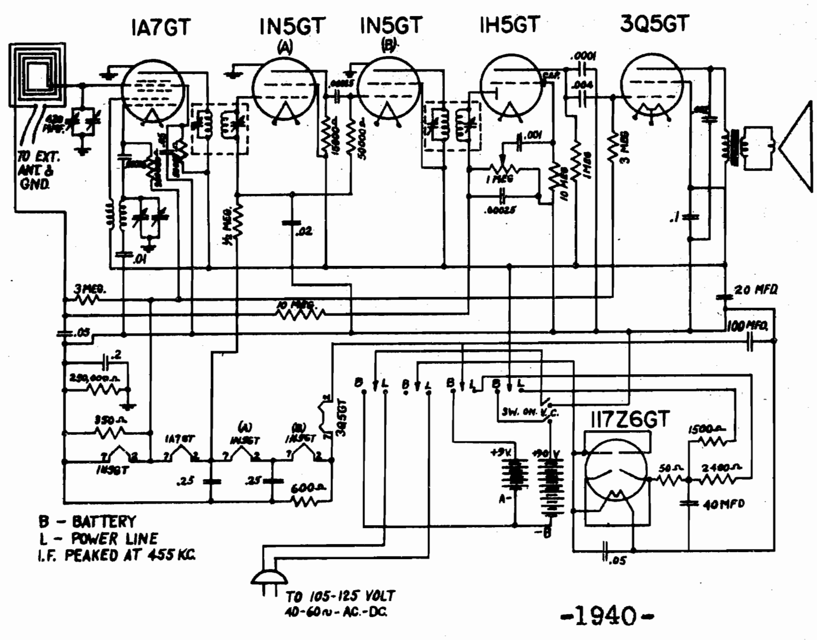
GENERAL ELECTRIC CO.

MODEL JB-630
MODEL JB-631



Schematic Diagram—Model JB-630

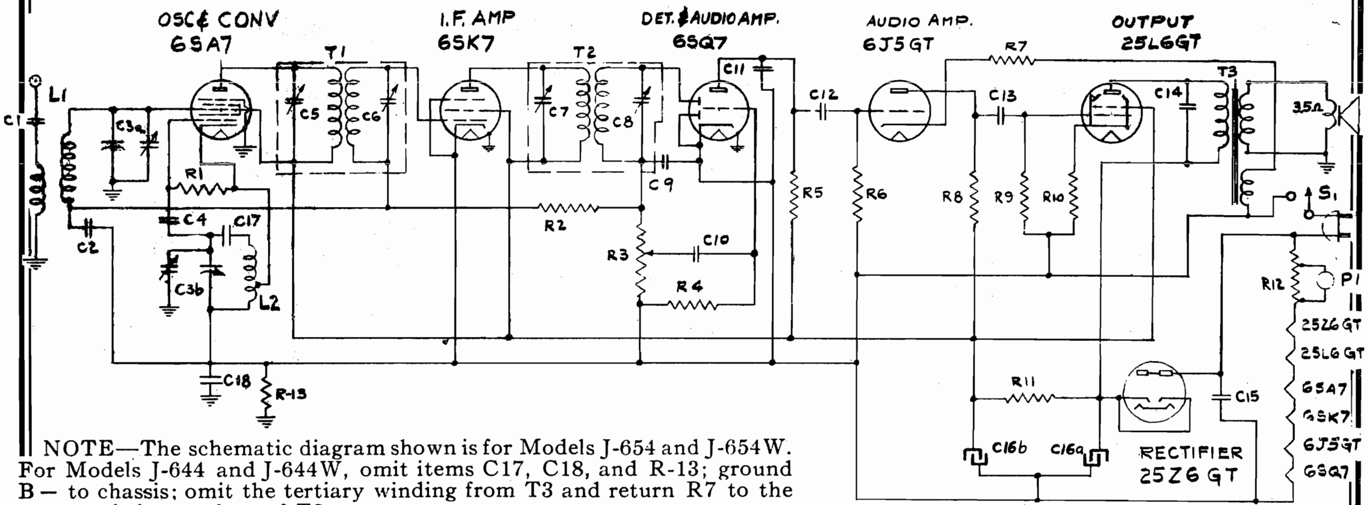
FOR ALIGNMENT, VOLTAGES, PARTS, SEE INDEX



Schematic Diagram—Model JB-631

MODELS J-644, J-644W, J-654, J-654W

GENERAL ELECTRIC CO.



NOTE—The schematic diagram shown is for Models J-654 and J-654W. For Models J-644 and J-644W, omit items C17, C18, and R-13; ground B— to chassis; omit the tertiary winding from T3 and return R7 to the ungrounded secondary of T3.

PARTS DESCRIPTION LIST

I.F. 455 KC

Symbol	Description	Symbol	Description	Symbol	Description
C1	.01 mfd. paper capacitor	C16a, 16b	50 mfd., 30 mfd. electrolytic	R9	470,000 ohm carbon resistor
C2	.05 mfd. paper capacitor	C17	.05 mfd. paper capacitor	R10	150 ohm carbon resistor
C3a, 3b	Tuning condenser	C18	.20 mfd. paper capacitor	R11	1000 ohm carbon resistor
C4	47 mmf. mica capacitor	R1	33,000 ohm carbon resistor	R12	Ballast resistor tube
C5–C8	I.F. trimmers	R2	2.2 megohm carbon resistor	R13	470,000 ohm carbon resistor
C9	470 mmf. mica capacitor	R3	0.5 megohm volume control	L1	Beam-a-Scope
C10	.02 mfd. paper capacitor	R4	4.7 megohm carbon resistor	L2	Oscillator coil
C11	470 mmf. mica capacitor	R5	470,000 ohm carbon resistor	T1	1st I.F. transformer
C12, C13	.005 mfd. paper capacitor	R6	1.0 megohm carbon resistor	T2	2nd I.F. transformer
C14	.01 mfd. paper capacitor	R7	3300 ohm carbon resistor	T3	Output transformer
C15	.05 mfd. paper capacitor	R8	39,000 ohm carbon resistor		

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Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains — Gain*
- Antenna Post to Converter Grid.....4.0 at 1000 KC
- I.F. on Converter Grid to I.F. on I.F. Amplifier Grid..................35 at 455 KC
- I.F. Amplifier Grid to Diode Plate...60 at 455 KC

(2) 0.05-volt, 400-cycle signal across the volume control will give ½-watt speaker output.* (Volume control turned to maximum.)

(3) Average RF voltage developed from oscillator cathode to B —...............................1.5 volts

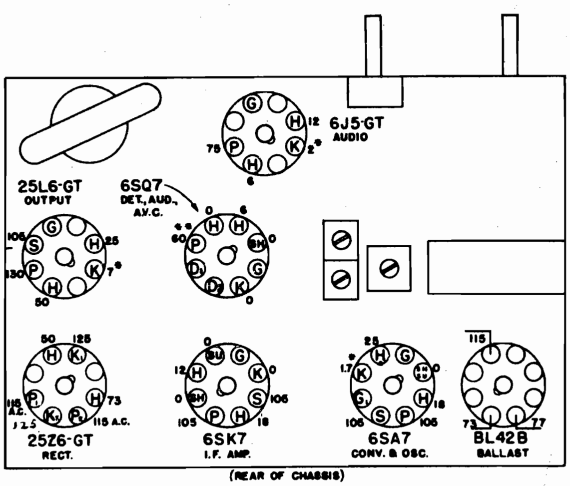
* Variations of ± 20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII
TRIM OSC 1650 KC; ANT 1500 KC

Intermediate Frequency..................455 KC

Electrical Power Output (117 line volts)
- Undistorted..........................1.5 watts
- Maximum..............................2.5 watts

Loud-speaker—Alnico Magnet Dynamic
- Outside Cone Diameter..................5 inches
- Voice Coil Impedance (400 cycles)........3.5 ohms



Socket Voltages

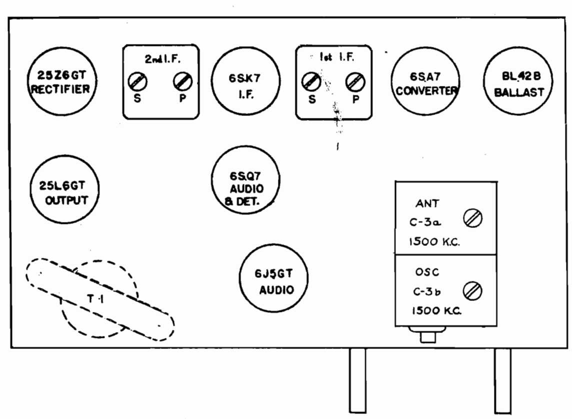
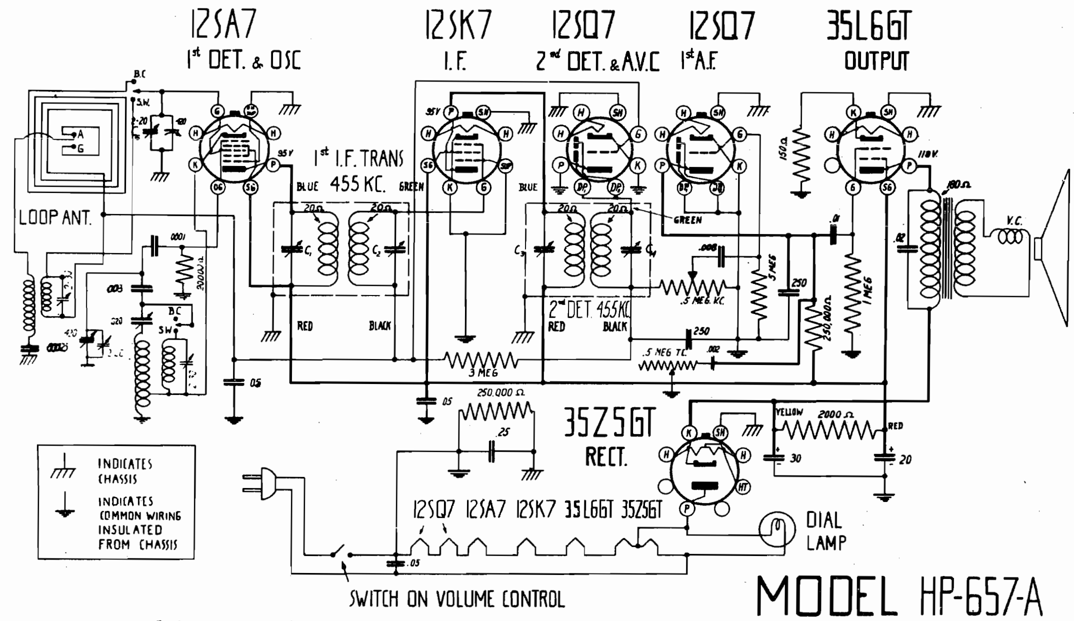


Fig. 1. Tube and Trimmer Location

GENERAL ELECTRIC CO.



Model HP-657-A

SERVICE DATA

Over-all Dimensions

Height .... 8 inches
Width .... 12⅞ inches
Depth .... 7¼ inches

Tuning Control Drive Ratio 5:1

Electrical Specifications

Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
105–125 AC or DC	40–60	30

Tuning Frequency Range

Broadcast Band .... 540–1650 KC
Police Band .... 2600–7500 KC

Electrical Power Output

Undistorted .... 0.8 watts
Maximum .... 1.6 watts

Loud-speaker—Permanent Magnet

Outside Cone Diameter .... 5 inches
Voice Coil Impedance (400 cycles) .... 3 ohms

Tubes

Converter-Oscillator GE-12SA7
I.F. Amplifier GE-12SK7
Detector—AVC GE-12SQ7
1st Audio Amplifier GE-12SQ7
Audio Output GE-35L6GT
Rectifier GE-35Z5GT
Dial Lamp .... Mazda No. 47

GENERAL INFORMATION

Model HP-657-A is a compact, six-tube, AC-DC, superheterodyne radio designed to receive programs on the broadcast and police-amateur-aircraft bands of frequency. Antenna and ground connections are not necessary as the built-in "Beam-a-Scope" provides adequate pick-up; however, terminals are provided on the cabinet back for connecting antenna and ground leads when signal strengths are low. The receiver is equipped with five mechanical "Feathertouch Tuning" keys adjustable by removing the keys and loosening the binding screws with a screwdriver. Additional design features include Underwriters' approval, full automatic volume control, continuously variable tone control, and single-ended tubes.

When operating from a DC source of power it is necessary to insert the power plug with the proper polarity. If the receiver fails to function with the power plug inserted one way, reverse the plug. If any hum is noticed when the receiver is used on AC, reverse the power plug as above.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. .... 455 KC
Broadcast R.F. .... 1650, 1500 and 600 KC
Police R.F. .... 7000 KC

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 12SK7 through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure applying the 455 KC signal to the control grid of the 12SA7 and aligning the 1st I.F. transformer. Do not remove the grid leads from the tubes. Finish alignment by over-all adjustments.

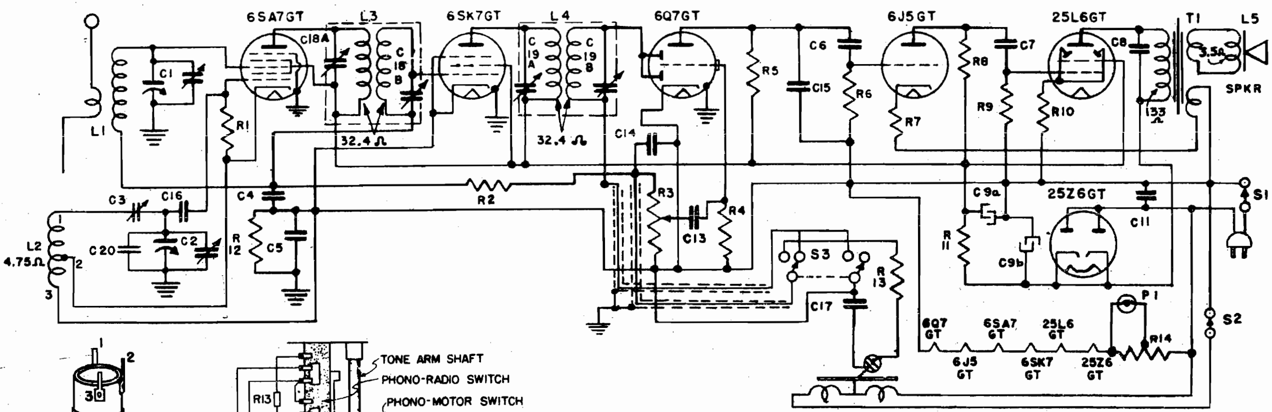
R.F. Alignment

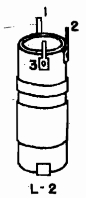
Apply R.F. signals either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope.

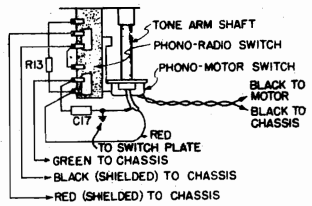
1. Rotate the gang condenser to maximum open and apply 1650 KC signal to Beam-a-Scope. Peak oscillator trimmer on right-hand section of gang condenser (as viewed from front) for maximum output.
2. Change generator signal to 1500 KC and set dial pointer to 1500 KC mark. Peak antenna trimmer on left-hand section of gang condenser.
3. Set pointer and generator signal to 600 KC. Peak broadcast padder while rocking the gang condenser. Broadcast padder is first from front on right side of chassis.
4. Rotate band switch to clockwise position and set dial pointer to the 7.0 MC mark. With 7.0 MC input signal align rear trimmer on right side of chassis and peak trimmer located on small antenna coil on top of chassis.

MODEL J-678

GENERAL ELECTRIC CO.







RC-7017	C-1, -2	CONDENSER—Tuning Condenser..........
RC-6515	C-3	CAPACITOR—Oscillator padder............
RC-072	C-4	CAPACITOR—.05 Mfd., 200 V. paper.........
RC-130	C-5	CAPACITOR—0.2 Mfd., 400 V. paper.........
RC-023	C-6, 7	CAPACITOR—.005 Mfd., 600 V. paper........
RC-039	C-8	CAPACITOR—.01 Mfd., 600 V. paper.........
RC-5145	C-9a	CAPACITOR—30 Mfd., 150 V..............
RC-5145	C-9b	CAPACITOR—50 Mfd., 150 V..............
RC-092	C-11	CAPACITOR—.05 Mfd., 600 V. paper.........
RC-060	C-13	CAPACITOR—.03 Mfd., 600 V. paper.........
RC-293	C-14	CAPACITOR—470 Mmf., mica..............
RC-250	C-15	CAPACITOR—220 Mmf., mica..............
RC-216	C-16	CAPACITOR—47 Mmf., mica...............
RC-104	C-17	CAPACITOR—0.1 Mfd., 400 V. paper.........
RC-226	C-20	CAPACITOR—10 Mmf., mica...............
RQ-1295	R-1	CAPACITOR—33,000 ohms, ½ W. carbon .....
RQ-1339	R-2	RESISTOR—2.2 megohm, ½ W. carbon.......
RV-119	R-3, S-1	VOLUME CONTROL—0.5 megohm potentiometer............................
RQ-1365	R-4	RESISTOR—15 megohm, ½ W. carbon.......
RQ-1323	R-5	RESISTOR—470,000 ohms, ½ W. carbon.......
RQ-1331	R-6	RESISTOR—1.0 megohm, ½ W. carbon......
RQ-1271	R-7	RESISTOR—3,300 ohms, ½ W. carbon.......
RQ-1297	R-8	RESISTOR—39,000 ohms, ½ W. carbon.......
RQ-1323	R-9	RESISTOR—470,000 ohms, ½ W. carbon......
RQ-1239	R-10	RESISTOR—150 ohms, ½ W. carbon.........
RQ-1459	R-11	RESISTOR—1,000 ohms, 1 W. carbon.......
RQ-1323	R-12	RESISTOR—470,000 ohms, ½ W. carbon......
RQ-1307	R-13	RESISTOR—100,000 ohms, ½ W. carbon......
RR-773	R-14	RESISTOR—BL42B Ballast resistor..........
RL-528	L-1	LOOP—Built-in antenna and back cover assembly
RL-2016	L-2	COIL—Oscillator coil....................
RT-341	L-3	TRANSFORMER—1st I.F. transformer.......
RT-342	L-4	TRANSFORMER—2nd I.F. transformer......
RT-475	T-1	TRANSFORMER—Output transformer.......

Alignment Frequencies

I.F.........455 KC R.F.........1500 and 580 KC
The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 6SK7GT through a .05-mfd. capacitor and align the 2nd IF transformer. Repeat the procedure, applying the 455-Kc signal to the control grid of the 6SA7GT and aligning the 1st I.F. transformer. Finish by over-all adjustments.

R.F. Alignment

With gang condenser plates completely closed, set dial pointer to the first mark at the left end of the scale. Apply a 1500-Kc signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Peak (C-3) on 580 KC while rocking the gang condenser. Retrim at 1500 KC.

Precaution

If the signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned out signal generator attenuator.

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains*
Antenna post to 6SA7GT grid....................4 at 1000 KC
6SA7GT grid to 6SK7GT grid....................30 at 455 KC
6SK7GT grid to 6Q7GT det. plate................100 at 455 KC

(2) Audio Gains
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½ watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

* Variations of +10%, −20% permissible.

Electrical Rating

A-6 Rating....................115 volts, 60 cycles AC, 75 watts
A-5 Rating....................115 volts, 50 cycles AC, 75 watts

Tuning Frequency Range ....550–1600 KC.

Intermediate Frequency................................455 KC.

Electrical Power Output

Undistorted.......................................2.0 watts
Maximum...2.5 watts

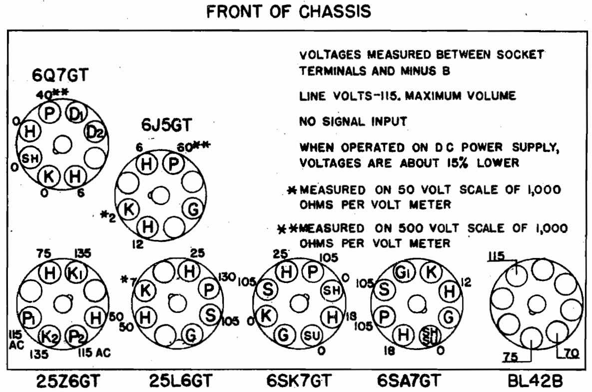
Loud-speaker—PM Dynamic

Outside cone diameter.............................6.5 inches
Voice coil impedance (400 cycles).....................3.5 ohms

Phonograph Mechanism

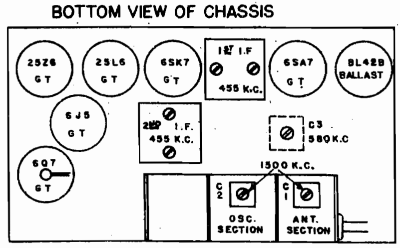
Type mechanism.................................Manual
Type pick-up....................................Crystal
Turntable speed..................................78 R.P.M.

FRONT OF CHASSIS



25Z6GT 25L6GT 6SK7GT 6SA7GT BL42B

BOTTOM VIEW OF CHASSIS



TO SET-UP PUSH BUTTONS

1. Make a list of stations desired on push buttons and arrange in order, from low to highest frequency; insert tabs of the call letters of the stations in the keys in the order listed.
2. Allow the receiver to run five minutes before making the following adjustments. Manually tune in first station, lift key upward and loosen adjusting bolt. Hold the tuning control to the exact tune position and with a screwdriver push in the adjusting bolt as far as it will go, then tighten the adjusting bolt.
3. Adjust for each of the five remaining stations in a similar manner.

GENERAL ELECTRIC CO.

MODEL J-709

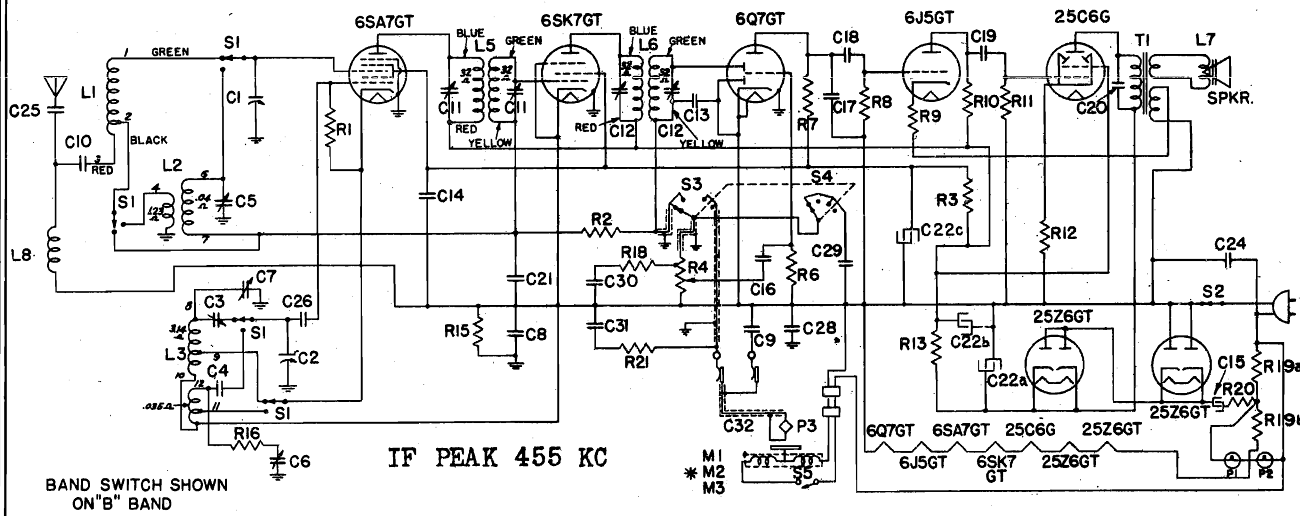


Fig. 3. Schematic Diagram

Symbol	Description
C-1	Antenna section tuning condenser
C-2	Oscillator section tuning condenser
C-3	"B" band padding capacitor
C-4	3900 mmf. mica condenser ±5%
C-5	3–30 mmf. "D" antenna trimmer
C-6	3–20 mmf. "D" oscillator trimmer
C-7	3–20 mmf. "B" oscillator trimmer
C-8	0.1 mfd. paper capacitor
C-9	0.1 mfd. paper capacitor
C-10	.01 mfd. paper capacitor
C-13	220 mmf. mica capacitor
C-14	.05 mfd. paper capacitor
C-15	30 mfd. 250 V. dry electrolytic
C-16	.02 mfd. paper capacitor
C-17	220 mmf. mica capacitor
C-18	.005 mfd. paper capacitor
C-19	.03 mfd. paper capacitor
C-20	.01 mfd. paper capacitor
C-21	0.1 mfd. paper capacitor
C-22a	40 mfd. 250 V. electrolytic
C-22b	20 mfd. 250 V. electrolytic
C-22c	20 mfd. 250 V. 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
C-29	.002 mfd. paper capacitor
C-30	.01 mfd. paper capacitor
C-31	.0072 mfd. paper capacitor
L-1	Beam-a-Scope
L-2	"D" antenna coil
L-3	"B-D" oscillator coil
L-5	1st I.F. transformer
L-6	2nd I.F. transformer
L-8	1½ mh. antenna choke
M-1	60-cycle phono motor
M-2	50-cycle phono motor
M-3	25-cycle phono motor
P-1, -2	Dial lamps, MAZDA No. 44
P-3	Crystal pick-up
R-1	33,000 ohms carbon resistor
R-2	2.2 megohms carbon resistor
R-3	3900 ohms carbon resistor
R-4	0.5 megohm volume control
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	220 ohms 1 W. carbon resistor
R-13	3300 ohms 2 W. carbon resistor
R-15	470,000 ohms carbon resistor
R-16	27 ohms carbon resistor
R-18	33,000 ohms carbon resistor
R-19a	33 ohms 3.5 W. wire wound
R-19b	20 ohms 2.5 W. wire wound
R-20	22 ohms 2 W. carbon resistor
R-21	100,000 ohms carbon resistor
S-1	Band switch
S-2	Power switch on volume control
S-3	Radio-phono switch
S-4	Tone control
S-5	Motor power switch
T-1	Output transformer

MODEL J-709

TECHNICAL AND SERVICE INFORMATION

Model J-709 combination uses the same chassis and record-changer mechanism as the Model H-708, data for which will be found in Vol. XI. The schematic Fig. 3 above and parts view of the automatic changer, Fig. 5 below, are corrected to care for the Model J-709.

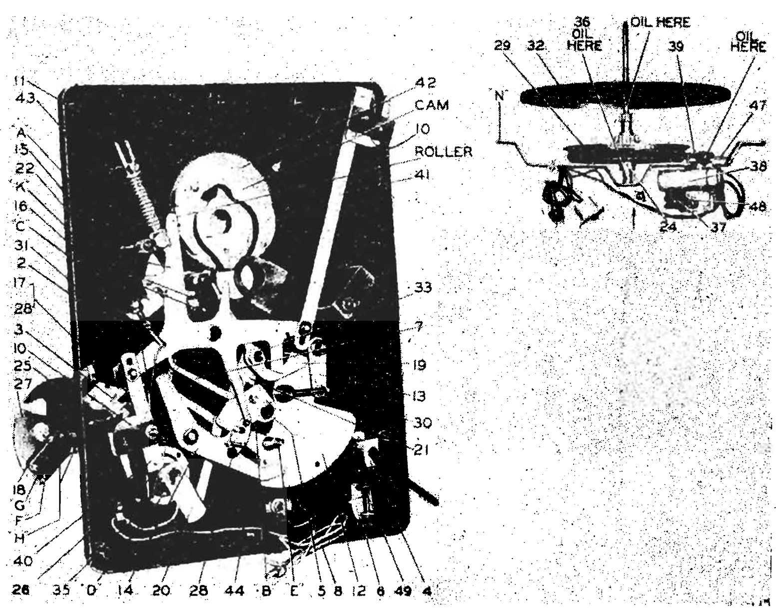


Fig. 5. Parts View of Automatic Record Changer

MODELS J-718 AND J-728

SPECIFICATIONS

Over-all Dimensions

Height....35 1/8 inches
Width....35 1/8 inches
Depth....16 inches

Electrical Rating

Rating	Power Supply (volts)	Frequency (cycles on AC)	Power Consumption (watts)
A6	110–125	60	95
A5	110–125	50	95
C2	110–125	25	105

Tuning Frequency Range

Broadcast Band....540–1600 KC
Short-wave Band No. 1....2300–6900 KC
Short-wave Band No. 2....6900–22,000 KC

Intermediate Frequency....455 KC

Electrical Power Output

Undistorted....4 Watts
Maximum....5.5 Watts

Loud-speaker—"Alnico" Magnet Dynamic

Outside Speaker Diameter....14 inches
Voice Coil Impedance....3.5 ohms

Tubes

R.F. Amplifier....GE-6SK7
Converter and Oscillator....GE-6SA7
I.F. Amplifier....GE-6SK7
Det., Aud., AVC....GE-6SQ7
Audio Driver....GE-6J5G or GT
Audio Output....GE-6Y6G
Rectifier....GE-5Y3G
Dial and Pilot Lamps....(4) MAZDA No. 44

Phonograph Mechanism

Type....Automatic Record Changer
Record Capacity
10-inch records....8
12-inch records....7
Type Pick-up....Crystal
Turntable speed....78 Rpm

GENERAL INFORMATION

Models J-718 and J-728 are radio-automatic phonograph combinations each incorporating a seven-tube, three-band, A-C radio receiver. The only difference between these two models is in the cabinet.

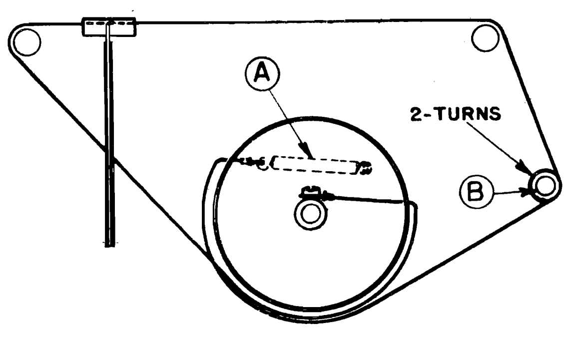


Fig. 4. Dial Cord Stringing Diagram

Setting Up the Receiver

The following remarks will assist the serviceman in correctly setting up these receivers for use:

(1) In order to press the volume or tuning knobs all the way on their respective shafts, the dial reflector plate should be held in place by pressure from the rear.

(2) The black speaker lead should be connected to the speaker terminal which is grounded to the speaker frame.

(3) A method of setting up station keys which will assure driftproof adjustments is to turn each iron core screw adjustment to its extreme counter-clockwise position, and then turn slowly in a clockwise direction until the desired station is tuned in.

Beam-a-Scope Removal

Before either the chassis or Beam-a-Scopes can be removed the leads between them must be disconnected. The cylindrical Beam-a-Scope leads are disconnected by pulling the pin-plug connections out of the Beam-a-Scope terminals. The short-wave Beam-a-Scope leads are disconnected by unscrewing the nuts which clamp the terminals on the phosphor-bronze strap and green leads, and the screw which clamps the terminal of the yellow lead.

Fig. 2 shows the location of the Beam-a-Scope leads when connected.

To remove the cylindrical Beam-a-Scope, the following procedure is recommended: Disconnect the four Beam-a-Scope leads. Pry loose the card-board strap which is stapled to the bottom of the cabinet and which holds the bottom end of the Beam-a-Scope in place. The cylindrical Beam-a-Scope can now be tilted enough out of vertical to allow continuous rotation of it. Rotate the Beam-a-Scope from right to left until it comes loose. NOTE: The upper pivot bolt by which the Beam-a-Scope is supported should never be loosened or removed.

When replacing the cylindrical Beam-a-Scope it should be screwed up on the bolt approximately five turns or until the blocking bolt prevents more than 180° rotation when the Beam-a-Scope hangs vertically. The card-board strap which holds the bottom pivot of the Beam-a-Scope in place should be restapled in such a position that the Beam-a-Scope hangs vertically and is free to turn without rubbing on the strap.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

NOTE: In no case should the magnet be removed from the assembled position.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available:

(1) STAGE GAINS *
(a) Antenna Post to R.F. Grid at
1,000 KC....5.5
4,000 KC....2.5
18,000 KC....2.5
(b) R.F. Grid to Converter Grid at
1,000 KC....5.5
4,000 KC....3.0
18,000 KC....2.0
(c) R.F. on Converter Grid to I.F. on 1st I.F. Grid at
1,000 KC....50
4,000 KC....50
18,000 KC....45
(d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at
455 KC....75
(e) I.F. Amplifier Grid to Detector Plate at
455 KC....70
(2) Voltage across volume control to give 1/2-watt speaker output at
400 cycles....03 volts
(3) DC voltage developed across oscillator grid resistor (R-7) at
1,000 KC....8.3
4,000 KC....7.8
18,000 KC....4.6

* Variations of ±20% permissible. All readings obtained with enough signal input to give 1/2-watt speaker output.

Frequency-degree Reference Chart

"BC" Band

1600 KC....168°	1200 KC....129°	700 KC....60°
1500 KC....158°	1000 KC....106°	600 KC....32°
1400 KC....148°	800 KC....80°	580 KC....24°
		540 KC....0°

"SW1" Band

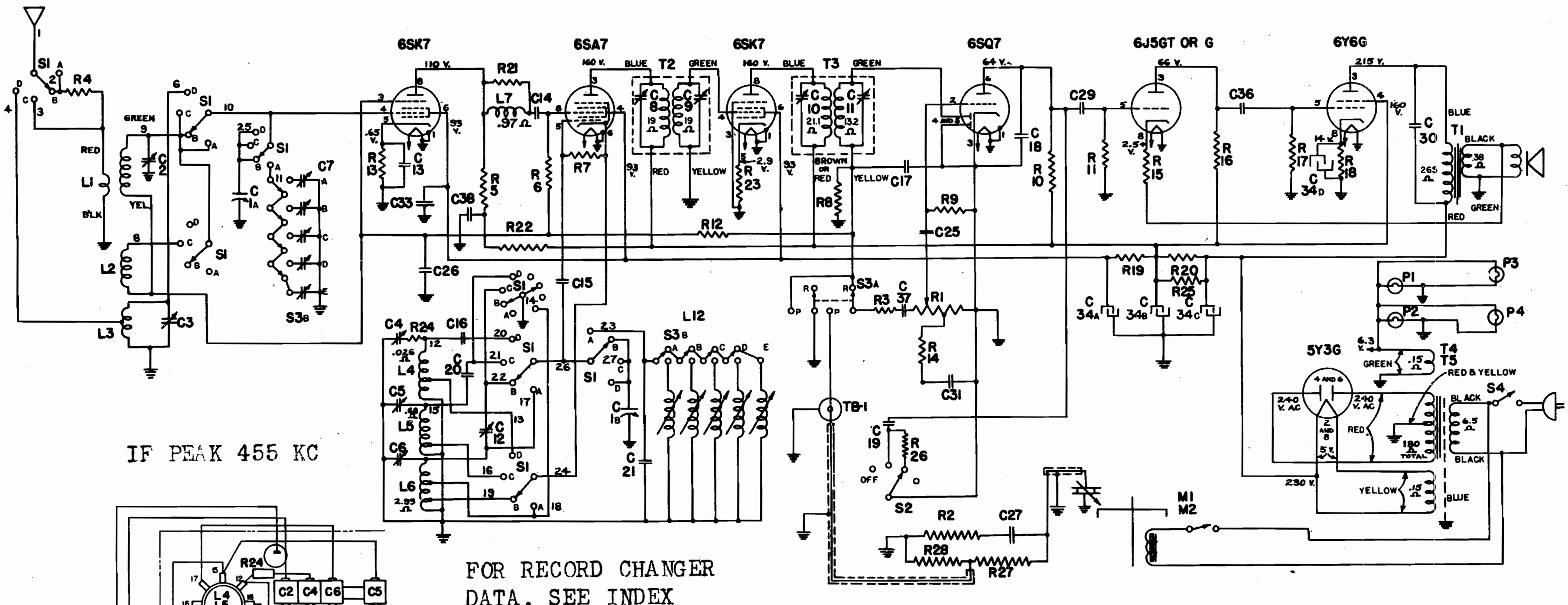
6.9 MC....173°	4.0 MC....98°
6.0 MC....150°	3.0 MC....59°
5.0 MC....126°	2.5 MC....24°

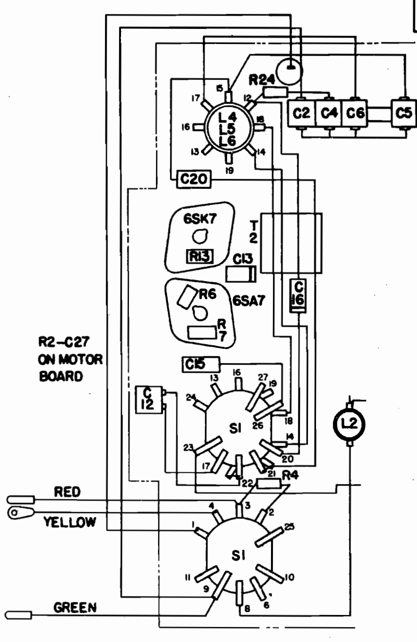
"SW2" Band

22 MC....172°	16 MC....134°	8 MC....46°
21 MC....164°	12 MC....101°	7 MC....20°
18 MC....146°	10 MC....79°	

GENERAL ELECTRIC CO.

MODELS J-718
J-728





Switch and Coil Section of Chassis Underview

Symbol	Description
C1A	Antenna Section of Tuning Condenser
C1B	Oscillator Section of Tuning Condenser
C2	"BC" Band Antenna Trimmer
C3	"SW2" Band Antenna Trimmer
C4	"SW2" Band Oscillator Trimmer
C5	"SW1" Band Oscillator Trimmer
C6	"BC" Band Oscillator Trimmer
C7	Station Selector Antenna Trimmers
C12	"BC" Band Padder
C13	.01 mfd. paper
C14	100 mmf. mica
C15	47 mmf. mica
C16	.008 mfd. polystyrene
C17	220 mmf. mica
C18	150 mmf. mica
C19	.005 mfd. paper
C20	2400 mmf. mica ±5%
C21	750 mmf. silvered mica ±5%
C25	.02 mfd. paper
C26	0.1 mfd. paper
C27	.01 mfd. paper
C29	.005 mfd. paper
C30	.01 mfd. paper
C31	.005 mfd. paper
C33	.01 mfd. paper

Symbol	Description
C34A	20 mfd. dry electrolytic
C34B	50 mfd. dry electrolytic
C34C	40 mfd. dry electrolytic
C34D	20 mfd. dry electrolytic
C36	.05 mfd. paper
C37	.005 mfd. paper
C38	.01 mfd. paper
L1	"BC" band Beam-a-Scope
L2	"SW1" band Antenna Coil
L3	"SW2" band Beam-a-Scope
L4	"SW2" band oscillator coil
L5	"SW1" band oscillator coil
L6	"BC" band oscillator coil
L7	R.F. interstage coil
L12	Station selector oscillator coils
M1, 2	Automatic record changer
P1 to 4	Pilot lamp, MAZDA No. 44
R1	2 megohm volume control
R2	100,000 ohms carbon
R3	47,000 ohms carbon
R4	1000 ohms carbon
R5	3300 ohms carbon
R6	47,000 ohms carbon
R7	22,000 ohms carbon
R8	470,000 ohms carbon
R9	4.7 megohms carbon
R10	330,000 ohms carbon
R11	470,000 ohms carbon

Symbol	Description
R12	2.2 megohms carbon
R13	47 ohms carbon
R14	150,000 ohms carbon
R15	3300 ohms carbon
R16	100,000 ohms carbon
R17	330,000 ohms carbon
R18	270 ohms 2 W. carbon
R19	3900 ohms 1 W. carbon
R20	3900 ohms 2 W. carbon
R21	10,000 ohms carbon
R22	1000 ohms carbon
R23	150 ohms carbon
R24	27 ohms carbon
R25	3900 ohms 2 W. carbon
R26	47,000 ohms carbon
R27	680,000 ohms carbon
R28	270,000 ohms carbon
S1	Band switch
S2	Tone control switch
S3A	Phono switch
S3B	Feathertouch tuning switch
S4	Power switch
T1	Output transformer
T2	1st I.F. transformer
T3	2nd I.F. transformer
T4, 5	Power transformer

MODELS J-718
J-728

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

The alignment procedure is given in table form below. The use of a standard I.R.E. dummy antenna in making all R.F. alignments is recommended. R.F. alignment can be performed by loop-coupling the generator signal to the receiver Beam-a-Scopes if care is exercised not to overcouple the two circuits. Keeping a distance of two feet or more between the generator loop and the receiver Beam-a-Scope will generally insure freedom from overcoupling. The relative position of the Beam-a-Scopes with respect to the chassis materially affects R.F. alignment; therefore, all R.F. alignments should be made with the chassis and Beam-a-Scopes mounted in the cabinet. In keeping with this recommendation all R.F. alignment trimmers are available either through holes in the back apron of the chassis or from the top of the chassis deck. See Fig. 1 for trimmer location. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet. Also the receiver should be kept away from large metal objects such as radiators, metal-top tables, etc.

ALIGNMENT CHART

Band Switch Setting	Input Frequency	Point of Input	Dummy Antenna	Trimmer	Comments
I.F. Alignment with Oscilloscope					
1. "BC" Band	455 KC Sweep	I.F. Grid and Chassis Ground	.05 Mfd. or larger	2nd I.F. Trimmers C-10, 11	Gang condenser plates open. Depress any station key other than Phono key. Connect audio input of oscilloscope to chassis ground and top of volume control. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. Finish by retrimming 2nd I.F. trimmers.
2. "BC" Band	455 KC Sweep	Green lead on "BC" Beam-a-Scope terminal board and chassis ground	.05 Mfd. or larger	1st I.F. Trimmers C-8, 9	
I.F. Alignment with Output Meter					
1. "BC" Band	455 KC with Modulation	Green lead on "BC" Beam-a-Scope terminal board and chassis ground	.05 Mfd. or larger	2nd I.F. Trimmers C-10, 11. 1st I.F. trimmers C-8, 9	Gang condenser plates open. Depress any key other than Phono key. Connect output meter across voice coil. Keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
R.F. Alignment with Chassis Mounted in Cabinet					
1. "BC" Band					Close gang plates, adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil. Tone control set to "Normal" position.
2. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-2)	Set pointer to 1500 KC and tune in signal with (C-6). Peak output with (C-2).
3. "BC" Band	580 KC with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-12)	Set Pointer to 580 KC and peak signal while rocking gang condenser
4. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-2)	Retrim for maximum output.
5. Repeat operation 3 if "BC" band trimmers are badly out of alignment.					
6. "SW1" Band	6 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-5)	Set pointer to 6 MC and peak signal while rocking gang condenser.
7. "SW2" Band	21 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-4) Ant. (C-3)	Set pointer to 21 MC and tune in signal with (C-4). Peak output with (C-3) while rocking gang condenser. When (C-4) is on proper peak, image of 21 MC signal should be heard 910 KC below or on 20.09 MC.
8. "SW2" Band	8 MC with Modulation	Antenna Post	I.R.E.		This operation may or may not be necessary depending on how much the short-wave Beam-a-Scope leads have been moved from their correctly dressed positions. Re-positioning will be indicated if an increased output meter reading can be obtained by moving the short-wave Beam-a-Scope phosphor-bronze lead closer or farther away from the green lead. The moving should be done with an insulated rod or stick.
9. Repeat operation 7 if the Beam-a-Scope leads are moved in operation 8.					

R.F. ALIGNMENT
With Chassis Outside of Cabinet

R.F. alignment can be performed only on the "BC" and "SW1" bands with the chassis outside of the cabinet. Any alignment attempted on "SW2" band will not be satisfactory. The same relative position between the chassis and broadcast loop should be maintained when aligning outside the cabinet as these components occupy in the cabinet. Since the glass dial scale is fastened to the cabinet it cannot be used for reference during alignment of the chassis outside of the cabinet. Use must be made, therefore, of 0–180° calibrated scale which is cemented to the back of the dial-reflector plate. From the "frequency-degree reference chart" the degree readings for corresponding frequency settings may be obtained. To use these degree readings, first completely close the gang condenser plates and then slide the pointer along the cord until the left-hand edge of the pointer-guide slide lines up with the 0° mark. By using this left-hand edge (as viewed from the rear) of the slide as the degree-scale pointer the receiver may be tuned to any frequency. Example: By rotating the tuning control until the left-hand edge of the slide is in line with 158°, the receiver will be tuned to 1500 KC on the "BC" band.

The "BC" and "SW1" band alignment procedure is the same as outlined in steps 2 to 6 inclusive of the chart—"R.F. Alignment with Chassis Mounted in Cabinet."

After the alignment has been performed on the "BC" and "SW1" bands, the chassis should be mounted in the cabinet and "SW2" band alignment checked as described in steps 7 to 9 of the chart—"R.F. Alignment with Chassis Mounted in Cabinet."

NOTE: After moving the pointer along the cord to use the left-hand edge as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

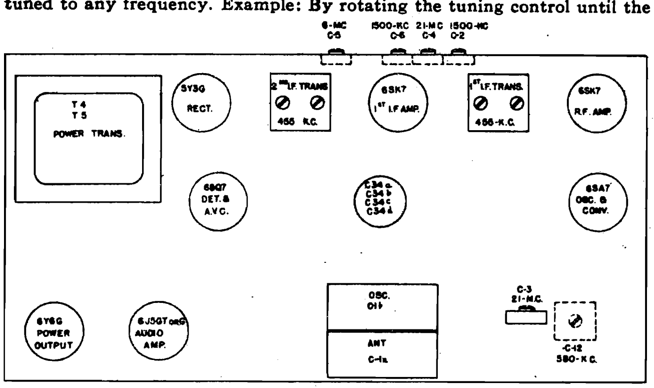


Fig. 1. Trimmer Location

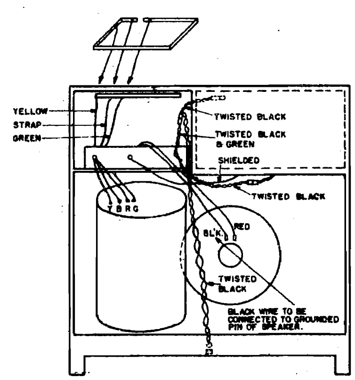


Fig. 2. Interconnection Diagram

GENERAL ELECTRIC CO.

MODEL J-805
(GOLDEN TONE)

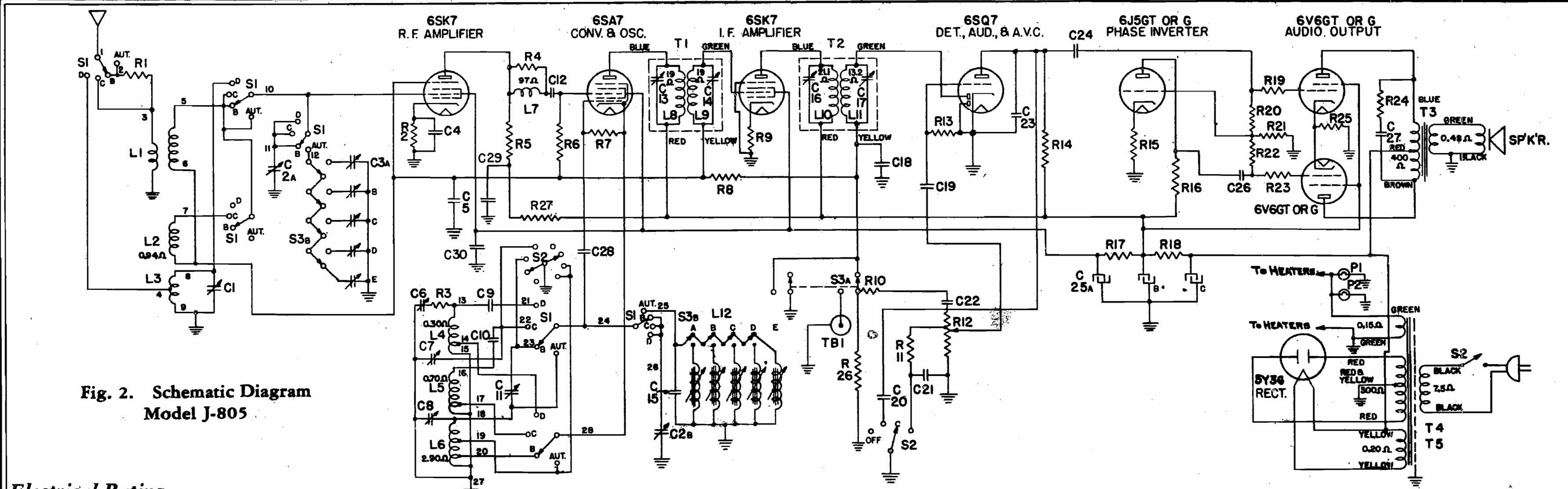


Fig. 2. Schematic Diagram
Model J-805

Electrical Rating

Rating	Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
A	110–125	50–60	85
C	110–125	25–60	85

Electrical Power Output

Undistorted........................6.0 watts
Maximum........................9.0 watts

Tone Control........................3-position

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter..............12 inches
Voice Coil Impedance................3.5 ohms

Tuning Frequency Range

Broadcast Band......................540–1700 KC
Short-wave Band No. 1..............2400–7000 KC
Short-wave Band No. 2..............7000–22000 KC

Intermediate Frequency........................455 KC

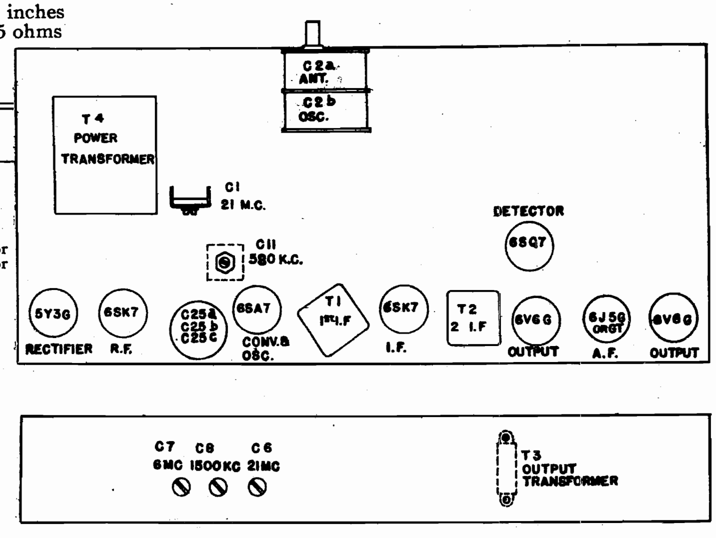


Fig. 1. Trimmer Location

PARTS DESCRIPTION LIST

Symbol	Description	Symbol	Description	Symbol	Description
C1	"D" band antenna trimmer	C28	47 mmf. mica capacitor	R13	4.7 megohms carbon resistor
C2A	Antenna section of tuning condenser	C29	.01 mfd. paper capacitor	R14	470,000 ohms carbon resistor
C2B	Oscillator section of tuning condenser	C30	.01 mfd. paper capacitor	R15	3300 ohms carbon resistor
C3	Antenna station selector trimmer strip	L1	"B" and "C" band Beam-a-Scope	R16	68,000 ohms carbon resistor
C4	.01 mfd. paper capacitor	L2	"C" band antenna coil	R17	8200 ohms 2 W. carbon resistor
C5	0.1 mfd. paper capacitor	L3	"D" band Beam-a-Scope	R18	1800 ohms 3 W. carbon resistor
C6	"D" band oscillator trimmer	L4	"D" band oscillator coil	R19	1000 ohms carbon resistor
C7	"C" band oscillator trimmer	L5	"C" band oscillator coil	R20	150,000 ohms carbon resistor
C8	"B" band oscillator trimmer	L6	"B" band oscillator coil	R21	56,000 ohms carbon resistor
C9	.008 mfd. paper capacitor	L7	R.F. interstage coil	R22	270,000 ohms carbon resistor
C10	2400 mmf. ±5% mica capacitor	L12	Oscillator station selector coil strip	R23	1000 ohms carbon resistor
C11	"B" band padding trimmer	P1	Dial lamp, MAZDA No. 44	R24	5600 ohms carbon resistor
C12	100 mmf. mica capacitor	P2	Dial lamp, MAZDA No. 44	R25	180 ohms 1 W. carbon resistor
C15	750 mmf. ±5% silvered mica	R1	1000 ohms carbon resistor	R26	470,000 ohms carbon resistor
C18	220 mmf. mica capacitor	R2	47 ohms carbon resistor	R27	1000 ohms carbon resistor
C19	.02 mfd. paper capacitor	R3	27 ohms carbon resistor	S1	Band switch
C20	.003 mfd. paper capacitor	R4	10,000 ohms carbon resistor	S2	Tone control switch
C21	.005 mfd. paper capacitor	R5	3300 ohms carbon resistor	S3A	Phono-FM-Tel switch
C22	.005 mfd. paper capacitor	R6	47,000 ohms carbon resistor	S3B	Station selector switch
C23	220 mmf. mica capacitor	R7	22,000 ohms carbon resistor	T1	1st I.F. transformer
C24	.03 mfd. paper capacitor	R8	2.2 megohms carbon resistor	T2	2nd I.F. transformer
C25A	10 mfd. 300 V. dry electrolytic	R9	150 ohms carbon resistor	T3	Output transformer
C25B	15 mfd. 300 V. dry electrolytic	R10	47,000 ohms carbon resistor	T4	50-60 cycle-power transformer
C25C	30 mfd. 350 V. dry electrolytic	R11	82,000 ohms carbon resistor	T5	25 cycle power transformer
C26	.03 mfd. paper capacitor	R12	2 megohms volume control (0.5-meg-ohm tap)		
C27	.002 mfd. paper capacitor				

MODEL 805
(GOLDEN TONE)

GENERAL ELECTRIC CO.

NOTE: The oscillator coil and band switch terminals are numbered in the Chassis Parts Layout, Fig. 3, to assist in locating the corresponding numbered points on the Schematic Diagram, Fig. 2. This numbering will also assist in rewiring if the coil or switch are replaced. I.F. transformer connections are shown as an aid in replacement.

Tubes

R. F. Amplifier	GE-6SK7
Converter and Oscillator	GE-6SA7
I. F. Amplifier	GE-6SK7
Det., Aud., AVC	GE-6SQ7
Phase Inverter	GE-6J5G or GT
Audio Output	(2) GE-6V6G or GT
Rectifier	GE-5Y3G
Dial Lamp	(2) MAZDA No. 44

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*

(a) Antenna Post to R. F. Grid at
- 1000 KC 6.5
- 4000 KC 3.0
- 18000 KC 2.3

(b) R.F. Grid to Converter Grid at
- 1000 KC 5.0
- 4000 KC 3.0
- 18000 KC 2.0

(c) R.F. on Converter Grid to I.F. on 1st I.F. Grid at
- 1000 KC 47
- 4000 KC 47
- 18000 KC 39

(d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at
- 455 KC 55

(e) I.F. Amplifier Grid to Detector Plate at
- 455 KC 77

(2) Voltage across Volume Control to Give ½-watt Speaker Output at
- 400 cycles .... .05 volts

(3) DC Voltage Developed Across Oscillator Grid Resistor (R-7) at
- 1000 KC 6.0
- 4000 KC 5.5
- 18000 KC 3.9

*Variations of ± 20% are permissible. All readings obtained with enough input signal to give ½-watt speaker output.

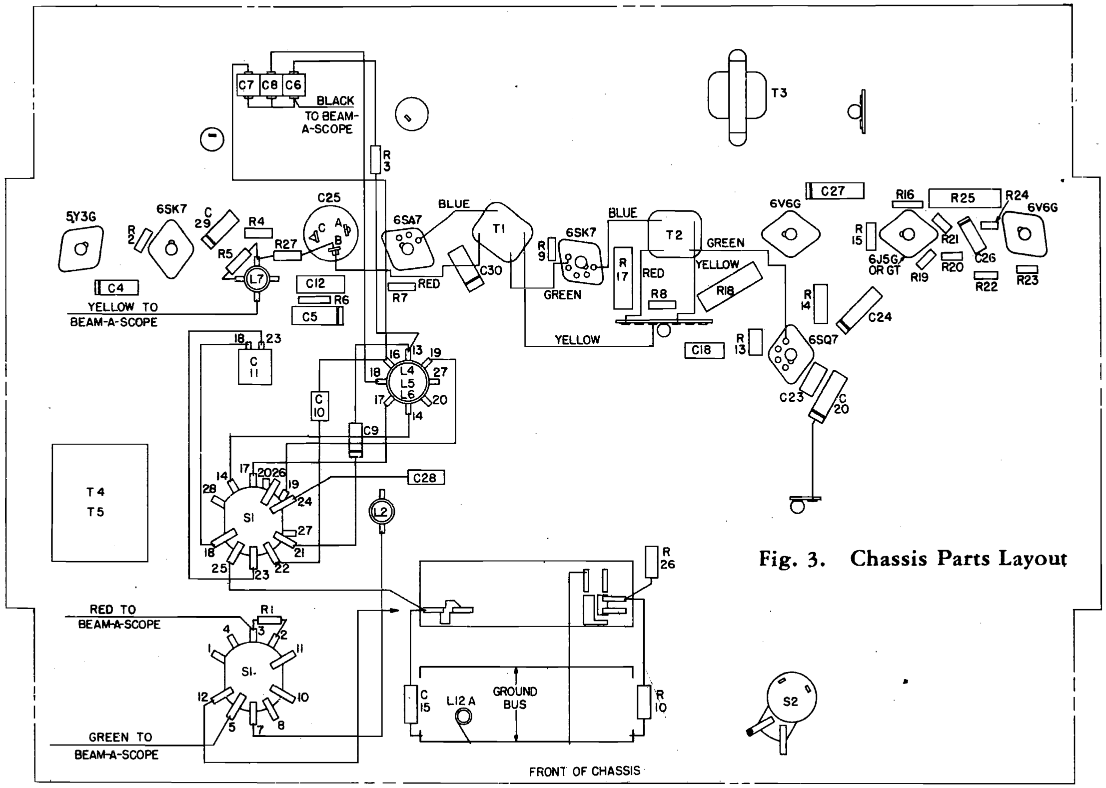
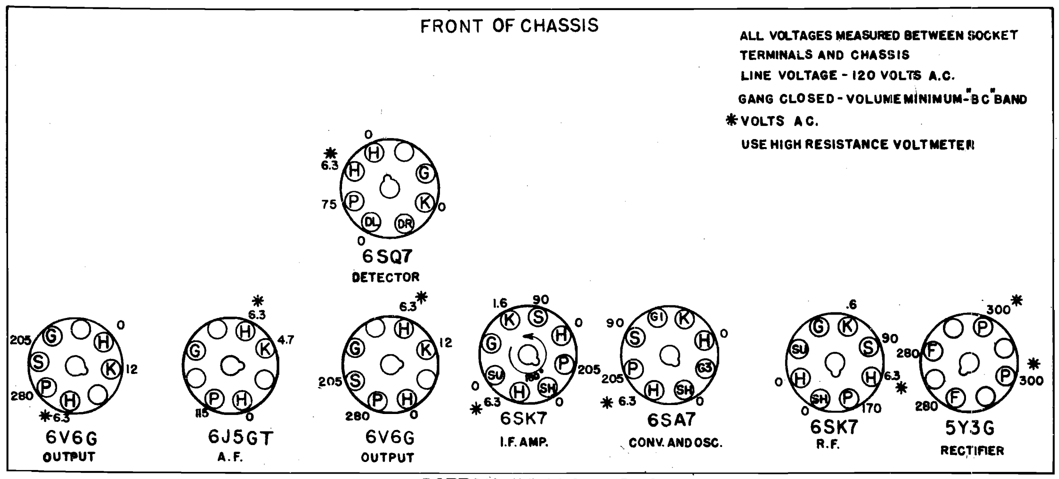


Fig. 3. Chassis Parts Layout



BOTTOM VIEW OF CHASSIS
Fig. 4. Socket Voltages

GENERAL ELECTRIC CO.

MODEL J-805
(Golden Tone)

GOLDEN TONE
MODEL J-805

GENERAL INFORMATION

Model J-805 is an eight-tube superheterodyne receiver designed to operate on an alternating-current power supply. The receiver incorporates the latest developments in radio of which the General Electric Dual Beam-a-Scopes are notable. Broadcast and short-wave No. 1 signals are selected by the cylindrical Beam-a-Scope which is in the speaker compartment. Short-wave No. 2 signals are selected by the Beam-a-Scope which is mounted on the cabinet above the chassis. Additional features include single-ended tubes, iron-core oscillator station selector coils, five feather-touch tuning station keys, one Phono-FrequencyModulation-Television key, tone monitor circuit, automatic volume control and push-pull power output.

Phono-FM-Tel

This receiver is equipped with a pin jack on the rear apron of the chassis and a Phono-FM-Tel key for adapting it to use with record players, frequency modulation converters and television picture receiver and sound converters. General Electric plug, Stock No. RP-145, fits the pin jack.

Setting Up the Receiver

The following remarks will assist the serviceman in correctly setting up this receiver for use:

(1) In order to press the volume or tuning knobs all the way on their respective shafts, the dial reflector plate should be held in place by pressure from the rear.

(2) After releasing the shipping screws the position of the chassis should be checked to insure accurate tuning. Close the gang condenser plates and push the chassis one way or the other until the pointer lines up with the first markings on the left side of the dial.

(3) The black speaker lead should be connected to the speaker terminal which is grounded to the speaker frame.

(4) A method of setting up station keys which will assure driftproof adjustments is to screw the iron core all the way out and then turn slowly inward until the desired station is tuned in.

Chassis or Beam-a-Scope Removal

Before either the chassis or Beam-a-Scope can be removed the leads between them must be disconnected. The cylindrical Beam-a-Scope leads are disconnected by pulling the pin plugs out of the Beam-a-Scope terminals. The short-wave Beam-a-Scope leads are disconnected by unscrewing the nuts which clamp the terminals on the two phosphor-bronze straps and the screw which clamps the terminal of the yellow lead.

Figs. 8 and 9 show the correct location of the Beam-a-Scope leads when reconnecting. The cylindrical Beam-a-Scope leads must be threaded down through the slot in the cabinet shelf which is immediately below the antenna-ground terminal board. The leads can then be brought out to the position of the cutout in the back of the cabinet shelf where they can be inserted in the Beam-a-Scope terminals.

To remove the cylindrical Beam-a-Scope the following procedure is recommended: Disconnect the four Beam-a-Scope leads. Unscrew the long self-tapping screw which prevents the Beam-a-Scope from rotating continuously in one direction This screw is located in the cabinet shelf. Pry loose the cardboard strap which is stapled to the bottom of the cabinet and which holds the bottom of the Beam-a-Scope in place. The Beam-a-Scope can now be rotated from right to left until it comes loose. Note: The upper pivot bolt by which the Beam-a-Scope is supported should never be loosened or removed.

When replacing the cylindrical Beam-a-Scope it should be screwed up on the bolt approximately five turns from the position where the bolt first takes hold. The self-tapping screw in the cabinet shelf should then be screwed down until it acts as a stop for the projection next to the terminals. The screw should not be run down so far that it contacts the projection on the opposite side from the terminals as this will limit rotation to only 180 degrees. The cardboard strap should be placed over the bottom Beam-a-Scope pivot and stapled to the cabinet in such a position that the Beam-a Scope hangs vertically and is free to turn without rubbing on the strap.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

Note—In no case should the magnet be removed from the assembled position.

Alignment Procedure

The alignment procedure is given in table form below. The use of a standard I.R.E. dummy antenna in making all R.F. alignments is recommended. R.F. alignment can be performed by loop-coupling the generator signal to the receiver Beam-a-Scopes if care is exercised not to over-couple the two circuits. Keeping a distance of two feet or more between the generator loop and the receiver Beam-a-Scope will generally insure freedom from overcoupling. The relative position of the Beam-a-Scopes with respect to the chassis materially affects R.F. alignment; therefore, all R.F. alignments should be made with the chassis and Beam-a-Scopes mounted in the cabinet. In keeping with this recommendation all R.F. alignment trimmers are accessible through holes in the back apron of the chassis or from the top of the chassis (refer to the Trimmer Location diagram, Fig. 1). Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet. Also the receiver should be kept away from large metal objects such as radiators, metal-top tables, etc.

R.F. Alignment
With Chassis Outside of Cabinet

R.F. alignment can be performed only on the "BC" and "SW-1" bands with the chassis outside the cabinet. Any alignment attempted on "SW-2" band will not be satisfactory. The same relative position between the chassis and cylindrical Beam-a-Scope should be maintained when aligning outside the cabinet as these components occupy in the cabinet. Since the glass dial scale is fastened to the cabinet it cannot be used for reference during alignment of the chassis outside of the cabinet. Use must be made, therefore, of a 0–180 deg calibrated scale which is cemented to the back of the dial reflector plate. To use these readings, first completely close the gang condenser plates and then slide the pointer along the cord until the inside edge of the right-hand pointer-guide clip is in line with the 0 deg mark. (See Fig. 6.) By using this edge of the clip as the degree-scale pointer the receiver may be tuned to any frequency.

Example: By setting the edge of the clip to 154 deg the receiver will be tuned to 1500 KC on the "BC" band.

The "BC" and "SW-1" band alignment procedure is the same as outlined in steps 2 to 5 inclusive of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

After the alignment has been performed on the "BC" and "SW-1" bands the chassis should be mounted in the cabinet and "SW-2" band alignment checked as described in steps 6 to 8 of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

Note: After moving the pointer along the cord to use one of the guide clips as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

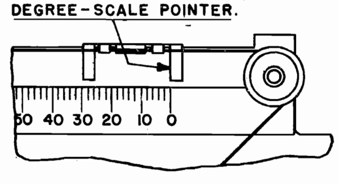


Fig. 6. Pointer-guide Clip Setting with Gang Condenser Closed

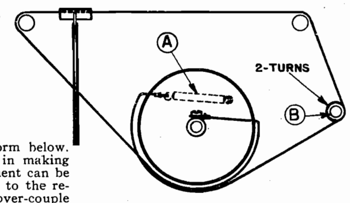


Fig. 7. Dial Cord Stringing Diagram

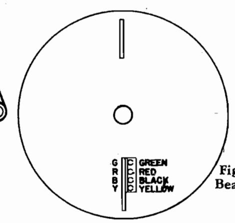


Fig. 8. Cylindrical Beam-a-Scope Connections

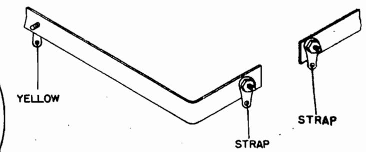


Fig. 9. Short-wave Beam-a-Scope Connections

ALIGNMENT CHART
I.F. Alignment with Oscilloscope

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC Sweep	I.F. Grid	.05 mfd. or larger	2nd I.F. Trimmers, C-16, 17	Gang condenser plates open. Depress any station key other than Phono-FM-Tel key. Connect audio input of oscilloscope to chassis ground and junction of R-10 and R-26. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. Finish by retrimming 2nd I.F. trimmers.
2. "BC" Band	455 KC Sweep	Converter Grid	.05 mfd. or larger	1st I.F. Trimmers, C-13, 14	

I.F. Alignment with Output Meter

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC with Modulation	Converter Grid	.05 mfd. or larger	2nd I.F. Trimmers C-16, 17	Gang condenser plates open. Depress any key other than Phono-FM-Tel key. Connect output meter across voice coil. Keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
				1st I.F. Trimmers, C-13, 14	

R.F. Alignment
With Chassis Mounted in Cabinet

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC"					Close gang plates, adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil. Tone control set to "Normal" position.
2. "BC" Band	580 KC with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-11)	Set dial pointer to 580 KC and tune in signal with (C-11) while rocking gang condenser.
3. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-8)	Set dial pointer to 1500 KC. Peak trimmer for maximum output while rocking the gang condenser.
4. "BC" Band	580 KC. with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-11)	Realign for maximum output with a low input signal, rocking the gang condenser.
5. "SW-1" Band	6 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-7)	Set pointer to 6 MC and peak signal while rocking gang condenser.
6. "SW-2" Band	21 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-1)	Set pointer to 21 MC and tune in signal with (C-6). Peak output with (C-1) while rocking gang condenser. When (C-6) is on proper peak, image of 21 MC signal should be heard 910 KC below or on 20.09 MC.
7. "SW-2" Band	8 MC with Modulation	Antenna Post	I.R.E.		This operation may or may not be necessary depending on how much the short-wave Beam-a-Scope leads have been moved from their correctly dressed positions. Repositioning will be indicated if an increased output meter reading can be obtained by moving the short-wave Beam-a-Scope phosphor-bronze strap leads closer or farther away from one another. The moving should be done with an insulated rod or stick.

8. Repeat Operation 6 if the short-wave Beam-a-Scope leads are moved appreciably in Operation 7.

MODELS J-808, J-818, J-828, J-809

GENERAL ELECTRIC CO.

SPECIFICATIONS

Over-all Dimensions

Model	J-808, -818, -828	J-809
Height	35 inches	37⅛ inches
Width	36½ inches	38¼ inches
Depth	17½ inches	17¼ inches

Tuning Control Drive Ratio............................25:1

Electrical Rating (All Models)

Rating	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
A6	110–125	60	100
A5	110–125	50	100
C2	110–125	25	100

Tuning Frequency Range

Broadcast Band.............................540–1600 KC
Short-wave Band No. 1.......................2300–7000 KC
Short-wave Band No. 2.......................7000–22,000 KC

Intermediate Frequency....................455 KC

Electrical Power Output

Undistorted.................................10 watts
Maximum.....................................12 watts

Tone Control

Models—J-808, -818, -828 (Individual Phonograph and Radio Controls)—3 positions each.
J-809 (Phonograph and Radio Controls Combined)—3 positions.

Loud-speakers—"Alnico" Magnet Dynamic

Outside Cone Diameters.......................6½ and 14 inches
Voice Coil Impedances........................3.5 ohms each

Phonograph Mechanism

Type.................................Automatic Record Changer
Record Capacity
10-inch...........................8
12-inch...........................7
Type Pickup...........................Crystal
Turntable Speed.......................78 Rpm

Tubes

R.F. Amplifier.......................GE-6SK7
Converter and Oscillator.................GE-6SA7
I.F. Amplifier.........................GE-6SK7
Det., Aud., AVC......................GE-6SQ7
Phase Inverter........................GE-6J5G or GT
Audio Output........................(2) GE-6V6G or GT
Rectifier..............................GE-5Y3G
Dial Lamps.........................(3) MAZDA No. 44

GENERAL INFORMATION

These models each contain an eight tube, superheterodyne receiver which is designed to operate from an alternating current power supply. Dual Beam-a-Scopes insure satisfactory performance at all frequencies within the tuning ranges of the receiver. Broadcast and short-wave No. 1 signals are selected by the cylindrical Beam-a-Scope. Short-wave No. 2 signals are selected by the Beam-a-Scope which is mounted on the cabinet. Additional features include single-ended tubes, iron core oscillator station selector coils, five feathertouch tuning station keys, and automatic volume control.

Models J-808, J-818 and J-828 are provided with dual controls for volume and tone. One set of volume and tone controls permit adjustment of the radio output only while the remaining set of controls permit adjustment of the phonograph output. The phonograph volume and tone controls are mounted on a plate separate from the chassis. Fig. 2 shows the interconnections between chassis and phonograph controls, chassis and phono motor, chassis and speakers, and chassis and Beam-a-Scopes.

Phono-FM-Tel

All models are designed to allow the ready connection of separate record players, frequency modulation converters, and television picture receivers with sound converters. Models J-808, J-818 and J-828 are equipped with a pin jack immediately in back of the plug connection on the bottom apron of the chassis. Model J-809 is equipped with a pin jack on the back apron of the chassis into which a plug connection is made from the tone arm of the automatic record changer. If a separate record player, frequency modulation converter, or television picture receiver with sound converter is to be used with the Model J-809, the record changer plug connection can be removed and the auxiliary plug connection made. General Electric plug, Stock No. RP-145, fits the pin jack. The left-hand feathertouch tuning key, marked "Tel-FM" on Models J-808, J-818 and J-828, and "Phono" on Model J-809, when depressed switches the receiver from radio to operation with the auxiliary equipment.

Setting Up the Receiver

The following remarks will assist the serviceman in correctly setting up this receiver for use:

(1) In order to press the volume or tuning knobs all the way on their respective shafts, the dial reflector plate should be held in place by pressure from the rear.

(2) The black speaker lead should be connected to the 14-inch speaker terminal which is grounded to the speaker frame and to the 6½ inch speaker terminal which is not grounded. This will assure proper phasing of the speakers.

(3) A method of setting up station keys which will assure drift-proof adjustments is to screw the iron core all the way out and then turn slowly inward until the desired station is tuned in.

Chassis or Beam-a-Scope Removal

MODELS J-808, 818 AND J-828

The chassis in anchored to the chassis board which in turn is held in place by three woodscrews located along the bottom edge. Removal of these three woodscrews will allow the chassis to be dropped down and taken out. Three felt pads are stapled to the upper edge of the chassis board to firmly cushion the board in the cabinet slot.

To remove the cylindrical Beam-a-Scope proceed as follows: Disconnect the four Beam-a-Scope leads and the Beam-a-Scope drive cord. Remove the two woodscrews in the bracket which holds the Beam-a-Scope drive shaft in place. This will allow the shaft to be swung clear of the wooden stopping block on the cylindrical Beam-a-Scope. Tilt or raise the cabinet off the floor enough to get a screwdriver under the bottom Beam-a-Scope support. Remove the two woodscrews which hold the support in place. The Beam-a-Scope can now be rotated from right to left until it is free.

MODEL J-809

The chassis is held in place on the cabinet shelf by four mounting bolts accessible from the under side. Removal of these bolts will free the chassis from the shelf.

To remove the cylindrical Beam-a-Scope proceed as follows: Disconnect the four Beam-a-Scope leads. Remove the Beam-a-Scope drive cord. With a screwdriver remove the two woodscrews which hold the bottom Beam-a-Scope support to the cabinet. These screws are accessible from the top side of the support next to the lower rear cross-member of the cabinet. The Beam-a-Scope can now be rotated from right to left until it comes loose from the upper pivot.

The Beam-a-Scope drive mechanism is held in place by two bolt-and-nut anchorages. The nuts are accessible from the bottom side of the plate. If in attempting to remove these nuts, the bolt is found to turn then it will be necessary to remove the chassis to get at the bolt heads. This mechanism will have to be removed to replace either the control drum or the drive cord. When replacing the drive cord, it will be best to take out the Beam-a-Scope and drive unit as one assembly allowing the cord to be completely restrung before remounting the assembly.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

NOTE.—In no case should the magnet be removed from the assembled position.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*

(a) Antenna Post to R.F. Grid at

1000 KC	5.5
4000 KC	2.5
18000 KC	2.5

(b) R.F. Grid to Converter Grid at

1000 KC	5.5
4000 KC	3.0
18000 KC	2.0

(c) R.F. on Converter Grid to I.F. on 1st I.F. Grid at

1000 KC	50
4000 KC	50
18000 KC	45

(d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at
455 KC 60

(e) I.F. Amplifier Grid to Detector Plate at
455 KC 55

(2) Voltage across volume control to give ½-watt speaker output at 400 cycles .068 volts

(3) DC voltage developed across oscillator grid resistor (R-7) at

1000 KC	8.3
4000 KC	7.8
18000 KC	4.6

* Variations of ±20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

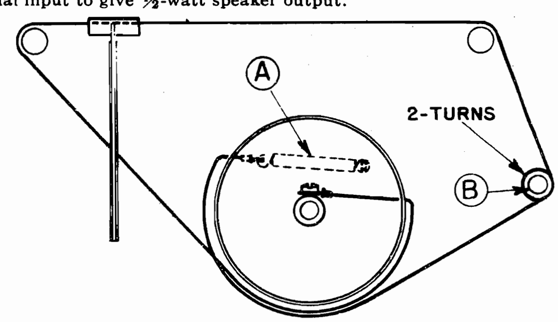


Fig. 8. Dial Cord Stringing Diagram

GENERAL ELECTRIC CO.

MODELS J-808, J-818, J-828

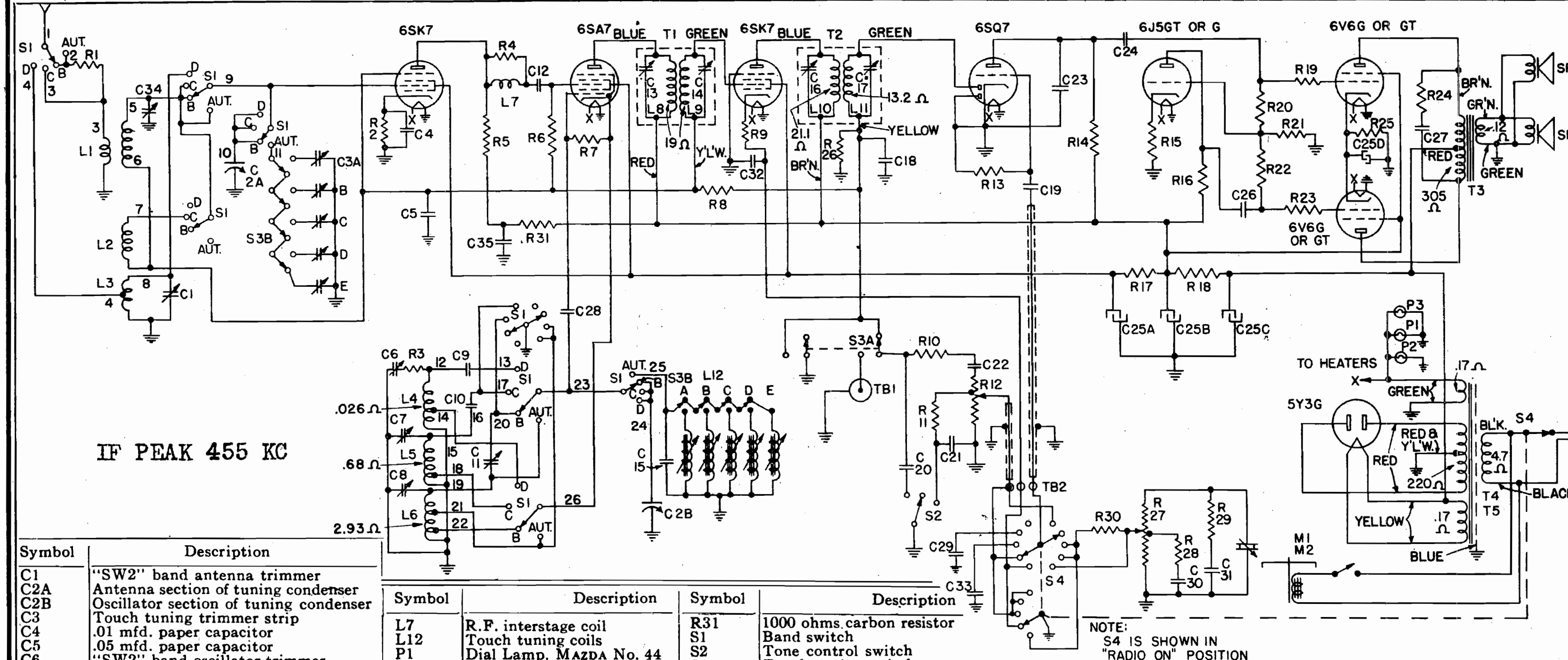


Fig. 3. Schematic Diagram—Models J-808, J-818, and J-828

Symbol	Description
C1	"SW2" band antenna trimmer
C2A	Antenna section of tuning condenser
C2B	Oscillator section of tuning condenser
C3	Touch tuning trimmer strip
C4	.01 mfd. paper capacitor
C5	.05 mfd. paper capacitor
C6	"SW2" band oscillator trimmer
C7	"SW1" band oscillator trimmer
C8	"BC" band oscillator trimmer
C9	.008 mfd. polystyrene capacitor
C10	2400 mmf. ±5% mica capacitor
C11	"BC" band padder
C12	100 mmf. mica capacitor
C15	750 mmf. silvered mica capacitor
C18	330 mmf. mica capacitor
C19	.02 mfd. paper capacitor
C20	.003 mfd. paper capacitor
C21	.003 mfd. paper capacitor
C22	.005 mfd. paper capacitor
C23	220 mmf. mica capacitor
C24	.03 mfd. paper capacitor
C25A	10 mfd. 350 V. dry electrolytic
C25B	20 mfd. 400 V. dry electrolytic
C25C	30 mfd. 400 V. dry electrolytic
C25D	20 mfd. 25 V. dry electrolytic
C26	.03 mfd. paper capacitor
C27	.002 mfd. paper capacitor
C28	47 mmf. mica capacitor
C29	.004 mfd. paper capacitor
C30	.003 mfd. paper capacitor
C31	.008 mfd. paper capacitor
C32	.05 mfd. paper capacitor
C33	220 mmf. mica capacitor
C34	"BC" band antenna trimmer
C35	.01 mfd. paper capacitor
L1	"BC" band Beam-a-Scope
L2	"SW1" band antenna coil
L3	"SW2" band Beam-a-Scope
L4	"SW2" band oscillator coil
L5	"SW1" band oscillator coil
L6	"BC" band oscillator coil

Symbol	Description
L7	R.F. interstage coil
L12	Touch tuning coils
P1	Dial Lamp, MAZDA No. 44
P2	Dial lamp, MAZDA No. 44
P3	Dial lamp, MAZDA No. 44
R1	1000 ohms carbon resistor
R2	47 ohms carbon resistor
R3	27 ohms carbon resistor
R4	10,000 ohms carbon resistor
R5	3300 ohms carbon resistor
R6	47,000 ohms carbon resistor
R7	22,000 ohms carbon resistor
R8	2.2 megohms carbon resistor
R9	150 ohms carbon resistor
R10	47,000 ohms carbon resistor
R11	82,000 ohms carbon resistor
R12	2 megohms volume control (.5 megohm tap)
R13	4.7 megohms carbon resistor
R14	470,000 ohms carbon resistor
R15	2200 ohms carbon resistor
R16	68,000 ohms carbon resistor
R17	11,200 ohms wire wound resistor
R18	1940 ohms wire wound resistor
R19	1000 ohms carbon resistor
R20	150,000 ohms carbon resistor
R21	56,000 ohms carbon resistor
R22	330,000 ohms carbon resistor
R23	1000 ohms carbon resistor
R24	5600 ohms carbon resistor
R25	180 ohms 1 W. carbon resistor
R26	470,000 ohms carbon resistor
R27	2 megohm volume control (.5 megohm tap)
R28	82,000 ohms carbon resistor
R29	100,000 ohms carbon resistor
R30	220,000 ohms carbon resistor

Symbol	Description
R31	1000 ohms carbon resistor
S1	Band switch
S2	Tone control switch
S3	Touch tuning switch
S4	Phono-Radio switch
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer
T4	60-cycle power transformer
T5	25/50-cycle power transformer

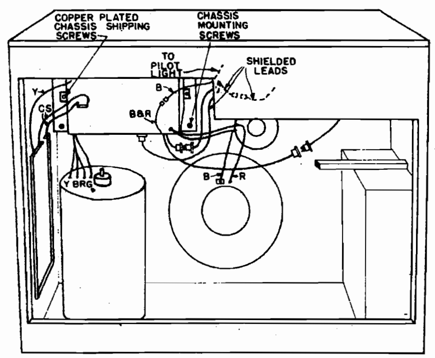


Fig. 2. Interconnection Diagram (Models J-808, J-818, J-828)

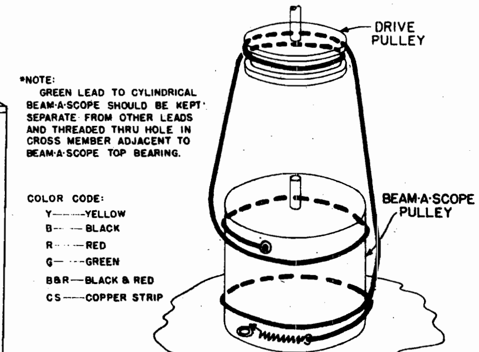


Fig. 10. Beam-a-Scope Drive Cord Stringing Diagram (Models J-808, J-818, J-828)

MODELS J-808, J-809, J-818, J-828

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

The alignment procedure is given in table form below. The use of a standard I.R.E. dummy antenna in making all R.F. alignments is recommended. R.F. alignment can be performed by loop coupling the generator signal to the receiver Beam-a-Scopes if care is exercised not to overcouple the two circuits. Keeping a distance of two feet or more between the generator loop and the receiver Beam-a-Scope will generally insure freedom from overcoupling. The relative position of the Beam-a-Scopes with respect to the chassis materially affects R.F. alignment; therefore, all R.F. alignments should be made with the chassis and Beam-a-Scopes mounted in the cabinet. In keeping with this recommendation all R.F. alignment trimmers are available either on top of the chassis or through holes in the back apron as shown in Fig. 1. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet. Also the receiver should be kept away from large metal objects such as radiators, metal-top tables, etc.

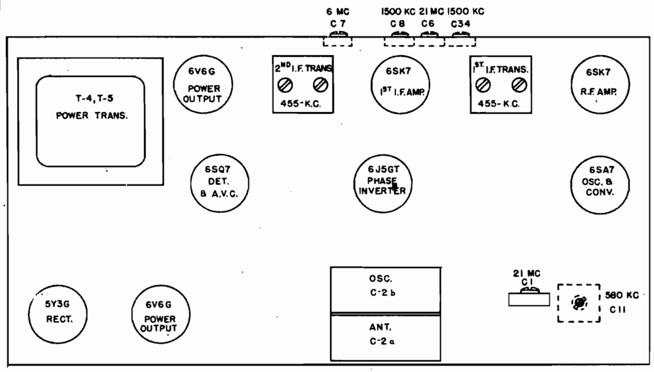


Fig. 1. Trimmer Location (All Models)

R.F. ALIGNMENT WITH CHASSIS OUTSIDE OF CABINET

R.F. alignment can be performed only on the "BC" and "SW1" bands with the chassis outside of the cabinet. Any alignment attempted on "SW2" band will not be satisfactory. The same relative position between the chassis and broadcast loops should be maintained when aligning outside the cabinet as these components occupy in the cabinet. Since the glass dial scale is fastened to the cabinet it cannot be used for reference during alignment of the chassis outside of the cabinet. Use must be made, therefore, of a 0–180° calibrated scale which is cemented to the back of the dial reflector plate. From the reference chart Fig. 7 the degree readings for corresponding frequency settings may be obtained by laying a straight edge across the chart perpendicular to the line of figures and sliding the straight edge along to the various frequency settings desired. The degree readings will be found on either of the degree scales. To use these degree readings, first completely close the gang condenser plates and then slide the pointer along the cord until the left-hand edge of the pointer-guide slide lines up with the 0° mark. By using the left-hand edge (as viewed from the rear) of the slide as the degree-scale pointer the receiver may be tuned to any frequency. Example: By rotating the tuning control until the left-hand edge of the slide is in line with 158°, the receiver will be tuned to 1500 KC on the "BC" band.

The "BC" and "SW1" band alignment procedure is the same as outlined in steps 2 to 6 inclusive of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

After the alignment has been performed on the "BC" and "SW1" bands the chassis should be mounted in the cabinet and "SW2" band alignment checked as described in steps 7 to 9 of the chart "R.F. Alignment with Chassis Mounted in Cabinet."

NOTE: After moving the pointer along the cord to use the left-hand edge as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

ALIGNMENT CHART

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC Sweep	I.F. Grid	.05 mfd. or larger	2nd I.F. Trimmers C-16, 17	Gang condenser plates open. Depress any station key other than Phono-FM-Tel key. ("Radio On" position in Models J-808, 818, 828.) Connect audio input of oscilloscope to chassis ground and top of volume control, R12. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. Finish by retrimming 2nd I.F. trimmers.
2. "BC" Band	455 KC Sweep	Green lead on cylindrical Beam-a-Scope	.05 mfd. or larger	1st I.F. Trimmers C-13, 14	

I.F. ALIGNMENT WITH OUTPUT METER

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band	455 KC with Modulation	Green lead on cylindrical Beam-a-Scope	.05 mfd. or larger	2nd I.F. Trimmers C-16, 17. 1st I.F. Trimmers C-13, 14	Gang condenser plates open. Depress any key other than Phono-FM-Tel key. ("Radio On" position in Models J-808, 818, 828.) Connect output meter across voice coil. Keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.

R.F. ALIGNMENT WITH CHASSIS MOUNTED IN CABINET

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. "BC" Band					Close gang plates, adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil. Tone control set to "Normal" position.
2. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-8) Ant. (C-34)	Set pointer to 1500 KC and tune in signal with (C-8). Peak output with (C-34).
3. "BC" Band	580 KC with Modulation	Antenna Post	I.R.E.	Osc. Padder (C-11)	Set pointer to 580 KC and peak signal while rocking gang condenser.
4. "BC" Band	1500 KC with Modulation	Antenna Post	I.R.E.	Osc. (C-8) Ant. (C-34)	Retrim for maximum output.
5. Repeat operation 3 if "BC" band trimmers are badly out of alignment.					
6. "SW 1" Band	6 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-7)	Set pointer to 6 MC and peak signal while rocking gang condenser.
7. "SW 2" Band	21 MC with Modulation	Antenna Post	I.R.E.	Osc. (C-6) Ant. (C-1)	Set pointer to 21 MC and tune in signal with (C-6). Peak output with (C-1) while rocking gang condenser. When (C-6) is on proper peak, image of 21 MC signal should be heard 910 KC below or on 20.09 MC.
8. "SW 2" Band	8 MC with Modulation	Antenna Post	I.R.E.		This operation may or may not be necessary depending on how much the short-wave Beam-a-Scope leads have been moved from their correctly dressed positions. Repositioning will be indicated if an increased output meter reading can be obtained by moving the short-wave Beam-a-Scope strap leads closer or farther away from one another. The moving should be done with an insulated rod or stick.
9. Repeat operation 7 if the Beam-a-Scope leads are moved in operation 8.					

GENERAL ELECTRIC CO.

MODELS J-808, J-809, J-818, J-828

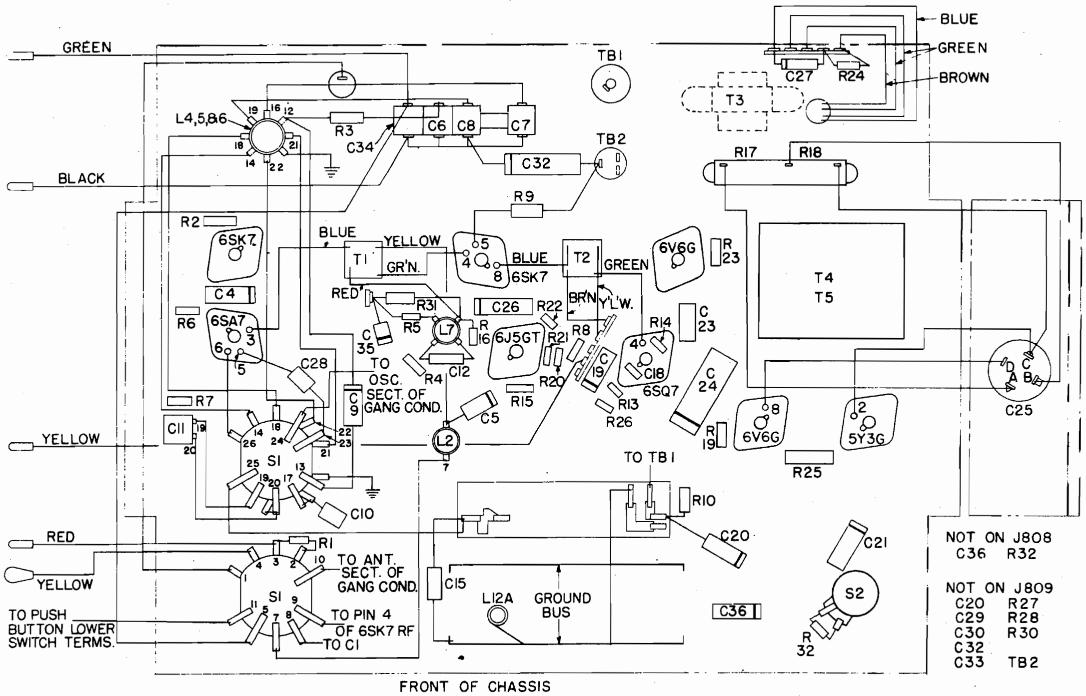


Fig. 5. Chassis Parts Layout (All Models)

FRONT OF CHASSIS

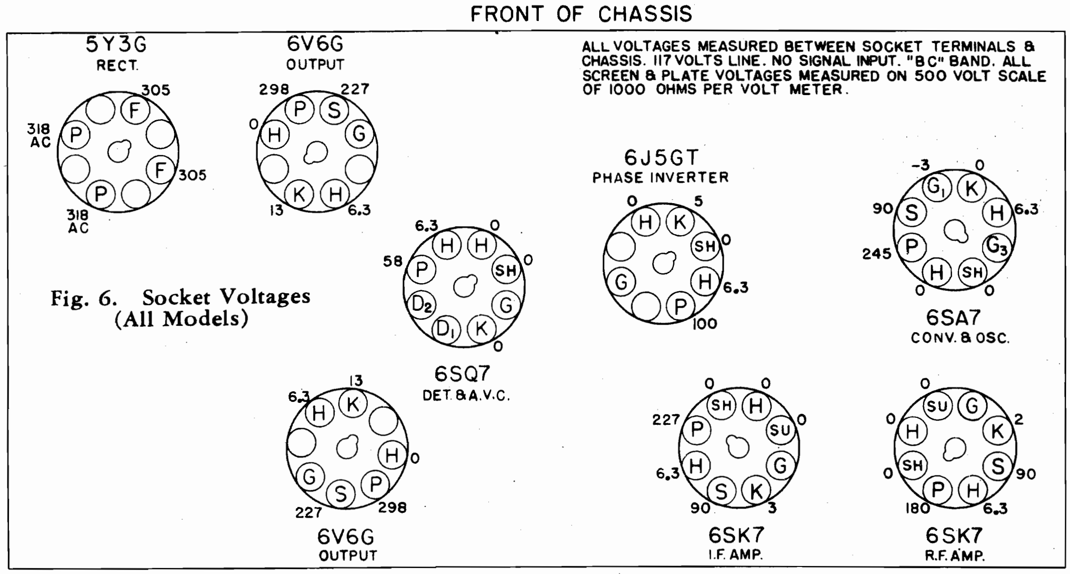


Fig. 6. Socket Voltages (All Models)

BOTTOM VIEW OF CHASSIS

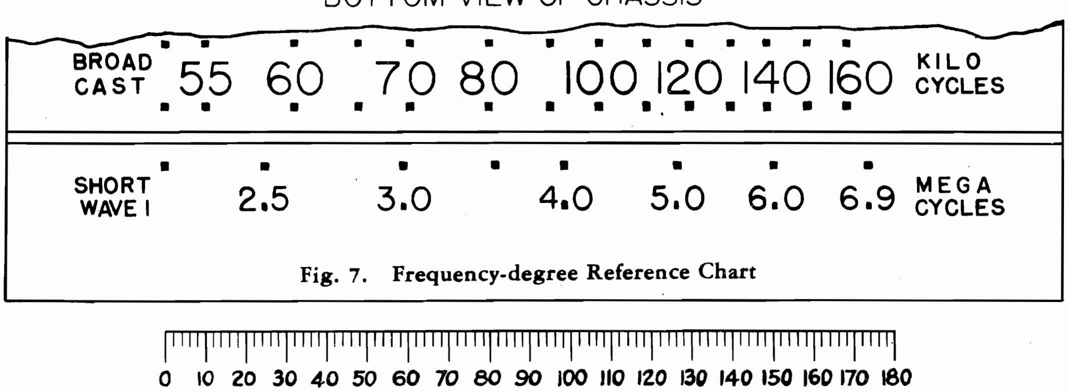


Fig. 7. Frequency-degree Reference Chart

NOTE: The oscillator coil and band-switch terminals are numbered in the Chassis Parts Layout, Fig. 5, to assist in locating the corresponding numbered points on the Schematic Diagrams, Figs. 3 and 4. This numbering will also assist in rewiring if the coil or switch is replaced. I.F. transformer connections are shown as an aid in replacement.

MODELS J-718, J-728, J-808, J-809, J-818, J-828

GENERAL ELECTRIC CO.

AUTOMATIC RECORD CHANGER

USED IN MODELS

J-718, J-728, J-808, J-809, J-818 AND J-828

This automatic Record Changer is a standard assembly in all of the above models. It is designed for operation on 110 volts, 60 cycles only and will automatically play a series of eight 10-inch or seven 12-inch records of the 78 revolutions per minute type. Manual operation is also provided. Records of the last few years with the standard eccentric or spiral stopping groove will operate the automatic mechanism and change your records.

OPERATING INSTRUCTIONS

Before operating the phonograph, either automatically or manually, be sure the pick-up is down and can be moved by hand; if not, a "cycle" must be completed to bring it down. To do this, throw the turntable switch to "ON." The turntable will start to revolve and the cycle of motion on the pick-up arm will be resumed. When the pick-up arm comes down, turn the turntable switch off.

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 a series of 10-inch records, 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 outward 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. This switch will not operate unless receiver power is turned on.

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 or changing needles the pick-up arm should be moved out to the right beyond the turntable and placed at rest on the support with the left edge of the pick-up arm in the left-edge recess of the support as shown in Fig. 2a.

When changing needles rest the pick-up arm in the right recess of the support as shown in Fig. 2b. To insert a needle initially, loosen the needle screw on the front of the pick-up, place the needle in hole at top so that it drops down against the needle gauge plate and then tighten up the needle screw. As soon as the needle has been changed raise the pick-up arm and return to the position of rest as described in the preceding paragraph.

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 arm in needle-changing 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 grasping the knob posts with the fingers, 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.

AUTOMATIC OPERATION

1. See that pick-up arm is in rest position (Fig. 2a) with needle properly in place. If mechanism will not allow pick-up arm to come to the rest position, complete a "cycle" as explained in the first paragraph under "Operation."

2. Place the series of records (up to eight 10-inch or seven 12-inch records) on the record-holder posts (as shown in Fig. 1). The records should be arranged in the desired order with the desired selection face up and the last selection on top.

3. Throw turntable switch to "On."

(NOTE—The radio power should be turned on or phonograph will not operate.)

4. To start the automatic cycle, simply push the lever to the "Reject" position and then return it immediately to the numbered position corresponding to the size of records to be played. The pick-up will raise up and swing outward and the first record will drop down and the pick-up will come to rest on it.

The whole series of records will play without further attention, and the last record will repeat until the Turntable Switch is turned off. If the record-changing mechanism is in a change cycle wait until it is completed before stopping the turntable. 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 (Fig. 2a). The record player is then ready for reloading, or for manual operation.

MANUAL OPERATION

To play records manually:

1. Proceed as in Step 1, under "Automatic Operation."

2. Swing record-holder shelves clear of turntable. Place record on turntable with desired selection upwards.

3. Set Index and Record-reject Lever to "Manual" position.

4. Proceed as in Step 3 under "Automatic Operation" and when turntable has attained speed, lift pick-up and lower gently onto the record so that the needle point enters the outside groove. When you have finished playing, be sure that the turntable has stopped and the pick-up is in the rest position over needle gauge plate. Never leave pick-up with needle resting on a record or on the turntable.

SERVICE DATA

General Information

The turntable is driven through a friction drive wheel mounted on the turntable spindle. It is important that the drive motor spindle and rubber tires on the main driving wheel and idler pulley be kept clean and free from oil, grease, dirt or any foreign matter. Any quick-drying naphtha is satisfactory for cleaning these parts. The drive motor bearing is lubricated from an oil well filled and sealed at the factory. It should not require lubrication in the field. The turntable is not removable from the spindle without removing the tapered pin "24" which fastens the rubber-tired driving wheel to the spindle. Once the pin is removed, the driving wheel can be slipped off the spindle and the turntable and spindle assembly lifted upward from the motor board. Caution should be exercised not to bend the spindle. The spindle bearing should be oiled and the cup and ball thrust bearing oiled and checked for proper position.

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 on 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.

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.

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. and 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 4⅝ 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 5⅝ 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. and G. Record Separating Knife.—The upper plate (knife) "25" on each of the record post 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 both separating knives have turned clockwise as far as the mechanism will turn them; 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. Some backlash will be present in the rotation of these shelves. They should be adjusted so that backlash permits them to move away from record but not closer than the 1/16 inch specified above. 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 under side of motor board.

The turntable bearing must be lubricated from the top of the motor board. Using an oil can with a long spout, reach in between the turntable and motor board and apply oil directly to the spindle.

Do not allow oil or grease to come in contact with rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

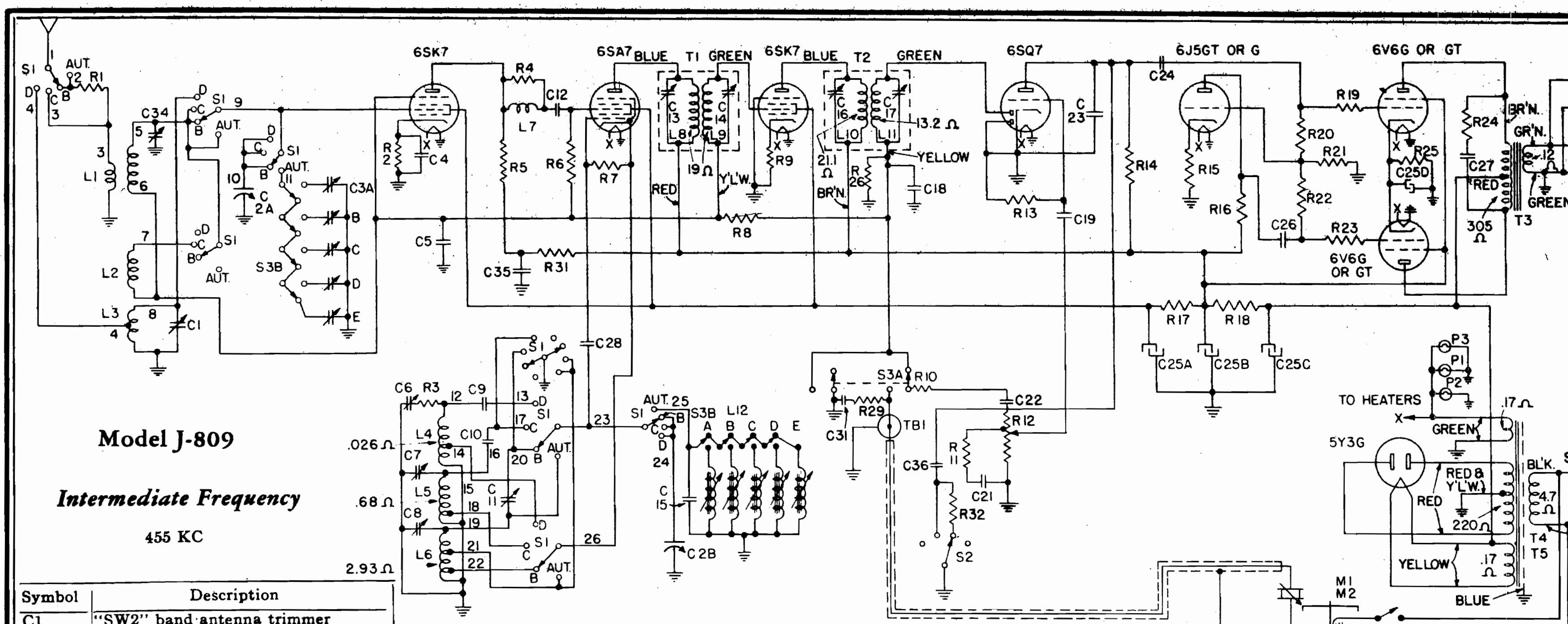
MISCELLANEOUS SERVICE HINTS

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 record—Make complete adjustments "D" and "E."
3. Needle does not land properly on 12-inch record but correctly 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; instrument is not being operated at normal room temperature (65° F); oil, grease or dirt on driving wheel or idler pulley rubber tire. The motor support bracket "N" should be moved in its mounting holes until motor spindle is parallel to the turntable spindle and exactly at right angles to the main driving wheel "29." The bracket mounting nuts should then be securely tightened.
9. Record knives strike edge of records—Record 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. When playing both types of records mixed and needle either lands in 10-inch position on 12-inch record or misses record entirely—Increase tension of mixed record discriminating lever spring "M."

GENERAL ELECTRIC CO.

MODEL J-809



Model J-809

Intermediate Frequency

455 KC

Fig. 4. Schematic Diagram—Model J-809

Symbol	Description
C1	"SW2" band antenna trimmer
C2A	Antenna section of tuning condenser
C2B	Oscillator section of tuning condenser
C3	Touch tuning trimmer strip
C4	.01 mfd. paper capacitor
C5	.05 mfd. paper capacitor
C6	"SW2" band oscillator trimmer
C7	"SW1" band oscillator trimmer
C8	"BC" band oscillator trimmer
C9	.008 mfd. polystyrene capacitor
C10	2400 mmf. ±5% mica capacitor
C11	"BC" band padder
C12	100 mmf. mica capacitor
C15	750 mmf. silvered mica capacitor
C18	330 mmf. mica capacitor
C19	.02 mfd. paper capacitor
C21	.003 mfd. paper capacitor
C22	.005 mfd. paper capacitor
C23	390 mmf. mica capacitor
C24	.03 mfd. paper capacitor
C25A	10 mfd. 350 V. dry electrolytic
C25B	20 mfd. 400 V. dry electrolytic
C25C	30 mfd. 400 V. dry electrolytic
C25D	20 mfd. 25 V. dry electrolytic
C26	.03 mfd. paper capacitor
C27	.002 mfd. paper capacitor
C28	47 mmf. mica capacitor
C31	.008 mfd. paper capacitor
C34	"BC" band antenna trimmer
C35	.01 mfd. paper capacitor
C36	.01 mfd. paper capacitor
L1	"BC" band Beam-a-Scope
L2	"SW1" band antenna coil
L3	"SW2" band Beam-a-Scope
L4	"SW2" band oscillator coil
L5	"SW1" band oscillator coil
L6	"BC" band oscillator coil
L7	R.F. interstage coil
L12	Touch tuning coils
P1	Dial lamp, Mazda No. 44
P2	Dial lamp, Mazda No. 44
P3	Dial lamp, Mazda No. 44
R1	1000 ohms carbon resistor
R2	47 ohms carbon resistor
R3	27 ohms carbon resistor
R4	10,000 ohms carbon resistor
R5	3300 ohms carbon resistor
R6	47,000 ohms carbon resistor
R7	22,000 ohms carbon resistor
R8	2.2 megohms carbon resistor
R9	150 ohms carbon resistor
R10	47,000 ohms carbon resistor
R11	82,000 ohms carbon resistor
R12	2 megohms volume control (.5 megohms tap)
R13	4.7 megohms carbon resistor
R14	470,000 ohms carbon resistor
R15	2200 ohms carbon resistor
R16	68,000 ohms carbon resistor
R17	11,200 ohms wire wound resistor
R18	1940 ohms wire wound resistor
R19	1000 ohms carbon resistor
R20	150,000 ohms carbon resistor
R21	56,000 ohms carbon resistor
R22	330,000 ohms carbon resistor
R23	1000 ohms carbon resistor
R24	5600 ohms carbon resistor
R25	180 ohms 1 W. carbon resistor
R26	470,000 ohms carbon resistor
R29	100,000 ohms carbon resistor
R31	1000 ohms carbon resistor
R32	39,000 ohms carbon resistor
S1	Band switch
S2	Tone control switch
S3	Touch tuning switch
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer
T4	60-cycle power transformer
T5	25/50-cycle power transformer

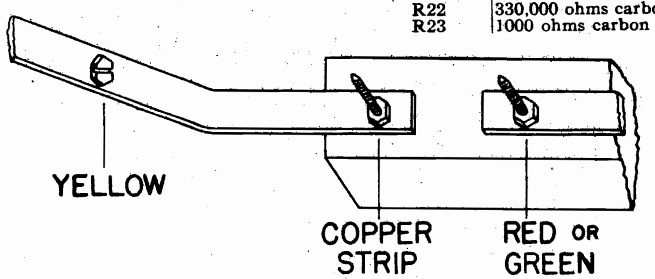


Fig. 9. Shortwave Beam-a-Scope Connections (Model J-809)

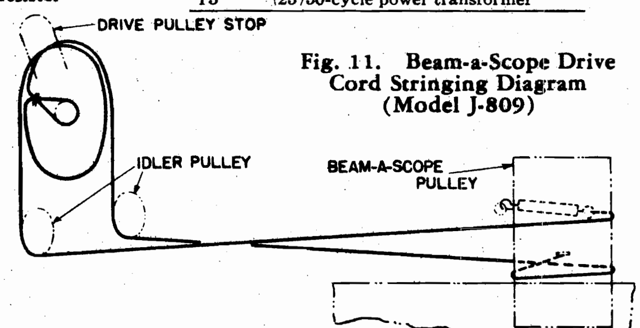
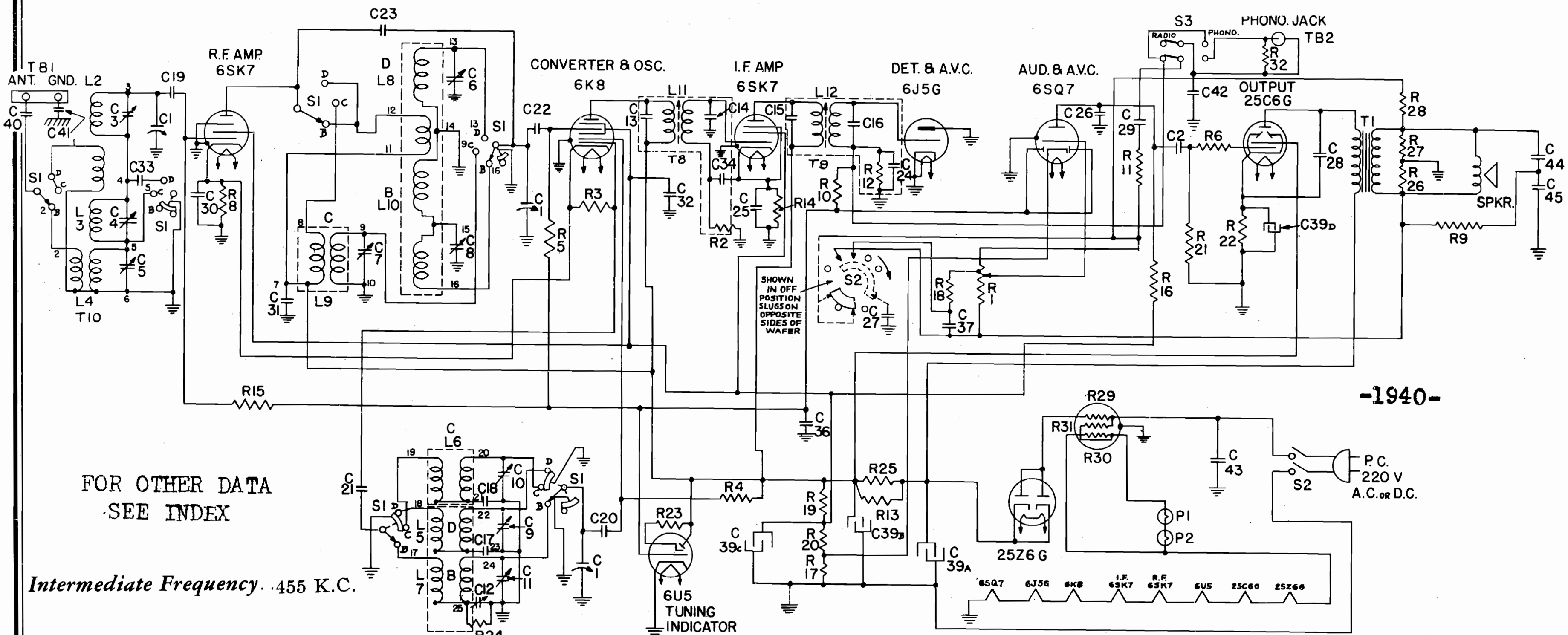


Fig. 11. Beam-a-Scope Drive Cord Stringing Diagram (Model J-809)

MODEL JE-810

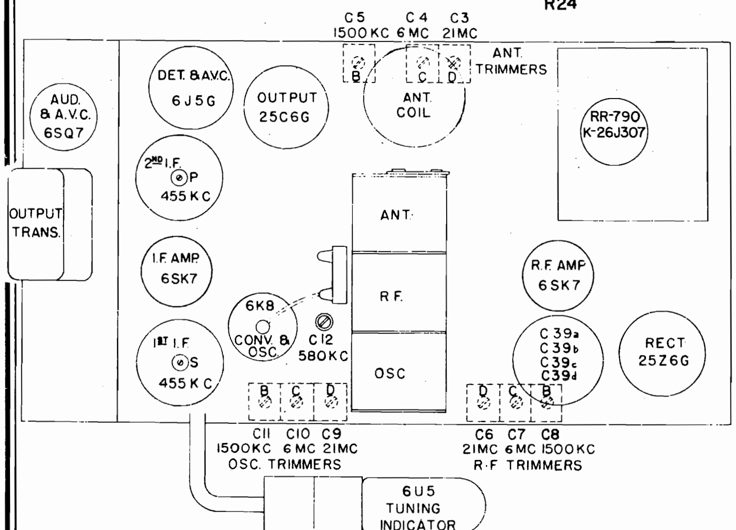
GENERAL ELECTRIC CO.

-1940-



FOR OTHER DATA SEE INDEX

Intermediate Frequency. 455 K.C.

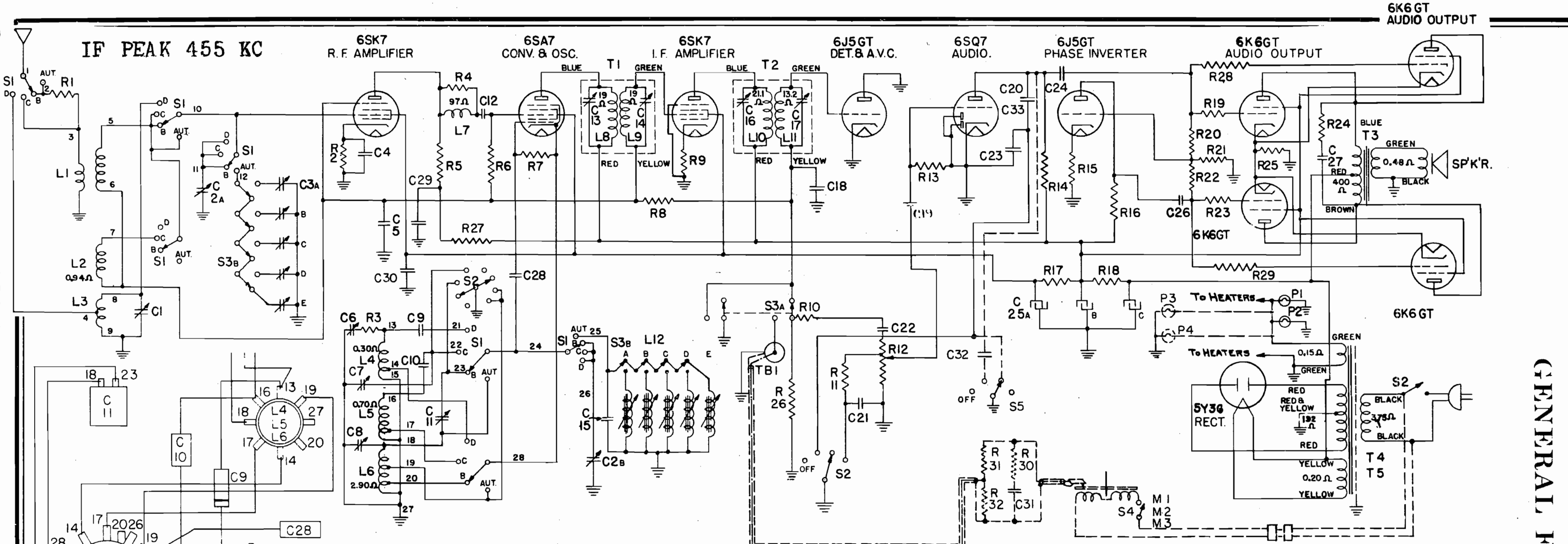


POWER CONSUMPTION 105 WATTS

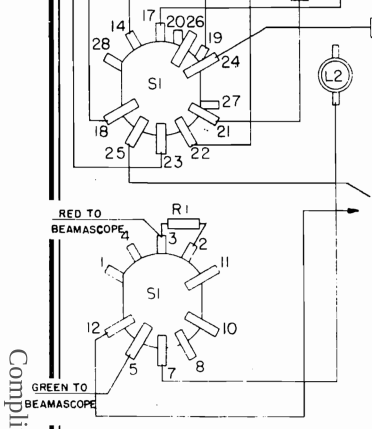
Symbol	Description	Symbol	Description	Symbol	Description
C1	Tuning Condenser	C33	.006 Mfd. 600 V. Paper	R4	22,000 Ohms Carbon
C2	.05 Mfd. 600 V. Paper	C34	.05 Mfd. 200 V. Paper	R5	560,000 Ohms Carbon
C3	5-40 Mmf. "D" Ant. Trimmer	C36	.05 Mfd. 200 V. Paper	R6	1000 Ohms Carbon
C4	3-30 Mmf. "C" Ant. Trimmer	C37	.002 Mfd. 600 V. Paper	R8	120 Ohms Carbon
C5	2-20 Mmf. "B" Ant. Trimmer	C39a	40 Mfd. 300 V. Dry Electrolytic	R9	220 Ohms Carbon
C6	3-30 Mmf. "D" R.F. Trimmer	C39b	50 Mfd. 250 V. Dry Electrolytic	R10	2.2 Megohms Carbon
C7	3-30 Mmf. "C" R.F. Trimmer	C39c	20 Mfd. 250 V. Dry Electrolytic	R11	47,000 Ohms Carbon
C8	3-30 Mmf. "B" R.F. Trimmer	C39d	20 Mfd. 25 V. Dry Electrolytic	R12	330,000 Ohms Carbon
C9	3-30 Mmf. "D" Osc. Trimmer	C40	.01 Mfd. 600 V. Paper	R13	3900 Ohms 2 W. Carbon
C10	3-30 Mmf. "C" Osc. Trimmer	C41	.01 Mfd. 600 V. Paper	R14	330 Ohms Carbon
C11	5-45 Mmf. "B" Osc. Trimmer	C42	.25 Mfd. 400 V. Paper	R15	560,000 Ohms Carbon
C12	300-650 Mmf. "B" Osc. Padder	C43	.02 Mfd. Metal Cased	R16	330,000 Ohms Carbon
C17	2800 Mmf. ±5% Mica	C44	0.1 Mfd. 200 V. Paper	R17	150 Ohms Carbon
C18	1600 Mmf. ±5% Mica	C45	.05 Mfd. 200 V. Paper	R18	120,000 Ohms Carbon
C19	470 Mmf. Mica	L2	"D" Antenna Coil	R19	2700 Ohms 2 W. Carbon
C20	470 Mmf. Mica	L3	"C" Antenna Coil	R20	15,000 Ohms 1 W. Carbon
C21	47 Mmf. Mica	L4	"B" Antenna Coil	R21	470,000 Ohms Carbon
C22	470 Mmf. Mica	L5	"D" Oscillator Coil	R22	270 Ohms 2 W. Carbon
C23	10 Mmf. L.P.F. Mica	L6	"C" Oscillator Coil	R23	1.0 Megohm Carbon
C24	100 Mmf. Mica	L7	"B" Osicllator Coil	R24	5600 Ohms Carbon
C25	.05 Mfd. 200 V. Paper	L8	"D" R.F. Coil	R25	3900 Ohms 2 W. Carbon
C26	220 Mmf. Mica	L9	"C" R.F. Coil	R26	270 Ohms Carbon
C27	.002 Mfd. 600 V. Paper	L10	"B" R.F. Coil	R27	1500 Ohms Carbon
C28	.008 Mfd. 1000 V. Paper	P1	Dial Lamp, Mazda No. 44	R28	6.8 Megohms Carbon
C29	.002 Mfd. 600 V. Paper	P2	Dial Lamp, Mazda No. 44	R29	200 Ohms 10 W. Ballast
C30	.05 Mfd. 200 V. Paper	R1	2.0 Megohms Volume Control	R30	200 Ohms 15 W. Ballast
C31	.05 Mfd. 600 V. Paper	R2	330,000 Ohms Carbon	R31	434 Ohms 45 W. Ballast
C32	.05 Mfd. 600 V. Paper	R3	33,000 Ohms Carbon	R32	220,000 Ohms Carbon

GENERAL ELECTRIC CO.

MODELS J1106
J1108



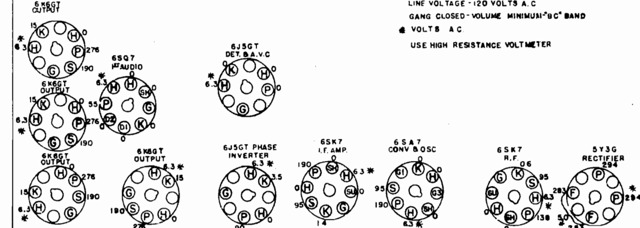
Switch and Coil Section of Chassis Underview

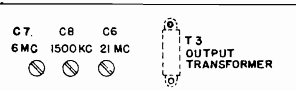


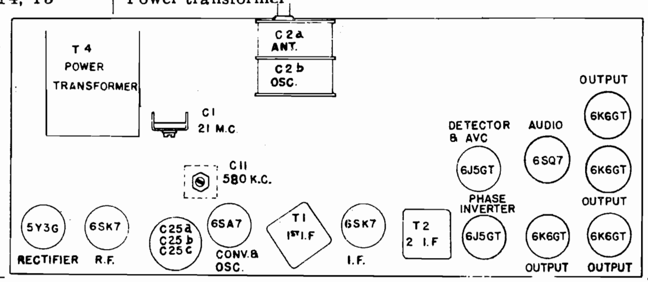
NOTE—Parts and lines shown dotted are to be added in circuit for J-1108 receiver only.

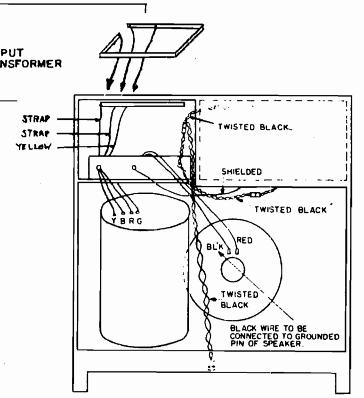
Symbol	Description
C1	2-20 mmf. trimmer
C2a, 2b	Tuning condenser
C3a, b, c, d, e	Touch tuning trimmer strip
C4	.01 mfd. paper capacitor
C5	.10 mfd. paper capacitor
C6, 7, 8	Osc. trimmer strip
C9	.008 mfd. paper capacitor
C10	2400 mmf. mica capacitor
C11	"BC" band padder
C12	100 mmf. mica capacitor
C15	750 mmf. silvered mica
C18	220 mmf. mica capacitor
C19	.02 mfd. paper capacitor
C20	.003 mfd. paper capacitor
C21,22	.005 mfd. paper capacitor
C23	220 mmf. mica capacitor
C24	.03 mfd. paper capacitor
C25a	10 mfd. dry electrolytic
C25b	15 mfd. dry electrolytic
C25c	30 mfd. dry electrolytic
C26	.03 mfd. paper capacitor
C27	.002 mfd. paper capacitor
C28	47 mmf. mica capacitor
C29, 30	.01 mfd. paper capacitor
C31	.008 mfd. paper capacitor
C32	.005 mfd. paper capacitor
C33	.002 mfd. paper capacitor
R1	1000 ohm carbon resistor
R2	47 ohm carbon resistor
R3	27 ohm carbon resistor
R4	10,000 ohm carbon resistor
R5	3300 ohm carbon resistor
R6	47,000 ohm carbon resistor
R7	22,000 ohm carbon resistor
R8	2.2 megohm Carbon resistor
R9	150 ohm carbon resistor
R10	47,000 ohm carbon resistor
R11	82,000 ohm carbon resistor
R12	2.0 megohm volume control
R13	4.7 megohm carbon resistor
R14	470,000 ohm carbon resistor
R15	3300 ohm carbon resistor
R16	68,000 ohm carbon resistor
R17	6800 ohm carbon resistor
R18	1900 ohm carbon resistor
R19	1000 ohm carbon resistor
R20	150,000 ohm carbon resistor
R21	120,000 ohm carbon resistor
R22	270,000 ohm carbon resistor
R23	1000 ohm carbon resistor
R24	5600 ohm carbon resistor
R25	220 ohm, carbon resistor
R26	470,000 ohm carbon resistor
R27, 28, 29	1000 ohm carbon resistor
R30	100,000 ohm carbon resistor
R31, 32	220,000 ohm carbon resistor
S1	Band change switch
S2	Tone control switch
S3	Station selector switch
L1	"BC" band Beam-a-Scope
L2	"SW1" ant. coil
L3	"SW2" band Beam-a-Scope
L4	"SW2" band osc. coil
L5	"SW1" band osc. coil
L6	"BC" band osc. coil
L7	RF coil
L12	Station selector coils
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer
T4, T5	Power transformer

ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS UNLESS OTHERWISE STATED
LINE VOLTAGE - 120 VOLTS A.C.
GANG CLOSED - VOLUME MINIMUM - "BC" BAND
● VOLTS A.C.
USE HIGH RESISTANCE VOLTMETER









MODELS J1106
J1108

GENERAL ELECTRIC CO.

Tuning Frequency Range

Broadcast Band....................540–1700 KC
Short-wave Band No. 1....................2400–7000 KC
Short-wave Band No. 2....................7000–22,000 KC

Intermediate Frequency**................455 KC**

Electrical Power Output

Undistorted.............................6 watts
Maximum.............................9.5 watts

Loud-speaker "Alnico" Magnet Dynamic

Outside Diameter.......................14 inches
Voice Coil Impedance (400 cycles).......3.5 ohms

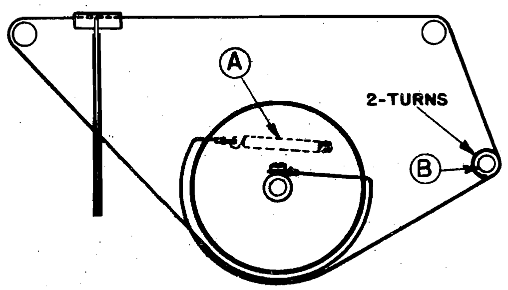


Fig. 5. Dial Cord Stringing Diagram

BEAM-A-SCOPE REMOVAL

Before either the chassis or Beam-a-Scope can be removed, the leads between them must be disconnected. Fig. 1 shows the location of the Beam-a-Scope leads when connected.

***Model J-1106*—**To remove Beam-a-Scope, disconnect the leads, unscrew the long self-tapping screw from cabinet shelf, then pry loose the cardboard strap which is stapled to the bottom of the cabinet and holds the Beam-a-Scope in place. Now rotate the Beam-a-Scope from right to left until it comes loose. NOTE: The upper pivot bolt support should never be loosened.

To replace the Beam-a-Scope the reverse procedure is followed and the strap should be restapled to the cabinet.

***Model J-1108*—**To remove the Beam-a-Scope from this model, use the same procedure as above with the exception of the bottom support removal. This receiver uses a wooden support held in place by two wood screws which are accessible from underneath the cabinet base. When the screws are removed the wood support can be removed allowing the Beam-a-Scope to be rotated from right to left until it is free.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*
  (a) Antenna Post to R. F. Grid at
    1000 KC..............................6.5
    4000 KC..............................3.0
    18000 KC.............................2.3
  (b) R.F. Grid to Converter Grid at
    1000 KC..............................5.0
    4000 KC..............................3.0
    18000 KC.............................2.0
  (c) R.F. on Converter Grid to I.F. on 1st I.F. Grid at
    1000 KC..............................47
    4000 KC..............................47
    18000 KC.............................39
  (d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at
    455 KC...............................55
  (e) I.F. Amplifier Grid to Detector Plate at
    455 KC...............................77
(2) Voltage across Volume Control to Give ½-watt** Speaker Output at
    400 cycles...........................0.05 volts
(3) DC Voltage Developed across Oscillator Grid Resistor (R-7) at
    1000 KC..............................6.0
    4000 KC..............................5.5
    18000 KC.............................3.9

* Variations of ±20 per cent are permissible. All readings obtained with enough input signal to give ½-watt speaker output.

** ½-watt speaker output at 400 cycles is equivalent to a reading of 1.32 volts as measured by a high resistance A-C voltmeter across the voice coil of the receiver speaker.

Phonograph Mechanism (Model J-1108)

Type......................Automatic Record Changer
Record Capacity...Twelve 10-inch or ten 12-inch records
Type Pickup..........................Crystal
Turntable Speed......................78 Rpm

ALIGNMENT PROCEDURE

The alignment procedure, performed with the chassis in the cabinet, is given in table form below. All R.F. alignment is performed by capacity coupling the test oscillator to the receiver input. This is accomplished by using a three-foot piece of wire as an antenna connected to the high side of the test oscillator output and brought to within three feet of the Beam-a-Scope input when making the alignment. Metal objects such as tools, meters, etc. should not be placed on top of the cabinet.

Before making the R.F. alignment make sure the pointer is set to the line at the left-hand edge of the dial scale when the gang condenser plates are closed. Output meter alignment is preferable and the meter may be connected across the voice coil; then turn volume control to maximum. Keep the signal input as low as possible to avoid AVC action.

ALIGNMENT CHART

Step	Test-Osc. Connect to	Osc. Output Frequency	Pointer Setting	Tune Trimmer for Max. Output
1	6SK7 I.F. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C16 &C17
2	6SA7 grid in series with .05 mfd	455 KC	"BC" Band 550 KC	C13 & C14
3	Use Capacity Coupling	580 KC	"BC" Band 580 KC	C11**
4	Use Capacity Coupling	1500 KC	"BC" Band 1500 KC	C8
5	Repeat step 3			
6	Use Capacity Coupling	6.0 MC	"SW1" Band 6 MC	C7
7	Use Capacity Coupling	21.0 MC	"SW2" Band 21 MC	C6*
8	Use Capacity Coupling	21.0 MC	"SW2" Band 21 MC	C1**

* Use minimum capacity peak.
** Rock gang condenser for optimum peak.

R.F. Alignment with Chassis Outside of Cabinet

R.F. alignment can be performed only on the "BC" and "SW1" bands with the chassis outside of the cabinet. Any alignment attempted on "SW2" band will not be satisfactory. The same relative position between the chassis and broadcast loop should be maintained when aligning outside the cabinet as these components occupy in the cabinet. Since the glass dial scale is fastened to the cabinet it cannot be used for reference during alignment of the chassis outside of the cabinet. Use must be made, therefore, of 0–180° calibrated scale which is cemented to the back of the dial-reflector plate. From the "frequency-degree reference chart" the degree readings for corresponding frequency settings may be obtained. To use these degree readings, first completely close the gang condenser plates and then slide the pointer along the cord until the left-hand edge of the pointer-guide slide lines up with the 0° mark. By using this left-hand edge (as viewed from the rear) of the slide as the degree-scale pointer the receiver may be tuned to any frequency. Example: By rotating the tuning control until the left-hand edge of the slide is in line with 154°, the receiver will be tuned to 1500 KC on the "BC" band.

The "BC" and "SW1" band alignment procedure is the same as outlined in steps 3 to 6 inclusive of the chart—"R.F. Alignment with Chassis Mounted in Cabinet."

The chassis should be mounted in the cabinet and "SW2" band alignment checked as described in steps 7 and 8 of the chart.

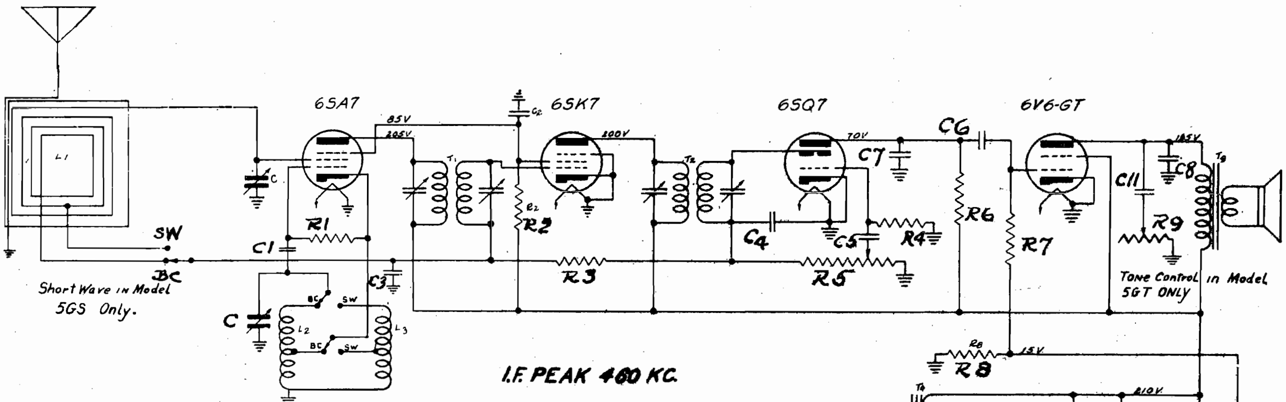
NOTE: After moving the pointer along the cord to use the left-hand edge as a reference pointer for the degree scale, it will be necessary after reassembly in the cabinet for the gang condenser plates to be closed and the pointer to be moved back along the cord so that it lines up with the first dial markings on the left.

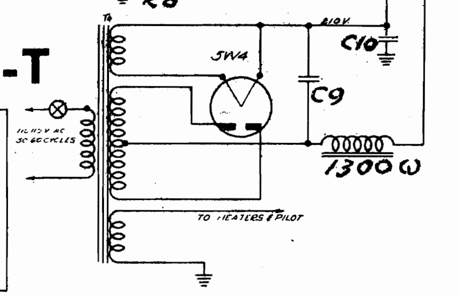
FREQUENCY-DEGREE REFERENCE CHART

"BC" Band	"SW1" Band	"SW2" Band
1500 KC..154°	6.0 MC.. 143°	21 MC.. 162°
1000 KC..104°	4.0 MC.. 96°	12 MC.. 101°
580 KC.. 20°	2.5 MC.. 20°	7 MC.. 28°

GILFILLAN BROS. INC.

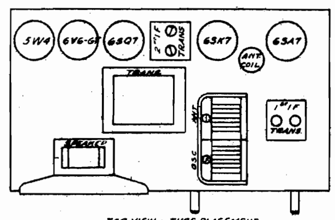
MODELS 5G-S, 5G-T
MODEL 5L





Models 5G-S and 5G-T

CONDENSERS		RESISTORS		MISC
C_1	.00005 MFD MICA	R_1	25M OHMS ½ WATT	T_1 · 1ST I F TRANSFORMER
C_2	.05 " 400 VOLTS	R_2	15M " 1 "	T_2 · 2ND " "
C_3	.05 " 200 "	R_3	2 MEG. " ½ "	T_3 · OUTPUT "
C_4	.00025 " MICA	R_4	2 MEG " " "	T_4 · POWER "
C_5	.01 " 200 VOLTS	R_5	500M - VOL CONTROL	
C_6	.01 600 "	R_6	250M - ½ WATT	L_1 · LOOP
C_7	.001 " " "	R_7	490M " " "	L_2 · OSCILLATOR COIL BC
C_8	.006 " " "	R_8	400 " ½ "	L_3 · " " SW
C_9	8 - 450V. FILTER	R_9	50 000 " TONE CONTROL	ALL VOLTAGES CHECKED AT 115 VOLTS AC PRIMARY.
C_{10}	" " "			
C_{11}	.03 - 800 VOLTS			

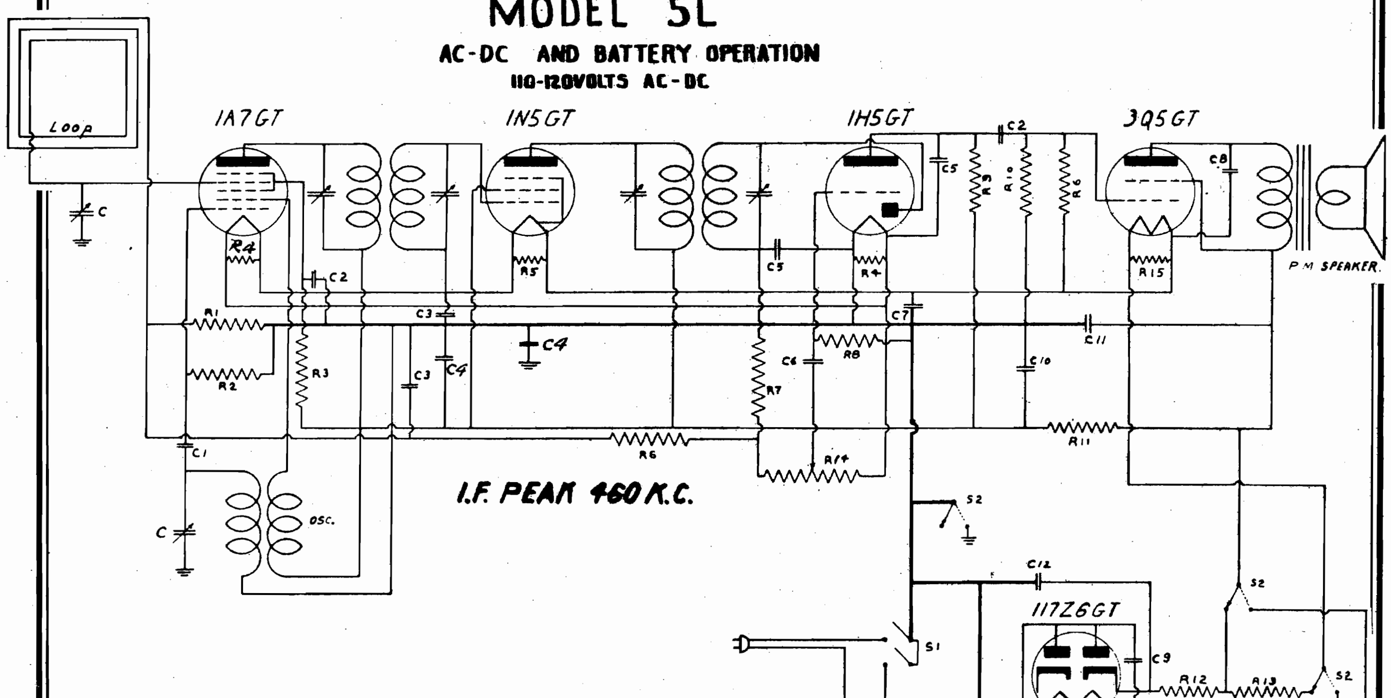


TOP VIEW - TUBE PLACEMENT

MODEL 5L

AC-DC AND BATTERY OPERATION

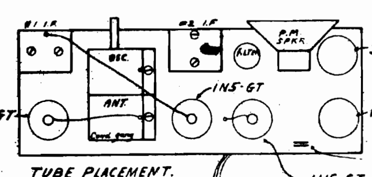
110-120 VOLTS AC-DC



C	CONDENSERS
C	CONDENSER GANG
1	.0001 MFD. MICA
2	.01 MFD 200 VOLT TUBULAR
3	.05 " " "
4	.25 " " " "
5	.00025 MFD MICA
6	.006 MFD 600 VOLT "
7	100 " 25 " "
8	.001 " 400 " "
9	.05 " " " "
10, 11, 12	40 " 150 " FILTER.

R	RESISTORS
1	10 MEG. OHM ¼ WATT
2	250M " " "
3	30 M " " "
4	150 " " "
5	250 " " "
6	3 MEG " " "
7	50M " " "
8	5 MEG " " "
9	500M " " "
10	700M " " "
11	500 " " "
12	500 " 7½ "
13	1650 " " "
14	500M VOL. CONTROL.
15	1000 OHM ¼ WATT.

S1 · Switch on Vol. Control.
S2 · Slide Switch in Rear of Chassis Shown for AC OPERATION.



TUBE PLACEMENT.

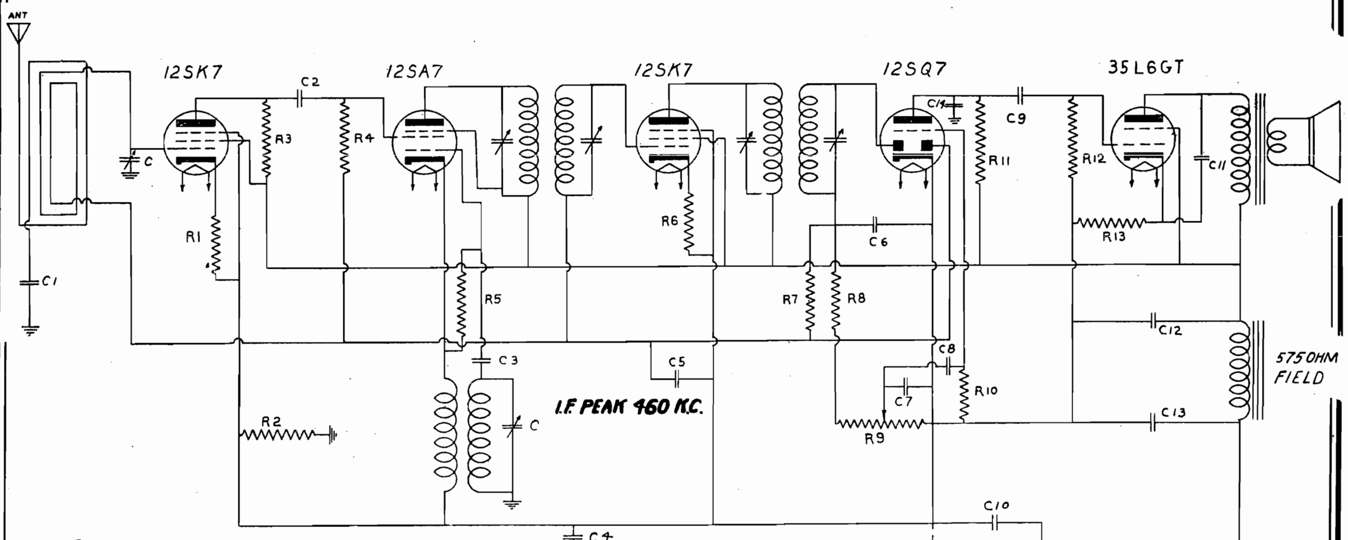
USE BATTERY PACK RAY-O-VAC No. AB-794

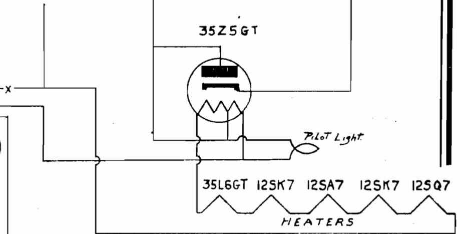
INSERT A.C PLUG HERE FOR BATTERY OPERATION.

MFG. by. Gilfillan Bros Inc. 9/31/40

MODELS 6K, 6L, 6R
MODEL 6U

GILFILLAN BROS. INC.



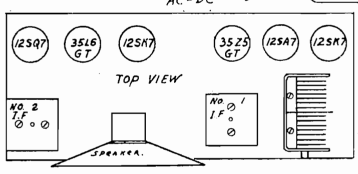


RESISTORS

R1	100	OHM ¼ Watt Resistor
R2	200M	" " " "
R3	4700	" " " "
R4	100M	" " " "
R5	20M	" " " "
R6	100	" " " "
R7	2 Meg.	" " " "
R8	50M	" " " "
R9	500M	VOL. CONTROL
R10	10MEG	OHM ¼ Watt Resistor
R11	500M	" " " "
R12	500M	" " " "
R13	140	" ½ " "

CONDENSERS

C		Condenser Gang.
C1	.002	MFD TUBULAR
C2	.0005	MFD MICA
C3	.0001.	" "
C4	.25	" 200 VOLT TUBULAR
C5	.05	" " " "
C6	.00022	" MICA
C7	.00022	" "
C8	.005	" 200 VOLT TUBULAR
C9	.01	" 200 " "
C10	.05	" 200. " "
C11	.025	" 400 " "
C12, C13	20	" 150 " FILTER.
C14	.0001	" MICA

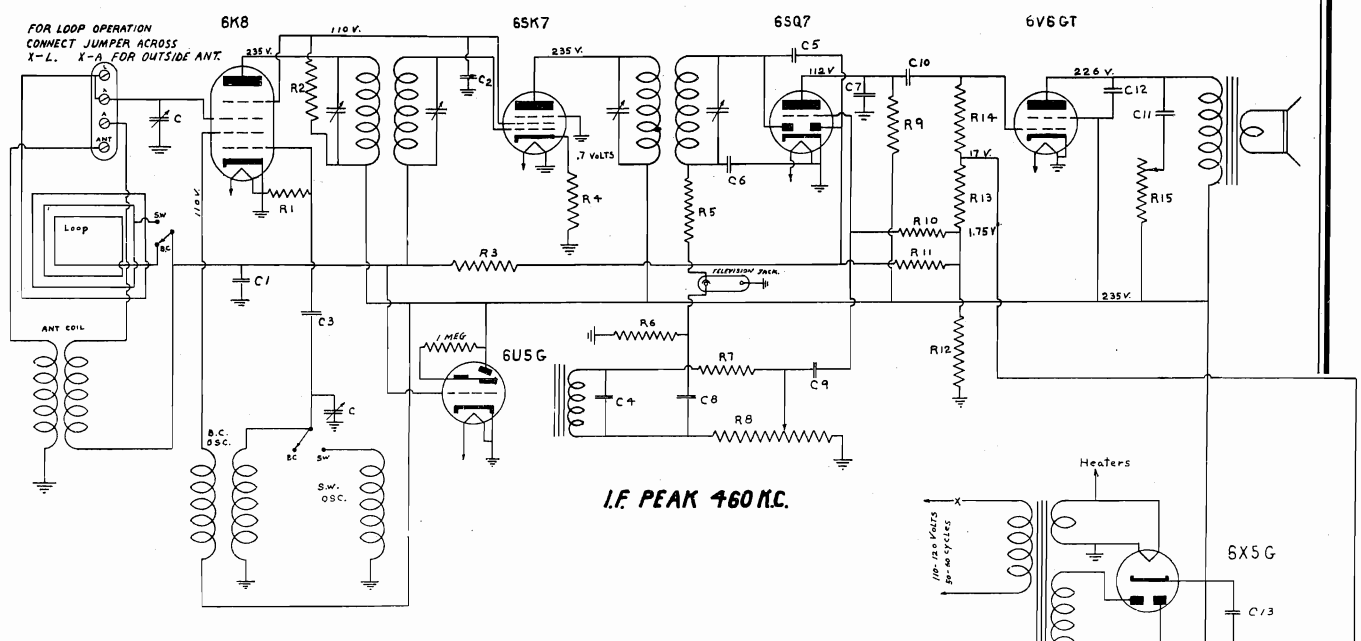


TUBE PLACEMENT.

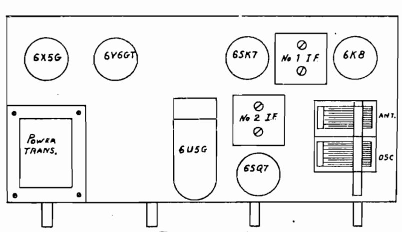
GILFILLAN BROS INC

MODELS 6K-6L-6R

FEB.-20-40



CONDENSERS		RESISTORS	
C	CONDENSER GANG	R1	100M OHM ¼ WATT RESISTOR
C1	.05 MFD. 200 VOLT TUBULAR.	R2	10M " 2 " "
C2	.05 " 400 " "	R3	1MEG " ¼ " "
C3	70 MMFD. MICA CONDENSER.	R4	100 " " " "
C4	70 " " "	R5	25M " " " "
C5	70 " " "	R6	100M " " " "
C6	.00025 MFD. " "	R7	" " " " "
C7	.0005 " " "	R8	500M " VOLUME CONTROL
C8	.01 MFD 400 VOLT "	R9	250M " ¼ WATT RESISTOR
C9	.01 MFD 400 " "	R10	10MEG " " " "
C10	.01 MFD 600 " "	R11	3 " " " " "
C11	.05 " 800 " "	R12	40 " " " "
C12	.006 " 600 " "	R13	400 " 1 " "
C13	16MFD. 450 " FILTER	R14	1MEG " ¼ " "
C14	4MFD. " " "	R15	250M " TONE CONTROL

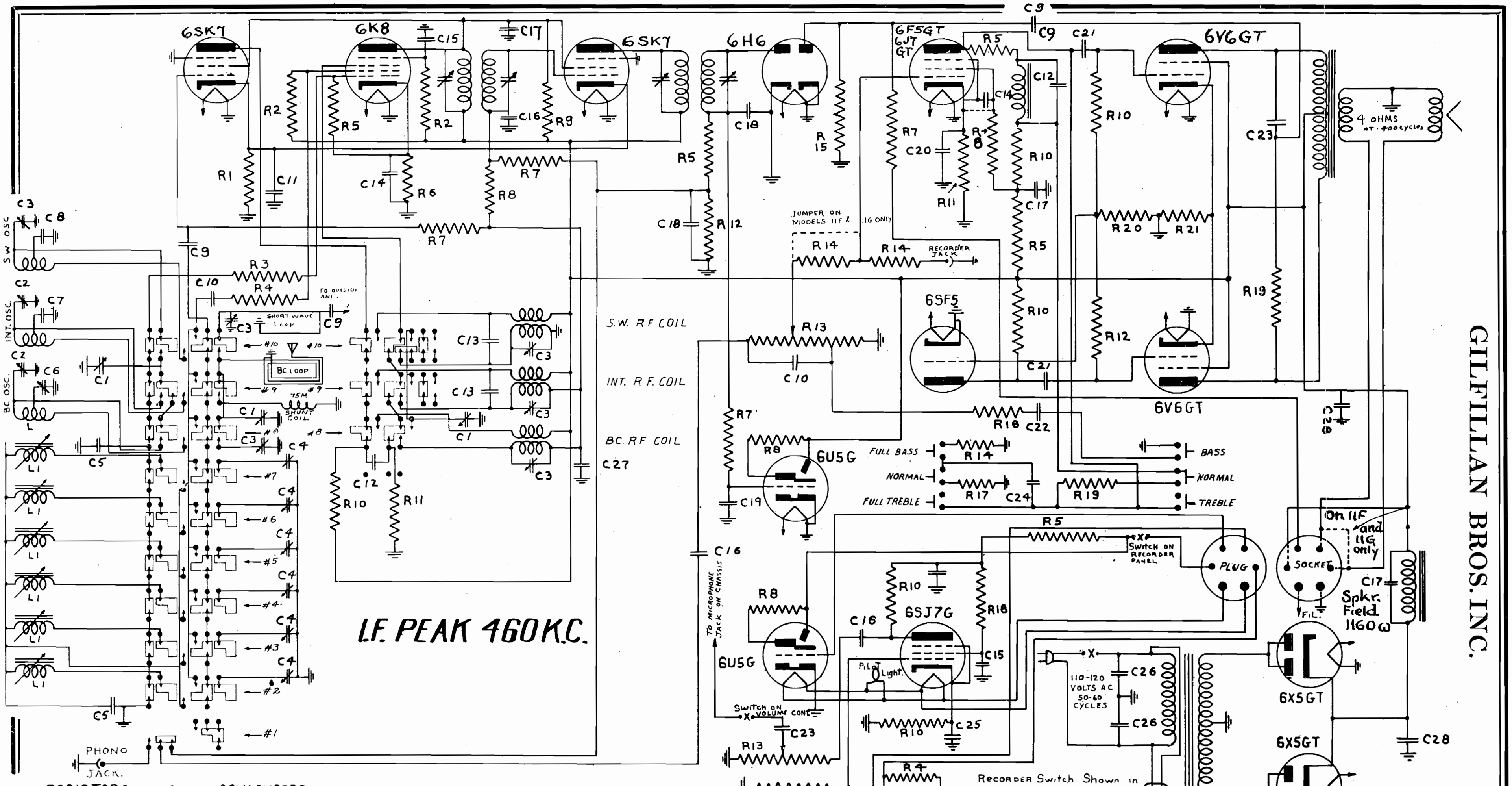


Tube Placement.

GILFILLAN BROS INC.
ENGINEERING DEPT
MODEL 6U
2-10-40

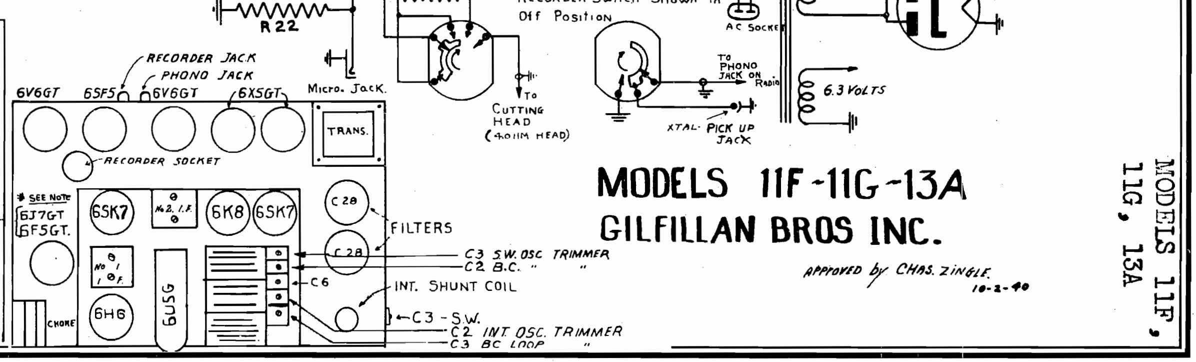
MODELS 11F, 11G, 13A

GILFILLAN BROS. INC.



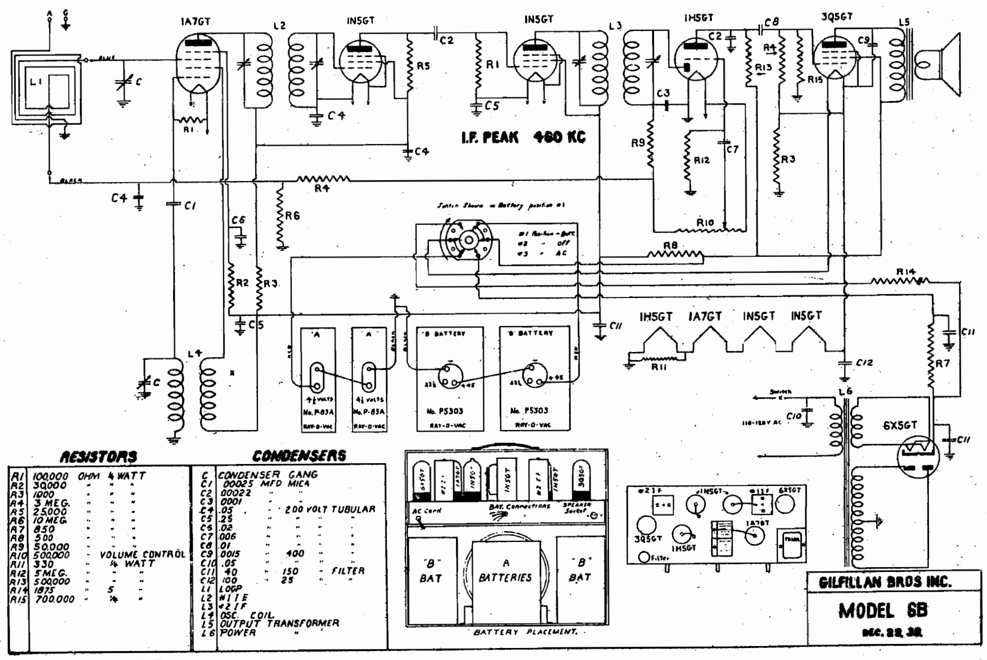
R	RESISTORS			C	CONDENSERS	C	
1	250 OHM	1/4 WATT		1	CONDENSER GANG	25	10 MFD. 25 VOLT
2	25M	"	"	2	3-30 MMFD. TRIMMERS	26	.006 MFD. 600 VOLT TUBULAR
3	25	"	"	3	1.5-20 " "	27	.05 " 200 " "
4	100	"	"	4	AUTOMATIC TUNING "	28	40 " 450 " FILTER
5	50M	"	"	5	370 MMFD. SILVER CONDENSERS.	L1	IRON CORE OSC.
6	300	"	"	6	800 " PADDER	#1	PHONO PUSH BUTTON
7	2 MEG	"	"	7	.0014 " "	#2	AUTOMATIC TUNING
8	1 "	"	"	8	.0057 " "	#3	" "
9	40M	"	"	9	.0005 MFD. MICA	#4	" "
10	100M	"	"	10	.00005 " "	#5	" "
11	4M	"	"	11	.25 MFD. 200 VOLT TUBULAR	#6	" "
12	200M	"	"	12	.00025 MFD. MICA	#7	" "
13	500M	VOL. CONT.		13	.00001 " "	#8	B.C. TUNING BUTTON
14	10M	1/4 WATT		14	.1 MFD. 200 VOLT TUBULAR	#9	INT. " "
15	500M	"	"	15	.1 " 400 " "	#10	S.W. " "
16	20M	"	"	16	.05 " " " "		
17	30M	"	"	17	.25 " 600 " "		
18	500M	"	"	18	.0001 MFD. MICA		
19	8500	"	"	19	.02 " 200 VOLT		
20	180M	"	"	20	50 " 50 "		
21	180	2	"	21	.05 " 600 "		
22	5 MEG	1/4	"	22	.02 " " "		
				23	.005 " 800 "		
				24	.01 " 600 "		

* NOTE: MODELS WITH SERIAL Nos. 30590 TO 30689 USE 6J7GT ALL OTHERS USING 6F5GT HAVE JUMPER AS SHOWN WITH DOTTED LINE. C14 IS LEFT OFF



MODEL 6B
MODELS 11F, 11G, 13A

GILFILLAN BROS.INC.



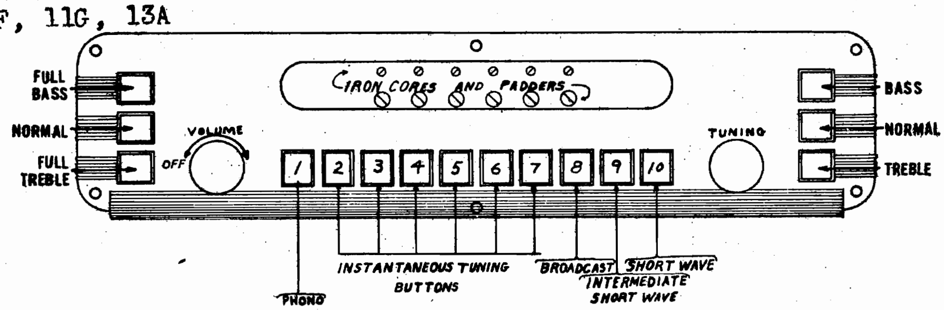
RESISTORS

R1	100,000 OHM ¼ WATT
R2	30,000 " " "
R3	1000 " " "
R4	3 MEG. " " "
R5	25,000 " " "
R6	10 MEG. " " "
R7	850 " " "
R8	500 " " "
R9	50,000 " " "
R10	500,000 " VOLUME CONTROL
R11	330 " ¼ WATT
R12	5 MEG. " " "
R13	500,000 " " "
R14	1875 " 5 "
R15	700,000 " ¼ "

CONDENSERS

C	CONDENSER GANG
C1	.00025 MFD MICA
C2	.00022 " "
C3	.0001 " "
C4	.05 " 200 VOLT TUBULAR
C5	.25 " " " "
C6	.02 " " " "
C7	.006 " " " "
C8	.01 " " " "
C9	.0015 " 400 " "
C10	.05 " " " "
C11	40 " 150 " FILTER
C12	100 " 25 " "
L1	LOOP
L2	#11 I E
L3	#2 I F
L4	OSC. COIL
L5	OUTPUT TRANSFORMER
L6	POWER "

MODELS 11F, 11G, 13A



Plug in AC cord, turn "Off Volume" knob on, push in "Broadcast" button, and select stations as desired by using tuning knob.

Use same procedure, though push in "Intermediate Short Wave" or "Short Wave" buttons for tuning these bands.

To set broadcast band stations to buttons for instantaneous tuning:

Remove decorated cover above long row of knobs (with fingernail or screw driver). This will expose six pairs of screws. These are the iron-core tuners and padders. From left to right these iron cores tune stations for buttons number two to seven, inclusive. Select the six stations desired, remove the call letters from the station tab sheet, insert the tabs in the buttons, assigning the station with the lowest KC frequency to button No. 2 and, in order, to the station with the highest KC frequency to button No. 7.

To actually set stations to the buttons:

By means of manual tuning, play the station to be set; then push the button at which the station is to be set; then with a screwdriver turn iron-core (long screw) till station is located. Adjust station to loudest volume, using padder screw (short screw); then readjust long screw till station is set to a point where the tuning eye is at its most closed position. The station is then "set" to the button.

This procedure must be repeated for each station to be set to each button, and it is suggested that, after the stations are all once set to their buttons, they be rechecked before replacing the cover.

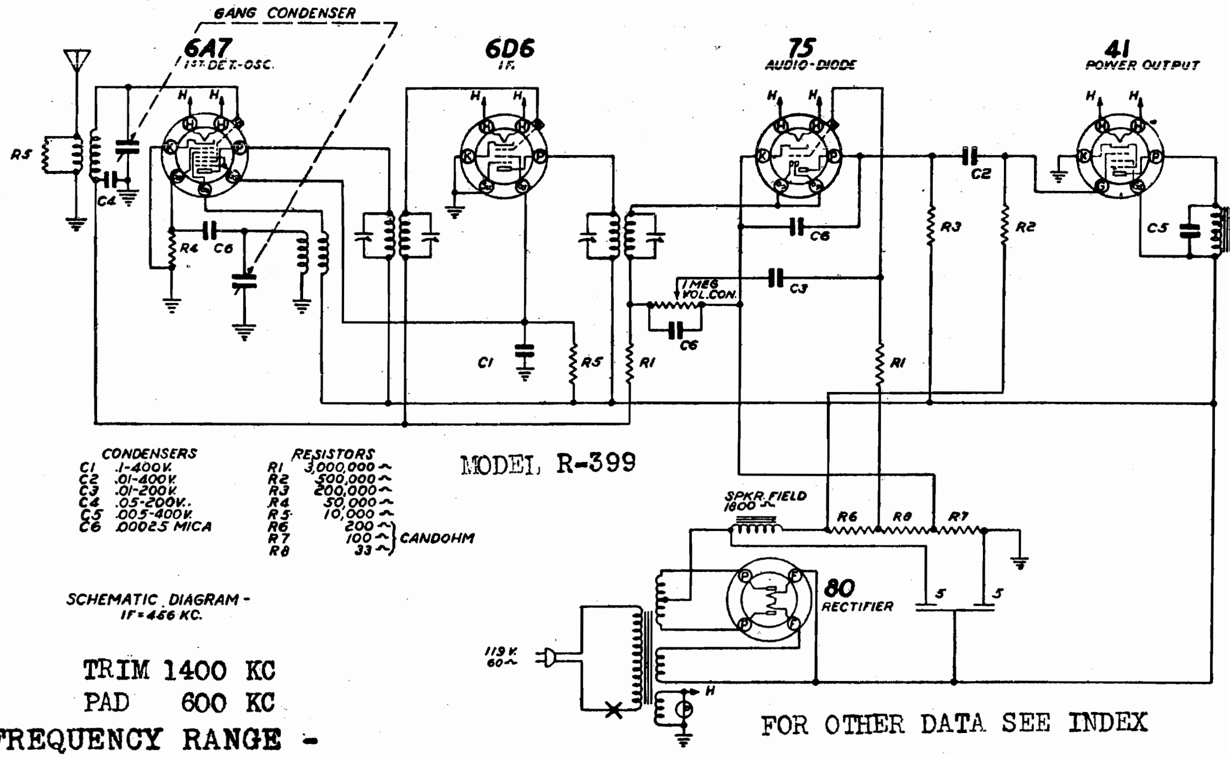
Standard broadcast antenna is mounted on a swivel in rear of cabinet. For tuning some more distant stations, it may be desirable to rotate antenna to position of loudest volume or, if necessary, an outside antenna may be connected to a green wire lead coming from this broadcast loop. For short wave tuning, some locations will require an outside antenna. This outside antenna should be connected to the green wire coming from the short wave loop, which is located directly above the chassis. If extra antenna is desired for both short wave and standard broadcast performance, both green antenna leads can be joined together satisfactorily to one outside antenna.

If a phonograph or microphone is to be used, they should be plugged into the rear of the chassis in place provided and so marked. To use as a phonograph or with microphone, push in "Phono" button. In the rear of the chassis is provided a 110 volt plug. This is for your convenience for using this radio with a phonograph attachment or with a lamp.

A six-prong outlet is provided in the chassis pan. This outlet is wired into the circuit and can be used only in conjunction with a special microphone pre-amplifier and control that has been designed especially for recording purposes. The consumer owning this receiver may purchase a portable recorder and, by connecting it to our microphone pre-amplifier, it is possible to make recordings of the highest quality.

MODELS R-399,R-405

B. F. GOODRICH



CONDENSERS	
C1	.1-400V.
C2	.01-400V.
C3	.01-200V.
C4	.05-200V.
C5	.005-400V.
C6	.00025 MICA

RESISTORS		
R1	3,000,000 ~	
R2	500,000 ~	
R3	200,000 ~	
R4	50,000 ~	
R5	10,000 ~	
R6	200 ~	CANDOHM
R7	100 ~	CANDOHM
R8	33 ~	CANDOHM

MODEL R-399

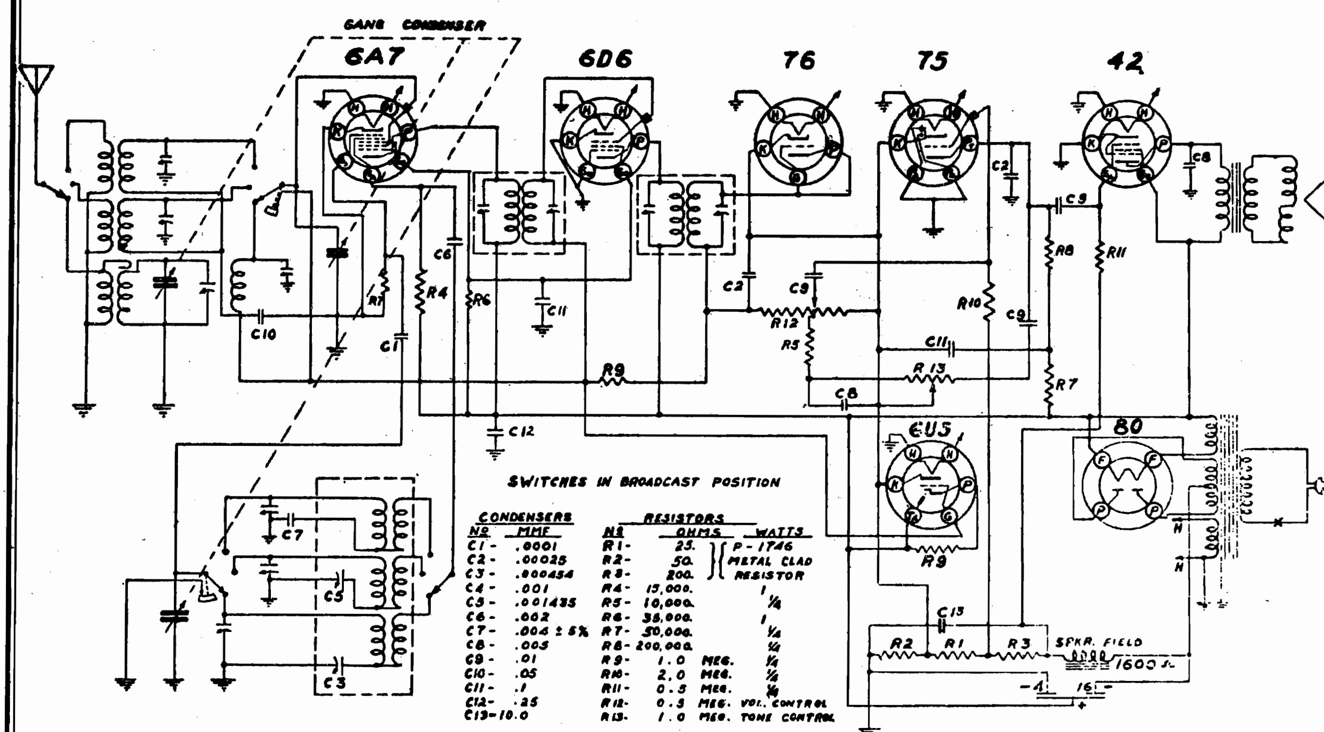
SCHEMATIC DIAGRAM - IF=456 KC.

TRIM 1400 KC
PAD 600 KC

FREQUENCY RANGE - 535 to 1720 KC

FOR OTHER DATA SEE INDEX

CONVENTIONAL ALIGNMENT SEE SPECIAL SECT. VOL. VIII



SWITCHES IN BROADCAST POSITION

CONDENSERS No	MMF
C1 -	.0001
C2 -	.00025
C3 -	.000454
C4 -	.001
C5 -	.001435
C6 -	.002
C7 -	.004 ± 5%
C8 -	.005
C9 -	.01
C10 -	.05
C11 -	.1
C12 -	.25
C13 -	10.0

RESISTORS No	OHMS	WATTS
R1 -	25.	P - 1746 METAL CLAD RESISTOR
R2 -	50.	P - 1746 METAL CLAD RESISTOR
R3 -	200.	P - 1746 METAL CLAD RESISTOR
R4 -	15,000.	1
R5 -	10,000.	1/4
R6 -	35,000.	1
R7 -	50,000.	1/4
R8 -	200,000.	1/4
R9 -	1.0 MEG.	1/4
R10 -	2.0 MEG.	1/4
R11 -	0.5 MEG.	1/4
R12 -	0.5 MEG.	VOL. CONTROL
R13 -	1.0 MEG.	TONE CONTROL

MODEL R-405

FREQUENCY RANGE -

550 to 1700 KC
1700 to 5400 KC
5600 to 18100 KC

IF PEAKED AT 456 KC

FOR OTHER DATA SEE INDEX

MODELS R-399, R-400, R-404, R-405, R-419, R-421

B. F. GOODRICH

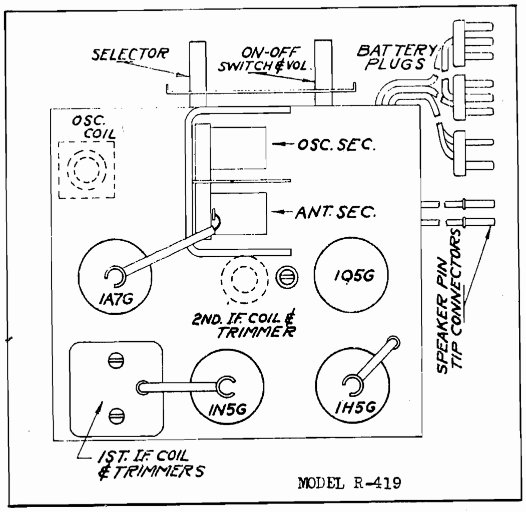
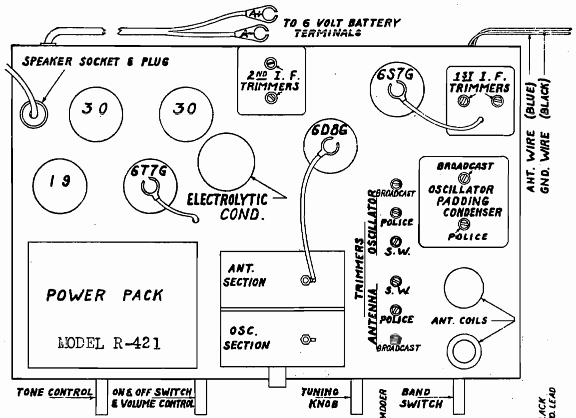
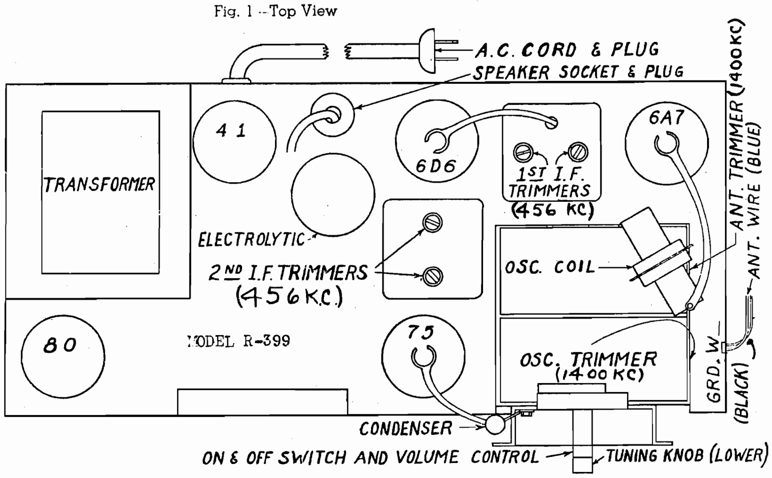
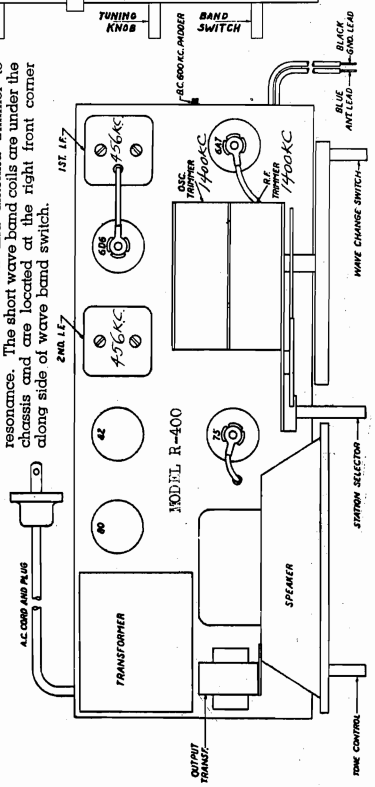


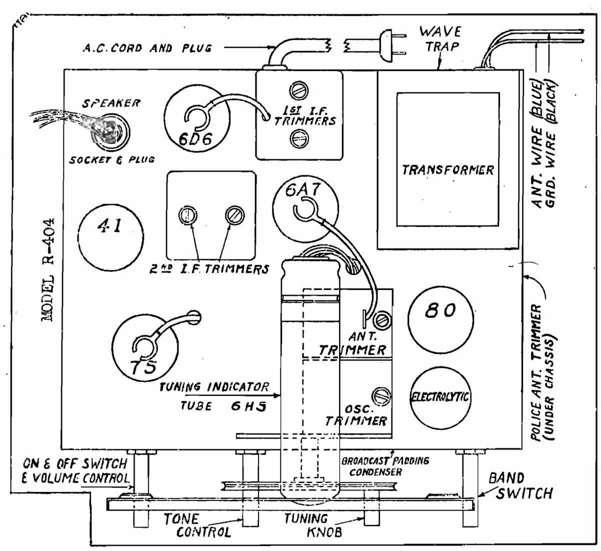
Fig. 1 --Top View



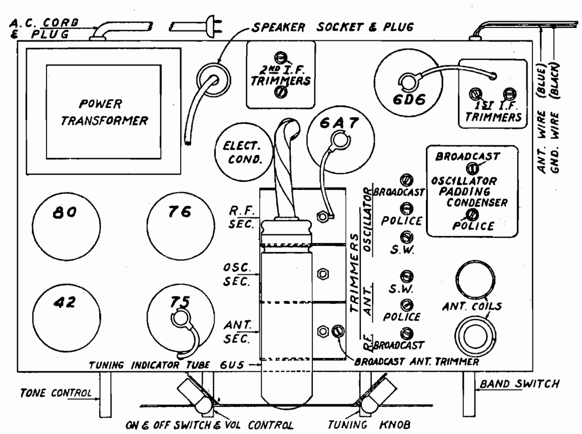


S.W. ALIGNMENT: Set the dial pointer to 6000KC (also the test oscillator) and adjust the antenna and antenna trimmer to resonance. The short wave band coils are under the chassis and are located at the right front corner along side of wave band switch.



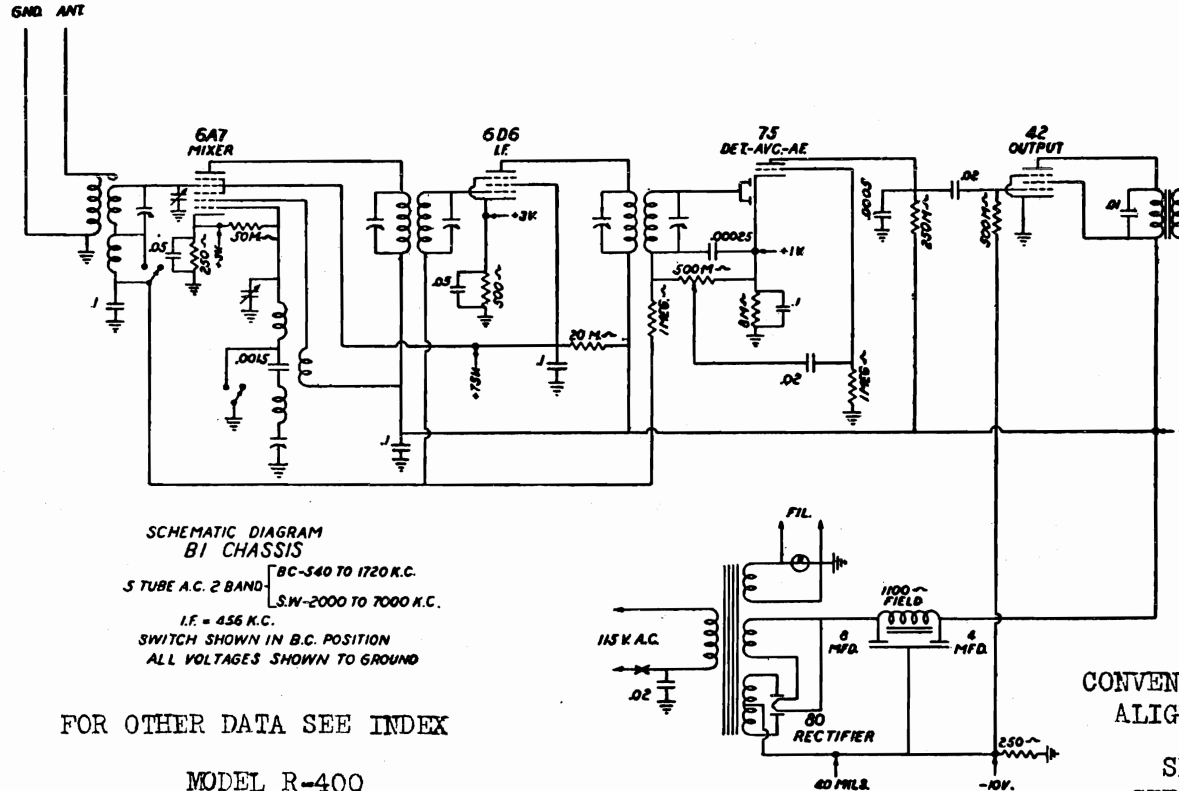


MODEL R-405



B. F. GOODRICH

MODELS R-400, R-424

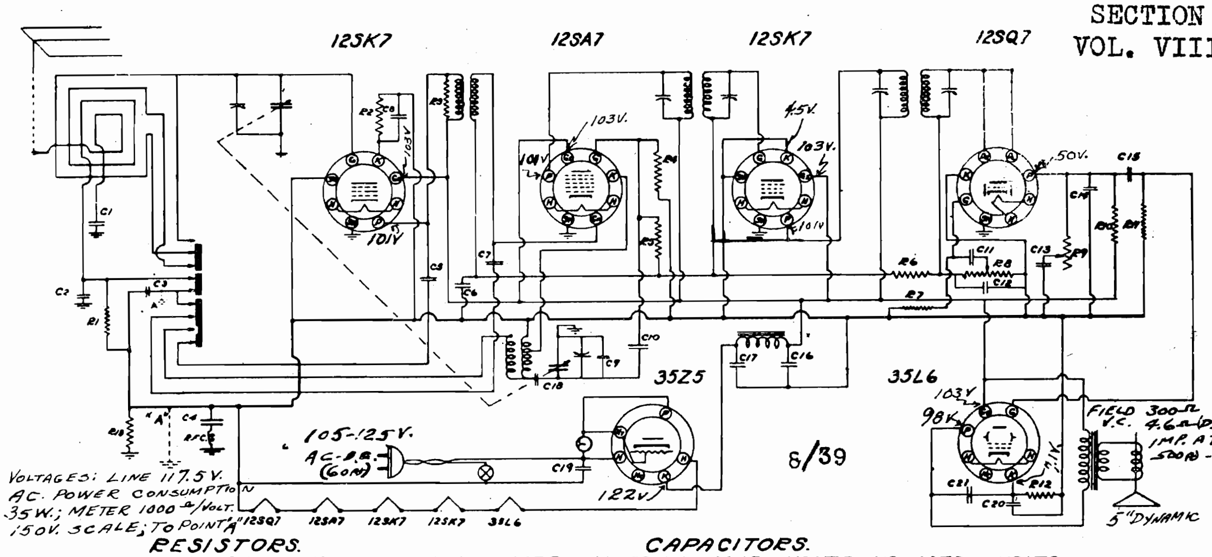


FOR OTHER DATA SEE INDEX

MODEL R-400

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOL. VIII



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RESISTORS.						CAPACITORS.								
No	OHMS	WATTS	No	OHMS	WATTS	No	MFD.	VOLTS	No	MFD.	VOLTS.	No	MFD.	VOLTS
R1	150K±10%	½	R8	500K-V.C.	½	C1	.001	600	C8	.05	200	C15	.01	400
R2	600±10%	½	R9	500K-T.C.-	½	C2	.00127±5%	Mica	C9	.000010	Mica.	C16	20.	150
R3	5K±10%	½	R10	150K	½	C3	.05	400	C10	.00005	Mica.	C17	20.	150
R4	15Meg.	½	R11	250K	½	C4	.25	200	C11	.01	400	C18	.02	400
R5	25K	½	R12	200±10%	½	C5	.00006±5%	Mica.	C12	.00025	Mica	C19	.05	400
R6	2Meg	½	R13	150K	½	C6	.05	200	C13	.005	600	C20	20.	25
R7	5Meg	½				C7	.00006±5%	Mica	C14	.0005	Mica.	C21	.02	400

I.F. 455 K.C.

In some sets C3, C4, C18, R13 and the R.F. choke (RFC) are not used and points "A" are connected to chassis.

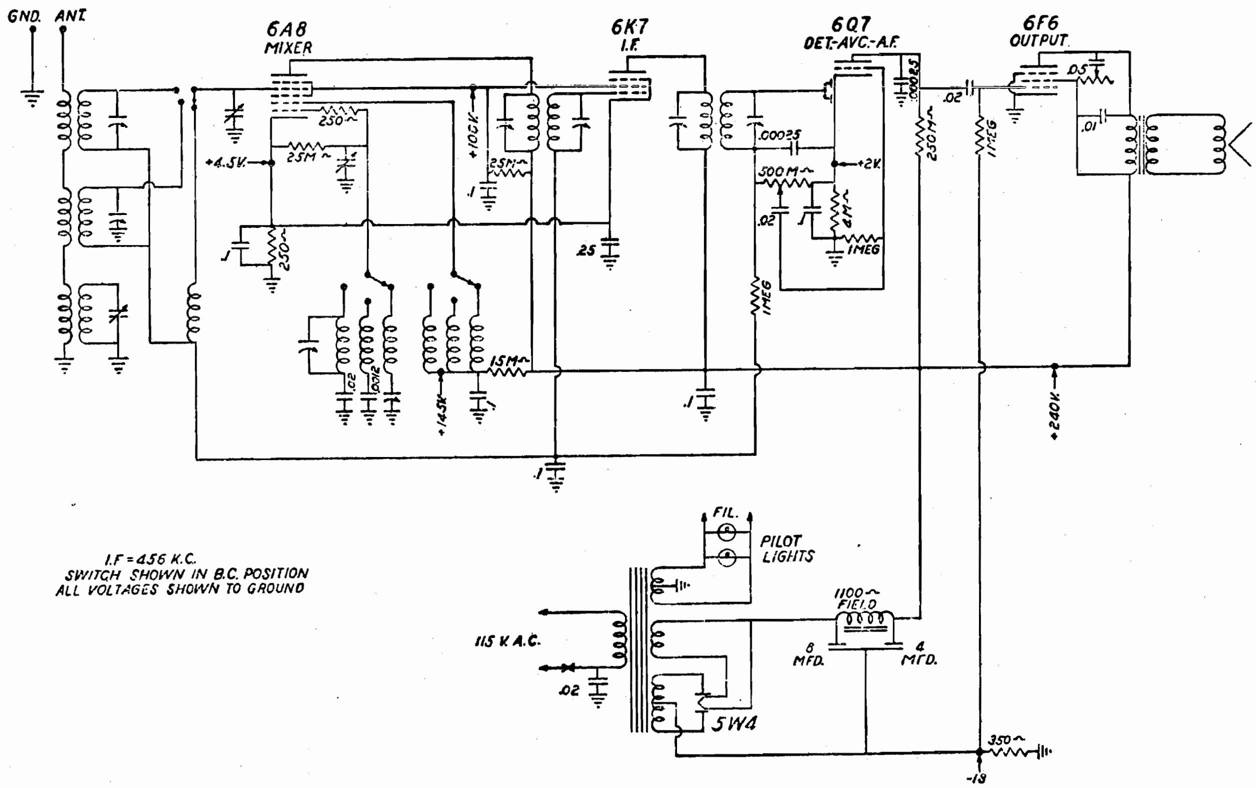
I.F. ALIGNMENT CONVENTIONAL (SEE VOL.VIII).
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

FOR OTHER DATA SEE INDEX

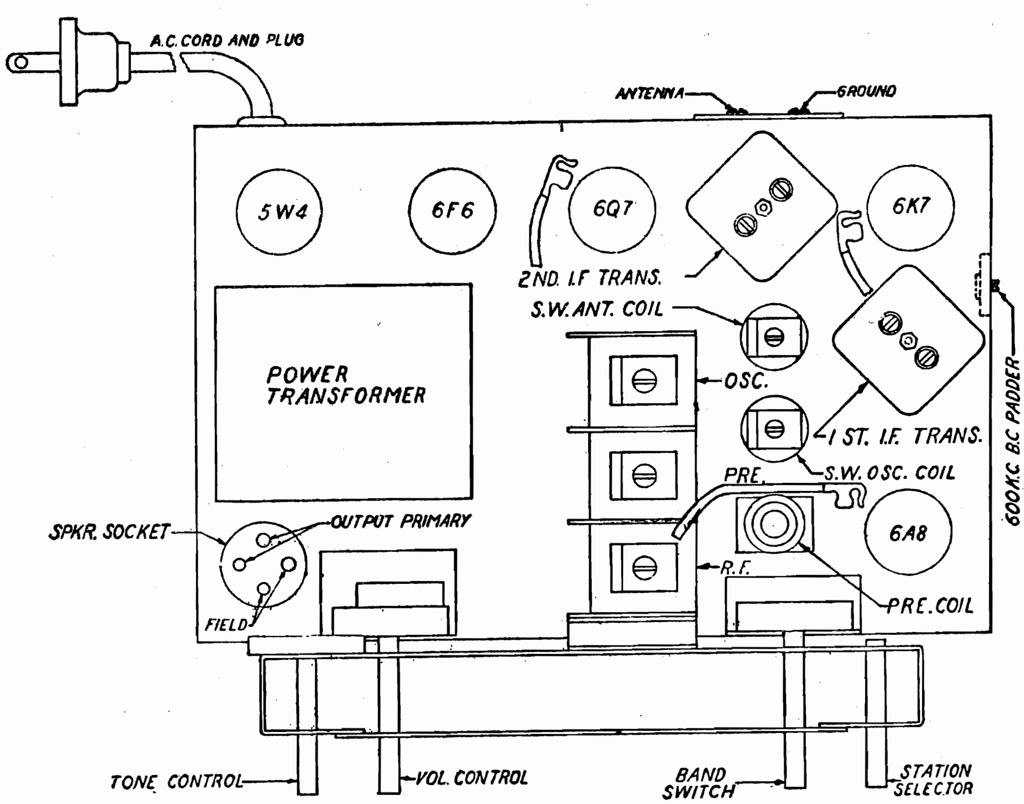
MODEL R-424

MODEL R-401

B. F. GOODRICH

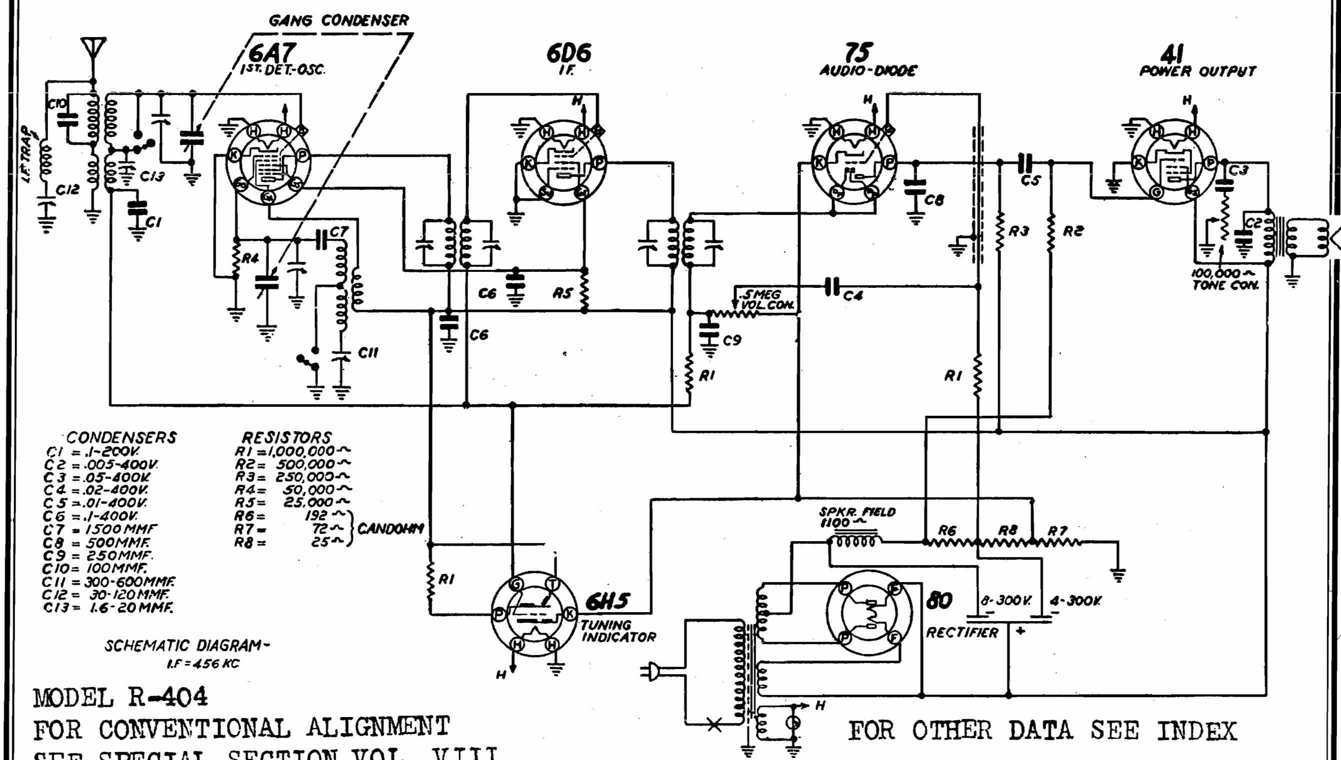


FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL.VIII



B. F. GOODRICH

MODELS R-404, R-415A



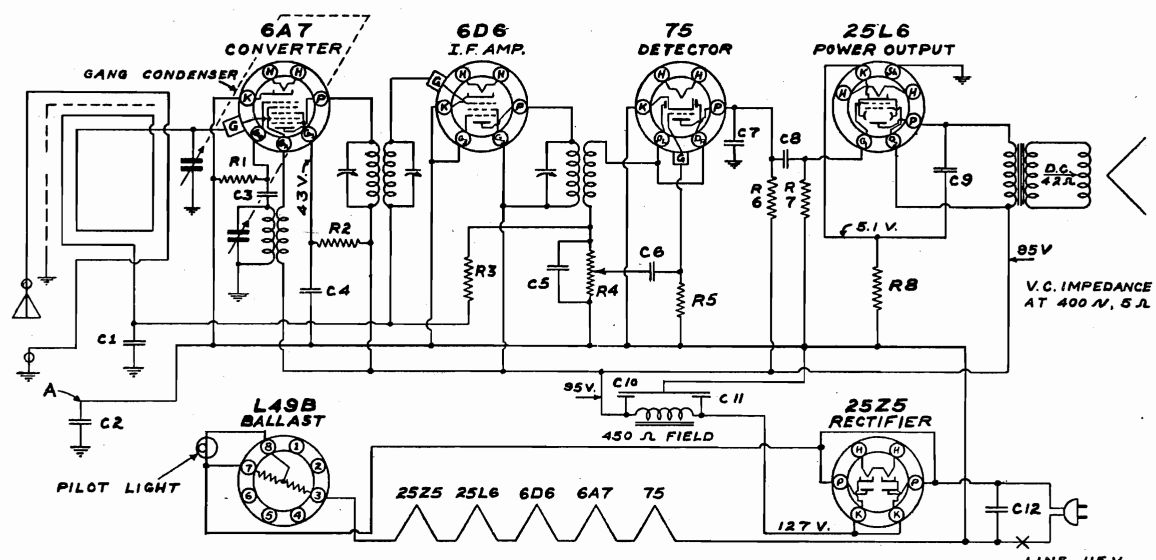
MODEL R-404

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

TRIM 1400 KC (BB)
PAD 600 KC (BB)
TRIM 6000 KC (SW)

FOR OTHER DATA SEE INDEX

FREQUENCY RANGE
535 to 1750 KC
2200 to 6500 KC



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

CONDENSERS

Nº	MFDS.	VOLTS
C1	.02	200
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

C2 is used in some models
In others point A connects to chassis

I.F. 456 K.C.
↓ INDICATES CHASSIS GROUND

MODEL R-415A

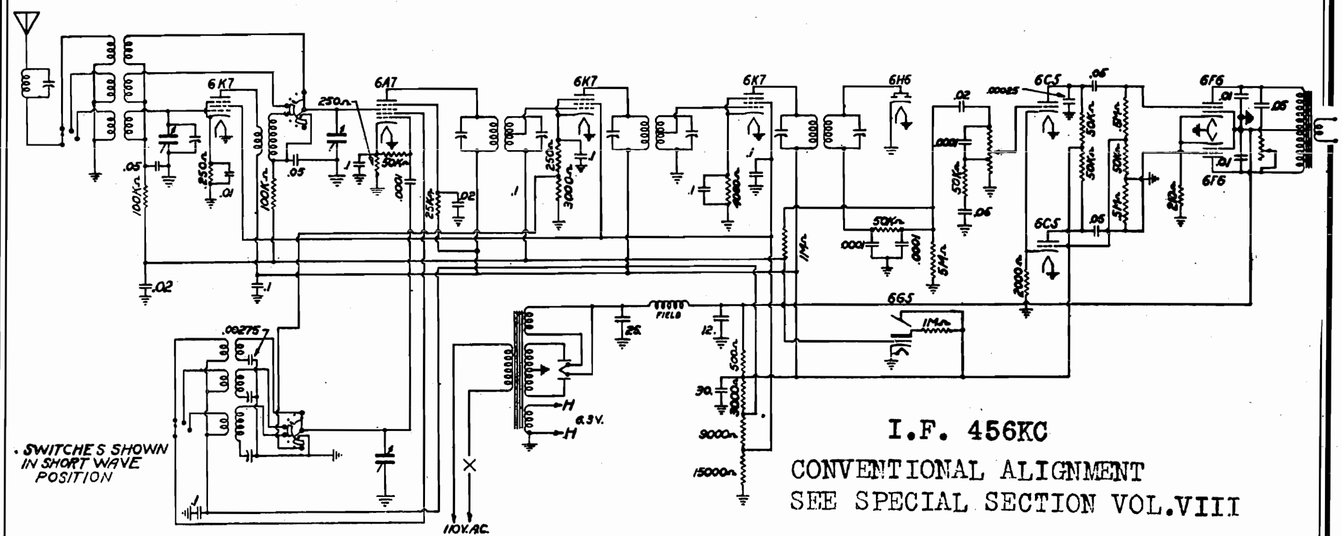
FOR OTHER DATA SEE INDEX

TRIM OSC 1630 KC
TRIM ANT 1400 KC

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

MODEL R-410

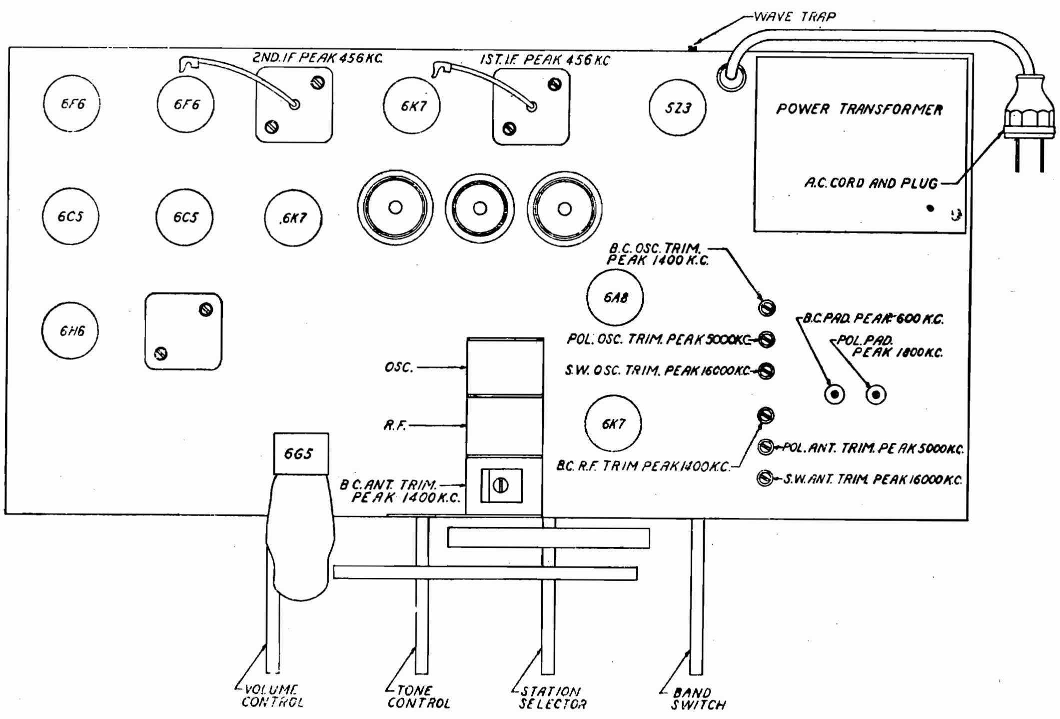
B. F. GOODRICH



I.F. 456KC
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL.VIII

WAVE TRAP ADJUSTMENT

At the rear of the chassis near the Antenna and Ground posts is an adjustment screw connected to a trap circuit for elimination of code interference when operating on the broadcast band. If code interference is encountered adjustment of this screw will filter it out. It is to be used only if such interference is experienced in broadcast reception. It's use prevents code transmitters operating on a frequency around 456 K. C. from being received by the I. F. amplifier which is tuned to 456 K. C.



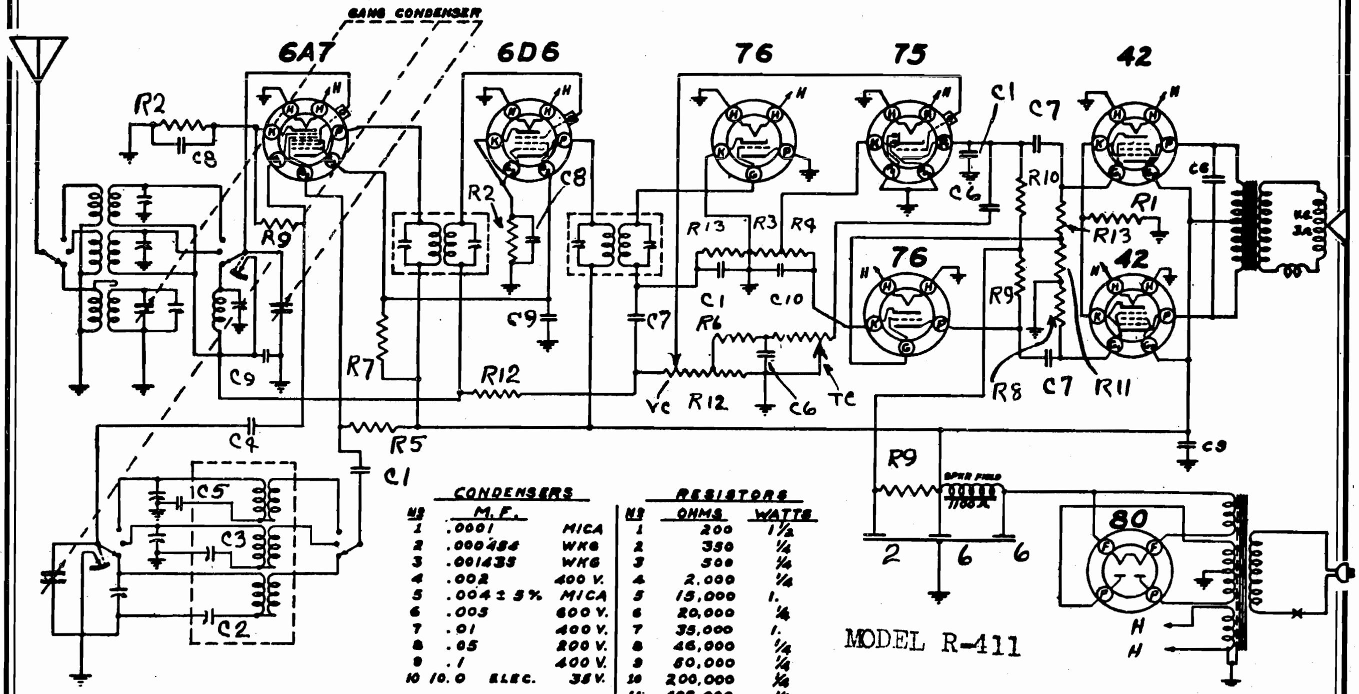
SERVICE DATA FOR ALL BANDS

If it is suspected that the oscillator has stopped but is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 6A8 (short stator and rotor plates of oscillator section on gang condenser). If oscillating properly, grounding the grid will cause an appreciable drop in oscillator voltage. Grounding or shorting the stator and grid components should be accomplished by grounding the stator mounting nut to the frame of the condenser with a screw-driver or any metallic conductor.

Do not wedge a screw-driver between the plates for this is liable to permanently warp the plates and thus prevent the oscillator section of the gang condenser from tracking

B. F. GOODRICH

MODELS R-405, R-411, R-421, R-436, R-454



No.	M.F. (CONDENSERS)	
1	.0001	MICA
2	.000454	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.

No.	OHMS (RESISTORS)	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	50,000	¼
10	200,000	¼
11	455.000	¼
12	1 MEG.	¼
13	5 MEG.	¼

MODEL R-411

V.C. - VOLUME CONTROL.
T.C. - TONE CONTROL.
SWITCHES IN BROADCAST POSITION.

FREQUENCY RANGE

535 to 1730- KC
1.7 to 5.6 - MC
5.6 to 18.1- MC

IF PEAKED AT 456 KC

Eight Tube AC Superheterodyne

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. Align all four I.F. trimmers to peak or maximum reading on the output meter.

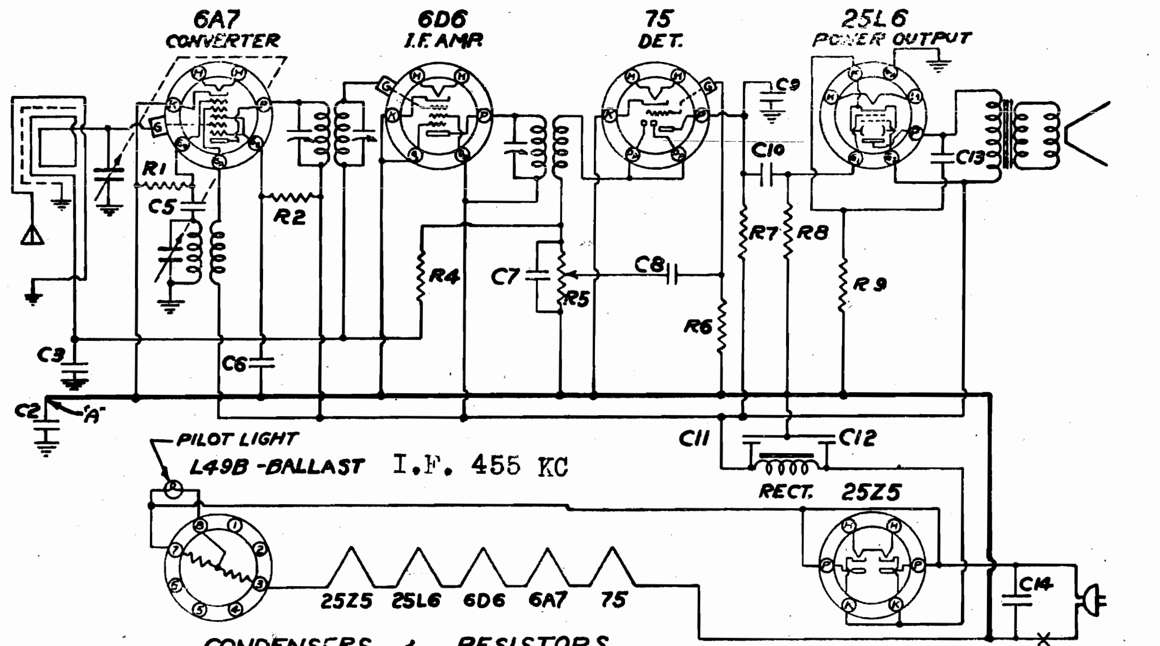
BROADCAST BAND ALIGNMENT Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. 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 R-412, R-412A

B. F. GOODRICH



I.F. 455 KC

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOL. VIII

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.	150
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.

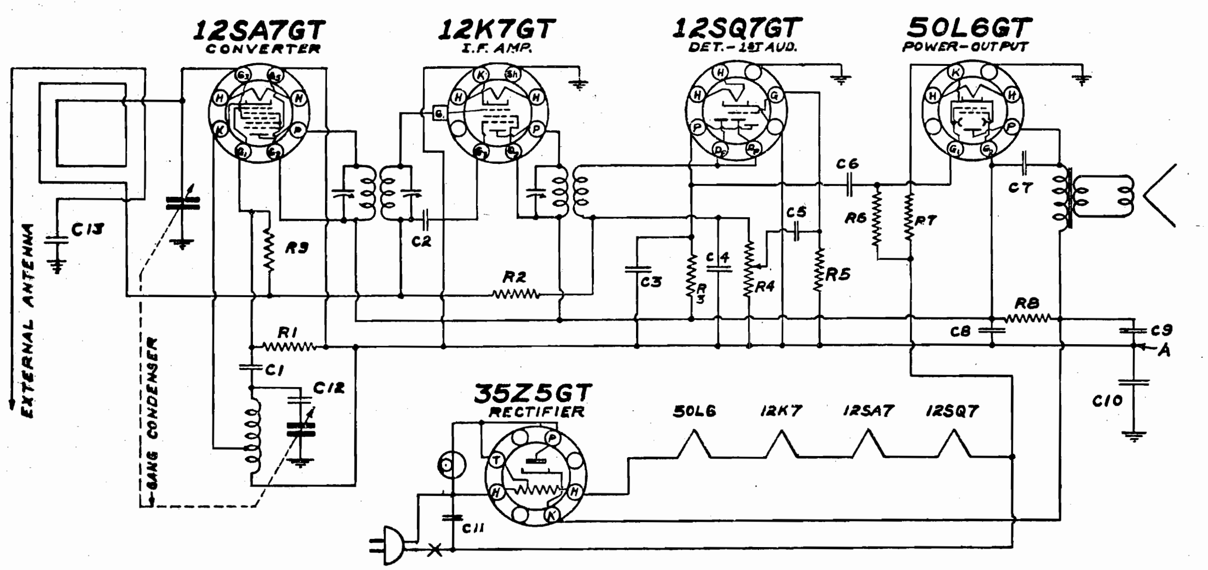
FOR OTHER DATA SEE INDEX

SCHEMATIC DIAGRAM

MODEL R-412

NOTE: C2 USED on some models. On others POINT "A" IS CONNECTED TO CHASSIS

ALIGNMENT MODELS R-412 and R-412A---Trim Osc 1730 KC, Ant 1400 KC Pad 600 KC



RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150 ± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C	R9	15 MEG.	½
R5	5 MEG.	½			

CAPACITORS

Nº	MFD.	VOLTS	Nº	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

FOR OTHER DATA SEE INDEX

I.F. 455 KC

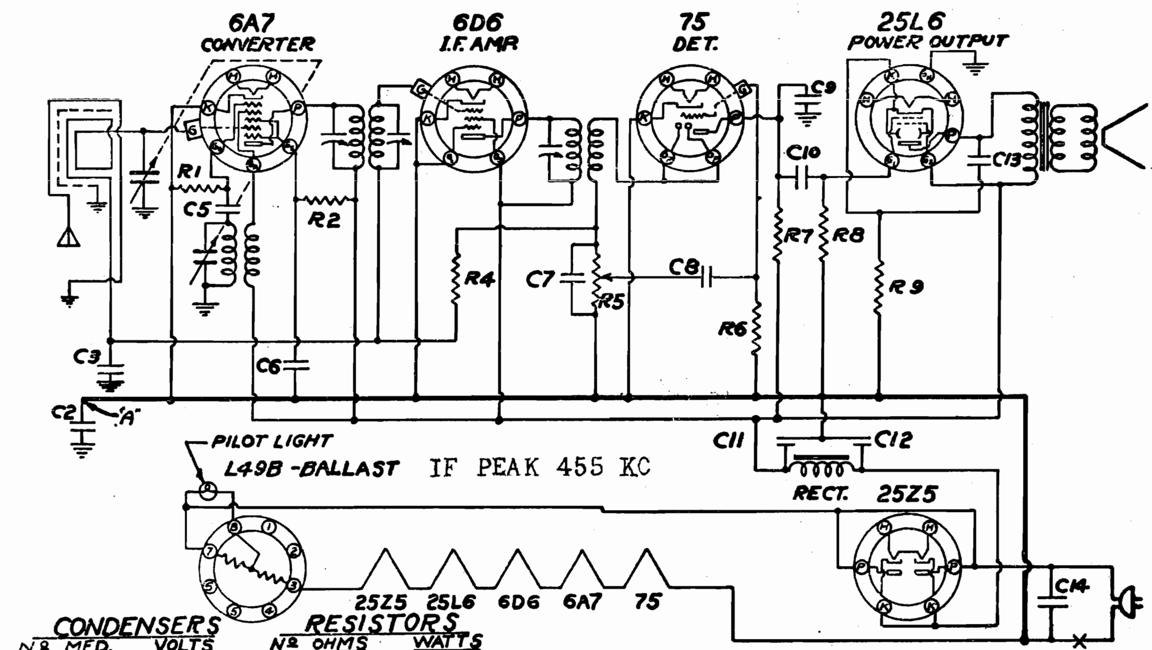
TUBES SHOW BOTTOM VIEW

MODEL R-412A

C10 and C12 used in some models. In others point "A" is connected to chassis.

B. F. GOODRICH

MODELS R-413, R-413A



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.	150
C13	.005	600
C14	.05	400

RESISTORS

Nº	OHMS	WATTS
R1	50,000	1/2
R2	30,000	1/2
R4	2,000,000	1/2
R5	500,000	VOL CONT
R6	5,000,000	1/2
R7	250,000	1/2
R8	500,000	1/2
R9	150	1/2 ± 10%

⏚ IND. CHASSIS GND.

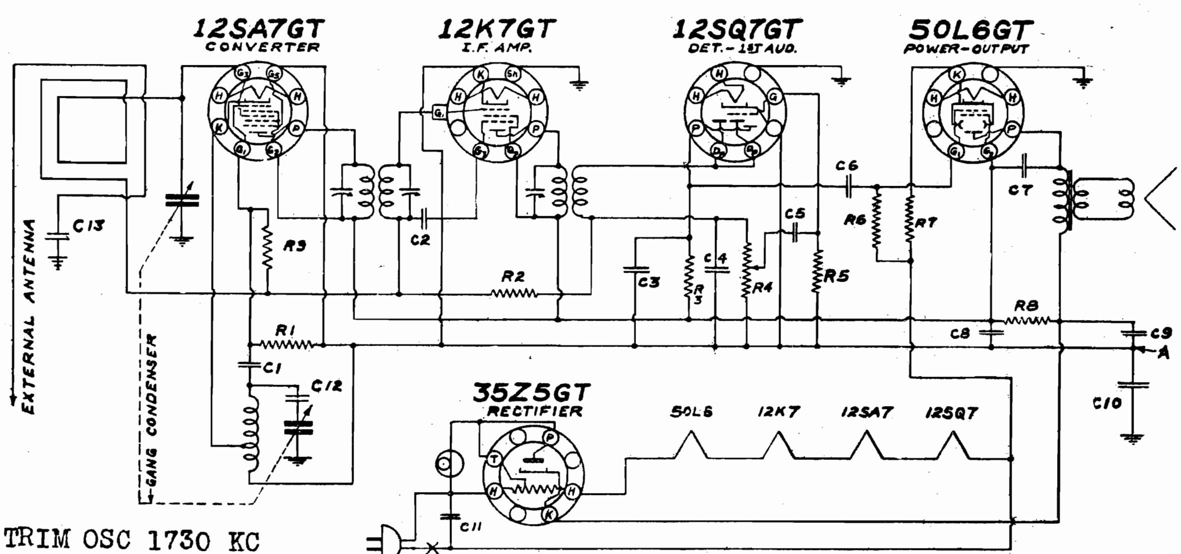
TRIM OSC 1730 KC
TRIM ANT 1400 KC

MODEL R-413

FOR OTHER DATA SEE INDEX

NOTE: C2 USED on some models; On others POINT "A" IS CONNECTED TO CHASSIS

CONVENTIONAL ALIGNMENT PROCEDURE FOR BOTH THESE MODELS
FOR FULL DETAILS SEE SPECIAL SECTION VOL. VIII.



TRIM OSC 1730 KC
TRIM ANT 1400 KC

FOR OTHER DATA SEE INDEX

RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	20,000	1/2	R6	500,000	1/2
R2	2 MEG.	1/2	R7	150 ± 10%	1/2
R3	250,000	1/2	R8	1,000	1
R4	500,000	V.C	R9	15 MEG.	1/2
R5	5 MEG.	1/2			

CAPACITORS

Nº	MFD.	VOLTS	Nº	MFD.	VOLTS
C1	0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

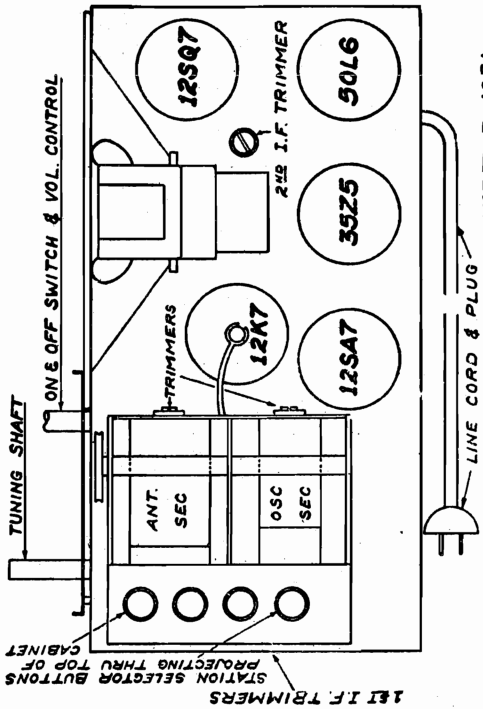
I.F. 455 K.C
TUBES SHOW BOTTOM VIEW

MODEL R-413A

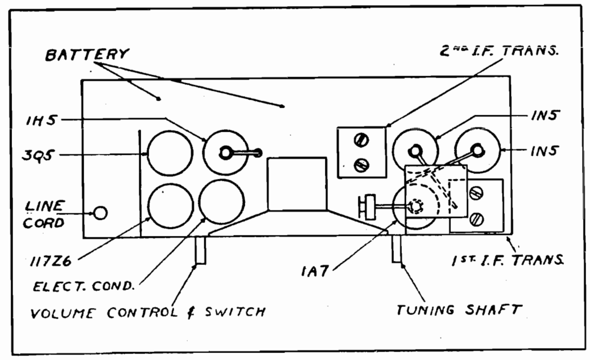
C10 and C12 used in some models. In others point "A" is connected to chassis.

MODELS R-412A, R-413, R-413A, R-415A, R-460, R-471, R-478

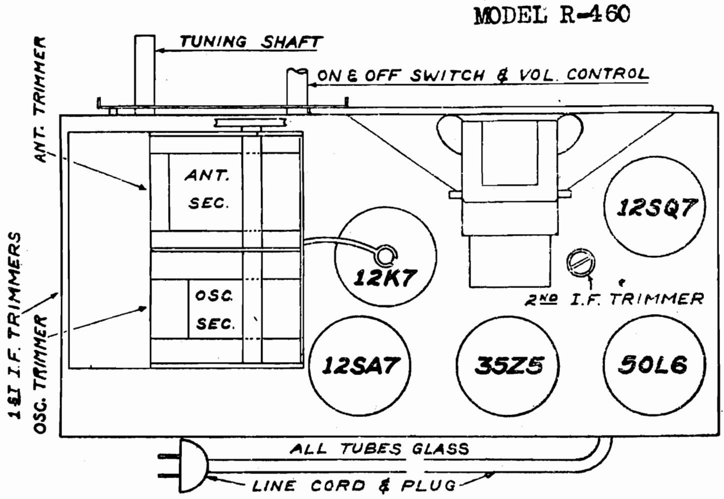
B. F. GOODRICH



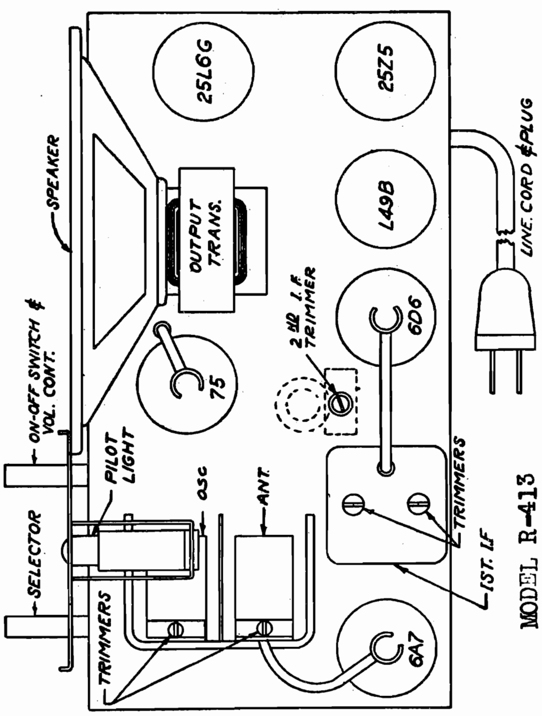
MODEL R-413A



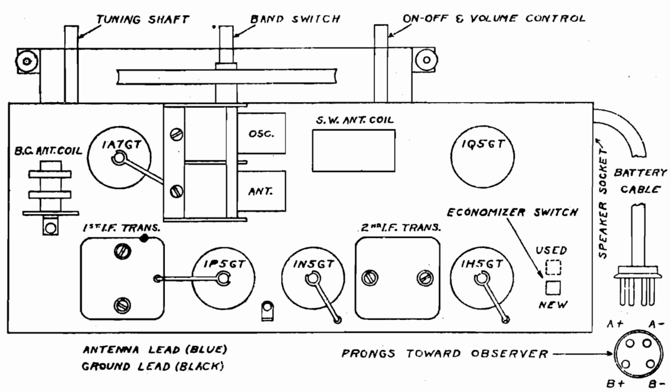
MODEL R-460



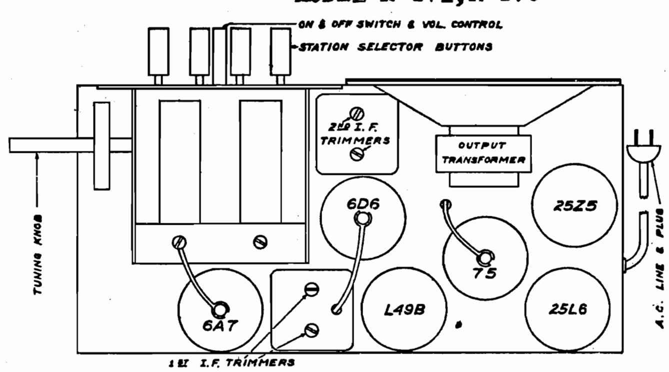
MODEL R-412A



MODEL R-413



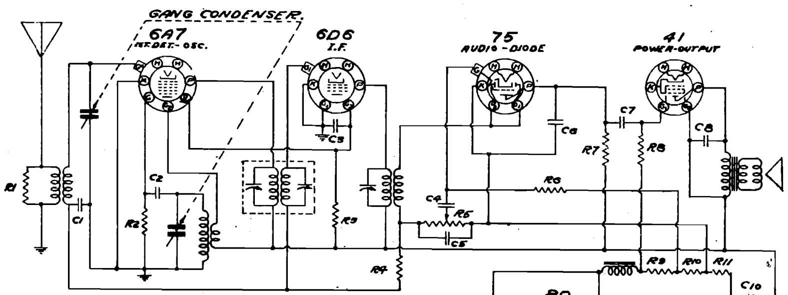
MODEL R-471, R-478



MODEL R-415A

MODELS R-414, R-416

B. F. GOODRICH

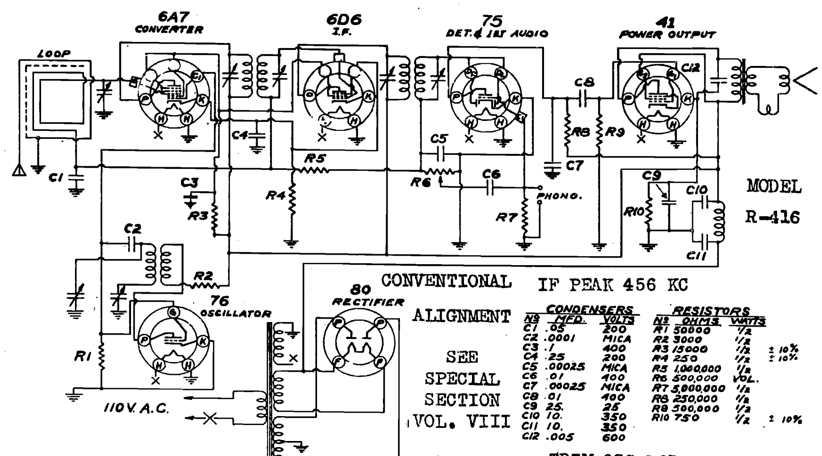


IF = 456

CAPACITORS No.	MFD.	VOLTS-SPL.	RESISTORS No.	OHMS	WATTS
1	.1	200	1	15000	1/4
2	.0001	MICA	2	50000	"
3	.1	400	3	15000	"
4	.01	400	4	2000000	"
5	.00025	MICA	5	500000	VOL. CONT.
6	.00025	MICA	6	2000000	1/4
7	.01	400	7	200000	"
8	.01	400	8	500000	"
9	8	300 ELECT.	9	225 } ±10%	1/2
10	8	300 ELECT.	10	40 } ±10%	1/2
			11	170 } ±10%	1/2

110-120V. A.C. 60~

MODEL R-414



MODEL R-416

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOL. VIII

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 ± 10%
C3	.1	400	R3	15000	1/2 ± 10%
C4	.25	200	R4	250	1/2
C5	.00025	MICA	R5	1,000,000	1/4
C6	.01	400	R6	500,000	VOL.
C7	.00025	MICA	R7	5,000,000	1/4
C8	.01	400	R8	250,000	1/4
C9	25.	25	R9	500,000	1/2
C10	10.	350	R10	750	1/2 ± 10%
C11	10.	350			
C12	.005	600			

TRIM OSC 1630 KC
TRIM ANT 1400 KC

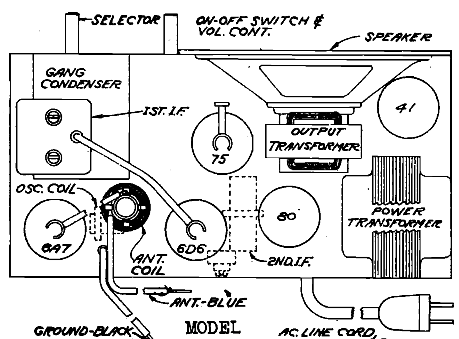
BROADCAST BAND A.C. SUPERHETERODYNE

RANGE 535 - 1730 KILOCYCLES

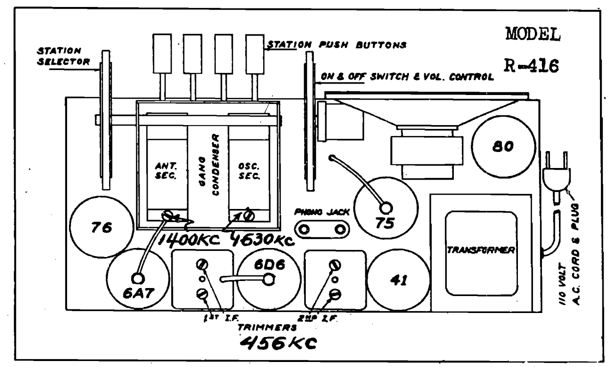
CORRECT ALIGNMENT PROCEDURE MODEL R-414 The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band alignment should be the next procedure.

I.F. ALIGNMENT 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. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT Adjust the oscillator to 1730 KC and connect the output to the antenna lead (Blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the gang condenser trimmer (oscillator) to receive this signal. After this has been carefully done, the next step is to set the generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. This is all that is necessary for the alignment unless the plates of the gang condenser have been bent out of shape. In case of bent plates, set the test oscillator and the receiver to 600 KC and bend the plates into the position for maximum output.



MODEL R-414



MODEL R-416

Voltages—Line 115 Volts AC. MODEL R-416
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

Speaker (Part No. P3087)
Field resistance.......................................1,500 ohms
DC voice coil resistance......................... 4.6 ohms
Voice coil impedance at 400 cycles... 5 ohms

PROCEDURE FOR SETTING UP PUSH BUTTONS

MODEL R-416

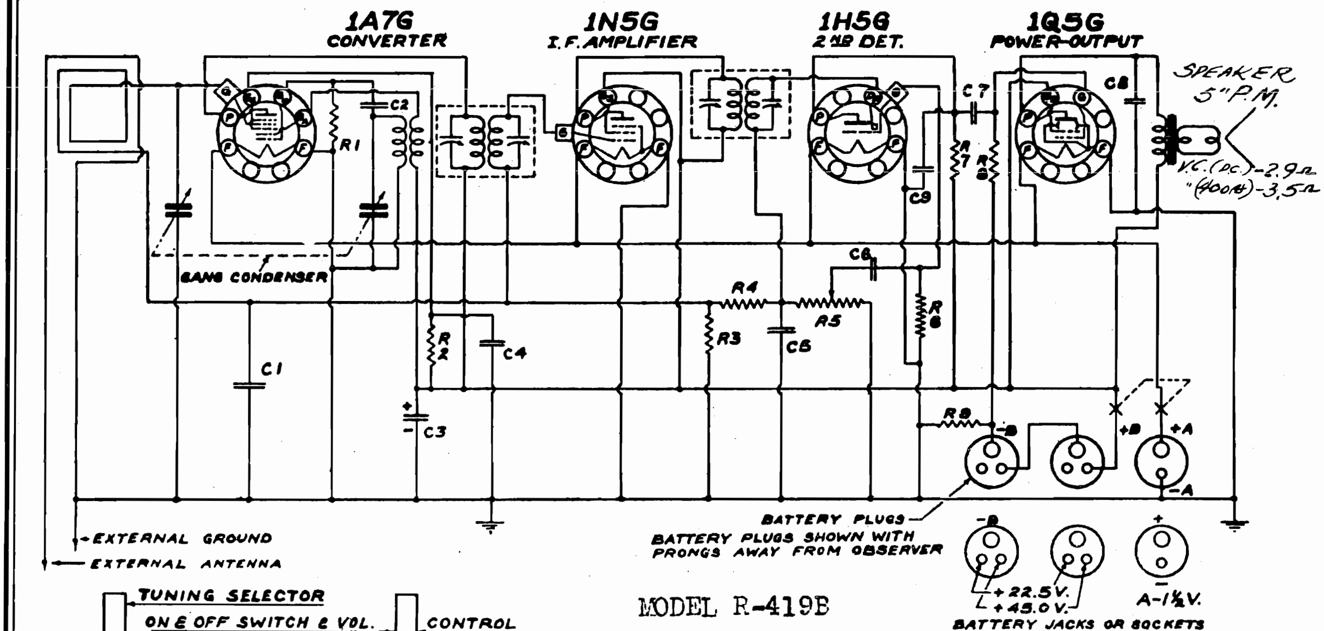
There are four push buttons by means of which four stations may be selected (See Fig. 1). Make a list of four stations tuned in regularly. Loosen any of the push buttons by turning the push button proper, counter clockwise a few turns. Holding it in, tune in any one of your favorite stations by means 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.

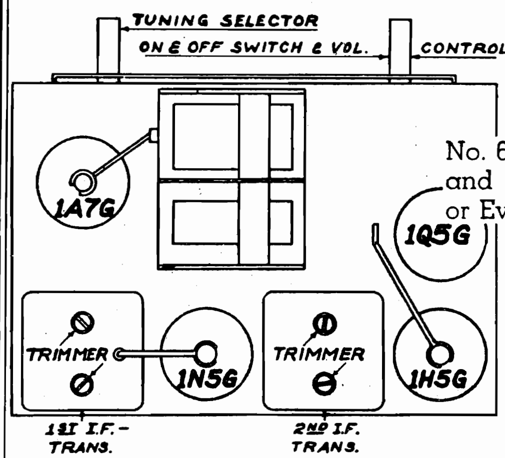
Release the push button and loosen another push button. Holding it in, tune in another favorite station using the station selector. Turn the selector wheel very slowly back and forth until the signal is clearest. Now tighten the push button by turning it clockwise.

Repeat this operation for the remaining two buttons, tightening each button securely as it is set.

MODEL R-419B

B. F. GOODRICH





AT LEFT

TOP VIEW OF CHASSIS

POWER SUPPLY The power supply of this portable radio uses one Ray-O-Vac No. P96A, General No. 6-F-1, Burgess No. 6FP1 or Eveready No. 743. Portable "A" battery and two Ray-O-Vac No. 5303, General No. V-30-B, Burgess No. B30P1 or Eveready No. 762 Portable "B" batteries.

ALIGNMENT
BROADCAST BAND

Trim Ant.- 1400 kc
" Osc.- 1610 kc

I.F.- 455 kc

I.F. ALIGNMENT Remove the chassis from the cabinet and connect one end of a 100,000 ohm resistor to the grid of the 1A7 tube and the other end to the A.V.C. fahnestock clip (See "antenna and ground" for location of this clip). Adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (1A7) thru a .05 or .1 mfd. condenser. The ground of the signal generator should be connected to the chassis ground. Align all I.F. trimmers to peak or maximum reading on the output meter.

CAPACITORS

No	MFDS.	VOLTS	No	MFDS	VOLTS
C1	05	200	C6	.01	400
C2	.00005	MICA	C7	.01	400
C3	.0(ELECT)	150	C8	.002	400
C4	.05	200	C9	.00025	MICA
C5	.00025	MICA			

RESISTORS

No	OHMS	WATTS	No	OHMS	WATTS
R1	200,000	½	R6	2,000,000	½
R2	70,000	½	R7	500,000	½
R3	2,000,000	½	R8	1,000,000	½
R4	2,000,000	½	R9	440	½
R5	500,000	V.C.			

SERVICE INFORMATION

Speaker (Part No. P3465) 5" PM Type

D.C. voice coil resistance......................2.9 ohms

Voice coil impedance at 400 cycles.3.5 ohms

Oscillator Coil (Part No. P3318) (Brown Dot)

Primary—No. 2 and No. 3—1.7 ohms.

Secondary—No. 4 and No. 1— 4.9 ohms.

First I.F. Transformer (Part No. P3048)

Primary—Blue white, plate; red white B+— 12.1 ohms.

Secondary—White, grid; black white, AVC— 24.9 ohms.

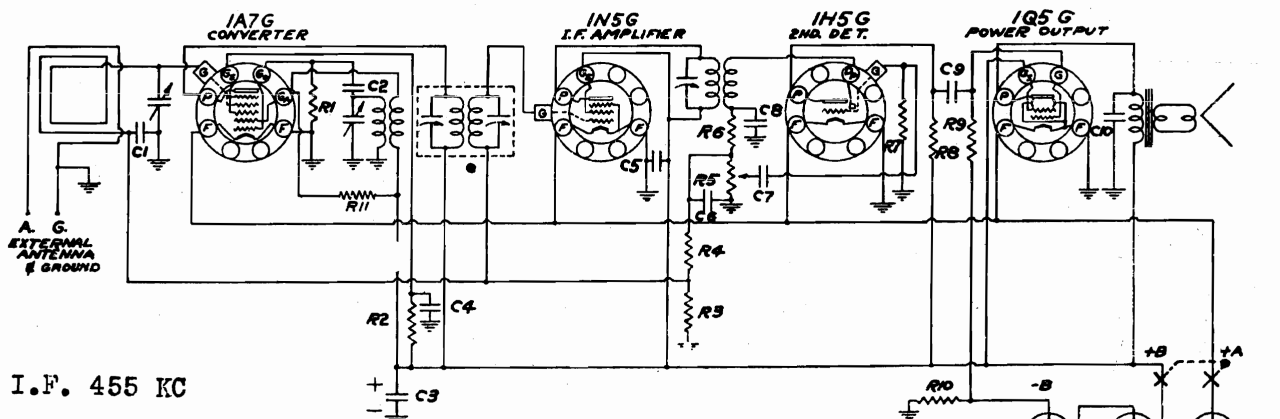
Second I.F. Transformer (Part No. P2606)

Primary—Blue white, plate; red white B+—15.1 ohms.

Secondary—White, grid; black white, AVC—11.8 ohms.

B. F. GOODRICH

MODELS R-419, R-420



I.F. 455 KC

TRIM OSC 1610 KC
TRIM ANT 1400 KC

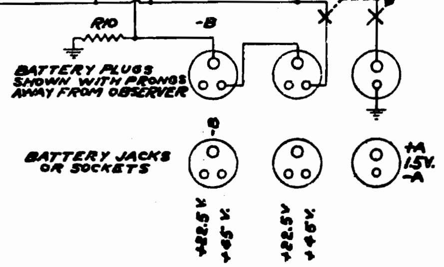
MODEL R-419

CONDENSERS

No	MFD.	VOLTS
C1	.05	200
C2	.00005	MICA
C3	4.-150V.	ELEC.
C4	.05	200
C5	.05	200
C6	.0002	MICA
C7	.01	400
C8	.0002	MICA
C9	.01	400
C10	.001	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	440	1/2	
R11	15,000	1/2	

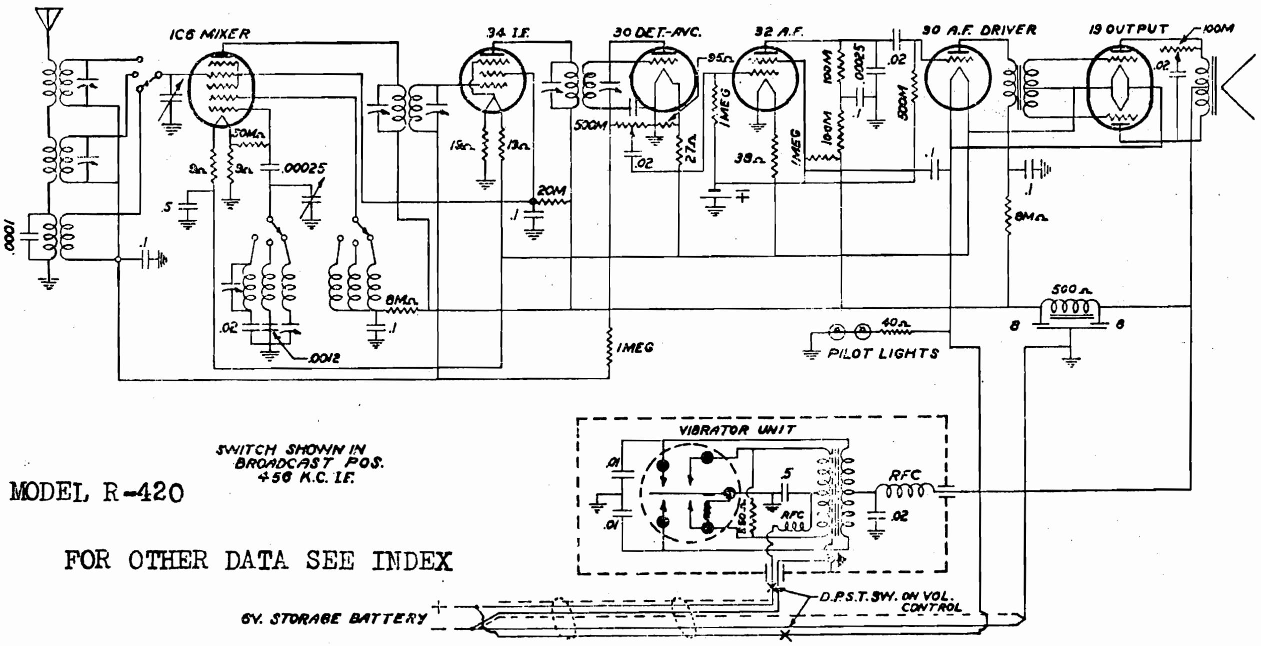


I.F. ALIGNMENT Remove the receiver chassis from the cabinet and connect a 100,000 ohm resistor to the green and yellow leads in place of the loop antenna to which they were originally connected. Adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (1A7) through a .05 or .1 mfd. condenser. The ground on the signal generator should be connected to the chassis ground. Align all I.F. trimmers to peak or maximum reading on the output meter.

FOR OTHER DATA, SEE INDEX

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION
VOL. VIII



MODEL R-420

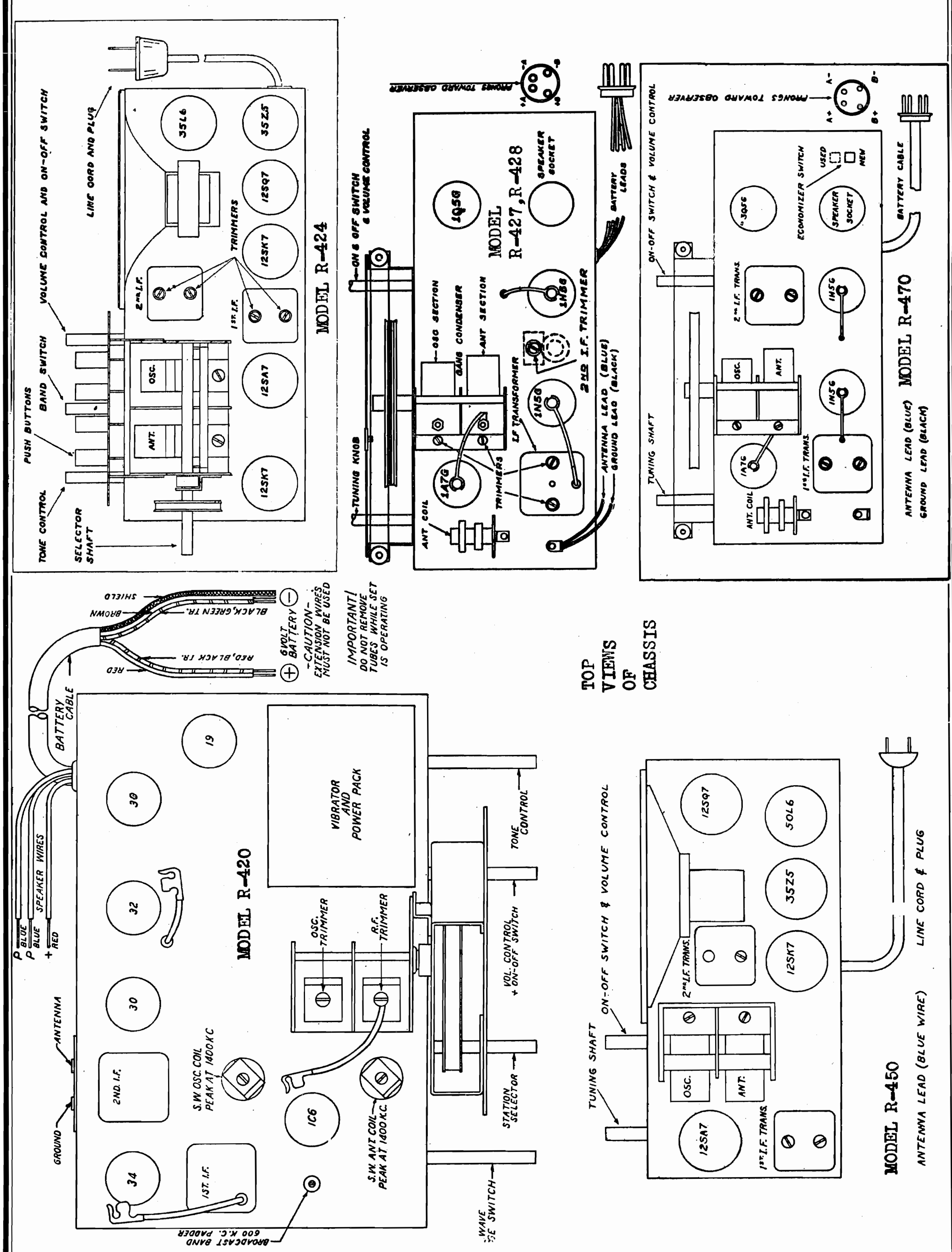
FOR OTHER DATA SEE INDEX

BATTERY SELECTION This receiver is designed to operate entirely from a 6 volt storage battery. It requires no other batteries. It will operate from any storage battery having a capacity ranging from 90 to 175 ampere hours. It is suggested, for the sake of greatest economy, that the largest possible capacity battery be used. The following is a schedule giving the number of hours of service on a single charge from batteries of standard capacities. A fully charged battery will provide satisfactory power for the periods specified before requiring additional charge.

90 Ampere Hour Capacity provides	60 hours use.
100 Ampere Hour Capacity provides	66 hours use.
110 Ampere Hour Capacity provides	73 hours use.
120 Ampere Hour Capacity provides	80 hours use.
150 Ampere Hour Capacity provides	100 hours use.
170 Ampere Hour Capacity provides	113 hours use.

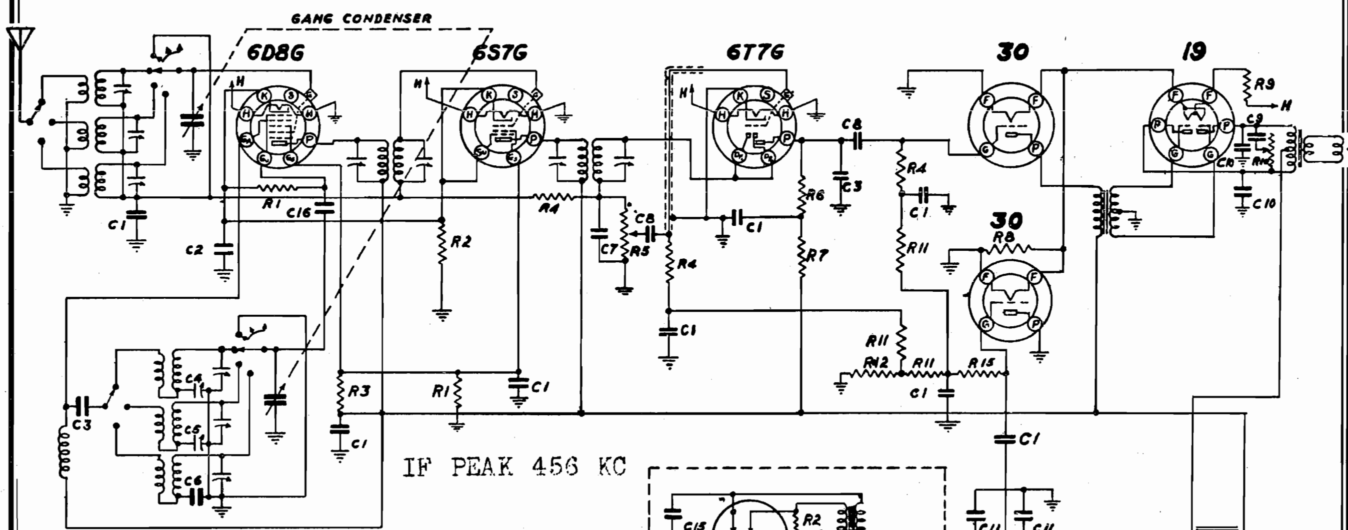
MODELS R-420, R-424, R-427, R-428, R-450, R-470

B. F. GOODRICH



B. F. GOODRICH

MODELS R-421, R-460



CONDENSERS

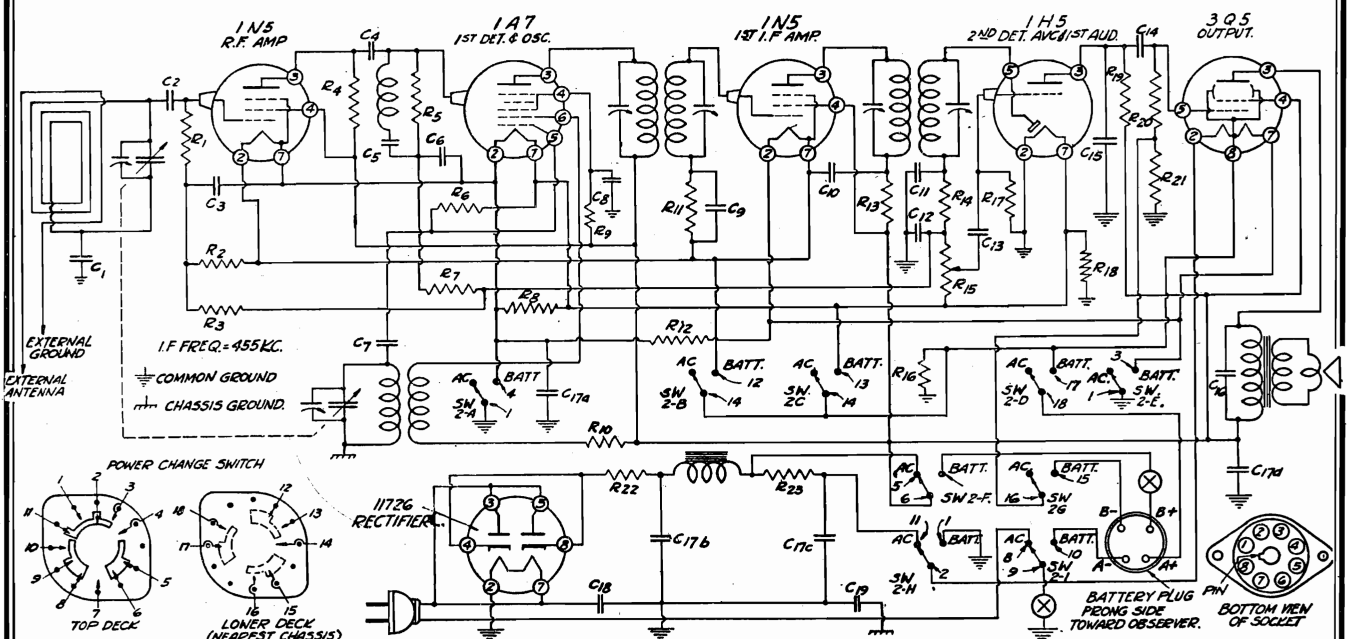
C1 - .1-200V.
C2 - .25-200V.
C3 - 500MMF.
C4 - 300-600 MMF.
C5 - 800-1600 MMF.
C6 - 4000 MMF.
C7 - 250 MMF.
C8 - .02-400 V.
C9 - .05-400V.
C10 - .002-400 V.
C11 - .005-400 V.
C12 - .01 - 600 V.
C13 - .5-10 V.
C14 - .05-200 V.
C15 - .01-1000 V.
C16 - 100 MMF.

RESISTORS

R1 - 50,000 Ω ¼ W.
R2 - 250 Ω ¼ W.
R3 - 15,000 Ω ¼ W.
R4 - 1 MEG Ω ⅓ W.
R5 - 500,000 Ω VOLUME CONTROL
R6 - 250000 Ω ¼ W.
R7 - 100,000 Ω ¼ W.
R8 - 14.3 Ω ± 5%
R9 - 8.1 Ω ± 5%
R10 - 100,000 Ω TONE CONTROL
R11 - 500,000 Ω ¼ W.
R12 - 70,000 Ω ¼ W.
R13 - 200,000 Ω ¼ W.
R14 - 70. Ω ± 10%
R15 - 600,000 Ω ⅛ W.

SWITCHES IN BROADCAST POSITION

MODEL R-421
FOR OTHER DATA SEE INDEX



RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	1,000,000	½	R13	5,000	½
R2	5,000,000	½	R14	70,000	½
R3	5,000,000	½	R15	1,000,000	V.C.
R4	10,000	½	R16	1,500	½
R5	250,000	½	R17	5,000,000	½
R6	200,000	½	R18	150	½
R7	1,000,000	½	R19	1,000,000	½
R8	300	½	R20	1,000,000	½
R9	30,000	½	R21	400—10%	½
R10	500	½	R22	30	½
R11	15,000,000	½	R23	1,950	5
R12	700	½			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.1	200	C12	.00005	Mica
C2	.00025	Mica	C13	.01	400
C3	.01	200	C14	.01	400
C4	.00005	Mica	C15	.00025	Mica
C5	.00006	Mica	C16	.002	400
C6	.01	200	C17a	40.	25
C7	.00005	Mica	C17b	30.	150
C8	.01	400	C17c	40.	25
C9	.01	200	C17d	30.	150
C10	.05	200	C18	.05	400
C11	.00005	Mica	C19	.25	200

In Model G6 switch points 15, 16, 17 and 18 are not used. Power change switch 2A thru 2I and the pictorial view shown in the "AC-DC" position.

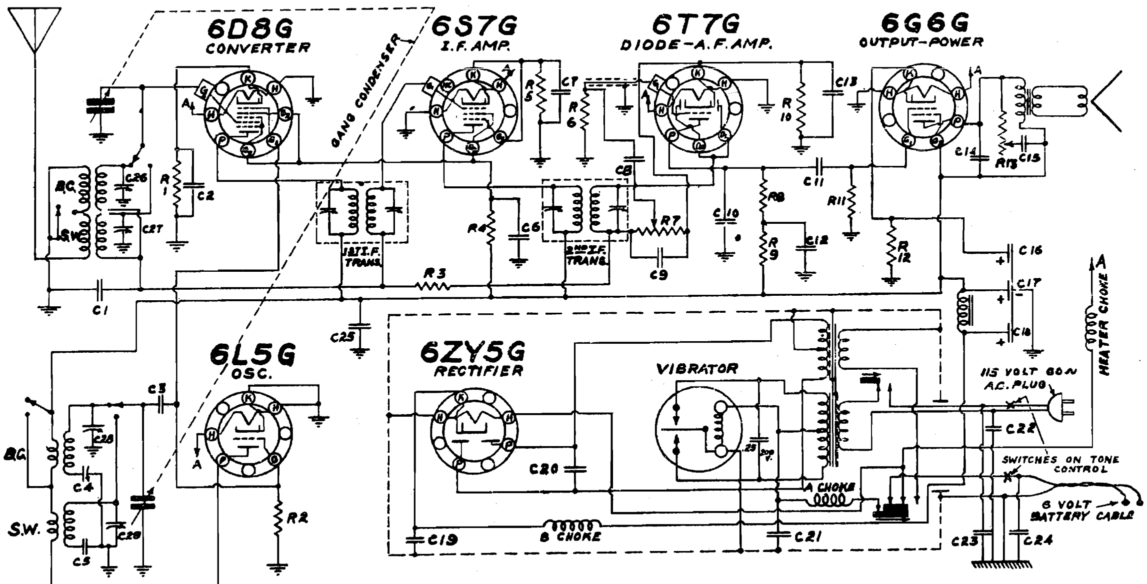
In late models C1 is not used and C11 and R14 are inside 2nd I.F. can.

MODEL R-460

TRIM OSC 1550 KC, ANT 1400 KC, PAD 600 KC   FOR OTHER DATA SEE INDEX

MODEL R-422

B. F. GOODRICH



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 μμf.	MICA	15	.05 "	400 V.
4	300-600 μμf	"	16	5. "	25 V.
5	4000 μμf	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 "	1,000 V. OIL TYPE
9	250 μμf.	MICA	21	.5 "	10 V.
10	250 "	"	22	.05 "	400 V.
11	.01 Mfd.	400 V.	23	.01 "	600 V.
12	.1 "	200 V.	24	.5 "	10 V.
			25	.1 "	200 V.

RESISTORS

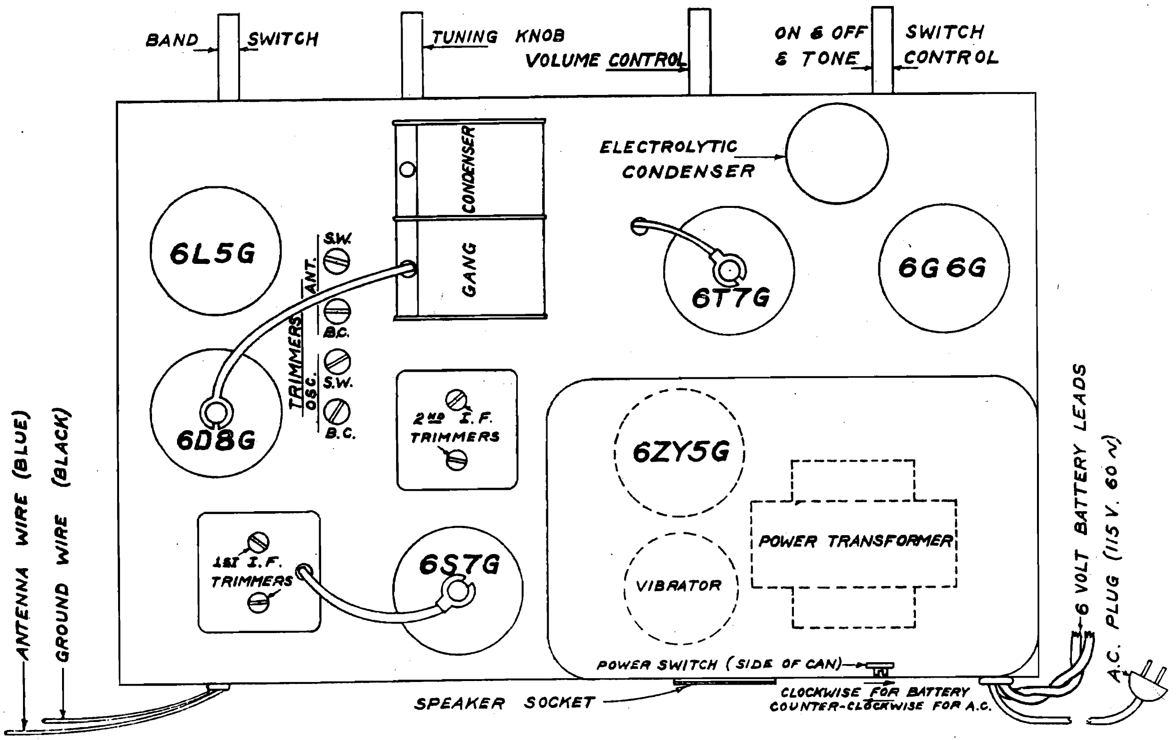
Nº	OHMS	WATTS	SPL. TOL.
1	1500	¼	± 10%
2	50,000	¼	
3	1,000,000	¼	
4	30,000	¼	
5	1,000	¼	± 10%
6	1,000,000	¼	
7	500,000	¼	(VOL. CONT)
8	500,000	¼	
9	200,000	¼	
10	10,000	¼	± 10%
11	500,000	¼	
12	450	¼	± 10%
13	100,000	¼	(TONE CONT.)

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTTON **VOL.VIII**

BAND SWITCH IN BROADCAST POSITION.
POWER SWITCH IN BATTERY POSITION.
I.F. – 456 K.C.
C26 TO C29 – 2 TO 20 μμf. TRIMMERS

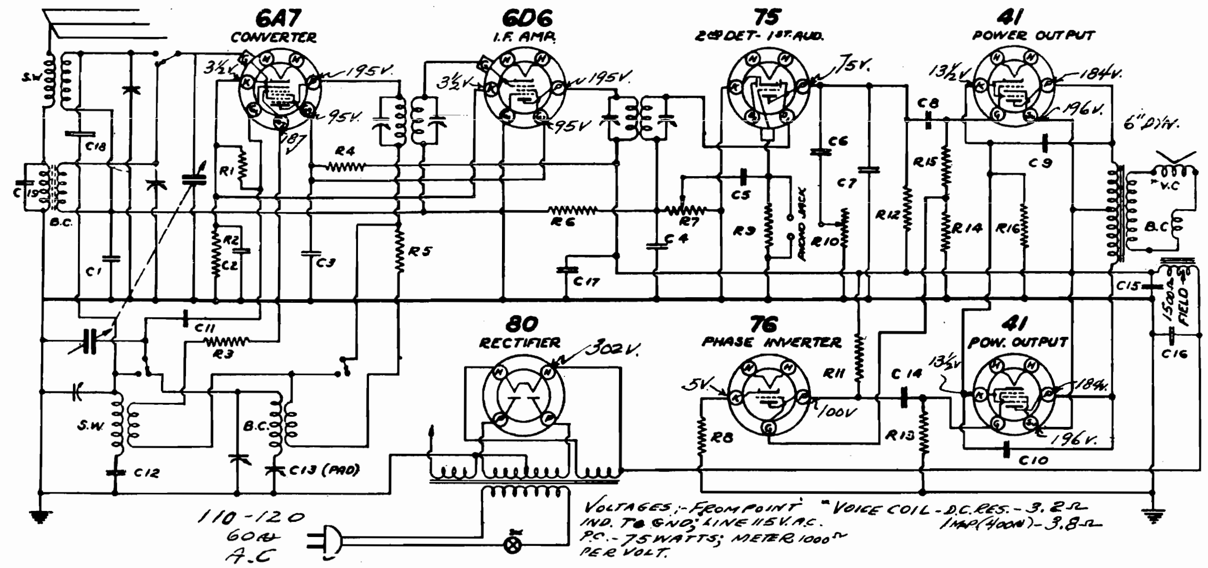
MODEL R-422

This receiver is designed to operate over two tuning ranges; the broadcast range which extends from 535 to 1730 Kilocycles (KC) (173.4 to 561 meters), and the International Short Wave Band which extends from 5650 to 18,100 Kilocycles (KC) (16.5 to 53 Meters). This latter range is the one which includes the internationally assigned bands—the 19, 25, 31, 39 and 49 meter bands.



B. F. GOODRICH

MODELS R-423, R-436



CAPACITORS						RESISTORS					
No.	MFDS	VOLTS	No.	MFDS	VOLTS	No.	OHMS	WATTS	No.	OHMS	WATTS
C1	.05	200	C11	.0001	MICA	R1	50,000	1/2	R11	50,000	1/2
C2	.25	200	C12	.004±5%	MICA	R2	200	1/2	R12	250,000	1/2
C3	.05	400	C13	300-600 μμfd	PADDER	R3	250	1/2	R13	500,000	1/2
C4	.00025	MICA	C14	.01	400	R4	20,000	1/2	R14	100,000	1/2
C5	.01	400	C15	10.0	350	R5	1,000	1/2	R15	400,000	1/2
C6	.005	600	C16	10.0	350	R6	2 MEG	1/2	R16	300	1/2
C7	.00025	MICA	C17	.05	400	R7	500,000	VOL. CON.			
C8	.01	400	C18	GIMMICK		R8	3,000	1/2			
C9	.005	600	C19	.0001	MICA	R9	5 MEG	1/2			
C10	.005	600				R10	500,000	TONE CON.			

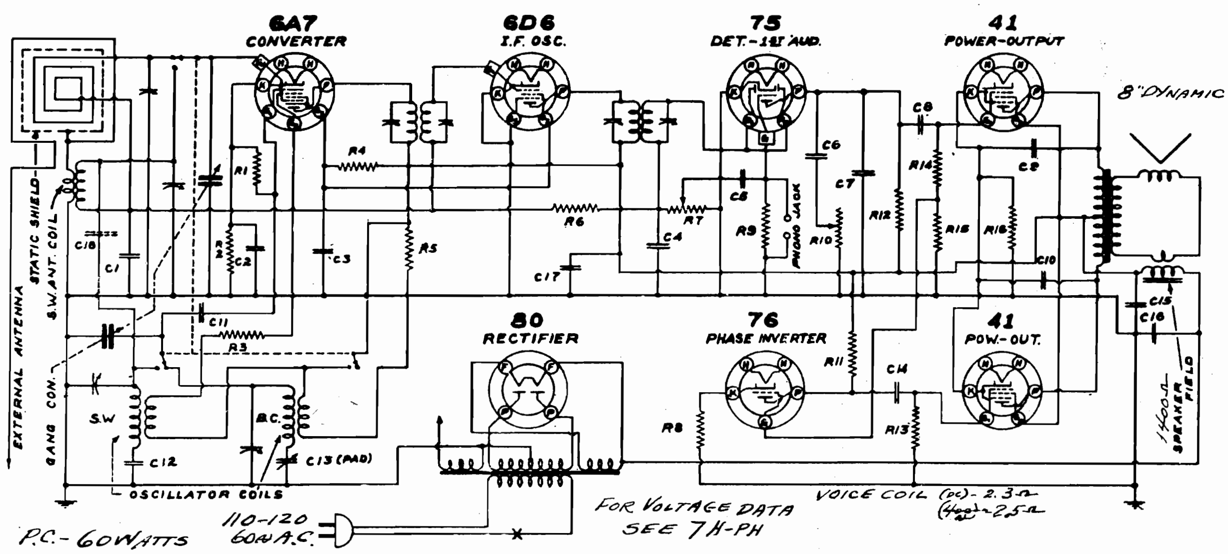
I.F. 455 KC

BAND SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF TUBE SOCKETS SHOWN
GANG CONDENSER CAPACITY 443 μμfds.

TRIM OSC- 1730 KC (BB)
TRIM OSC- 18100 KC (SW)
PAD OSC- 600 KC (BB)
TRIM ANT- 1400 KC (BB)
TRIM ANT- 16000 (SW)

MODEL R_423

FOR
ALIGNMENT PROCEDURE
SEE MODEL R-411



CAPACITORS						RESISTORS					
No.	MFDS	VOLTS	No.	MFDS.	VOLTS	No.	OHMS	WATTS	No.	OHMS	WATTS
C1	.05	200	C10	.005	600	R1	50,000	1/2	R10	500,000	TONE CON.
C2	.25	200	C11	.0001	MICA	R2	300	1/2	R11	50,000	1/2
C3	.05	400	C12	.004±5%	MICA	R3	250	1/2	R12	250,000	1/2
C4	.00025	MICA	C13	300-600 μμfds.		R4	20,000	1/2	R13	500,000	1/2
C5	.01	400	C14	.01	400	R5	1,000	1/2	R14	400,000	1/2
C6	.005	600	C15	10.0	350	R6	2 MEG.	1/2	R15	100,000	1/2
C7	.00025	MICA	C16	10.0	350	R7	500,000	VOL. CON.	R16	300	1/2
C8	.01	400	C17	.05	400	R8	3,000	1/2			
C9	.005	600	C18	GIMMICK		R9	5 MEG.	1/2			

I.F. 455 KC

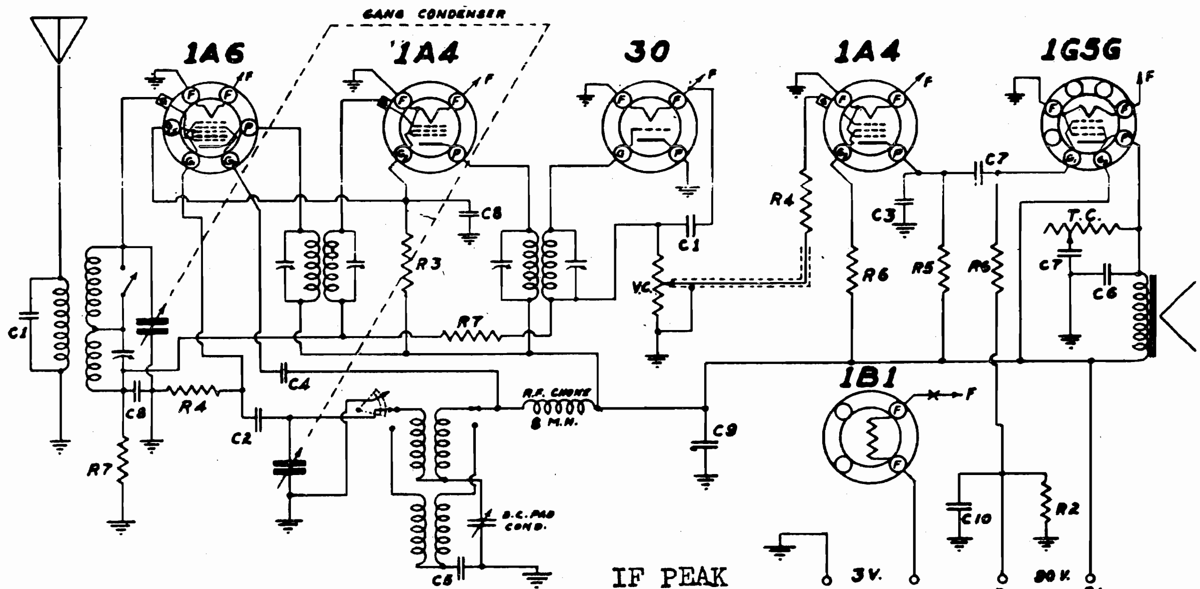
SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF SOCKETS SHOWN.
GANG CONDENSER CAPACITY 443 μμfds.

MODEL R-436

TRIM OSC-1550 KC (BB)
OTHER ALIGNMENT DATA SAME AS MODEL R-411

MODEL R-425

B. F. GOODRICH



IF PEAK
456 KC

CONDENSERS

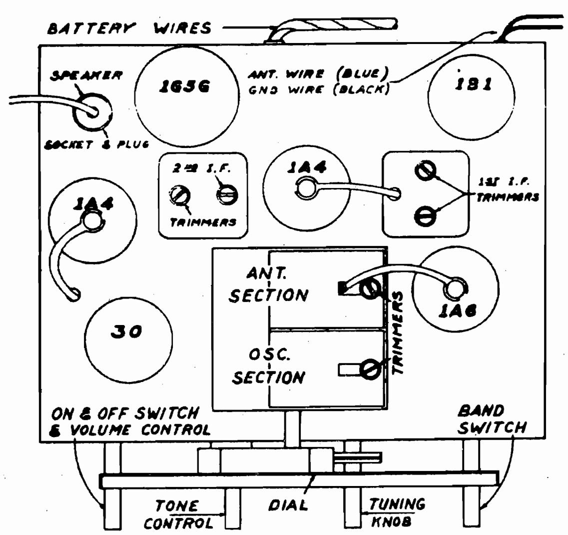
No.	MFD.	
1	.0001	MICA
2	.00025	"
3	.0005	"
4	.001	"
5	.0015	"
6	.002	200 VOLTS
7	.01	200 "
8	.05	200 "
9	.25	
10	10.0	ELECT. 25 V.

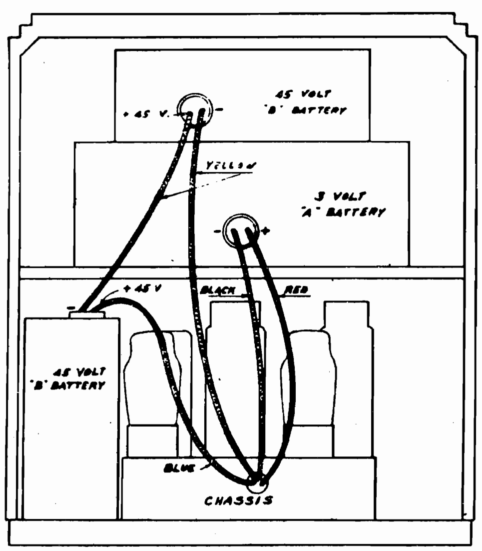
RESISTORS

No.	OHMS	WATTS
1	50.	1/8
2	535. ± 5%	1/2
3	10,000.	1/3
4	50,000.	1/4
5	200,000.	1/4
6	1. MEG.	1/4
7	2. MEG.	1/4

V.C. - VOLUME CONTROL - 1 MEGOHM.
T.C. - TONE CONTROL - 100,000 OHMS.
SWITCHES IN BROADCAST POSITION.

FREQUENCY RANGE -
535 to 1730 KC
2.2 to 6.5 MC





IF ALIGNMENT - Wave change Sw. in BC position. Gang condenser at minimum, generator at 456 KC, output to 1A6 CG thru .05 MFD condenser, Generator grounded to receiver, align four trimmers of IF transformers.

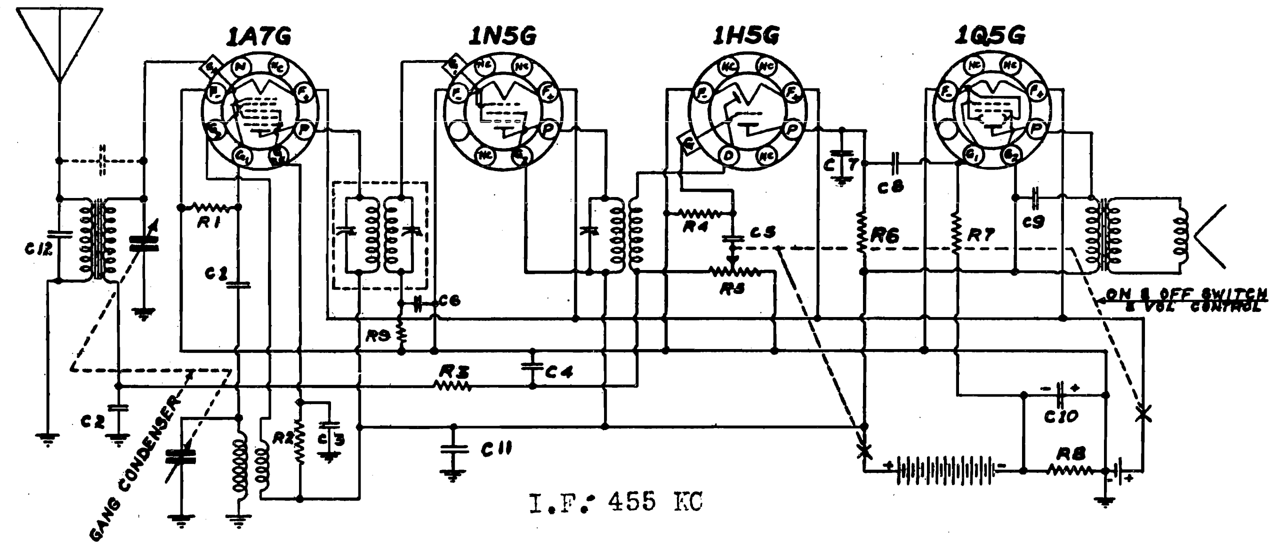
BROADCAST - Generator connected to antenna lead thru 200 MMFD condenser, and set at 1400 KC. Gang condenser at minimum. Trim oscillator then Antenna trimmers Pad the oscillator circuit at 600 KC while rocking gang condenser.

SHORT WAVE - Generator at 6000 KC, start rotating gang condenser from HF end, when signal is heard, adjust antenna trimmer (SW) for maximum peak.

Repeat all adjustments for maximum performance.

B. F. GOODRICH

MODELS R-427, R-428, R-451



I.F. 455 KC

CAPACITORS

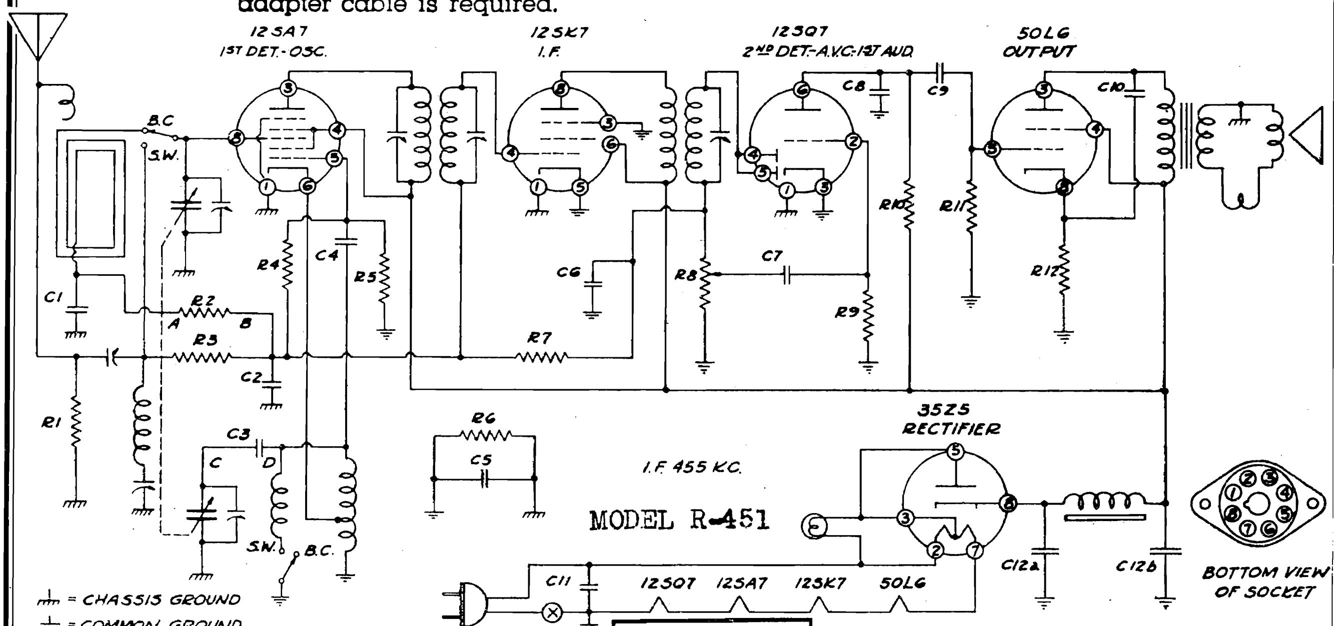
No	CAP.-MFDS.	TYPE	No	CAP.-MFDS	TYPE
C1	.00005	MICA	C7	.00025	MICA
C2	.05	200V.	C8	.01	400V.
C3	.1	200V.	C9	.005	400V.
C4	.00025	MICA	C10	20. (ELECT)	25V.
C5	.01	400V.	C11	.1	200V.
C6	.002	400V.	C12	.00005	MICA

RESISTORS

No	OHMS	WATTS	No	OHMS	WATTS
R1	200,000	¼	R6	250,000	¼
R2	70,000	¼	R7	500,000	¼
R3	1 MEG.	¼	R8	440	¼
R4	2 MEG.	¼	R9	2 MEG.	¼
R5	500,000	VOL. CONTROL			

MODELS R-427, R-428
CONVENTIONAL ALIGNMENT
FOR OTHER DATA SEE INDEX

POWER SUPPLY This receiver is designed to operate on a single unit Ray-O-Vac No. AB-82, Burgess 17G-D60, Eveready 748 or General 60DL-11L Battery. No other batteries are required as this battery is a combination 90 volt "B" battery and a 1½ volt "A" battery. To use separate batteries a P2863 battery adapter cable is required.



MODEL R-451

ISSUE A
APRIL 1940

FOR OTHER DATA SEE INDEX

CONVENTIONAL ALIGNMENT

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	250,000	¼	R7	2,000,000	¼
R2	100,000	¼	R8	500,000	V.C.
R3	250,000	¼	R9	5,000,000	¼
R4	10,000,000	¼	R10	250,000	¼
R5	25,000	¼	R11	500,000	¼
R6	150,000	¼	R12	150—10%	¼

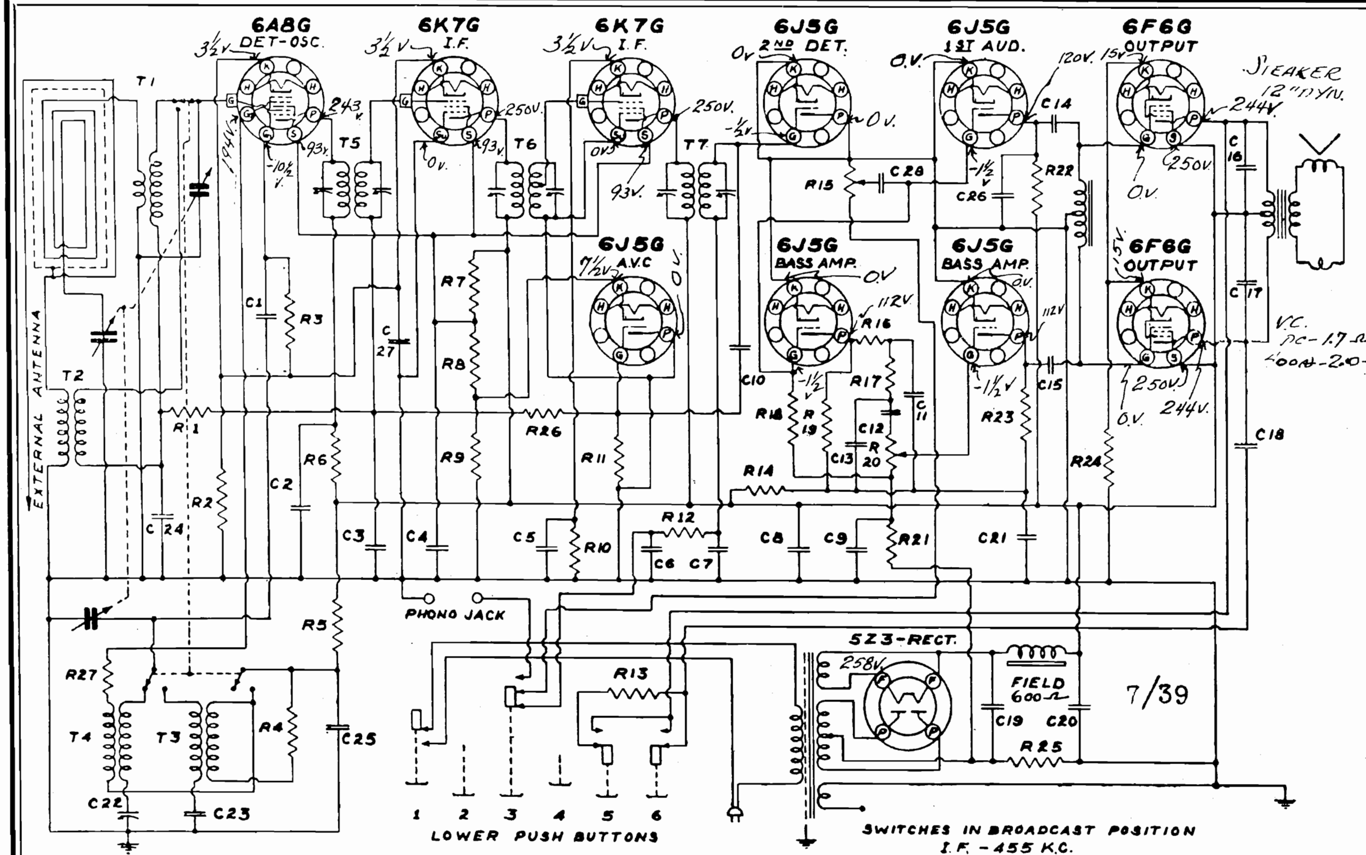
CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C8	.0005	Mica
C2	.05	200	C9	.01	400
C3	.02	200	C10	.02	400
C4	.0001	Mica	C11	.05	400
C5	.2	200	C12a	30. Elec.	150
C6	.00025	Mica	C12b	20. Elec.	150
C7	.005	400			

In some models all common grounds become chassis grounds, C1, C3, C5, R2, and R6 are omitted. Point "A" is connected to point "B" and point "C" to point "D."

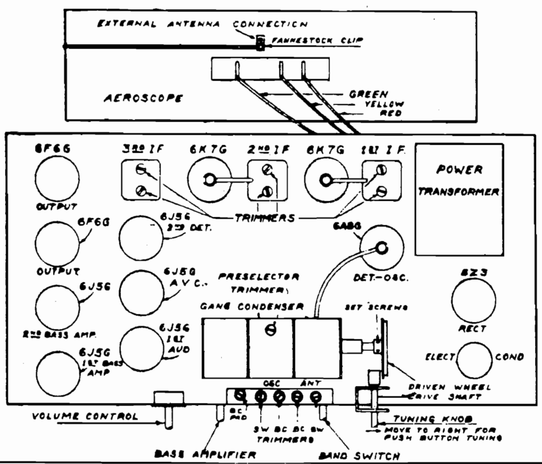
MODEL R-437

B. F. GOODRICH



	CONDENSERS
C 1—	.0001 mfd. mica
C 2—	.05 mfd. 400 volt tubular
C 3—	.05 mfd. 200 volt tubular
C 4—	.25 mfd. 200 volt tubular
C 5—	.05 mfd. 200 volt tubular
C 6—	.0001 mfd. mica
C 7—	.0001 mfd. mica
C 8—	.05 mfd. 400 volt tubular
C 9—	.25 mfd. 200 volt tubular
C10—	.00005 mfd. mica
C11—	.05 mfd. 400 volt tubular
C12—	.1 mfd. 400 volt tubular
C13—	.1 mfd. 400 volt tubular
C14—	.15 mfd. 400 volt tubular
C15—	.15 mfd. 400 volt tubular
C16—	.002 mfd. 600 volt tubular
C17—	.002 mfd. 600 volt tubular
C18—	.02 mfd. 400 volt tubular
C19—	25 mfd. 475 volt wet electrolytic
C20	20 mfd. 450 volt dry electrolytic
C21	15 mfd. 450 volt dry electrolytic
C22—	300—600 mmfd., B. C. pad
C23—	.004 mfd. mica, 5% S.W. pad
C24—	.05 mfd. 200 volt tubular
C25—	.05 mfd. 400 volt tubular
C26—	00025 mfd. mica
C27—	.25 mfd. 200 volt tubular
C28—	.01 mfd. 400 volt tubular

ALIGNMENT
BROADCAST BAND
Pad-600 kc
Trim osc-1550 kc
" ant-1400 kc
SHORTWAVE BAND
Trim osc- 18,100 kc
" ant- 16,000 kc



I.F. 455 KC
FOR CONVENTIONAL
ALIGNMENT SEE SPECIAL
SECTION OF VOL.VIII

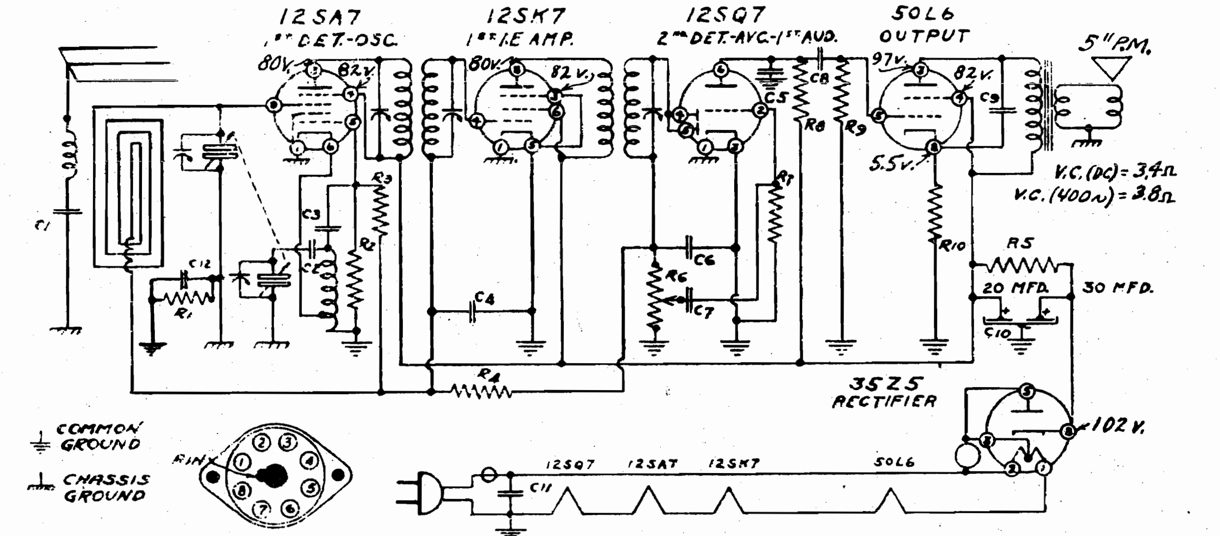
AT LEFT
TOP VIEW OF CHASSIS

VOLTAGES;- FROM POINT INDICATED TO GROUND.
LINE 115 V.AC. P.C-125W.

	RESISTORS
R 1—	250,000 ohm ½ watt
R 2—	170 ohm 1/3 watt 10%
R 3—	50,000 ohm ½ watt
R 4—	1,000 ohm ½ watt
R 5—	10,000 ohm ½ watt
R 6—	3,000 ohm ½ watt
R 7—	20,000 ohm 2 watt
R 8—	30,000 ohm ½ watt
R 9—	3,000 ohm ½ watt
R10—	500 ohm ½ watt
R11—	1,000,000 ohm ½ watt
R12—	20,000 ohm ½ watt
R13—	10,000 ohm 1 watt
R14—	5,000 ohm ½ watt
R15—	500,000 ohm vol. control
R16—	10,000 ohm ½ watt
R17—	20,000 ohm ½ watt
R18—	1,000,000 ohm ½ watt
R19—	25,000 ohm ½ watt
R20—	500,000 ohm bass control
R21—	500,000 ohm ½ watt
R22—	30,000 ohm ½ watt
R23—	25 000 ohm ½ watt
R24—	220 ohm 2 watt 10%
R25—	30 ohm (wire wound) ½ watt
R26—	250,000 ohm ½ watt
R27—	150 ohm ½ watt

B. F. GOODRICH

MODELS R-450,R-470



MODEL R-450

ISSUE A
MARCH 1940

CONDENSERS

No.	Capacity	Volts
C1	.001	600
C2	.02	400
C3	.00005	Mica
C4	.05	200
C5	.0005	Mica
C6	.00025	Mica
C7	.01	400
C8	.002	600
C9	.01	400
C10	20.0	150
	30.0	150
C11	.05	400
C12	.25	200

RESISTORS

No.	Ohms	
R1	150,000	½ Watt
R2	20,000	½ Watt
R3	15,000,000	½ Watt
R4	2,000,000	½ Watt
R5	1,000	1 Watt
R6	500,000	Vol. Cont.
R7	5,000,000	½ Watt
R8	250,000	½ Watt
R9	500,000	½ Watt
R10	150	½ Watt 10%

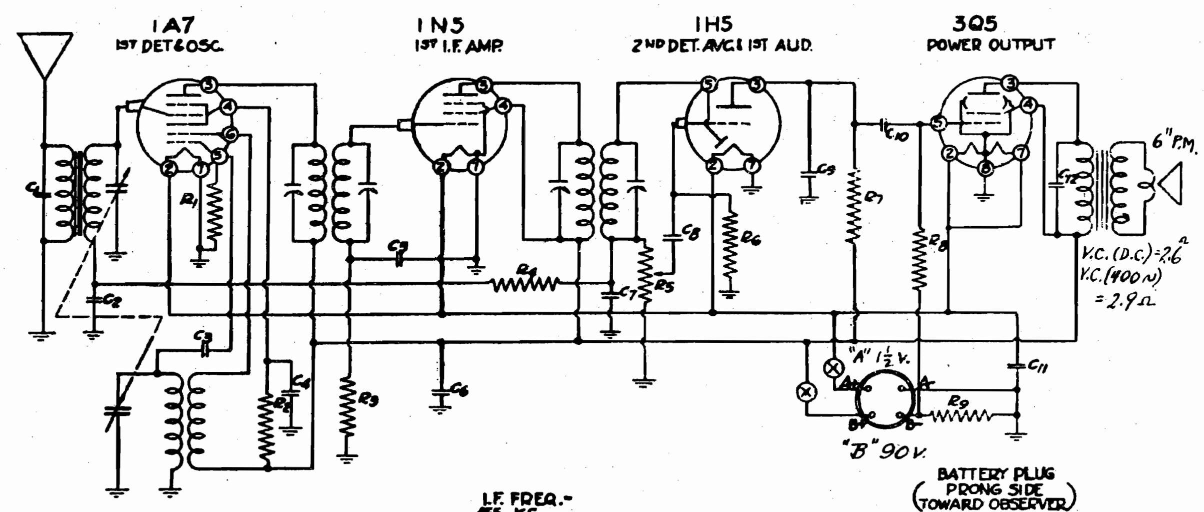
For SOCKET LAYOUT See INDEX

C2,C12 and R1 are not used in some sets,all grounds connecting to chassis ground

I.F. PEAK - 455 KC
TRIM OSC. - 1730 KC
TRIM ANT. - 1400 KC

VOLTAGES: Line 115 v. AC. Power consumption, 30 watts. Volume control maximum. Meter 1000 ohms per volt. Read from point indicated to common ground.

CONVENTIONAL ALIGNMENT



I.F. FREQ.- 455 KC

RESISTORS

No.	Ohms	Watts
R1	200,000	½
R2	30,000	½
R3	5 Meg.	¼
R4	1 Meg.	¼
R5	500,000	V.C.
R6	5 Meg.	¼
R7	" "	¼
R8	" "	¼
R9	440 10%	¼

CONDENSERS

No.	Capacity (Mfd.)	Volts
C1	.00005	Mica
C2	.05	200
C3	.00005	Mica
C4	.1	200
C5	.002	400
C6	.001	200
C7	.00025	Mica
C8	.01	400
C9	.00025	Mica
C10	.01	400
C11	20 (Elect.)	25
C12	.005	400

I.F. PEAK - 455 KC
TRIM OSC. - 1730 KC
TRIM ANT. - 1400 KC

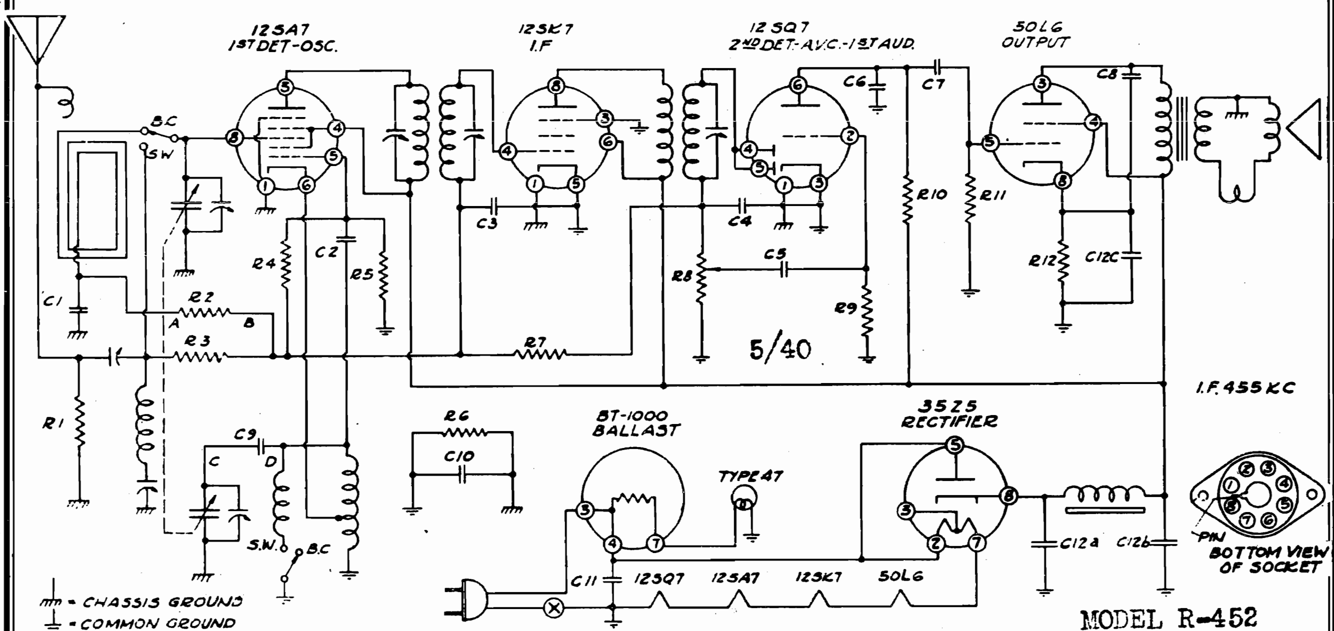
ISSUE A
MARCH 1940

MODEL R-470

For SOCKET LAYOUT See INDEX

MODELS R-452, R-453

B. F. GOODRICH



MODEL R-452

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	250,000	¼	R7	2,000,000	¼
R2	100,000	¼	R8	500,000	V.C
R3	250,000	¼	R9	5,000,000	¼
R4	10,000,000	¼	R10	250,000	¼
R5	25,000	¼	R11	500,000	¼
R6	150,000	¼	R12	150—10%	¼

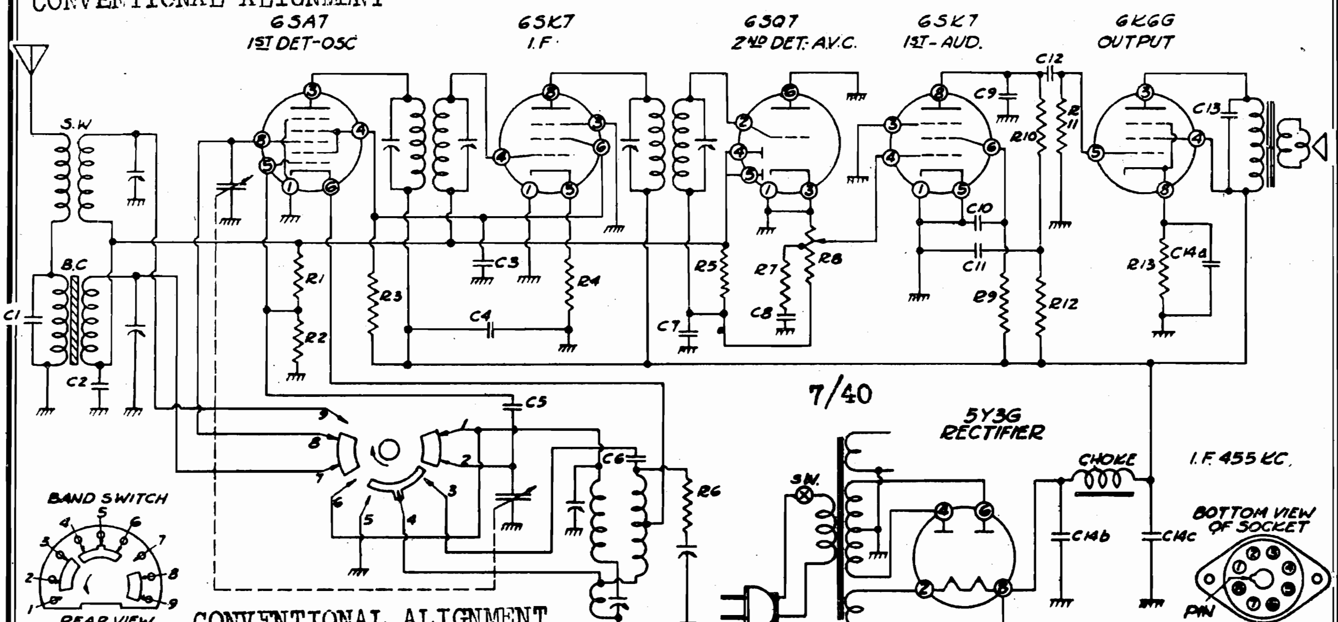
CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C8	.02	400
C2	.0001	Mica	C9	.02	200
C3	.05	200	C10	.2	200
C4	.00025	Mica	C11	.05	400
C5	.005	400	C12a	30.	150
C6	.0005	Mica	C12b	20.	150
C7	.01	400	C12c	20.	25

In model J6 all common grounds become chassis grounds, C1, C9, C10, R2 and R6 are omitted. Point "A" is connected to point "B" and point "C" to point "D."

FOR OTHER DATA SEE INDEX

CONVENTIONAL ALIGNMENT



CONVENTIONAL ALIGNMENT

MODEL R-453

Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.

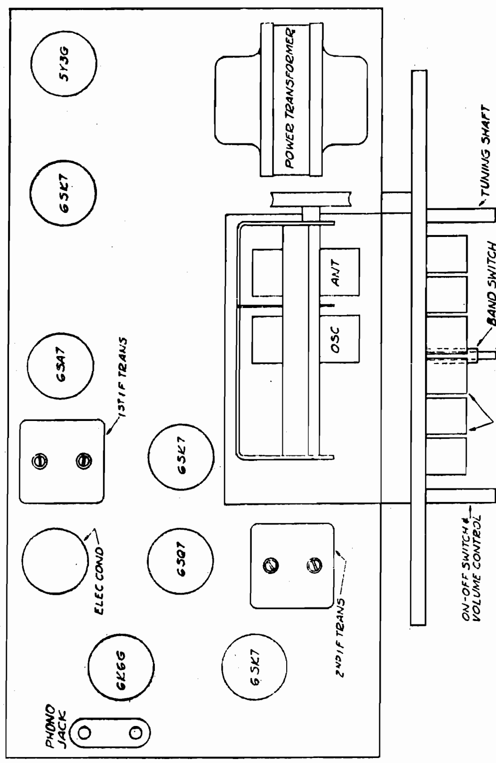
FOR OTHER DATA SEE INDEX

No.	Ohms	Watts	No.	Ohms	Watts
R1	10,000,000	¼	R9	1,000,000	¼
R2	20,000	¼	R10	200,000	¼
R3	10,000	1	R11	500,000	¼
R4	100—10%	¼	R12	50,000	¼
R5	2,000,000	¼	R13	500—10%	½
R6	30	¼			
R7	8,000	¼			
R8	500,000	V.C.			

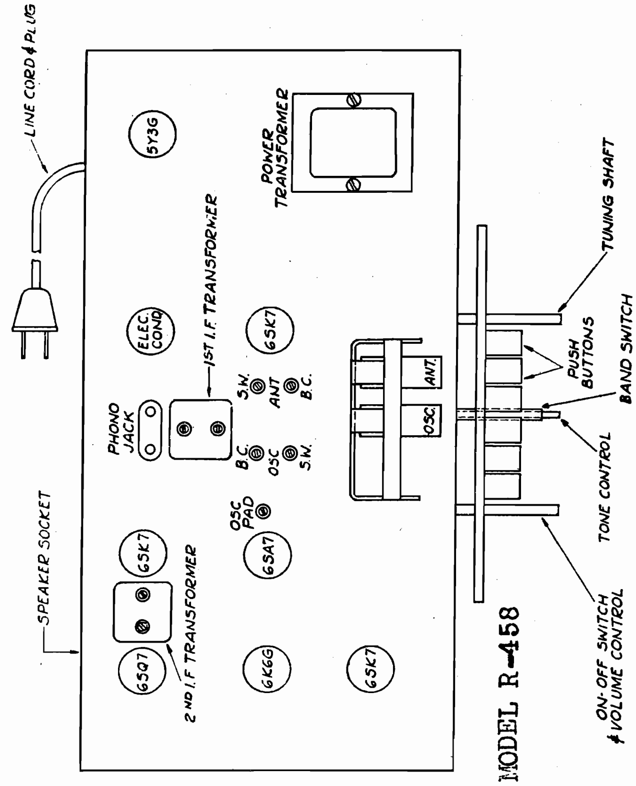
No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C9	.00025	Mica
C2	.05	200	C10	.05	200
C3	.05	400	C11	.1	200
C4	.05	400	C12	.01	400
C5	.00005	Mica	C13	.005	600
C6	.004 —5%	Mica	C14a	20.	25
C7	.00025	Mica	C14b	20.	350
C8	.05	200	C14c	20.	350

B. F. GOODRICH

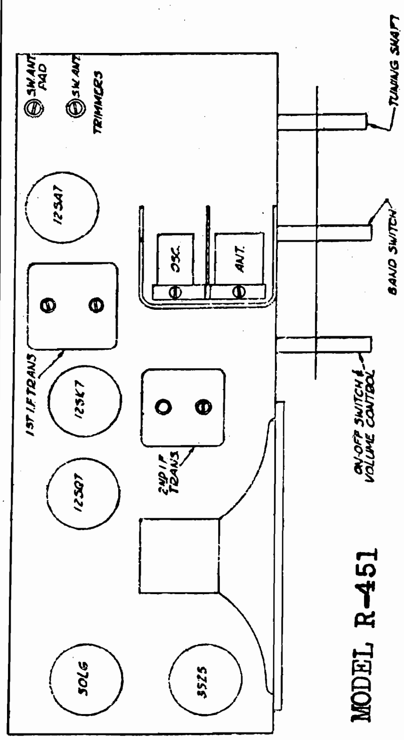
MODELS R-451, R-452, R-453, R-454, R-458



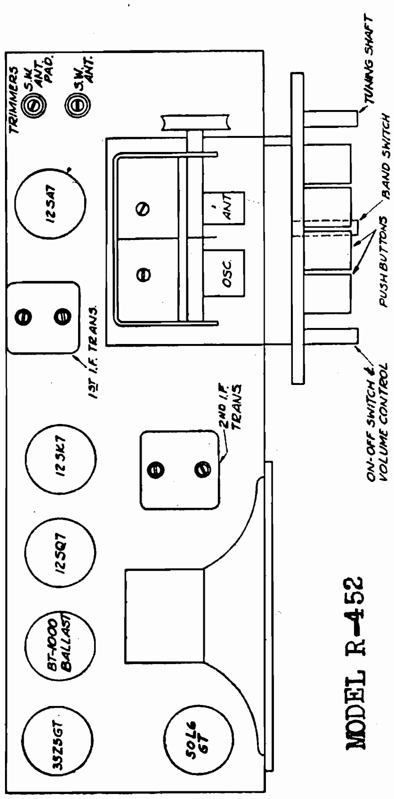
MODEL R-454



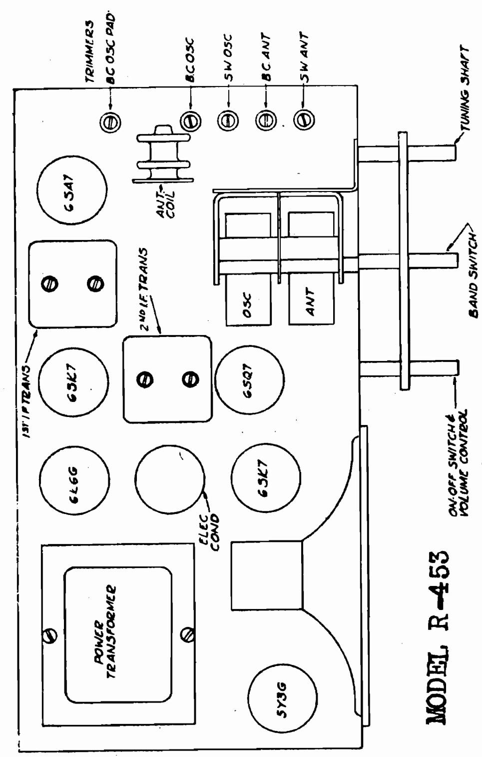
MODEL R-458



MODEL R-451



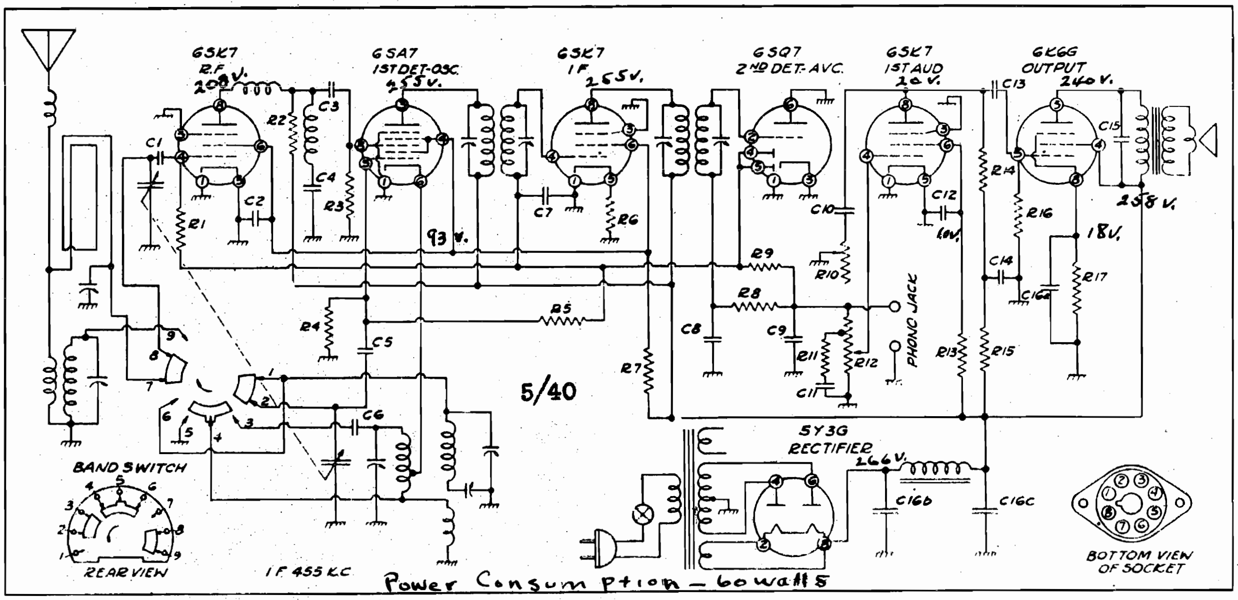
MODEL R-452



MODEL R-453

MODELS R-454, R-458

B. F. GOODRICH



Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.

RESISTORS

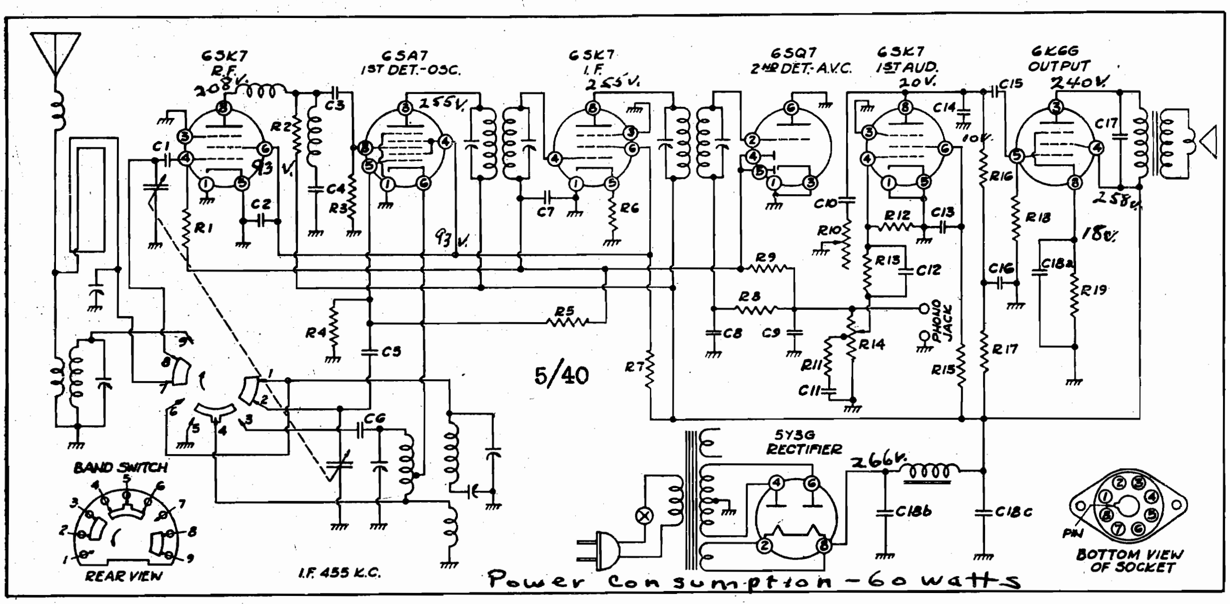
No.	Ohms	Watts	No.	Ohms	Watts
R1	500,000	¼	R10	500,000	T.C.
R2	4,000	½	R11	10,000	¼
R3	100,000	½	R12	500,000	V.C.
R4	25,000	½	R13	2,000,000	¼
R5	5,000,000	¼	R14	250,000	¼
R6	100	¼	R15	50,000	¼
R7	15,000	2	R16	500,000	¼
R8	50,000	¼	R17	600—10%	½
R9	1,000,000	¼			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C10	.002	600
C2	.05	400	C11	.05	200
C3	.0001	Mica	C12	.25	400
C4	.00006—5%	Mica	C13	.01	400
C5	.0001	Mica	C14	.25	400
C6	.003—5%	Mica	C15	.005	600
C7	.05	200	C16a	20.	25
C8	.0001	Mica	C16b	20.	350
C9	.00025	Mica	C16c	20.	350

FOR OTHER DATA SEE INDEX

MODEL R-454



Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	500,000	¼	R11	15,000	¼
R2	2,500	½	R12	2,000,000	¼
R3	100,000	½	R13	2,000,000	¼
R4	25,000	½	R14	500,000	V.C.
R5	5,000,000	¼	R15	2,000,000	¼
R6	100	¼	R16	250,000	¼
R7	15,000	2	R17	50,000	¼
R8	50,000	¼	R18	500,000	¼
R9	1,000,000	¼	R19	600—10%	½
R10	500,000	T.C.			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C11	.05	200
C2	.05	400	C12	.05	200
C3	.0001	Mica	C13	.25	400
C4	.00006—5%	Mica	C14	.00025	Mica
C5	.0001	Mica	C15	.01	400
C6	.003 —5%	Mica	C16	.25	400
C7	.05	200	C17	.002	600
C8	.00005	Mica	C18a	20.	25
C9	.0001	Mica	C18b	30.	350
C10	.002	600	C18c	30.	350

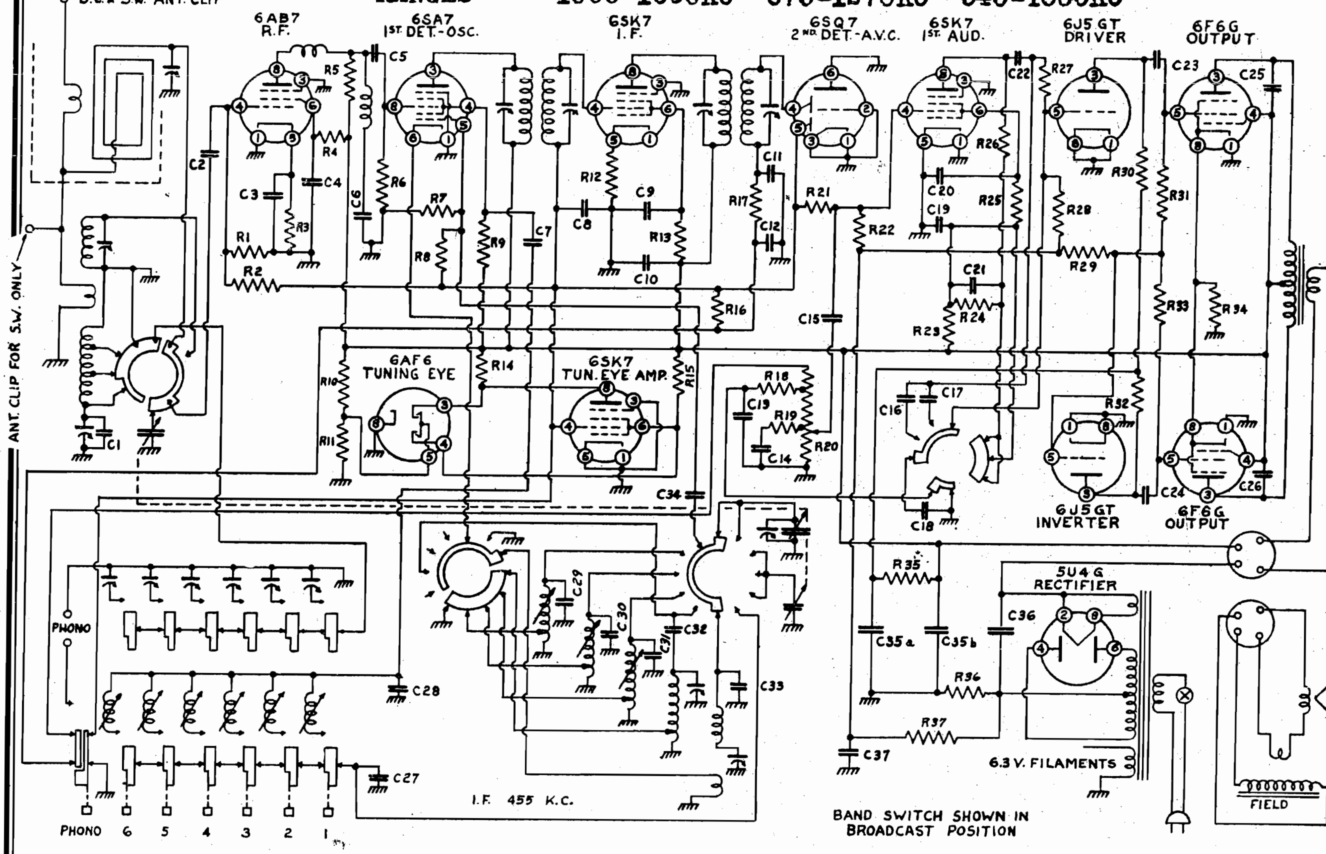
FOR OTHER DATA SEE INDEX

MODEL R-458

B. F. GOODRICH

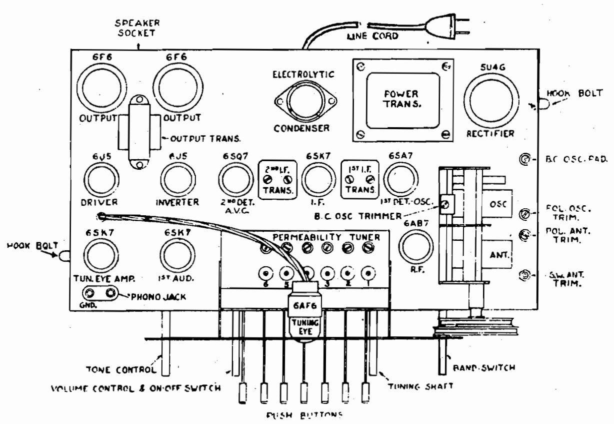
MODEL R-459

PUSH-BUTTON RANGES	#1, #2	#3, #4	#5, #6
	1000-1630KC	670-1270KC	540-1080KC

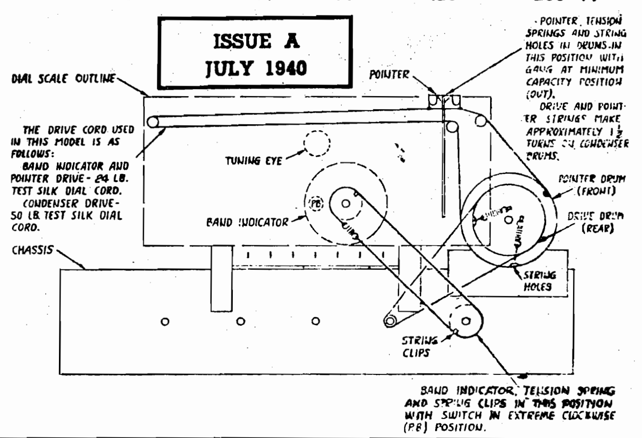


ALIGNMENT CONVENTIONAL-SEE SPECIAL SECTION VOL. VIII

R 1	1,000,000 ohm ½ watt	R20	500,000 ohm V.C.	C1	.00002	10% Mica	C20	.05	400 V.
R 2	2,000,000 ohm ½ watt	R21	1,000,000 ohm ½ watt	C2	.0001	Mica	C21	.05	400 V.
R 3	250 ohm ½ watt	R22	2,000,000 ohm ½ watt	C3	.05	200 V.	C22	.01	400 V.
R 4	50,000 ohm ½ watt	R23	50,000 ohm ½ watt	C4	.05	400 V.	C23	.02	400 V.
R 5	5,000 ohm ½ watt	R24	100,000 ohm ½ watt	C5	.0001	Mica	C24	.02	400 V.
R 6	100,000 ohm ½ watt	R25	500,000 ohm ½ watt	C6	.00006	5% Mica	C25	.005	600 V
R 7	25,000 ohm ½ watt	R26	15,000 ohm ½ watt	C7	.05	400 V.	C26	.005	600 V.
R 8	5,000,000 ohm ½ watt	R27	500,000 ohm ½ watt	C8	.05	200 V.	C27	.0005	2½% Mica
R 9	15,000 ohm 2 watt	R28	100,000 ohm ½ watt	C9	.05	400 V.	C28	.003	5% Mica
R10	25,000 ohm 1 watt	R29	250,000 ohm ½ watt	C10	.1	400 V.	C29	.0003	2½% Mica
R11	30,000 ohm ½ watt	R30	50,000 ohm ½ watt	C11	.0001	Mica	C30	.00025	2½% Mica
R12	100 ohm ½ watt	R31	250,000 ohm ½ watt	C12	.0001	Mica	C31	.0002	2½% Mica
R13	50,000 ohm ½ watt	R32	50,000 ohm ½ watt	C13	.02	200 V.	C32	.003	5% Mica
R14	200,000 ohm ½ watt	R33	300,000 ohm ½ watt	C14	.02	200 V.	C33	.00003	10% Mica
R15	200,000 ohm ½ watt	R34	220 ohm 1 watt	C15	.05	400 V.	C34	.0001	Mica
R16	1,000,000 ohm ½ watt	R35	20,000 ohm ½ watt	C16	.0001	Mica	C35a	16 Mfd.	450 V.
R17	50,000 ohm ½ watt	R36	25 ohm 1 watt	C17	.00025	Mica	C35b	20 Mfd.	450 V.
R18	30,000 ohm ½ watt		10%	C18	.001	600 V.	C36	25 Mfd.	450 V.
R19	30,000 ohm ½ watt	R37	250,000 ohm ½ watt	C19	.25	400 V.	C37	.25	200 V.

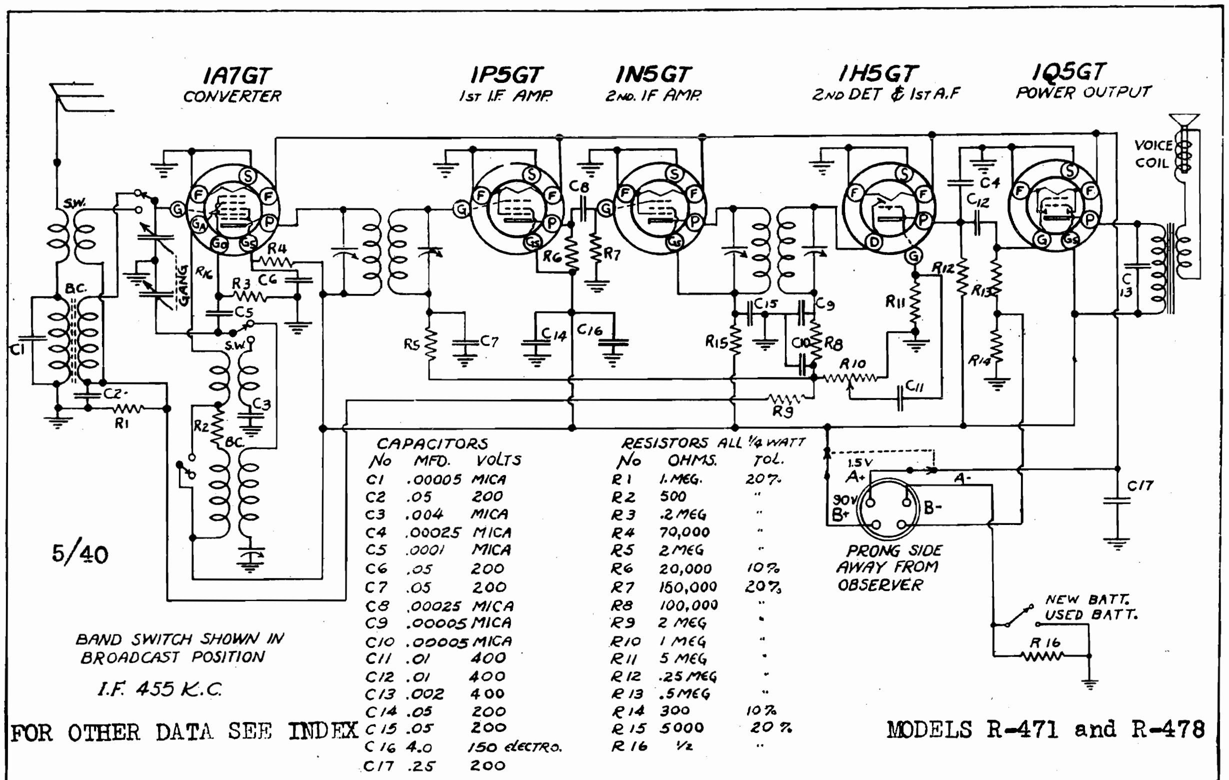


ISSUE A
JULY 1940



MODELS R-471, R-478
R-480

B. F. GOODRICH



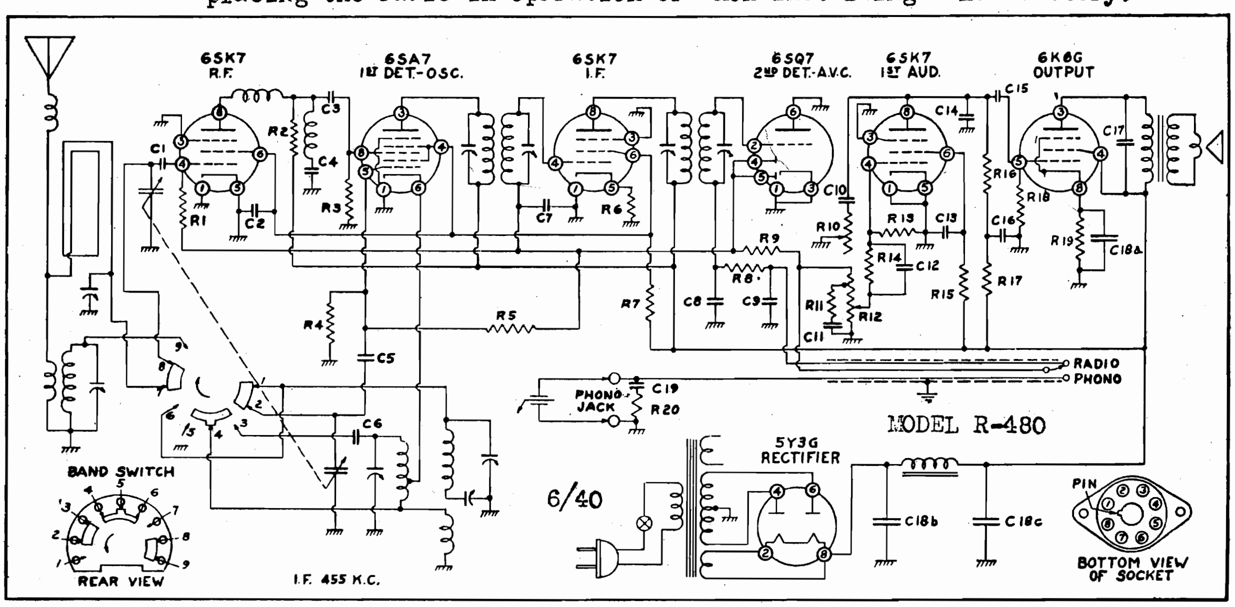
CAPACITORS

No	MFD.	VOLTS
C1	.00005	MICA
C2	.05	200
C3	.004	MICA
C4	.00025	MICA
C5	.0001	MICA
C6	.05	200
C7	.05	200
C8	.00025	MICA
C9	.00005	MICA
C10	.00005	MICA
C11	.01	400
C12	.01	400
C13	.002	400
C14	.05	200
C15	.05	200
C16	4.0	150 electro.
C17	.25	200

RESISTORS ALL 1/4 WATT

No	OHMS.	TOL.
R1	1. MEG.	20%
R2	500	"
R3	.2 MEG	"
R4	70,000	"
R5	2 MEG	"
R6	20,000	10%
R7	150,000	20%
R8	100,000	"
R9	2 MEG	"
R10	1 MEG	"
R11	5 MEG	"
R12	.25 MEG	"
R13	.5 MEG	"
R14	300	10%
R15	5000	20%
R16	1/2	"

The ECONOMIZER switch is located on the top left of chassis. Always have this switch in the "NEW" battery position when first placing the radio in operation or when installing a new battery.



Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.

RESISTORS

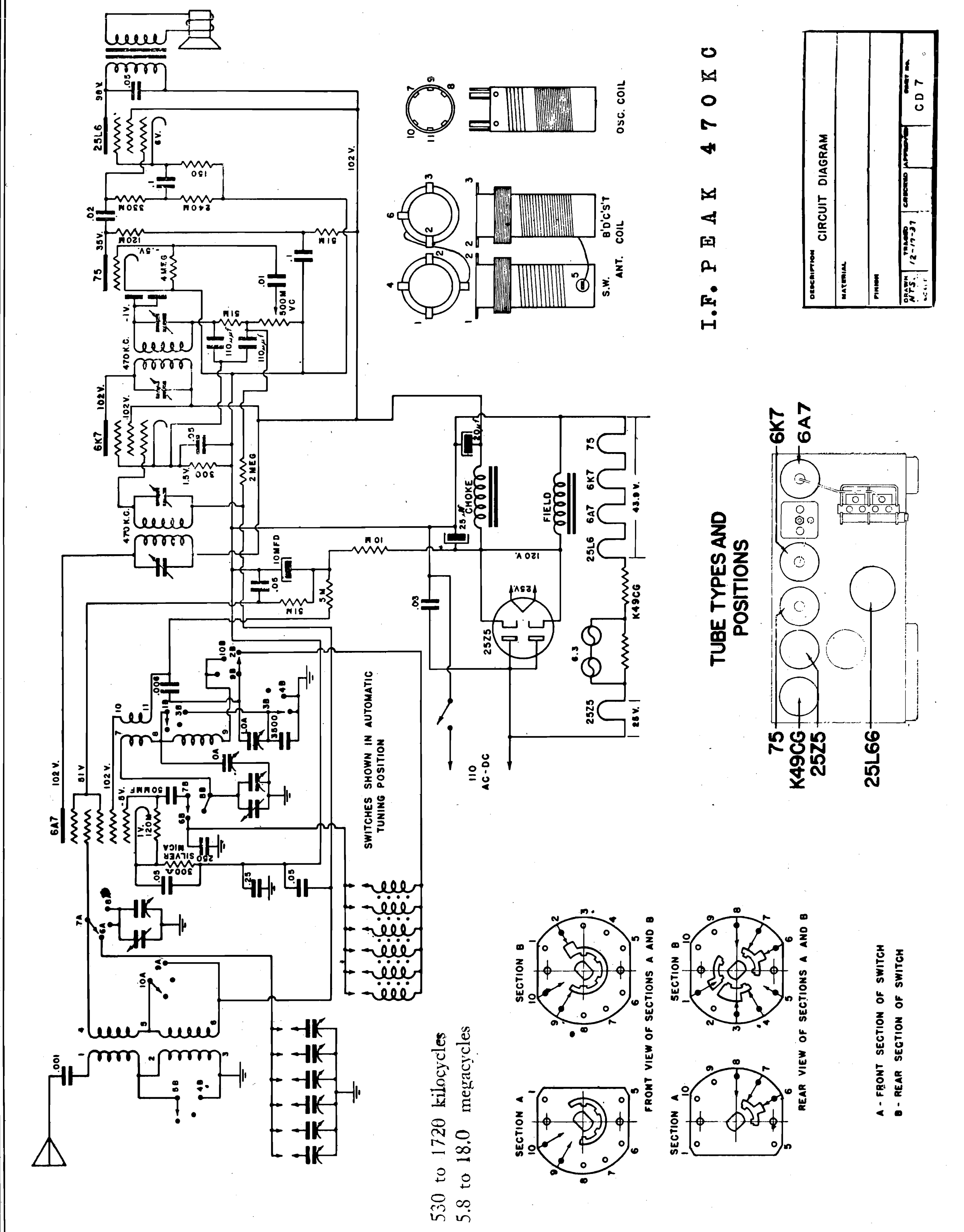
No.	Ohms	Watts	No.	Ohms	Watts
R1	500,000	1/4	R12	500,000	V.C.
R2	2,500	1/2	R13	2,000,000	1/4
R3	100,000	1/2	R14	2,000,000	1/4
R4	25,000	1/2	R15	2,000,000	1/4
R5	5,000,000	1/4	R16	250,000	1/4
R6	100	1/4	R17	50,000	1/4
R7	15,000	2	R18	500,000	1/4
R8	50,000	1/4	R19	600—10%	1/2
R9	1,000,000	1/4	R20	50,000	1/4
R10	500,000	T.C.			
R11	15,000	1/4			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C12	.05	200
C2	.05	400	C13	.25	400
C3	.0001	Mica	C14	.00025	Mica
C4	.00006—5%	Mica	C15	.01	400
C5	.0001	Mica	C16	.25	400
C6	.003—5%	Mica	C17	.002	600
C7	.05	200	C18a	20.	25
C8	.00005	Mica	C18b	30.	350
C9	.0001	Mica	C18c	30.	350
C10	.002	600	C19	.005	400
C11	.05	200			

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 01006



MODELS 01006,01007 GOODYEAR TIRE & RUBBER CO., INC.

Automatic Unit

Principle of Operation

The basic circuit of any radio receiver is the inductance coil and tuning condenser which determines the frequency to which the system is tuned. The frequency at which this circuit resonates can be varied in two ways; either by holding the inductance coil at a fixed value of inductance and changing the capacity of the condenser, or by holding the condenser at a fixed value of capacity and changing the inductance of the coil. This is so because the frequency is proportional to the inductance times the capacity and changing one or the other will change their product.

Previous push-button systems accomplished their purpose in one of two ways. They either rotated the tuning condenser mechanically with an electric motor, or disconnected the tuning condenser by means of a switch and substitu ed pre-set padding condensers in the antenna and oscillator circuits.

In the push-button system the entire oscillator circuit (coil and gang condenser) is disconnected and in its place is put a silvered mica condenser of fixed capacity and a coil, the inductance of which can be varied by means of an iron slug that moves with a screw adjustment, inside the coil. This is the second system of tuning mentioned above and has the following advantages in this case. The condenser is made by electroplating a small deposit of silver on each side of a piece of mica and encasing the whole unit in a weatherproof compound. The silver, having a low temperature coefficient has a negligible expansion with changes in temperature, and humidity has no effect because of the weatherproof compound. Therefore, changes in the condenser capacity are controlled. The coil is impregnated with a moisture-proof wax and the whole circuit is tuned by varying the inductance of the coil. The only uncontrollable factor in the system is the variation in capacity of the wiring and other parts. But this variation is so small that its detuning effect is not noticeable to the ear.

In the system the silvered mica condenser which tunes all six of the push button coils is in the main part of the receiver and connected on the wave switch. The push-button coils are mounted on the push-button unit and are adjusted from the back by slotted screws. The adjustable padding condensers directly above the slotted screws are used to align the antenna coil in the receiver to each of the push-button coils depending on which button is pushed. Variation in capacity of this padder has no effect on the tuning of the system. It simply drops the sensitivity slightly.

Instructions for Pre-setting "Fingertip Control" Circuits for Six Stations in the Broadcast Tuning Range

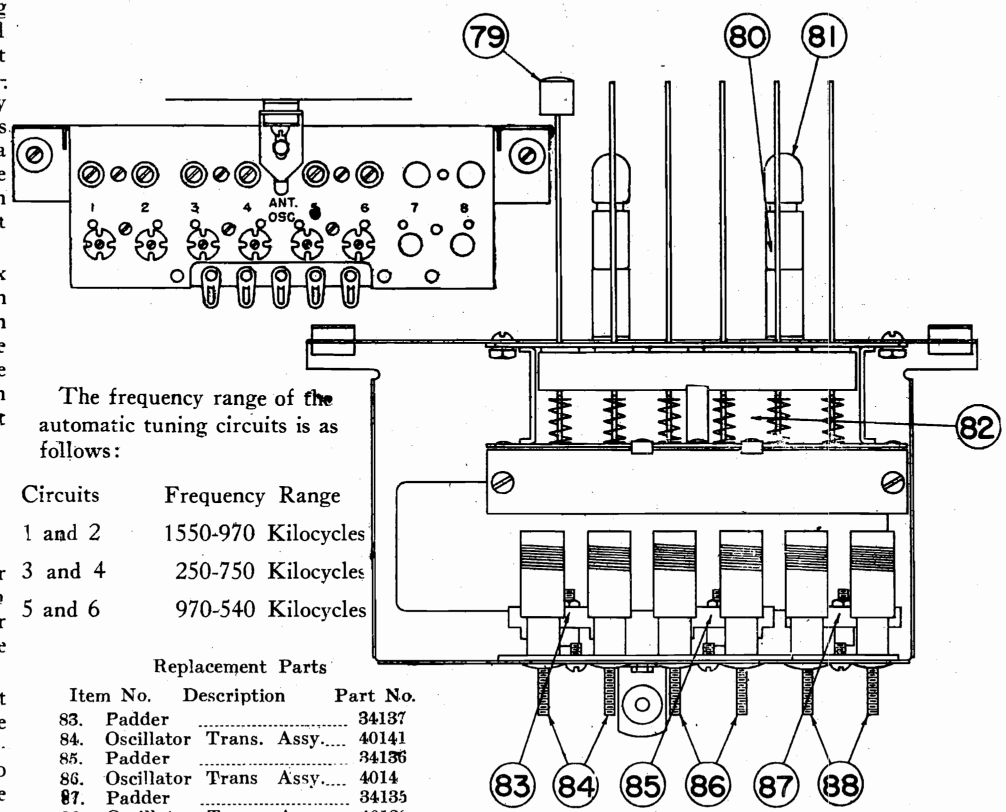
The automatic tuning unit is located immediately above the receiver chassis, the circuits being adjustable from the rear of this unit. Although it is possible to adjust the circuits without the aid of a signal generator, for best results it is recommended that a serviceman be allowed to pre-set the tuning circuits in the following manner.

Turn the wave change switch to the left. Six stations in the broadcast band may be chosen, and the tabs on which are printed the call letters of these stations should be selected from the sheet provided and inserted in the escutcheon slots. It is preferable to place the tabs in the slots according to frequency; that is to say, the low frequency stations should appear at the left as the unit is faced and the high frequency stations at the right.

The tuning circuits corresponding to a given station will be found at the rear of the automatic unit housing, immediately behind the station call letter tab slot. Assuming that you are facing the rear of the receiver and it is desired to set up WJZ at 760 kilocycles on the third circuit from the right, the following is the recommended procedure. Adjust the signal generator, modulated with an audio frequency, to 760 kilocycles. Using a small screw driver adjust the converter oscillator circuit, third hole from right in the lower row, until signal is loudest. Then adjust antenna circuit, third hole in upper row, until signal is at a maximum.

Readjust converter circuit carefully for maximum signal strength. Other frequencies may be set up in a similar manner on the remaining circuits.

If a signal generator is not available turn the wave switch to the middle position for manual tuning and tune the receiver to the desired station. Then turn the switch to the left ("fingertip-control" automatic position) and adjust the automatic unit oscillator and antenna circuits exactly as described abov Repeat procedure until all desired stations are set up. When all desired stations are set up recheck all oscillator adjustments for calibration accuracy



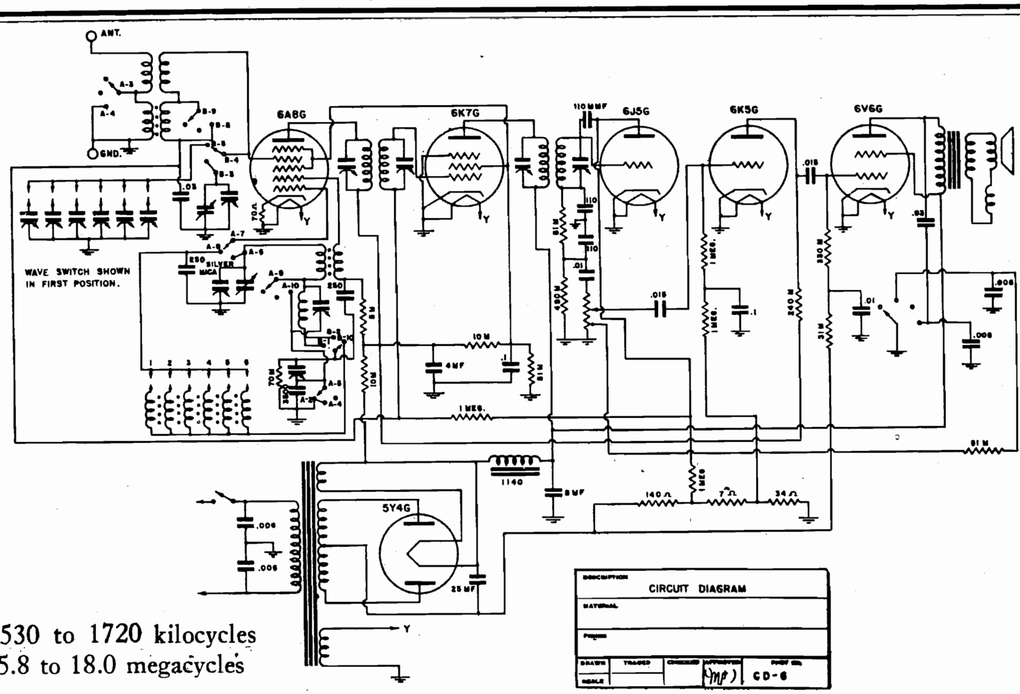
The frequency range of the automatic tuning circuits is as follows:

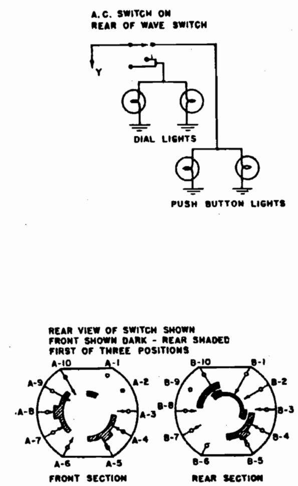
Circuits	Frequency Range
1 and 2	1550-970 Kilocycles
3 and 4	250-750 Kilocycles
5 and 6	970-540 Kilocycles

Replacement Parts

Item No.	Description	Part No.
83.	Padder	34137
84.	Oscillator Trans. Assy.	40141
85.	Padder	34136
86.	Oscillator Trans Assy.	4014
87.	Padder	34135
88.	Oscillator Trans. Assy	40138

GOODYEAR TIRE & RUBBER CO., INC. **MODEL 01007**





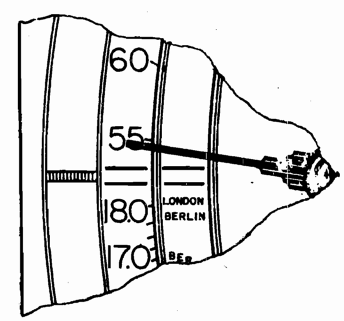


Fig. 3

530 to 1720 kilocycles
5.8 to 18.0 megacycles

Aligning I. F. System

Connect a 470KC signal Generator to the grid of the 6A7 converter tube through a .002MFD condenser. Connect an output meter across the speaker voice coil. Turn receiver volume control on full and with wave switch in broadcast position, adjust trimmers (74) and (75) (See Fig. 2) for maximum output. Then adjust (71) and (73) for maximum reading. Repeat adjustments on (74) and (75).

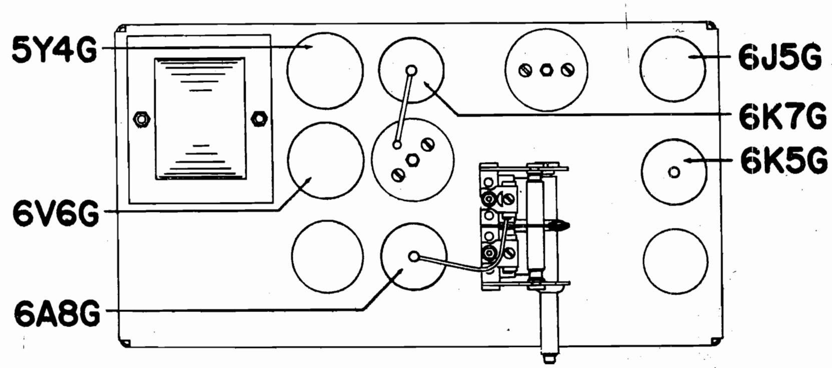
Broadcast and Short Wave Band Adjustments

Note: The following adjustments must proceed in the order specified

(1) Turn variable condenser to maximum capacity and set pointer as indicated in Fig. 3. Turn band selector switch to left or broadcast position. Tune set to a scale frequency of 1550KC and connect a 1550KC signal generator to the antenna post through a 200MMFD condenser. Loosen trimmer screw (66) and adjust trimmer (77) until signal is tuned in. Adjust trimmer (65) for maximum output.

(2) Then set band selector switch to extreme right or short wave position. Set signal generator to 18 megacycles and substitute a 400 ohm resistor for the 200MMFD condenser. Adjust trimmer (66) until signal is tuned in. At this point check the dial at 17.1 megacycles for the 18 megacycle image.

TUBE TYPES AND POSITIONS



(3) Turn band selector switch to broadcast position and reset the signal generator to 1550KC. Substitute the 200MMFD condenser for the 400 ohm resistor in the generator lead and adjust trimmer screw (77) until signal is tuned in. Then tune receiver to 600KC on dial and with the signal generator, set to 600KC, rock the gang while adjusting trimmer (76) for maximum 1550KC and if incorrect, repeat 1550KC adjustment procedure outlined in Section (1).

All of the above adjustments must be made before pre-setting the "fingertip control" circuits.

MODELS 01006,01007 GOODYEAR TIRE & RUBBER CO., INC.

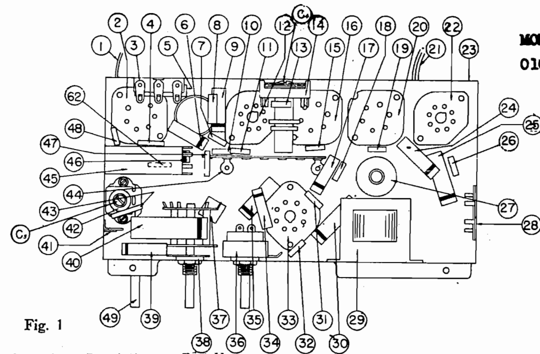
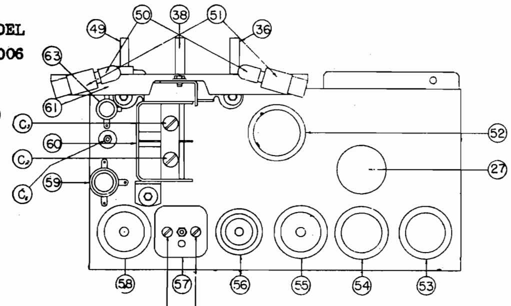


Fig. 1

MODEL 01006



Item No.	Description	Part No.
1.	Antenna Assembly	77110
2.	7 Prong Socket	15124
3.	Wire Panel 3 Lug	10103
4.	Resistor 300 Ohm 1 Watt	47122
5.	Tub. Cond. .001-1000 Volt	32113
6.	Tub. Cond. .05-200 Volt	32114
7.	Res. 51,000 Ohm ½ Watt	47120
8.	Resistor, 300 Ohm 1 Watt	47122
9.	Tub. Cond. .05-200 Volt	32114
10.	Res. 4,000,000 Ohm ½ Wt.	47125
11.	Res. 5,000 Ohm ½ Watt	47105
12.	8 Prong Socket	15113
13.	Res. 51,000 Ohm ½ Watt	47120
14.	2nd. I. F. Transformer	41102
15.	Res. 10,000 Ohm ½ Watt	47110
16.	6 Prong Socket	15123
17.	Tubular Cond. .02-200 Volt	32118
18.	Res. 240,000 Ohm ½ Watt	47128
19.	Res. 120,000 Ohm ½ Watt	47127
20.	6 Prong Socket	15123
21.	A. C. Cord & Plug	78110
22.	8 Prong Socket	15113
23.	Sub base	20110
24.	Tub. Cond. .03-400 Volt	32115
25.	Tubular Cond. .1-200 Volt	32117
26.	Res. 51,000 Ohm ½ Watt	47120
27.	Electrolytic Condenser	31100
28.	Speaker Socket	15130
29.	Choke	42102
30.	Tubular Cond. .1-200 Volt	32117
31.	Res. 330,000 Ohm ½ Watt	47130
32.	Resistor 150 Ohm ½ Watt	47129
33.	8 Prong Socket	15113
34.	Tubular Cond. .01-200 Volt	32102
35.	Tubular Cond. .05-200 Volt	32114
36.	Volume Control	49102
37.	Mica Cond. 3500 MMFD	30102
38.	Wave Switch	65114
39.	Tub Cond. .05-200 Volt	32123
40.	Tubular Cond. .25-200 Volt	32105
41.	Wire Panel 2 Lug	10101
42.	Padding Condenser	34109
43.	Mica Condenser Silvered	30111
44.	Wire Panel 7 Lug	10107
45.	Oscil. Trans. Bc. & S. W.	40155
46.	Tub. Cond. .05-200 Volt	32114
47.	Mica Cond. 600 MMFD	30105
48.	Res. 120,000 Ohm ½ Watt	47127
49.	Tun. Cond Ft. & Dr. Assy.	20117
50.	Pilot Lamp	51101
51.	Pilot Lamp Socket Assy.	90111
52.	25L6G Tube	50113
53.	K49CG Tube	54103
54.	25Z5G Tube	50108
55.	75G Tube	50112
56.	6K7M Tube	50127
57.	1st. I. F. Transformer	41109
58.	6A7G Tube	50110
59.	Ant. Trans. Broadcast	40153
60.	Variable Condenser	33107
61.	Dial Plate	20212
62.	Mica Cond. 50 MMFD	30109
63.	Ant. Trans. Shortwave	40154
C-1	1st. I. F. Primary Padder	
C-2	Ant. Broadcast & S.W. Padder	
C-3	Shortwave & Oscillator Padder	
C-4	2nd. I. F. Padder	
C-5	Broadcast Oscillator Padder	
C-6	Broadcast Oscil. Series Padder	
C.	1st. I. F. Secondary Padder	
79.	Knob	13124
82.	Tuning Unit Switch	65114

Aligning I. F.

Fig. 2

Connect an output meter across the speaker voice coil and turn receiver volume control on full. Turn wave switch to manual position and variable condenser to extreme high frequency end of scale. Connect a 470 K.C. signal generator to the grid of the 6A7 tube through a condenser in the order of .002 Mfd capacity. Keep the signal to a low audible value and adjust trimmer (C4) (See Fig. 2) for maximum output. Then adjust trimmers (C) and (C1) (See Fig. 1 for maximum output. Finally repeat (C4) adjustment.

Broadcast and Shortwave Band Adjustments

Note: The following adjustments must proceed in order specified.

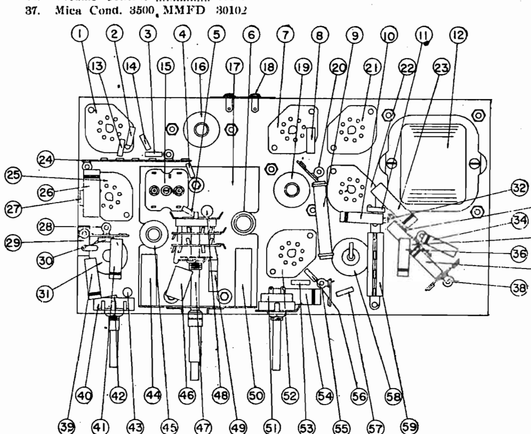
(1.) Turn variable condenser to maximum capacity and set pointer on small dot approximately 1-16 inch above top horizontal scale dividing line. Tune set to a scale frequency of 1550 K.C. and connect a 1550 K.C. generator to antenna lead through a 100 Mmfd condenser. Turn center knob to manual position. Volume control should be on full.

(2.) Loosen trimmer (C2) and adjust trimmer (C5), until signal is tuned in. Then adjust (C3) for maximum output.

(3.) Turn center knob to shortwave position, substitute a 400 ohm resistor for the condenser in the signal generator lead and set generator to a frequency of 18 megacycles. Tune set to 18 megacycles and adjust trimmer (C2) until signal is tuned in.

(4.) Turn center knob back to manual and substitute the 100 Mmfd condenser for the 400 ohm resistor in the generator lead. Set signal generator to 1550 K.C. Tune set to 1550 K.C. and adjust trimmer (C5) until signal is tuned in. Set signal generator to 600 K.C. With the set tuned close to 600 K.C. on the dial, vary the gang condenser slowly back and forth, adjusting (C6) at the same time until maximum output is indicated. Finally recheck dial for calibration accuracy against signal generator at the 1550 K.C. point. If found to be incorrect, repeat the 1550 K.C. adjustment procedure outlined in step number (1).

All of the above adjustments must be made before pre-setting the automatic circuits.



MODEL 01007

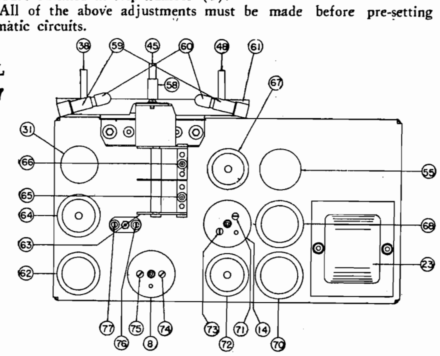
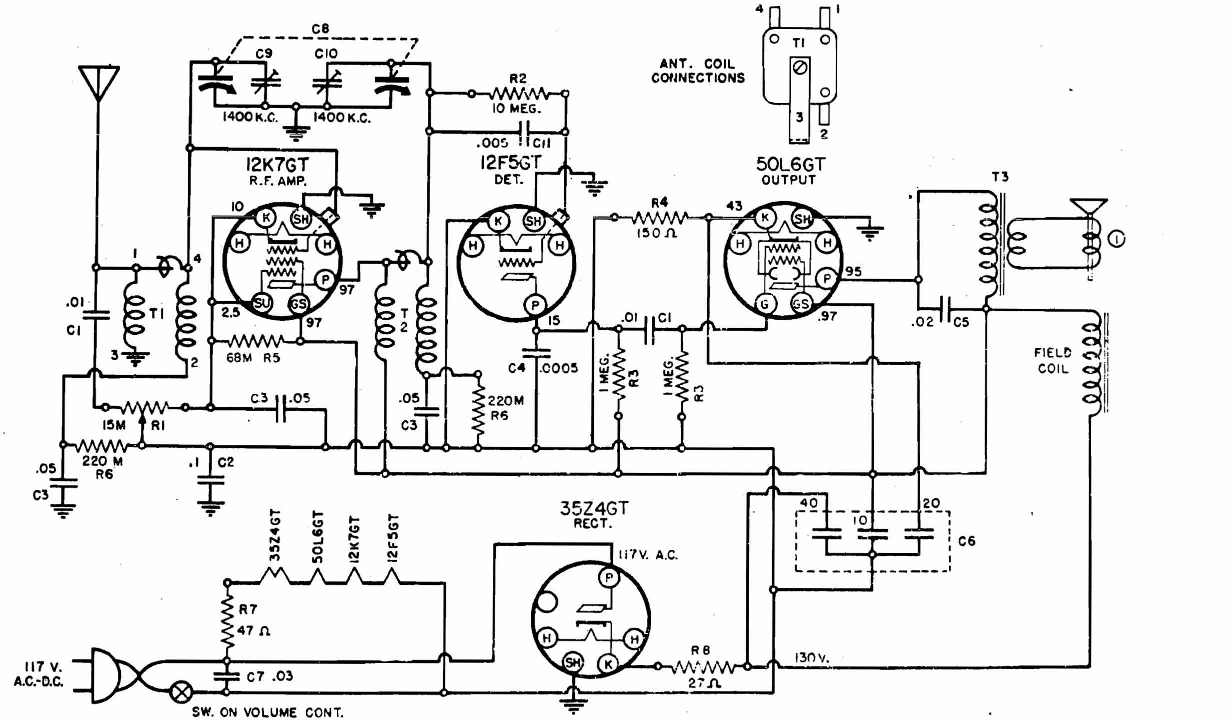


Fig. 2

Item No.	Replacement Parts Description	Part No.
1	7 Prong Socket	15119
2.	Mica Cond. 110 M. Mfd.	30101
3.	Res. 490,000 Ohm ½ Watt	47119
4.	Ris. 5,000 Ohm, ½ Watt	47105
5.	Res. 70,000 Ohm, ½ Watt	47135
6.	Ant. Trans. Short Wave	40116
7.	7 Prong Socket	15119
8.	Res. 10,000 Ohm, 1 Watt	47114
9.	Res. 10,000 Ohm; 3 Watt	47115
10.	Tubu. Cond. .01-200 Volt	32102
11.	Res. 330,000 Ohm, ½ Watt	47130
12.	Power Transformer	42101
13.	Res. 1,000,000 Ohm, ½ W.	47106
14.	Res. 1,000,000 Ohm, ½ W.	47106
15.	Padding Condenser	34103
16.	2nd. I. F. Transformer	41104
17.	R. F. Base	20114
18.	Antenna & Ground Panel	10105
19.	Ist. I. F. Transformer	41105
20.	Wire Panel 2 Lug	10101
21.	7 Prong Socket	15119
22.	7 Prong Socket	11119
23.	Tubu. Cond. .03-600 Volt	32110
24.	Wire Panel 17 Lug	10106
25.	7 Prong Socket	15119
26.	Tubular Cond. .1-200 Volt	32117
27.	Res. 240,000 Ohm, ½ W.	47128
28.	Wire Panel 3 Lug	10103
29.	Wire Panel 2 Lug	10101
30.	Res. 1,000,000 Ohm, ½ W.	47106
31.	Electrolytic Condenser	31102
32.	Res. 51,000 Ohm, ½ W.	47120
33.	Wire Panel 4 Lug	10104
34.	Pap. M'ld Cond. .006-400V	32125
35.	Tub. Cond. .015-400V.	32112
36.	Tub. Cond. .006-400V	32107
37.	Pap. M'ld. Cond. .006-400V	32125
38.	Wire Panel 2 Lug	10102
39.	Tub. Condenser .01-200V	32102
40.	Volume Control	49107
41.	Tubular Cond. .015-200V	32109
42.	Res. 51,000 Ohm, ½ Watt	47120
43.	Tub. Cond. .006-200V.	32104
44.	Oscill'tr Trans. Broadc'st	40145
45.	Antenna Trans. Br'dc'st.	40144
46.	Mica Condenser Silvered	30111
47.	Wave Switch	65113
48.	Tub. Cond. .05-200V.	32123
49.	Mica Cond. 3500 M-Mfd.	30102
50.	Oscillator Trans. Srt. W've	40117
51.	Tone Cont. & Line Sw't'ch	66101
52.	7 Prong Socket	15119
53.	Res. 51,000 Ohm, ½ Watt	47120
54.	Tubular Cond. .1-400 V.	32111
55.	Wire Panel 2 Lug	10101
56.	Res. 70 Ohm. ½ Watt	47134
57.	6A8G Tube	50106
58.	6V6G Tube	50104
59.	B. C. Resistor	48100
60.	Pilot Lamp	51102
61.	Scale Plate	20123
62.	6J5G Tube	50103
63.	Variable Condenser	33104
64.	6K5G Tube	50109
65.	Bro'dc'st & Shortw've, Ant. Pad	
66.	Shortwave Oscillator Pad.	
67.	6T8G Tube	50106
68.	6V6G Tube	5010A
69.	Pilot Lamp. Soc. Assembly	90182
70.	5Y4G Tube	50105
71.	1st. I. F. Primary Pad	
72.	JK7G Tube	50107
73.	1st. I. F. Secondary Pad.	
74	2nd. I. F. Primary Pad	
75	2nd. I. F. Secondary Pad.	
76.	Br'd'c'st Series Oscillator Pad	
77.	Broadcast Parallel Oscil. Pad.	
78.	Drive Shaft	21126
79.	Knob	18124
80.	Pilot Lamp Soc't Assem.	
81.	Pilot Lamp	51102
82.	Push Button Switch	65112

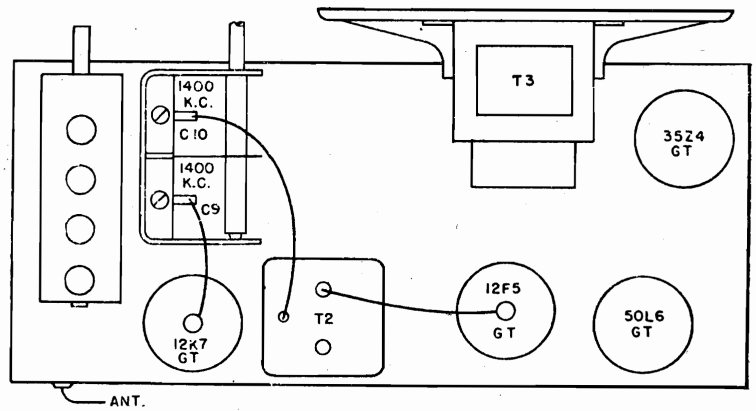
GOODYEAR TIRE & RUBBER CO., INC. MODELS 015140, 015141



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
CAPACITY VALUES ARE IN MICROFARADS.

WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.

9-462



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 top 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 3 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.

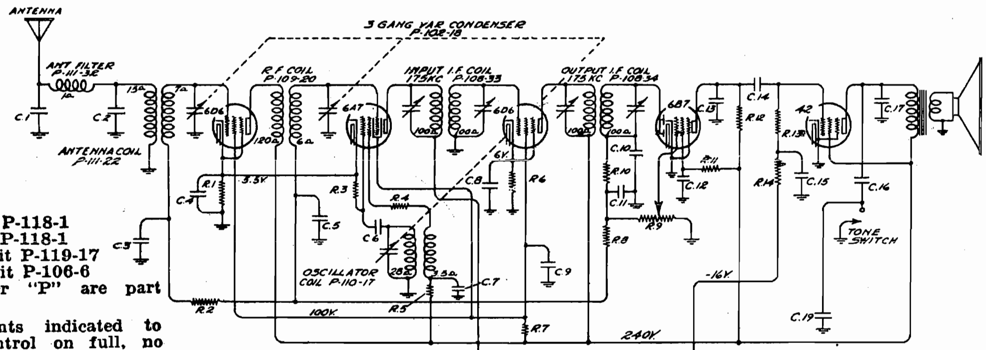
Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there 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 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.

MODEL 690

GOODYEAR TIRE & RUBBER CO., INC.



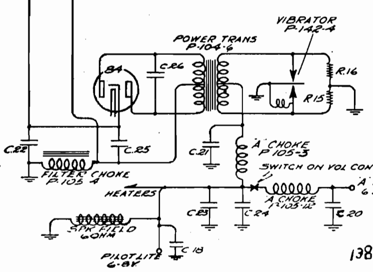
NOTE:

C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.22 and C.25 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.

Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

Serial No. 40001 up.

IF PEAK 175 KC



DESCRIPTION:

Model 690 is a six tube superheterodyne receiver, with an intermediate frequency of 175 K.C. and a tuning range of from 520 to 1550 K.C. 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. All adjustments are accessible and any part replaceable without removing the chassis from the cabinet.

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.

ANTENNA CONNECTION:

The antenna is connected to the receiver by means of the antenna cable. The antenna wire is the single black wire projecting from the end of the cable. Splice this wire to the roof antenna lead and ground the pig-tail shielding as close to the corner post of the car as possible.

On open and convertible models where underslung strap or plate antennas are used it may be necessary to ground the exhaust pipe and muffler to the frame at both ends with heavy copper braid

CONNECTIONS TO BATTERY:

The battery cable, number 152-2, (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 148-3, 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.

GENERATOR INTERFERENCE:

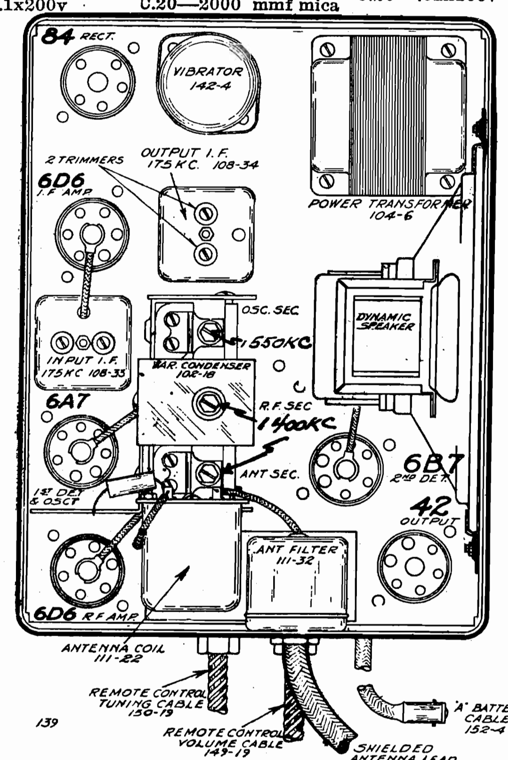
Remove the generator cutout mounting screw and fasten the condenser (148-1) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten down securely. Connect the condenser lead to the battery terminal of the cutout. The generator condenser is absolutely necessary as it is used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated.

RESISTORS

No.	Value
R.1	500 ⅛w
R.2	100M ⅓w
R.3	50M ⅓w
R.4	3500 ⅓w
R.5	20M ½w
R.6	1500 ⅓w
R.7	25M 1w
R.8	500M ⅓w
R.9	1 meg vol. control P-101-21
R.10	100M ⅓w
R.11	1 meg ⅓w
R.12	250M ⅓w
R.13	301M ⅓w
R.14	301m ⅓w
R.15	100
R.16	100

CONDENSERS

No.	Value
C.1	20 mmf mica
C.2	20 mmf mica
C.3	.01x400v
C.4	.1x200v
C.5	.05x200v
C.6	100 mmf mica
C.7	.1x200v
C.8	.1x200v
C.9	.1x200v
C.10	100 mmf mica
C.11	100 mmf mica
C.12	.1x200v
C.13	100 mmf mica
C.14	.01x400v
C.15	.25x400v
C.16	.025x400v
C.17	.006x600v
C.18	500 mmf mica
C.19	500 mmf mica
C.20	2000 mmf mica
C.21	1.0 mfdx120v
C.22	8 mfd x300v
C.23	.5 mfd x120v
C.24	.01x400v
C.25	8 mfd x300v
C.26	.01x400v



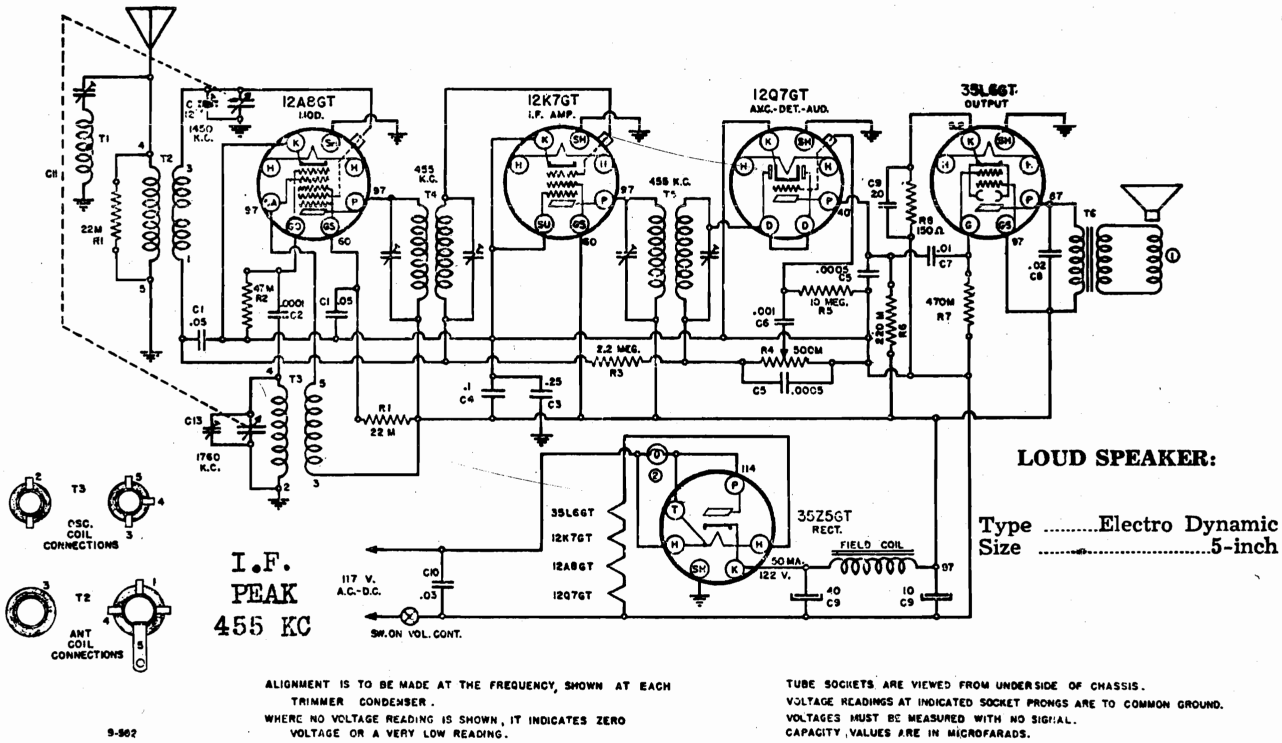
DUMMY ANTENNAS.

I.F. —A .1 mfd. condenser connected in series with the test oscillator output lead.

Broadcast —A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

GOODYEAR TIRE & RUBBER CO., INC. MODELS 015150, 015151



LOUD SPEAKER:

Type ....Electro Dynamic
Size 5-inch

PILOT LAMP:

The pilot lamp is a 6.3 volt 150 Mill. type (No. 47) and should be replaced with such, in order that the filament voltages across the radio tubes do not change.

FREQUENCY RANGE:

Broadcast ....538 K.C. to 1760 K.C.

ALIGNMENT FREQUENCIES:

Antenna Trimmer	Oscillator Trimmer
1450 KC	1760 KC

INTERMEDIATE FREQUENCY ....455 K.C.

POWER SUPPLY:

Power Main ....105-130 Volts AC/DC
Power Consumption ....30 Watts

POWER OUTPUT:

Type ....Single Class A
Undistorted ....1.4 Watts
Maximum ....2 Watts

ALIGNMENT PROCEDURE

PRELIMINARY

Output Meter Connections.................................**Across Loud Speaker Voice Coil**
Output Meter Reading to Indicate 1 Watt.................................**1.95 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 On**

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTIONS	TRIMMER ADJUSTMENT (In Order Shown)	TRIMMER FUNCTION
Closed	455 Kc.	.1 mfd.	12A8GT	T4-T5	I. F.
Closed	455 Kc.	.0002 mfd.	Antenna Conn.	T1 (Min. Output)	Wave Trap
Fully Open	1760 K.C.	.0002 mfd.	Antenna Conn.	C13	Osc. Trimmer
Fully open	1450 K.C.	.0002 mfd.	Antenna Conn.	C12	Ant. Trimmer

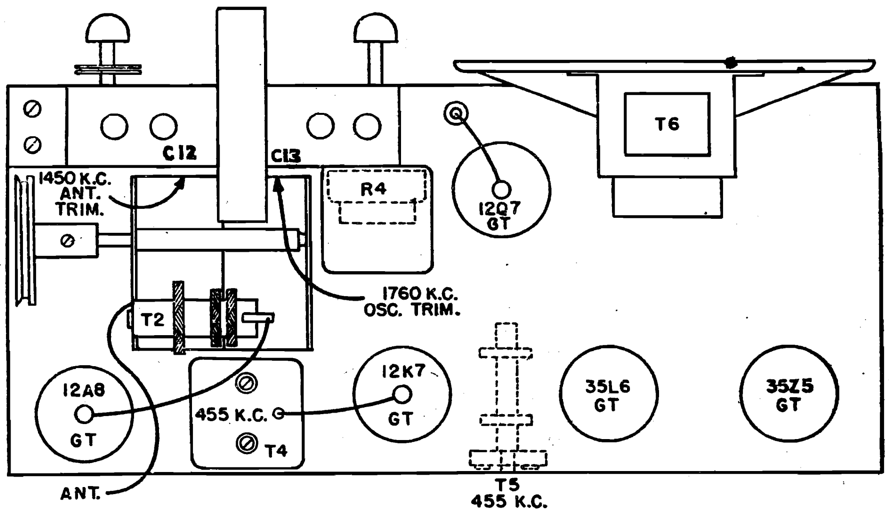
The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the A.V.C. of the receiver from interfering with accurate alignment.

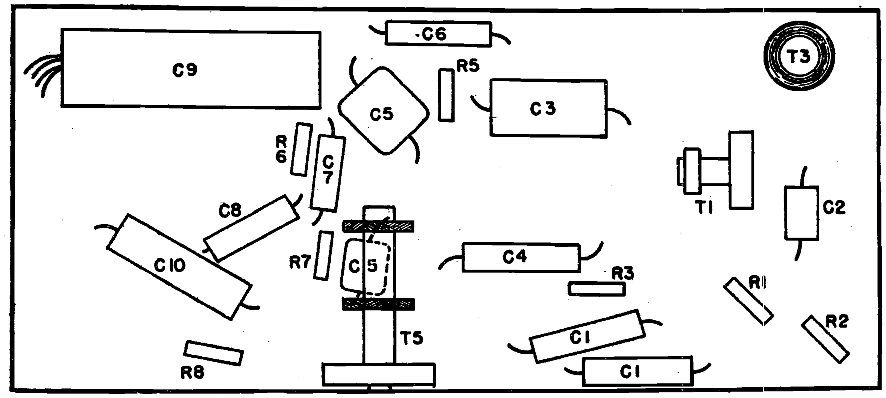
When adjusting T1, Antenna Wave Trap, Trimmer, increase generator output. To obtain clearly defined trimmer setting for a minimum output.

MAR. 21, 1939

MODELS 015150,015151 GOODYEAR TIRE & RUBBER CO., INC.



LOCATION OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS UNDER CHASSIS

C10		Condenser .03 mf. 600V
C8		Condenser .02 mf. 400V
C5		Condenser .0005 mf. mica
C7		Condenser .01 mf. 200V
C2		Condenser .0001 mf. mica
C1		Condenser .05 mf. 200V
C6		Condenser .001 mf. 400V
C3		Condenser .25 mf. 200V
C4		Condenser .1 mf. 200V
C9	1012118239	Condenser Electrolytic (40x10) & 20 mf.
C11	1012019132	Condenser Variable C12 & C13
R4	1012524134	Control Volume 500M
R7		Resistor 470M ohm 1/3W
R6		Resistor 220M ohm 1/3W
R3		Resistor 2.2 meg. ohm 1/3W
R1		Resistor 22M ohm 1/3W
R2		Resistor 47M ohm 1/3W
R5		Resistor 10 meg. ohm 1/3W
R8		Resistor 150 ohm 1/3W
T2	1011810239	Transformer Antenna
T4	1015510241	Transformer 1st I.F.
T5	1015710283	Transformer 2nd I.F.
T3	1011810240	Transformer Oscillator
T1	1016310256	Wave Trap (coil & trimmer)

FOR SETTING OF PUSH-BUTTONS SEE MODEL 015140

HOW THE AUTOMATIC PUSH-BUTTON TUNER FUNCTIONS:

This unit is mechanically operated by means of a proven cam and lever action, designed to rotate a shaft 90 degrees. Since the variable gang condenser shaft must rotate 180 degrees, a 2 to 1 step up mechanical lever action is incorporated to give full rotation to the gang condenser. Three links are used to transmit the operation of the push-button to the variable gang condenser; first, a driver lever or link connected to the tuner lever bar, (see Pictorial); second, a driven lever arm connected to the gang condenser shaft; and third, a connecting link, connecting the two lever arms together mechanically.

The plunger bar that retains the screw type push-buttons, also holds a cam to itself by a shoulder rivet. This cam floats on the rivet proper and is locked into position with a small square plate, floating in the plunger bar. To lock cam into position, screw the push-button knob toward the right (clock-wise). The end of the push-button screw will then force a small square plate known as a brake shoe against the periphery of the cam. The push-button must be tightened firmly after the position of the station selection is determined. To change the setting of the cam, the push-button knob must be loosened by rotating it toward the left (counter-clockwise). When this push-button screw is loosened, it will automatically release the brake shoe from the cam, leaving the cam free to rotate and set its new position to the setting of the lever bar.

If it becomes necessary to realign the tuner in relation to the gang condenser, the following procedure should be followed to assure perfect tuning operation:

1. Attach driver arm to the lever bar by means of two machine screws, making sure that they are assembled with lockwashers and tightened securely.

2. Slip the drum assembly, which consists of the drum, drum hub, and the driven arm, over the variable condenser shaft but do not tighten set screws.

3. Connect these two lever arms by slipping the connecting link over the heads of the shoulder rivets. This link has a slight bend (offset) about 1/3 of its length and is to be installed with the shorter end towards the top and the offset towards the rear when looking at it from the drum end. Attach the tension spring between the two shoulder rivets. This spring is incorporated to take up all the unnecessary slack in the drive.

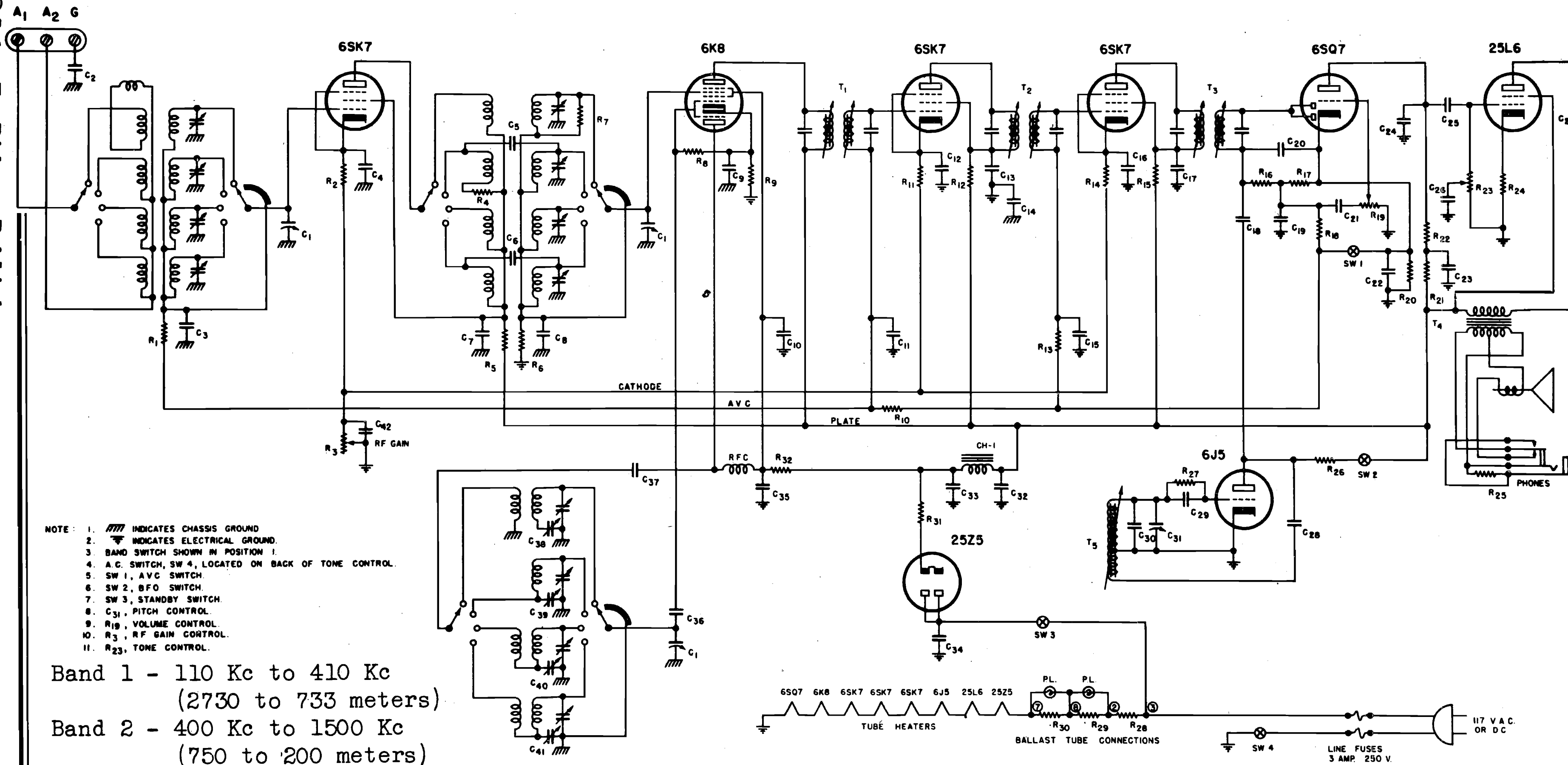
4. In making the final adjustment, that of setting the condenser in relation to the tuner, close the condenser completely to maximum capacity and rotate drum with the left hand in a clock-wise rotation, until the driver arm comes gradually down to within ⅛ of an inch of the variable condenser shaft. When in this position, tighten set screws in the drum hub with the right hand.

It is essential that all set screws be tightened securely so as to prevent a variation from original setting.

If, for some reason, a replacement is necessary for some particular item on the tuner proper, such as a lever bar, cam, plunger bar or brake shoe, it would be advisable to return the complete tuner proper for replacement.

THE HALLICRAFTERS INC.

MODEL S-22R
Skyrider Marine



Band 1 - 110 Kc to 410 Kc
(2730 to 733 meters)

Band 2 - 400 Kc to 1500 Kc
(750 to 200 meters)

Band 3 - 1.7 Mc to 5.9 Mc
(177 to 51 meters)

Band 4 - 5.3 Mc to 18 Mc
(56 to 16.7 meters)

NOTE: The SKYRIDER MARINE Model S22R is an AC-DC receiver which operates on 110/125 volts only. Should operation be desired from a lower voltage DC source, an external converter delivering 110/125 volts should be used. A 220 volt DC Model S22R is available on order and uses a special line cord with dropping resistor.

If an inverted "L" antenna is used, connect lead-in to A_1 and leave the jumper between A_2 and G. If an "all wave" doublet is used, connect the transmission line to A_1 and A_2 with the jumper removed from A_2 and G. A separate antenna may be used for one s-w band; use a half-wave antenna whose length can be calculated from

$$\text{Length in feet} = \frac{463}{\text{Frequency in megacycles}}$$

MODEL S-22R
Skyrider Marine

THE HALLICRAFTERS INC.

ALIGNMENT PROCEDURE

ALIGNMENT INSTRUCTIONS:

Equipment needed for aligning:
1 - An all wave signal generator which will provide an accurately calibrated signal at the test frequencies indicated.
2 - Output indicating meter connected to a headphone plug, and inserted in the headphone jack.
3 - Non-metallic screw driver.
4 - Dummy antenna of .002 mfd. condenser and 400 ohm resistor.

SETTING OF CONTROLS PRIOR TO ALIGNMENT - IF AND RF.

1 - Tone control at maximum high frequency position.
2 - AVC switch OFF.
3 - BFO switch OFF.
4 - RF Gain at maximum.
5 - AF gain at maximum.

1600 Kc IF ALIGNMENT.

Tune receiver to 5,000 Kc with the band switch in #3 position.

Connect hot side of signal generator to 6K8 grid cap through 1 MFD condenser - ground of generator to the chassis. Signal generator output - 1,600 Kc.

Adjust screws S1 to S6 inclusive on IF transformers T 1-2-3 for maximum gain.

BFO ADJUSTMENT - With a 1600 Kc signal being fed into the IF amplifier, and the BFO switch ON, place the Pitch Control with the white dot UP. Now adjust the screw S7 on the top of T5 for zero beat. Further adjustment of the Pitch Control from the front of the panel will enable you to vary the frequency of the beat note to your satisfaction.

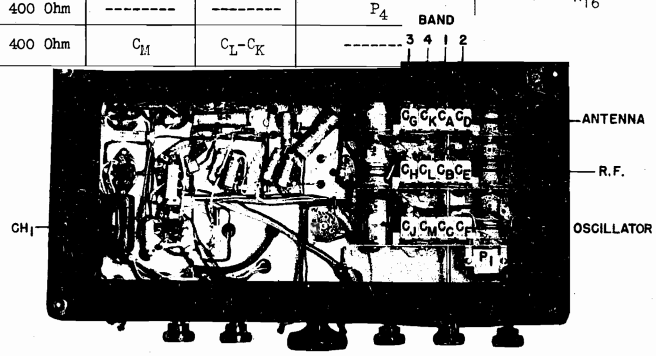
R.F. ALIGNMENT

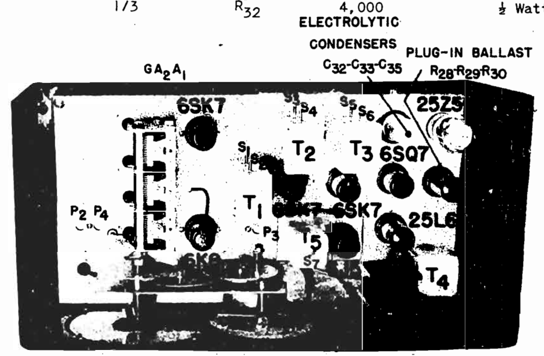
Connect hot Lead of Signal Generator to A_1 through dummy Antenna shown in Table. Leave Jumper connected between A_2 and G. Ground of Generator to Chassis.

BAND	REC. DIAL SETTING	SIG. GEN. FREQ.	DUMMY ANTENNA	HIGH FREQUENCY END: ADJUST OSC WITH	HIGH FREQUENCY END: ADJUST TRIMMERS WITH	LOW FREQUENCY END: ADJUST OSCILLATOR WITH
1	125 Kc	125 Kc	.002 mfd	--------	--------	P_1
	350 Kc	350 Kc	.002 mfd	C_C	C_A-C_B	--------
2	450 Kc	450 Kc	.002 mfd	--------	--------	P_2
	1400 Kc	1400 Kc	.002 mfd	C_F	C_E-C_D	--------
3	2 Mc	2 Mc	400 Ohm	--------	--------	P_3
	4.5 Mc	4.5 Mc	400 Ohm	C_J	C_G-C_H	--------
4	7 Mc	7 Mc	400 Ohm	--------	--------	P_4
	15 Mc	15 Mc	400 Ohm	C_M	C_L-C_K	--------

NO.	VALUE	VOLTAGE OR PURPOSE	TYPE
C_1	Tuning Condenser	563 mmfd per section	
C_2	.01 mfd	400 V.	Paper
C_3	.05 mfd	400 V.	Paper
C_4	.05 mfd	400 V.	Paper
C_5	5 mmf		Ceramicon
C_6	5 mmf		Ceramicon
C_7	.25 mfd	400 V.	Paper
C_8	.05 mfd	400 V.	Paper
C_9	.05 mfd	400 V.	Paper
C_{10}	.1 mfd	400 V	Paper
C_{11}	.02 mfd	400 V.	Paper
C_{12}	.02 mfd	400 V.	Paper
C_{13}	.01 mfd	400 V.	Paper
C_{14}	.25 mfd	400 V.	Paper
C_{15}	.02 mfd	400 V.	Paper
C_{16}	.02 mfd	400 V.	Paper
C_{17}	.01 mfd	400 V.	Paper
C_{18}	10 mmf		Ceramicon
C_{19}	100 mmf		Mica
C_{20}	100 mmf		Mica
C_{21}	.02 mfd	400 V.	Paper
C_{22}	10 mf	25 V.	Electrolytic
C_{23}	.05 mfd	400 V.	Paper
C_{24}	250 mfd		Mica
C_{25}	.05 mfd	400 V.	Paper
C_{26}	.01 mfd	400 V.	Paper
C_{27}	.005 mfd	600 V.	Paper
C_{28}	.01 mfd	400 V.	Paper
C_{29}	250 mmfd		Mica
C_{30}	200 mmfd		Mica
C_{31}	5 mmf	BFO Pitch Con.	Air Variable
C_{32}	40 mfd	150 V.	Electrolytic
C_{33}	40 mfd	150 V.	Electrolytic
C_{34}	.05 mfd	400 V.	Paper
C_{35}	30 mfd	150 V.	Electrolytic
C_{36}	100 mmfd		Mica
C_{37}	2000 mmfd		Mica
C_{38}	32 mmfd	Band 1 Pad	
C_{39}	110 mmfd	Band 2 Pad	
C_{40}	480 mfd	Band 3 Pad	
C_{41}	1300 mfd	Band 4 Pad	
C_{42}	.1 mfd	200 V.	Paper
SW1		A.V.C. "ON-OFF"	
SW2		B.F.O. "ON-OFF"	
SW3		Standby	
SW4		A.C.-D.C. Line	

NO.	VALUE IN OHMS	WATTAGE OR PURPOSE
R_1	100,000	1/3
R_2	300	1/3
R_3	25,000	R. F. Gain Control
R_4	400	1/3
R_5	1,000	1/3
R_6	100,000	1/3
R_7	100,000	1/3
R_8	50,000	1/3
R_9	400	1/3
R_{10}	100,000	1/3
R_{11}	500	1/3
R_{12}	1,000	1/3
R_{13}	100,000	1/3
R_{14}	400	1/3
R_{15}	1,000	1/3
R_{16}	100,000	1/3
R_{17}	250,000	1/3
R_{18}	1 Meg.	1/3
R_{19}	500,000	Audio Gain Control
R_{20}	7,500	1/3
R_{21}	100,000	1/3
R_{22}	250,000	1/3
R_{23}	500,000	Tone Control
R_{24}	140	1/2
R_{25}	100	1/2
R_{26}	5,000	1/3
R_{27}	250,000	1/3
R_{28}	Plug-in Ballast Tube Muter-Type BK29D	
R_{29}	Plug-in Ballast Tube Muter-Type BK29D	
R_{30}	Plug-in Ballast Tube Muter-Type BK29D	
R_{31}	25	1 Watt
R_{32}	4,000	½ Watt





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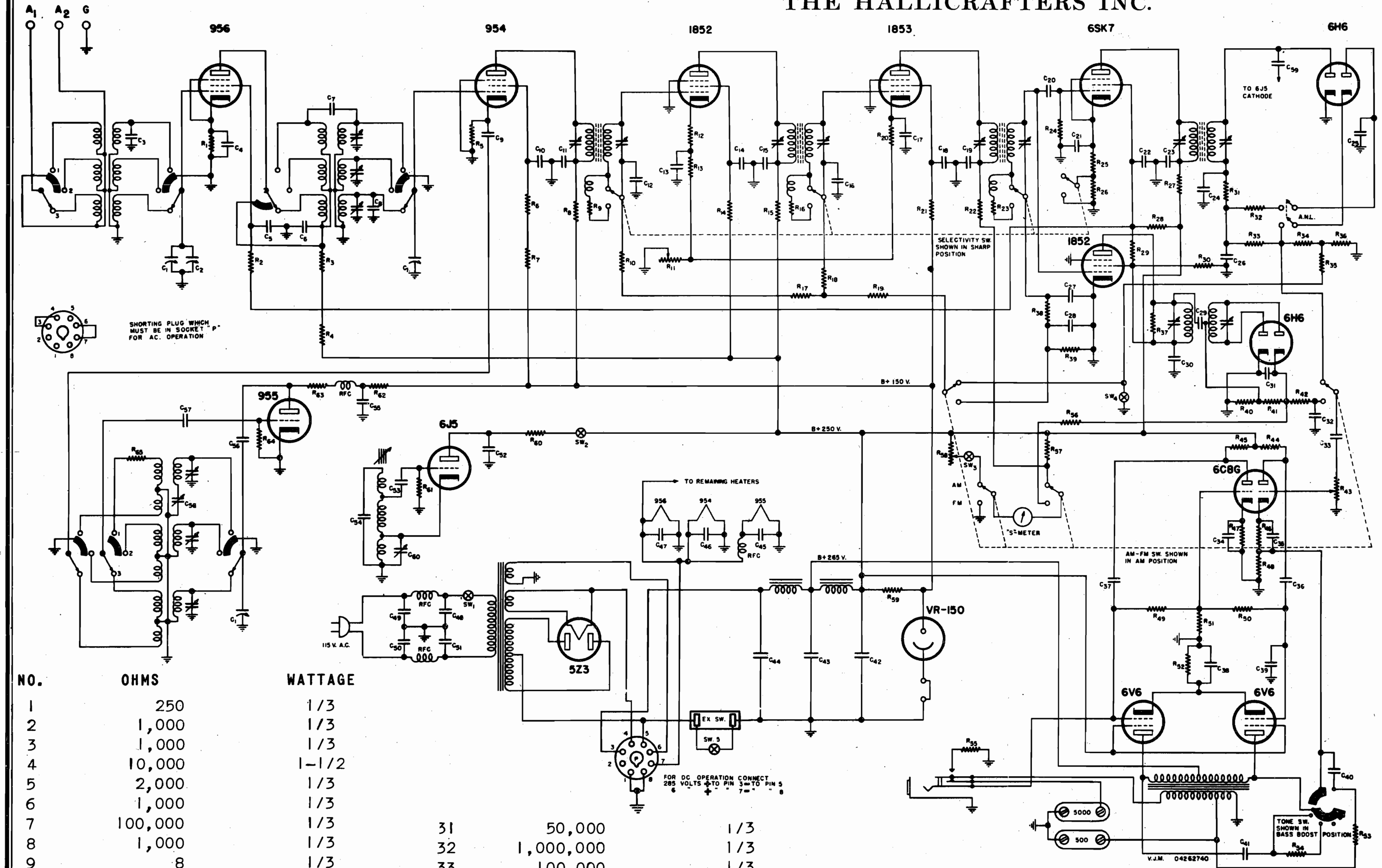

NO.	OHMS	WATTAGE
1	250	1/3
2	1,000	1/3
3	1,000	1/3
4	10,000	1-1/2
5	2,000	1/3
6	1,000	1/3
7	100,000	1/3
8	1,000	1/3
9	8	1/3
10	100,000	1/3
11	10,000	R.F. Gain Control
12	35	1/3
13	120	1/3
14	40,000	1/3
15	300	1/3
16	8	1/3
17	100,000	1/3
18	100,000	1/3
19	100,000	1/3
20	200	1/3
21	1,000	1/3
22	300	1/3
23	8	1/3
24	500,000	1/3
25	300	1/3
26	5,000	1/3
27	1,000	1/3
28	7,500	10 Wire Wound
29	2,000	1/3
30	20,000	1-1/2

NO.	OHMS	WATTAGE
31	50,000	1/3
32	1,000,000	1/3
33	100,000	1/3
34	250,000	1/3
35	500,000	1/3
36	250,000	1/3
37	15,000	1/3
38	50,000	1/3
39	250,000	1/3
40	100,000	1/3
41	100,000	1/3
42	200,000	1/3
43	500,000	Audio Gain Control
44	250,000	1/3
45	250,000	1/3
46	5,000	1/3
47	5,000	1/3
48	120	1/3
49	250,000	1/3
50	250,000	1/3
51	100,000	1/3
52	250	1-1/2
53	10,000	1/3
54	4,000	1-1/2

NO.	OHMS	WATTAGE
55	5,000	1-1/2
56	600,000	1/3
57	17	1/3 Wire Wound
58	1,500	S. Meter Zero Adj. Wire Wound
59	3,200	10
60	25,000	1-1/2
61	50,000	1/3
62	300	1/3
63	5,000	1/3
64	20,000	1/3
65	35	1/3

Band 1	27.5	to	47	mc
Band 2	46	to	82	mc
Band 3	82	to	145	mc

I.F. PEAK 5.25 MC

NO.	CAPACITY	VOLTAGE	TYPE
1	60 mmf	Per Section	Air
2	15 mmf	Ant.Trimmer	Air
3	5 mmf		3 Ceramicon
4	.002 mfd		Mica
5	300 mmf		Mica
6	.002 mfd		Mica
7	10. mmf		Ceramicon
8	10. mmf		Ceramicon
9	300 mmf		Mica
10	300 mmf		Mica
11	.01 mfd	600	Paper
12	.001 mfd		Mica
13	.02 mfd	400	Paper
14	.02 mfd	400	Paper
15	01 mfd	600	Paper
16	.001 mfd		Mica
17	.02 mfd	400	Paper
18	.02 mfd	400	Paper
19	.01 mfd	600	Paper
20	50 mmf		Mica
21	.02 mfd	400	Paper
22	.02 mfd	400	Paper
23	.01 mfd	600	Paper
24	50 mmf		Mica
25	.05 mfd	400	Paper
26	50 mmf		Mica
27	100 mmf		Mica
28	500 mmf		Mica
29	25 mmf		Mica
30	.002 mfd		Mica
31	50 mmf		Mica
32	500 mmf		Mica
33	.05 mfd	400	Paper
34	30 mfd	25	Electrolytic
35	30 mfd	25	Electrolytic
36	.05 mfd	400	Paper
37	.05 mfd	400	Paper
38	20 mfd		Electrolytic
39	.002 mfd		Mica
40	.05 mfd	400	Paper
41	.05 mfd	400	Paper
42	10. mfd	350	Electrolytic
43	30 mfd	350	Electrolytic
44	10 mfd	400	Electrolytic
45	300 mmf		Mica
46	300 mmf		Mica
47	300 mmf		Mica
48	.01 mfd	600	Paper
49	.01 mfd	600	Paper
50	.01 mfd	600	Paper
51	.01 mfd	600	Paper
52	.002 mfd		Mica
53	100 mmf		Mica
54	200 mmf		Ceramicon
55	300 mmf		Mica
56	50 mmf		Ceramicon
57	.001 mfd		Mica
58	450 mmf		Pad
59	2 mmf		Twisted Pair
60	25 mmf	B.O. Pitch Control	Air

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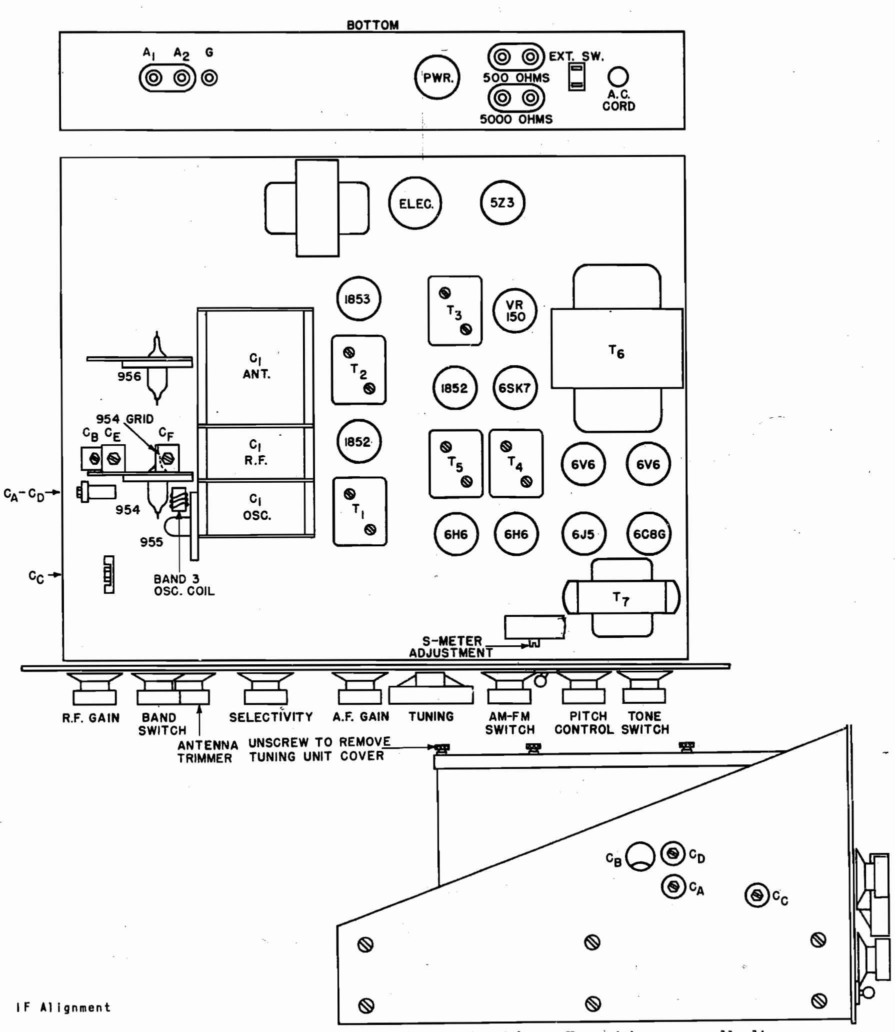
MODEL S-27



IF Alignment

Connect a signal generator to the grid of the 954 converter tube. Use either a small clip or a piece of flexible wire wound around the grid terminal. Do not attempt to solder to the tube as the heat is certain to crack the glass. Connect a suitable output meter across the speaker terminals.

Controls should be set as follows:

RF gain control at maximum sensitivity.
Band switch in band 2.
Selectivity switch in sharp position.
AM-FM switch in AM position.

Audio gain control in maximum position.
AVC switch in off position.
ANL switch in off position.
BFO switch in off position.

Tune the signal generator to 5.25 megacycles and align transformers T_1, T_2, T_3 and T_4 for maximum response.

A bakelite screw-driver with a metal or insulated tip is necessary for accurate alignment.

This alignment process should be repeated at least once to assure greatest possible selectivity.

To align the "discriminator" transformer (T_5) turn the selectivity switch to the broad position and the AM-FM switch to the AM position.

Leave the signal generator set at the frequency originally used for IF alignment with the modulation left on. Rotate the trimmer control across the discriminator (T_5) secondary (nearest the front of the chassis) until the signal drops to zero. As this point is approached very suddenly, turn the control very slowly. Now slightly detune the signal generator until the output meter gives a readable indication. Adjust the primary trimmer control of the discriminator transformer for maximum response.

Next detune the signal generator to either side of resonance and note the maximum output in each case as indicated on the output meter. These values should be the same for good balance. If they are not, then tune the signal generator to the lower of the two peaks and adjust the primary until the output rises an amount equal to about half the difference of the two outputs previously noted.

Retest for balance as above and readjust the primary till both maximum readings are alike when the signal generator is detuned to either side of resonance.

If a balance cannot be obtained, it is an indication that the discriminator secondary trimmer control has been adjusted off its proper center and will require a very slight readjustment in either direction. The direction of adjustment that will cause the off-tune peaks to assume the same values is the correct one. Care must be taken in adjusting the discriminator secondary control as even a slight misadjustment will result in the distorted reception of frequency-modulated signals.

RF Alignment

Connect a high frequency signal generator to the antenna terminal (A_1) through a 75 ohm resistor and the ground of the generator to the ground terminal of the receiver. Leave terminal A_2 connected to the ground terminal.

The Ferris Signal Generator Model 18B is recommended for alignment purposes. If this is not available, harmonics of a standard signal generator may be used.

The controls should be set in the same position as for IF alignment.

Set the AM-FM switch in the AM position.
Set the bandswitch on band 1.
Tune the generator and receiver to 42 mc.

Adjust oscillator trimmer C_A until the signal is heard. The frequency of the oscillator is higher than that of the signal. Next adjust trimmer C_B and the antenna trimmer for maximum response.

Tune both receiver and signal generator to 28 megacycles and adjust padder C_C for maximum response while rocking the tuning control. Then repeat the alignment at the high frequency end as described.

BAND 2

Tune the receiver and signal generator to 75 megacycles. Adjust trimmer C_D until the signal is heard. In this band, the frequency of the oscillator is lower than that of the signal. Adjust the antenna trimmer and trimmer C_E for maximum response while rocking the gang condenser. No padder condenser adjustment is provided for the low-frequency end of this band.

BAND 3

Tune the receiver and signal generator to 120 megacycles. Adjust trimmer C_F and the antenna trimmer for maximum response while rocking the gang. It is not recommended that the frequency of the oscillator in this band be adjusted except at the factory. Should it be impractical to return the receiver to the factory for adjustment, then the following instructions are included.

Remove the top cover and locate the high frequency oscillator coil. The white wire winding, one end of which is connected to a terminal on the form is the primary. By carefully shifting the free end of this winding the frequency can be changed over a sufficient range. This lead should be cemented in place with Q-Max or any other low loss cement when adjustment is completed.

Repeat the adjustment of C_F as described above after shifting the frequency of the oscillator.

As in band 2, the frequency of the oscillator is higher than that of the signal. No padder condenser adjustment is provided for the low frequency end of this band.

MODELS S-17,
SX-17 (1939)

THE HALLICRAFTERS INC.

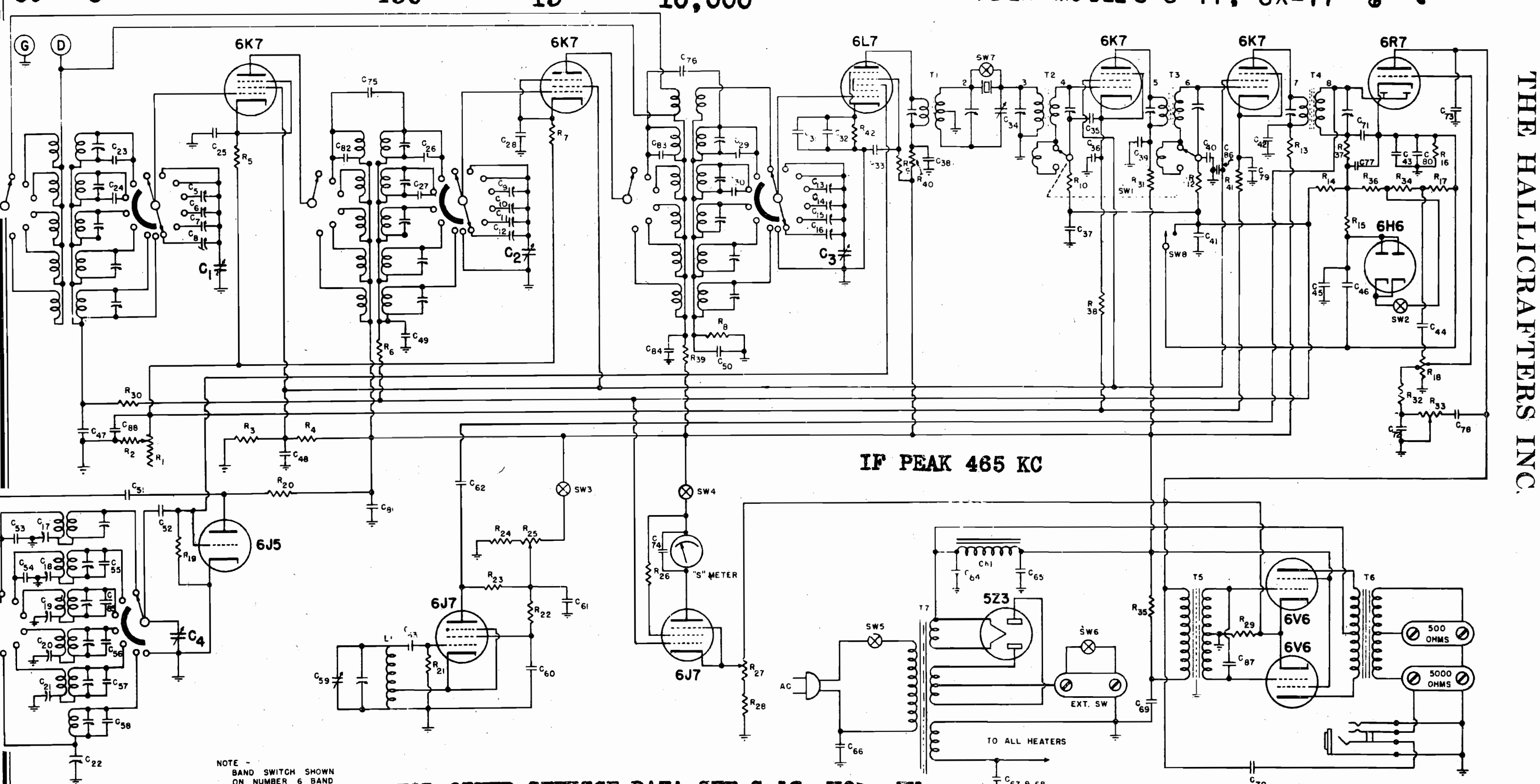
NOTE: 6H6 Silencer voltages;pins 3,4,5, and 8 are -2 volts; pin 7,6,3 volts. See chart VOL. IX.

For other parts see S-17. VOL.IX

No.	Capacity	Type	Voltage
36	.1 mfd	Air	200
38	.05 "		400
39	.05 "		400
42	.05 "		400
45	.1 mfd		200
46	.002 "	Mica	
48	25 "		400
69	8 "		450
78	.1 mfd		400
79	.1 "		200
86	.1 mfd		200
87	.0005 "		450
88	.25 "		400

No.	Ohms	Wattage
1	10,000	R.F.Gain
2	95	1/3
10	100,000	1/3
13	10,000	"
29	400	2
31	10,000	"
32	60,000	"
38	2,000	"
40	10,000	"
41	1,500	"
42	280	1

SKYRIDER MODELS S-17, SX-17



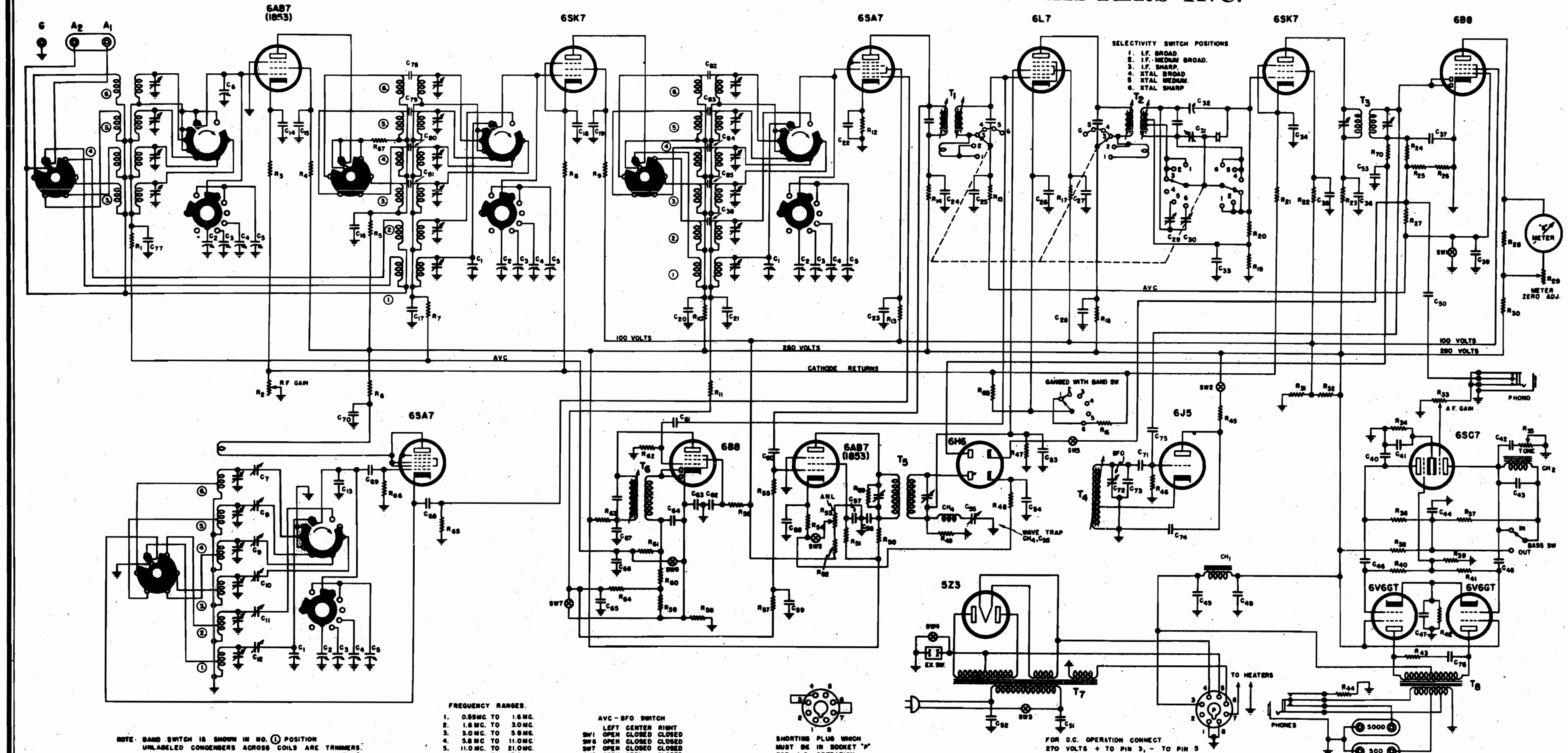
IF PEAK 465 KC

NOTE - BAND SWITCH SHOWN ON NUMBER 6 BAND

FOR OTHER SERVICE DATA SEE S-17, VOL. IX.

THE HALLICRAFTERS INC.

MODEL SX28
Super Skyrider



Power Consumption—at 117 volts—60 cycles—138 watts
Power Consumption—DC operation—18 amp. at 6 volts or 108 watts
Power Output —8 watts undistorted
Sensitivity—(for .05 watts output) Bands 1 to 5—2 MV and under; 6th band 4 MV

		2 x	1000 x
Selectivity—	IF broad (high fidelity)	12 kc	36 kc
	IF Sharp	4.1 kc	22 kc

Frequency Range RF—Note: These are the actual frequencies covered corresponding to nominal figures indicated on the front panel.

550 to 1,620 kilocycles
1.5 to 3.1 megacycles
2.9 to 5.9 megacycles
5.75 to 11.5 megacycles
10.3 to 21.5 megacycles
20.4 to 42 megacycles

Frequency response AF (audio filter out broad IF—tone control high-70 to 3000 cycles ± 2½ DB
Speaker Output Impedances—5000 and 500 ohms
Intermediate Frequency—455 kc

No.	Value	Voltage or Purpose	Type
C 1	Band No. 1 Tuning Condenser	......	......
C 2	Main Tuning Condenser	......	......
C 3	3 Plate Bandspread Condenser	......	......
C 4	4 Plate Bandspread Condenser	......	......
C 5	5 Plate Bandspread Condenser	......	......
C 6	50 mmf	......	Variable Air
C 7	2,160 mmf	Band No. 6 Pad	Mica
C 8	2,962 mmf	5 Pad	Mica
C 9	2,276 mmf	4 Pad	Mica
C10	1,600 mmf	3 Pad	Mica
C11	876 mmf	2 Pad	Mica
C12	515 mmf	1 Pad	Mica
C13	Temperature Compensated	Condenser	
C14	.02 mfd	400	Tubular
C15	.02 mfd	400	Tubular
C16	.02 mfd	400	Tubular
C17	.05 mfd	200	Tubular
C18	.02 mfd	400	Tubular
C19	.02 mfd	400	Tubular
C20	.02 mfd	400	Tubular
C21	.05 mfd	200	Tubular
C22	.02 mfd	400	Tubular
C23	.02 mfd	400	Tubular
C24	.02 mfd	400	Tubular
C25	.02 mfd	400	Tubular
C26	.05 mfd	200	Tubular
C27	.02 mfd	400	Tubular
C28	.02 mfd	400	Tubular
C29	20 mmf	Trimming Condenser	
C30	20 mmf	Trimming Condenser	
C31	20 mmf	Trimming Condenser	
C32	20 mmf	Crystal Phasing	Air
C33	.02 mfd	400	Tubular
C34	.05 mfd	200	Tubular
C35	.02 mfd	400	Tubular
C36	.02 mfd	400	Tubular
C37	50 mmf		Mica
C38	5 mmf		Ceramic

C39	.02 mfd	400	Tubular
C40	500 mmf	......	Mica
C41	10. mfd	25	Electrolytic
C42	.02 mfd	400	Tubular
C43	5000 mmf	....	Mica
C44	10. mfd	300	Electrolytic
C45	.05 mfd	400	Tubular
C46	.05 mfd	400	Tubular
C47	40 mfd	25	Electrolytic
C48	30 mfd	400	Electrolytic
C49	30 mfd	450	Electrolytic
C50	.02 mfd	400	Tubular
C51	.01 mfd	600	Tubular
C52	.01 mfd	600	Tubular
C53	.05 mmf	200	Mica
C54	.05 mfd	400	Tubular
C55		Trimming Cond.	
C56	.02 mfd	400	Tubular
C57	.02 mfd	400	Tubular
C58	.05 mfd	200	Tubular
C59	.05 mfd	200	Tubular
C60	50 mmf	......	Mica
C61	250 mmf	......	Mica in T_1
C62	.02 mfd	400	Tubular
C63	.05 mfd	200	Tubular
C64	100 mmf	......	Mica
C65	.02 mfd	400	Tubular
C66	.05 mfd	200	Tubular
C67	.02 mfd	400	Tubular
C68	50 mmf	......	Mica
C69	50 mmf	......	Mica
C70	2000 mmf	......	Mica
C71	100 mmf	......	Mica
C72	25 mmf	BFO Control	Air
C73	500 mmf	......	Mica in T_4
C74	.01 mfd	600	(Braided Leads)
C75	2 mmfd	......	Twisted Leads
C76	2000 mmfd	......	Mica
C77	.05 mfd	200	Tubular

C78	10 mmfd	......	Ceramic
C79	5 mmfd	......	Ceramic
C80	5 mmfd	......	Ceramic
C81	2 mmfd	......	Twisted Leads
C82	10 mmfd	......	Ceramic
C83	5 mmfd	......	Ceramic
C84	5 mmfd	......	Ceramic
C85	2 mmfd	......	Twisted Leads

No.	Value in Ohms	Wattage or Purpose
R 1	100,000	⅓
R 2	10,000	RF Gain Control
R 3	300	⅓
R 4	25,000	½
R 5	3,000	⅓
R 6	7,000	2
R 7	100,000	⅓
R 8	300	⅓
R 9	1,000	⅓
R10	3,000	⅓
R11	100,000	⅓
R12	400	⅓
R13	1,000	⅓
R14	3,000	⅓
R15	100,000	⅓
R16	250	⅓
R17	1,000	⅓
R18	3,000	⅓
R19	100,000	⅓
R20	500,000	⅓
R21	400	⅓
R22	1,000	⅓
R23	3,000	⅓
R24	100,000	⅓
R25	250,000	⅓
R26	250,000	⅓
R27	500,000	
R28	100	⅓
R29	500	"S" Meter Control
R30	30,000	2
R31	11,000	1½ Candohm
R32	4,000	7
R33	500,000	AF Gain Control
R34	1,000	⅓
R35	500,000	Tone Control
R36	100,000	⅓
R37	100,000	⅓
R38	50,000	⅓
R39	200,000	⅓
R40	250,000	⅓
R41	250,000	⅓
R42	200	2
R43	20,000	1
R44	5,000	10
R45	20,000	1
R46	50,000	⅓
R47	5,000	1
R48	100,000	⅓
R49	1,000,000	⅓
R50	5,000	⅓
R51	20,000	½
R52	50,000	⅓
R53	50,000	ANL Control
R54	54	⅓
R55	500,000	⅓
R56	1,000	⅓
R57	100,000	⅓
R58	200	⅓
R59	250,000	⅓
R60	250,000	⅓
R61	500,000	⅓
R62	500,000	⅓ Inside T_1
R63	3,000	⅓
R64	500,000	⅓
R65	50,000	⅓
R66	50,000	⅓
R67	500	⅓
R68	600	½
R69	100,000	⅓
R70	1,000,000	⅓

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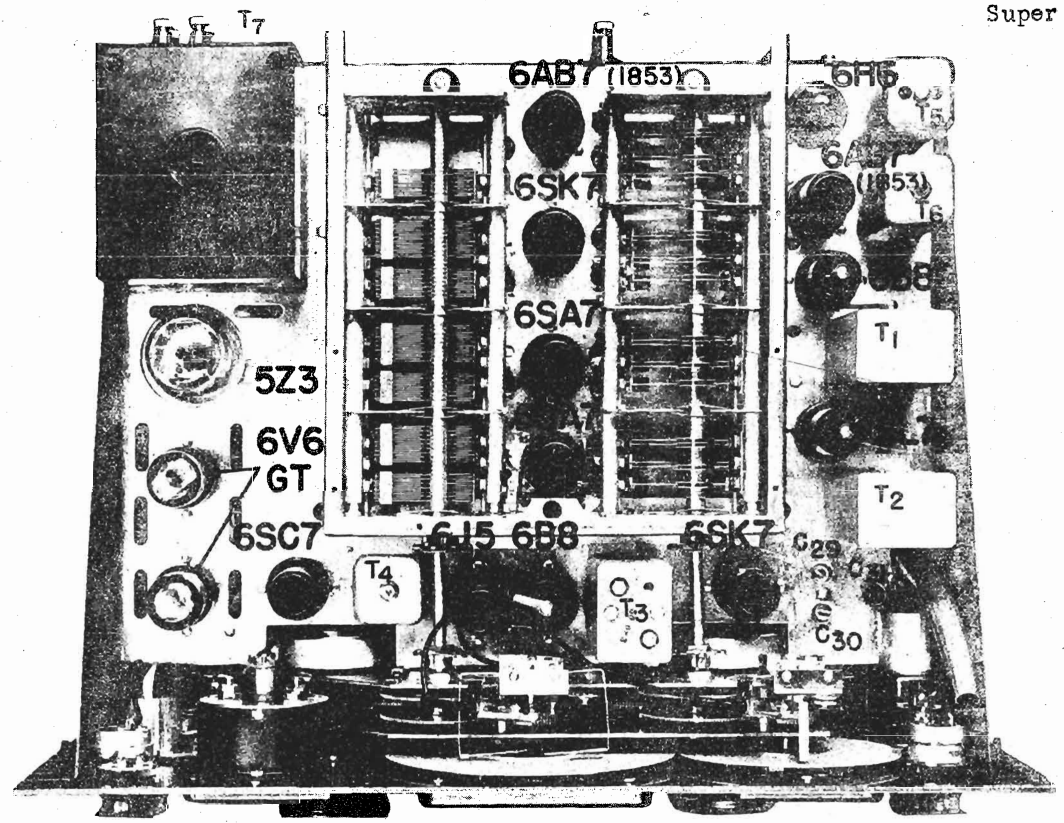
MODEL SX 28
Super Skyrider

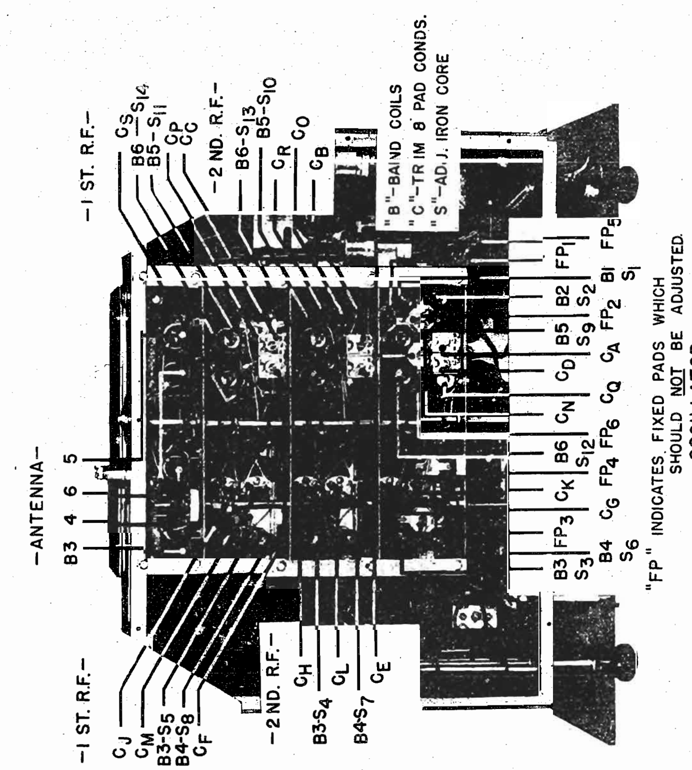


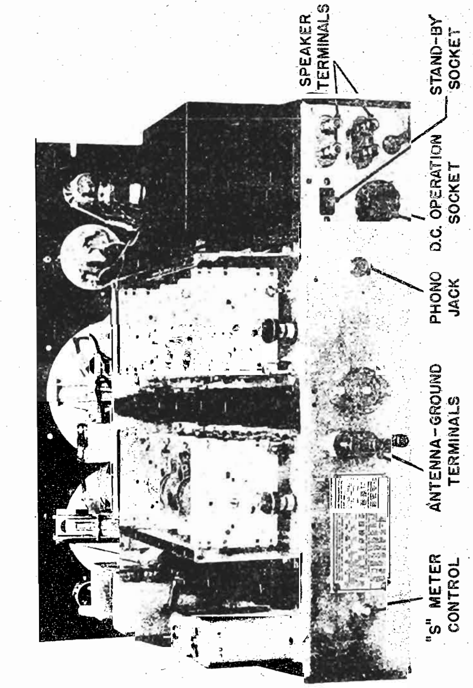
The following measurements made with a 20,000 ohms per volt meter and taken from the socket terminal indicated to ground or receiver chassis. Antenna and ground were disconnected from the receiver when these measurements were taken and the RF and AF gain controls set at maximum. "DL" means Dead Lug but will indicate voltage when used as a tie. Normal tolerance allows a variation of ±10% from the indicated values.

TUBE	FUNCTION	SOCKET TERMINALS								
		1	2	3	4	5	6	7	8	Cap.
6AB7	RF Amp. (1)	...	...	...	0.1	4.15	170	6.3	227	....
6SK7	RF Amp. (2)	...	...	4.35	0.1	4.35	105	6.3	279	....
6SA7	Mixer	...	...	250	100	0.12	4.1	6.3	...	....
6SA7	HF Osc.	...	...	116	116	0.3	...	6.3	116	....
6L7	IF Amp. (1) Noise Limiter	...	...	245	102	...	...	6.3	4	−.075
6SK7	IF Amp. 2	...	...	4	...	4	107.5	6.3	235	....
6B8	2nd Det. S Meter Tube	...	...	17.2	−.255	−.255	108	6.3	...	−.17
6B8	AVC Amp.	...	...	225.5	0.2	0.2	107	6.3	2	....
6AB7	Noise Amp.	...	...	...	.07	1.1	150	6.3	225	....
6H6	Noise Rectifier	...	...	...	.1	...	17.6 DL	6.3	−.1	....
6J5	Beat Osc.	...	...	140	...	−7.4	...	6.3	...	BFO ON ONLY FOR TEST
6SC7	1st Audio Amp.	...	140	...	...	137	1.4	6.3	...	....
6V6GT	P.P. Audio Amp.	...	...	310	290	...	198 DL	6.3	17	....
6V6GT	P.P. Audio Amp.	...	...	310	290	...	...	6.3	17	....
5Z3	Rectifier	320	340 AC	340 AC	320	...	...	...	...	....

MODEL SX28
Super Skyrider

THE HALLICRAFTERS INC.





ALIGNMENT PROCEDURE MODEL SX-28—SUPER SKYRIDER

Equipment Needed for Aligning:

1—An all wave signal generator which will provide an accurately calibrated signal at the test frequencies indicated.

2—Output indicating meter connected to 5000 ohm output terminals.

3—Non-metallic screw driver.

4—Dummy antenna of 200 mmf and also 400 ohm carbon resistor.

Setting of controls prior to alignment—IF and RF.

Tone control at maximum high frequency position (#9)—BFO at 0—Bass switch at Bass IN—AF Gain at #9—RF Gain at #9—Band switch—IF alignment position .55 to 1.6 band—RF alignment depending on band aligned.

Selectivity control at sharp IF—Send-Receive switch in Receive—Crystal phasing at #3 on left side—ANL—OFF at 0—AVC OFF.

Important: Have bandspread control so logging scale reads 100.

Antenna trimmer adjusted for Maximum gain at each RF alignment point on Bands 3-4-5-6.

Note: Antenna trimmer not in circuit on bands 1 and 2.

455 KC—IF Alignment: Tune main dial to 1400 kc on .55 to 1.6 mc band. Connect the hot lead from the signal generator to 6SA7 mixer terminal #8—Ground to chassis. Roughly adjust the aligning screws of T1, the lower screw of which is accessible through hole in right mounting bracket, for maximum gain. Now adjust lower screw on T2 (do not adjust upper screw). Also adjust C31 and the air trimmer condenser at the top of T3 for maximum gain.

Switch to Crystal Broad Position—Turn on BFO and adjust to a tone of about 1000 cycles. Vary the frequency of the signal generator while adjusting the top screw on T2 until the output goes through a maximum, dips down and starts going up again. Adjust the phasing control for maximum selectivity and then back off the top screw on T2 until the output reaches a minimum value between the two maximum values first noted. The frequency of the signal generator should be varied over a small range while adjusting the top screw of T2. A swishing note, in contrast to the usual sharp crystal tone will be apparent when the correct adjustment has been reached.

Switch to "Xtal Sharp" and adjust C_{30} for maximum output while varying signal generator frequency. Two points of maximum output will be noted corresponding to two adjustments of C_{30}. Either one of these points may be used at which to leave C_{30}. a sharply peaked tone will result at the correct adjustment.

Switch to "Xtal Medium" and adjust C_{29} till the output is midway between the outputs reached while aligning the "Xtal Sharp" and "Xtal Broad" positions. The apparent sharpness of tone should be midway between the "Sharp" and "Broad" positions.

Switch again to "Xtal Sharp" and set the signal generator to exact crystal frequency. Set BFO front panel control to a tone of approximately 1000 cycles. Switch again to "Sharp IF" and carefully realign the IF transformers as earlier described in the first paragraph of these instructions.

BFO Adjustment: Set front panel control to zero—BFO switch ON—Signal Generator tuned to crystal frequency —selectivity switch in IF Sharp position—now, adjust screw on top of T4, after loosening lock nut, to zero best.

Noise Limiter and AVC Amplifier Adjustment: Have the controls set as before except that the AVC switch is now in the ON position. Connect a high resistance type voltmeter across R47 which is connected between terminal #5 of the 6L7 tube and chassis.

ANL & AVC Amplifiier Adjustment. Connect a 50,000 ohm resistor across primary of T5 (Red and Blue leads). Set generator at 455 kc as for IF alignment. Connect generator to grip of 6AB7 tube (pin #4). Rotate ANL contro all the way to the right, or position #9. Adjust screws on top of T5 for maximum indication on DC meter connected across R47. Reconnect generator, as for IF alignment, to mixer grid of 6SA7 tube. Remove 50,000 ohm resistor which was inserted across primary of T5 during alignment. Remove grid clip off top of 6L7 tube. With generator set at 455 kc and ANL control at extreme right adjust wave trap trimmer C55 for minimum signal as indicated on output meter.

With generator connected to 6SA7 mixer grid as above, replace 6L7 grid and turn ANL control to extreme left until switch clicks. Connect high resistance DC meter across 6B8 diode filter condenser C64. Adjust screw on top of T6 for maximum indication on DC meter across C64.

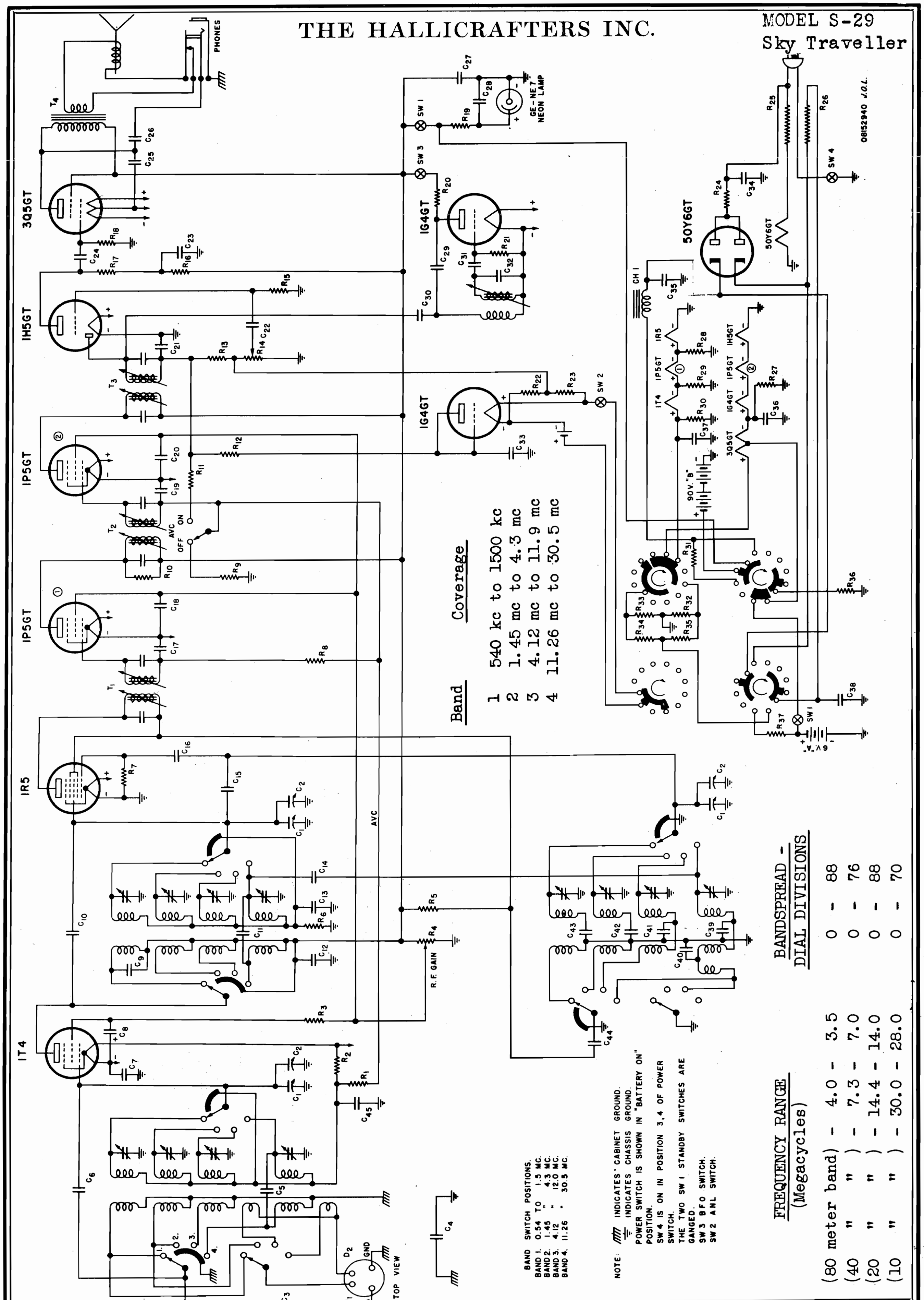
RF ALIGNMENT

Connect hot lead of signal generator to A_1—through dummy antenna shown in table. Leave jumper connected between A_2 and G. Ground of Generator to Chassis.

Band	Rec. Dial Setting	Sig. Gen. Freq.	Dummy Antenna	HIGH FREQUENCY END: Adjust Osc. With	HIGH FREQUENCY END: Adjust Trimmers for Max. Gain	LOW FREQUENCY END: Adjust Osc. With	LOW FREQUENCY END: Permeability Tuned By
1	1.4 mc	1.4 mc	200 mmf	C_A	C_B C_C	....	....
1	.6	.6	200 mmf	....	....	S_1	....
2	2.8	2.8	400 ohms	C_D	C_E C_F	....	....
2	1.6	1.6	400 ohms	....	....	S_2	....
3	5.6	5.6	400 ohms	C_G	C_H C_J	....	....
3	3.2	3.2	400 ohms	....	....	S_3	S_4 S_5
4	11	11	400 ohms	C_K	C_L C_M	....	....
4	6	6	400 ohms	....	....	S_6	S_7 S_8
5	20	20	400 ohms	C_N	C_O C_P	....	....
5	11	11	400 ohms	....	....	S_9	S_{10} S_{11}
6	36	36	400 ohms	C_Q	C_R C_S	....	....
6	22	22	400 ohms	....	....	S_{12}	S_{13} S_{14}

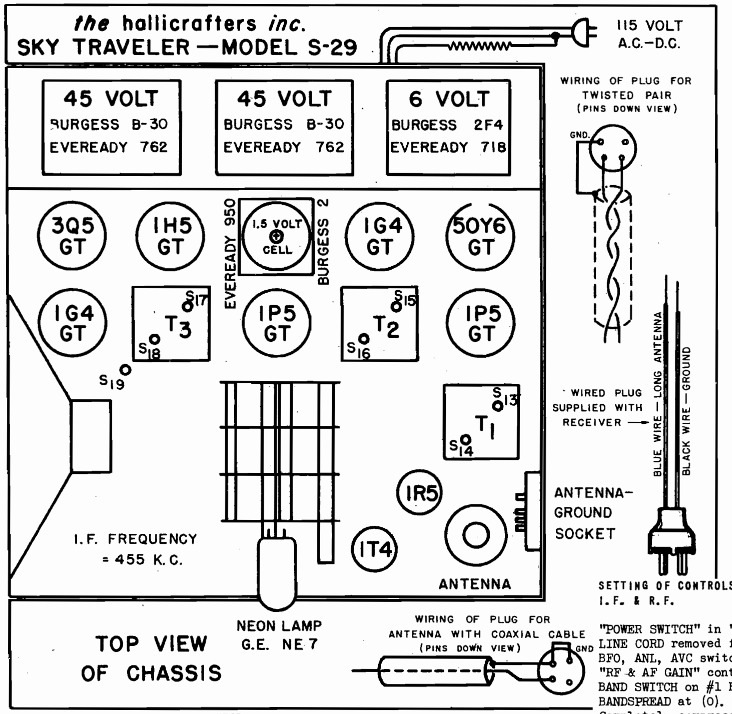
THE HALLICRAFTERS INC.

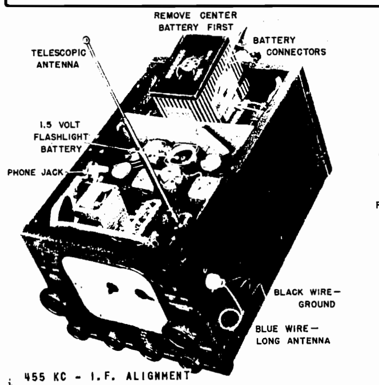
MODEL S-29
Sky Traveller

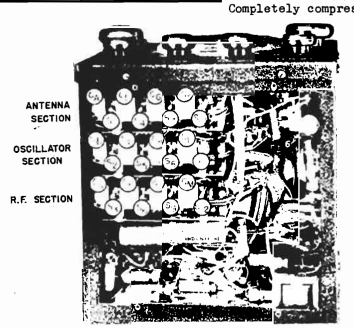


MODEL S-29
Sky Traveller

THE HALLICRAFTERS INC.







BOTTOM VIEW

455 KC - I.F. ALIGNMENT

Set "MAIN TUNING" control at 1500 kc.
Have antenna plug removed from antenna socket.
Tune generator to 455 kc.
Connect low side (GND) of generator to chassis.
Connect high side (HOT) of generator to lug on rear Stator section (R.F.) of main tuning condenser through a 0.1 mfd condenser.
Proceed to adjust the screws S_{13} to S_{18} inclusive protruding from the tops of the I.F. transformers, T_1, T_2 and T_3, for maximum output.

SETTING OF CONTROLS PRIOR TO ALIGNMENT I.F. & R.F.

"POWER SWITCH" in "BAT" position.
LINE CORD removed from outlet.
BFO, ANL, AVC switches "OFF".
"RF & AF GAIN" controls for maximum vol
BAND SWITCH on #1 Band.
BANDSPREAD at (0).
Completely compress the telescopic ant

Without changing the frequency of the generator after completing I.F. alignment - turn BFO switch "ON" and remove modulation from the signal generator. Adjust screw S_{19} to the desired tone (approximately 1000 cycles).

NOTE: - It is also possible to adjust the BFO without the aid of the signal generator by tuning a signal to exact resonance with the BFO switch "OFF" - with BFO "ON" adjust S_{19} to desired tone.

Insert "long-antenna" plug, furnished with receiver, into antenna socket and connect generator as indicated in chart below. A condenser in the receiver in series with the blue lead compensates for the reduction in capacity when the antenna is folded and the covers removed - thus, a dummy antenna is unnecessary.

NOTE: - On #3 and 4 Bands, it may be necessary to "rock" the main tuning condenser to compensate for slight shifts in oscillator frequency. When adjusting the trimmers and slugs for maximum gain, the oscillator frequency is 455 kc. less than the signal frequency on #4 band.

Connect hot lead of signal generator to BLUE wire of antenna plug and low side of generator to BLACK wire. A dummy antenna is unnecessary.

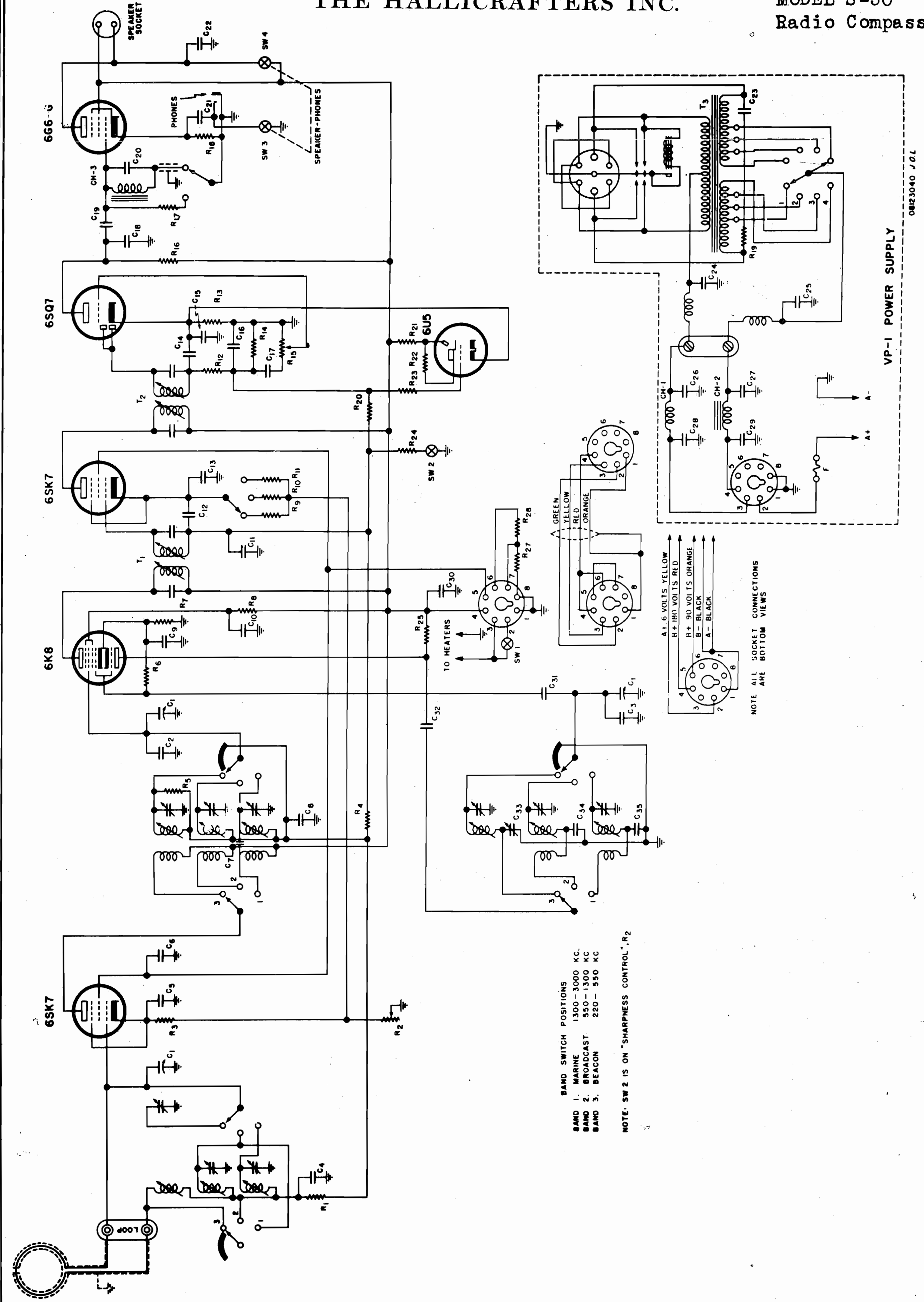
Band	Signal Generator Frequency and Receiver Dial Setting	Oscillator Frequency Relative to Signal	HIGH FREQUENCY END: Adjust Osc. with	HIGH FREQUENCY END: Adjust Trimmers For Max. Grain	LOW FREQUENCY END: Adjust Osc. with	LOW FREQUENCY END: Adjust Slugs For Max. Grain
1	1.4 mc	Above	C_B	C_A C_C		
	.6				S_2	S_1 S_3
2	4.0	Above	C_E	C_D C_F		
	1.6				S_5	S_4 S_6
3	11.0	Above	C_H	C_G C_J		
	5.0				S_8	S_7 S_9
4	28.0	Below	C_L	C_K C_M		
	14.0				S_{11}	S_{10} S_{12}

No.	Capacity	Voltage	Type
C1	Main Tuning Gang		air
2	Bandspread Gang		air
3	25 mmfd		ceramicon
4	0.1 mfd	400	paper
5	10 mmfd		ceramicon
6	5 mmfd		ceramicon
7	.05 mfd	200	paper
8	.01 mfd	400	paper
9	15 mmfd		ceramicon
10	5 mmfd		ceramicon
11	5 mmfd		ceramicon
12	.05 mfd	200	paper
13	.05 mfd	200	paper
14	3 mmfd		twisted pair
15	2 mmfd		twisted pair
16	50 mmfd		mica
17	.05 mfd	200	paper
18	.01 mfd	400	paper
19	.05 mfd	200	paper
20	.01 mfd	400	paper
21	50 mmfd		mica
22	.003 mfd	400	paper
23	0.1 mfd	200	paper
24	0.01 mfd	400	paper
25	.005 mfd	400	paper
26	.01 mfd	400	paper
27	60 mfd	150	electrolytic
28	.02 mfd	200	paper
29	.01 mfd	400	paper
30	2 mmfd		twisted pair
31	100 mmfd		mica
32	500 mmfd		mica
33	.05 mfd	200	paper
34	.05 mfd	400	paper
35	60 mfd	150	electrolytic
36	100 mfd	40	electrolytic
37	60 mfd	40	electrolytic
38	60 mfd	150	electrolytic
39	4230 mmfd		mica
40	250 mmfd		mica
41	2030 mmfd		mica
42	880 mmfd		mica
43	380 mmfd		mica
44	.01 mfd	400	paper
45	.05 mfd	200	paper

No.	Ohms		Wattage
R1	2 megs		1/3
2	2 megs		1/3
3	9000		1/3
4	500,000	R.F. Gain	
5	5,000		1/3
6	2 megs		1/3
7	100,000		1/3
8	1 meg		1/3
9	2 megs		1/3
10	40,000		1/3
11	2 megs		1/3
12	1 meg		1/3
13	100,000		1/3
14	500,000	A.F. Gain	
15	10 megs		1/3
16	100,000		1/3
17	500,000		1/3
18	500,000		1/3
19	400,000		1/3
20	50,000		1/3
21	50,000		1/3
22	300		1/3
23	1100		1/3
24	25		1
25	450		line cord
26	450		line cord
27	1100		1/3
28	500		1/3
29	550		1/3
30	600		1/2
31	9000		1/3
32	900		1/3
33	800		1
34	800		3
35	845		3
36	750		1/3
37	2000		2

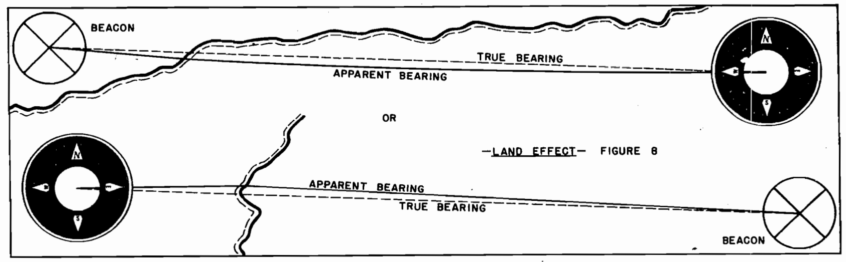
THE HALLICRAFTERS INC.

MODEL S-30
Radio Compass



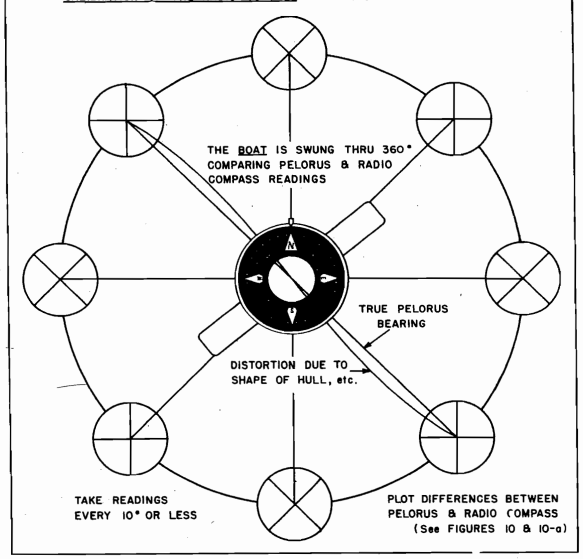
MODEL S-30
Radio Compass

THE HALLICRAFTERS INC.



—LAND EFFECT— FIGURE 8

—CALIBRATION OF THE RADIO COMPASS— FIGURE 9



PARTS LIST

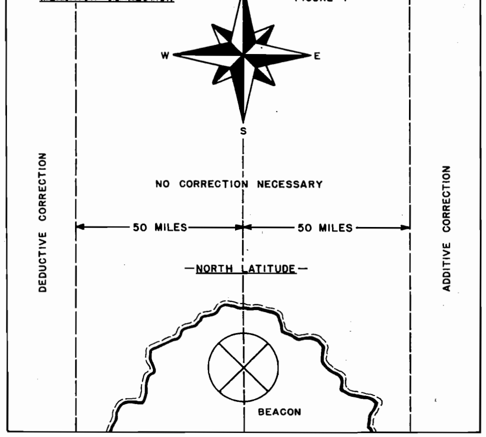
RESISTORS

NO.	OHMS	WATTAGE
1	200,000	1/2
2	10,000	R. F. Gain Control
3	400	1/2
4	200,000	1/2
5	250,000	1/2
6	50,000	1/2
7	300	1/2
8	30,000	1
9	1,000	1/2
10	400	1/2
11	200	1/2
12	50,000	1/2
13	2,000	1/2
14	200,000	1/2
15	500,000	Audio Gain Control
16	500,000	1/2
17	1 Meg.	1/2
18	600	1/2
19	200	1/2
20	1 Meg.	1/2
21	1 Meg.	1/2
22	1 Meg.	1/2
23	2 Meg.	1/2
24	200	1/2
25	15,000	1
26		
27	30,000	1/2
28	15,000	1/2

CONDENSERS

NO.	CAPACITY	VOLTAGE	TYPE
1	530 mmf	Per Section	Air
2	50 mmf		Ceramicon
3	50 mmf		Ceramicon
4	.05 mfd	400	Paper
5	.05 mfd	400	Paper
6	0.1 mfd	400	Paper
7	10 mmf		Ceramicon
8	.05 mfd	400	Paper
9	.05 mfd	400	Paper
10	.02 mfd	400	Paper
11	.05 mfd	400	Paper
12	.01 mfd	400	Paper
13	.01 mfd	400	Paper
14	.0001 mfd		Mica
15	10 mfd	25	Elect.
16	.0001 mfd		Mica
17	.01 mfd	400	Paper
18	.00025 mfd		Mica
19	.01 mfd	400	Paper
20	.0075 mfd		Mica
21	20 mfd	50	Elect.
22	.01 mfd	600	Paper
23	.01 mfd	1600	Paper
24	.02 mfd	600	Paper
25	.5	200	Paper
26	8 mfd	450	Elec.
27	30 mfd	25	Elec.
28	8 mfd	450	Elec.
29	30 mfd	25	Elec.
30	.25	400	Paper
31	.0001 mfd		Mica
32	.001 mfd		Mica
33	No.44066 800 mmf		Variable Pad
34	.0019 mfd		2½% Mica
35	.0037		5% Mica

—MERCATOR CORRECTION— FIGURE 7



ERRORS TO BE CONSIDERED

1 - THE OPERATOR - Errors of the operator which depend entirely on his experience, may be difficult to predict. After he has familiarized himself with adjustment of the "SHARPNESS" control, he need only allow about ± 1/2 degree on strong static-free signals that produce a NULL of about 2 degrees width. If the NULL should cover some 10 degrees after complete adjustment, he cannot allow less than ± 2 degrees.

2 - MOTION OF THE VESSEL - Yawing and pitching usually only affect the ship's course. The HELMSMAN must apply the correct magnetic deviation to the compass indication and must sometimes estimate possible error at the time readings are taken.

3 - MERCATOR ERROR - occurs in plotting the earth - a spherical volume, on the conventional MERCATOR CHART - a plane area. Since MERCATOR CORRECTION is necessary only on rare occasions, as shown by Figure 7, it will not be treated in detail.

4 - LAND EFFECT - occurs when the signal passes over land before its course over water. In this respect, radio waves are comparable to light passing thru materials of various density. (Figure 8 illustrates the error).

CAUTION - Do not rely on readings taken over land or along a shoreline.

5 - NIGHT EFFECT - is most noticeable at sunrise and sunset. More radio waves are reflected back to earth at night than during daylight. It is evident by a broadening of the NULL and possible shifts in apparent bearings taken at distances greater than 250 miles. Over short ranges the effect is negligable.

6 - RADIO COMPASS DEVIATION - must be determined and accounted for as in the magnetic compass. A calibration curve (figure 10) determined as indicated by the self-explanatory Figure 9, must be made with the aid of the PELORUS, immediately after installation.

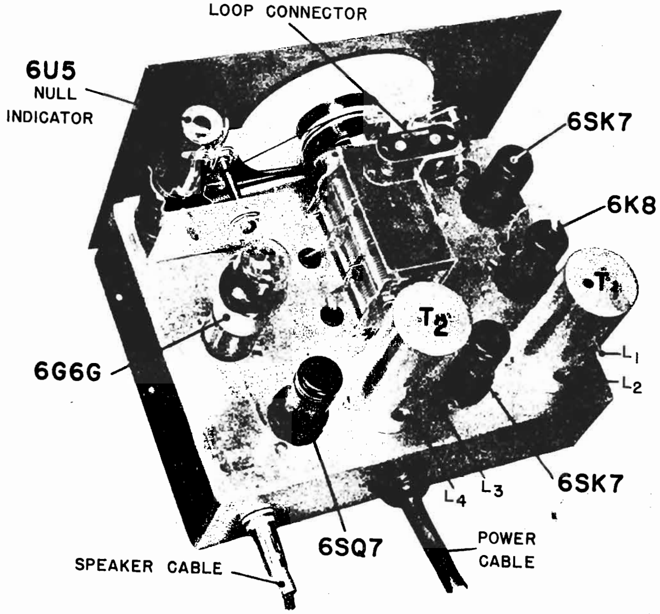
If the RADIO COMPASS is not in line with the LUBBER LINE, the CALIBRATION curve will be similar to that shown by the dotted line.

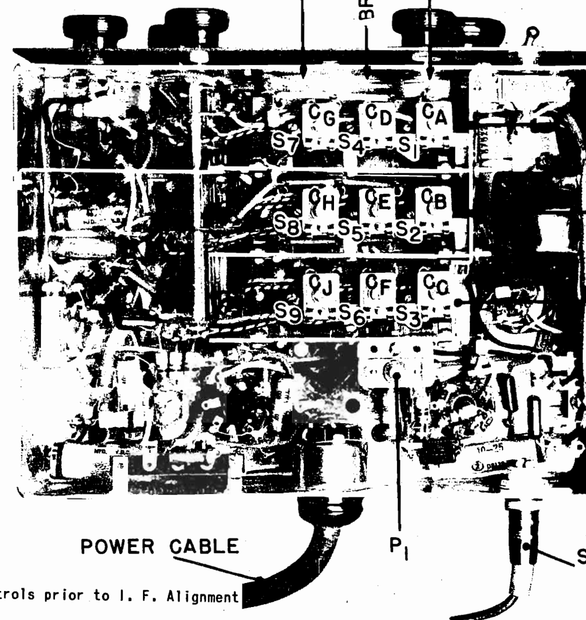
If the RADIO COMPASS is located too close to a metal object (see LOCATION) a curve similar to the other broken line will result.

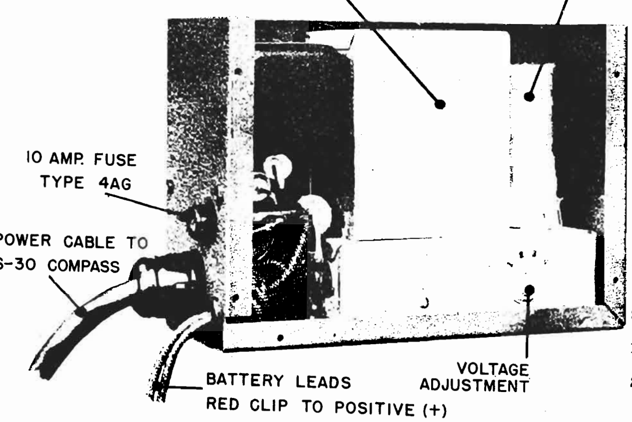
REMEDIES are immediately evident to the operator.

THE HALLICRAFTERS INC.

MODEL S-30
Radio Compass







Setting of controls prior to I. F. Alignment

1 - "OFF" control to NORMAL

2 - "Volume" on full

3 - "Sharpness" on full

4 - main tuning dial set at 3 mc

5 - Bandswitch - Marine Band

6 - Connect signal generator to grid of 6K8 tube. Ground lead of generator to chassis of receiver

7 - Adjust indicated trimmers as per instructions.

Setting of controls for R. F. Alignment

1 - All controls similar to I. F. alignment

2 - Receiver dial adjusted to the aligning frequency

3 - **NOTE:** Generator connected to receiver inductively by forming a loop with a few turns of wire and placing it in the field of the loop on the receiver - leave end of wire free.

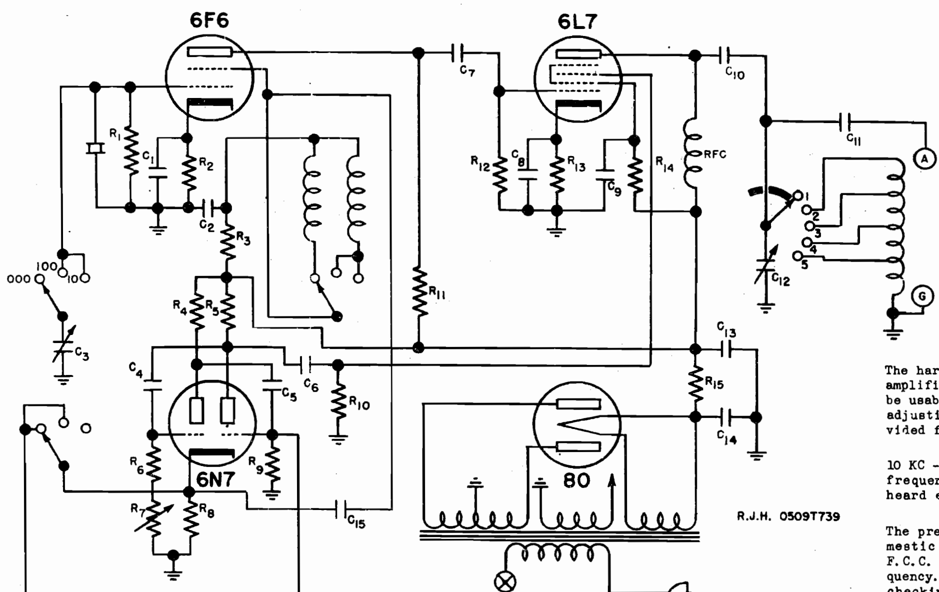
NOTE: On the beacon band the slug S_3, is used for calibrating the center of the band - the pad, P_1, for calibrating the low frequency end of the band.

Allow receiver and signal generator to reach operating temperature before making adjustments.

RANGE	SIG. GEN. & TUNING DIAL SETTING	DUMMY ANTENNA	PAD	TRIMMERS OR SLUGS	ADJUSTMENT
IF	175 kc 3 mc Marine	.1 mfd	None	L_1-L_2-L_3-L_4 on sides of I. F. cans T_1 & T_2	Adjust to maximum output
Beacon	250 kc	inductive	P_1	S_1-S_2-S_3	"
	500 kc	loop	None	C_A-C_B-C_C	"
Broadcast	600 kc	loop	Fixed	S_4-S_5-S_6	"
	1200 kc	loop	None	C_D-C_E-C_F	"
Marine	1300 kc	loop	Fixed	S_7-S_8-S_9	"
	2800 kc	loop	None	C_G-C_H-C_I	"

MODEL HT 7
Frequency
Standard

THE HALLICRAFTERS INC.



RESISTOR			CONDENSERS			
R	OHMS	WATTAGE	C	CAPACITY		TYPE & VOLTAGE
1	5000000	1/2	1	.1	mfd	200
2	500	1/2	2	.1	"	400
3	25000	1	3	25	mmfd	air variable
4	2500	1	4	.002	mfd.	Mica
5	2500	1	5	.002	"	"
6	20000	1	6	.002	"	"
7	15000	variable	7	.001	"	"
8	300	1/2	8	.01	"	400
9	30000	1	9	.01	"	"
10	50000	1/2	10	.002	"	Mica
11	85000	1	11	10	mmfd	"
12	100000	1/2	12			
13	500	1/2	13	8	mfd	350 electrolytic
14	15000	1	14	8	"	350 electrolytic
15	4000	10	15	35	mmfd	Ceramic

OPERATION

The Model HT 7 Frequency Standard is designed to be operated on 110-125 volt 50-60 cycle alternating current. It is suggested that the user connect the HT 7 to a receiver; "A" terminal on Standard to antenna post on receiver and "G" terminal to receiver ground post. After you have become familiarized with the way the unit should be operated, the wire which is connected to the "A" post on the standard can be more loosely coupled to the receiver by twisting this wire around the antenna lead until the most satisfactory amount of coupling has been reached.

1000 KC - Set the Freq.-KC Switch to the 1000 KC position after the OFF-ON switch has been placed in the "ON" position. Now turn the band switch on the Standard to #1 band. The receiver should be adjusted for standard broadcast band coverage during these initial steps of adjustment. With the beat oscillator in the receiver turned on you should be able to hear a strong signal at 1000 KC in the broadcast band and at every 1000 KC throughout the other tuning ranges of the receiver.

The 1000 KC frequency is ground to a tolerance of .05%, and has a temperature co-efficient of about 23 cycles per megacycle per degree centigrade. Obviously, the 1000 KC harmonics should be used only as markers to approximately locate the even 100 KC divisions. For accurate measurements, the crystal switch should be placed in the 100 KC position.

100 KC - Place the crystal switch at the 100 KC position. A signal from the standard will now be heard every 100 KC on the receiver.

NOTE - To accurately adjust the standard the following procedure should be carefully followed: Place the crystal switch at the 1000 KC position. Turn off the beat frequency oscillator in the receiver. Now tune in a broadcast station, or preferably WWV, transmitting on an even 100 KC frequency (600-700-800 KC). Tune in this signal accurately. Place the crystal switch in the 100 KC position. Undoubtedly a beat note will be heard. Now adjust the "Crystal Tuning" control slowly until you have reached zero beat. If the receiver is equipped with a resonance indicator, such as a meter or eye, this adjustment will be more accurately made by watching the pulses of the indicator while exact zero beat is being approached.

In the 100 KC position the crystal has a temperature drift of about 10 cycles per megacycle per degree centigrade. Temperature variations is normal service over several hours may cause frequency variations of approximately 50 parts per million.

The harmonics of the 100 KC oscillator become noticeably weak above 7 megacycles. A harmonic amplifier with a tunable output circuit is provided to raise the output level so that it will be usable through the 30 MC band. By setting the "Band Switch" to positions 2, 3, 4 or 5, and adjusting the "Output tuning" control a point will be found where sufficient output is provided for all checking purposes.

10 KC - With the crystal switch set at the 10 KC position, a multivibrator, locked to crystal frequency, is connected into the circuit. This will provide output signals which will be heard every 10 KC apart between the 100 KC points.

The presence of the 10 KC harmonics allows the standard to be set to zero beat with any domestic broadcast station inasmuch as they are spaced 10 KC apart. It is required by the F.C.C. that broadcast stations remain within 50 cycles plus or minus of their assigned frequency. Most station maintain 5 or 10 cycle deviation as maximum so they constitute accurate checking points. Highest accuracy is, of course, obtained when beating against WWV, but broadcast carriers allow sufficient accuracy for most purposes.

The adjustment screw on the rear of the unit selects the sub-harmonic of 100 KC on which the multivibrator operates. If this control is improperly adjusted, there may be more or less than 9 signals between 100 KC points - that is the signals may be $\frac{100}{8}$ or $\frac{100}{10}$ KC apart - 8 or 10 signals being heard instead of 9. Count the number of 10 KC harmonics between 100 KC points and if you find more or less than 9, adjust this control until 9 signals are heard between the 100 KC markers. This adjustment is originally made at the factory so it is improbable any further adjustment will be found necessary. Once the multivibrator has been locked to the proper sub-harmonic the output will be very stable.

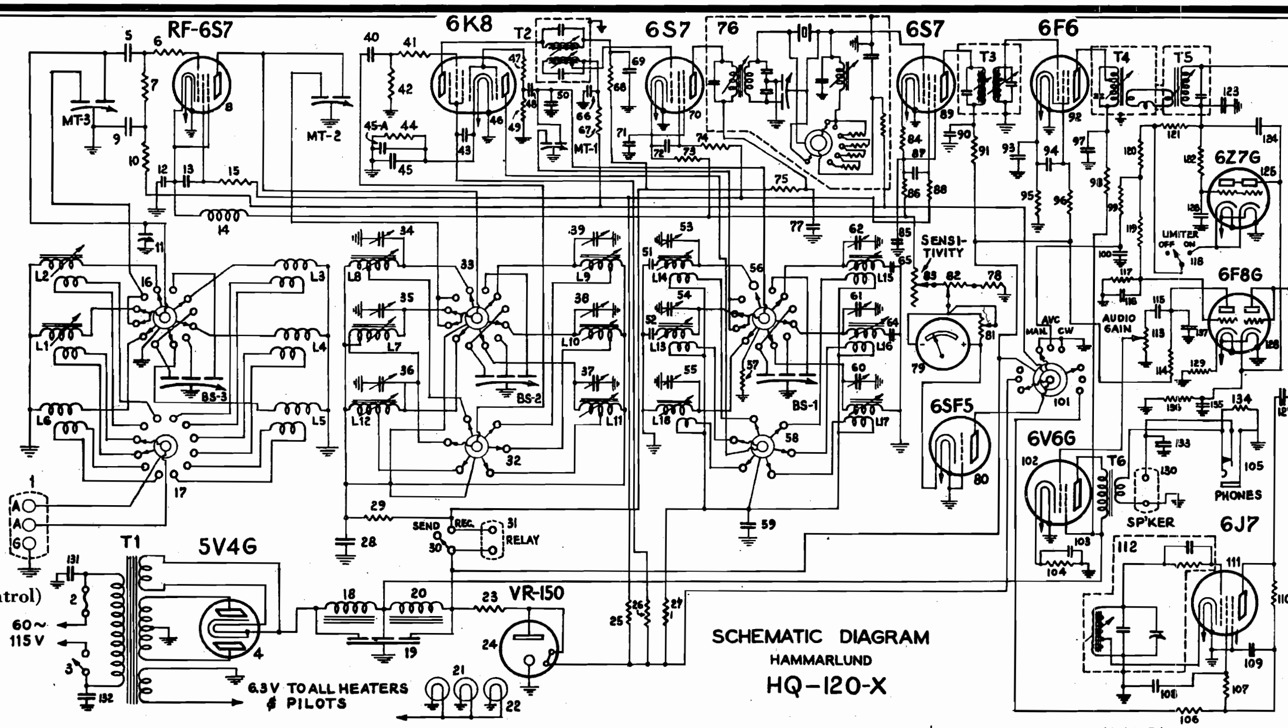
USES

The HT 7 will be of great help in providing an accurate source of signal energy for receiver alignment purposes. When aligning receivers connect the standard to the receiver as outlined previously; establish the 1000 KC marker positions and then align the receiver accurately from the 100 KC signals it delivers.

With the widespread use of the Electron coupled oscillator for frequency control in amateur transmitters, in addition to the most recent FCC regulations imposing the necessity for accurate frequency checking, the HT 7 fills a needed want. The edges of the various amateur bands can be immediately established roughly by using the 1000 KC signal output. Exact band edge location can then be determined by resetting to the 100 KC output frequency. In the 10 KC position the standard can then be used for frequency measurement purposes by interpolating between dial divisions and the frequency of the standard. Presume for example, that you wish to locate a signal on 7263 KC on the receiver. Set the standard to 1000 KC and locate the band edge at 7000 KC. Then switch the standard to the 100 KC position and count over two 100 KC points. We have now located 7200 KC. Now set to 10 KC crystal position and count over six 10 KC points from 7200. We now have 7260 KC. Log the dial setting for 7260 KC. Now tune over one more 10 KC harmonic to 7270 KC. Let us suppose that 7260 KC came in at 76 on the dial and 7270 KC was heard at 79. This represents a difference of three divisions to cover 10 KC, consequently each KC represents .3 divisions on the dial. To locate our exact frequency of 7263 KC simply move the dial .9 divisions past 76 (the 7260 calibration point) or namely to 76.9.

MODEL HQ-120-X (late)

HAMMARLUND MFG. CO., INC.



L-1	Antenna coil .54–1.32 mc. range
L-2	Antenna coil 1.32–3.2 mc. range
L-3	Antenna coil 3.2–5.7 mc. range
L-4	Antenna coil 5.7–10 mc. range
L-5	Antenna coil 10–18 mc. range
L-6	Antenna coil 18–31 mc. range
L-7	R.F. coil .54–1.32 mc. range
L-8	R.F. coil 1.32–3.2 mc. range
L-9	R.F. coil 3.2–5.7 mc. range
L-10	R.F. coil 5.7–10 mc. range
L-11	R.F. coil 10–18 mc. range
L-12	R.F. coil 18–31 mc. range
L-13	H.F. osc. coil .54–1.32 mc. range
L-14	H.F. osc. coil 1.32–3.2 mc. range
L-15	H.F. osc. coil 3.2–5.7 mc. range
L-16	H.F. osc. coil 5.7–10 mc. range
L-17	H.F. osc. coil 10–18 mc. range
L-18	H.F. osc. coil 18–31 mc. range
T-1	Power transformer 50–60 cycle, 115 V
T-2	First I.F. transformer
T-3	Third I.F. transformer
T-4	I.F. output coil assembly
T-5	Diode input coil
T-6	Audio output transformer 6 ohm
1	Antenna terminal strip
2	Fuse block (1.5A fuse Pt. No. 6065)
3	Power switch (comb. with audio gain control)
4	Rectifier tube socket 5V4-G
5-40-116	600 mmf. mica condensers
6-41	25. ohm resistor (½ W.)
7	500,000 ohm resistor (½ W.)
8	Tube socket 6S7-RF (iso.)
9-12-13-43-59-66-69-72-77-87-90-97	.02 mf. paper cond. (500 V.)
10-67-106	10,000 ohm resistor (½ W.)
11	Antenna compensating condenser
14	R.F. choke
15-29-68-74-75-88-91-98	2000 ohm resistor (½ W.)
16-33	R.F. and detector grid switch wafer
17	Antenna switch wafer
18	First filter choke
19	Filter condenser
20	Second filter choke
21	.15 amp. pilot lamps (6-8 V.)
22	Dial and meter lamps socket assembly
23	3000 ohm resistor (10 W. wire wound)
24	Tube socket VR-150
25	6000 ohm resistor (1 W.)
26	7000 ohm resistor (1 W.)
27-114	10,000 ohm resistor (1 W.)
28	.005 mf. mica condenser
30-118	Send-Receive and Limiter switches
31	Relay pin jack
32	Det. grid tap and osc. plate switch wafers
34-35-36-37-38-39-53-54-55-60-61-62	Special MEX trimmer cond.

HQ-120-X

CRYSTAL MODEL

FOR OTHER DATA, SEE MODEL HQ-120-X VOL. X

Tuning Range
31-.54 MC

Form IM 3-4

42-49-119-121	50,000 ohm resistor (½ W.)
44-129	230 ohm resistor (½ W.)
126-131-132-133-45-71-85-94-100-108-109	.05 mf. condenser (500 V.)
45A	.005 mf. mica condenser
46	Tube socket 6K8-Conv. (iso.)
47	15 ohm resistor (½ W.)
48	50. mmf. condenser (silver)
50-127	5.5 mmf. condenser (silver)
51	673 mmf. condenser (silver)
52	300 mmf. condenser (silver)
56	H.F. osc. grid switch wafer
57	10. ohm resistor (½ W.)
64	.0015 mf. mica condenser
65	.001 mf. mica condenser
70-89	Tube socket 6S7
73	700. ohm resistor (½ W.)
76	Crystal filter
78	50. ohm resistor ½ (W.)
79	Tuning meter
80	Tube socket 6SF-5
81-82	80. ohm meter circ. potentiometers
83	Sensitivity control 10,000 ohms

84	400 ohm resistor (½ W.)
86	300. ohm resistor (½ W.)
92	Tube socket 6F6
93	.1 mf. condenser (500 V.)
95	600 ohm resistor (½ W.)
96	50,000 ohm resistor 1 watt
99-122	1-meg. resistor (½ W.)
101	AVC-MAN-BFO switch
102	Tube socket 6V6G—Audio
103	40 mf. electrolytic condenser
104	350. ohm resistor (1 W.)
105	Phone jack
136-107-110	100,000 ohm resistor (½ W.)
111	Tube socket 6J7
112	Beat oscillator
113	Audio gain control (500,000 ohm combined with power switch).
115	.01 mf. condenser (500 V.)
117	20,000 ohm resistor (½ W.)
120	25,000 ohm resistor (½ W.)
123-124-135	50. mmf. mica condenser
137	1000. mmf. mica condenser
125	Tube socket 6Z7-G
128	Tube socket 6F8-G
130	Speaker terminal strip
134	25 ohm resistor (1 W.)

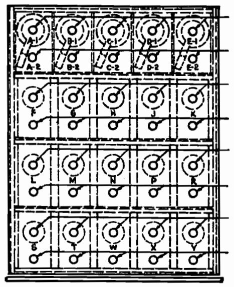
MODEL SP-200-SX Series

HAMMARLUND MFG. CO., INC.

H.F. OSCILLATOR AND R.F. ALIGNMENT

Connect the output of the test oscillator to the "A.A." terminal strip. Connect the output meter to the speaker voice coil terminals. The controls on the front panel should be set as follows:

(1) Band Change Switch on 540–1160 K.C. (2) Main Tuning Dial on 1100 K.C. (3) Band Spread Dial on 100. (4) Sensitivity Control "To Produce appropriate output meter reading." (5) Audio Gain Control "Full On." (6) C.W.-MOD switch on "MOD." (7) A.V.C.-MANUAL Switch on "MANUAL." (8) SEND-RECEIVE Switch on "RECEIVE." (9) "Phones-Speaker" Switch on "PHONES."



Turn the receiver over, bottom side up, placing a small block of wood under the rear of the switch section to protect the shield cans and tubes. The main tuning unit bottom plate should remain in place while H.F. oscillator and R.F. adjustments are being made. In order to facilitate the alignment of these stages, we have indicated in dotted lines, the coil positions beneath the bottom cover plate, together with all capacity and inductance adjusters. Capacity adjusting condensers are located on the coil bases and inductance adjusters extend through the top of each coil. The coil markings correspond to the designations on the schematic wiring diagram. Set the test oscillator to produce a 2.5 MC. signal. Adjust the trimmer capacitor "Y" until a peak reading is obtained in the output meter. Now set the main tuning condenser dial to 1.26 MC. and adjust the test oscillator for a 1.26 MC. signal. Turn the inductance adjustment on coil "Y" for a peak reading on the output meter. As these two adjustments react on each other it will be necessary to repeat them until no further change in either capacity or inductance is necessary. This realignment should only be done after making sure that the calibration of main dial is incorrect.

Turn the main tuning dial to 2.5 MC. and set the test oscillator for 2.5 MC. signal. Adjust each capacitor on coil "R"-"K"-"E2" in the order named, for peak reading on the output meter. The Sensitivity control should be adjusted so that no overloading occurs and an appropriate reading on the output meter is maintained. Now set the main tuning dial at 1.26 MC. and the test oscillator on the same frequency and turn the "inductance adjustments" on coil "R"-"K"-E1" for peak reading on the output meter. These adjustments are also interlocking and should be repeated until no further improvement can be noticed. This completes the H.F. Oscillator and R.F. coil alignment for the frequency range of 1.25 to 2.50 MC.

The alignment procedure of the H.F. Oscillator and R.F. coils in the remaining frequency ranges is exactly the same as outlined for the 1.25-2.50 MC. band. Test oscillator frequencies and main tuning dial settings vary as follows:

Range	*Capacity Frequency*	*Condensers*	*Inductance Frequency*	*Coils*
1.25 to 2.50 MC.	2.5 MC.	Y-R-K-E2	1.26 MC.	Y-R-K-E1
2.5 to 5.0 MC.	5.0 MC.	X-P-J-D2	2.5 MC.	X-P-J-D1
20.0 to 40.0 MC.	40 MC.	W-N-H-C2	20 MC.	W-N-H-C1
5.0 to 10.0 MC.	10.0 M.C.	T-M-G-B2	5.0 M.C.	T-M-G-B1
10.0 to 20.0 MC.	20.0 M.C.	S-L-F-A2	10.0 M.C.	S-L-F-A1

I. F. ALIGNMENT

The following adjustments should only be attempted after making *certain* that the I.F. channel of the receiver is out of alignment.

The alignment of the I.F. amplifier may be checked as follows: Connect a low reading (1 volt) output meter across the voice coil terminals. Connect a test oscillator (modulated at 400 cycles or less) to the antenna terminals of the receiver. Set the crystal selectivity switch on Number 1, the phasing control on the arrow, and the band-width control at 3. With the AVC-MANUAL switch on "manual" and the A.F. gain at 10, adjust the sensitivity control for an output meter reading of approximately 1 volt, with the test signal tuned accurately. Now, check the settings of the I.F. tuning condenser on T-2, T-3, and T-4 (*DO NOT DISTURB* the screw tuning adjustments of the Crystal Filter T-1). Then reduce the A.F. gain to protect the output meter and throw the AVC-MANUAL to "AVC" and turn the sensitivity control to 10. Then adjust T-6 for maximum "S" meter reading. This can be done most satisfactorily by adjusting the input from the test oscillator to produce an "S" reading of approximately 8.

To check the alignment of the Crystal Filter T-1, an oscillograph and sweep frequency oscillator are required. First adjust the sweep frequency oscillator to exact agreement with the crystal resonant frequency with the Crystal Selectivity switch on Number 5, and the phasing control on the arrow. Then, set the switch on Number 1 and adjust the lower screw on T-1 for maximum height, and the upper screw for symmetry of oscillograph image.

SELECTIVITY

The selectivity curves shown on page are representative curves made on a sample receiver and will hold reasonably true for all models. These curves were taken with the signal generator operating at the intermediate frequency and these curves will maintain throughout the entire range of the receiver, except at the very low frequency end of the broadcast band where the R.F. selectivity has a very slight narrowing effect. The selectivity of the "Super-Pro" is divided into two distinct ranges. In Fig. 5, appear the wide band curves. These curves were made at 4 different positions of the band width control. However, the actual selectivity obtainable is continuously variable between curves 3 and 16. Particular attention should be paid to the steepness of the sides of these curves. They are relatively straight and do not have the usual flare at the outer limits. This means that there will be less background interference from stations operating either higher or lower in frequency than the station being received. The advantage of having continuously variable selectivity over relatively wide limits in a receiver is readily apparent when one considers that the operator has absolute control and can adjust the receiver to compensate for almost any degree of interference that may be present. For example, when interference is not serious, the band width control can be set to the widest position and permit high quality reproduction of either voice or music. In other cases where interference is present, the band width control can be adjusted to the point where selectivity is just sufficient to eliminate interference. This adjustment provides maximum fidelity with a minimum of interference. It also permits the operator to utilize the extreme sensitivity of the "Super-Pro." Even in crowded bands, the selectivity can be adjusted to a point where interference is not bothersome and the sensitivity can be turned up to provide reception of extremely weak signals with marked clarity.

In Fig. 6, the variable selectivity crystal filter curves are illustrated. It will be noticed that the crystal filter fills in the gap very nicely between position "3" of the band width control and what would normally be maximum crystal selectivity for code reception. This variable selectivity crystal filter is an exclusive HAMMARLUND development and will be found only in a HAMMARLUND receiver. The crystal filter has five ranges of selectivity. The first three are intended for phone reception. The widest position of these, however, will permit good quality music under conditions where interference would, in most cases, make reception impossible. Positions four and five are for CW code reception and provide the usual single signal response.

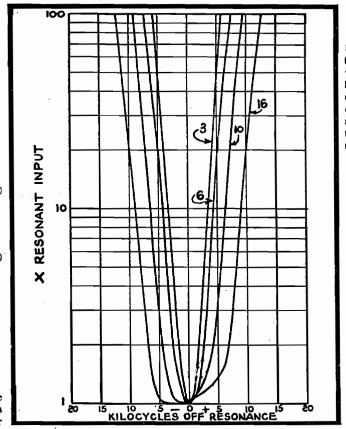
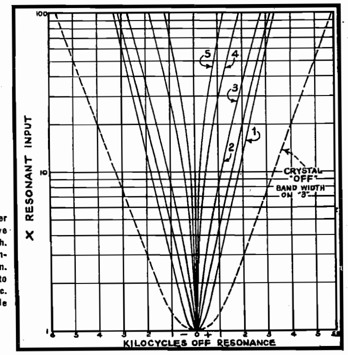


FIG. 5—I.F. curves taken at four positions of the band width control. The actual selectivity of the I.F. amplifier is continuously variable between curves 3 and 16. Particular attention should be paid to the sharp cut-off which greatly reduces back-ground interference.

FIG. 6—Variable crystal filter selectivity curves showing five positions of the control switch. Positions 1, 2 and 3 are intended for voice reception. Position 1 is broad enough to permit reception of music. Positions 4 and 5 are for single signal code reception.



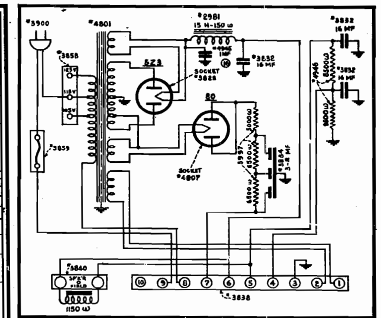


FIG. 12—Standard "Super-Pro" power supply for use with electro-dynamic speaker. Special models have filter choke connected in place of the speaker field.

POWER SUPPLY

1	Power transformer 110 volts 60 cycle A.C.
2	Filter choke
3	A.C. input Cord and Plug
4	Fuse Block for 2A. fuse
5	Line Voltage Adjusting Strip
6	Speaker Field Terminal Strip
7	Connecting Terminal Strip
8-9-10	Filter Condenser 16 mfd. electrolytic 450 volts
11	Filter Condenser 8-8-8 mfd. electrolytic 450 volts
12	Resistor 18,000 ohms (2 taps)
13	Resistor 18,000 ohms (1 tap)
14	Tube socket 80
15	Tube socket 5Z3
16	1 mf. paper filter condenser

The "Super-Pro" is available to cover several frequency ranges. Such information as is given in this book will pertain to all models. The two standard models have the following tuning ranges:

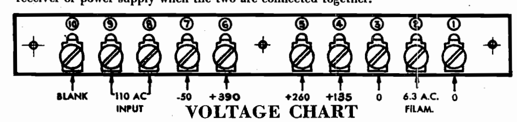
SP-200
540 – 1160 kc.
1160 – 2500 kc.
2.5 – 5 mc.
5 – 10 mc.
10 – 20 mc.

Other models cover low frequencies in the neighborhood of 150 to 400 kc. as well as certain higher frequencies.

SP-200-S
1250 – 2500 kc.
2.5 – 5 mc.
5 – 10 mc.
10 – 20 mc.
20 – 40 mc.

* In this model, the 1000 to 2000 meter band is substituted for the 60 to 120 meter band. ***NOTE BELOW**

Drawing below provides voltage readings at the various terminals on either the receiver or power supply when the two are connected together.



VOLTAGE CHART

TUBE	FUNCTION IN RECEIVER	VOLTS AT SOCKET TERMINAL No.							
		1	2	3	4	5	6	7	8
6K7	1st Radio Freq.	0	0	250	135	...	135	6.3 AC	0
6K7	2nd Radio Freq.	0	0	250	135	...	135	6.3 AC	0
6L7	1st Detector	0	0	250	115	...	...	6.3 AC	0
6J7	High Freq. Oscillator	0	0	160	160	160	...	6.3 AC	...
6K7	1st I.F. Amplifier	0	0	250	135	0	...	6.3 AC	0
6SK7	2nd I.F. Amplifier	0	0	0	—43.	0	135	6.3 AC	250
6SK7	3rd I.F. Amplifier	0	0	0	—2.	0	100	6.3 AC	240
6N7	Noise Limiter	0	0	+.4	—.2	—.2	+.4	4.0 AC	—.2
6H6	2nd Detector	0	0	—.2	+.4	—.2	...	6.3 AC	+.4
6SK7	AVC Amplifier	0	0	0	—2.	0	110	6.3 AC	240
6H6	AVC	0	0	—3.2	—3.4	—3.2	...	6.3 AC	—3.4
6SJ7	Beat Oscillator	0	0	0	—.1	0	40.	6.3 AC	155.
6C5	1st A.F. Amplifier	0	0	110	...	...	—3.3	6.3 AC	0
6F6	A.F. Driver	0	0	240	240	...	—20.	6.3 AC	0
6F6	P.P. A.F. Output	0	0	380	380	0	...	6.3 AC	38
6F6	P.P. A.F. Output	0	0	380	380	0	...	6.3 AC	38.

Measurements were made on 115 volt AC line, with line voltage adjustment set at 115 volt tap. Set sensitivity and audio gain controls at minimum. A.V.C. Manual Switch should be in manual position. CW-MOD Switch in C.W. position, Limiter Switch in "On" position, and "Send-Receive" switch in receive position. D.C. readings were obtained with voltmeter having a resistance of 1000 ohms per volt. Use chassis as a common terminal. Voltages within ±10% are satisfactory. The 6.3 volt A.C. filament reading is obtained between chassis and terminal No. 2 on strip. Terminal No. 10 on strip is blank except when used for battery operation.

	Tuning Range
SP-210-X	15-560 Meters
SPR-210-X	15-560 Meters
SP-220-X	15-560 Meters
SPR-220-X	15-560 Meters
SP-210-SX	7½-240 Meters
SPR-210-SX	7½-240 Meters
SP-220-SX	7½-240 Meters
SPR-220-SX	7½-240 Meters
SP-210-LX	*15-2000 Meters
SPR-210-LX	*15-2000 Meters
SP-220-LX	*15-2000 Meters
SPR-220-LX	*15-2000 Meters

*** SEE NOTE ABOVE**

MODEL SP-200-SX

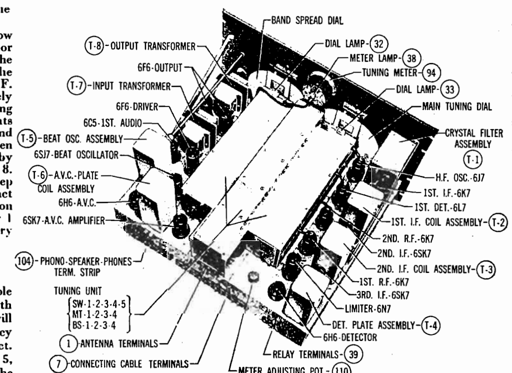
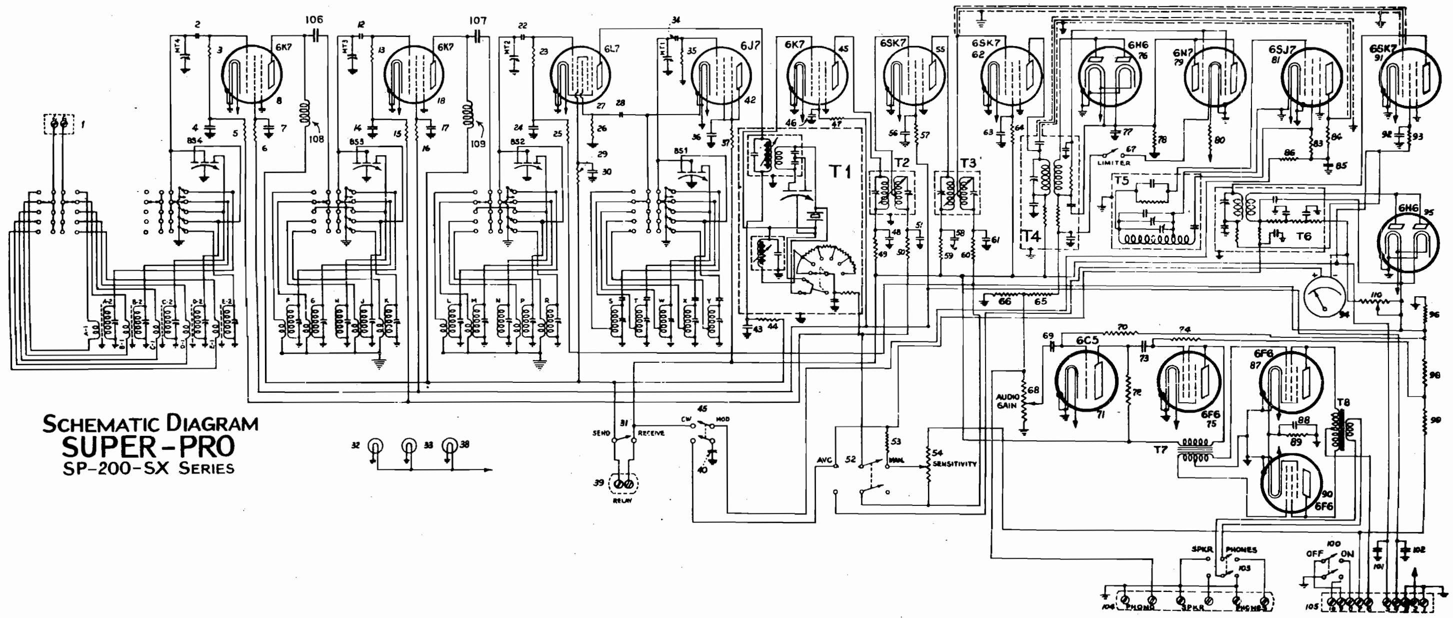


FIG. 7—Top view of "SP-200-X" receiver showing the general layout of parts. All important parts are labeled. Encircled numbers correspond to numbers appearing in the circuit diagram.

Form P-10-40

HAMMARLUND MFG. CO., INC.

MODEL SP-200-SX Series



SCHEMATIC DIAGRAM
SUPER-PRO
SP-200-SX SERIES

FIG. 11

A1	Antenna Input Coil Assembly	10.0 to 20.0 m.c.
A2	Antenna Output Coil Assembly	10.0 to 20.0 m.c.
B1	Antenna Input Coil Assembly	5.0 to 10.0 m.c.
B2	Antenna Output Coil Assembly	5.0 to 10.0 m.c.
C1	Antenna Input Coil Assembly	20.0 to 40.0 m.c.
C2	Antenna Output Coil Assembly	20.0 to 40.0 m.c.
D1	Antenna Input Coil Assembly	2.5 to 5.0 m.c.
D2	Antenna Output Coil Assembly	2.5 to 5.0 m.c.
E1	Antenna Input Coil Assembly	1250 to 2500 k.c.
E2	Antenna Output Coil Assembly	1250 to 2500 k.c.
F	1st R.F. Coil Assembly	10.0 to 20.0 m.c.
G	1st R.F. Coil Assembly	5.0 to 10.0 m.c.
H	1st R.F. Coil Assembly	20.0 to 40.0 m.c.
J	1st R.F. Coil Assembly	2.5 to 5.0 m.c.
K	1st R.F. Coil Assembly	1250 to 1160 k.c.
L	2nd R.F. Coil Assembly	10.0 to 20.0 m.c.
M	2nd R.F. Coil Assembly	5.0 to 10.0 m.c.
N	2nd R.F. Coil Assembly	20.0 to 40.0 m.c.
P	2nd R.F. Coil Assembly	2.5 to 5.0 m.c.
R	2nd R.F. Coil Assembly	1250 to 2500 k.c.
S	High Frequency Osc. Coil Assembly	10.0 to 20.0 m.c.
T	High Frequency Osc. Coil Assembly	5.0 to 10.0 m.c.
W	High Frequency Osc. Coil Assembly	20.0 to 40.0 m.c.
X	High Frequency Osc. Coil Assembly	2.5 to 5.0 m.c.
Y	High Frequency Osc. Coil Assembly	1250 to 2500 k.c.
T-1	Crystal filter assembly (465 kc.)	
T-2, T-3	1st and 2nd, I.F. Transformer Coil Assembly	
T-4	Detector plate coil assembly	
T-5	Beat oscillator coil assembly	
T-6	A.V.C. Plate coil assembly	

T-7	Push-Pull Input Transformer
T-8	Push-Pull Output Transformer
1	Antenna terminal strip
2-12-22	Capacitor Fixed Mica type 600 mmf
28	Capacitor Fixed Silver type 95 mmf.
34	Capacitor Fixed Silver type 50 mmf.
77	Capacitor Fixed Mica type 50 mmf.
69	Capacitor Fixed Tubular type .02 mf. 500 V.
4-14-24	Capacitor Fixed Tubular type .01 mf. 500 V.
7-17-30-36-43-46-48-51-56-58-61-63-73-85-92	Capacitor Fixed Tubular type .05 mf. 500 V.
40-101-102	Capacitor Fixed Tubular type .25 mf. 400 V.
88	Capacitor Dry Electrolytic 40 mf. 150 V.
80	Resistor 4 ohms wire wound 5 watt
89	Resistor 750 ohms wire wound 10 watt
96	Resistor 300 ohms metallized ½ watt
98	Resistor 1,700 ohms metallized ½ watt.
44-6-47-49-57-59-16	Resistor 2,000 ohms metallized ½ watt.
99	Resistor 3,000 ohms metallized 1 watt.
86	Resistor 5,000 ohms metallized ½ watt.
5-15-25-50-60	Resistor 10,000 ohms metallized ½ watt.
37	Resistor 12,000 ohms metallized 2 watt.
29	Resistor 25,000 ohms metallized 2 watt.
35-26	Resistor 25,000 ohms metallized ⅓ watt.
66-84	Resistor 50,000 ohms metallized ½ watt.

64-72-93	Resistor 50,000 ohms metallized 1 watt
65	Resistor 75,000 ohms metallized ½ watt
78	Resistor 250,000 ohms metallized ½ watt
3-13-23	Resistor 250,000 ohms metallized ⅓ watt
70-74-83	Resistor 500,000 ohms metallized ½ watt
53	Resistor 2,000,000 ohms metallized ½ watt
8-18-45	Tube socket 6K7
55-62-91	Tube socket 6SK7
76-95	Tube socket 6H6
79	Tube socket 6N7
81	Tube socket 6SJ7
71	Tube socket 6C5
75-87-90	Tube socket 6F6
27	Tube socket 6L7
42	Tube socket 6J7
32-33	Dial lamps 6.3 volt .15 amp.
38	Meter lamp 6.3 volt .15 amp. Bayonet type
94	Tuning meter
100	Off-on Switch
52-103	AVC-MANUAL and SPEAKER-PHONES Switch
41	CW-MOD Switch
31	Send-Receive Switch
67	Limiter switch
54	Sensitivity control 50,000 ohm
68	Audio Gain Control 250,000 ohm
39	Relay terminal strip
104	Phono-Speaker-Phones terminal strip
105	Connecting terminal strip
106-107	Capacitor Fixed Silver type 300 mmf.
110	Meter adjusting potentiometer 1,000 W wire wound

HAMMARLUND MFG. CO., INC.

OPERATION

"SUPER-PRO" MODEL SP-200-SX

Although the "Super-Pro" is a highly technical piece of apparatus, with quite a large number of controls, it is relatively easy to operate. There are 15 controls on the panel. However, they are not all used at the same time. The number of controls necessary for operation will depend on the type of service for which the receiver is being used. The major controls are the band switch, main tuning, band spread, and audio gain. The remaining controls are brought into play as conditions demand their use. Assuming that the speaker, power supply and antenna have been connected according to instructions, the various controls should be set in the following positions: crystal selectivity, off; "phasing" on zero; "band width" on 6; "limiter," off; switch under the limiter control in "AVC" position; "sensitivity," maximum (10); band spread dial on 100; "signal" switch, on "modulation"; the toggle switch just beneath, should be set on "Speaker"; "audio gain" on 6; send-receive switch on "Rec."; beat oscillator on zero. Then, turn the main switch in the center of the panel marked "On-and-Off" to the on position. This puts the entire receiver in operation. The band switch should be adjusted to either the broadcast band or the next highest frequency band. This should permit reception of local stations and allow the operator to familiarize himself with various adjustments. The band width control should be adjusted to provide the most pleasing tone when there is no serious interference. Otherwise, it should be adjusted to the point providing best tone quality with a minimum of interference. The beat oscillator is turned on when the "signal" switch is in the "CW" position. The beat oscillator control varies the pitch of the heterodyne. This feature is used for code reception and for locating weak signals. The "limiter" control turns the noise limiter on and off. The noise limiter is most valuable on the shorter waves where automobile ignition interference is more serious. So far, we have considered the receiver adjustments necessary for phone reception. For code reception, the "AVC-Man." control should be set in the "Man." position and the sensitivity control turned down to provide proper sensitivity. On strong signals, this control should not be turned all the way on because there will be a tendency to overload the receiver. Volume is controlled with the "audio gain" control and not with the "sensitivity" control. The crystal filter is very effective and easy to operate because of its excellent stability. The first three positions are generally used for phone reception and will serve for code reception where interference is not severe. The last two positions are for code reception exclusively. When the crystal selectivity control is adjusted for optimum selectivity, the phasing control should be used to reject heterodyne interference or "whistle." The receiver can be temporarily silenced by turning the "Send-Receive" switch in the "Send" position. This allows the receiver to be ready for instant service and is more commonly called the "stand by switch" when the receiver is used for communication purposes. All tuning can be done with the main tuning control. In this case, the band spread dial is left at 100. The band spread dial operates so as to spread out a narrow band of frequencies in the neighborhood of the frequency at which the main dial is set. The band spread dial works continuously throughout the entire range of the receiver except on the lowest frequency bands. In this manner, many short wave broadcast or amateur bands can be spread out over the band spread dial for easy tuning. The wave ranges of the receiver are so arranged that when the band spread and main dial are set for 80 meter amateur band reception, the 40-meter band as well as the other amateur bands will appear on the band spread dial merely by turning the wave change switch. This is a great convenience and eliminates the necessity for searching each time for the amateur band which is to be covered by the band spread dial. For ear-phone operation, ear-phones are plugged into the terminal strip so marked on the rear of the chassis, and a switch on the front panel changes the receiver from ear-phone to loud speaker operation.

The next feature for consideration is the "S" Meter. This is used to judge relative signal levels and also as a tuning indicator. Maximum reading of the meter always indicates that the receiver is in exact tune with the station. The meter is calibrated in "S" units from 1 to 9, and the relative reading on any particular signal can be changed by re-setting the meter control adjustment which is located toward the rear of the chassis. The chassis drawing shows the position of this adjustment. A suggested method of adjusting the meter would be to tune in a signal of moderate strength. If you are accustomed to calling this signal, "S-8" or "S-9," then adjust the meter control so that it indicates that value. This adjustable meter arrangement allows the operator to provide reports consistent with his usual system of reporting. No amount of explaining will teach the operator exactly how to control a receiver. Experience is absolutely necessary in order to obtain best results.

CIRCUIT ARRANGEMENT

TWO-STAGE T.R.F. AMPLIFIER: For maximum sensitivity, high image ratio, and low noise level, the "SP-200" has two stages of tuned radio frequency amplification ahead of the mixer stage. The antenna input circuit is electrostatically shielded from the grid circuit of the first tube. This permits the use of low impedance transmission lines between the antenna and the receiver with a minimum of noise pick-up. When lines or lead-ins of the two wire type having an impedance of approximately 100 ohms are employed, no matching transformer is necessary. The input impedance of the receiver is approximately 112 ohms. The two tuned R.F. stages are employed on all bands covered by the receiver. Both inductive and capacitive trimming are employed in all signal frequency circuits.

OSCILLATOR AND MIXER: Two separate tubes are employed in the oscillator and mixer stages to improve stability and prevent pulling. There is a very respectable gain in the mixer stage which tends to minimize any noise that may be generated in the rest of the receiver. In fact, the gain in this stage is so great that the noise contributed by the following stages is negligible.

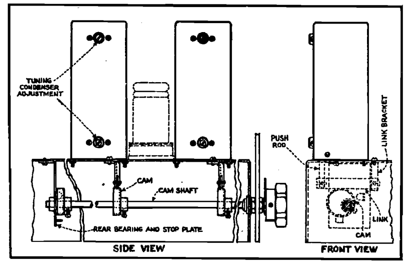


FIG. 1—Band width control which varies selectivity and permits the operator to adjust the receiver for best quality obtainable with minimum interference.

BAND SPREAD: In order to maintain relatively uniform band spread in the various tuning ranges of the receiver, every gang of the band spread condenser is subdivided into three sections. This allows the use of a proper sized condenser for maximum spread regardless of the position of the wave change switch. There are approximately 85 degrees spread for each of the important amateur bands, and there is also a corresponding spread over the other frequencies outside the amateur band.

CRYSTAL FILTER UNIT: The crystal filter used in the "Super-Pro" is an exclusive HAMMARLUND development and will be found only in HAMMARLUND receivers. This new filter has five ranges of selectivity varying from broad for phone reception, to knife-edge selectivity for single signal code reception. There are three positions for voice reception, and two for C.W. telegraph. The output of the filter is relatively constant over the entire selectivity range and has, therefore, little effect on "S" meter readings. Selectivity in the crystal filter circuit is not varied by detuning the load circuit. All circuits remain exactly in tune and selectivity is varied by changing the "Q" of the load circuit. This, together with the balanced phasing condenser, eliminates interlocking of controls and changes in filter gain when the selectivity is varied. Every precaution has been taken to effectively shield all circuits so that there is no feed-back or instability to impair the performance on even the highest frequencies. Stability is further insured by employing isolating resistor networks in every circuit that offers the slightest path for feed-back.

I.F. AMPLIFIER: There are three I.F. amplifier stages in the "SP-200." This elaborate amplifier is required in order to obtain a very high degree of selectivity. Special transformers are employed to hold down the gain per stage in order to maintain a high degree of selectivity and maximum stability. The band width of the I.F. amplifier is controlled by a cam arrangement which varies the coupling in two of the I.F. transformers. The I.F. channel is variable from 16 kc. down to 3 kc. with the crystal filter out of the circuit. The crystal filter, when in the circuit, is variable down to better than 100 cycles. Thus, full range selectivity is available. This wide degree of variable selectivity permits the operator to select the band width providing highest quality reproduction with a minimum of interference. In the "SP-200," the band width can be adjusted to suit operating conditions.

AVC SYSTEM: The automatic volume control system in the "SP-200" is extremely efficient. Both R.F. stages and the first two I.F. stages are automatically controlled by the incoming signal in order to compensate for variation in signal strength due to fading. This system is very fast in operation and will hold a rapidly fading signal to a relatively constant output. Special amplifier and rectifier stages are employed in order to obtain maximum efficiency.

BEAT FREQUENCY OSCILLATOR: The beat frequency oscillator circuit is designed to effectively heterodyne signals of various magnitudes. This oscillator is of the electron coupled type and is thoroughly isolated from the rest of the receiver. Careful selection of circuit values has resulted in excellent stability.

SECOND DETECTOR: A 6H6 connected in a half-wave rectifier circuit is employed for the second detector. The proper selection of circuit values in this circuit has resulted in a minimum of distortion. This circuit is more or less conventional and complete technical details are available by referring to the diagram.

NOISE LIMITER: The noise limiter in the "SP-200" is the latest development in audio peak limiting devices. It is designed to work with or without the AVC system and will follow variations in incoming signal strength. It is automatic and needs no adjustment. The limiter is designed to cut off interference of the automobile ignition nature at a point equal to approximately 100% modulation of the carrier of the signal being received. This provides for reception of 100% modulated signals without seriously affecting the quality of the voice or music. It must be remembered that this limiter will only limit interference of very short pulse duration. Such interference, as caused by auto ignition systems and similar disturbances will be reduced to a negligible quantity.

A.F. AMPLIFIER: The audio frequency channel of the series 200 "Super-Pro," is designed for high quality reproduction. The first stage is a 6C5 triode voltage amplifier. The second stage is a single 6F6 triode connected and used as a driver for the output amplifier which is a pair of 6F6's operated in push-pull, class AB. The rated output of this amplifier is approximately 14 watts. The fine quality of the A.F. amplifier in the

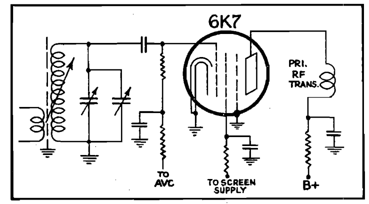


FIG. 2—Circuit diagram of first T.R.F. amplifier showing the electrostatic shield which reduces noise pickup.

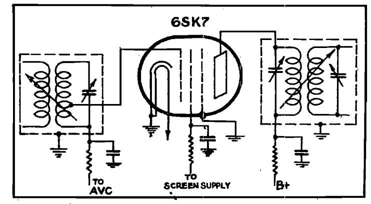


FIG. 3—Typical I.F. amplifier circuit with variable selectivity characteristics. Each circuit has isolating resistor and condenser to assure stability.

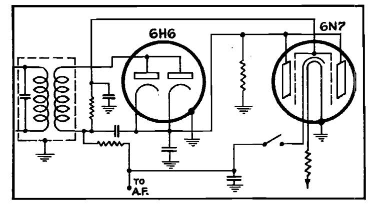


FIG. 4—"Super-Pro" noise limiter designed to reduce automobile ignition interference and other disturbances having similar characteristics.

"Super Pro" is particularly apparent when the band width control is set in the wide position. There is no tone control in this amplifier and none is needed. The A.F. portion of the "Super-Pro" will respond equally well to both low and high frequencies. Attenuation of the higher frequencies is accomplished by narrowing the I.F. band width. In this manner, the band width control serves to control tone.

POWER SUPPLY: The power supply for the "SP-200" is an extra heavy duty unit designed to furnish filament plate and grid bias voltages. The power supply is a separate unit connected to the receiver by a flexible cable. Being a separate unit, the power supply introduces a minimum of hum in the receiver and also reduces the overall temperature rise of the receiver, and thus permits better stability. The high voltage rectifier in the power supply is a 5Z3 connected in a full wave circuit with a two-section filter consisting of 32 mf. capacity and a 15 henry filter choke. The field of the speaker serves as a second filter choke in standard model receivers. In special models, a choke is mounted in the power supply to take the place of the speaker field. Grid bias for the entire receiver is supplied by an 80 rectifier tube operating from a tap on the high voltage secondary. The C-Bias supply also has a multi-section filter consisting of three 8 mf. condensers, and three resistors. The primary of the standard power supply has three taps for operation on 105, 115, and 125 volt power lines. A fuse is also provided to guard against damage in cases of overload.

CALIBRATION: The main tuning dial of the "Super-Pro" is calibrated for all frequencies covered by the receiver. In the process of manufacture, every effort is made to maintain accuracy and, as a result, the accuracy of the calibration is guaranteed to be within ½ of 1% of the highest frequency of the band in use. When using the calibrated dial, it should be remembered that the figures are intended as a tuning guide and not for frequency measuring purposes.

"S" METER: The "S" meter in the "Super-Pro" was designed to provide greatest satisfaction to the operator. It is in no way, limited by fixed, factory-made adjustments. A variable control on the rear of the chassis allows the operator to set the maximum reading of the meter to conform with his particular system of reporting signal strength in "S" numbers. The meter can be adjusted to read "S-9" on any signal from 10 to 10,000 microvolts. It is adjusted at the factory to indicate "S-9" on a 25 microvolt signal, but as pointed out above, this can readily be changed. Another feature is the centrally located scale. This is much more convenient than a scale that starts at the extreme left of the meter dial, and brings the indicating pointer well out in the clear. Special meter design has also eliminated the possibility of damage due to an extremely strong signal.

MODEL J
SOLOVOX

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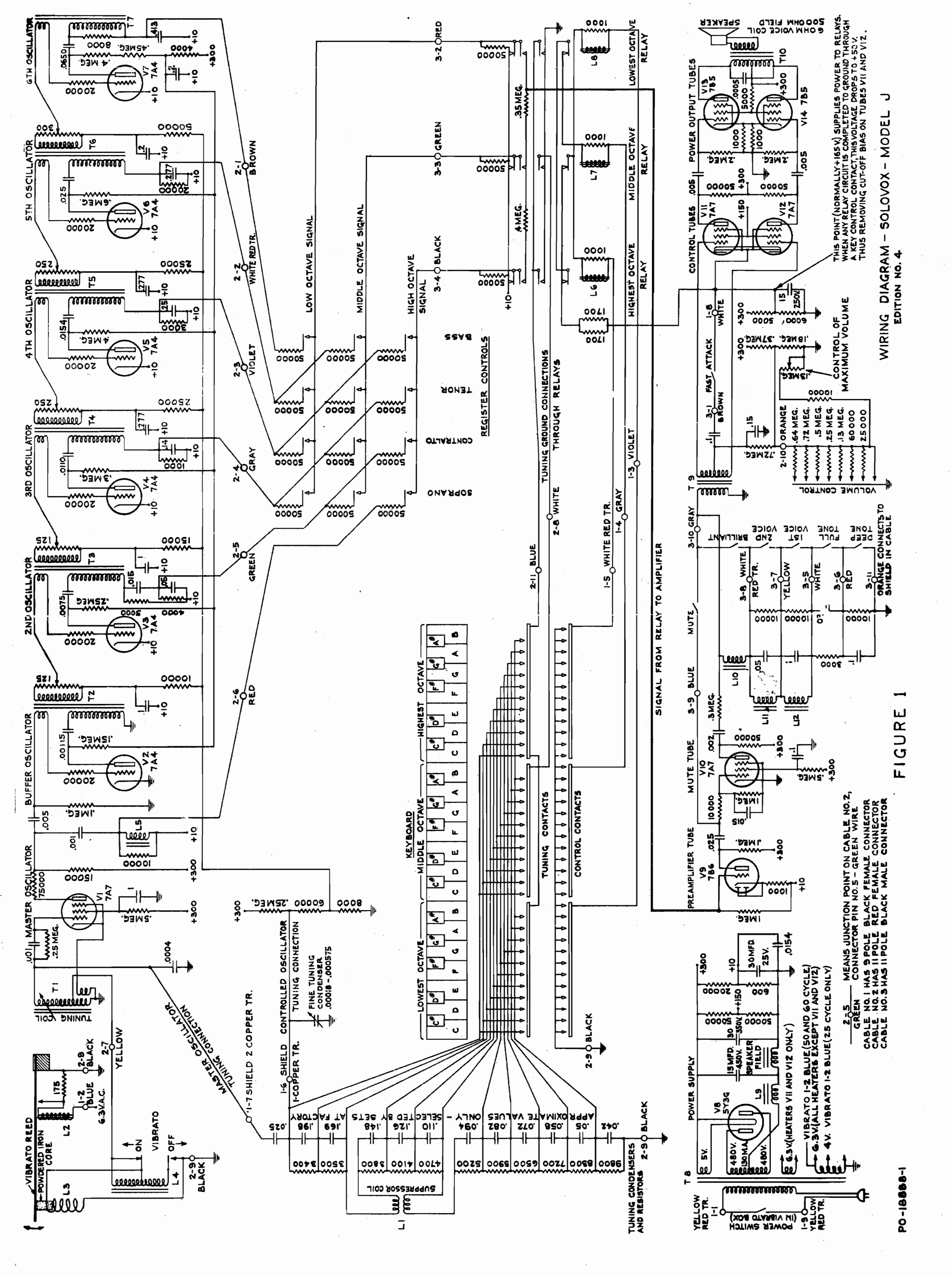

MODEL J
SOLOVOX

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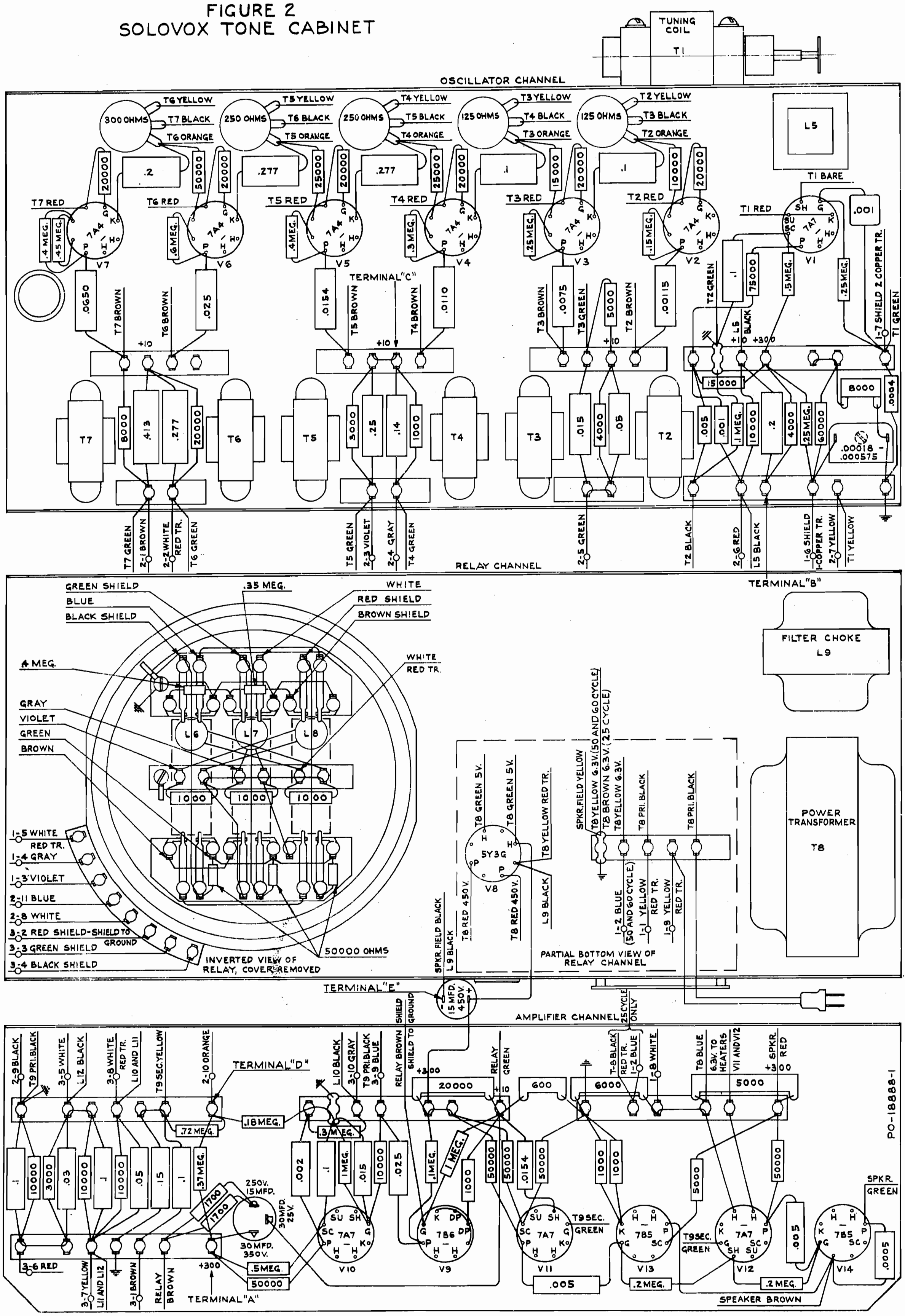
FIGURE 2
SOLOVOX TONE CABINET



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MODEL J
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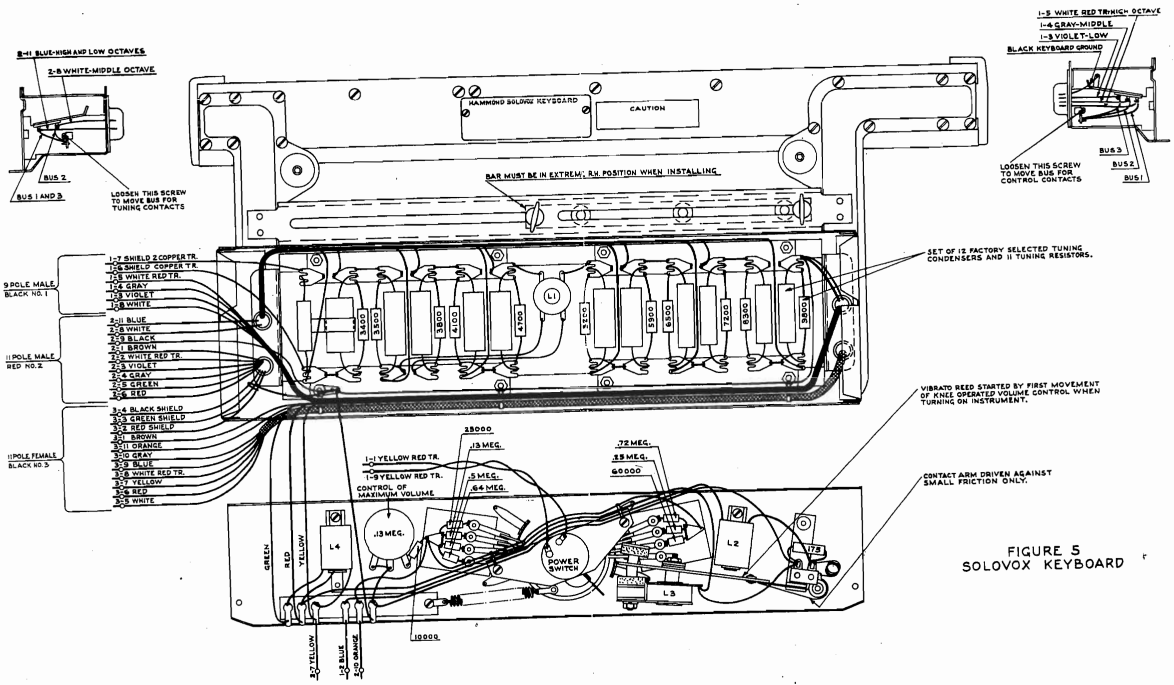

FIGURE 5
SOLOVOX KEYBOARD

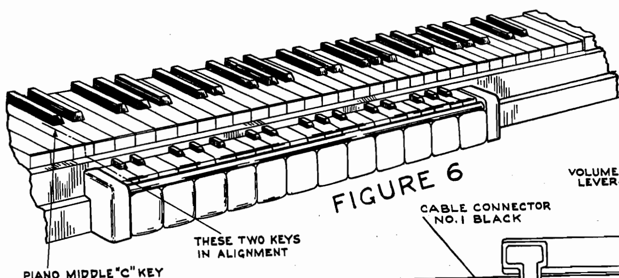

FIGURE 6

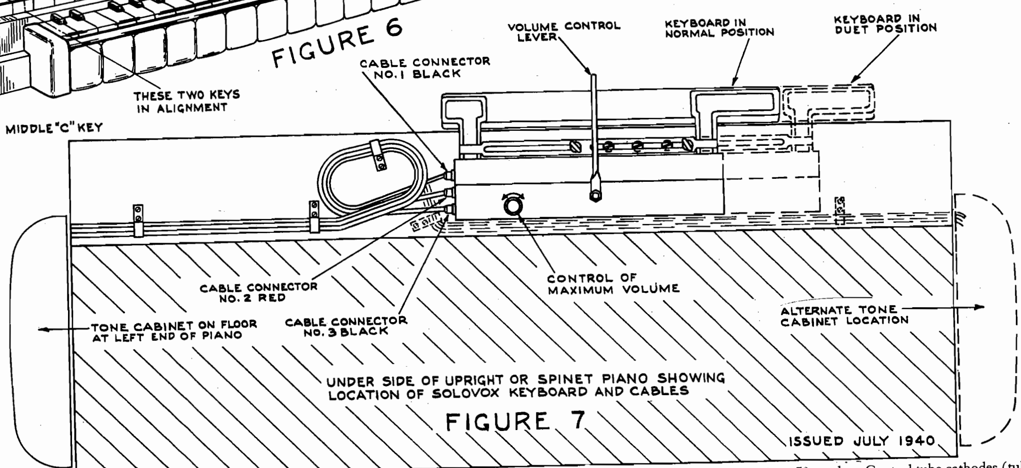

FIGURE 7

SOLOVOX TUBE SOCKET VOLTAGES

These readings are taken with a 1000 ohms-per-volt meter, having three scales of 15, 150 and 600 volts. All voltages are taken with a line voltage of 117 and deviations of as much as 20% may be caused by line voltage variations. All controls are off, the volume control is in its softest position, and no key is depressed unless specified. The negative lead of the voltmeter is connected to chassis ground.

Connect Positive Voltmeter Lead to	Meter Should Read		This Shows Voltage of
Terminal A (amplifier channel)	300	volts	Amplifier and master oscillator B +
Terminal B (oscillator channel)	290	volts	Controlled oscillator B +
Terminal C (oscillator channel)	10.5	volts	Controlled oscillator cathodes
Tube V1 plate	135	volts	Master oscillator plate
Tube V1 screen	35	volts	Master oscillator screen
Tube V9 plate	150	volts	Preamplifier plate
Tube V9 cathode	12.5	volts	Preamplifier bias
Tube V10 plate	137	volts	Mute plate
Tube V10 screen	26	volts	Mute screen
Tubes V11 and V12 plates	195	volts	Control tube plates
Tubes V11 and V12 screens	135	volts	Control tube screens
Tubes V11 and V12 cathodes (no key depressed)	170	volts	Control tube cathodes (tubes cut off)
Tubes V11 and V12 cathodes (any key depressed)	50	volts	Control tube cathodes (tubes operating)
Tubes V13 and V14 plates	305	volts	Output tube plates
Tubes V13 and V14 screens	290	volts	Output tube screens
Tubes V13 and V14 cathodes	24	volts	Output tube bias
Terminal D (volume control in softest position)	0	volts	Control tube grids
Terminal D (volume control in loudest position)	35	volts	Control tube grids (voltage will vary depending on setting of maximum volume control)
Terminal E (positive lead connected to ground)	76	volts	Speaker field

A. C. VOLTAGES

Heater voltage to all tubes except V8	= 6.3 volts R.M.S.
Rectifier tube V8 filament voltage	= 5.0 volts R.M.S.
Ground to either plate of rectifier tube	= 490 volts R.M.S.
A.C. Ripple voltage across speaker field	3.5 volts R.M.S.

MODEL J
SOLOVOX

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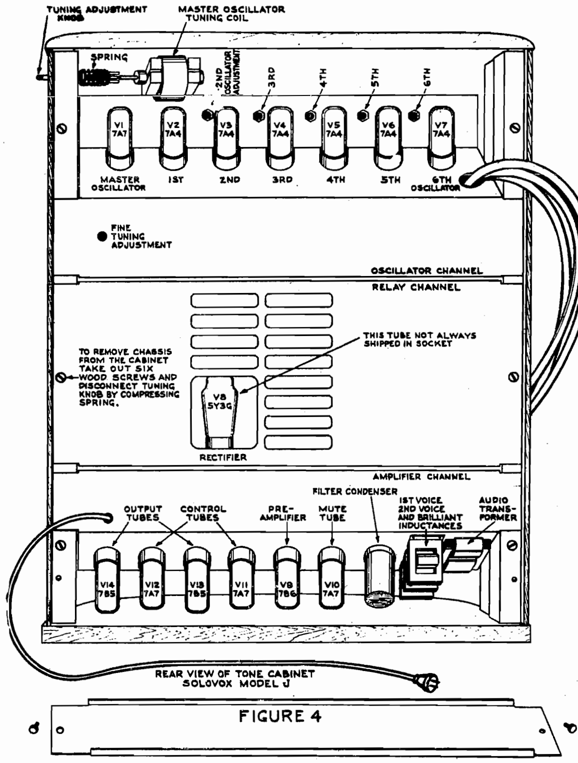


FIGURE 4

Tuning

The Solovox remains in tune indefinitely. However, because of the variation in pitch of the piano or other instrument with which the Solovox is to be played, a tuning adjustment knob has been provided. (The tuning knob, about the size of the end of a pencil, projects through the curved surface of the woodwork near one corner of the tone cabinet.)

Tuning the Solovox is a very simple matter as all of the tones are simultaneously tuned by making this single adjustment. Clockwise turning of the knob lowers the pitch and counter-clockwise turning raises it. For greatest accuracy, only the "CONTRALTO", "VIBRATO OFF" and "DEEP TONE" control tablets should be "in" and the middle octave F, F# or G keys of the Solovox tuned to the corresponding piano notes. (A control tablet is "in" when the top of the tablet is pushed in.)

Some favor tuning the Solovox a little sharper than the piano. We do not recommend too much of this, but in no case should it be at all flat to the piano.

There is another so-called "fine tuning adjustment" in the form of a control on the back of the tone cabinet. We suggest that you leave this alone, unless you want to get into something considerably more complicated, which is described further on in the technical section of this leaflet.

Limit of Tuning

Whereas the turning of the single tuning knob tunes all notes of the Solovox, there is of course a limit which cannot be exceeded before something starts to go wrong with the notes in some octaves. (Notes *"GARGLE,"* or play *exactly* one octave up, or an *exact* musical fifth down.)

A second very simple adjustment will then fix these notes as well, and you will find it easy to make this adjustment, if the occasion should arise, by following the procedure given below, called "Adjustment of Oscillators."

Of course you need not bother with these adjustments unless you hear the *"GARGLE"* or the wrong octave effect.

Adjustment of Oscillators

If some notes are noisy or play the wrong pitch, adjust the oscillators as follows: Push in the "SOPRANO," and "DEEP TONE" controls, with all others off. Tune highest F# to corresponding F# on piano with tuning knob, paying no attention to what other notes do. Notes in the highest octave of the Solovox will now have the same pitch as the top octave of the piano.

Holding down the F# key in the middle octave of the Solovox, place a screwdriver in the "second oscillator adjustment" slot (See Figure 4 on backside of this leaflet) and turn it, first one way and then the other. The instrument will play higher than the right pitch in one direction, and lower in the other, while in the range between it will play an F# note of the same pitch as the second highest F# key on the piano. The pitch can be checked by making sure that there is no sudden jump in pitch between the Solovox middle octave B and the highest octave C. When the proper pitch is determined, find the farthest point in each direction where it will play this note, and place the slot *exactly* midway between these limits.

Holding down the lowest octave Solovox F# key, repeat this procedure with the "third oscillator adjustment." As before, there should be a smooth transition in pitch between the B note of the octave being adjusted, and the C note of the next octave above, which has already been adjusted.

To adjust the fourth oscillator, hold down the lowest octave F# key with only the "CONTRALTO," and "DEEP TONE" controls in. For the fifth oscillator use "TENOR" and "DEEP TONE," and for the sixth oscillator adjustment, use "BASS," and "DEEP TONE," holding the lowest F# key in each case.

Adjustment of Maximum Volume Control Knob

The maximum volume obtainable is controlled by a knob located under the keyboard to the left of the volume control, and regulates the maximum loudness when the knee-operated lever is all the way to the right. With the lever in this position the knob may be turned by the player to suit himself.

To determine where to set this knob, first set the controls to some useful setting such as "TENOR" and "DEEP TONE." Now move the knee-operated volume control as far as it will go to the right, hold down some key such as middle C, and turn the maximum volume control knob to the right until the volume becomes as loud as is useful. Do not turn the knob to the right any farther as to do so will only mean that the knee-operated volume control will become unnecessarily sensitive which is particularly undesirable for the novice and beginner.

When playing in large halls, or with other instruments, it may be found advantageous to increase this maximum volume very materially. Under these conditions, when a very loud tone is played, the quality will become very bright. This increase in brilliance produces many novel tone qualities which are useful under conditions where a loud piercing tone is desirable.

HOW THE SOLOVOX WORKS

All of the notes of the Solovox are controlled by a single radio vacuum tube master oscillator operating at the audio frequencies of the highest octave of the instrument (2093-3951 c.p.s.). Each time a key is depressed, a switch under it tunes this master oscillator to the pitch associated with the key in this highest octave range. Thus, whenever a "C" key is depressed (the tuning key contacts for all the "C's" are in parallel), this oscillator is tuned to 2093 c.p.s., which is its lowest frequency. If a "B" note is depressed the frequency will be 3951 c.p.s., which is its highest frequency.

The output of this master oscillator controls the frequency of a first controlled oscillator (called the "buffer oscillator") which is adjusted to operate at the same frequency as the master oscillator. The output of this buffer oscillator, in turn, controls the frequency of the second controlled oscillator so adjusted to oscillate at one-half the frequency of the first oscillator. This new frequency corresponds to a note of pitch one octave lower than the buffer oscillator.

Similar cascaded oscillators provide pitches of two, three, four and five octaves below that of the buffer oscillator. In this way, each time the master oscillator is tuned to some given note, each of these six controlled oscillators produces a note which is in exact octave relation to the master, thus forming a series of six notes in exact octave relationships. The particular oscillator selected for sounding through an amplifier and speaker depends upon the particular playing key depressed, and also upon which of the BASS, TENOR, CONTRALTO or SOPRANO controls are used. A second contact under each key operates an electrical relay, having contacts to select the desired oscillator.

There are three relays—one for each of the three octaves of keys. A further function of the second key contact is to transmit the signal to the speaker with a controlled rate of attack so as not to be musically abrupt. Tuned electrical circuits and tone controls similar to radio tone controls alter the quality of tone over a wide range.

HAMMOND INSTRUMENT CO.

The Oscillators

All the tones of the Solovox are controlled by a single vacuum tube oscillator called the "MASTER OSCILLATOR" (V1, Figure 1). This oscillator operates at any one of the twelve audio frequencies comprising the twelve notes of the highest octave range of the instrument (2093 cycles to 3951 cycles). Each time a key is depressed, a contact under it closes to tune this oscillator to the pitch associated with that key. For instance, whenever any C key is depressed (there are three C keys on the keyboard), this master oscillator is tuned to 2093 cycles, its lowest frequency. If, on the other hand, any one of the three B keys is depressed, the master oscillator will operate at 3951 cycles, its highest frequency.
If, on the other hand, any one of the three B keys is depressed, the master oscillator will operate at 3951 cycles, its highest frequency.

The condensers which tune the master oscillator are shown at the left of Figure 1, and are located in the vibrato box fastened to the Solovox keyboard.

The output of this master oscillator controls the frequency of the first controlled oscillator, called the "BUFFER OSCILLATOR" (V2, Figure 1), which operates at the same frequency as the master oscillator.

Following this buffer oscillator is the SECOND CONTROLLED OSCILLATOR, whose frequency is tuned to approximately one-half that of the frequency of the buffer oscillator. Furthermore, its frequency is stabilized to be exactly one-half that of the buffer oscillator by applying a "locking" signal from the buffer oscillator to its grid circuit. The amount of this locking signal is regulated by a potentiometer. Thus, the output frequency of the second controlled oscillator is an octave lower in pitch than the master oscillator.

Similarly, the third, fourth, fifth and sixth CONTROLLED OSCILLATORS provide respective outputs of exactly two, three, four and five octaves lower in pitch than that of the master oscillator. A potentiometer associated with each provides the correct amount of locking signal. It is to be noted that these controlled oscillators (being of the relaxation type), are readily tuned by altering their grid bias. It is the function of the tuning resistors in parallel with the tuning condensers to apply the appropriate grid bias to tune all of the controlled oscillators simultaneously to their approximate sub-octave frequencies. The amount of bias varies, depending upon which tuning contact is connected by a playing key, and the frequencies of the controlled oscillators shift correspondingly.

When no key is depressed, all the oscillators operate at their highest pitches ("B" notes). Thus, whenever a key other than "B" is depressed, all oscillators shift simultaneously from their "B" frequencies to the frequencies corresponding to the key depressed. *The tuning condensers accurately tune the master oscillator, and the tuning resistors tune the controlled oscillators. By interconnecting the controlled oscillators in*

Register Controls and Relays

From the above, we see that whenever any one of the three G# keys, for instance, is depressed, the oscillators are tuned to provide a series of G# notes in exact octave relations. The selection of the particular oscillator output to sound through the speaker is determined by a second contact under each of the playing keys. This second contact is called the CONTROL CONTACT. There are three relays connected to the control contacts—one relay is operated any time a key in the lowest octave of playing keys is depressed, another relay for the middle octave of playing keys, and a third relay for the highest octave of playing keys.

Also, whenever a control contact is closed, a cutoff bias is removed from push-pull control tubes V11 and V12, causing them to transmit the signal with a smooth rate of tonal attack to the power output tubes and speaker. This function of the control tubes will be explained subsequently.

Each of the three relays has a contact to connect the grid of the preamplifier tube V9 to the desired oscillator through the register controls ("BASS-TENOR-CONTRALTO-SOPRANO"). For example, if we push in the "SOPRANO" control and depress the G key in the middle of the keyboard, the tuning contact will tune all the oscillators to the G notes of the respective octaves, and the control contact will operate the middle octave relay. This relay completes a circuit from the output of the second controlled oscillator, whose wire is numbered 2-5, through a 50,000 ohm register control resistor to the middle octave relay contact, and then to the preamplifier tube V9. Thus, the register controls function to shift the pitch range of the Solovox keyboard as a whole to four different positions. By simultaneously depressing two or more of these controls, a composite tone will be heard, consisting of the outputs of several oscillators simultaneously sounding in their octave relations to each other.

Other contacts associated with each of the relays serve to prevent undesirable tones from occurring when two keys are simultaneously depressed in adjoining octave groups through a legato style of playing on the part of the musician. If two keys are depressed within one of the three octave groups, the lowest pitched of the two will be automatically selected for sounding through the speaker.

The "Mute"

The signal from the plate of the preamplifier tube V9 is fed to the grid of the "MUTE" tube. This tube operates nonlinearly to suppress the sharp curvature of the input signal wave form, and thus renders the tone more mellow. When this muted effect is not desired, the mute switch is used to by-pass this portion of the circuit.

"Deep Tone," "Full Tone," "First Voice," "Second Voice" and "Brilliant" Controls

Following the "mute" is a series of tone controlling circuits arranged to alter the frequency characteristic of the amplifier in a manner similar to radio tone controls. For instance, with "DEEP TONE" the signal develops across a condenser which emphasizes the low frequencies; with "FULL TONE" the signal develops across a resistor with a small condenser in shunt, which leaves the frequency characteristic essentially flat except for the very high frequencies; "FIRST VOICE" puts a resonance in the 500 cycle zone; "SECOND VOICE" puts a resonance near 1000 cycles; and with "BRILLIANT" the signal develops across an inductance, L10, emphasizing the higher frequencies. It is to be noted that these tone control circuits are connected in series, and may be used singly or in groups.

Control Tubes V11 and V12

As mentioned before, the control contacts under the playing keys serve to remove the cutoff bias from control tubes V11 and V12, as well as to operate one of the three relays. This is explained by considering that the cathodes of tubes V11 and V12 are connected to the mid-point of the voltage divider shown to the left of the control tubes in Figure 1. When no playing key is down, this voltage is about 165 volts positive with respect to ground, and, therefore, these tubes are cut off. When any playing key control contact is closed, the resistance of the relay coil is put in parallel with the 6000 ohm resistor and this causes the cathode voltage to drop to 50 volts. This removes the cutoff bias from tubes V11 and V12, which are of the remote cutoff type. The 16 mfd. condenser across the 6000 ohm resistor serves to make the tonal attack and decay rate smooth. A .1 mfd. condenser connected between the control tube cathodes and the center tap of transformer T9 produces a slow rate of attack but can be disconnected if desired by operating the "fast attack" switch.

Volume Control

The volume of the Solovox is controlled by a knee-operated rheostat. This rheostat is actually a switch connected to seven fixed resistors, and is, therefore, not subject to wear as is the usual type of volume control. This rheostat forms part of a voltage divider circuit which varies the grid bias to the remote cutoff control tubes V11 and V12, and, therefore, changes the gain of these tubes to produce a corresponding change of volume in sound from the speaker. The grid potential varies from approximately +45 volts at the maximum volume position (depending on setting of maximum volume control), to ground potential at the minimum position.

The Vibrato

The vibrato effect is produced by means of a magnetically driven reed having a small piece of powdered iron attached to it in such a way as to vibrate in and out of a coil placed beside the reed. Thus, the inductance of the coil varies periodically as the powdered iron core swings in and out of it. This coil is connected to a tap on the master oscillator tuning coil, and causes the oscillator frequency to vary, producing a vibrato effect. This reed is caused to swing when the volume control lever is pulled forward in starting the instrument. After the reed is once started, the magnetic drive keeps it in motion as long as the instrument is on.

Tuning

The Solovox, as a whole, is tuned by adjusting the frequency of the master oscillator. The tuning knob accomplishes this by moving a powdered iron core in and out of inductance L1.

Power Output Tubes

V13 and V14 are power output pentodes connected in the usual push-pull manner to drive the loud speaker. The speaker field functions as a choke coil in the power supply system.

Power Supply

The power supply of the Solovox uses a single rectifier tube V8.

Note that control tubes V11 and V12 have a separate heater winding on power transformer T8. This prevents an appreciable difference in potential from arising between the heaters and cathodes of control tubes V11 and V12.

MODEL J
SOLOVOX

HAMMOND INSTRUMENT CO.

PRACTICAL SERVICE SUGGESTIONS

The materials and electrical parts in the Hammond Solovox are of the finest quality available. Aside from occasional replacement of a vacuum tube, no service problems need be expected to arise. A few conditions which might possibly be encountered are listed below with information which will enable a radio service technician to correct them without difficulty. Some additional information useful to the service technician is in the first section entitled "TUNING AND SIMPLE ADJUSTMENTS."

If any of the following conditions appear, first make sure that the three cable connectors in the left end of the keyboard under the piano are secure. The faces of the plugs and their receptacles should be together. If the Solovox does not play properly, this is the most likely cause.

1. *Changing tubes*—There are fourteen tubes in the Solovox: Six type 7A4, four type 7A7, two type 7B5, one type 7B6, and one type 5Y3G. These are all standard radio tubes, and can be tested and replaced, if necessary, by any radio dealer. All tubes can be reached from the back of the tone cabinet. A metal guard covering the lower row of tubes is easily removed by taking out two screws—see Fig. 4. Be sure to replace all tubes in the exact sockets from which they came.

If any of the 7A4 tubes are replaced, the oscillators should be readjusted as described under "Adjustment of Oscillators," Page 2.

The two type 7A7 control tubes (V11 and V12, located in the amplifier channel, Fig. 4) should be matched to avoid undesirable thumps when keying. It is therefore recommended that both be replaced at the same time with new tubes of the same make.

2. *Some notes are noisy or play the wrong pitch.* If a note is noisy, it may be due to (A) a faulty oscillator adjustment, (B) a faulty relay contact, or (C) a faulty key contact. To ascertain which of these is the cause, follow this procedure:

(A) If the trouble lies in a faulty oscillator adjustment, the corresponding note one octave lower in pitch will also be noisy because it is controlled by the higher oscillator. If, on the other hand, the lower note is not noisy, it indicates that the oscillator adjustment is satisfactory. In the event that readjustment is necessary, check as described in "TUNING AND SIMPLE ADJUSTMENTS." If any notes still do not play correctly, replace the 7A4 tube associated with the highest pitched oscillator that fails to operate properly on any note. The following chart will be helpful in finding the oscillator associated with notes of any particular octave.

	Lowest Octave of Playing Keys	Middle Octave of Playing Keys	Highest Octave of Playing Keys
"BASS" Control Connects to............	6th Osc.	5th Osc.	4th Osc.
"TENOR" Control Connects to..........	5th Osc.	4th Osc.	3rd Osc.
"CONTRALTO" Control Connects to...	4th Osc.	3rd Osc.	2nd Osc.
"SOPRANO" Control Connects to.......	3rd Osc.	2nd Osc.	Master Osc.

After the tube has been replaced, reset the oscillator adjustment potentiometers—see page 2, "Adjustment of Oscillators."

(B) If the trouble lies in a faulty relay contact, it will be present on all 12 keys of one of the octave groups and will persist on these 12 keys regardless of the combination of playing controls used. All contacts used are of precious material so that in all probability a particle of lint has lodged between the contacts which may be easily cleared by lifting and wiping the contact. Note that the relays are accessible without disconnecting any wires, it merely being necessary to first remove the two large nuts which hold the relay assembly to the tone cabinet frame work. After removing these two nuts, turn over the assembly and remove the four screws which hold the cover plate. After removing the cover plate, all contacts will be readily accessible.

(C) If the trouble lies in a faulty key contact, trouble will be present, of course, only on one note. In this case, move the bus bar shifters as described in the following suggestions numbered "6" and "7".

3. *Instrument fails to play.* Ordinarily the first thing to do in this case is to test all the tubes. If the tubes are lighted, the cable plugs are making proper connection, and the controls are in playing position, the most likely source of trouble is in the amplifier circuit. In most respects this is a conventional amplifier circuit, and the voltage measurements given on page 13 will enable a radio service technician to locate the trouble.

4. *Key thumps or clicks.* If a transient effect in the form of an annoying thump appears each time a key is released, the two type 7A7 control tubes (V11 and V12) are probably not matched properly. In this case, install two new tubes of the same make. A loud click each time a key is released indicates that the control tube cathode condenser is probably open, or partially open.

5. *Hum.* An excessive 120 cycle hum in the speaker indicates that the filter choke (L9) is defective, or one of the filter condensers is open.

6. *One key does not sound.* If a certain key fails to play on any of the register controls, it probably has a dirty control contact which can be cleared easily by shifting the control contact bus-bar whose adjustment is at the right end of the keyboard. To reach the bus-bar shifters, first remove the two molded bakelite end pieces. A drawing accompanying the keyboard (Figure 5), shows how the contact shifters are arranged. Loosen the clamping screw and shift the bus-bar about 1/32". Be sure to tighten the clamping screw carefully.

7. *One key plays note "B" instead of its correct pitch (with adjacent keys playing correctly).* If this occurs, the key under question has a dirty tuning contact which can be cleared easily by shifting the tuning contact bus-bar having adjustment at the left end of the keyboard. This is reached as described in the preceding paragraph.

8. *One octave of notes fails to play.* If a single octave of the Solovox keyboard fails to play for any combination of the register controls, the trouble is probably in the relay associated with that octave or a wire leading to it. Check voltage at the relay coil and the control tube cathodes (V10 and V11).

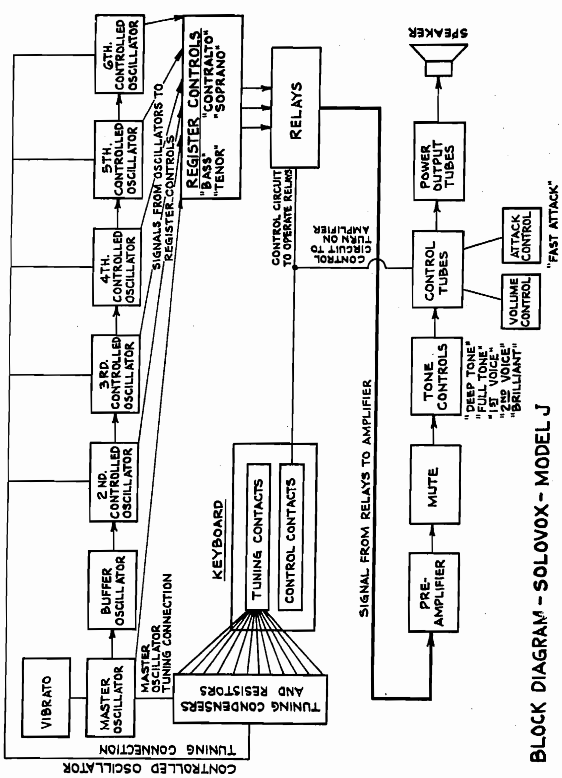
9. *Adjustment of Master Oscillator Fine Tuning Condenser.* An additional tuning adjustment is provided in the form of a screw driver operated trimming condenser at the back of the tone cabinet, upper left hand corner (See Fig. 4). After several years of use under very adverse conditions of humidity, or if an exceedingly accurate tuning is required, this adjustment may need to be made. First, however, always tune as described on page 1. If, after tuning F, F# or G, it is found that other notes (most likely C or B) are out of tune, the tuning breadth of the octave may be readjusted as follows:

(a) Depress the middle "C" key with the "VIBRATO OFF," "CONTRALTO," and "DEEP TONE" controls pushed in. Tune to zero beat, preferably with a Hammond Organ, or piano which has just been tuned. In tuning this "C," use the tuning knob of the tone cabinet. If it is found impossible to tune the "C" with the tuning knob, the two wood screws at the top of the tuner may be loosened, and the black bakelite tube moved to a position in the tuning coil such that the range of the tuning knob does cover the correct "C" pitch. Before making this adjustment, be sure the "VIBRATO" switch tablet is not set midway between its on and off positions. For tuning purposes, the "VIBRATO" tablet should be pushed in at the top of the tablet.

(b) After tuning the "C" key with the tuning knob, depress a "B" key and tune to zero beat with the screw driver operated trimming condenser located in back of the tone cabinet, see Fig. 4. The instrument will now be exceedingly accurately tuned.

DIRECTIONS FOR CONNECTING ADDITIONAL AMPLIFIERS TO SOLOVOX

When the Solovox is used in large auditoriums or with a large orchestra, additional amplifiers may be connected across the Solovox voice coil terminals which are accessible for this purpose on the speaker framework. Standard Hammond Organ Tone Cabinets are recommended as they may be connected with no changes necessary other than securing a push-pull ground with two 200 ohm resistors connected to the Solovox voice coil terminals and their junction point used as a ground for the Hammond Organ Tone Cabinet. By locating the resistors in the Hammond Organ Tone Cabinet, it is only necessary to run two wires (they need not be shielded and may be as long as 200 feet) to the extra tone cabinet.



BLOCK DIAGRAM - SOLOVOX - MODEL J

FIGURE 3

HOWARD RADIO CO.

MODELS 302R, 302RA 302RT (Late)

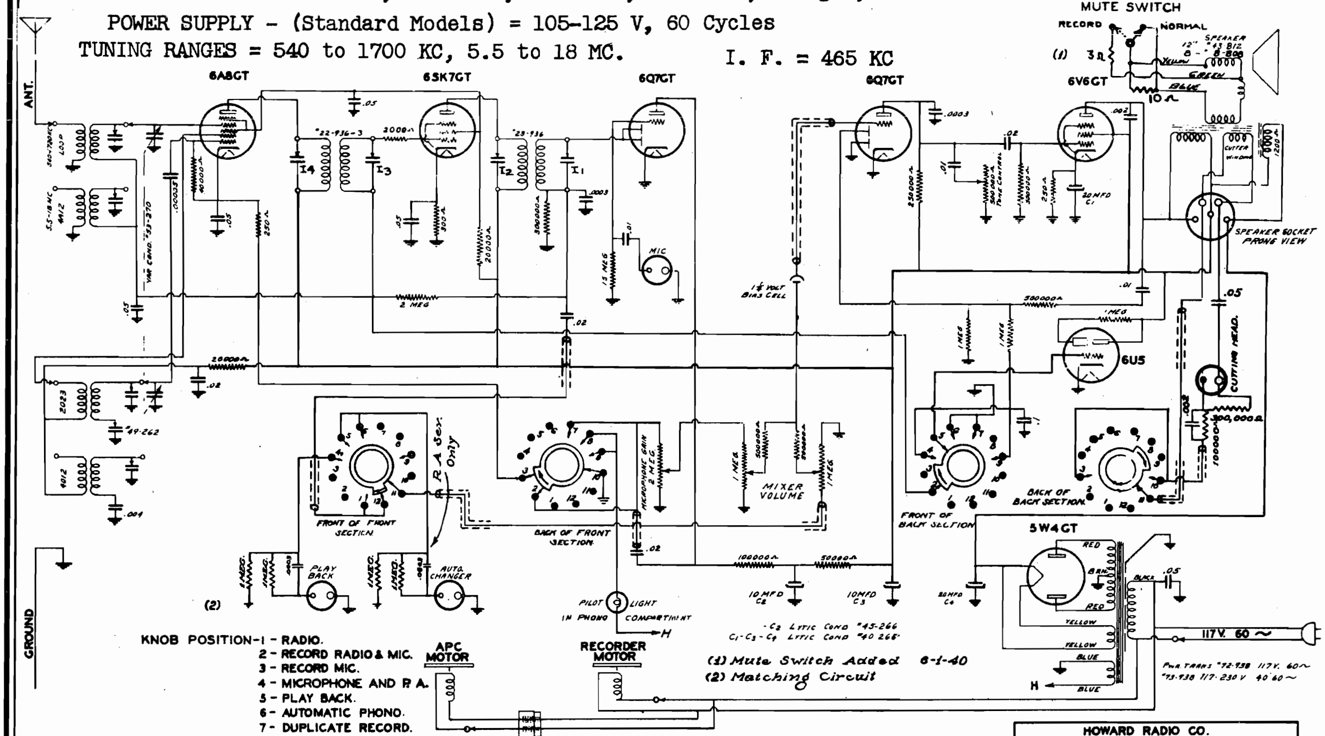
ANTENNA SYSTEM = Built-in loop with available connection from outside antenna. On short wave band, outside antenna required. BROWN lead to antenna, and BLACK lead to ground.

TYPE = Conventional | POWER OUTPUT - (MAX.) = 6 Watts; UPO = 4 Watts

CONSUMPTION - Receiver, 70 WATTS; Recorder, 30 WATTS; Changer, 30 WATTS.

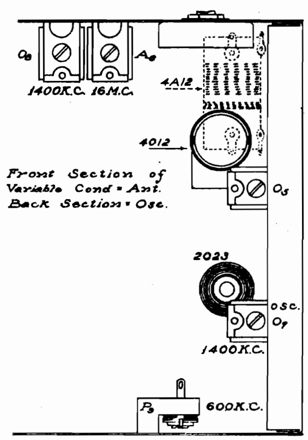
POWER SUPPLY - (Standard Models) = 105-125 V, 60 Cycles

TUNING RANGES = 540 to 1700 KC, 5.5 to 18 MC. I. F. = 465 KC



MODEL - 302-R Console Recorder
302-RT Table Model Recorder
302-RA Console Recorder with Automatic Record Changer

HOWARD RADIO CO.		
MODEL 302 R (RA)	302 RT	
DWG. NO. C71-715		2-21-40
DWN. BY.	CHCKD. BY.	APPVD. BY.
R.B.M.		J.F.R.



ALIGNMENT PROCEDURE

Wave-Band Switch position	Position of Dial Pointer	Signal Generator Frequency	Signal Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	540	465 KC	Grid of 6A8GT	A,D	I_1,I_2,I_3,I_4	IF
SW	16 MC	16 MC	Brown Ant. lead	B,E	O_5,A_6	Osc. Ant.
BC	1400 KC	1400 KC	Brown Ant. lead		O_7,A_8	Osc. Ant.
BC	600 KC	600 KC	Brown Ant. lead	C	P_9	Osc. Pad.

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I. F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 16 MC, then a weaker image will be heard at 15,070 KC, in other words 930 KC less on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- Check for oscillator cross-over between 16 and 18 MC. If necessary for stability, turn the antenna trimmer "IN" slightly.

SOCKET VOLTAGE READINGS:

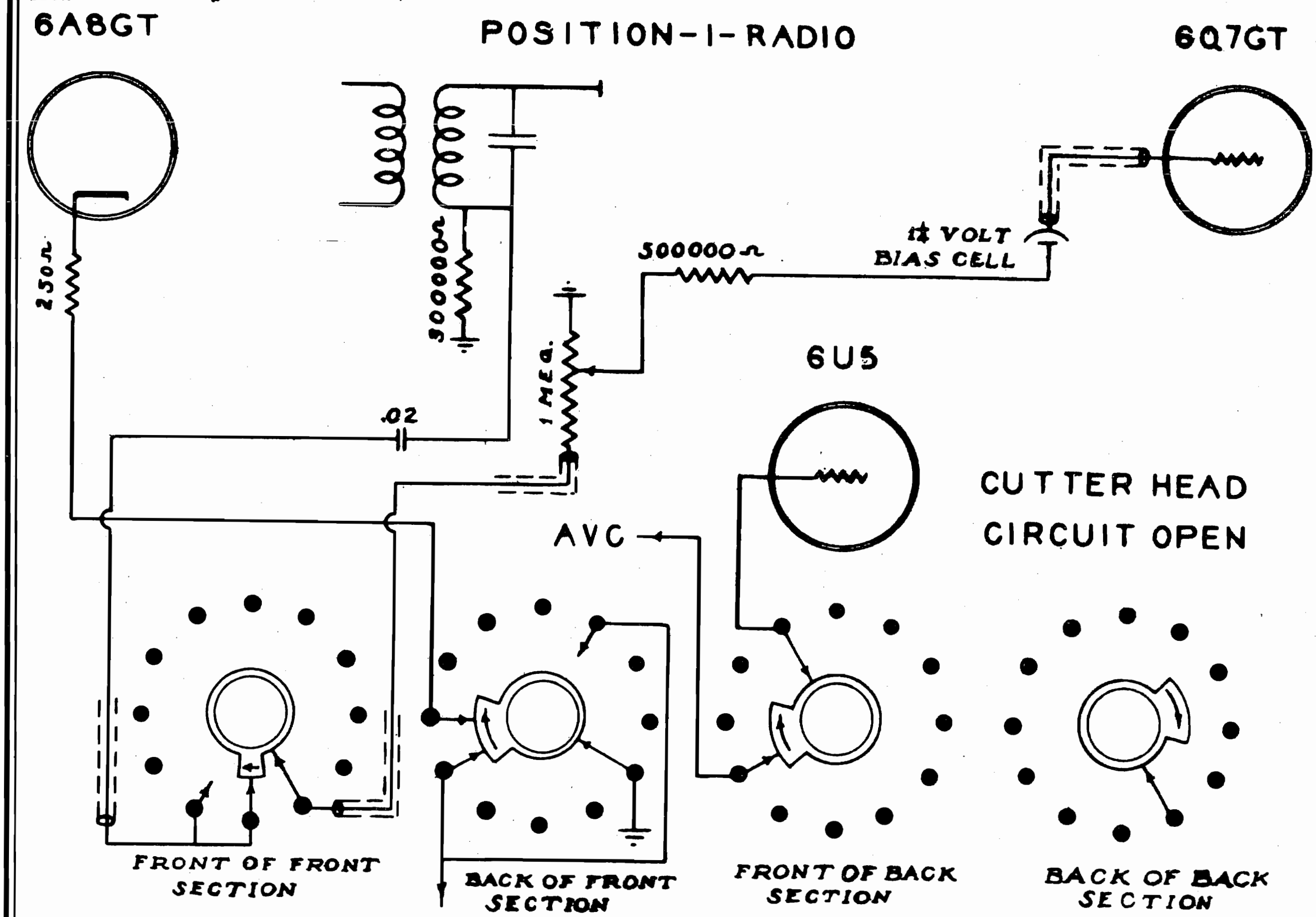
TUBE	FUNCTION	CATHODE	SCR. GRID	PLATE	OSC. PLATE
6A8GT	Mixer	3	95	225	140
6SK7GT	I.F. Amp	3	95	225	
6Q7GT	Diode & Mic. Gain			90	
6Q7GT	Audio			75	

TUBE	FUNCTION	CATHODE	SCR. GRID	PLATE
6U5	Tunning & level cont.			220
6V6GT	Output	12	230	220
5W4GT	Rect.			

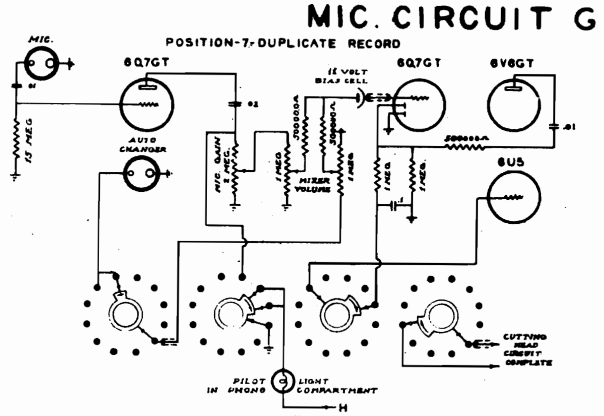
MODELS 302R, 302RA
302RT (Late)
MODELS 568R, 568RA

HOWARD RADIO CO.

POSITION-1-RADIO



MIC. CIRCUIT GROUNDED

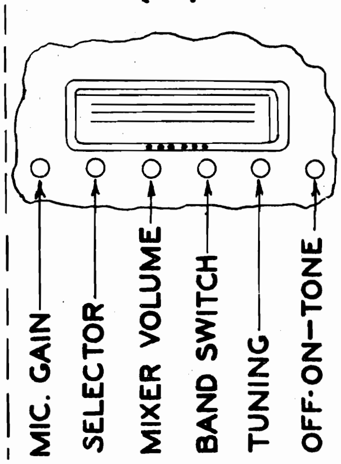


In the "Duplicate Record" position, the tuning-eye is again in the circuit, for indication of proper cutting level, the cutting head circuit is complete, and the duplication is made from the original blank in position on the automatic turntable. The microphone is in use for another superimposed registration if desired.

With our automatic record changer models when duplicating from a small 6½" record, due to the fact that this record, having a small surface, is liable to slip on the turntable, we have provided a spring finger that slips over the spindle that locks this record in place.

All chassis models have the input socket for the automatic changer pick-up, or if the model is not equipped with the automatic changer, a conventional turntable and crystal pick-up may be plugged into this socket and the duplication of the record can be accomplished.

CONTROL LAYOUT FOR 568R [RA] SERIES



THE MASTER SWITCH with which these features are selected, has seven positions as follows:

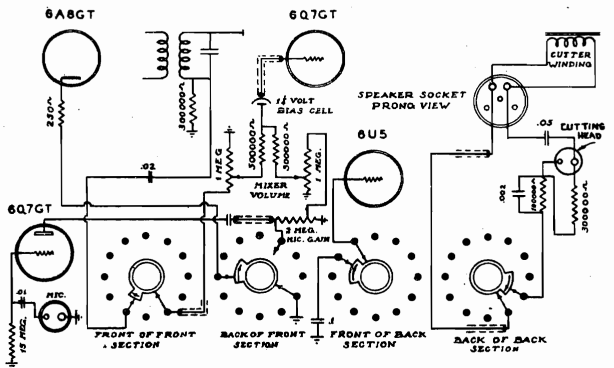
1. Radio
2. Record Radio & Microphone
3. Record Mic.
4. Microphone for P.A. System
5. Play-back
6. Automatic Phono
7. Duplicate Record

AUTOMATIC RECORD CHANGER WITH RA SERIES: USE ALSO FOR PLAYING RECORDS WHILE THEY ARE BEING DUPLICATED BY CUTTING ARM

HOWARD RADIO CO.

MODELS 302R, 302RA
302RT (Late)
MODELS 568R, 568RA

POSITION-2-RECORD RADIO & MIC



In the "Record-Radio & Mic." position, the radio circuit remains the same as in "Radio" position. The microphone circuit becomes effective as the short is removed from the Mic. Gain Control. The The percentage of radio and/or microphone is then controlled with the dual control feeding the 6Q7GT Audio and the Mic. Gain Control.

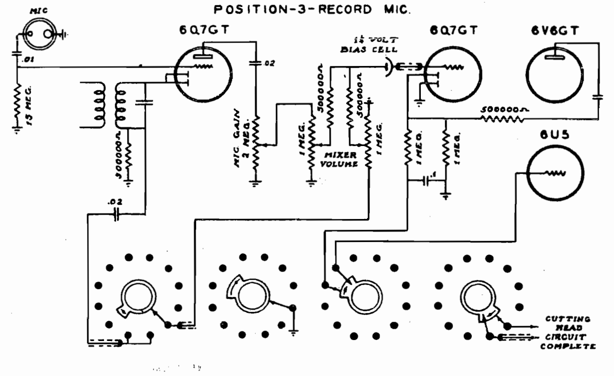
The 6U5 now becomes the visual amplitude indicator of the recording voltage. The voltage is taken from the output plate (6V6), rectified and applied to the grid of the 6U5.

The cutter head circuit is completed.

THE PROPER VOLTAGE LEVEL FOR THE CUTTING OPERATION IS VERY IMPORTANT. TOO HIGH A LEVEL AS INDICATED BY THE CONTINUOUSLY OVERLAPPING OF THE TUNING-EYE RESULTS NOT ONLY IN FEED-BACK, BUT ACTUAL OVERCUTTING OF THE RECORD, RESULTING IN DISTORTION. HOWEVER, IT SEEMS THAT THE GENERAL PRACTICE IS FOR THE OPERATOR TO MORE OFTEN "UNDERCUT" THE RECORDING BY NOT PROVIDING SUFFICIENT CUTTING VOLTAGE. THIS RESULTS IN A HIGH BACKGROUND LEVEL AND POOR QUALITY.

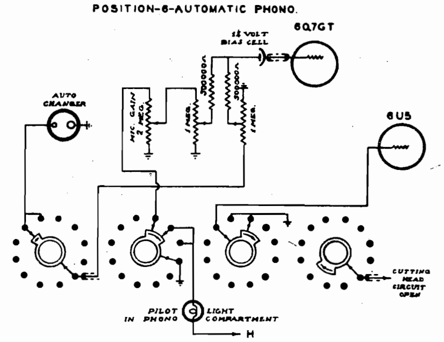
The series condenser (.002) in one side of the cutting head circuit is a controlling compensator for high response when recording. Increasing the value of this condenser will increase the high frequency effect in recording.

POSITION-3-RECORD MIC.



In the "Record Mic." position, the radio diode circuit is opened, the bias circuit is opened at the mixer tube, cutting out the radio, and cutting head circuit is closed.

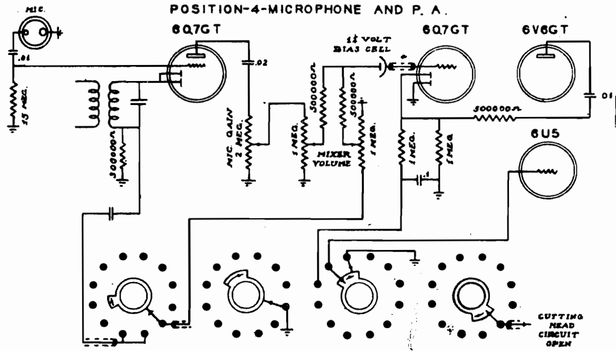
POSITION-6-AUTOMATIC PHONO.



With the Howard "RA" Series, the automatic changer is included. With the switch in this position the audio system remains the same as in "Play-Back" position, except the pick-up arm of the changer is in use.

A pilot light is switched on over the changer unit when switch is in this position.

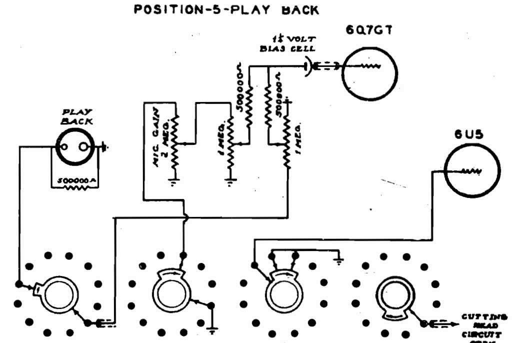
POSITION-4-MICROPHONE AND P. A.



In the "Mic. P.A." position, only the microphone is in the circuit. An additional microphone extension is usually used with the microphone at a remote point, using the receiver as a public address system.

As shown in the above diagram, the tuning-eye becomes inactive.

POSITION-5-PLAY BACK



In the "Play-Back" position the pick-up connects to one section of the dual volume control from which the audio output is regulated in the conventional manner.

The resistor directly in shunt with the play-back or pick-up circuit is a compensator controlling the low frequency response at "Play-Back" position. Decreasing this value will decrease the low response.

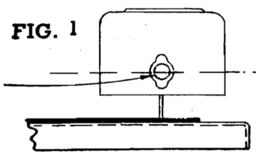
MODELS 302R, 302RA
302RT (Late)
MODELS 568R, 568RA

HOWARD RADIO CO.

GENERAL ADJUSTMENTS ON RECORDER MECHANISM.

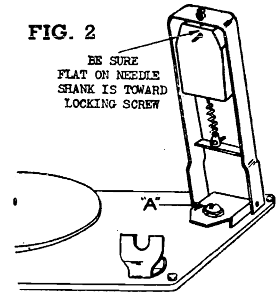
CUTTING HEAD POSITIONING ADJUSTMENT

FIG. 1



The cutting head position has been adjusted properly at the factory, using HOWARD Home Recording Blanks. However, check this adjustment by noticing if the Cutting Needle Locking Screw will locate itself in the Vertical Center of the clearance slot (See Fig. 1), when the record is being cut.

FIG. 2

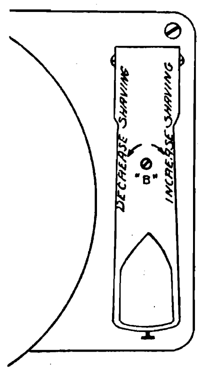


When necessary to change the position of this screw in the slot, loosen locking nut (See Fig. 2) and turn screw "A" to RIGHT to raise needle locking screw; or turn to LEFT to lower.

After any adjustment is completed, be sure to tighten locking nut.

CUTTING NEEDLE PRESSURE ADJUSTMENT

FIG. 3



For quality recordings, it is of vital importance that the right amount of pressure is obtained with the cutting needle. Observe the character of the shaving as the record is being cut. The size of the shaving should be about the size of a human hair (approx. .003"). If it is too heavy, the groove in the record may be too close to the adjacent groove which would cause distortion. If the shaving appears to be too fine and "kinky", an insufficient pattern will be cut with distortion as a result.

Before making any change in the amount of pressure, FIRST BE SURE THE CUTTING NEEDLE ITSELF IS NOT DEFECTIVE, LOOSE OR MOUNTED WRONG, since the conditions as mentioned above due to improper pressure can also be caused by a defective needle. Check needle first.

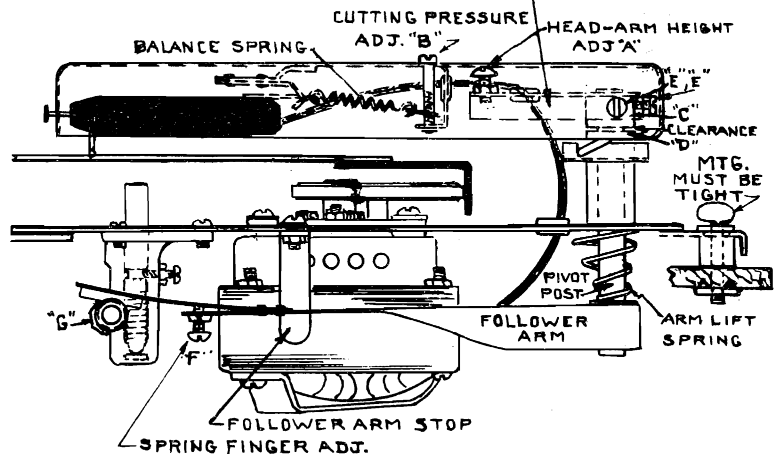
When necessary to INCREASE thickness of shaving thread (See Fig. 3) TURN CUTTING PRESSURE adjustment "B" to the right. TO DECREASE thickness of shaving thread, turn adjustment to the left.

THE CORRECT HEIGHT OF FOLLOWER ARM IN RELATION TO THE CUTTER ARM is obtained by seeing that the pivot post (which is a fixed part of the follower arm) is flush with the bushing on the top side of the arm platform. See Fig. 4. Also see that there is a small clearance between the pivot post bushings "C" and "D" when the cutting arm is lowered to the cutting position. The two hex. head screws "E" - "E" permits both this adjustment and at the same time the very important FOLLOWER ARM ADJUSTMENT IN RELATION TO THE SWING OF THE CUTTERARM as follows: When the follower arm touches the follower arm stop, the cutting stylus should be just outside the edge of the paper label on the Howard Record blanks.

THE BRONZE SPRING ADJUSTMENT ON THE FOLLOWER ARM. When the cutting arm is in cutting position, the bronze spring tongue should seat firmly into the bottom of the spiral groove of the lateral feed screw. This pressure should be great enough so that there will be no tendency of the knife edge tongue to climb out of the thread causing uneven grooves and distortion. However, too much pressure is to be avoided. The screw "F" controls this tension, and if the spring lifts itself away from the tip of this screw in the cutting position, it indicates too much pressure. This may also be caused by the follower arm being too low or bent downward for some reason.

END PLAY ADJUSTMENT OF LATERAL FEED SCREW. Loosen locking nut for screw "G"; turn screw slowly to right until the end play cannot be felt; reverse screw slightly to left to allow running clearance, and tighten lock nut.

FIG. 4



MODELS 302R, 302RA
302RT (Late)
MODELS 568R, 568RA

HOWARD RADIO CO.

AUDIO FEED-BACK is controlled by placing Selector Switch in position for a recording. Turn fader to extreme left and adjust Mic. Gain Control just below the feed-back point.

THE CRYSTAL TYPE CUTTING HEAD is energized by a special 70,000 Ohm secondary winding (a part of the output transformer) that matches the impedance of the cutting head.

THE CUTTING HEAD CRYSTAL MICROPHONE AND CRYSTAL PLAY-BACK units are so designed and compensated to provide uniform frequency response for recording and play-back.

In the "Radio" position, the ground circuit return for the mixer tube bias is completed through the switch. Radio silencing is accomplished by opening the mixer tube cathode.

The 6U5 becomes the conventional tuning eye tube since the grid is connected through the switch directly to the AVC line.

The Microphone output circuit is shorted out.

Before we consider the cause and remedy of some of the troubles that may be encountered with any recording device, it is necessary to review the fundamental purpose of the records and needles themselves.

RECORD BLANKS

The ideal record material is that substance that has the right quality of material to respond to the variations of the cutting stylus and yet have the right amount of "GRAINING" so when used with the play-back needle, the needle takes most of the wear and not the record pattern.

Needle scratch will be objectionable with records having too coarse a grain material base. However, we do not recommend the use of non-metallic needles to reduce this needle scratch condition. For practical use the loss of volume with this type needle requires increase of audio volume and the background increases likewise.

NEEDLES

The function of a play-back needle is to act as a transmission medium between the modulated record groove and the reproducing unit. Therefore, the frequency characteristic of a needle depends upon its shape, material, and size. The metallic needles are superior to non-metallic for a greater range of response; likewise the heavier shank needles will naturally have a greater range.

Regarding the playing life of a needle, generally speaking the metallic type may be grouped into about three classes: (1) The soft metallic one-play type; (2) Hard steel types, 10 or 25 plays; (3) Semi-permanent and permanent types, 1000 or 2000 plays.

It must be remembered that the causes of faulty reproduction and the quick wearing out of records can more often be due to dull or rough edge needles than from the type of needle or record blank. This also applies to the cutting needle which, although it may be in the permanent life class, can become chipped by rough handling or damaged when used with inferior grade blanks on which the coating is insufficient, and the cutting needle may cut through to the hard core of the blank.

Since the actual depth of the groove is nearly three thousandths of an inch (.003") for safety the coating should be at least twice that thickness.

Getting back to the reproducing needle, since the variations that the needle is to follow are lateral in nature, it is obvious that the needle is not supposed to be extremely pointed so as to ride in the bottom of the groove; and at the other extreme it is obvious that the needle should not be too blunt (like a dull needle) so as to ride near the top edge of the groove, losing all of the higher frequencies. Since the bearing surface, or radius point, of the needle should be slightly over two thousandths of an inch (.002") it becomes apparent as to what happens to the quality when the point becomes blunt so that the diameter is greater than what we can call the "Wave Length" of the higher frequency pattern in which the blunt needle could not follow the small curve variation for the high frequency reproduction. Never rotate the needle in the socket once it has been used.

SERVICE NOTES

THE CUTTING HEAD

This crystal unit similar in structure to the regular reproducing head, is likewise subject to extreme temperatures both hot and cold.

Heat at about 123° Fahrenheit will begin to soften the crystals and permanently damage the unit. Average temperatures encountered in the home a distance from the radiator should not cause trouble.

Coldness does not cause permanent damage, the effect being to "stiffen" the unit resulting in an increase of background "rumble" if a recording is made during that period.

ROUGH HANDLING

To bounce either the play-back or the cutter head around carelessly will invite trouble. Severe shock against the end of the needle may not fracture the crystal, but at least the needle (or stylus) mounting will be damaged or the edge of the needle may be roughened which would ruin the next record.

Forcing the cutting arm by hand when it is not raised enough for the follower arm to become disengaged may throw arms out of alignment with each other.

CUTTING SHAVING TOO HEAVY

Under a magnifying glass, the grooves should appear as about the width as the spaces between them for proper cut. If the thread is coarse and stiff, try new cutting needle, then if necessary, refer to procedure of adjustments given herein.

When the record is being cut, watch the shavings as it leaves the needle and see that it winds toward the center of the record and does not work back underneath the cutting needle causing it to bounce over the shavings.

CUTTING SHAVING TOO FINE

If the thread is light, fluffy, or not continuous, after trying new cutting needle, refer to procedure of adjustment given herein.

MODELS 302R, 302RA
302RT (Late)
MODELS 568R, 568RA

HOWARD RADIO CO.

MICROPHONICS OR FEED-BACK

This condition is the normal result of improper use of the "Mic. Gain Control" with the visual indicator for proper cutting voltage. Overcutting of the record is also possible with too high an input. At the other extreme, lack of sufficient input results not only in poor quality, but also raises the background level.

RUMBLE

Any recording system as sensitive as the Howard Recorder, is capable of picking up the mechanical vibrations of the motor. The sacrificing of this sensitivity to eliminate any possibility of motor rumble is not the cure or is it necessary. Under normal conditions of operation in which both the motor frame and turntable unit are suspended on soft rubber cushions, the rumble will not be recorded if:

(1) The amplitude of the signal is sufficient when the blank is being cut.

(2) The Tone Control is in the treble position at the time of recording.

(3) The cutting stylus is in good condition and is MOUNTED TIGHT.

(4) The crystal is at room temperature at the time of recording.

(5) The play-back needle is not dull or has become "shouldered".

WARBLE

By "warble" we mean the sing-song effect with the low frequencies predominating. We first consider the possibility that something has happened to vary the motor speed during recording. (See Speed Regulation below).

Although the recorder base is mounted on rubber feet at each corner, it is essential that the wing screws remain drawn tight against the washers. When the base floats too freely, vibrations are introduced from the drive mechanism causing a warble effect when played back. Examine the grooves closely if there appears to be a shaded spiral effect across the blank, you can be sure that the vibrations have created a regular pattern of their own due to the wing screws being too loose at each corner of the base. Tighten them.

Consider the possibility that the cutting needle might have been loose.

After the customary trial of a new play-back needle, check the mounting of the play-back arm. It is held in place with a "Y" shaped hand that could lose its tension causing the arm to vibrate. It can be tightened by removing arm and spreading out fingers for more tension.

"Warble" effect can be caused if the original cutting was made too heavy and which might be reproduced satisfactorily with one type needle having a wide point, but another type needle having an extremely fine point will wobble around the bottom of the groove with incomplete, uneven registration.

SPEED REGULATION

The motor being of a constant speed synchronous type, operating at its rated frequency, should not vary. However, we must check the frequency marking as shown on the Motor Frame with the power line.

It is suggested that the speed of the motor be checked in the conventional manner by the use of a cardboard stroboscope disc using a gas illuminated electric light.

The correct speed with the play-back arm in place on the record is 78 R.P.M.

The speed of the motor when used in a district requiring a converter cannot be depended upon.

Irregularities of speed can be caused by excessive shavings wound around the motor spindle and rubber drive mechanism beneath the turntable.

LOW RESPONSE

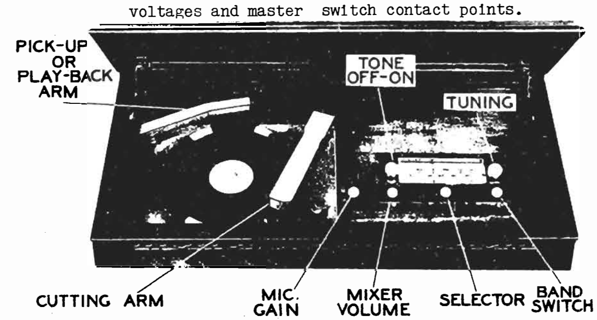
There is a conpensating resistor in the cutter circuit that will tend to make the play-back apparently to have a lower frequency response.

In recordings where the high frequencies seem to be missing, be sure to ascertain if the original recording was incorrectly made with the Tone Control in the "Bass" position.

Another reason for lack of "highs" is of course either a blunt play-back needle, or the ruination of the record during a previous play-back by a damaged needle that has trimmed the groove of its pattern for "highs".

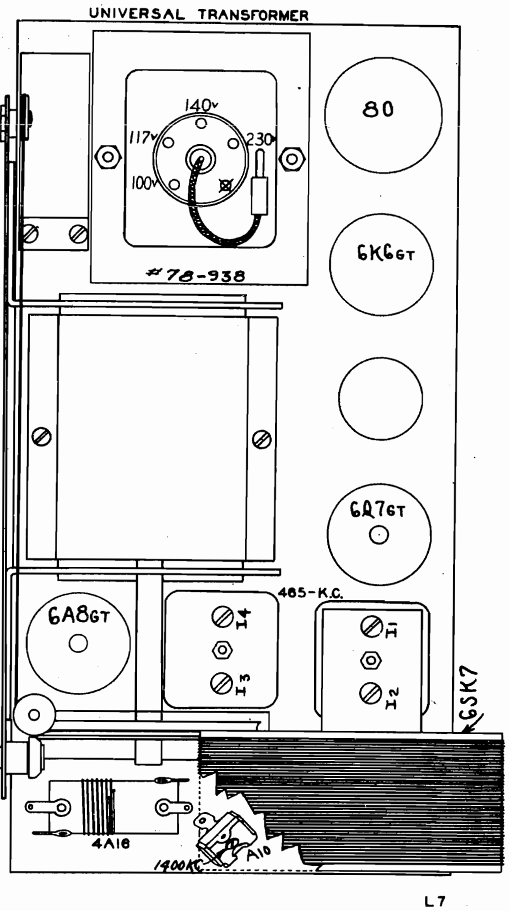
QUALITY RECORDINGS

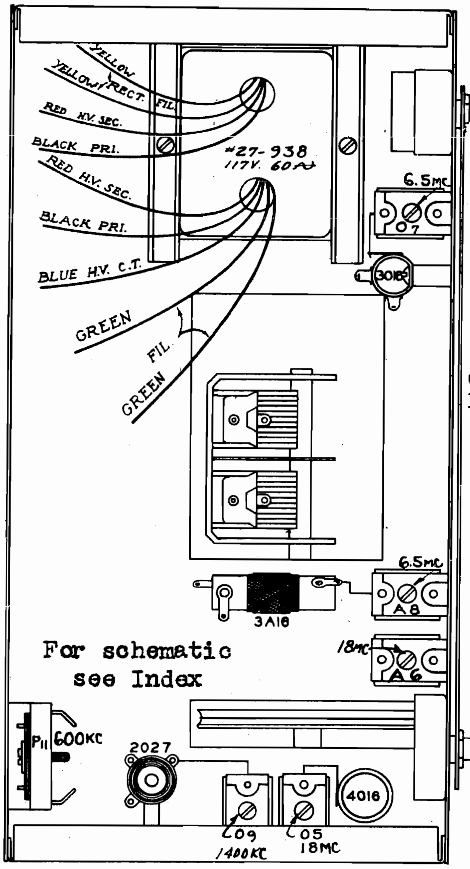
The elements effecting the cutting and reproducing of a blank have been outlined above. We are making no mention of the audio system of the radio since it is conventional and requires no special service attention other than the usual check of tubes, operating voltages and master switch contact points.



HOWARD RADIO CO.

MODEL 307
MODEL 307TP

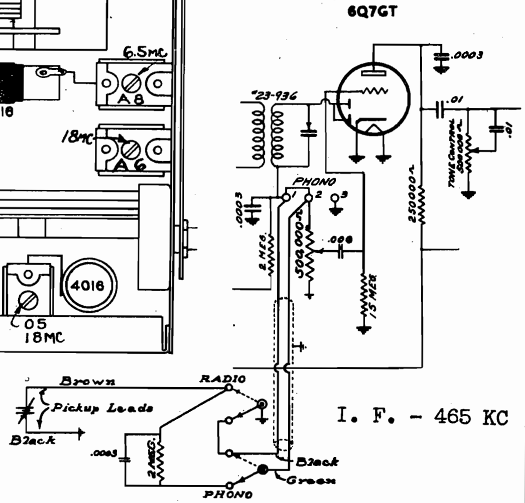




TUNING RANGES - 540 to 1700 KC, 2.2 to 7 MC, 7 to 22 MC, (555-175, 140-47, 47-13 Meters)
POWER OUTPUT - (MAX.) - 2.7 Watts; UPO 1.5 W.
ANTENNA SYSTEM = Connect Antenna to BROWN lead - Connect Ground to BLACK lead.
CONSUMPTION 50 WATTS Plus 15 Watts for TP Model.

Phono Circuit 307TP Only

Otherwise same as Model 307. See Index



I. F. - 465 KC

POWER SUPPLY - (Standard Models) = 105-125 V. 60 Cycles AC

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Signal Generator Frequency	Signal Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min.Cap.	465 KC	6A8 Grid	A	I1,I2,I3,I4	IF
SW	18 MC	18 MC	Brown lead	B,D,E	O5,A6	Osc. Ant.
Int.	6.5 MC	6.5 MC	Brown lead		O7,A8	Osc. Ant.
BC	1400 KC	1400 KC	Brown lead		O9,A10	Osc. Ant.
BC	600 KC	600 KC	Brown lead	C	P11	Osc. Pad.

NOTES

A - Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B - When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 18 MC, then a weaker image will be heard at 17,070 KC, in other words 930 KC less on the dial.
C - When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D - See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E - Check for oscillator cross-over between 18 and 22 MC. If necessary for stability, turn the antenna trimmer "IN" slightly.

SPEAKER = Electro-Dynamic SIZE = 6" V.C.IMP.(400CPS) = 4 Ohms FIELD = 1300 Ohms

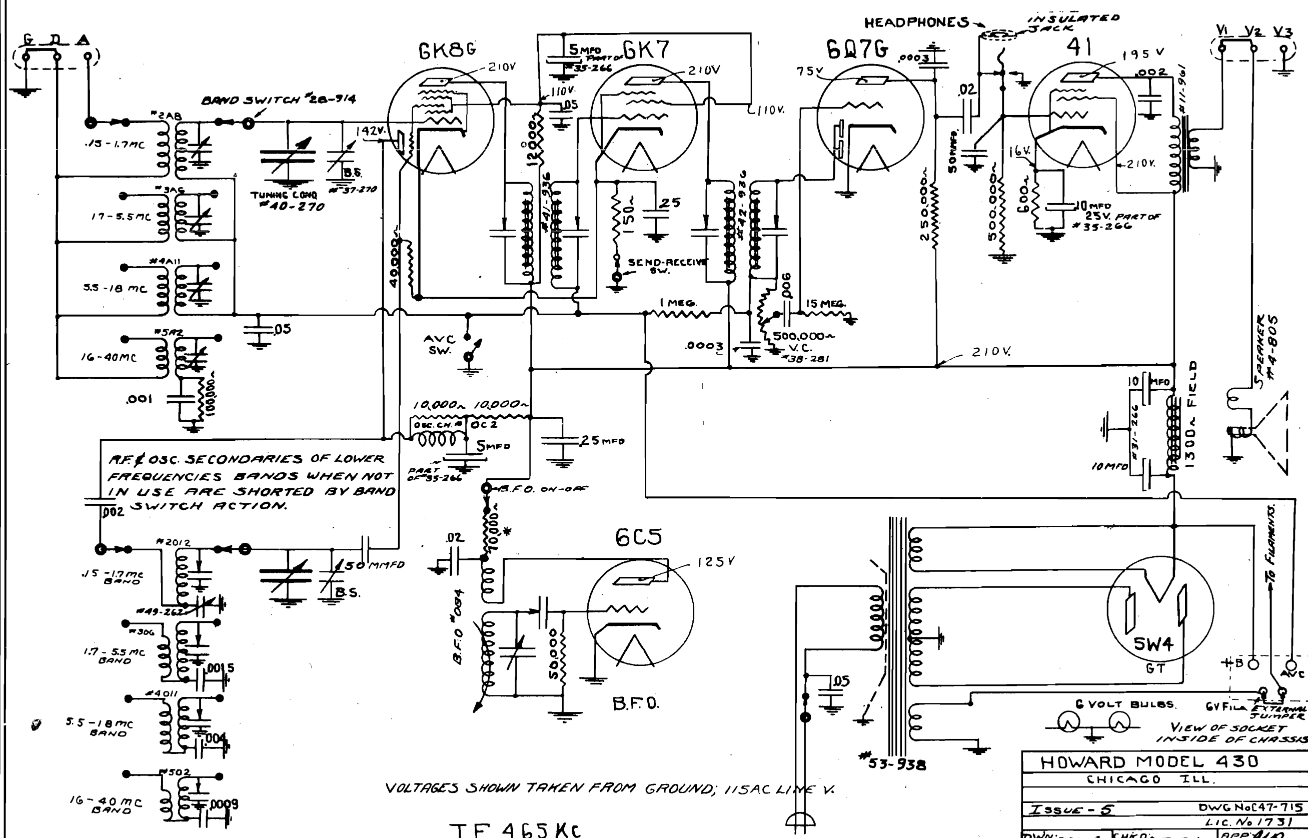
SOCKET VOLTAGE READINGS:

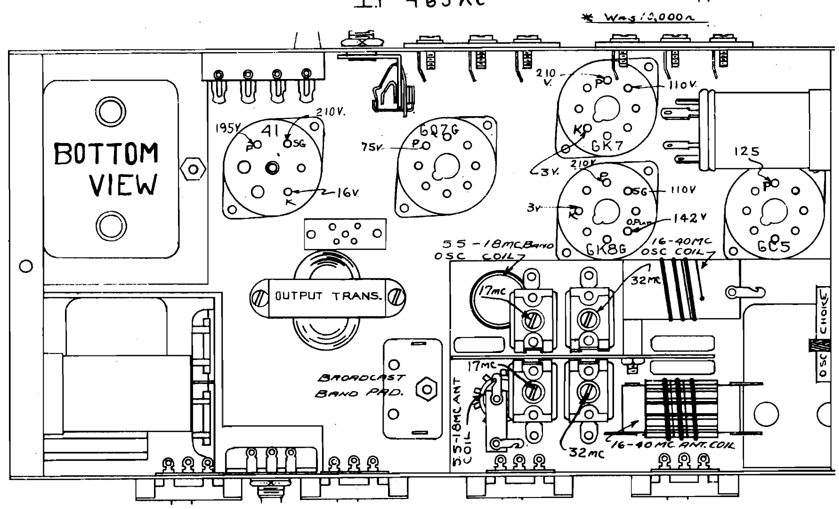
Voltage taken from ground with line voltage at - 117 AC.
High voltage reading off rectifier - 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter.

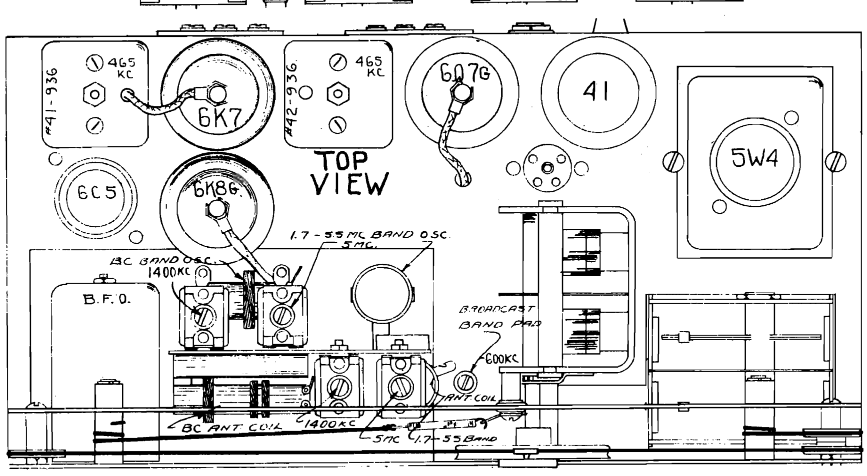
TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
6A8GT	Mixer	1.5	105	195	195
6SK7	IF	4.5	105	195	
6Q7GT	Det.			60	
6K6GT	Output	16	195	185	

MODEL 430

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.

HOWARD RADIO CO.

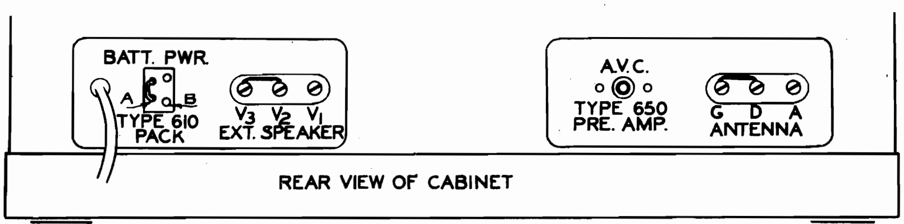
MODEL 435
MODEL 436
MODEL 437

MODELS—435-436-437 "PROGRESSIVE SERIES"

TYPE 3-820 EXTERNAL SPEAKER is designed especially for use with Howard Communications Receivers. The input impedance is of the correct value to perfectly match the output transformer of Models 435, 436, 437, and 460. The speaker unit consists of a heavy duty high efficiency permanent magnet, 8" dynamic speaker mounted in an acoustically treated (felt lined) welded steel cabinet finished in fine suede wrinkle, supplied with a 5 ft. spade terminal cable.

TYPE 610 "B" POWER PACK. For conversion of 6 Volts d.c. to 300 Volts d.c. for operation of Howard Models 435, 436, and 437 Communications Receivers from 6 Volt Storage Battery, the Type 610 Power Pack is a convenient and practical converter. A four prong plug fits the socket on Model 435, 436, and 437 Receivers, carrying both A and B power to the set. Only two connections from the Power Pack to the storage battery are required. Ample length of cable is provided. Battery current drawn for Model 435 is 6.6 amps; for Model 436 is 6.9 amps; and Model 437 is 7.75 amps. ON and OFF Switch on Power Unit.

(NOTE:- The Progressive Series 435, 436, 437, is based on the Model 435 receiver. The 436 is the 435 circuit with the addition of the noise silencer and additional features. The progressive additions to the original 435 circuit may include: 605 Carrier Level Meter, 3-820 External Speaker, 650 Pre-Selector, 660 Frequency Monitor, 655 Loop Kit, and 610 Power Pack. For data on these, SEE INDEX).



EXTERNAL CONNECTIONS

As we face the back of the receiver, the first terminal strip at the right coded G, D, A are the Antenna and Ground connections. For the conventional type of flat.top antenna systems leave the shorting wire between "G" and "D" and connect Antenna to "A". Connect ground to "G".

If a doublet antenna is used, remove the jumper between G and D and attach doublet wires to D and A and a ground to "G".

We have found it inadvisable to recommend a definite length of antenna due to variable conditions. We do, however, suggest that you refer to the recommendations as given in the A. R. R. L. Antenna handbook.

The single terminal next to the antenna-ground strip is coded for use with the Howard Model 650 Pre-Amplifier,

The three screw terminals coded V3, V2, and V1, of which V3 and V2 must be shorted when using the built-in speaker, can be adapted for the use of the Howard external speaker No. 3-820, by removing the shorting wire and connecting leads from the external permanent dynamic speaker to lugs V3 and V1.

The socket coded for use with the Howard 610 Power Pack must have the jumper in place between the two socket terminals as shown in the diagram below. See description of this Model 610, 6 Volt Power Supply.

ADAPTATION FOR BATTERY SUPPLY

When it is desired to use "A" and "B" batteries when the Howard 610 Power Pack is not available, connect as follows:

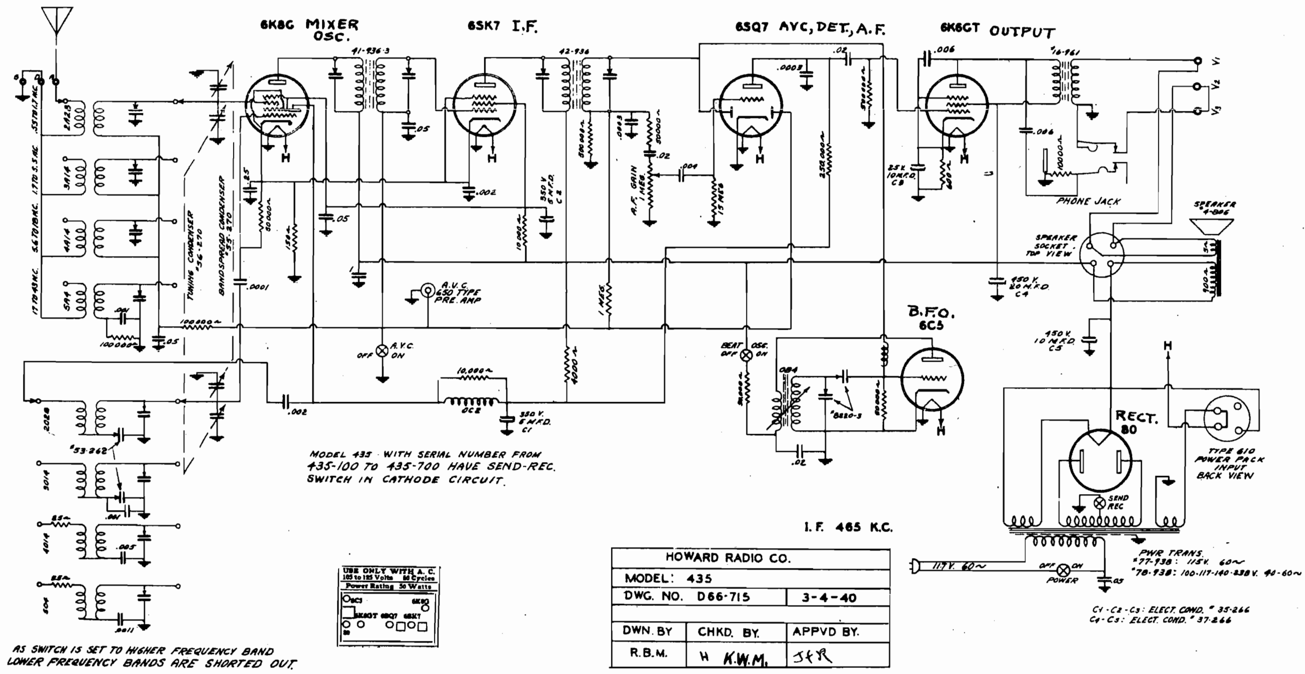
Remove the jumper from the battery power socket. Connect "B +" 250 Volts to terminal marked "B +" in diagram. Connect one side of the 6 Volt "A" supply to terminal marked "A". Connect the other side of the "A" supply and "B -" to the chassis ground terminal.

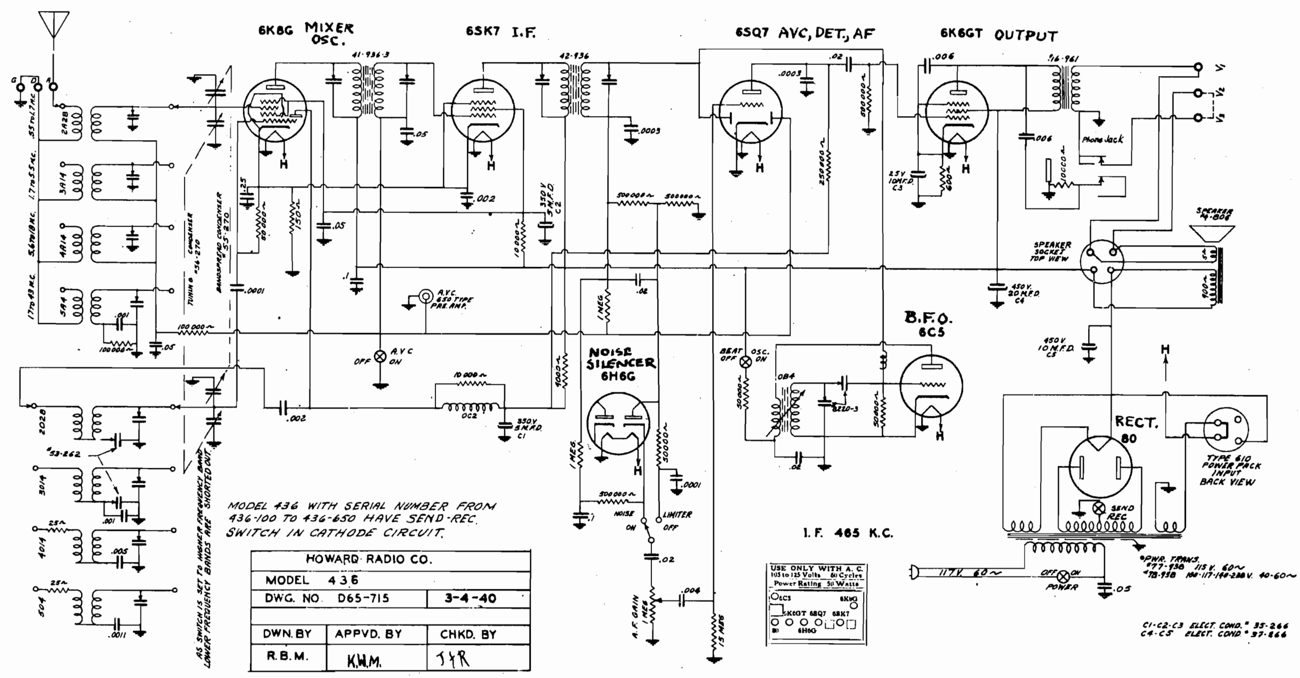
The "B" current required for Models 435 and 436 is 60 Mills. The "A" current requirement is 2.9 Amps. This includes the 605 Carrier Level Meter.

The "B" current required for Model 437 is 82 Mills. The "A" current requirement is 3.5 Amps, allowing for the 605 Carrier Level Meter.

MODEL 435
MODEL 436

HOWARD RADIO CO.





The following are the Engineering Specifications for Model 435,436.

POWER CONSUMPTION. . . . . .50 Watts, 105-125 Volts, A.C. 60 Cycle

INTERMEDIATE FREQUENCY . . . . .465 KC

FREQUENCY RANGE - Divided into four bands as follows:

.55 to 1.7 mc (545-176 meters)
1.7 to 5.6 mc (176-54 meters)
5.6 to 18 mc (54-16.6 meters)
17 to 43 mc (17-7 meters)

SPEAKER SYSTEM

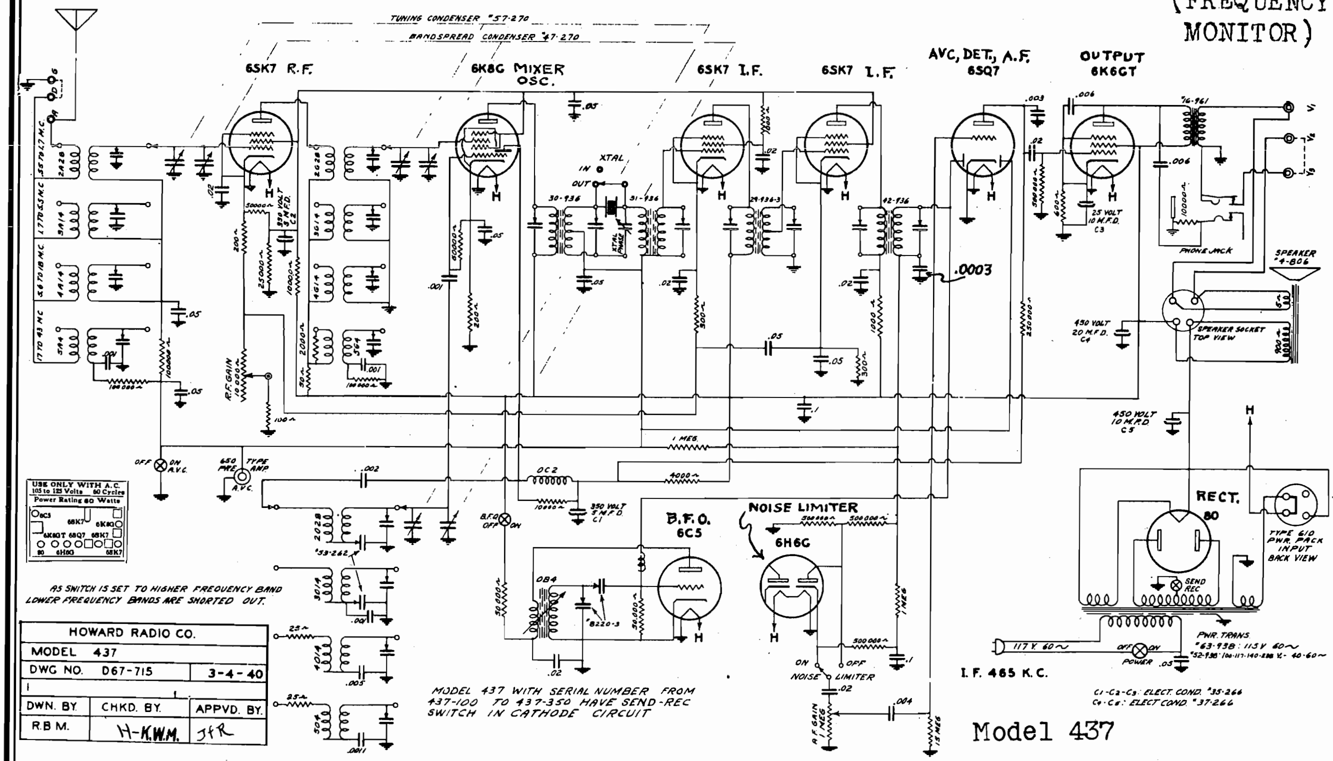
Built-in 6½" Electro Dynamic
Connections provided for External
Speaker (Howard Type 3-820)

POWER OUTPUT

Type. . . . . .Single 6K6G
Maximum . . . . 2½ Watts

HOWARD RADIO CO.

MODEL 437
MODEL 660
(FREQUENCY
MONITOR)



Model 437

FREQUENCY RANGE - Divided into four bands as follows:

.55 to 1.7 mc (545-176 meters)
1.7 to 5.6 mc (176-54 meters)
5.6 to 18 mc (54-16.6 meters)
17 to 43 mc (17-7. meters)

POWER CONSUMPTION. . . . . .60 Watts, 105-125 Volts, A.C. 60 Cycle

INTERMEDIATE FREQUENCY . . . . .465 KC

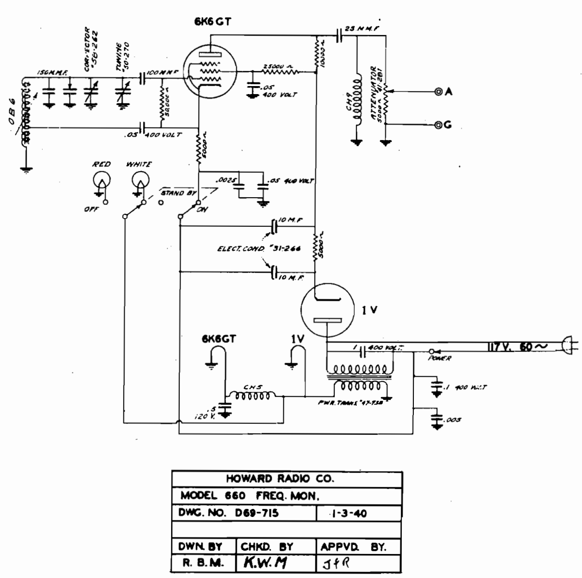
SPEAKER SYSTEM

Built-in 6½" Electro Dynamic
Connections provided for External
Speaker (Howard Type 3-820)

POWER OUTPUT

Type. . . . . .Single 6K6G
Maximum . . . . .4 Watts

TYPE 660 FREQUENCY MONITOR



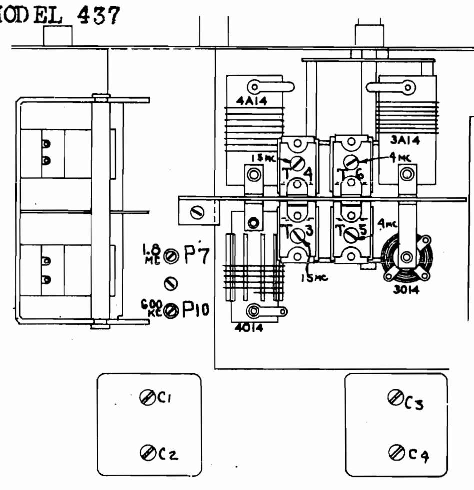
The Howard Frequency Monitor Model 660 consists of a highly stabilized oscillator covering the fundamental frequency range of 850 to 1030 kilocycles, harmonics of which are used as reference or measurement points on the higher bands. The R. F. Output of this oscillator is loosely coupled to the antenna circuit of the receiver, and the voltage applied to the receiver is controlled by a variable resistance attenuator.

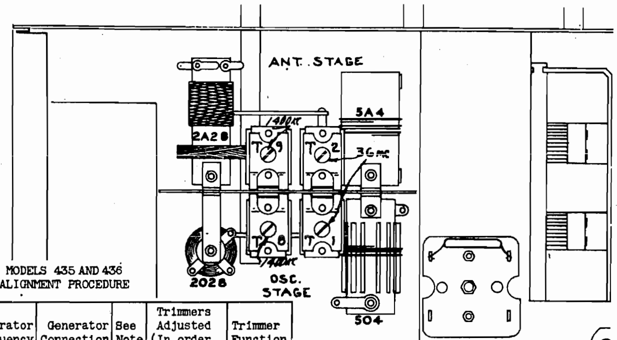
The Oscillator is tuned by a precision ceramic insulated variable condenser carrying an extremely accurate frequency scale covering the 10, 20, 40, 80 and 160 meter amateur bands as well as the fundamental range. The range is so selected that harmonics cover the entire length of all amateur bands, and these are calibrated so that frequency can be read within one kilocycle on the lower frequency bands and five kilocycles on the highest band.

The Power Supply for this unit is self-contained, and is for use on 105-125 Volts, A.C. 40-60 Cycle. Available at other voltages and frequencies on special order.

MODEL 435
MODEL 436
MODEL 437

HOWARD RADIO CO.





MODELS 435 AND 436
ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
1.7-.55	.55	465 KC	Mixer Grid	1	C1,C2,C3,C4	IF
43-17	36	36 MC	A and DG	2	T1,T2	Osc,Ant.
18-5.6	15	15 MC	A and DG	3	T3,T4	Osc,Ant.
5.5-1.7	4	4 MC	A and DG	3	T5,T6	Osc,Ant.
5.5-1.7	1.8	1.8 MC	A and DG	4	P7	Osc.Pad.
1.7-.55	1.4	1400 KC	A and DG		T8,T9	Osc,Ant.
1.7-.55	.60	600 KC	A and DG	4	P10	Osc.Pad.

The alignment is made with the BFO Off, the AVC Off, and the Band Spread set to 100.

The main dial hand must stop EXACTLY ON the last line at the end of the scale when the condenser is fully closed without force on the tuning control.

There should be an overload effect on powerful broadcast stations when the AVC is OFF.

NOTE 1: After the alignment of the I.F. stages is completed, align the BFO system as follows:

1. Set pitch control 3 turns back from the "IN" position and turn on the BFO Switch.
2. Adjust the trimmer in the BFO can to obtain maximum sound which will be a hissing noise. Turn tuning knob to be sure this sound is not some tunable frequency that is causing it.
3. Check beats against some broadcast station to determine if the strength of the beat is normal.

NOTE 2: In this band (17 to 43 MC) only the oscillator follows the received signal 465 KC lower in frequency. Therefore when checking for the image, if the alignment has been made at 36 MC, it will be found at about 37 MC. This will determine if the alignment was correctly made at 36 MC.

NOTE 3: Check for image on all bands except the 17 to 43 MC band at a point 930 KC lower on the dial.

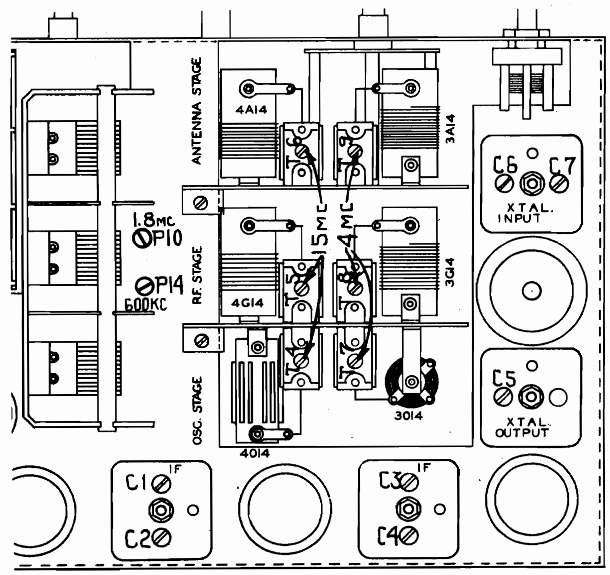
NOTE 4: Rock main dial slightly for point of maximum signal as the padding condenser is being adjusted.

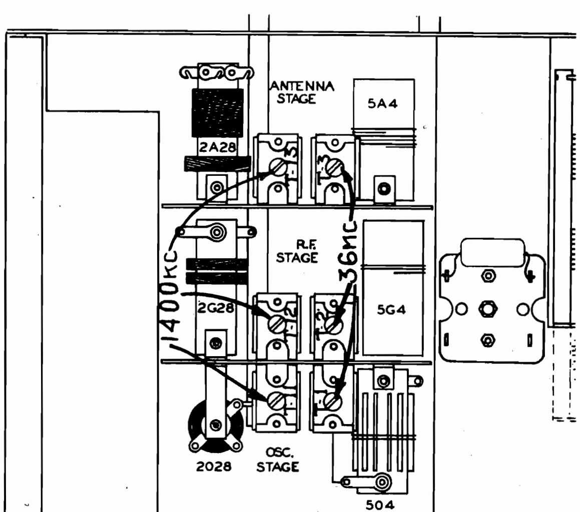
MODELS 435 AND 436
SOCKET VOLTAGES

TUBE	FUNC-TION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
6K8G	Mixer	3	100	195	170
6SK7	I.F.Amp.	3	100	195	
6SQ7	Det.			70	

TUBE	FUNC-TION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
6C5	BFO			70	
6K6GT	Output	14	195	180	
80	Rect.	High Voltage = 250 V.			
	Drop across field = 55 V.				

Readings from ground with 1000 Ohm per V. Meter
Line Voltage 117 V.
Main Filament Voltage 6.2 V.
Rectifier filament Voltage 4.9 V.





MODEL 437
SOCKET VOLTAGES

TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
6SK7	RF	3	92	240	
6K8G	Mixer	3	92	240	
6SK7	I.F.Amp	3	92	240	200
6SK7	I.F.Amp	3	92	233	

TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
6SQ7	Det.			70	
6K6GT	Output	17½	240	223	
6C5	BFO			75	
80	Rect.	High Voltage = 313V.			
	Drop across Spkr. Field = 73 V.				

R.F. Gain Full On
Readings from ground with 1000 Ohm per V. Meter
Line Voltage 117 V.
Main Filament Voltage 6.2 V.
Rectifier Filament Voltage 5 V.

MODEL 437
ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
1.7-.55	.55	465 KC	Mixer Grid	1	C1,C2,C3,C4	IF
43-17	36	36 MC	A and DG	2	T1,T2,T3	Osc,RF,Ant.
18-5.6	15	15 MC	A and DG	3	T4,T5,T6	Osc,RF,Ant.
5.5-1.7	4	4 MC	A and DG	3	T7,T8,T9	Osc,RF,Ant.
5.5-1.7	1.8	1.8 MC	A and DG	4	P10	Osc, Pad.
1.7-.55	1.4	1400 KC	A and DG		T11,T12,T13	Osc,RF,Ant.
1.7-.55	.60	600 KC	A and DG	4	P14	Osc, Pad.

The alignment is made with the BFO Off, the AVC Off, and the Band Spread set to 100.

The main dial hand must stop EXACTLY ON the last line at the end of the scale when the condenser is fully closed without force on the tuning control.

There should be an overload effect on powerful broadcast stations when the AVC is OFF.

NOTE 1: After the alignment of the I.F. stages is completed, align the BFO system as follows:

1. Set pitch control 3 turns back from the "IN" position and turn on the BFO Switch.
2. Adjust the trimmer in the BFO can to obtain maximum sound which will be a hissing noise. Turn tuning knob to be sure this sound is not some tunable frequency that is causing it.
3. Check beats against some broadcast station to determine if the strength of the beat is normal.

NOTE 2: In this band (17 to 43 MC) only the oscillator follows the received signal 465 KC lower in frequency. Therefore, when checking for the image, if the alignment has been made at 36 MC, it will be found at about 37 MC. This will determine if the alignment was correctly made at 36 MC.

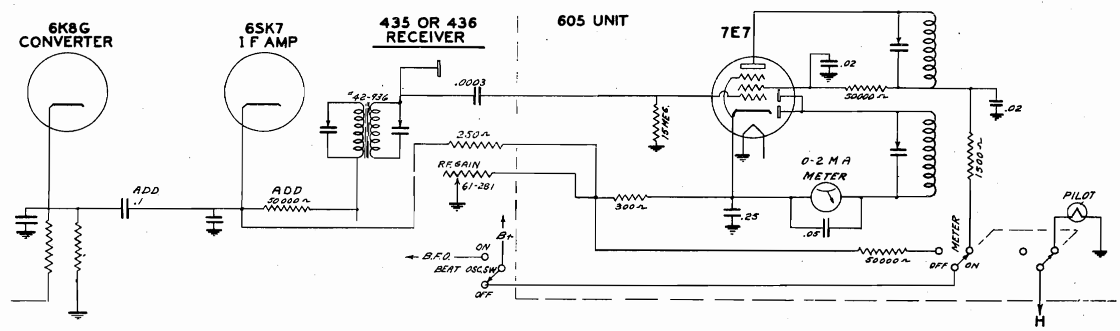
NOTE 3: Check for image on all bands except the 17 to 43 MC band at a point 930 KC lower on the dial.

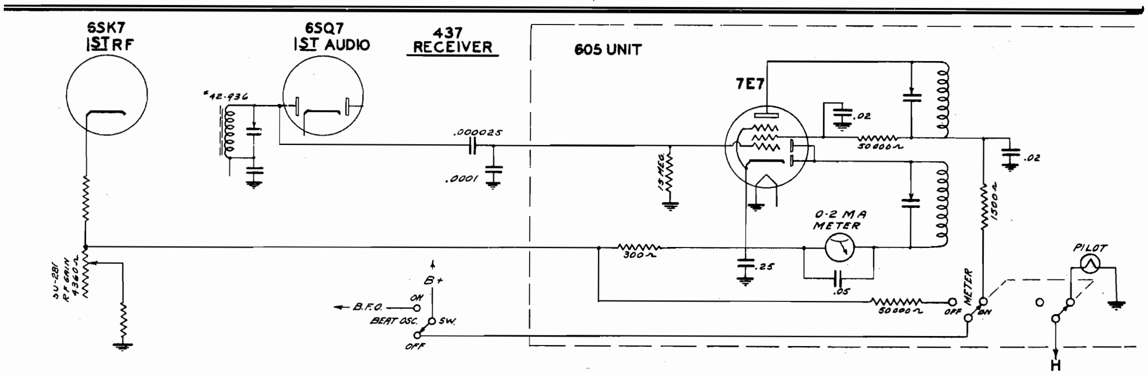
NOTE 4: Rock main dial slightly for point of maximum signal as the padding condenser is being adjusted.

HOWARD RADIO CO.

MODEL 435
MODEL 436
MODEL 437

TYPE 605 CARRIER LEVEL METER ADAPTABLE TO MODELS 435, 436, 437





THE HOWARD CARRIER LEVEL METER gives an indication of the strength of the signal carrier in microvolts as delivered at the receiver.

MODEL 605		
DWG. NO. 68-715		3-1-40
DWN BY	CHCKD BY	APPVD BY
RBM	K.W.M.	J.H.R.

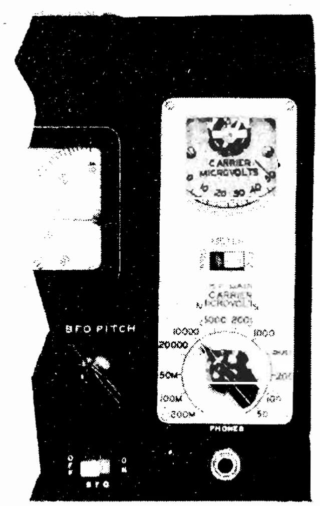
The meter scale is calibrated from 0 to 50. When the meter set control (R. F. Gain) located directly below meter, is set exactly on the 50 division, the reading on the meter will be the actual microvolts delivered to the receiver.

Before using the carrier level meter, tune the signal to exact resonance with the meter switch in the OFF position, and adjust the R. F. GAIN CONTROL to a point where the signal is just audible. This will not throw the meter off scale when the meter switch is thrown to the ON position. Follow instructions given below.

The AVC Switch must be ON.
The Meter Switch must be ON.
The BFO Switch must be OFF.

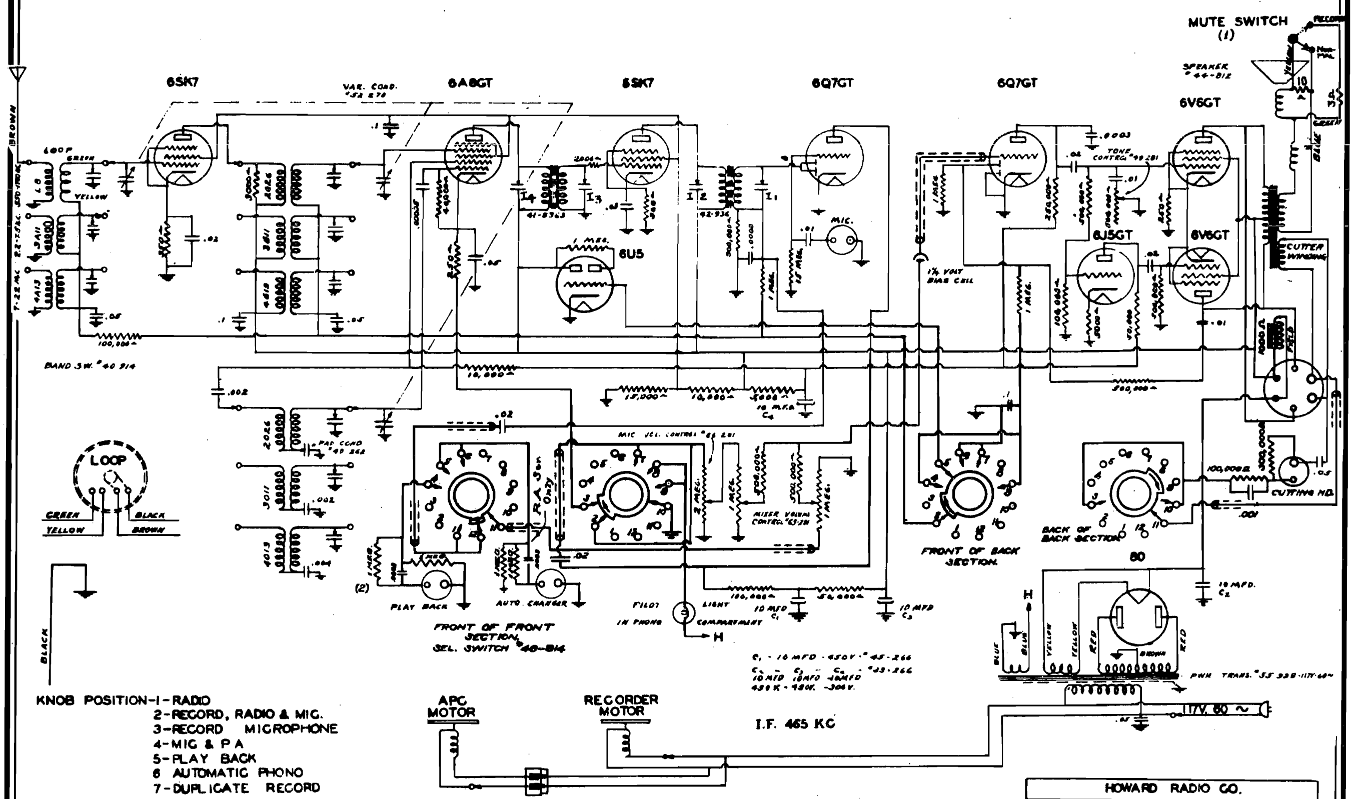
To avoid the possibility of introduced error, the BFO Switch is so connected that the meter is not in the circuit when the BFO Switch is in the ON position. Therefore the meter can be used only when the BFO Switch is in the OFF position.

The maximum deflection of meter pointer is the true indication of resonance in tuning. With a strong signal the meter will naturally be thrown off scale until the R. F. Control is rotated counter-clockwise. A point will be reached during this rotation where the meter hand is at 50. Then the input value in microvolts is read direct at the position of the pointer knob. For better accuracy this reading is multiplied by a correction factor as given on a separate chart to cover the various bands calibrated for each receiver.



MODELS 568R, 568RA Late

HOWARD RADIO CO.



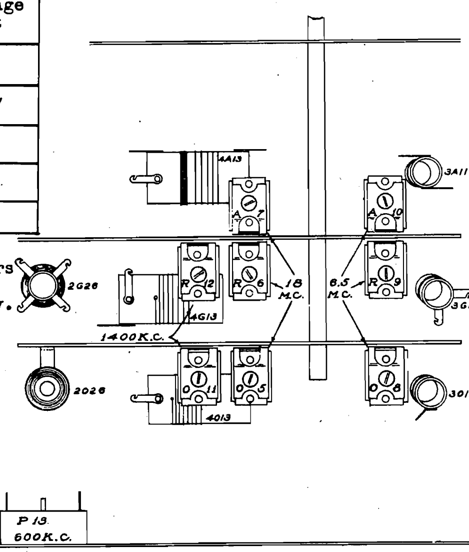
HOWARD RADIO CO.		
MODEL 568 R(RA)		
DWG. NO. C73-715		
DWN. BY.	CHCKD. BY.	APPVD. BY

(1) Mute Switch Added 6-1-40
(2) Matching Circuit

FOR OTHER DATA, SEE INDEX

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Signal Generator Frequency	Signal Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function	Check for Image at
BC	Min.Cap.	465 KC	Grid of 6A8GT	A,D	I_1, I_2, I_3, I_4	IF	
SW	18 MC	18 MC	Ant.Brown lead	B,E	O_5, R_6, A_7	Osc.RF.Ant.	17
PB	6.5 MC	6.5 MC	Ant.Brown lead		O_8, R_9, A_{10}	Osc.RF.Ant.	
BC	1400 KC	1400 KC	Ant.Brown lead		O_{11}, R_{12}	Osc.RF	
BC	600 KC	600 KC	Ant.Brown lead	C	P_{13}	Osc.Pad.	



A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 18 MC, then a weaker image will be heard at 17,070 KC, in other words 930 KC less on the dial.
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E- Check for oscillator cross-over between 18 and 22 MC. If necessary for stability, turn the mixer trimmer "IN" slightly.

SOCKET VOLTAGE READINGS:

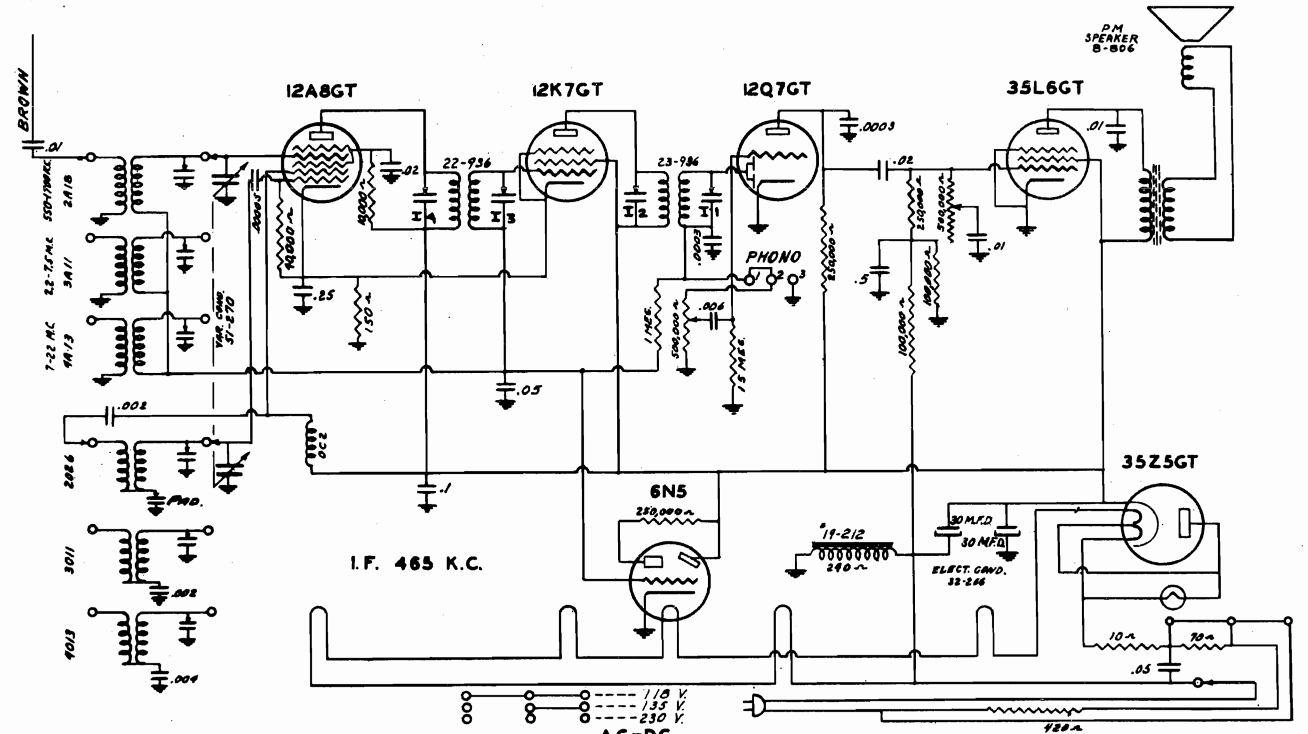
Voltage taken from ground with line voltage at - 117 V.
High voltage reading off rectifier = 340 V.
Drop across speaker field = 95 V.
Voltage taken with 1,000 Ohm per volt meter.

TUBE	FUNCTION	CATHODE	SCR. GRID	PLATE	OSC. PLATE	TUBE	FUNCTION	CATHODE	SCR. GRID	PLATE	OSC. PLATE
6SK7	RF	2½	100	245		6J5GT	Inverter	7		125	
6A8GT	Mixer	3½	100	245	140	6V6GT	Output	16	245	240	
6SK7	I.F.Amp.	3½	100	245		6V6GT	Output	16	245	240	
6Q7GT	Diode & Mic.Gain			80		6U5	Tuning & level cont.				
6Q7GT	Audio			70		80	Rect.				

CONSUMPTION - Receiver, 90 WATTS;
POWER SUPPLY - (Standard Models)
= 105-125 V. 60 Cycles
Changer, 30 WATTS. Recorder, 30 WATTS;
I.F. = 465 KC TYPE = Iron Core
POWER OUTPUT - (MAX.)
= 11 Watts; UPO = 8 Watts
TUNING RANGES = 540 to 1700 KC,
2.2 to 7.5 MC and 7 to 22 MC.
M O D E L - 568-R
10 tube console Recorder
568-RA
Recorder with Automatic Record Changer

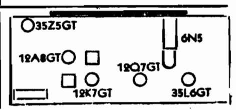
HOWARD RADIO CO.

MODEL 585



FOR ALTERNATING OR DIRECT CURRENT, VERIFY LINE VOLTAGE AND ARRANGE VOLTAGE TAPS.

LINE VOLTAGE	TOP REAR VIEW OF TERMINALS	TUBE LOCATION
105 to 120		
120 to 150		
210 to 250	NO CONNECTIONS	



POWER SUPPLY - (Standard Models) = AC-DC 3 Range 118V, 135V, 230V.

CONSUMPTION 25-50 WATTS

POWER OUTPUT - (MAX.) = 2.7W. upo 1.3

SPEAKER = Permanent Magnet SIZE = 6½"

V.C.IMP. (400CPS) = 4 Ohms

Tubes:

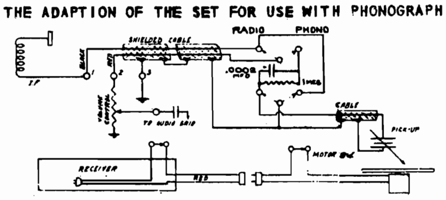
12A8GT Converter
12K7GT I F Amp.
12Q7GT Det. - Audio
35L6GT Output
6N5 Tuning Eye
35Z5GT Rectifier

SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at - 117 AC.
High voltage reading off rectifier = 107 V.
Drop across speaker field - x
Voltage taken with 1,000 Ohm per volt meter

TUBE	FUNCTION	CATH ODE.	SCR. GRID	PLATE
12A8 gt	Mixer	3	72	105 OR105
12K7 gt	IF	3	105	105
12Q7 gt	Det.	x	x	85
35L6 gt	Output		105	105

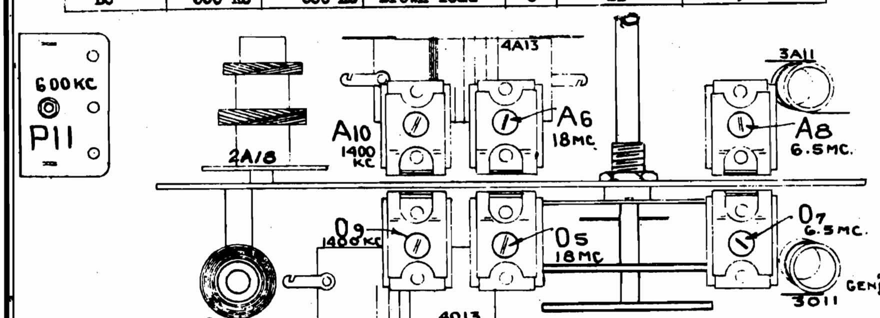
THE ADAPTION OF THE SET FOR USE WITH PHONOGRAPH



HOWARD RADIO CO.		
MODEL: 585		
DWG. NO. D60-715		9-18-39.
DWN. BY.	CHKD. BY.	APPVD. BY.
R.B.M.	H	

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Min. Cap.	465 KC	6A8 Grid	A,E	I_1 I_2 I_3 I_4	IF
SW	18 MC	18 MC	Brown lead	B,D	O_5, A_6	Osc., Ant.
PB	6.5 MC	6.5 MC	Brown lead		O_7 A_8	Osc., Ant.
BC	1400 KC	1400 MC	Brown lead		O_9 A_{10}	Osc., Ant.
BC	600 KC	600 KC	Brown lead	C	P_{11}	Osc., Pad.



NOTES

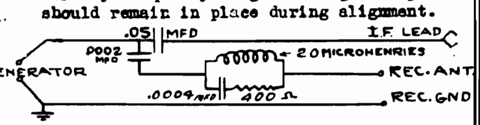
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

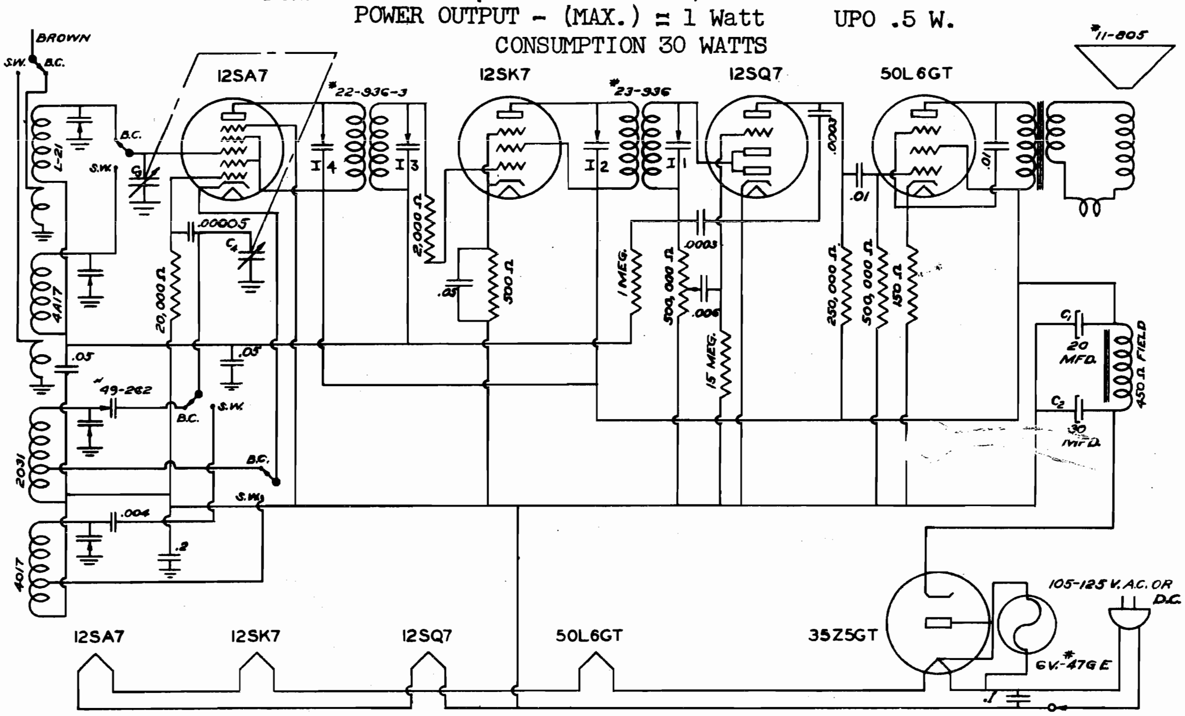
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



MODEL 702

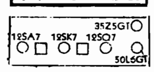
HOWARD RADIO CO.

POWER SUPPLY - (Standard Models) = 105-125 V. AC-DC
POWER OUTPUT - (MAX.) = 1 Watt UPO .5 W.
CONSUMPTION 30 WATTS



C_1 C_2-20, 30 MFD.-150, 150 V.-NO. 47-266.
C_3 C_4-VARIABLE CONDENSER-NO. 63-270.
VOLUME CONTROL AND SWITCH-NO. 69-281

I. F.-465 K.C.



V.C.IMP.(400CPS) = 5 Ohms | FIELD =450 Ohms
SPEAKER = Electro-dynamic
SIZE = 5"

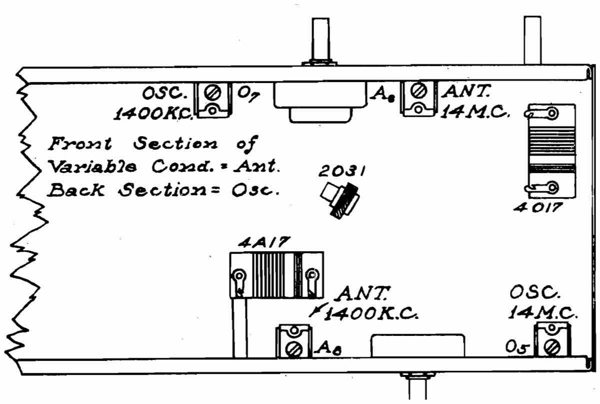
HOWARD RADIO CO.		
MODEL 702		
D78-715		4-5-40
DWN. BY.	CHKD. BY	APPVD. BY

TUNING RANGES = 540 to 1720 KC and 4.6 to 16 MC (178-550 and 18-65 Meters)

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Signal Generator Frequency	Signal Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function	Check for Image at
KC	540	456	Grid of 12SA7	A	I_1, I_2, I_3, I_4	IF	
MC	14 MC	14 MC	Ant. (Brown)	B	$0_5, A_6$	Osc. Ant.	13 MC
KC	14 KC	14 KC	Ant. (Brown)		$0_7, A_8$	Osc. Ant.	

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 14 MC, then a weaker image will be heard at 13,070 KC, in other words 930 KC less on the dial.
The tubes are connected in series in the order as shown by the schematic diagram.
The dual section filter condenser has a common negative, but note that it does not return to ground as the can is insulated from the chassis.



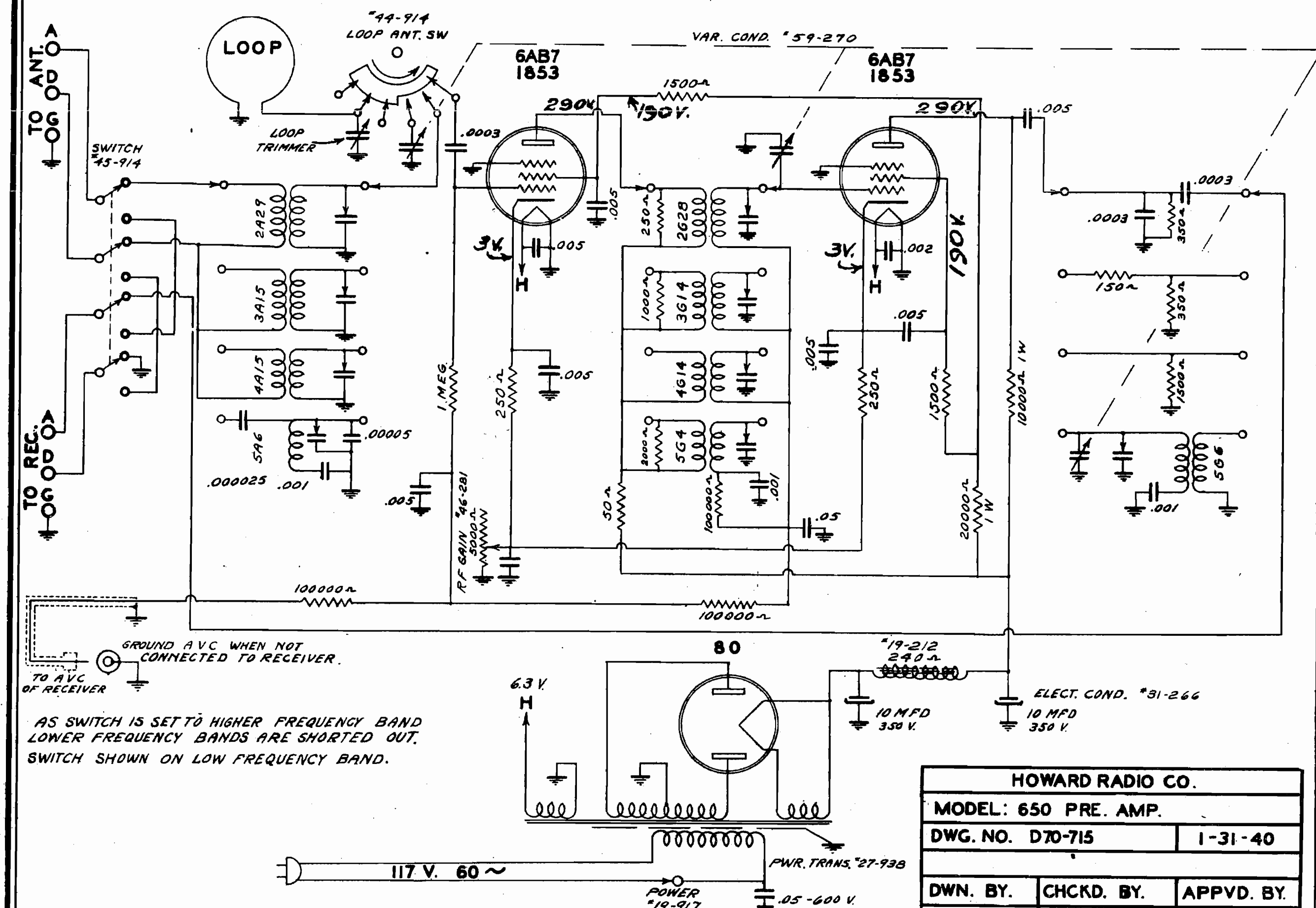
SOCKET VOLTAGE READINGS:

TUBE	FUNCTION	CATHODE	SCR. GRID	PLATE	OSC. PLATE
12SA7	Mixer		95	95	95
12SK7	I.F. Amp.	3.5	95	95	
12SQ7	Det.			45	
50L6GT	Output	6	9	82	

Voltage taken from ground with line voltage at - 117 V. AC.
High voltage reading off rectifier = 115 V.
Drop across speaker field = 20 V.
Voltage taken with 1,000 Ohm per volt meter, from cathode return to points as given.

HOWARD RADIO CO.

MODEL 650 Pre.Amp.
MODEL 655
LOOP KIT



Available at other voltages and frequencies.

The Howard Type 650 Pre-Amplifier is designed to be used with ANY RECEIVER and covers a frequency range of .55 mc. to 43 mc. The Pre-Amplifier is constructed for the use with an antenna having either single wire or doublet lead-in or the Howard Type 655 Loop Antenna Kit.

The use of the Loop Kit, Type 655, with this Pre-Amplifier will be indispensable in separating interfering signals and reducing certain noise conditions.

The Antenna-Loop Switch provides a convenient shift from either the loop or an external antenna system.

This unit is coupled at the back to the regular receiver without changing the receiver in any way.

The "IN-OUT" Switch allows the unit to be switched out of the input system allowing the regular antenna to be coupled direct to the receiver.

TYPE 655 LOOP KIT

The Kit consists of four separate loops having band coverage as follows:

NO. OF LOOP	COVERAGE
L14	1700 KC to 550 KC
L13	5.6 MC to 1.7 MC
L12	18 MC to 5.6 MC
L11	34 MC to 22 MC

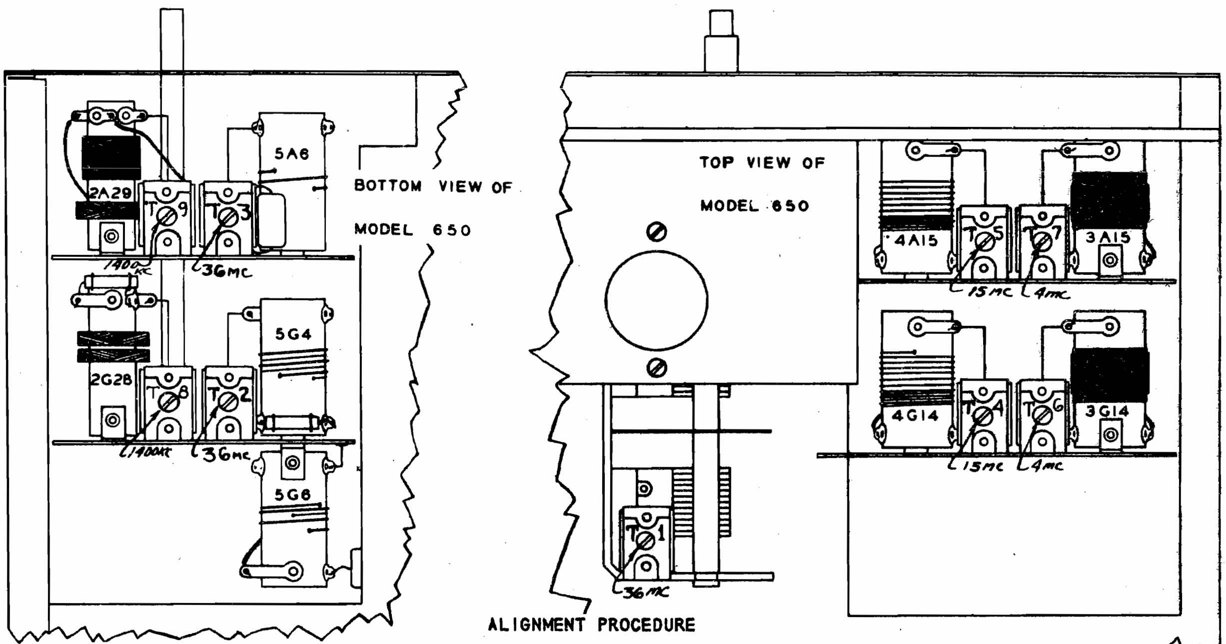
The Pre-Amplifier has a special switch position for the 30 MC LOOP (L11). When the switch is on this position, the Loop Trimmer is connected directly to the Loop, and the main variable condenser disconnected from the Loop. This is done to secure a loop of more effective height on the 30 MC BAND.

When using loops covering the three lower frequency ranges and with switch at Loop, the Loop Trimmer is used to bring the Loop into exact resonance with the incoming signal to secure greater loop performance. The High Frequency end range of the three lower frequency loops can be extended by having loop switch on 30 MC LOOP. In this position the Loop Trimmer will cover the following ranges:

L14 1400-1990 KC L13 4.4-6 MC L12 15.5-22 MC

MODEL 650 Pre.Amp.
MODEL 660 Freq. Mon.

HOWARD RADIO CO.



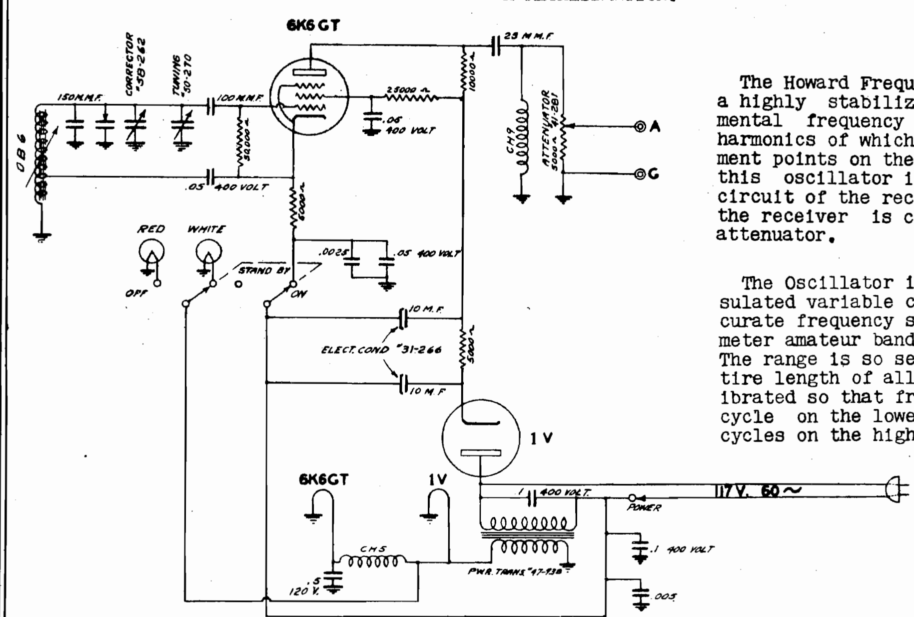
ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
43-17	36	36 MC	A and DG	5	T1,T2,T3	RF,RF,Ant.
18-5.6	15	15 MC	A and DG		T4,T5	RF,Ant.
5.5-1.7	4	4 MC	A and DG		T6,T7	RF,Ant.
1.7-.55	1.4	1400 KC	A and DG		T8,T9	RF,Ant.

NOTE 5: Align regular receiver first.
Set "Ant. Loop" to "Ant." position.

DUE TO THE CRITICAL ADJUSTMENTS THAT ARE REQUIRED WITH THE FREQUENCY MONITOR, MODEL 660, WE DO NOT ADVISE THAT ANY ATTEMPT BE MADE TO CALIBRATE THIS UNIT; WE THEREFORE SUGGEST IF IT HAS BEEN DETERMINED THAT THE UNIT IS OFF CALIBRATION, IT SHOULD BE SENT BACK TO THE FACTORY FOR A RECALIBRATION.

TYPE 660 FREQUENCY MONITOR



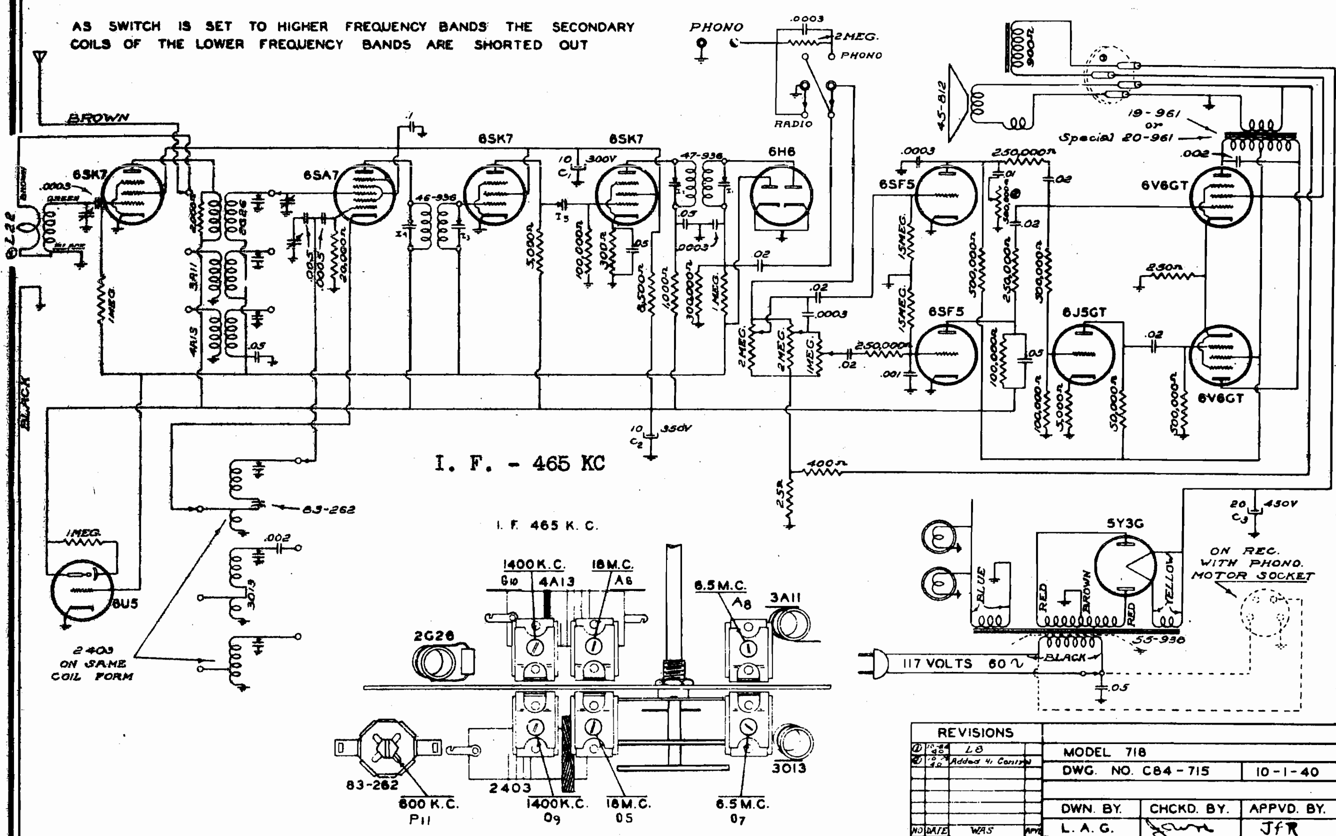
The Howard Frequency Monitor Model 660 consists of a highly stabilized oscillator covering the fundamental frequency range of 850 to 1030 kilocycles, harmonics of which are used as reference or measurement points on the higher bands. The R. F, Output of this oscillator is loosely coupled to the antenna circuit of the receiver, and the voltage applied to the receiver is controlled by a variable resistance attenuator.

The Oscillator is tuned by a precision ceramic insulated variable condenser carrying an extremely accurate frequency scale covering the 10,20,40,80 and 160 meter amateur bands as well as the fundamental range. The range is so selected that harmonics cover the entire length of all amateur bands, and these are calibrated so that frequency can be read within one kilocycle on the lower frequency bands and five kilocycles on the highest band.

HOWARD RADIO CO.		
MODEL 660 FREQ. MON.		
DWG. NO. D69-715		1-3-40
DWN. BY	CHKD. BY	APPVD. BY.
R. B. M.	K.W.M	J.F.R

HOWARD RADIO CO.

MODEL 718



CONSUMPTION: CHASSIS -- 105 W.
CHANGER -- 30 W.

VOICE COIL - 8 OHMS | FIELD - 900 OHMS

ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Con-nection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
BC	Max.Cap.	465 KC	Converter	A,E	I_1, I_2, I_3, I_4	IF
7-22	18	18 MC	Ant. Lead	B,D	$0_5, A_6$	Osc.,Ant.
2.2-7	6.5	6.5 MC	Ant. Lead		$0_7, A_8$	Osc.,Ant.
BC	1400	1400 KC	Ant. Lead		$0_9, G_{10}$	Osc., RF
BC	600	600 KC	Ant. Lead	C	P_{11}	Osc.,Pad.

A - Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B - When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C - When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D - See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E - The Interstage resistance coupled I.F. stage is coupled by a trimmer. Adjust to maximum capacity for Maximum gain.

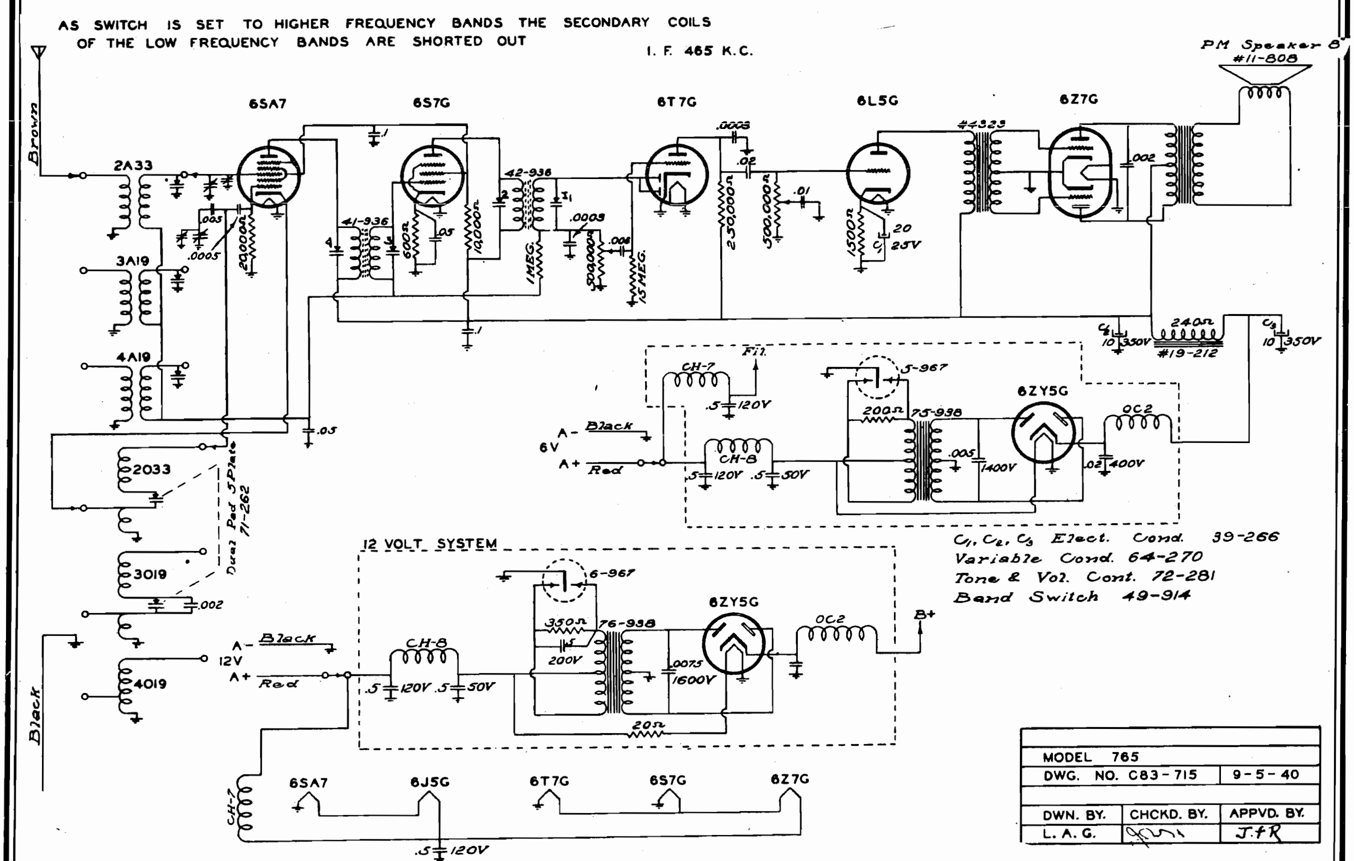
Voltage taken from ground with line voltage at - 115 V.Ac.
High voltage reading off rectifier - 320 V.
Drop across speaker field - 100 V.
Voltage taken with 1,000 Ohm per volt meter.
Tune set off station

TUBE	FUNCTION	CATHODE	SCR.GRID	PLATE	OSC. PLATE
6SK7	RF		75 - 100	212	
6SA7	Converter		75 - 100	215	75-100
6SK7	I.F.Amp.		75 - 100	150	
6SK7	I.F.Amp.	3	75 - 100	205	
6H6	Det.				
6SF5	Audio			25	

TUBE	FUNCTION	CATHODE	SCR.GRID	PLATE
6SF5	Bass Amp.			112
6J5GT	Inverter	6.5		130
6V6GT	Output	13	220	205
6V6GT	Output	13	220	210
5Y3G	Rectifier			
6U5	Tuning Eye			

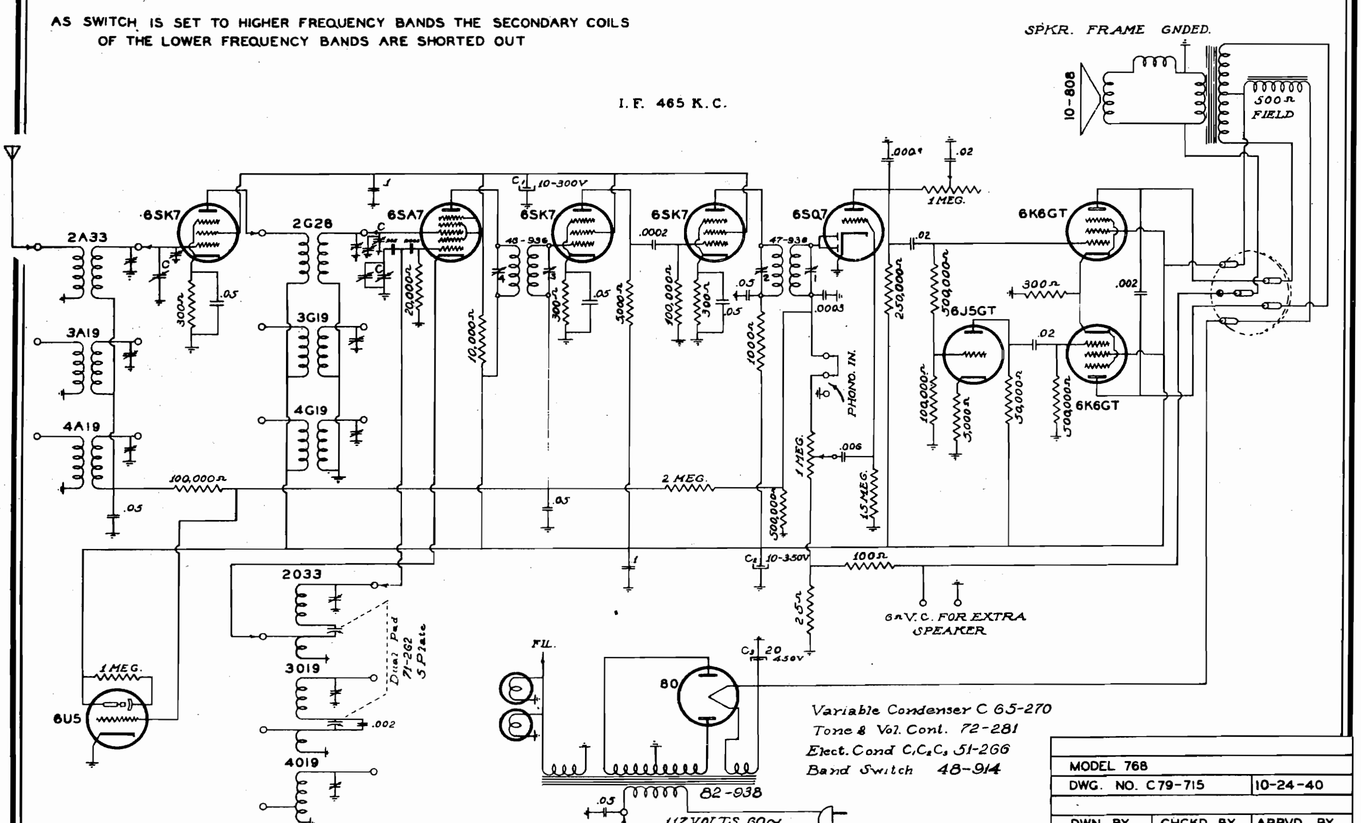
MODEL 765
MODEL 768

HOWARD RADIO CO



MODEL 765		
DWG. NO. C83-715		9-5-40
DWN. BY.	CHCKD. BY.	APPVD. BY.
L. A. G.		J.F.R

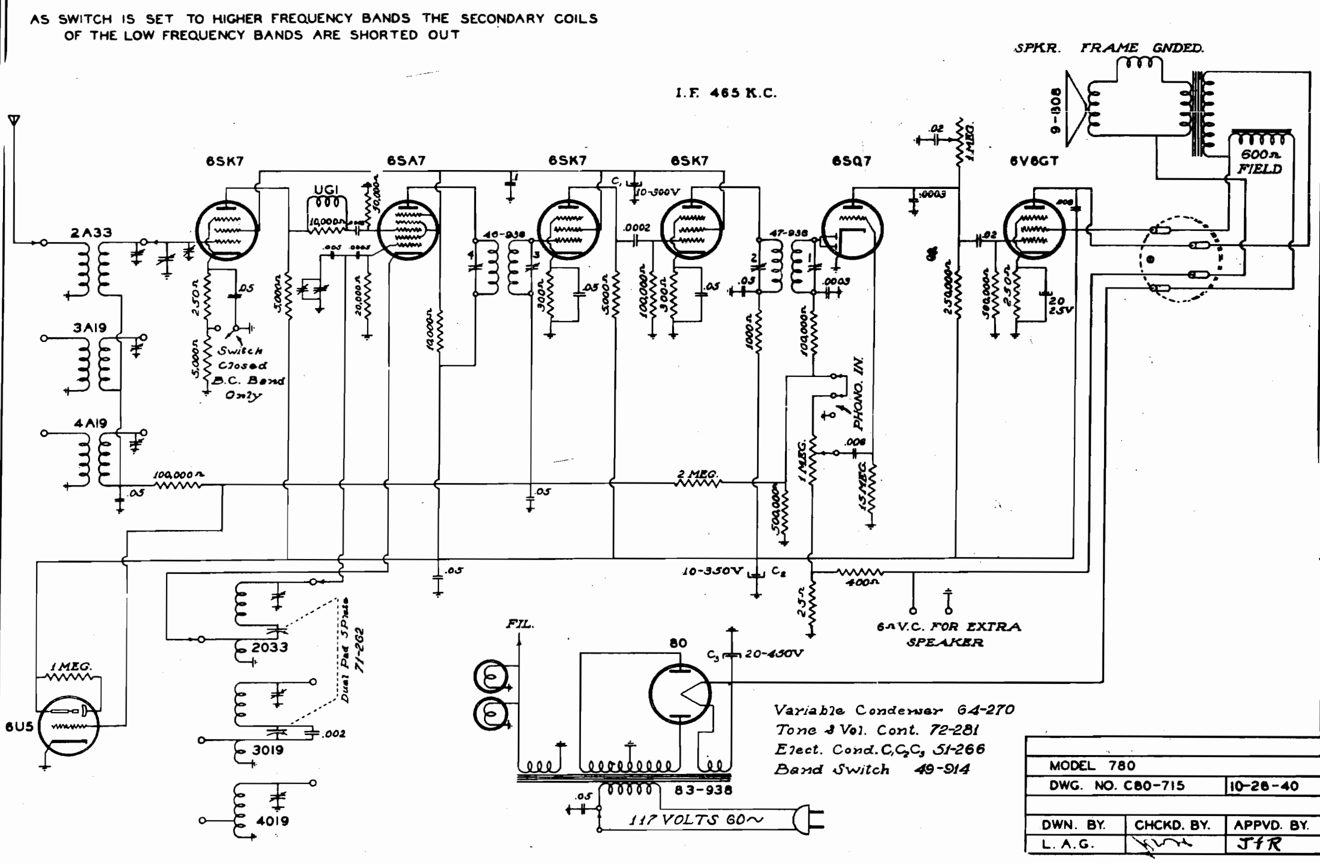
FOR OTHER DATA, SEE INDEX



MODEL 768		
DWG. NO. C79-715		10-24-40
DWN. BY.	CHCKD. BY.	APPVD. BY.
L. A. G.		J.F.R

MODEL 780

HOWARD RADIO CO.



Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
Broadcast	Max. Cap.	465 KC	Converter Grid	A,D	I_1, I_2, I_3, I_4	IF
7-22 MC	21	21 MC	Ant. (Brown)	B	O_5, A_6	Osc., Ant.
2.2-7 MC	6	6 MC	" "		O_7, A_8	Osc., Ant.
2.2-7 MC	2.2	2.2 MC	" "		P_9	Osc. Pad.
Broadcast	1400	1400 KC	" "		O_{10}, A_{11}	Osc., Ant.
Broadcast	600	600 KC	" "	C	P_{12}	Osc. Pad.

A--Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B--When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C--When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D--See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

Voltage taken from ground with line voltage at - 120 V.
High voltage reading off rectifier - 325 V.
Drop across speaker field - 58 V.
Voltage taken with 1,000 Ohm per volt meter.
Band Switch in BC position except R.F. Stage measurements.

MODEL 780
SOCKET VOLTAGE READINGS:

TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
6SK7	R.F. BC SW	8.5 2.5	110 98	260 210	
6SA7	Mixer		110	265	110
6SK7	I.F. Amp.	2	110	230	
6SK7	I.F. Amp.	4	110	250	

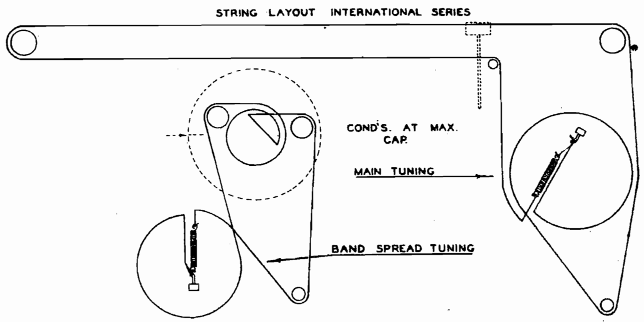
TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE
6SQ7	Diode-AVC			50
6V6GT	Output	12.5	265	250
80	Rect.			
6U5	Tuning Eye	265		

MODEL 765
MODEL 768
MODEL 780

HOWARD RADIO CO.

This sheet is a part of Form 75-480, 76-480, or 77-480 for International Models 780, 768, 765, etc.

The below layout shows the order of the drive cord for the tuning and Band Spread mechanisms should any servicing or replacement be necessary.



Trimmer Location for Models 765 and 780

FIG. 1
BOTTOM VIEW
MODEL 780, 765

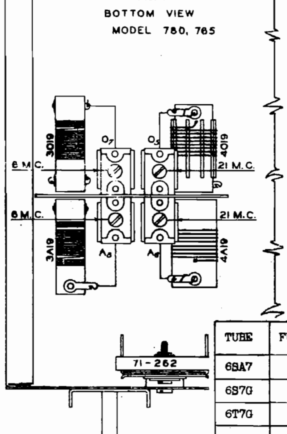
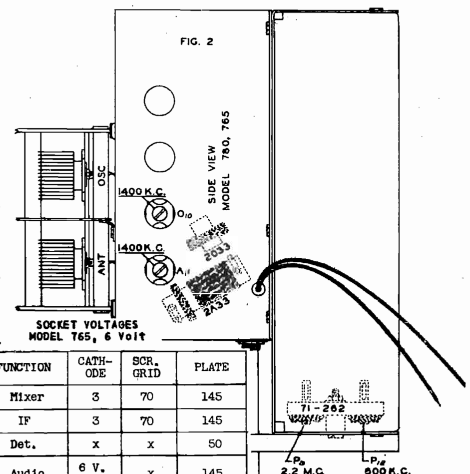


FIG. 2



SOCKET VOLTAGES
MODEL 765, 6 Volt

TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE
6SA7	Mixer	3	70	145
6S7G	IF	3	70	145
6T7G	Det.	x	x	50
6L5G	Audio	6 V. Bias	x	145
6Z7G	PP Output	x	x	140

Voltage taken from ground with line voltage at - 120 V.
High voltage reading off rectifier - 300 V.
Drop across speaker field - 65 V.
Voltage taken with 1,000 Ohm per volt meter.

TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
6SK7	R.F.	2.5	95	235	
6SA7	Mixer		95	235	95
6SK7	I.F.Amp.	3	95	195	
6SK7	I.F.Amp.	3	95	215	
6SQ7	Diode-AVC			47	

MODEL 768
SOCKET VOLTAGE READINGS:

TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE
6K6GT	Output	17	235	225
6K6GT	Output	17	235	225
6J5GT	Inverter	7.5		145
80	Rect.			
6U5	Tuning Eye			235

The below diagrams are the trimmer location layout for the International Series, such as the Model 768.

FIG. 3

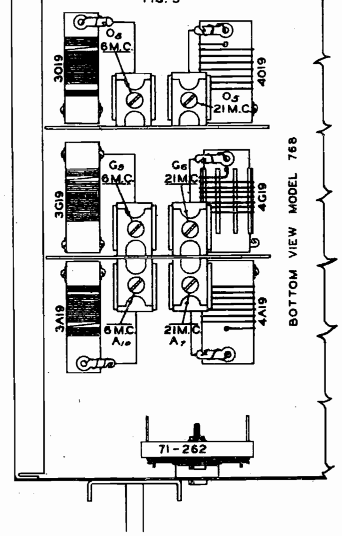
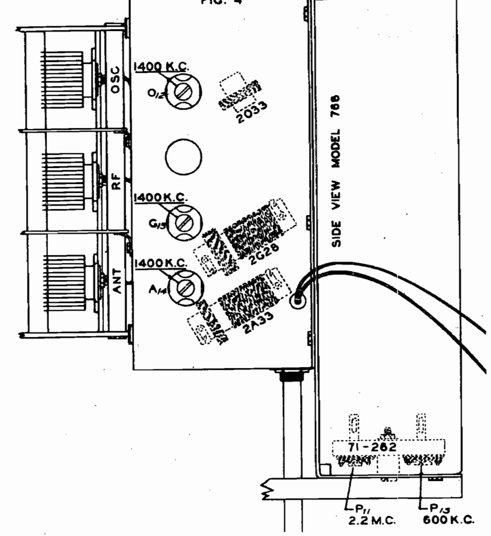


FIG. 4



MODEL 765
ALIGNMENT PROCEDURE

See Fig. 1 and Fig. 2.

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
Broadcast	Max. Cap.	465 KC	Converter Grid	A,D	I_1, I_2, I_3, I_4	IF
7-22 MC	21	21 MC	Ant. (Brown)	B	O_5, A_6	Osc., Ant.
2.2-7 MC	6	6 MC	" "		O_7, A_8	Osc., Ant.
2.2-7 MC	2.2	2.2 MC	" "		P_9	Osc.Pad.
Broadcast	1400	1400 KC	" "		O_{10}, A_{11}	Osc., Ant.
Broadcast	600	600 KC	" "	C	P12	Osc.Pad.

MODEL 768
ALIGNMENT PROCEDURE

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Generator Connection	See Note	Trimmers Adjusted (In order shown)	Trimmer Function
Broadcast	Max. Cap.	465 KC	Converter Grid	A,D	I_1, I_2, I_3, I_4	IF
7-22 MC	21	21 MC	Ant. (Brown)	B	O_5, G_6, A_7	Osc,RF,Ant.
2.2-7 MC	6	6 MC	" "		O_8, G_9, A_{10}	Osc,RF,Ant.
2.2-7 MC	2.2	2.2 MC	" "		P_{11}	Osc,Pad.
Broadcast	1400	1400 KC	" "		O_{12}, G_{13}, A_{14}	Osc,RF,Ant.
Broadcast	600	600 KC	" "	C	P_{15}	Osc,Pad.

A--Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B--When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C--When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D--See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

HUDSON MOTOR CAR CO.

MODEL JA-40

ELECTRICAL SPECIFICATIONS

I.F. Frequency 455 K.C.

I.F. Sensitivity (from 6K8 Grid) = 60 Microvolts for ½ Watt Output

Power Output, Max. 5 Watts; Undistorted 2.3 Watts

SPEAKER

5-inch P. M. Dynamic

Voice Coil Impedance 3.5 Ohms at 400 cycles

TUNING RANGE

540 K.C. to 1580 K.C.

TUBE COMPLEMENT

6K8GT Mixer
6K7GT I.F. Amplifier
6SQ7 2nd Detector AVC Audio
6V6GT Output
0Z4 Rectifier

VOLTAGE READINGS-

6 volts *at the set*

0Z4 cathode to chassis = 225 volts.

Output of filter = 205 volts (set B+).

Plate to cathode of 6V6 output tube pins = 3(+) and 8(−) = 205 volts.

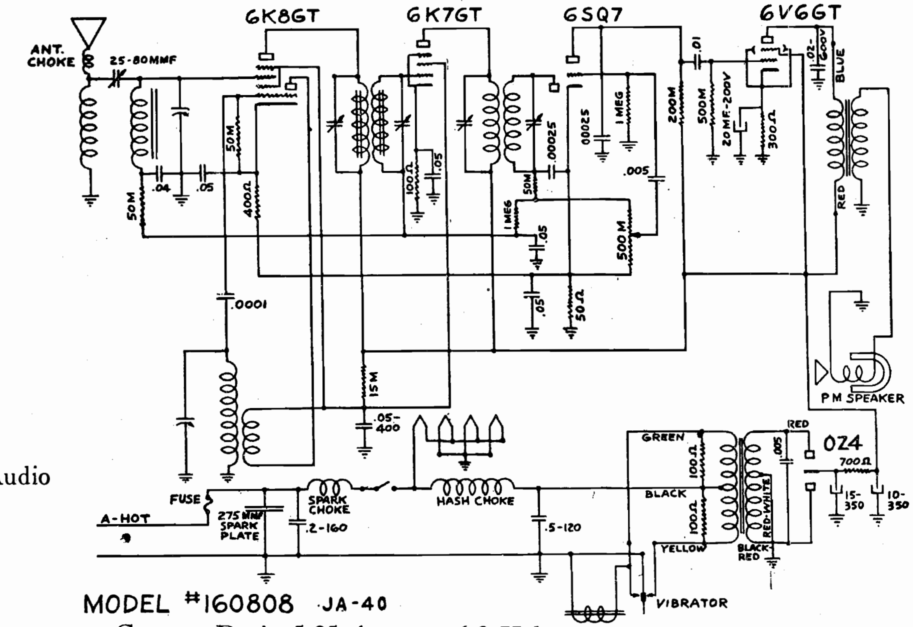
Cathode of 6V6 output (pin #8) to chassis 10 volts.

Screens of 6K7—6K8 (pin #4) to chassis 95 volts.

Screen of 6V6 to chassis (pin #4) 205 volts.

VIBRATOR

Non Synchronous Type



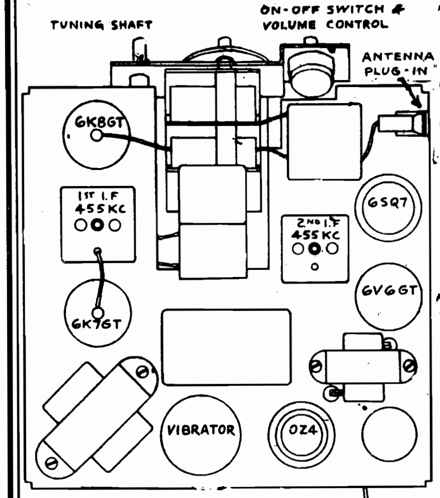
MODEL #160808 JA-40

Current Drain 5.25 Amps at 6.3 Volts

Fuse 14 Ampere

1940—Hudson

NOTE. Receivers with serial numbers above 14000 have a 1/10 MF condenser across vibrator points and a 200 ohm resistor in the cathode of the 6K8GT tube.



PART #7811 "A" BATTERY LEAD

TO ALIGN I.F.

Attach signal generator "hot" lead to grid of 6K7 through a 1/10 MF condenser, connect ground side of generator to case. Set signal generator at 455 K.C., turn volume control to maximum, attach an output meter or resonance indicator, either the plate circuit of the 6V6 tube or across the voice coil terminals of the speaker. Adjust 2nd I.F. transformer for maximum output. Shift hot generator lead to 6K8 grid and adjust 1st I.F. transformer for maximum output. Recheck 2nd I.F. adjustment, with generator connected to 6K8 grid. Do not use greater generator signal than is necessary to obtain good output meter reading. For location of 1st and 2nd I.F. transformers, see tube layout diagram. I.F. sensitivity = approximaely 60 micrtovolts for ½ watt output, measured from 6K8 grid.

TO ALIGN R.F.

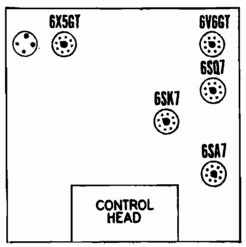
Use standard cowl antenna cable to connect signal generator to set. Connect a 35 micrmicro farad condenser to the signal generator "hot" terminal and the other side of the condenser to the antenna cable. Connect the ground side of the signal generator to the shield side of the cable. Turn variable condenser to zero capacity. Set signal generator to 1580 K.C. Adjust trimmer on oscillator section (front section of condenser) until signal is heard. Tune set to approximately 1400 K.C., set signal generator to this frequency, and adjust antenna compensator for maximum output. R.F. sensitivity 6 micro volts at 1400 K.C. and 10 micro volts at 600 K.C. for ½ watt output.

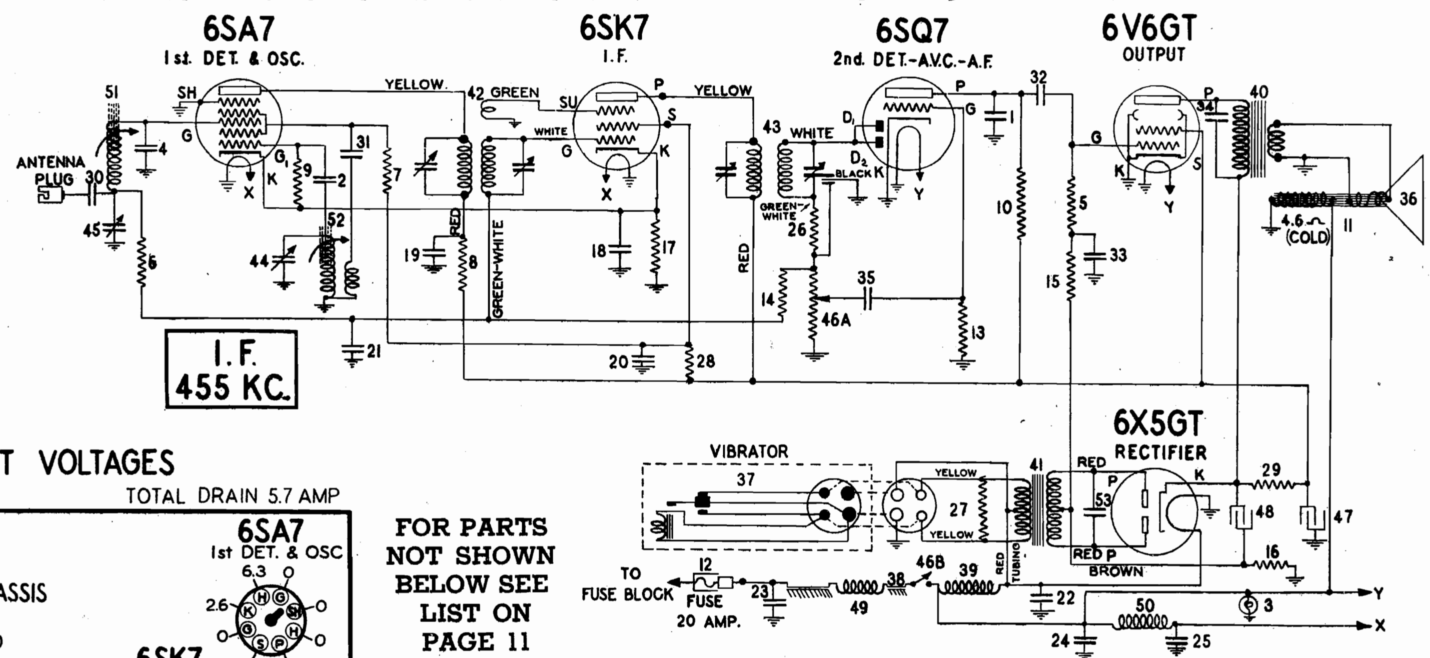
MODEL JA41

HUDSON MOTOR CAR CO.

HUDSON AUTOMOBILE RADIO RECEIVER—JUNIOR MODEL JA-41

TUBE LOCATIONS

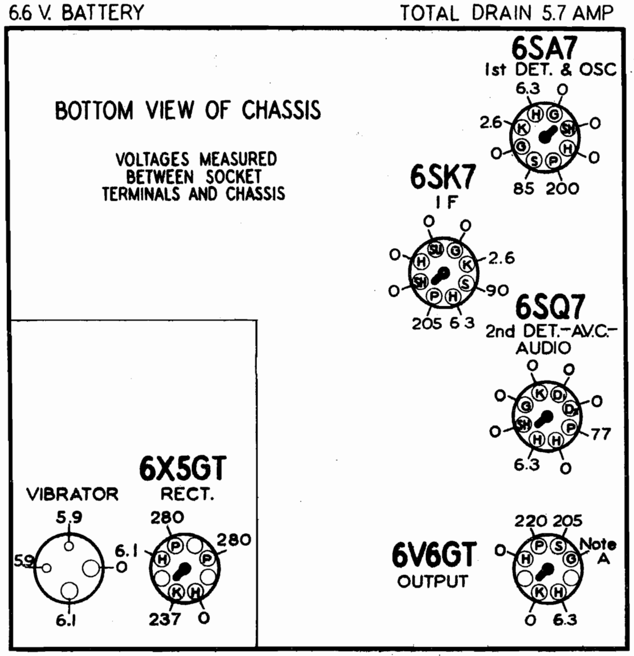




FOR PARTS NOT SHOWN BELOW SEE LIST ON PAGE 11

SOCKET VOLTAGES

6.6 V. BATTERY — TOTAL DRAIN 5.7 AMP



IMPORTANT: Use a high resistance voltmeter of at least 1000 ohms per volt.

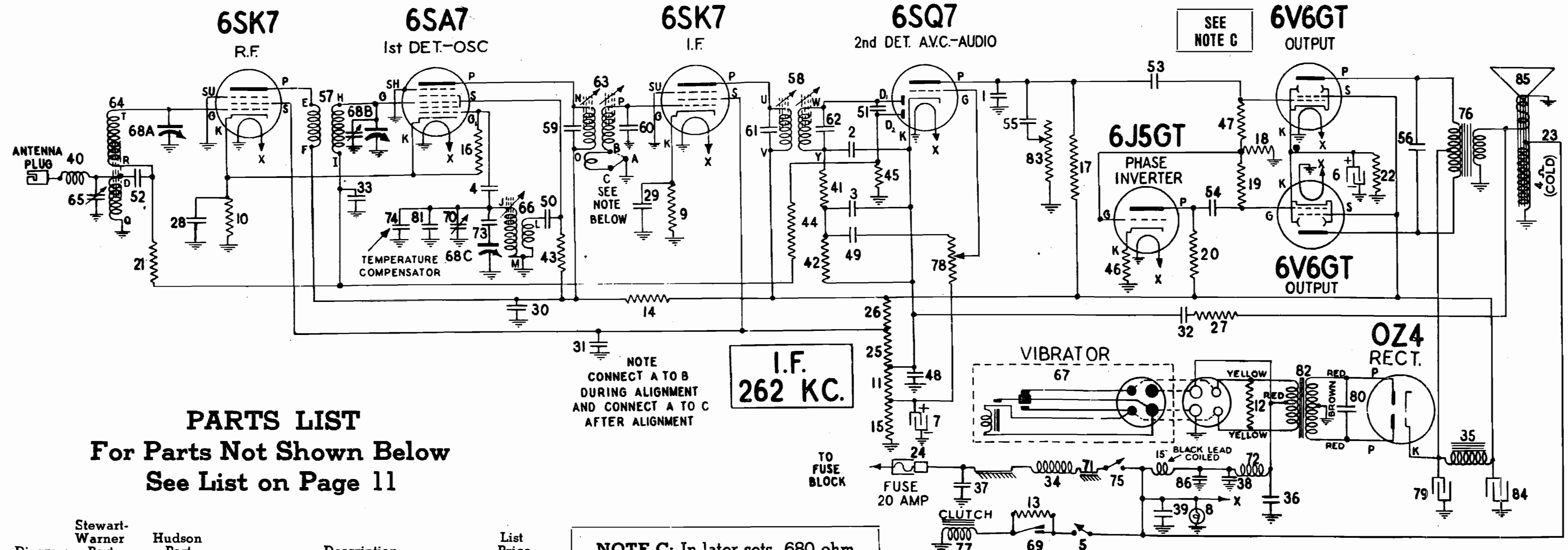
NOTE A: The bias for the control grid of the 6V6GT tube is—12 volts measured across resistor No. 16.

Diagram Number	Stewart-Warner Part Number	Hudson Part Number	Description	List Price
1	83539	BO-158447	Condenser—mica 260 mfd.	$0.20
2	85061	BO-158450	Condenser—mica 51 mmfd.	.15
3	110629	BO-200571	Dial light—6.3 volt	.15
4	112008	BO-200204	Condenser—mica 120 mmfd.	.16
5-6	112971	BO-158477	Resistor—insulated 470,000 ohm ¼ watt	.15
7	112977	BO-158481	Resistor—insulated 470 ohms ¼ watt	.15
8	112980	BO-158483	Resistor—insulated 1000 ohms ¼ watt	.15
9-10	112987	BO-158489	Resistor—insulated 220,000 ohms ¼ watt	.15
11	U-115121	BO-200681	Speaker—dynamic 5"	3.80
12	116049	BO-170420	Fuse—20 amp. 25 volt	.05
13	116050	BO-200231	Resistor—insulated 10 meg. ¼ watt	.12
14	116056	BO-200232	Resistor—2.2 meg. ¼ watt	.10
15	116058	BO-161479	Resistor—insulated 47,000 ohms ¼ watt	.12
16	116083	BO-200236	Resistor—insulated 300 ohms 2 watts wire wound	.24
17	116095	BO-161488	Resistor—220 ohms ¼ watt	.12
18-19-20	116625	BO-161461	Condenser—1. mfd. 600 volt	.25
21	116819	BO-161465	Condenser—.05 mfd. 600 volt	.20
22-23	118225	BO-161473	Condenser—.5 mfd. 150 volt	.45
24-25	118231	BO-200205	Condenser—.25 mfd. 150 volt	.32
26	118829	BO-200239	Resistor—47,000 ohms 1/10 watt	.10
27	118833	BO-200240	Resistor—220 ohms 1 watt	.15
28	118834	BO-200241	Resistor—insulated 15,000 ohms 1 watt	.15
29	118835	BO-200242	Resistor—insulated 1500 ohms 1 watt	.15
30-31	119193	BO-200206	Condenser—.01 mfd. 600 volt	.15
32-33	119414	BO-200207	Condenser—.02 mfd. 600 volt	.15
34	119415	BO-200208	Condenser—.015 mfd. 600 volt	.15
35	119817	BO-200211	Condenser—.004 mfd. 600 volt	.15
36	U-160762	BO-200684	Cone & voice coil for U-115121 speaker	1.60
37	160796	BO-200577	Vibrator	3.00
38	160845	BO-200218	Condenser—metal clad—.0002 mfd.	.18
39	160858	BO-200583	Choke coil	1.00
40	160938	BO-200586	Output transformer	1.50
41	160940	BO-200587	Power transformer—6 volt primary	3.65
42	160976	BO-200589	Transformer—1st I.F.	1.35
43	160981	BO-200590	Transformer—2nd I.F.	1.35
44	161006	BO-200221	Condenser—trimmer	.25
45	161007	BO-200222	Condenser—trimmer	.22
46A-46B	161019	BO-200592	Volume control—1 mg. with switch	1.30
47	161024	BO-200223	Condenser—electrolytic 10 mfd. 450 volt	.70
48	161025	BO-200224	Condenser—electrolytic 10 mfd. 450 volt	.70
49-50	161078	BO-200593	Choke coil	.25
51	161081	BO-200594	Antenna coil & tuning core (less shield can)	1.40
52	161086	BO-200595	Oscillator coil & tuning core (less shield can)	1.40
53	161101	BO-200227	Buffer condenser—.01 mfd. 2000 volts	.35

HUDSON MOTOR CAR CO.

MODEL DB41

HUDSON AUTOMOBILE RADIO RECEIVER—CUSTOM MODEL DB-41



NOTE C: In later sets, 680 ohm resistors (Part No. 116080) are connected in series with each output tube grid. A few sets used 800 ohms.

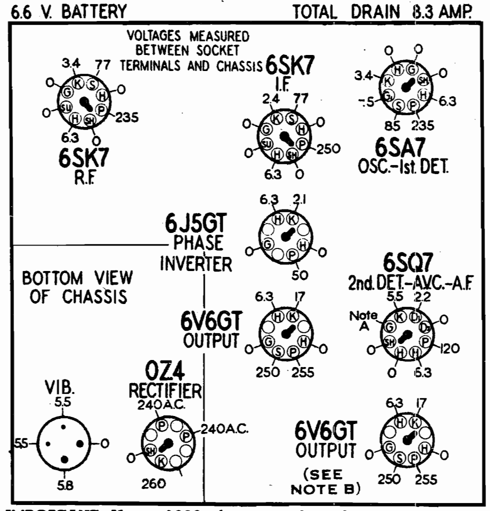
PARTS LIST
For Parts Not Shown Below
See List on Page 11

Diagram Number	Stewart-Warner Part Number	Hudson Part Number	Description	List Price
1	83539	BO-158447	Condenser—mica 260 mmfd.	$0.20
2-3	83783	BO-158448	Condenser—mica 110 mmfd.	.20
4	85563	BO-200203	Condenser—mica 26 mmfd.	.15
5	88054	BO-200570	Switch for "set-up"	.30
6-7	110377	BO-158460	Condenser—electrolytic 10 mfd. 35 volt	.80
8	110629	BO-200571	Dial light—6.3 volt	.15
9-10-11	112963	BO-158470	Resistor—insulated 330 ohms ¼ watt	.15
12-13	112976	BO-158480	Resistor—wire wound 220 ohms ½ watt	.15
14-15	112980	BO-158483	Resistor—insulated 1000 ohms ¼ watt	.15
16-17-18 19-20	112987	BO-158489	Resistor—insulated 220,000 ohms ¼ watt	.15
21	112993	BO-161477	Resistor—carbon 470,000 ohms 1/10 watt	.12
22	114335	BO-158493	Resistor—wire wound 430 ohms 2 watts	.20
23	M-115123	BO-200683	Speaker—dynamic 8"	5.80
24	116049	BO-170420	Fuse—20 amp. 25 volt	.05
25	116075	BO-200234	Resistor—27000 ohms 1 watt	.18
	116080	BO-200235	Resistor—680 Ohms ¼ Watt	.15
26	116084	BO-200237	Resistor—insulated 27000 ohms 2 watts	.15
27	116091	BO-161486	Resistor—insulated 6800 ohms ¼ watt	.15
28-29 30-31 32	116625	BO-161461	Condenser—.1 mfd. 600 volt	.25
33	116819	BO-161465	Condenser—.05 mfd. 600 volt	.20
34	117332	BO-161495	Choke coil in "A" line	.30
35	117334	BO-200702	Filter Choke—Iron Core	.95
36-37	118225	BO-161473	Condenser—.5 mfd. 150 volt	.45
38-39	118231	BO-200205	Condenser—.25 mfd. 150 volt	.32
40	118726	BO-161580	Antenna motor noise choke	.24
41	118829	BO-200239	Resistor—47,000 ohm 1/10 watt	.10
42	118836	BO-200243	Resistor—330,000 ohms 1/10 watt	.10
43	118837	BO-200244	Resistor—39,000 ohms 1 watt	.15
44-45	118839	BO-200246	Resistor—1.5 megohm 1/10 watt	.10
46	118840	BO-200247	Resistor—2,200 ohms ¼ watt	.10
47	118841	BO-200248	Resistor—130,000 ohms ¼ watt	.10
48-49 50-51	119193	BO-200206	Condenser—.01 mfd. 600 volt	.15
52-53-54	119414	BO-200207	Condenser—.02 mfd. 600 volt	.15
55	119416	BO-200208	Condenser—.008 mfd. 600 volt	.15
56	160430	BO-200212	Condenser—.001 mfd. 600 volt	.15

Diagram Number	Stewart-Warner Part Number	Hudson Part Number	Description	List Price
57	160661	BO-200572	Coil—R. F.	1.25
58	160681	BO-200573	Transformer—2nd I.F.	2.20
59-60 61-62	160685	BO-200213	Condenser—mica 110 mmfd. (5%)	.25
63	160721	BO-200573	Transformer—1st I.F.	2.20
64	160735	BO-200575	Coil—antenna	2.00
65	160760	BO-200214	Condenser—trimmer	.24
66	160765	BO-200576	Coil—oscillator	1.20
67	160796	BO-200577	Vibrator	3.00
68A to C	160801	BO-200215	Condenser—variable gang	3.65
69	160817	BO-200619	Contact switch for clutch	.90
70	160844	BO-200217	Condenser—air trimmer	.85
71	160845	BO-200218	Condenser—metal clad—.0002 mfd.	.18
72	160858	BO-200583	Choke coil	1.00
73	160859	BO-200219	Condenser—mica 840 mmfd.	.45
74	160860	BO-200220	Temperature compensator condenser	.40
75	160861	BO-200584	Switch—on-off	1.20
76	160863	BO-200585	Output transformer	1.70
77	160919	BO-200645	Clutch case & coil assembly	1.25
78	160954	BO-200588	Volume control—1 megohm	1.00
79	161025	BO-200224	Condenser—electrolytic 10 mfd. 450 volt	.70
80	161101	BO-200227	Buffer condenser—.01 mfd. 2000 volts	.35
81	161126	BO-200228	Condenser—mica 21 mmfd. (5%)	.20
82	161130	BO-200599	Power transformer—6 volt primary	4.90
83	161156	BO-200600	Tone control—500,000 ohms	.75
84	161168	BO-200229	Condenser—electrolytic 15 mfd. 450 volt	.80
85	161185	BO-200686	Cone & voice coil assembly	1.90
86	88205	BO-158455	Condenser .0021 mfd. mica	.35

SOCKET VOLTAGES

6.6 V. BATTERY TOTAL DRAIN 8.3 AMP.



IMPORTANT: Use a 1000 ohm per volt -voltmeter.

NOTE A: The voltage on the control grid of the 6SQ7 tube is 4.5 volts measured across resistor No. 15.

NOTE B: This socket mounted with keyway in opposite direction in later sets.

MODEL DB-41
MODEL JA-41
MODEL SA-41

HUDSON MOTOR CAR CO.

ALIGNMENT PROCEDURE FOR MODEL JA-41 ONLY

IMPORTANT: The "Simplified Alignment Procedure" should always be used unless the adjustments on the tuner cores have become loose or if someone has tampered with them.

Use the "General Alignment Procedure" only in instances of poor calibration, and poor sensitivity at the low frequency end even after the Simplified Procedure has been completed. The General Alignment Procedure is also necessary if the antenna or oscillator coils or cores are replaced.

SIMPLIFIED ALIGNMENT PROCEDURE

REMOVE TOP COVERS OF RECEIVER - BOTH SPEAKER SECTION AND CONTROL COVER

Dummy Antenna in Series with Signal Generator	Connection of Sig. Gen. output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Antenna Connection on Set	455 KC	Any point where it does not affect the Signal.	1—2	2ND I.F.	Adjust for maximum output.
				3—4	1ST I.F.	
50 MMFD. Mica Condenser	Antenna Connection on Set	1600 KC	Turn tuning knob to max. clockwise position.	5	Oscillator (Shunt) Condenser	Carefully adjust for maximum output.
50 MMFD. Mica Condenser	Antenna Connection on Set	1400 KC	Accurately tune to 1400 KC generator Signal.	6	Antenna (Shunt) Condenser	Adjust for maximum output.

CALIBRATE DIAL AS SHOWN UNDER HEADING "DIAL CALIBRATION" OVER FIG. 2 BELOW

After the set has been installed in the car, tune in a fairly weak station near 1400 KC and adjust trimmer No. 6 until maximum volume is obtained. This trimmer can be reached by removing the plug button at the left front corner of the bottom of the case.

GENERAL ALIGNMENT PROCEDURE

TO PERFORM THIS ALIGNMENT PROCEDURE THE RECEIVER CHASSIS MUST BE REMOVED FROM THE CASE.

Dummy Antenna in Series with Signal Generator	Connection of Sig. Gen. output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Antenna Connection on Set	455 KC	Any point where does not affect the signal.	1—2	2ND I.F.	Adjust for maximum output.
				3—4	1ST I.F.	

ADJUSTMENT OF TUNING CORES IN ANTENNA AND OSCILLATOR COILS:
1. Loosen the lock nuts at the ends of the threaded tuning core shafts (see Fig. 2 below).
2. Rotate the tuning knob of the receiver to the maximum clockwise position so that tuning cores are out as far as possible.
3. Rotate each tuning core so it extends out of the coil form exactly the amount shown in Fig. 2, below. Hold the core stationary, tighten the lock nut on the oscillator core (top coil) (see Fig. 2 below). Use a small amount of speaker cement on the lock nut to insure against change in setting. Do not tighten the lock nut on the antenna core as further adjustment is necessary.

Dummy Antenna in Series with Signal Generator	Connection of Sig. Gen. output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
50 MMFD. Mica Condenser	Antenna Connection on Set	1600 KC	Turn tuning knob to max. clockwise position.	5	Oscillator (Shunt) Condenser	Carefully adjust for maximum output.
50 MMFD. Mica Condenser	Antenna Connection on Set	1600 KC	Same as above	6	Antenna (Shunt) Condenser	Adjust for maximum output.
50 MMFD. Mica Condenser	Antenna Connection on Set	1400 KC	Accurately tune to 1400 KC generator signal.	7	Tuning core of Antenna coil.	Rotate core in or out for max. output. Tighten lock nut; use speaker cement on nut.

CALIBRATE DIAL AS SHOWN UNDER HEADING "DIAL CALIBRATION" OVER FIG. 2 BELOW

After the set has been installed in the car, tune in a fairly weak station near 1400 KC and adjust trimmer No. 6 until maximum volume is obtained. This trimmer can be reached by removing the plug button at the left front corner of the bottom of the case.

DIAL CALIBRATION: Place the case nose on the receiver case. Check the calibration by tuning in a station of known frequency on the high frequency end of the dial. If calibration is incorrect, hold the tuning knob and turn the dial drum, using the eraser on your pencil to rotate the drum, to the correct frequency. Repeat this after set is installed in car.

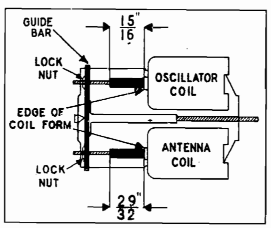


FIG. 2

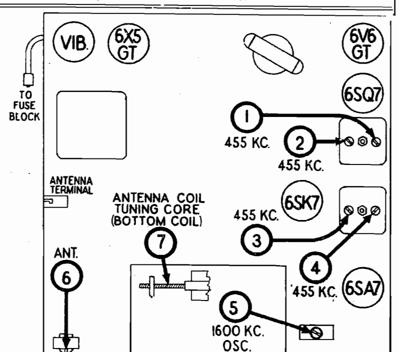


FIG. 3

ALIGNMENT PROCEDURE FOR MODELS DB-41 OR SA-41

For alignment an output meter and accurately calibrated signal generator are required.
1. Remove the top and bottom covers of the receiver case.
2. Connect output meter across voice coil or between the plates of the 6V6GT output tubes.
3. Connect the ground lead of the signal generator to the receiver chassis and leave it connected throughout this procedure.
4. Turn volume control to maximum volume position.
5. Check to see that pointer is ¾" from end of dial window (Vol. Control end) when gang condenser is fully meshed.

Dummy Antenna in Series with Signal Generator	Connection of Sig. Gen. output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
I. F. ALIGNMENT FOR MODEL DB-41 ONLY (8 tube Set)						
BEFORE ALIGNING THE I. F. TRANSFORMERS, CONNECT GREEN-WHITE JUMPER LOCATED UNDER 1ST I.F. TRANSFORMER BETWEEN TERMINALS A AND B AS SHOWN IN FIGURE 6.						
.1 MFD. Condenser	To point Marked "X" in Fig. 6	262 KC	Any point where it does not affect the signal.	1—2 (See Figs. 5 & 6)	2ND I.F.	Adjust for maximum output. Reconnect green-jumper (under 1st I. F.) between terminals A and C (see Fig. 6). This must be done before alignment of the rest of the receiver.
				3—4 (See Figs. 5 & 6)	1ST I.F.	
I. F. ALIGNMENT FOR MODEL SA-41 ONLY (6 tube Set)						
.1 MFD. Condenser	To point marked "X" in Fig. 8	455 KC	Any point where it does not affect the signal.	1—2 (See Figs. 7 & 8)	2ND I.F.	Adjust for maximum output. Then repeat adjustment.
				3—4 (See Fig.s 7 & 8)	1ST I.F.	
R. F. ALIGNMENT FOR EITHER MODEL SA-41 OR DB-41						
50 MMFD. Mica Condenser	Antenna Connection of Set	1600 KC	Gang condenser completely open. Dial pointer as far to right as possible.	5	Oscillator (Shunt) Condenser	Carefully adjust for maximum output.
50 MMFD. Mica Condenser	Antenna Connection on Set	1400 KC	Carefully tune to 1400 KC. generator signal.	8 This trimmer used on model DB-41 only (See Fig. 5)	R.F. (Shunt) Condenser	Adjust for maximum output.
50 MMFD. Mica Condenser	Antenna Connection on Set	1400 KC	Carefully tune to 1400 KC. generator signal.	6	Antenna (Shunt) Condenser	Adjust for maximum output.
50 MMFD. Mica Condenser	Antenna Connection of Set	600 KC	Tune to 600 K.C. generator signal.	7	Ajustable core of oscillator coil.	Adjust for maximum output. Try to increase output by detuning adjusting screw and retuning receiver dial until maximum output is obtained.

NOW REPEAT ADJUSTMENTS MADE ON TRIMMERS 5, 8, 6 AND 7

After the set had been installed in the car tune in a fairly weak station near 1400 KC. and adjust trimmer No. 6 until maximum volume is obtained. This trimmer can be reached by removing the plug button at the left front corner of the bottom of the case.

TOP VIEW OF MODEL DB-41

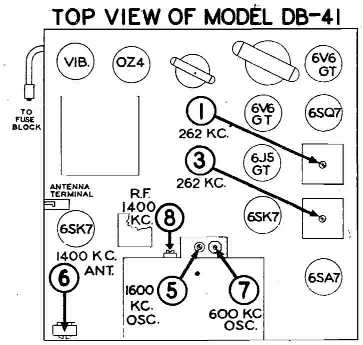


FIG. 5

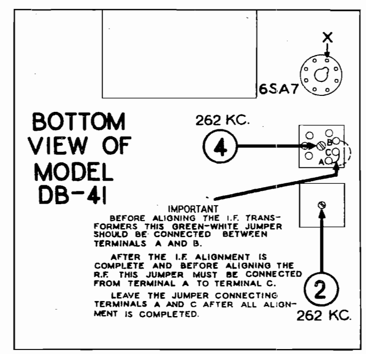
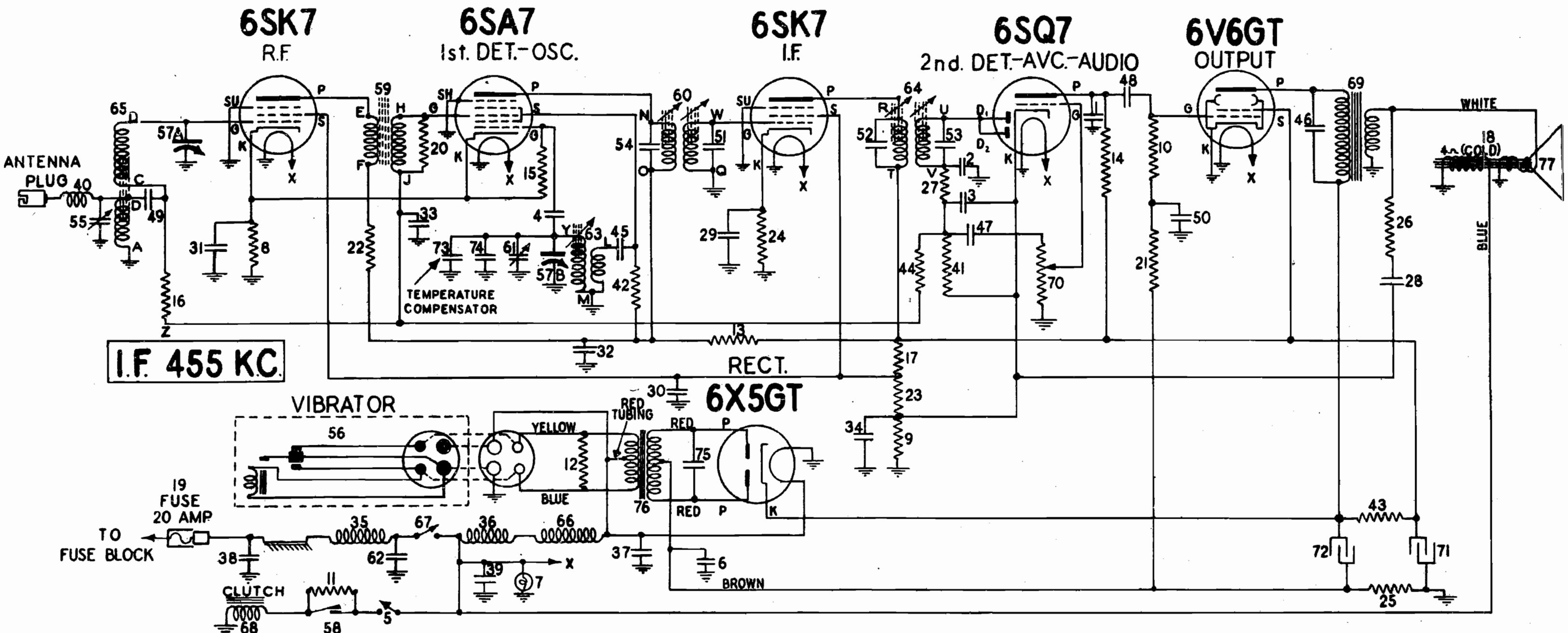


FIG. 6

HUDSON MOTOR CAR CO.

MODEL SA-41

HUDSON AUTOMOBILE RADIO RECEIVER—DELUXE MODEL SA-41



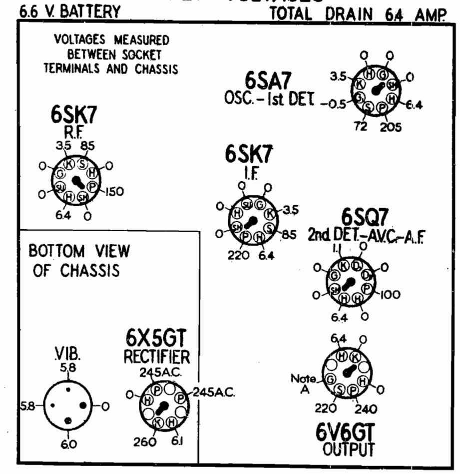
PARTS LIST—For Parts Not Shown Below See List on Page 11

Diagram Number	Stewart-Warner Part Number	Hudson Part Number	Description	List Price
1	83539	BO-158447	Condenser—mica 260 mmfd.	$0.20
2-3	83783	BO-158448	Condenser—mica 110 mmfd.	.20
4	85563	BO-200203	Condenser—mica 26 mmfd.	.15
5	88054	BO-200570	Switch—for "set-up"	.30
6	88205	BO-158455	Condenser—mica 2100 mmfd.	.35
7	110629	BO-200571	Dial light—6.3 volt	.15
8-9	112963	BO-158470	Resistor—insulated 330 ohms ¼ watt	.15
10	112971	BO-158477	Resistor—insulated 470,000 ohms ¼ watt	.15
11-12	112976	BO-158480	Resistor—wire wound 220 ohms ½ watt	.15
13	112980	BO-158483	Resistor—insulated 1000 ohms ½ watt	.15
14-15	112987	BO-158489	Resistor—insulated 220,000 ohms ¼ watt	.15
16	112993	BO-161477	Resistor—carbon 470,000 ohms 1/10 watt	.12
17	112998	BO-200230	Resistor—insulated 22,000 ohms 2 watts	.20
18	M-115122	BO-200682	Speaker—dynamic 6 inch	4.50
19	116049	BO-170420	Fuse—20 amp. 25 volt	.05
20	116052	BO-161478	Resistor—insulated 33,000 ohms 1/10 watt	.12
21	116066	BO-200233	Resistor—insulated 68,000 ohms ¼ watt	.12
22	116073	BO-161480	Resistor—insulated 10,000 ohms ½ watt	.15
23	116075	BO-200234	Resistor—27,000 ohms 1 watt	.18
24	116080	BO-200235	Resistor—insulated 680 ohms ¼ watt	.15
25	116083	BO 200236	Resistor—insulated 300 ohms 2 watts wire wound	.24
26	116091	BO-161486	Resistor—insulated 6800 ohms ¼ watt	.15
27	116096	BO-200238	Resistor—22,000 ohms 1/10 watt	.10
28-29-30 31-32	116625	BO-161461	Condenser—.1 mfd. 600 volt	.25
33-34	116819	BO-161465	Condenser—.05 mfd. 600 volt	.20
35-36	117332	BO-161495	Choke coil in "A" line	.30
37-38	118225	BO-161473	Condenser—.5 mfd. 150 volt	.45
39	118231	BO-200205	Condenser—.25 mfd. 150 volt	.32

Diagram Number	Stewart-Warner Part Number	Hudson Part Number	Description	List Price
40	118726	BO-161580	Antenna motor noise choke	.24
41	118836	BO-200243	Resistor—330,000 ohms 1/10 watt	.10
42	118837	BO-200244	Resistor—39,000 ohms 1 watt	.15
43	118838	BO-200245	Resistor—1500 ohms 2 watts	.15
44	118839	BO-200246	Resistor—1.5 megohm 1/10 watt	.10
45-46-47	119193	BO-200206	Condenser—.01 mfd. 600 volt	.15
48-49-50	119414	BO-200207	Condenser—.02 mfd. 600 volt	.15
51-52 53-54	160685	BO-200213	Condenser—mica 110 mmfd. (5%)	.25
55	160760	BO-200214	Condenser—trimmer	.24
56	160796	BO-200577	Vibrator	3.00
57A-57B	160808	BO-200216	Condenser—variable gang	2.40
58	160817	BO-200619	Contact switch for clutch	.90
59	160839	BO-200578	Coil—R. F. with shield	1.00
60	160841	BO-200579	Transformer—1st I.F.	.25
61	160844	BO-200217	Condenser—air trimmer	.85
62	160845	BO-200218	Condenser—metal clad—.0002 mfd.	.18
63	160846	BO-200580	Coil—oscillator	1.00
64	160847	BO-200581	Transformer—2nd I.F.	1.25
65	160849	BO-200582	Antenna coil & shield	2.00
66	160858	BO-200583	Choke coil	1.00
67	160861	BO-200584	Switch—on-off	1.20
68	160919	BO-200645	Clutch case & coil assembly	1.25
69	160938	BO-200586	Output transformer	1.50
70	160954	BO-200588	Volume control—1 megohm	1.00
71	161024	BO-200223	Condenser—electrolytic 10 mfd. 450 volt	.70
72	161025	BO-200224	Condenser—electrolytic 10 mfd. 450 volt	.70
73	161066	BO-200225	Temperature compensator condenser	.40
74	161098	BO-200226	Condenser—mica 15 mmfd.	.20
75	161101	BO-200227	Buffer condenser—.01 mfd. 2000 volts	.35
76	161120	BO-200598	Power transformer—6 volt primary	4.50
77	161158	BO-200685	Cone & voice coil assembly	1.80

SOCKET VOLTAGES

6.6 V. BATTERY — TOTAL DRAIN 6.4 AMP.



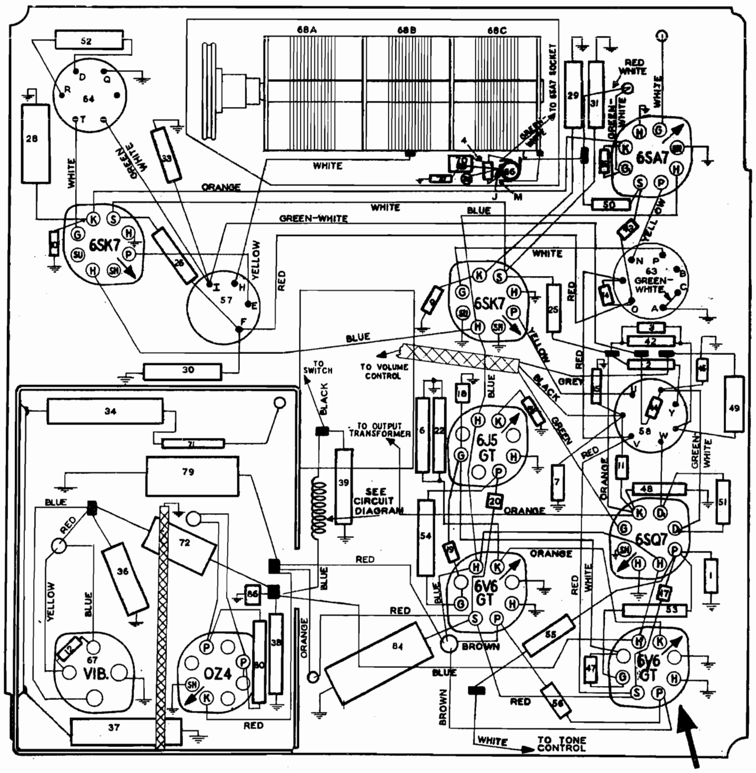
IMPORTANT: Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: The bias for the control grid of the 6V6GT tube is —13.5 volts measured across resistor No. 25.

MODEL DB-41
MODEL SA-41

HUDSON MOTOR CAR CO.

CHASSIS WIRING DIAGRAM FOR MODEL DB-41



TOP VIEW OF MODEL SA-41

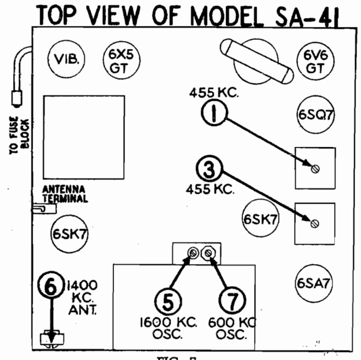


FIG. 7

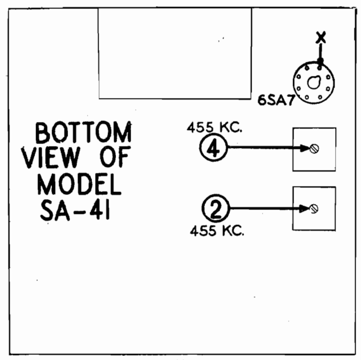


FIG. 8

THIS SOCKET MOUNTED WITH KEYWAY IN OPPOSITE DIRECTION IN LATE SETS

CHASSIS WIRING DIAGRAM FOR MODEL SA-41

HOW TO SET UP PUSH BUTTONS ON MODELS SA-41 AND DB41

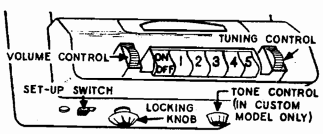
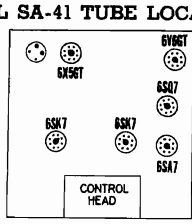


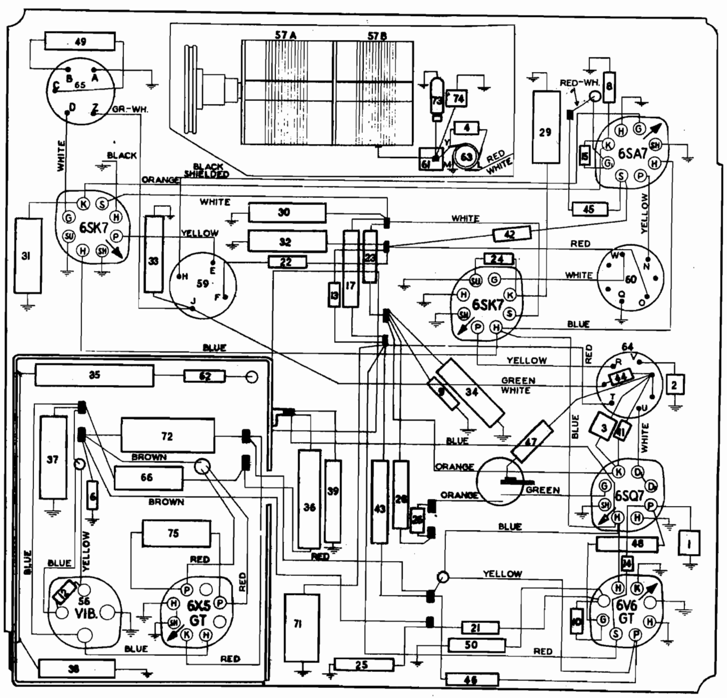
FIG. 4

(Radio must be connected to battery when buttons are operated). Numbered buttons can be set to stations on any part of the dial.

1. Operate set for 10 minutes before set-up.
2. TO UNLOCK MECHANISM
   (a) Rotate tuning control downward until dial pointer is at "RE-SET."
   (b) Move black set-up switch to right.
   (c) Push up locking knob and turn counter-clockwise approximately 2 turns, or until slight resistance is felt. Pull locking knob down to disengage.
3. Push in selected button as far as it will go and tune manually to desired station, while holding button in. Release button.
4. Follow same procedure for other buttons. After setting any button, do not touch it again until mechanism is locked as in 5. Otherwise, it must be reset as in 3.
5. TO LOCK MECHANISM
   (a) Rotate tuning control downward until dial pointer is at RESET.
   (b) Push up locking knob and turn clockwise as tightly as possible by hand. Pull locking knob down to disengage.
   (c) Push set-up switch to the left.

MODEL SA-41 TUBE LOCATIONS

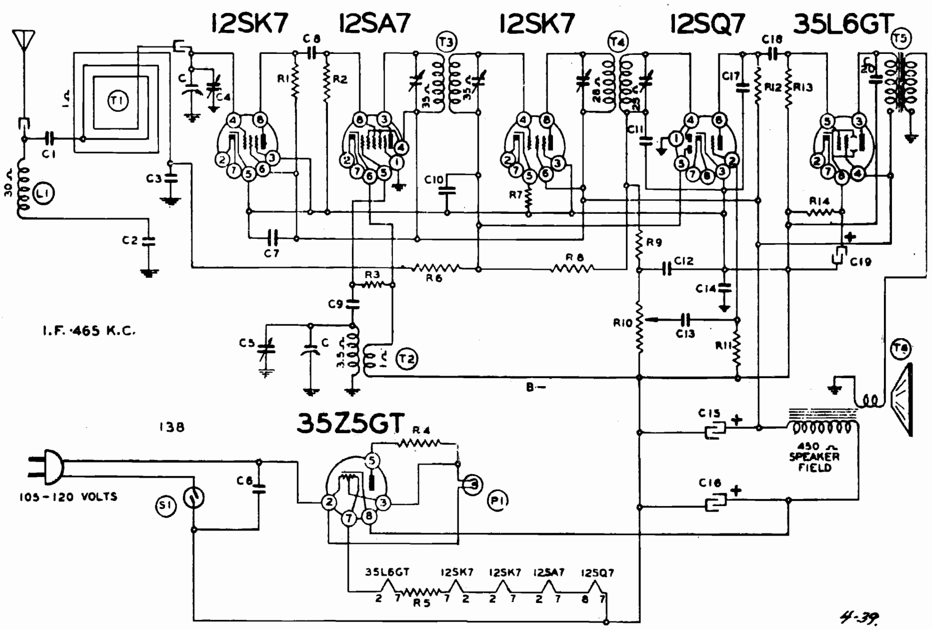




Terminals of coils shown in the circuit diagrams on the adjacent page are lettered to correspond to similarly lettered terminals on the chassis wiring diagrams and coil illustrations shown on this page. Terminals which are connected together carry the same letter.

LAFAYETTE RADIO MFG. CO.

MODEL FE-5



1—Type 12SK7 R. F. Amplifier.
1—Type 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

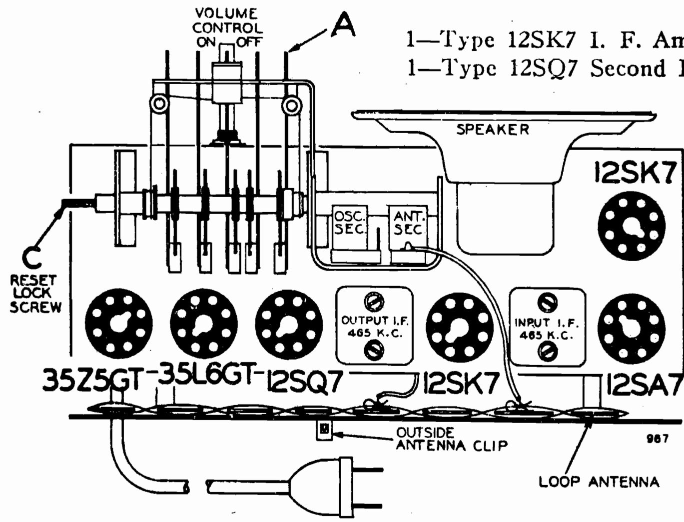
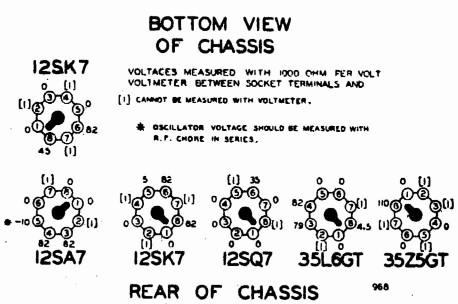


FIG. 1—TOP VIEW



PARTS		RESISTORS
R1	130218	5M ohm—⅓ w.
R2	13020	100M ohm—⅓ w.
R3	130176	20M ohm—⅓ w.
R4	130295	25 ohm—1 watt
R5	130295	25 ohm—1 watt
R6	130100	150M ohm—⅓ w.
R7	130203	40 ohm—⅓ w.
R8	1304	3 megohm—⅓ w.
R9	13012	50M ohm—⅓ w.
R10	101127	1 megohm volume control
R11	130257	5 megohm—⅓ w.
R12	13011	250M ohm—⅓ w.
R13	1303	500M ohm—⅓ w.
R14	130166	150 ohm—⅓ w.
		CONDENSERS
C	102104B	2 gang variable condenser
C1	12951	.000125 Mica
C2	12912	.00025 Mica
C3	10026	.02 x 400 v.
C4		Antenna Trimmer on gang
C5		Oscillator trimmer on gang
C6	1001	.1 x 400 v.
C7	1006	.25 x 200 v.
C8	1295	.0001 Mica
C9	1295	.0001 Mica
C10	1009	.05 x 200 v.
C11	1295	.0001 Mica
C12	1295	.0001 Mica
C13	10012	.003 x 600 v.
C14	100110	.2 x 400 v.
C15	11953E	30 mfd. lytic—150 w. v.
C16	11953E	30 mfd. lytic—150 w. v.
C17	1295	.0001 Mica
C18	10078	.01 x 200 v.
C19	11953E	40 mfd.—25 w. v. lytic
C20	10026	.02 x 400 v.
		C15, C16, and C19 in same unit
T1	111139	Loop Antenna
T2	110128	Oscillator Coil
T3	108140F	Input I. F. Coil
T4	108145B	Output I. F. Coil
T5	10588B	Output Transformer
T6	114116G	5" Dynamic Speaker (450 ohm field)
L1	1237	Antenna Loading Coil
P1	107249	6-8 volt, Pilot light - T-47
S1		Off-on Switch on Volume Control

ALIGNMENT

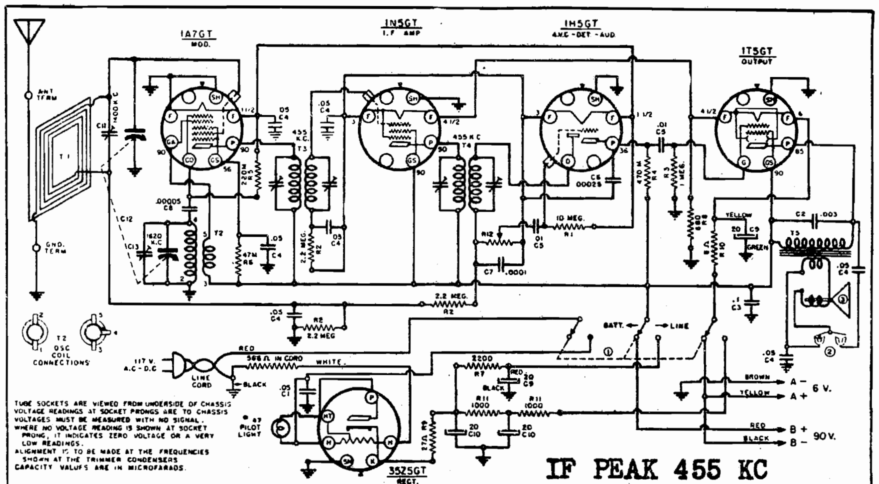
Connect B- of radio chassis to ground post of signal generator through .1 mf condenser.

I.F. peak 465 KC. I.F. alignment conventional---see Vol. V111. Special Sect.

Trim oscillator at 1650 KC. Trim antenna at 1400 KC. (Lay signal generator lead near, but not on, loop---when adjusting trimmer.)

MODEL D-9
MODEL D-93

LAFAYETTE RADIO MFG. CO.



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. VOLTAGE READINGS AT SOCKET PRONGS ARE TO CHASSIS. VOLTAGES MUST BE MEASURED WITH NO SIGNAL. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READINGS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. CAPACITY VALUES ARE IN MICROFARADS.

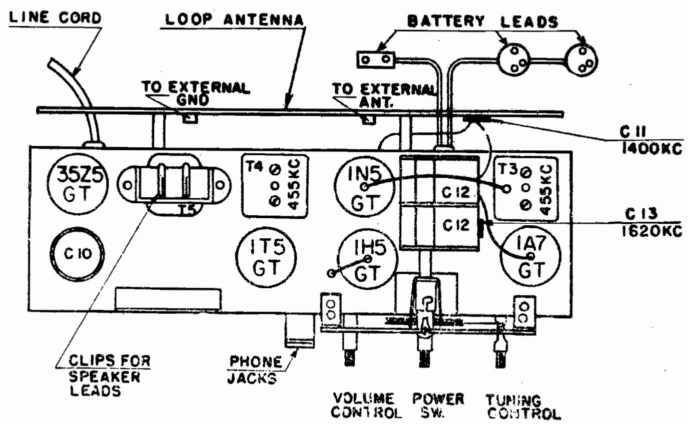
IF PEAK 455 KC

CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR COND.
C2	16-139	.003 " " " "
C3	16-115	.1 " 200 V. " "
C4	1622	.05 " " " "
C5	16-121	.01 " " " "
C6	1504	.00025 MFD. MICA CONDENSER
C7	1501	.0001 " " "
C8	1503	.00005 " " "
C9	18-263	20 x 20 " 150 W.V. ELECTROLYTIC
C10	18-262	20 x 20 " 150 W.V. "
C11	20-129	TRIMMER ON LOOP
C12	19-167	2 GANG VARIABLE COND. ALSO C13

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-195	1 " " "
R4	60-178	470 M OHM " "
R5	60-180	220 M " " "
R6	60-177	47 M " " "
R7	60-383	2200 " " "
R8	60-379	680 " " "
R9	60-220	27 " " "
R10	60-128	8 " 1/2 W. "
R11	60-644	1000 " 3 W. "
R12	24-150	1 MEGOHM VOLUME CONTROL

CODE	PART NO.	DESCRIPTION
T1	02-17	LOOP ANTENNA
T2	10-310	OSCILLATOR COIL
T3	10-355	1 ST. I.F. TRANSFORMER
T4	10-343	2 ND. " "
T5	80-196	OUTPUT TRANSFORMER
1	69-151	POWER SWITCH
2	12-3	PHONE JACK
3	79-298	5" P.M. SPEAKER

D-53

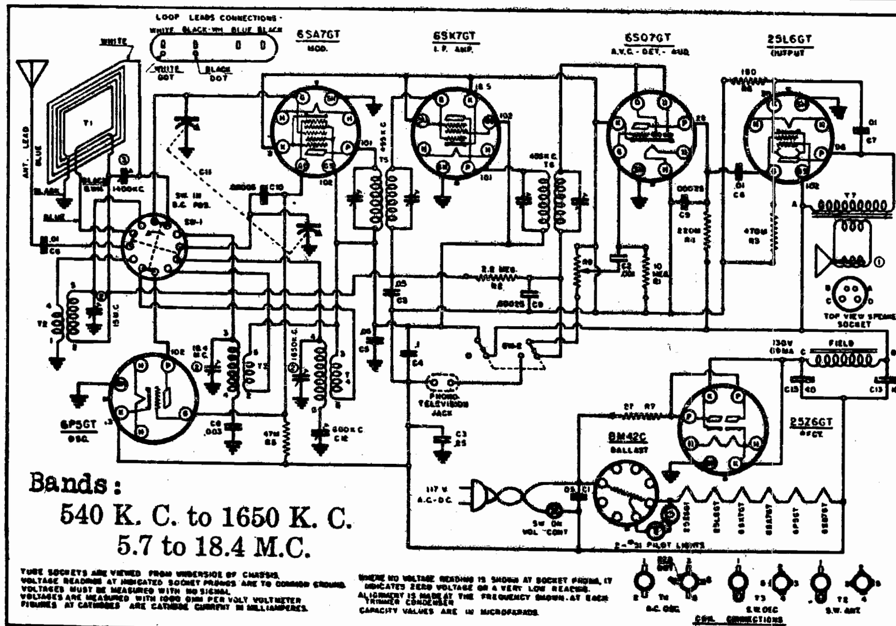


LOCATION OF PARTS ON TOP OF CHASSIS

MODEL D-93

Model No. D-93 radio receiver is a portable five (5) tube, 117 volt, 50-60 cycle A.C. or 117 volt D.C. or battery operated superheterodyne with self-contained loop antenna and batteries, designed to cover the standard broadcast band from 1620 to 535 K.C.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



Bands:
540 K. C. to 1650 K. C.
5.7 to 18.4 M.C.

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND. VOLTAGES MUST BE MEASURED WITH NO SIGNAL. VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER. CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " 200 V. " "
C4	16-115	.1 " " " "
C5	[illegible]	.05 " " " "
C6	16-121	.01 " " " "
C7	16-116	.01 " 400 V. " "
C8	16-118	.003 MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	[illegible]	.00005 " " "
C11	19-154	2 GANG VARIABLE CONDENSER
C12	[illegible]	PADDING CONDENSER
C13	18-236	40 x 10 MFD. 150 W.V. ELECTROLYTIC

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM " "
R4	60-180	220M " " "
R5	60-177	47M " " "
R6	60-184	150 " " "
R7	60-220	27 " " "
R8	24-140	500M " VOLUME CONTROL
SW1	60-141	BAND SWITCH
SW2	60-140	PHONO "

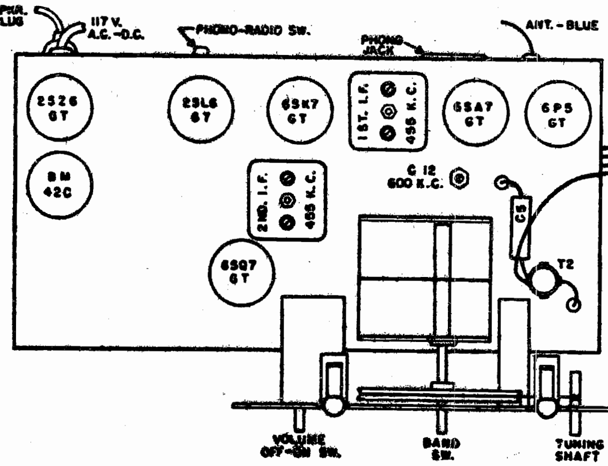
CODE	PART NO.	DESCRIPTION
T1	02-13	LOOP ANTENNA (B.C.)
T2	[illegible]	S.W. ANTENNA COIL
T3	[illegible]	S.W. OSCILLATOR COIL
T4	[illegible]	B.C. " "
T5	[illegible]	1ST I.F. TRANSFORMER
T6	[illegible]	2ND " "
T7	------	OUTPUT TRANS. (ON SPKR.)
1	79-477	6-1/2" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

D-78

IF PEAK 455 KC

Model No. D-9

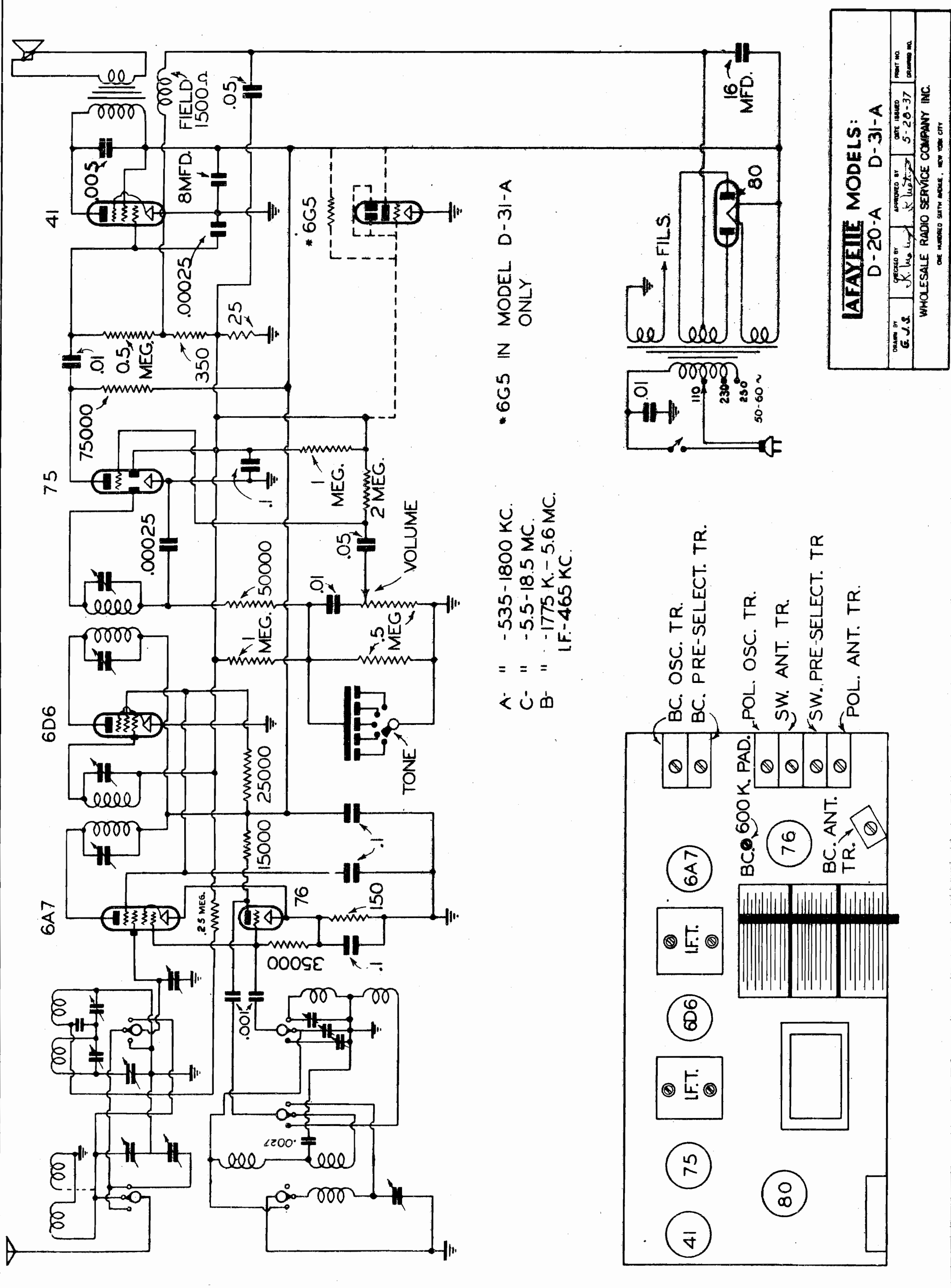
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



LOCATION OF PARTS ON TOP OF CHASSIS

LAFAYETTE RADIO MFG. CO.

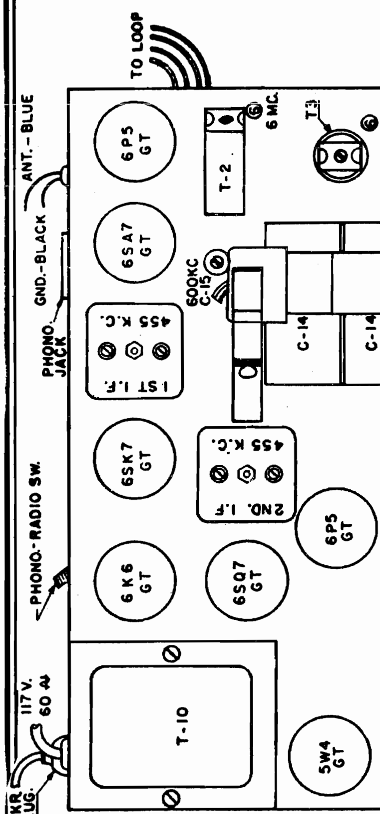
MODELS D-20-A, D-31-A

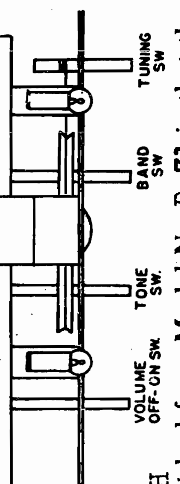


MODEL D-69
MODEL D-71

LATE

LAFAYETTE RADIO MFG. CO.





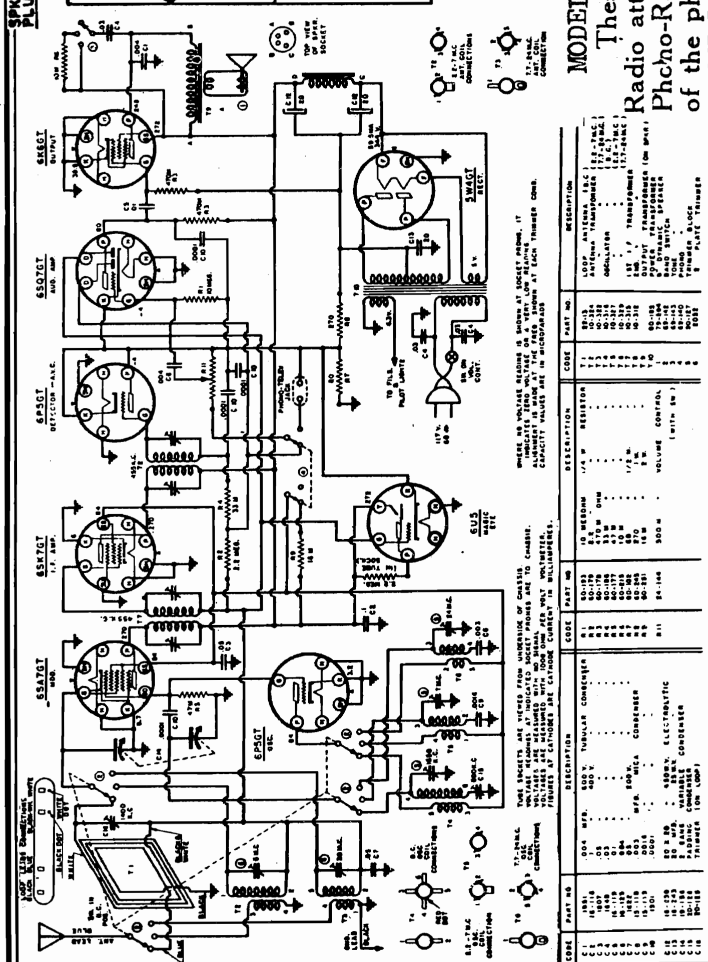
IF PEAK 455 KC

TUNING RANGE
540 to 1650 KC
2.22 to 7 MC
7.77 to 24 MC

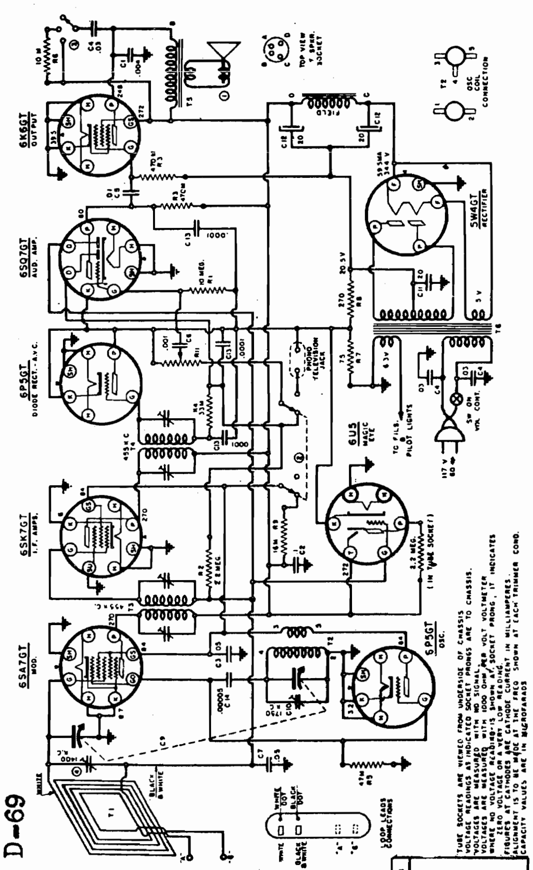
MODELS WITH PHONOGRAPH

These models are distinguished from Model No. D-71 in that the Phono-Radio attachment is wired thru a cable, directly to Phonograph unit. The Phcho-Radio switch will therefore be found mounted to the motor board of the phonograph instead of to the radio chassis.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



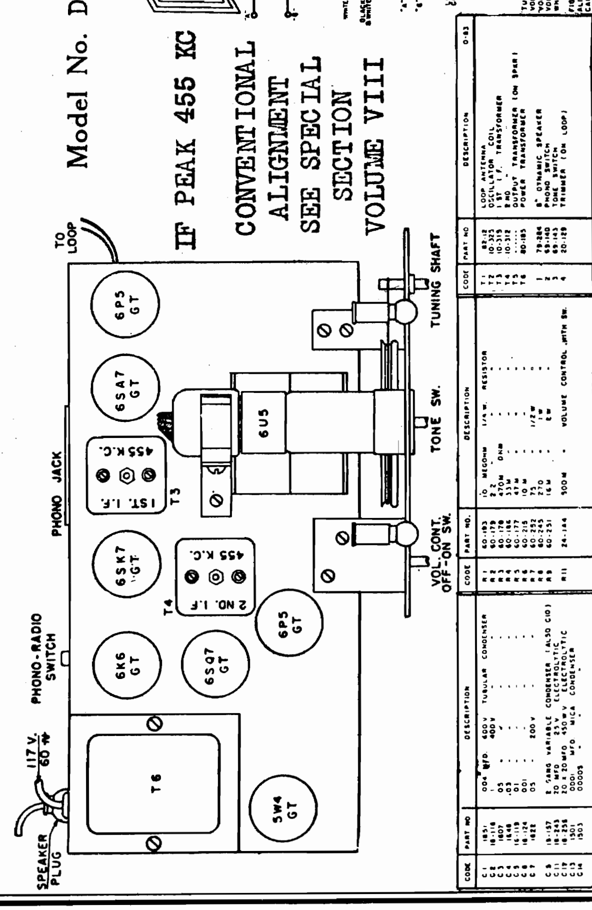
Model D-71



Model No. D-69

IF PEAK 455 KC

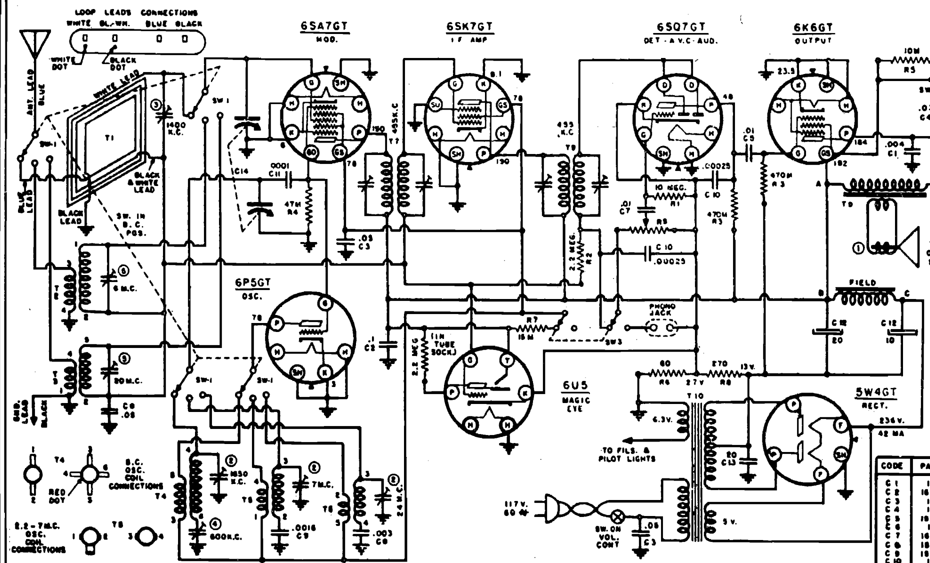
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



LAFAYETTE RADIO MFG. CO.

MODEL D-42
MODEL D-90

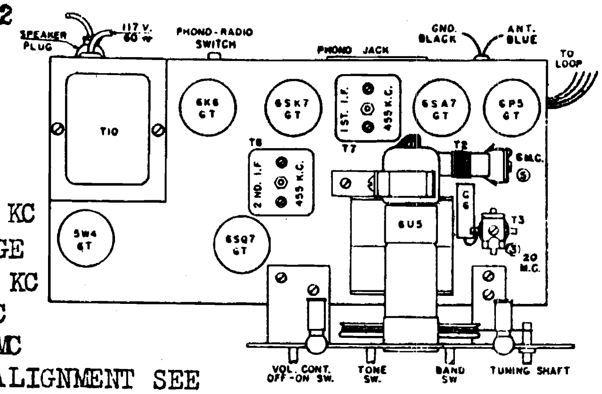
Model No. D-42



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES ARE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQ. SHOWN AT EACH TRIMMER COND.
CAPACITY VALUES ARE IN MICROFARADS

IF PEAK 455 KC
TUNING RANGE
540 to 1650 KC
2.22 to 7 MC
7.77 to 24 MC
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



CODE	PART NO.	DESCRIPTION
C1	1681	.004 MFD. 600V. TUBULAR CONDENSER
C2	16-116	.1 " 400V. " "
C3	1607	.05 " " " "
C4	1648	.03 " " " "
C5	19-119	.01 " " " "
C6	1622	.05 " 200V. " "
C7	16-121	.01 " " " "
C8	16-118	.003 MFD. MICA CONDENSER
C9	16-119	.0016 " " "
C10	1604	.00025 " " "
C11	1501	.0001 " " "
C12	18-284	20 X 10 " 350 W.V. ELECTROLYTIC
C13	16-243	20 MFD. 25 W.V. ELECTROLYTIC
C14	19-156	2 GANG VARIABLE CONDENSER

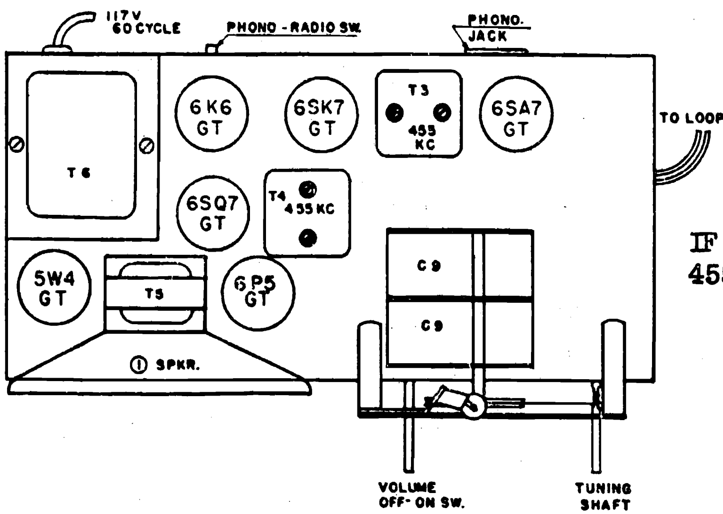
CODE	PART NO.	DESCRIPTION
R1	60-183	10 MEGOHM 1/4 W. RESISTOR
R2	60-178	2.2 " " "
R3	60-178	470M OHM " "
R4	60-177	47M " " "
R5	60-218	10M " " "
R6	60-182	60 " 1/2 W. "
R7	60-238	15M " 1 W. "
R8	60-245	270 " " "
R9	24-144	500M " VOLUME CONTROL
SW-1	69-142	BAND SWITCH
SW-2	68-143	TONE "
SW-3	69-140	PHONO "

CODE	PART NO.	DESCRIPTION D-79
T1	82-13	ANTENNA LOOP
T2	10-324	ANTENNA TRANSFORMER (2.2-7 M.C.)
T3	10-322	" " (7.7-24 M.C.)
T4	10-318	OSCILLATOR " (B.C.)
T5	10-327	" " (2.2-7 M.C.)
T6	10-329	" " (7.7-24 M.C.)
T7	10-313	1ST. I.F. TRANSFORMER
T8	10-312	2ND. I.F. "
T9	....	OUTPUT TRANS. (ON SPKR.)
T10	80-179	POWER TRANSFORMER
1	79-278	6 1/2" DYNAMIC SPKR.
2	20-127	TRIMMER BLOCK
3	20-125	TRIMMER (ON LOOP)
4	20-126	PADDING CONDENSER
5	2052	2 PLATE TRIMMER

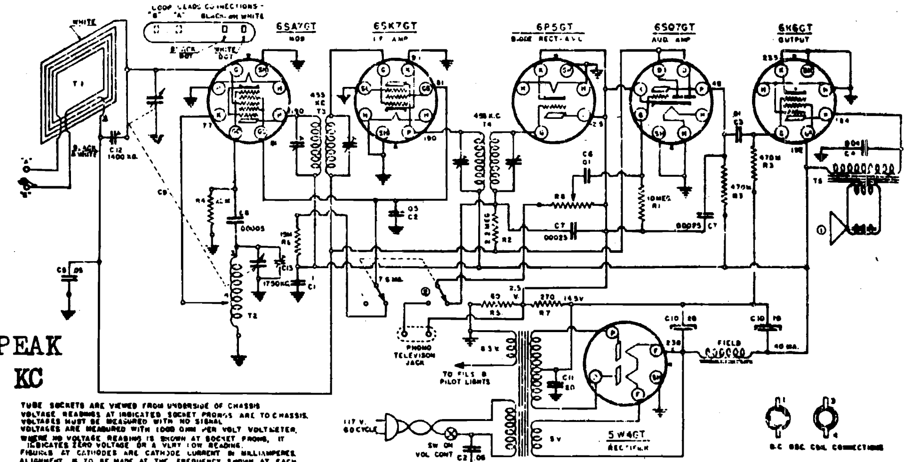
Model No. D-90

540 K. C. to 1750 K. C.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



IF PEAK
455 KC



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
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.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

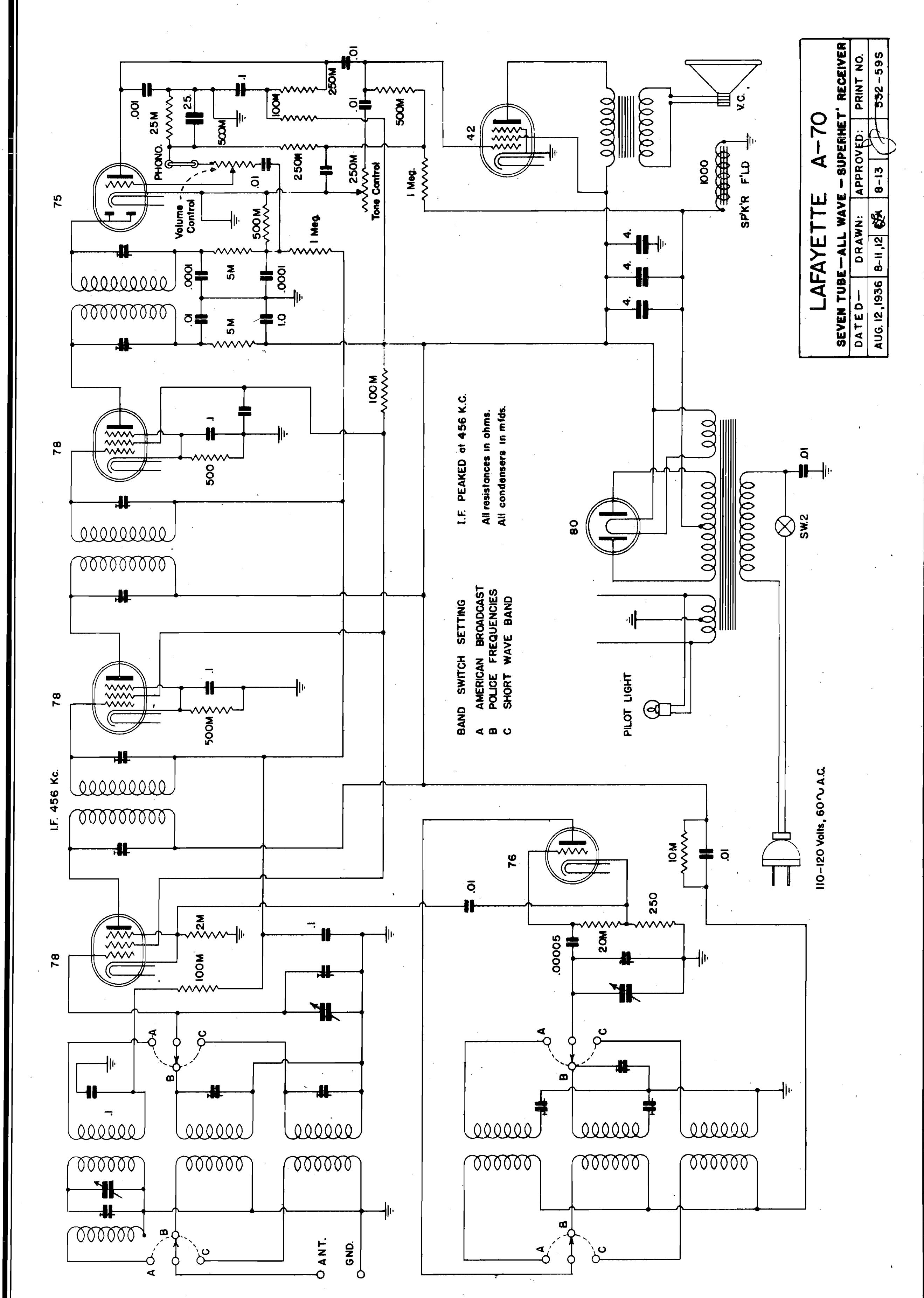
CODE	PART NO	DESCRIPTION
C1	16-116	.1 MFD 400V. TUBULAR CONDENSER
C2	1607	.05 " " " "
C3	16-119	.01 " " " "
C4	1671	.004 " 600V " "
C5	1622	.05 " 200V " "
C6	16-121	.01 " " " "
C7	1504	.00025" MICA CONDENSER
C8	1503	.00005" " "
C9	19-158	2 GANG VARIABLE CONDENSER(C13)
C10	18-234	20X 10 MFD. 350 W.V. ELECTROLYTIC
C11	10-243	20 MFD. 25V. ELECTROLYTIC
C12	20-129	TRIMMER (ON LOOP)

CODE	PART NO	DESCRIPTION
R1	60-183	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470M OHM
R4	60-185	22 M
R5	60-182	60 1/2 W.
R6	60-236	15 M 1 W.
R7	60-245	270 "
R8	24-146	500 M VOLUME CONTROL (WITH SW)

CODE	PART NO.	DESCRIPTION D-67
T1	82-10	LOOP ANTENNA
T2	10-311	B.C. OSCILLATOR COIL
T3	10-317	1ST. I.F. TRANSFORMER
T4	10-312	2ND I.F. TRANSFORMER
T5		OUTPUT TRANSFORMER (ON SPKR)
T6	86-179	POWER TRANSFORMER
1	78-275	5" DYNAMIC SPEAKER
2	69-140	PHONO SWITCH

MODEL A-70

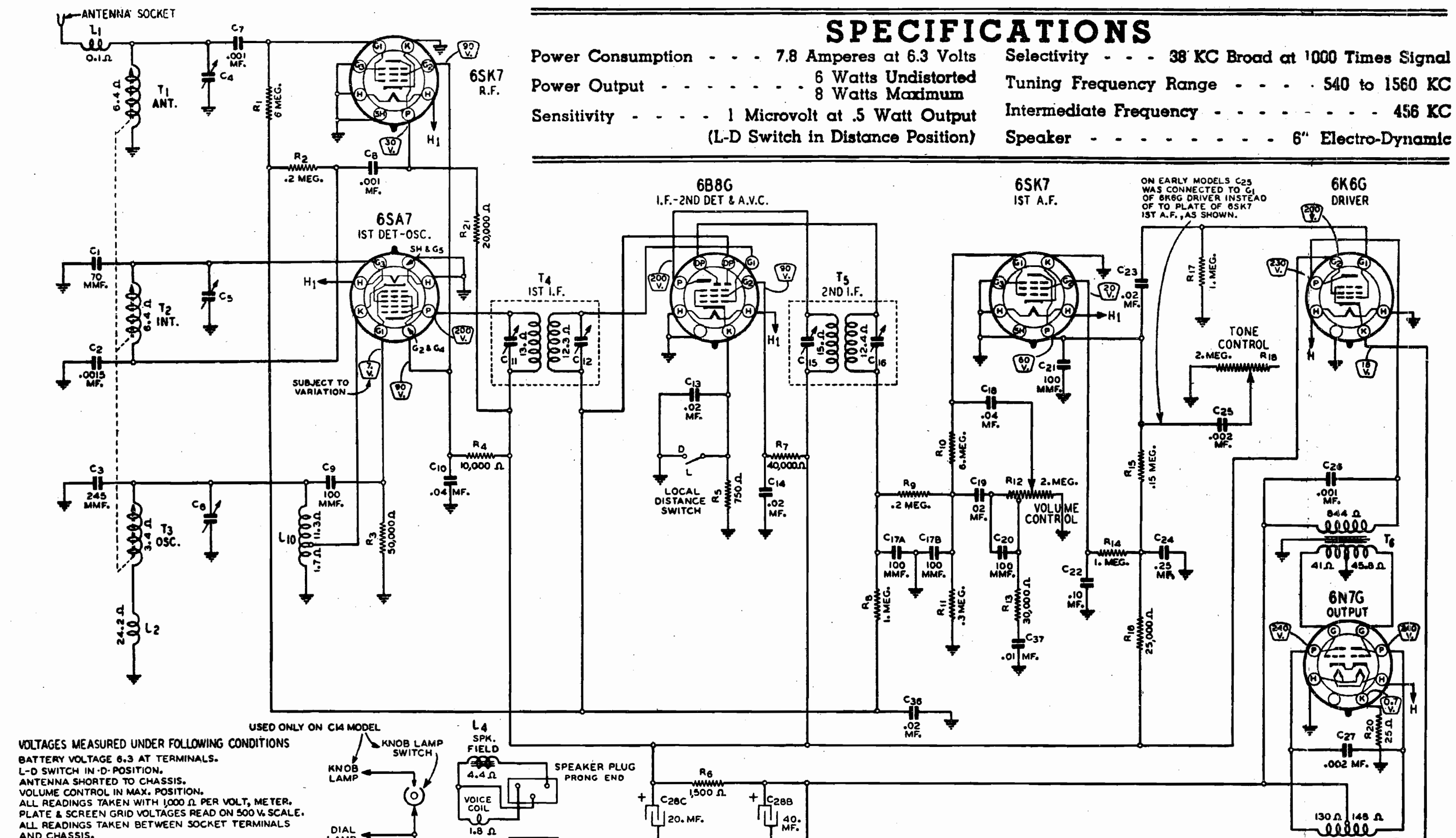
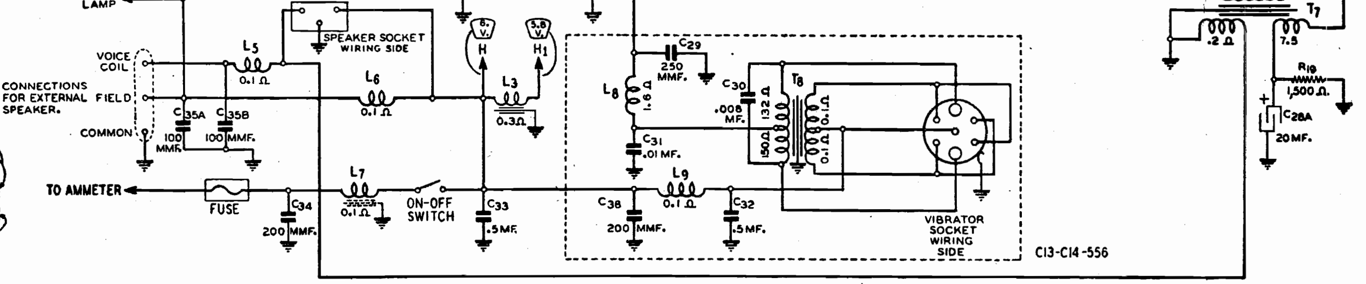
LAFAYETTE RADIO MFG. CO.



LAFAYETTE RADIO MFG. CO.

SPECIFICATIONS

Power Consumption	7.8 Amperes at 6.3 Volts
Power Output	6 Watts Undistorted 8 Watts Maximum
Sensitivity	1 Microvolt at .5 Watt Output (L-D Switch in Distance Position)
Selectivity	38 KC Broad at 1000 Times Signal
Tuning Frequency Range	540 to 1560 KC
Intermediate Frequency	456 KC
Speaker	6" Electro-Dynamic

VOLTAGES MEASURED UNDER FOLLOWING CONDITIONS
BATTERY VOLTAGE 6.3 AT TERMINALS.
L-D SWITCH IN ·D· POSITION.
ANTENNA SHORTED TO CHASSIS.
VOLUME CONTROL IN MAX. POSITION.
ALL READINGS TAKEN WITH 1,000 Ω PER VOLT, METER.
PLATE & SCREEN GRID VOLTAGES READ ON 500 V. SCALE.
ALL READINGS TAKEN BETWEEN SOCKET TERMINALS AND CHASSIS.

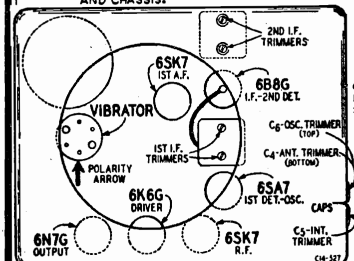
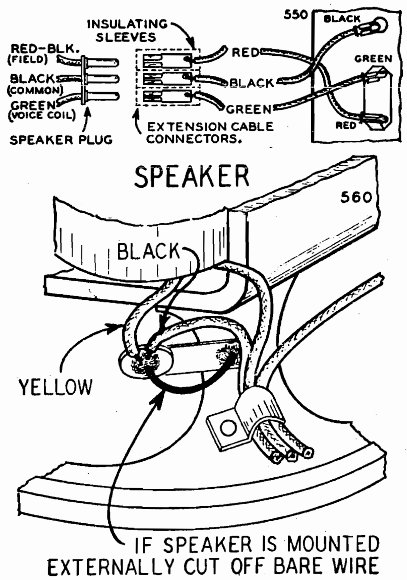


Fig. 5—Location of Tubes and Vibrator

MODEL BB-75

LAFAYETTE RADIO MFG. CO.



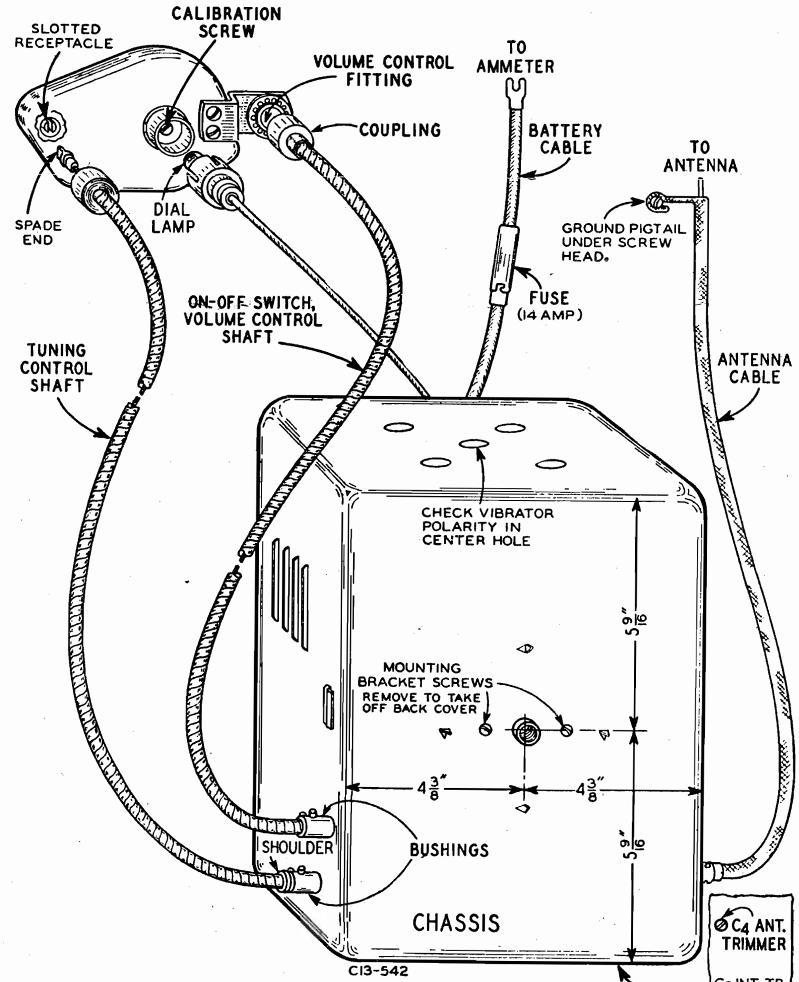


Fig. 3—General Installation View

Calibrating the Radio

To calibrate the radio, tune in a station of known frequency. Remove the dial lamp assembly from the back of the control unit. The calibration screw is at the bottom of the dial lamp tube. Hold the tuning knob. Insert a fine bladed screwdriver and turn this screw until the pointer is at the frequency of the station being received.

A short insulated screwdriver will be helpful.

ALIGNMENT PROCEDURE

Remove Grille, Speaker, Trimmer Caps and Rear Cover From Chassis Case—(See Figs. 3 and 5).

Volume Control—Maximum All Adjustments.

Local-Distance Switch—"Distance" Position.

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:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antenna—.05 mf., See Note A.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	IRON CORE SETTING	ADJUST TRIMMERS TO MAXIMUM (See Figs. 3 and 5)
I.F.				
456 KC	Control Grid (prong No. 8) 6SA7 1st Det. Tube	.05 mf.		1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
OSCILLATOR				
1560 KC	Antenna Cable See Note A	See Note A	Extreme Position out of Coil	Oscillator (C6)
1000 KC ADJUSTMENT				
1000 KC	Antenna Cable	See Note A	Tune to Max. Output with Tuning Knob	Int. (C5) Ant. (C4)

Reassemble Radio—Install in Car—Connect Car Antenna to Radio.

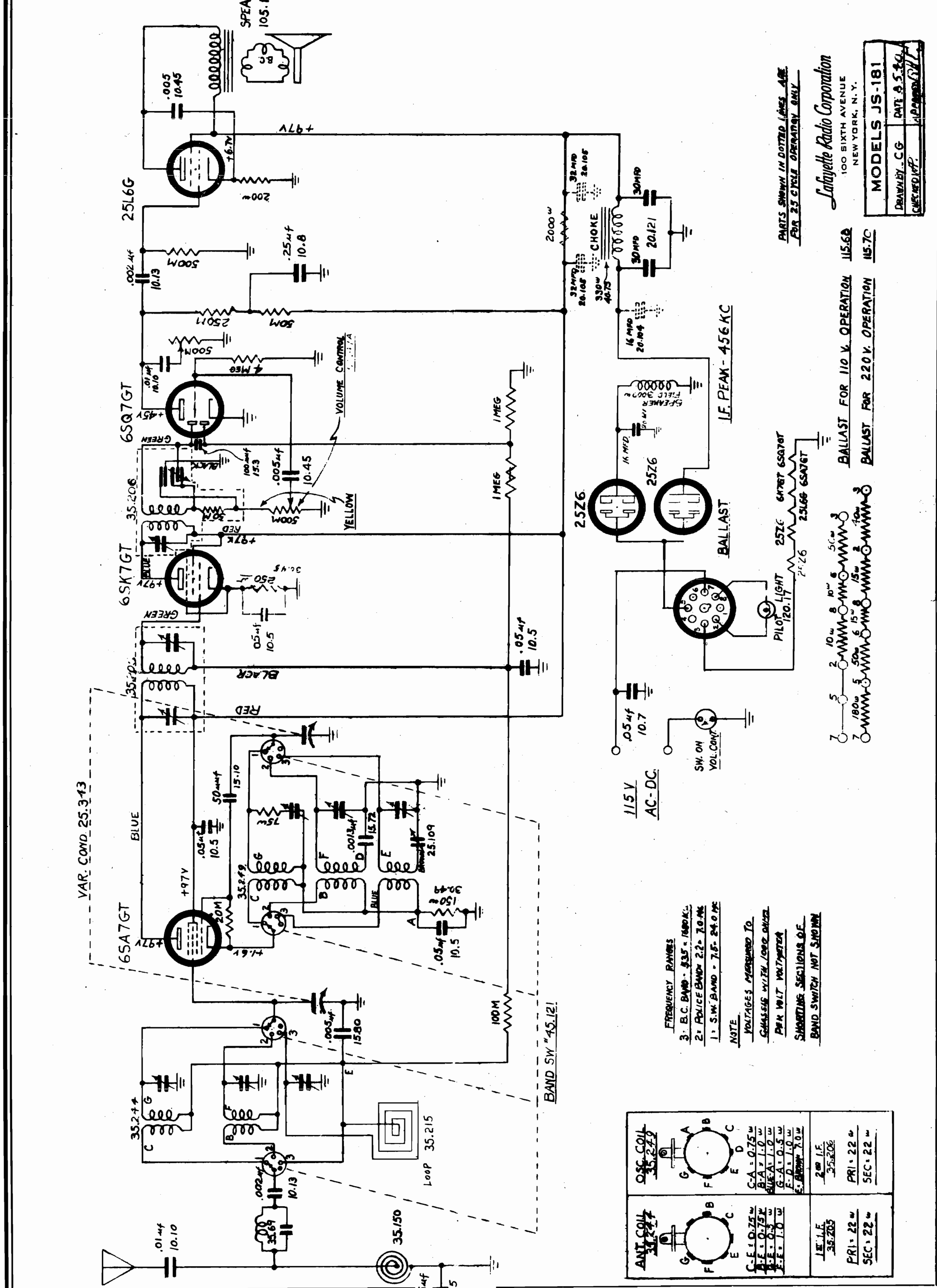
Car Antenna Readjustment—Tune in weak signal near 1000 KC—Readjust Antenna Trimmer C4 for maximum output.

NOTE A—Insert the antenna cable plug in the antenna socket on the chassis. The total capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 30 mmf., use a 30 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.

CALIBRATION—To calibrate the radio, tune in a station of known frequency. At the back of the control unit is the calibration screw. Remove the dial lamp assembly. Hold the tuning knob. Insert a fine bladed screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received.

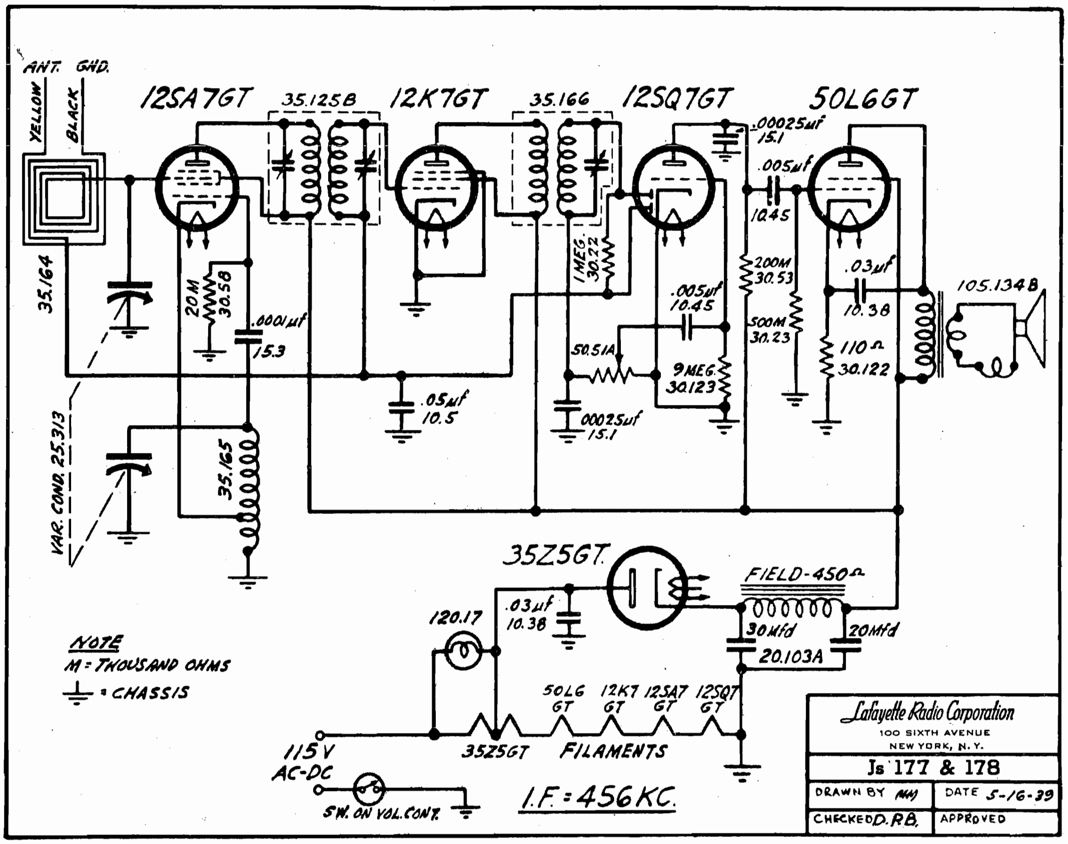
LAFAYETTE RADIO MFG. CO.

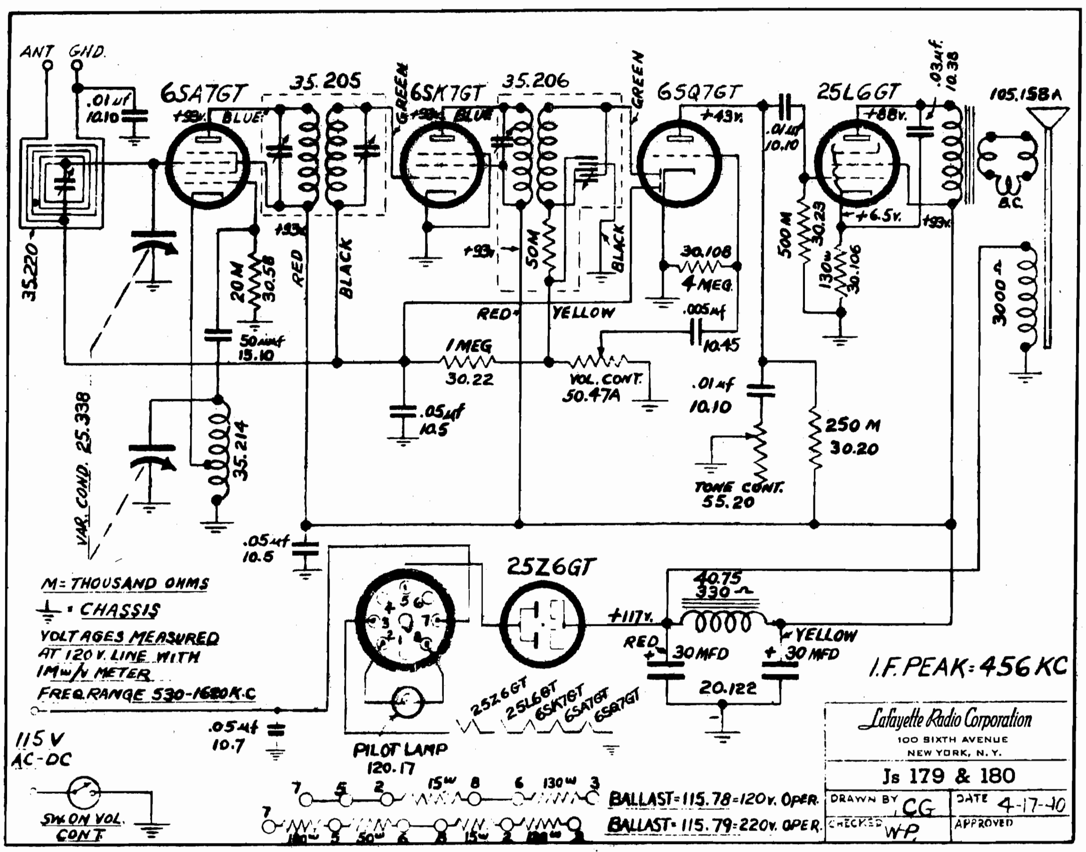
MODEL JS-181

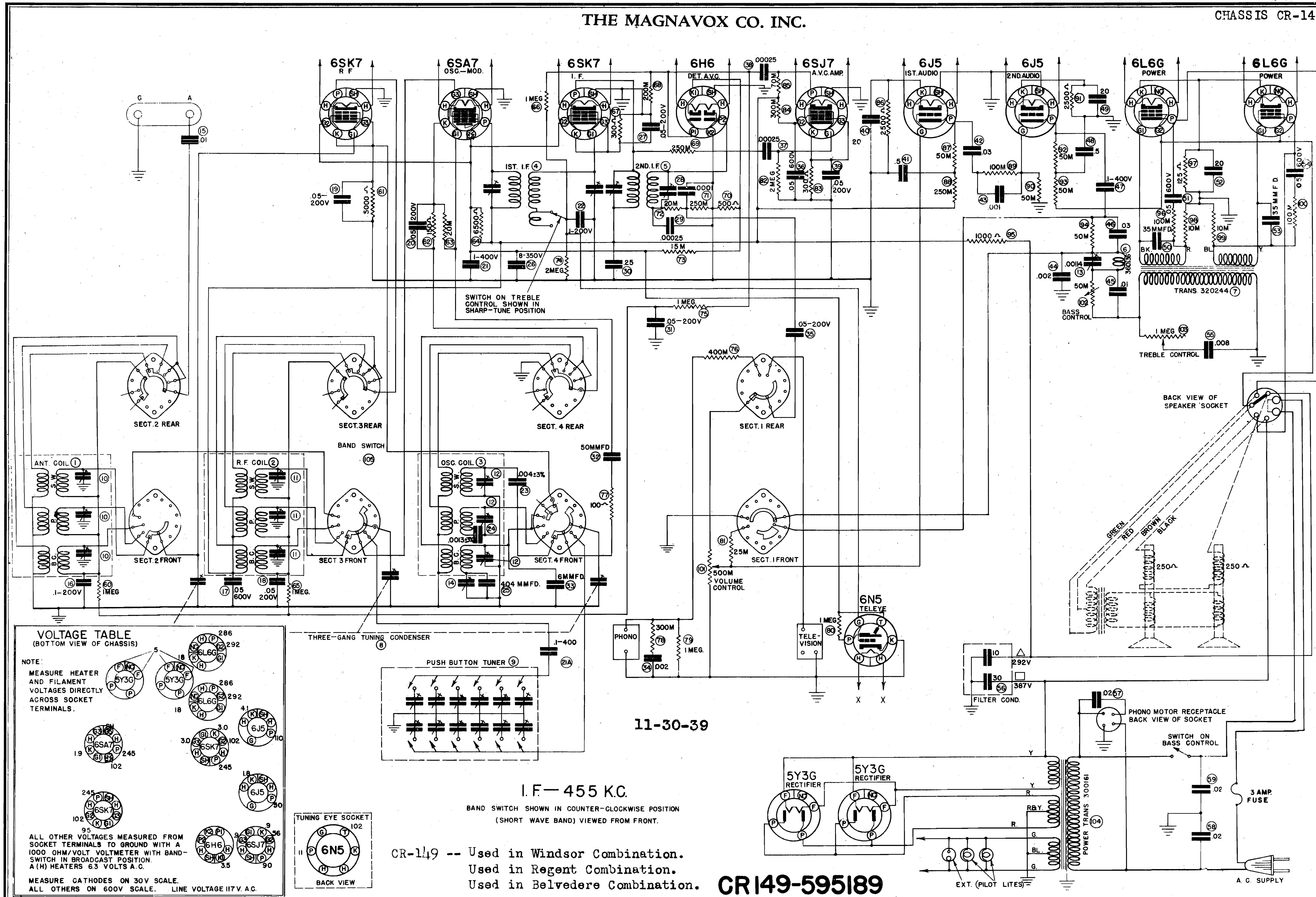


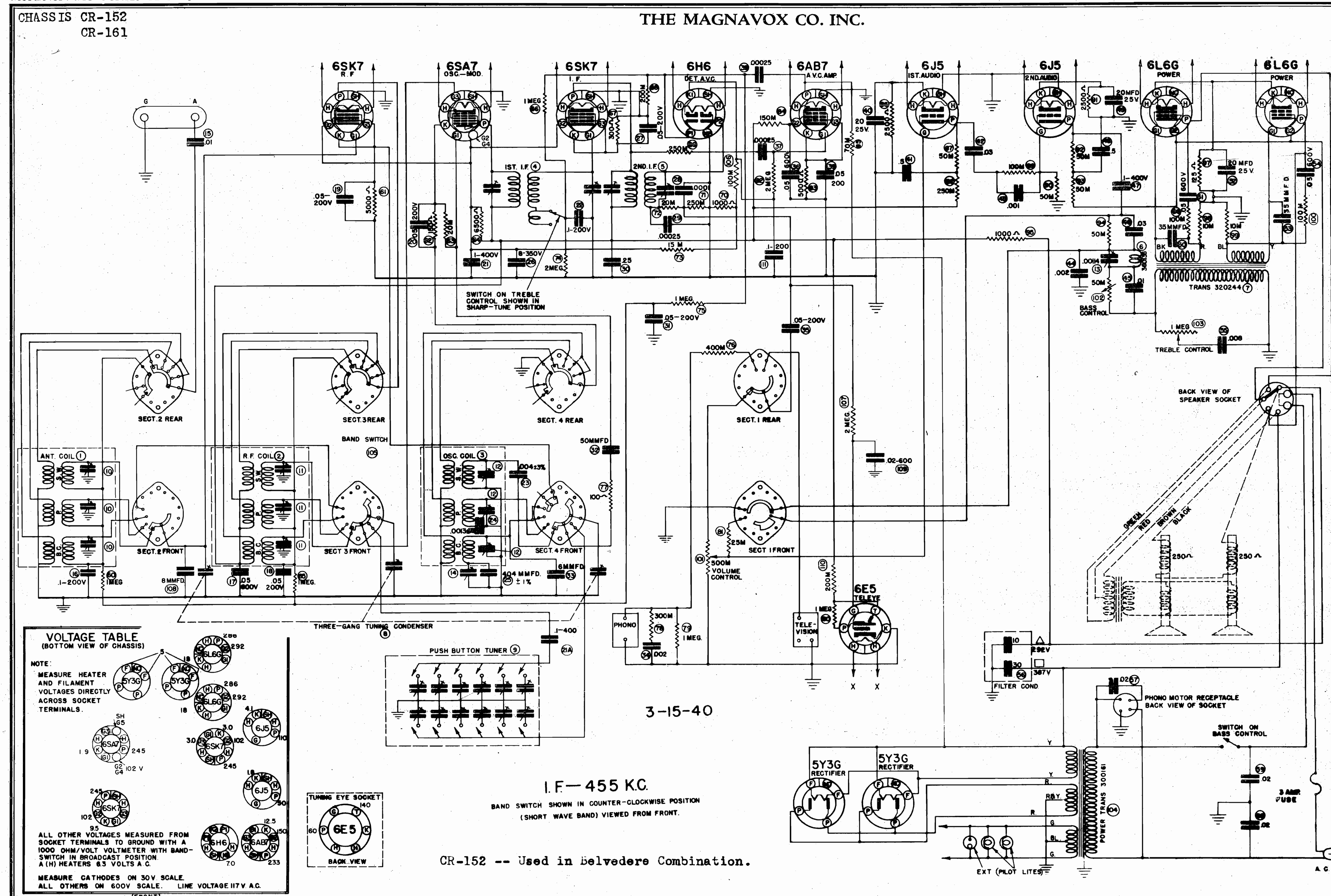
MODELS JS177, JS178
MODELS JS179, JS180

LAFAYETTE RADIO MFG. CO.






THE MAGNAVOX CO. INC.
CHASSIS CR-149
6SK7 R F
6SA7 OSC.-MOD.
6SK7 I. F.
6H6 DET. A.V.C.
6SJ7 A.V.C. AMP.
6J5 IST. AUDIO
6J5 2ND. AUDIO
6L6G POWER
6L6G POWER
IST. I.F.
2ND. I.F.
SWITCH ON TREBLE CONTROL SHOWN IN SHARP-TUNE POSITION
TRANS. 320244
BASS CONTROL
TREBLE CONTROL
BACK VIEW OF SPEAKER SOCKET
GREEN
RED
BROWN
BLACK
SECT. 2 REAR
SECT. 3 REAR
SECT. 4 REAR
SECT. 1 REAR
BAND SWITCH
ANT. COIL
R.F. COIL
OSC. COIL
SECT. 2 FRONT
SECT. 3 FRONT
SECT. 4 FRONT
SECT. 1 FRONT
VOLUME CONTROL
6N5 TELEYE
PHONO
TELE-VISION
THREE-GANG TUNING CONDENSER
PUSH BUTTON TUNER
FILTER COND.
PHONO MOTOR RECEPTACLE BACK VIEW OF SOCKET
SWITCH ON BASS CONTROL
3 AMP. FUSE
POWER TRANS. 300161
5Y3G RECTIFIER
5Y3G RECTIFIER
EXT. (PILOT LITES)
A. C. SUPPLY
11-30-39
VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)
NOTE:
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BAND-SWITCH IN BROADCAST POSITION.
A (H) HEATERS 6.3 VOLTS A.C.
MEASURE CATHODES ON 30V SCALE.
ALL OTHERS ON 600V SCALE. LINE VOLTAGE 117V. A.C.
(FRONT)
TUNING EYE SOCKET
BACK VIEW
I. F.— 455 K.C.
BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION (SHORT WAVE BAND) VIEWED FROM FRONT.
CR-149 -- Used in Windsor Combination.
Used in Regent Combination.
Used in Belvedere Combination.
CR149-595189


CHASSIS CR-152
CR-161
THE MAGNAVOX CO. INC.
6SK7 R.F.
6SA7 OSC.—MOD.
6SK7 I.F.
6H6 DET. A.V.C.
6AB7 A.V.C. AMP.
6J5 1ST. AUDIO
6J5 2ND. AUDIO
6L6G POWER
6L6G POWER
SWITCH ON TREBLE CONTROL SHOWN IN SHARP-TUNE POSITION
SECT. 2 REAR
SECT. 3 REAR
SECT. 4 REAR
SECT. 1 REAR
BAND SWITCH
ANT. COIL
R.F. COIL
OSC. COIL
SECT. 2 FRONT
SECT. 3 FRONT
SECT. 4 FRONT
SECT. 1 FRONT
THREE-GANG TUNING CONDENSER
PUSH BUTTON TUNER
500M VOLUME CONTROL
PHONO
TELE-VISION
6E5 TELEYE
TRANS 320244
BASS CONTROL
TREBLE CONTROL
BACK VIEW OF SPEAKER SOCKET
GREEN
RED
BROWN
BLACK
FILTER COND
PHONO MOTOR RECEPTACLE BACK VIEW OF SOCKET
SWITCH ON BASS CONTROL
3 AMP. FUSE
5Y3G RECTIFIER
5Y3G RECTIFIER
POWER TRANS 300161
EXT (PILOT LITES)
A.C. SUPPLY
VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)
NOTE:
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BAND-SWITCH IN BROADCAST POSITION.
A (H) HEATERS 6.3 VOLTS A.C.
MEASURE CATHODES ON 30V SCALE.
ALL OTHERS ON 600V SCALE. LINE VOLTAGE 117 V. A.C.
(FRONT)
TUNING EYE SOCKET
BACK VIEW
3-15-40
I.F.—455 K.C.
BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION
(SHORT WAVE BAND) VIEWED FROM FRONT.
CR-152 -- Used in Belvedere Combination.

THE MAGNAVOX CO. INC.

CHASSIS CR-149

SPECIFICATIONS

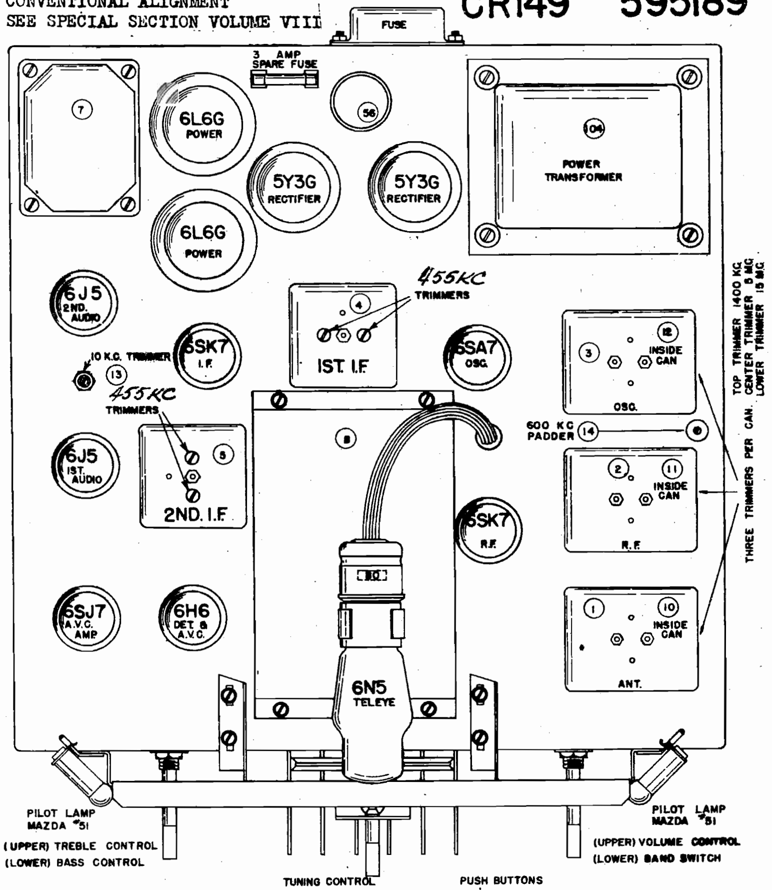
Primary voltage..117 V. AC; Intermediate frequency..............455 KC;
Power consumption180 watts; Tuning frequency range: 535 - 1720 KC; 1667 - 5680 KC; 5.6 - 18.4 MC;

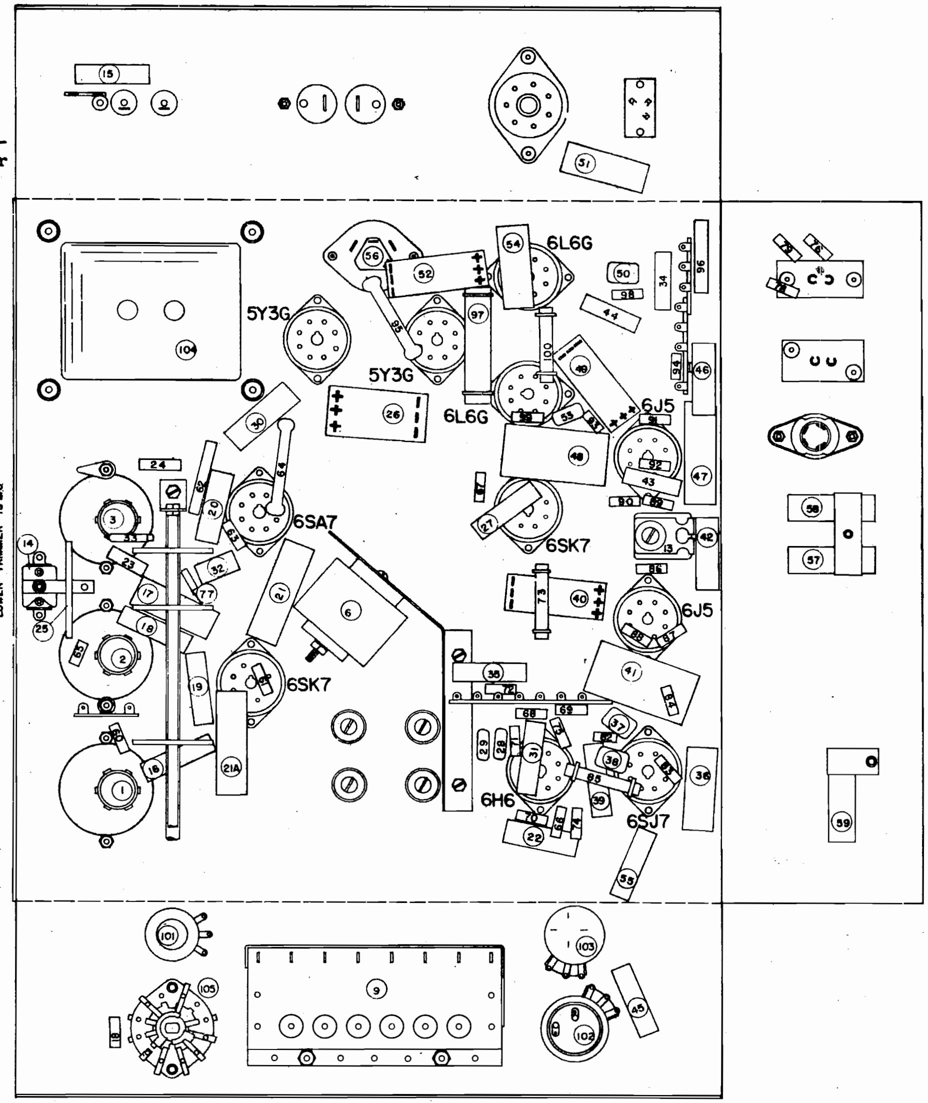
Speaker (120131):
Field Coil...250 ohms;
Transformer..NONE
Speaker (302):
Field Coil...250 ohms;
Transformer.. 5M ohms;
(for dual speakers)

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, A.V.C., inverse feedback circuit, bass compensation in volume control for phonograph pickup, push button condenser-type tuner temperature stabilized.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

CR149 595189





CHASSIS CR-152
CR-161

THE MAGNAVOX CO. INC.

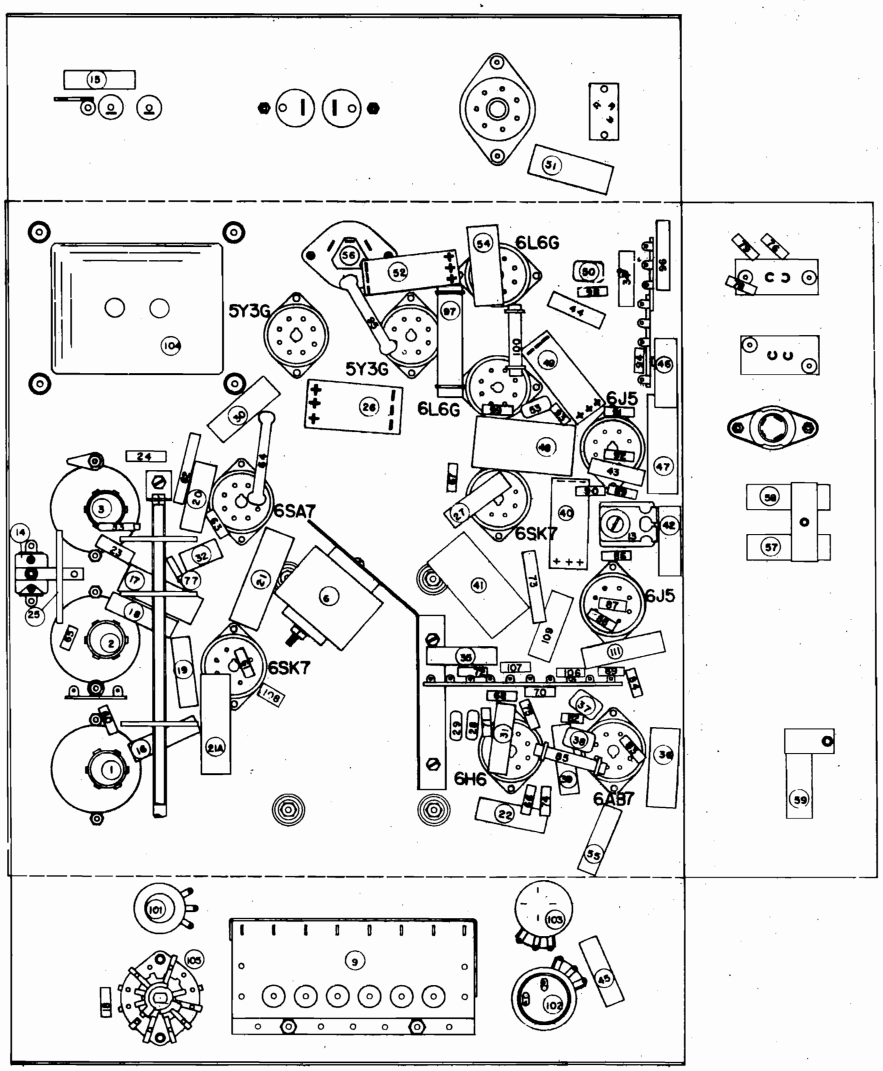
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.
BE SURE THAT THE BAND EXPANDER SWITCH IS SET IN "SHARP-TUNE" POSITION, WHEN ALIGNING THE SET. THIS IS DONE BY ROTATING THE TREBLE CONTROL TO THE LEFT AS FAR AS POSSIBLE.

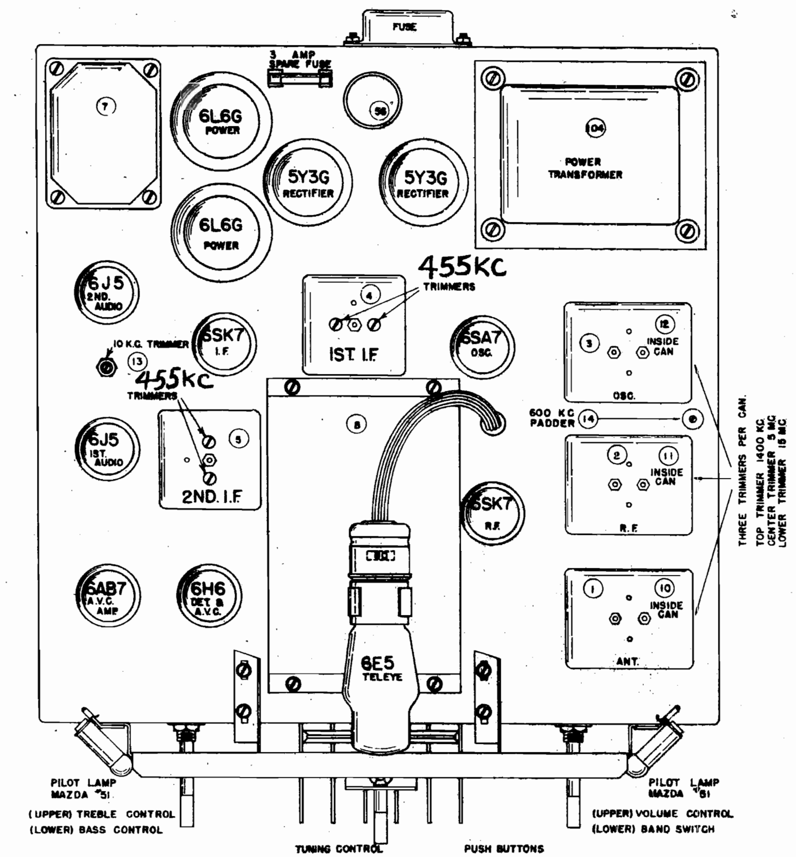
SPECIFICATIONS

Primary voltage.........117 V. AC; Intermediate frequency.............455 KC;
Power consumption.......180 watts; Tuning frequency range: 535 - 1720 KC; 1667 - 1720 KC; 5.6 - 18.4 MC;

Speaker (12C131):
Field Coil......... 250 ohms;
Transformer........ NONE
Speaker (302):
Field Coil......... 250 ohms;
Transformer........ 5M ohms;
(for dual speakers)

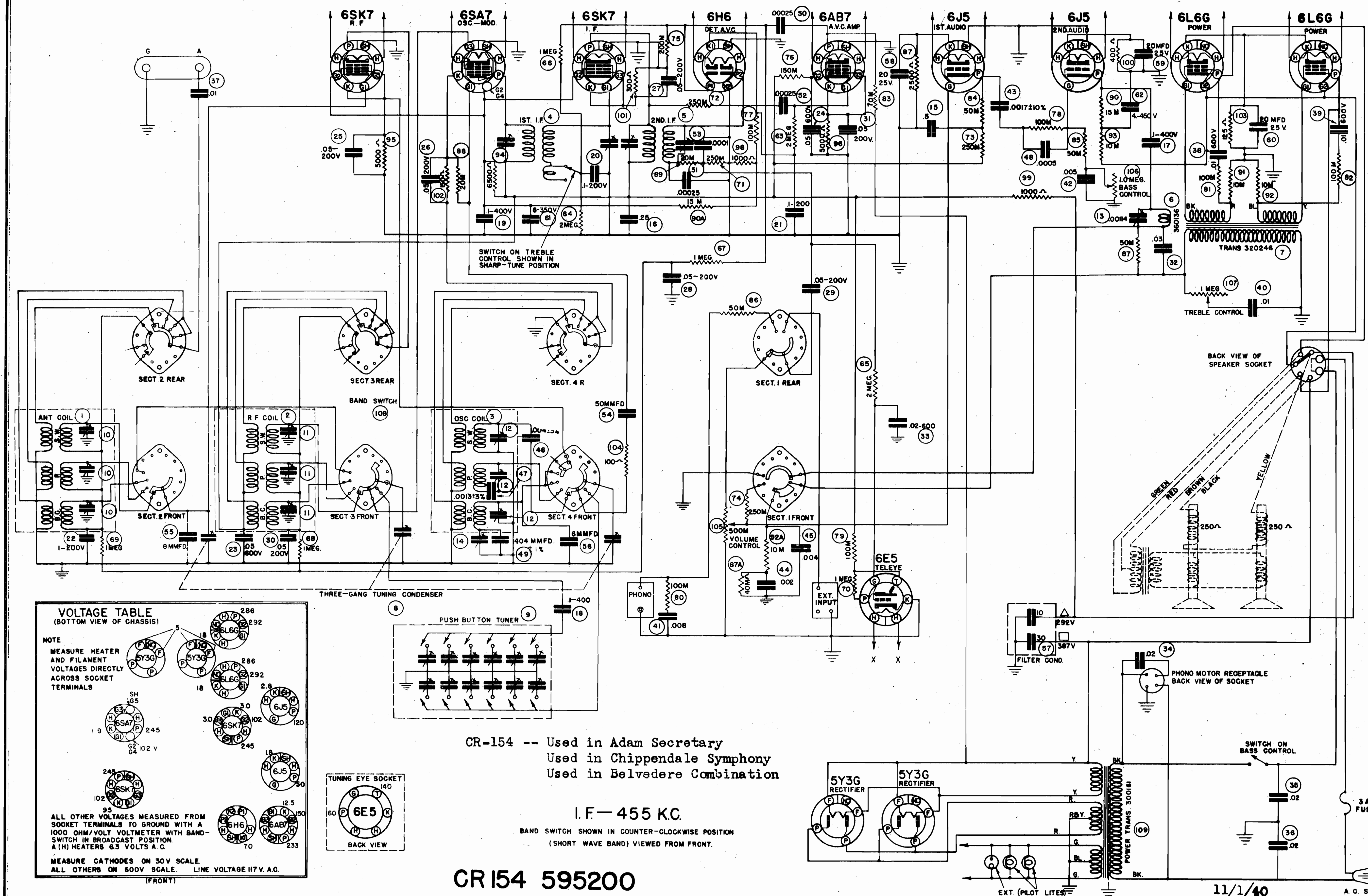
Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, amplified A.V.C., inverse feedback circuit, bass compensation in volume control for phonograph pickup, push button condenser-type tuner temperature stabilized.





CR152 595195

THE MAGNAVOX CO. INC.



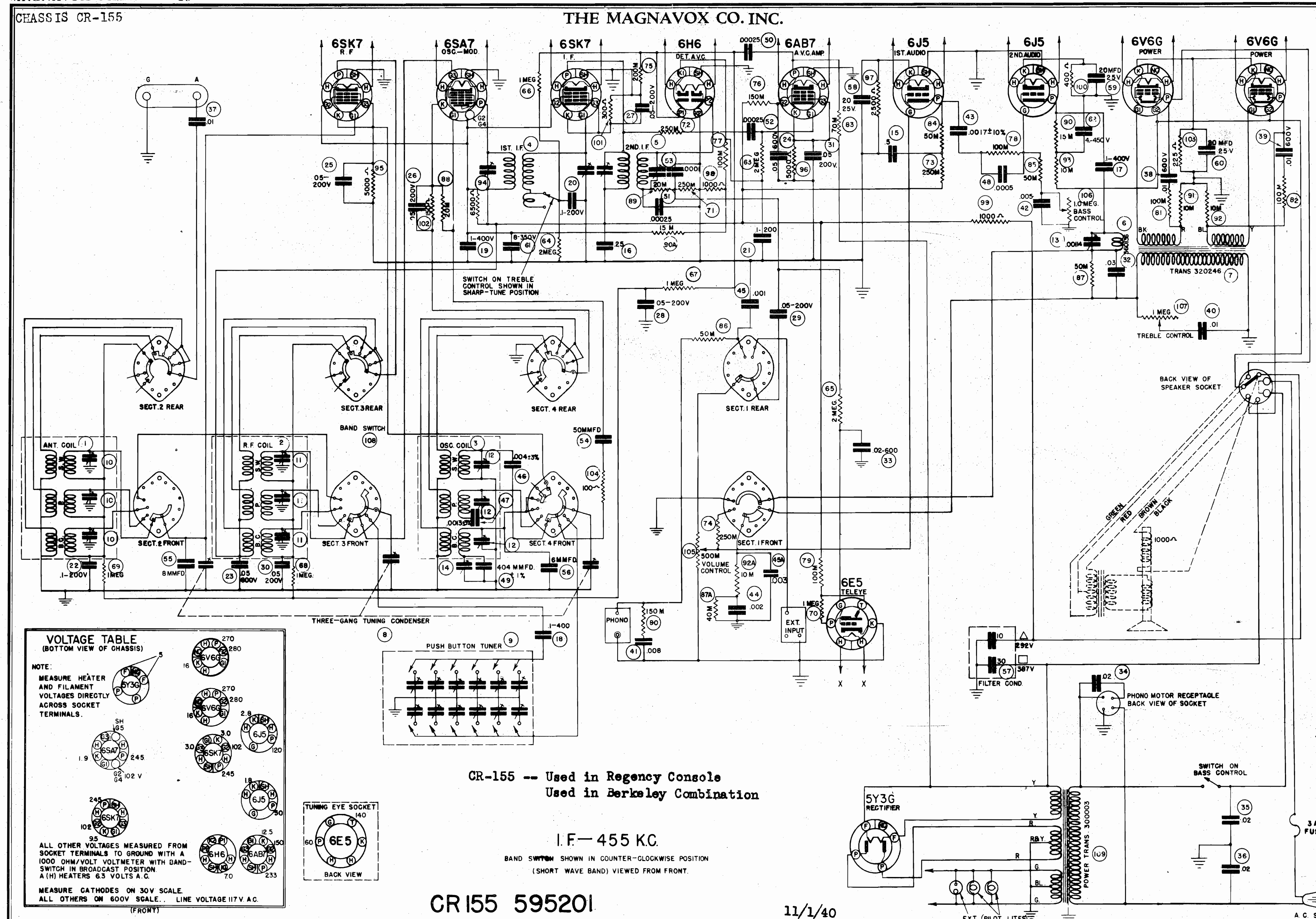
CR-154 -- Used in Adam Secretary
Used in Chippendale Symphony
Used in Belvedere Combination

I.F.— 455 K.C.

BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION (SHORT WAVE BAND) VIEWED FROM FRONT.

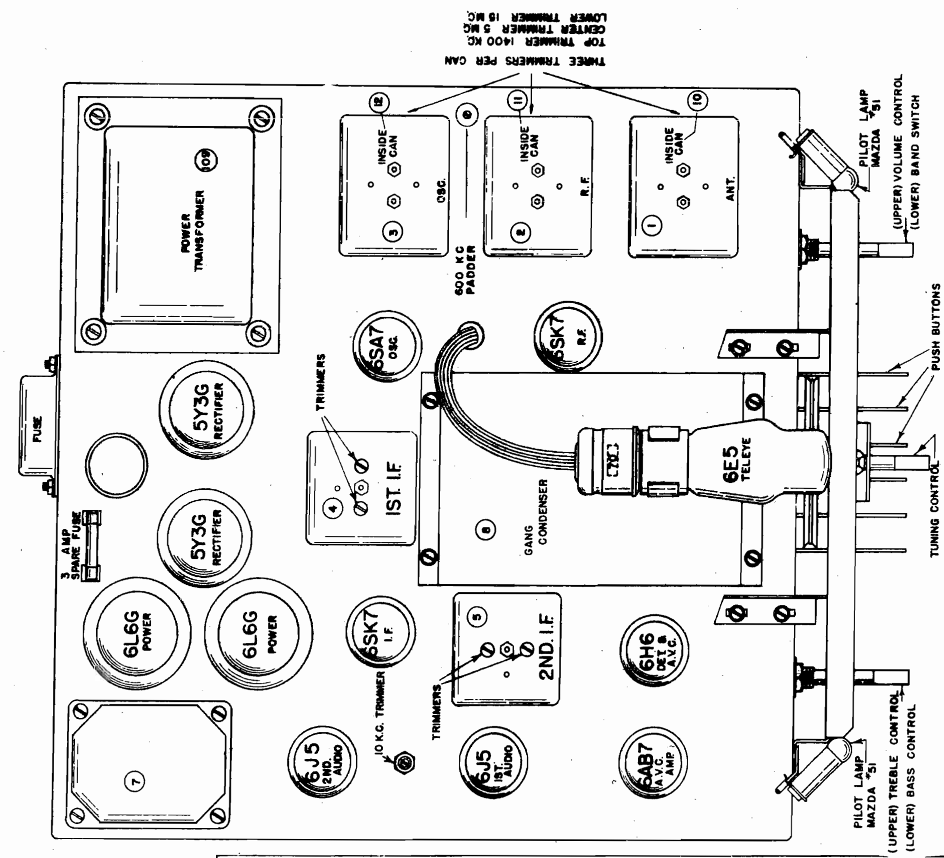
CR154 595200

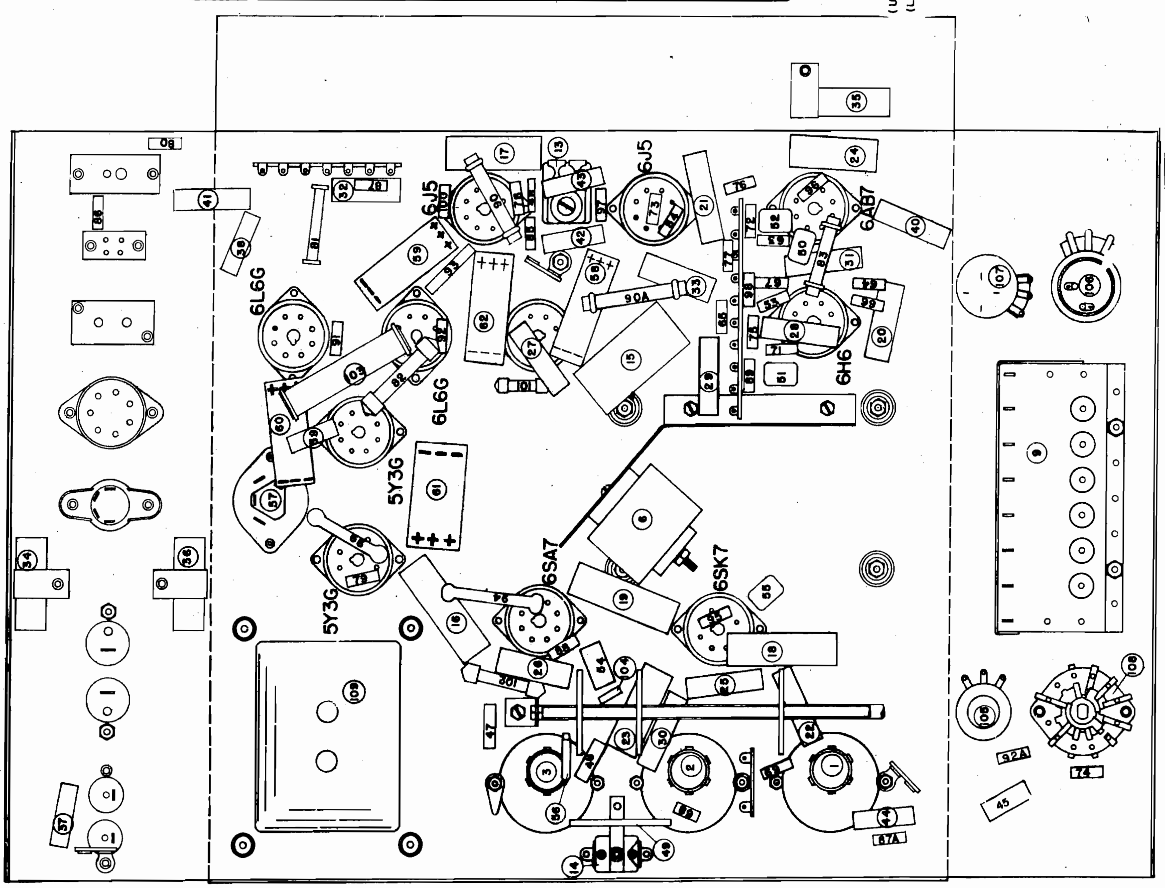
11/1/40


CHASSIS CR-155
THE MAGNAVOX CO. INC.
6SK7 R.F.
6SA7 OSC.-MOD.
6SK7 I.F.
6H6 DET. A.V.C.
6AB7 A.V.C. AMP
6J5 1ST. AUDIO
6J5 2ND. AUDIO
6V6G POWER
6V6G POWER
SWITCH ON TREBLE CONTROL SHOWN IN SHARP-TUNE POSITION
TRANS 320246
TREBLE CONTROL
BACK VIEW OF SPEAKER SOCKET
SECT. 2 REAR
SECT. 3 REAR
SECT. 4 REAR
SECT. 1 REAR
BAND SWITCH
ANT. COIL
R.F. COIL
OSC. COIL
SECT. 2 FRONT
SECT. 3 FRONT
SECT. 4 FRONT
SECT. 1 FRONT
THREE-GANG TUNING CONDENSER
PUSH BUTTON TUNER
VOLUME CONTROL
PHONO
EXT. INPUT
6E5 TELEYE
FILTER COND.
PHONO MOTOR RECEPTACLE BACK VIEW OF SOCKET
GREEN
RED
BROWN
BLACK
VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)
NOTE:
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BAND-SWITCH IN BROADCAST POSITION.
A (H) HEATERS 6.3 VOLTS A.C.
MEASURE CATHODES ON 30V SCALE.
ALL OTHERS ON 600V SCALE.. LINE VOLTAGE 117 V A.C.
(FRONT)
TUNING EYE SOCKET
BACK VIEW
CR-155 -- Used in Regency Console
Used in Berkeley Combination
I.F. — 455 K.C.
BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION
(SHORT WAVE BAND) VIEWED FROM FRONT.
CR155 595201
11/1/40
5Y3G RECTIFIER
POWER TRANS. 300003
SWITCH ON BASS CONTROL
3 AMP. FUSE
A.C. SUPPLY
EXT (PILOT LITES)

THE MAGNAVOX CO. INC.

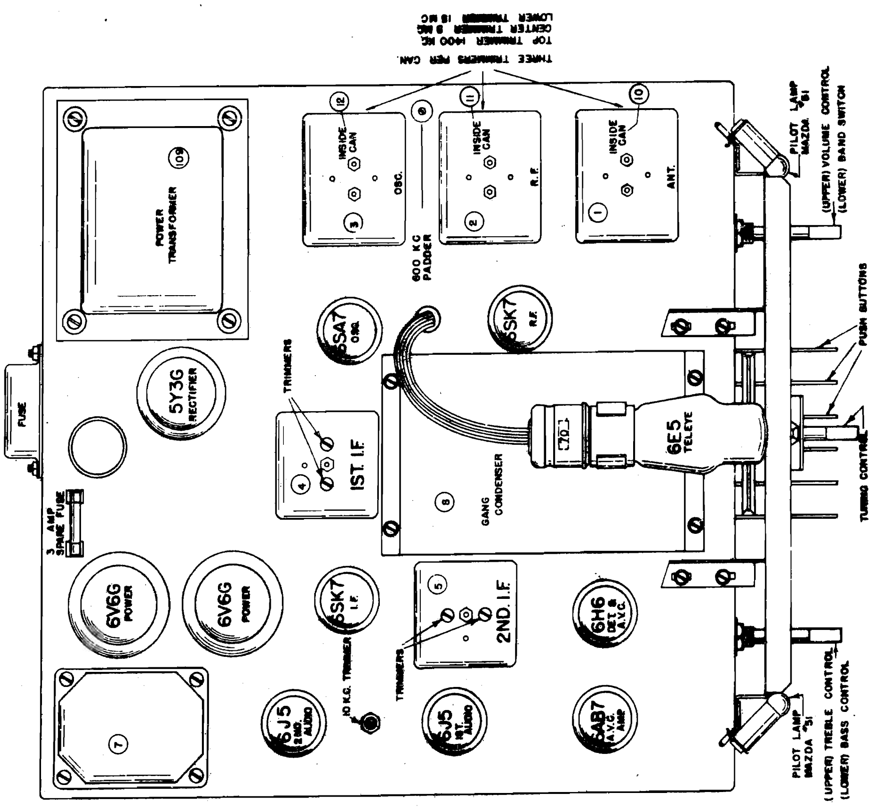
CHASSIS CR-154

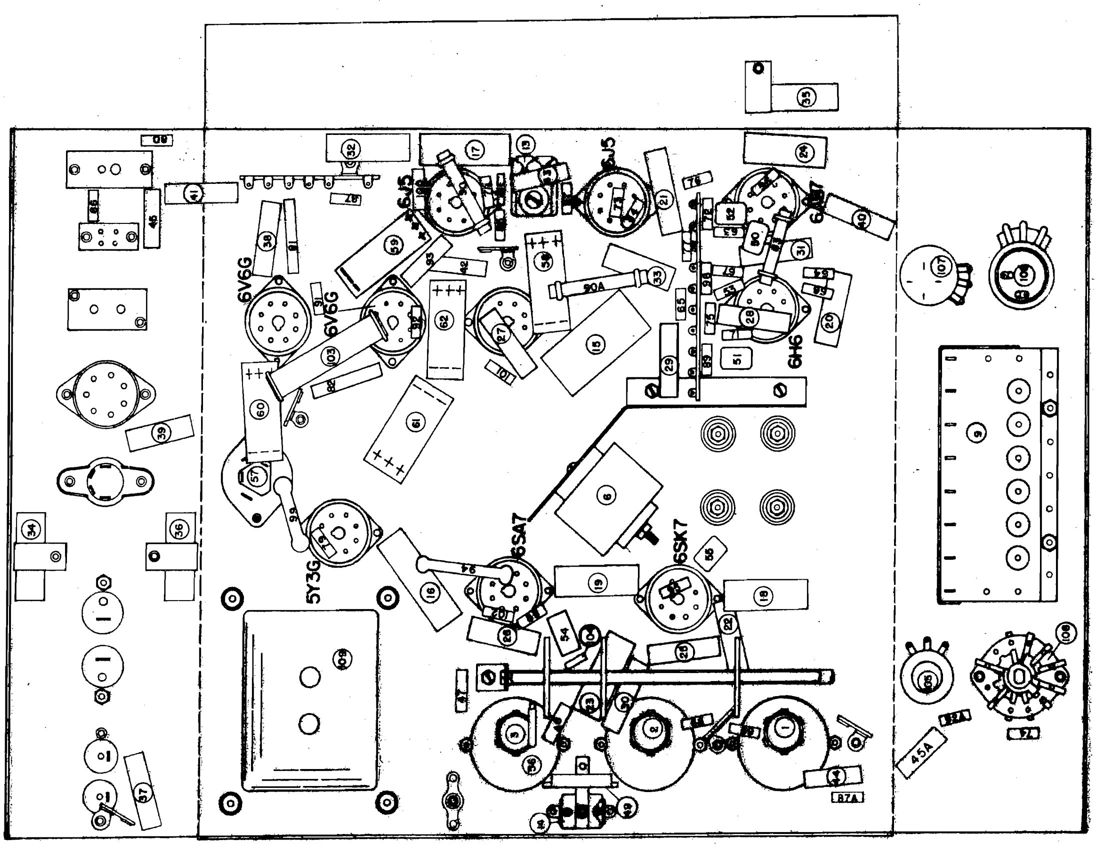




CHASSIS CR-155

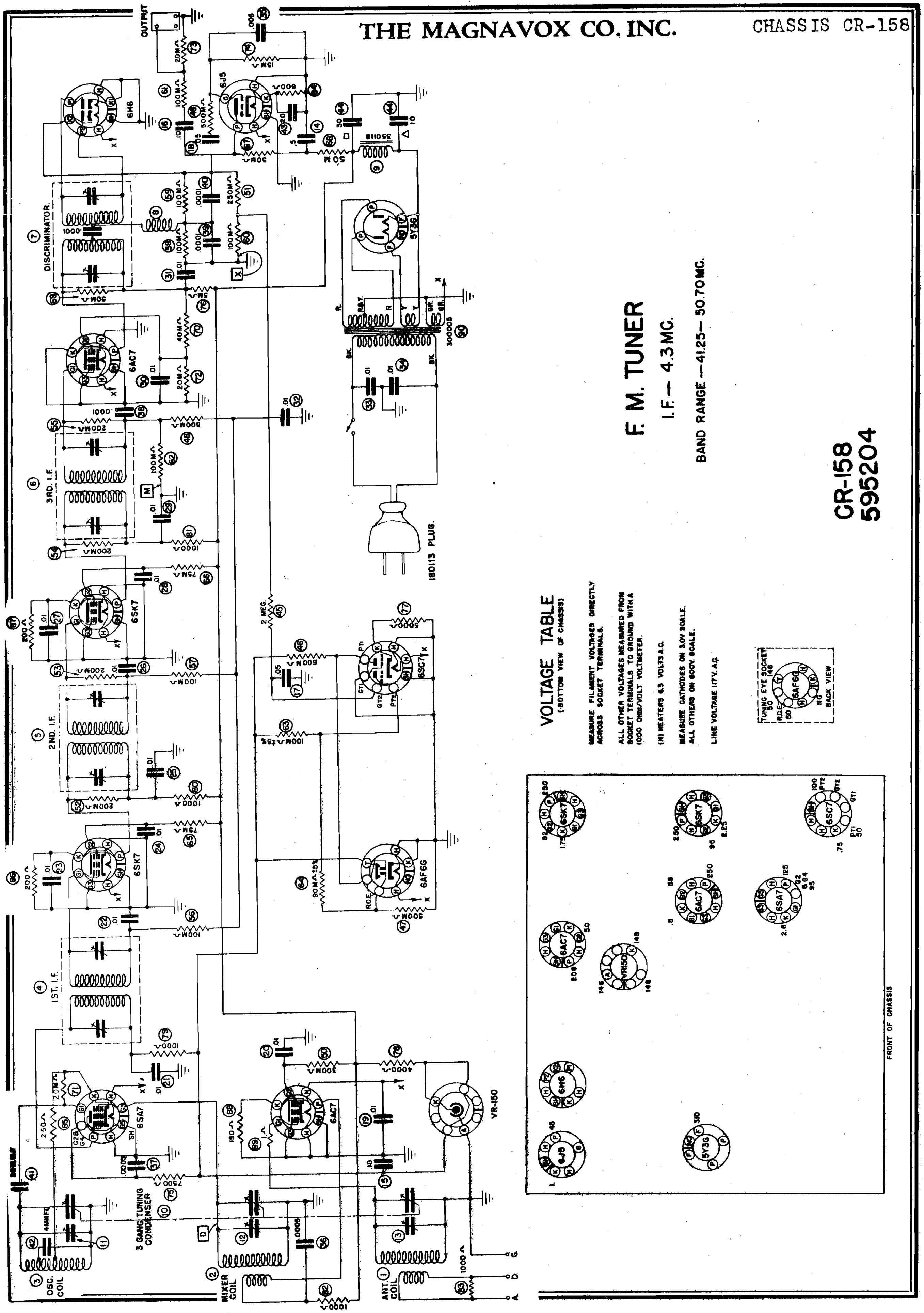
THE MAGNAVOX CO.INC.





THE MAGNAVOX CO. INC.

CHASSIS CR-158



CHASSIS CR-158

THE MAGNAVOX CO. INC.

1. Connect the "high" side of the generator output to the grid (G3) of the 6SA7 converter, and the "low" side of the generator to the ground of the chassis. The connection to the grid is most easily made by connecting to the stator of middle condenser in the tuning gang. If it is found that the generator does not furnish enough signal, it will be necessary to make this connection directly to the control grid of the 6SA7 tube and to disconnect the mixer coil from this grid. This point is indicated at "D" on the schematic diagram.

2. Connect a 0-50 or 0-200 microammeter in series with the "ground " end of the 100,000 ohm resistor (62). This is point "M" on the diagram. Connect the positive terminal of the meter to ground. This will measure the grid current of the 6AC7 tube. A reading of 30 to 100 microamperes is all that should be expected at this point. If an Analyst or a D.C. electronic voltmeter is available, it can be connected directly across this 100,000 ohm resistor (62) without disconnecting the resistor. This measures the limiter grid bias voltage. A reading of 3 to 10 volts should be considered normal.

3. Set the generator at 4300 kc. and align the I.F. trimmers for maximum gri current in the 6AC7 tube as indicated by the microammeter or voltmeter.

4. The I.F. stages are now aligned. Remove the microammeter and re-connect the 100,000 ohm resistor (62) as it was before.

5. The discriminator will be adjusted next. Connect the microammeter in series with the "ground" end of the 100,000 ohm resistor (60). This is indicated as point "X" on the diagram. The positive side of the meter is connected to ground. Instead of this, a high impedance electronic voltmeter, such as an Analyst or similar device, can be connected across this resistor. This measures the detector output current or voltage.

6. Adjust the test generator to 4375 kc. Adjust both trimmers on the discriminator transformer (7) for a peak. Adjust the output of the generator so that the meter reads at least 60 microamperes or 6 volts. Readjust the oscillator to 4300 kc. Adjust the trimmer nearest the 6H6 tube until the current or voltage is zero. A non-metallic screwdriver is essential; this is an extremely important operation. Re-set the oscillator to 4375 kc. and note the meter reading.

   Now reverse the meter connections so that the negative terminal is connected to ground. Set the generator to 4225 kc. and the meter reading should be within 10% of being the same. If not, the tuning of the discriminator transformer was not done carefully enough and must be repeated. This completes the adjustment of the discriminator. Re-connect the 100,000 ohm load resistor (60) to restore the circuit to its original condition.

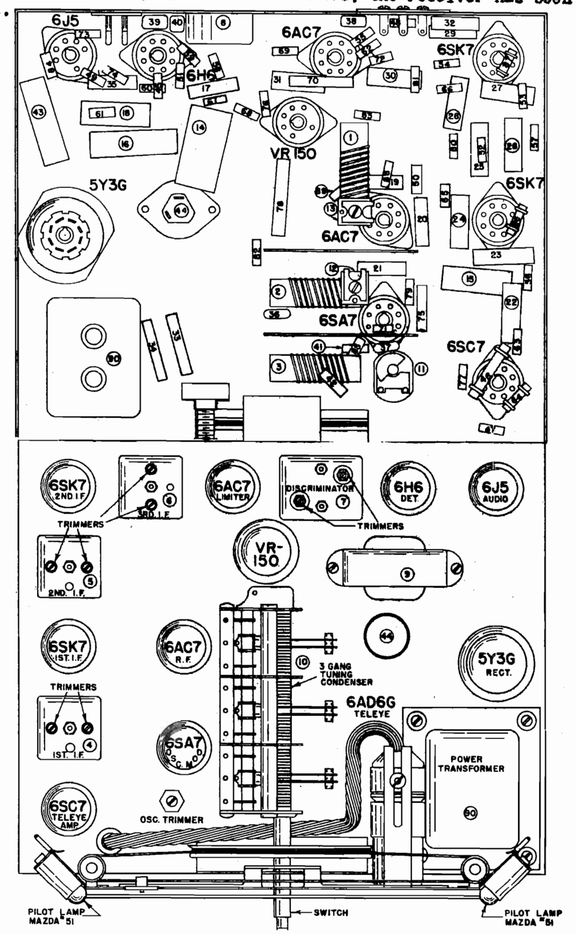
7. Re-connect the control grid of the 6SA7 to the mixer coil if this connection had been removed and disconnect the generator from this point.

8. The antenna, mixer, and oscillator coils are now ready to be aligned. Check to see that the dial pointer is at the end of the dial calibration (41.25 mc.) when the tuning gang is fully meshed.

9. Prepare to measure the limiter grid current by again connecting the microammeter as described in paragraph 2.

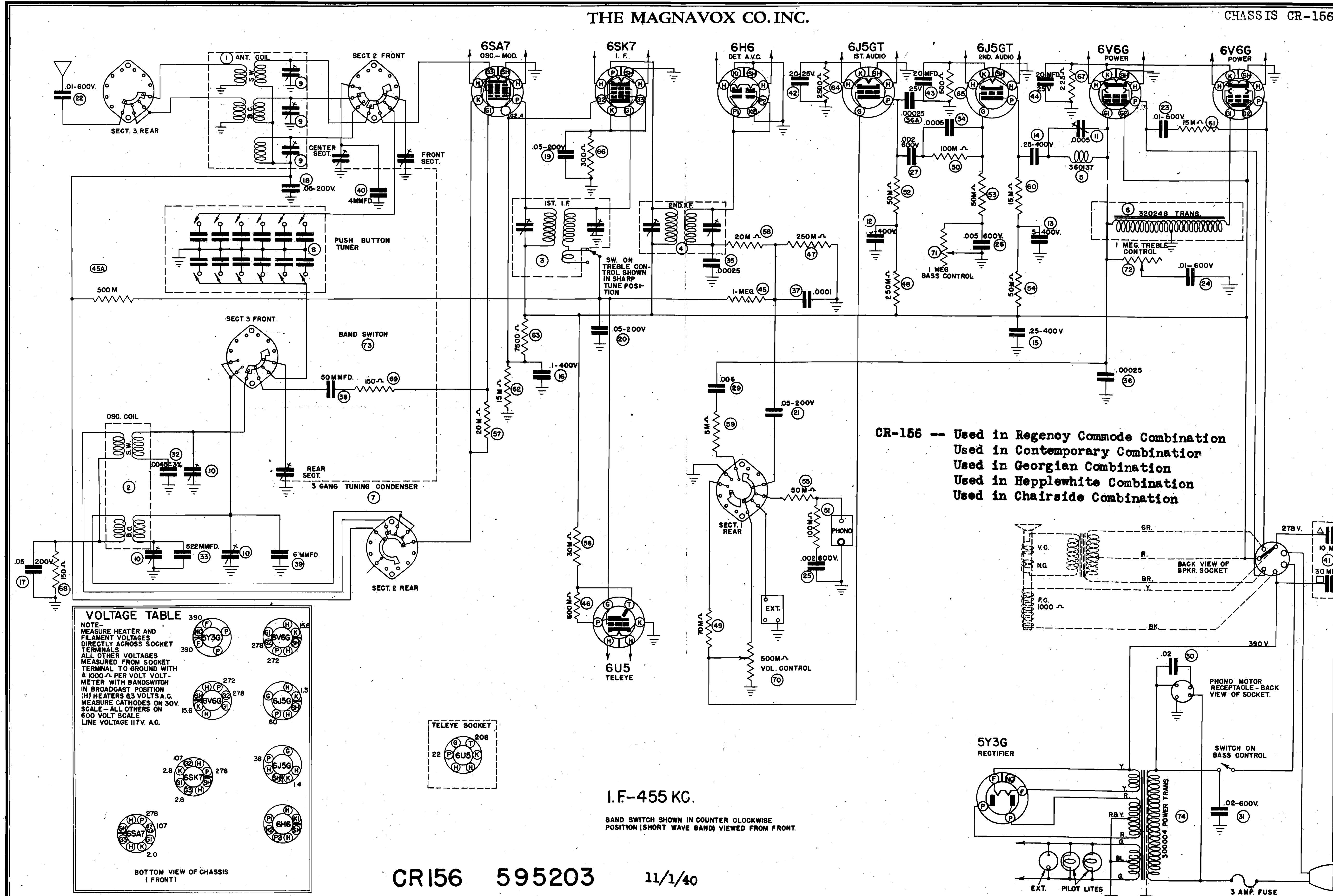
10. If an extremely accurate signal generator is available, it may be used for setting the oscillator to the dial calibration. The generator is connected to the antenna post through a 70 ohm resistor. Otherwise it will be necessary to connect an antenna to the receiver and use a F.M. transmitter for the frequency standard, preferably one between 47 mc. and 50 mc.

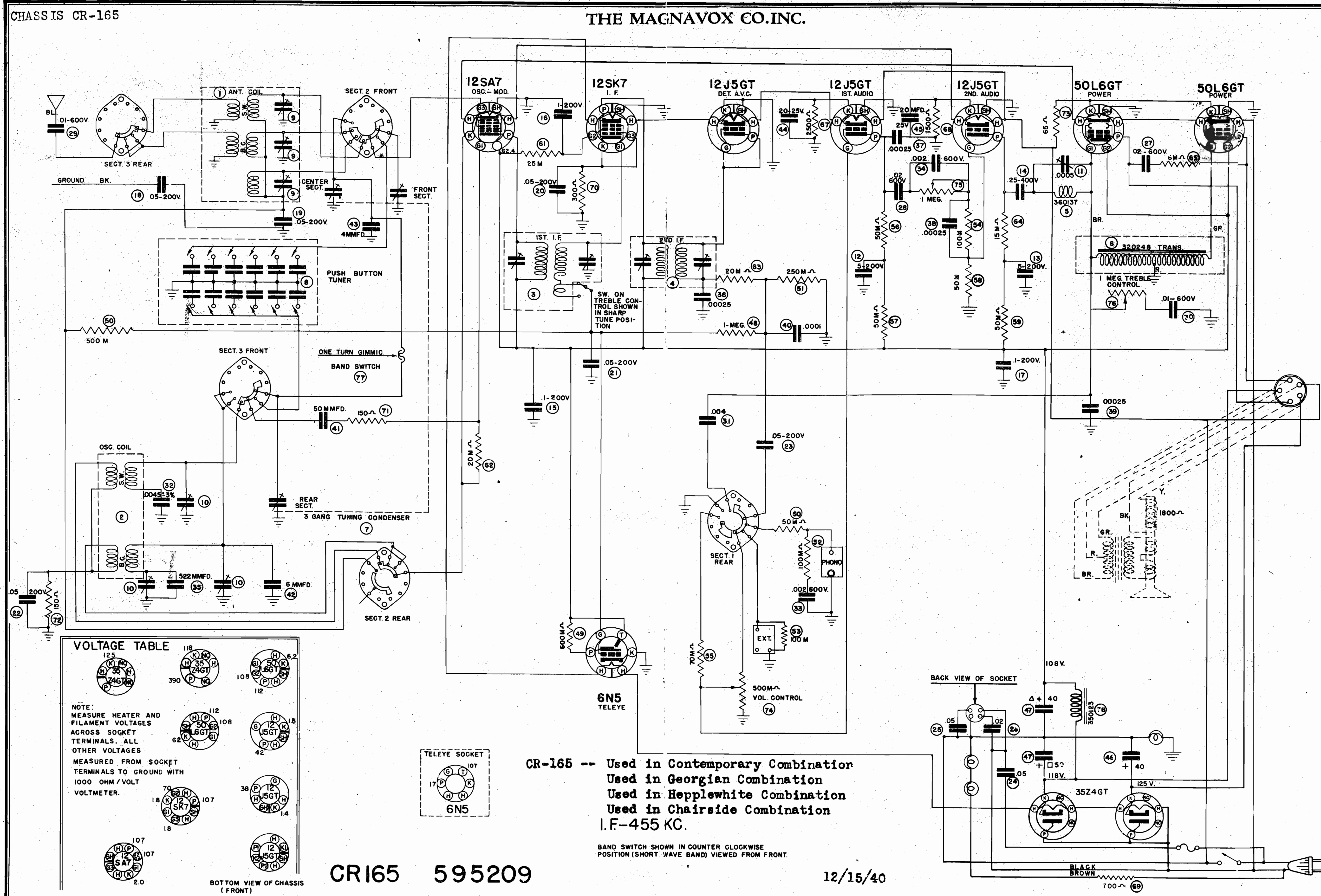
11. Set the dial to the known frequency of the transmitter and adjust the oscillator air trimmer (11) until the signal produces a maximum reading on the microammeter. Then adjust the trimmers (12) and (13) on the mixer and antenna coils for maximum reading. If too much signal is fed to the receiver, it will appear at several settings of the dial and confuse the adjusting. These trimmers should align rather loosely. If they are tightened so that the frequency of the R.F. circuit equals the oscillator frequency, suprious oscillations and responses are produced. The oscillator frequency is normally 4300 kc. lower than the signal frequency. When the above adjustments are completed and the 100,000 ohm resistor (60) is again grounded, the receiver has been aligned.



THE MAGNAVOX CO. INC.

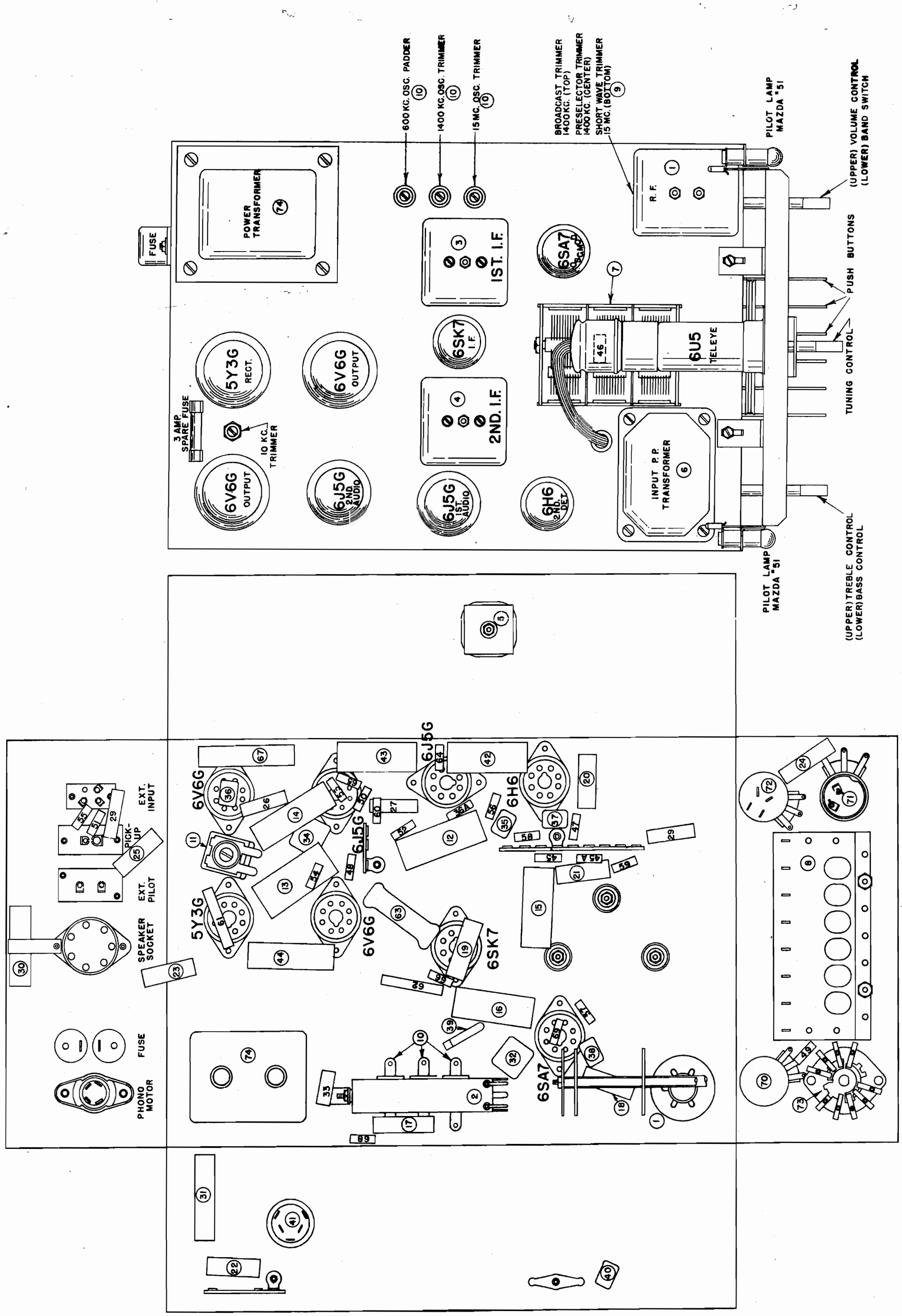
CHASSIS CR-156




CHASSIS CR-165
THE MAGNAVOX CO.INC.
12SA7
OSC.-MOD.
12SK7
I. F.
12J5GT
DET. A.V.C.
12J5GT
IST. AUDIO
12J5GT
2ND. AUDIO
50L6GT
POWER
50L6GT
POWER
ANT. COIL
SECT. 2 FRONT
SECT. 3 REAR
GROUND
CENTER SECT.
FRONT SECT.
PUSH BUTTON TUNER
IST. I.F.
2ND. I.F.
SW. ON TREBLE CONTROL SHOWN IN SHARP TUNE POSITION
SECT. 3 FRONT
ONE TURN GIMMIC
BAND SWITCH
OSC. COIL
REAR SECT.
3 GANG TUNING CONDENSER
SECT. 2 REAR
320248 TRANS.
1 MEG. TREBLE CONTROL
SECT. 1 REAR
PHONO
EXT.
500M VOL. CONTROL
6N5
TELEYE
BACK VIEW OF SOCKET
35Z4GT
BLACK
BROWN
VOLTAGE TABLE
NOTE:
MEASURE HEATER AND FILAMENT VOLTAGES ACROSS SOCKET TERMINALS. ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH 1000 OHM / VOLT VOLTMETER.
BOTTOM VIEW OF CHASSIS (FRONT)
TELEYE SOCKET
6N5
CR-165 -- Used in Contemporary Combination
Used in Georgian Combination
Used in Hepplewhite Combination
Used in Chairside Combination
I.F-455 KC.
BAND SWITCH SHOWN IN COUNTER CLOCKWISE POSITION (SHORT WAVE BAND) VIEWED FROM FRONT.
CR165 595209
12/15/40

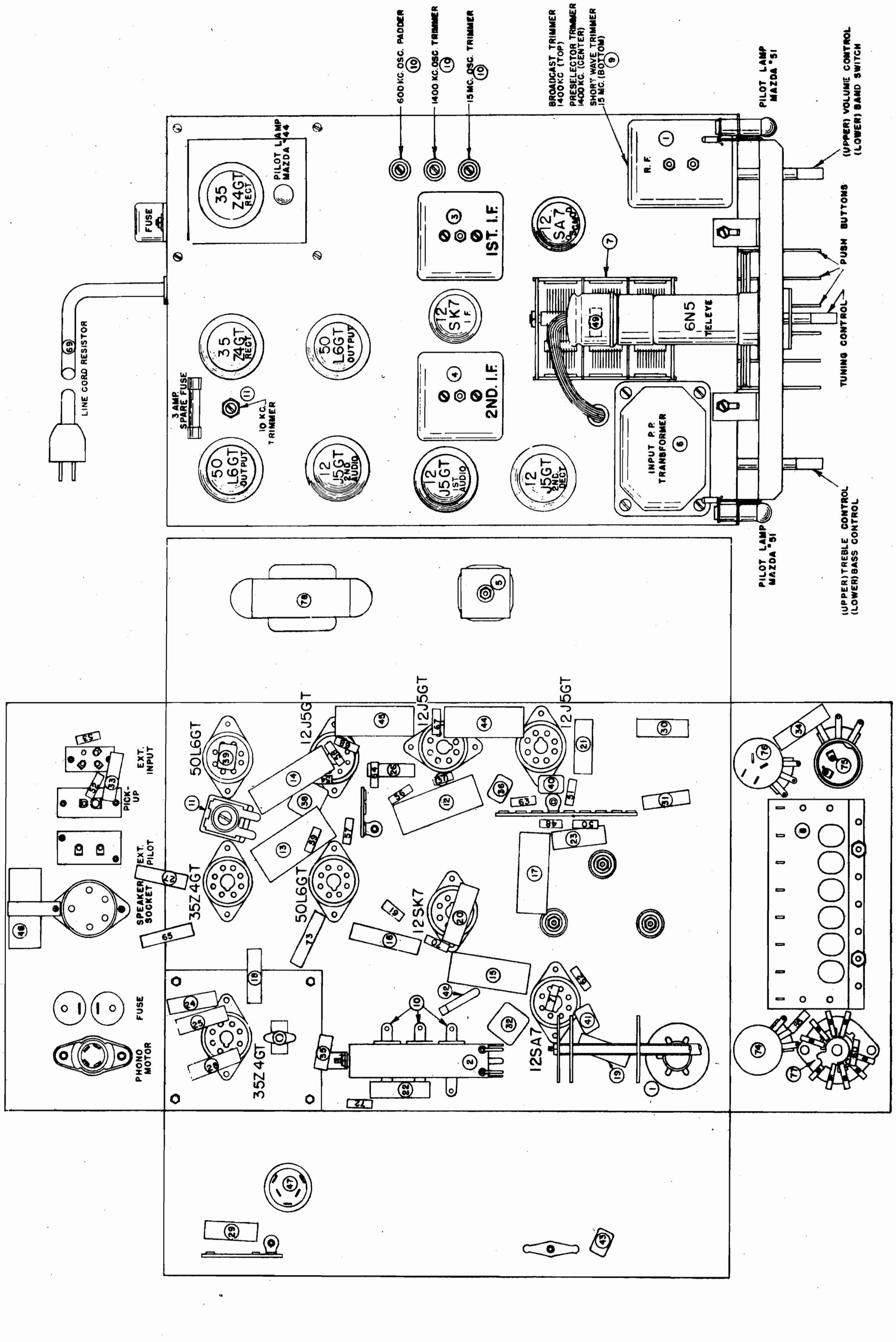
THE MAGNAVOX CO. INC.

CHASSIS CR-156



CHASSIS CR-165

THE MAGNAVOX CO. INC.

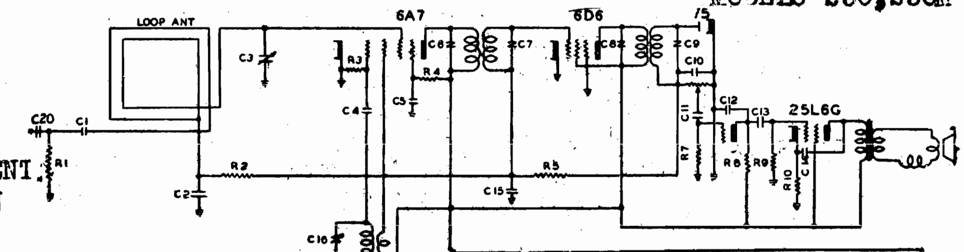


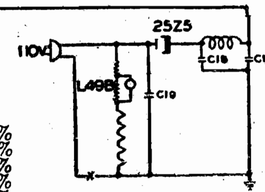
MAJESTIC RADIO & TELEV. CORP.

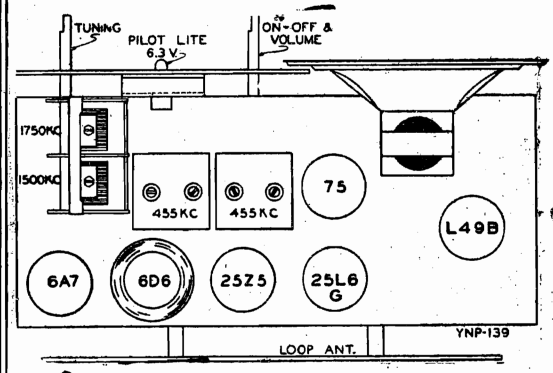
MODEL 1D59-L
MODELS 2D60, 5CAA
MODELS 250, 250M

MODEL 1D59-L

CONVENTIONAL ALIGNMENT.
SEE SPECIAL SECTION
VOLUME VIII





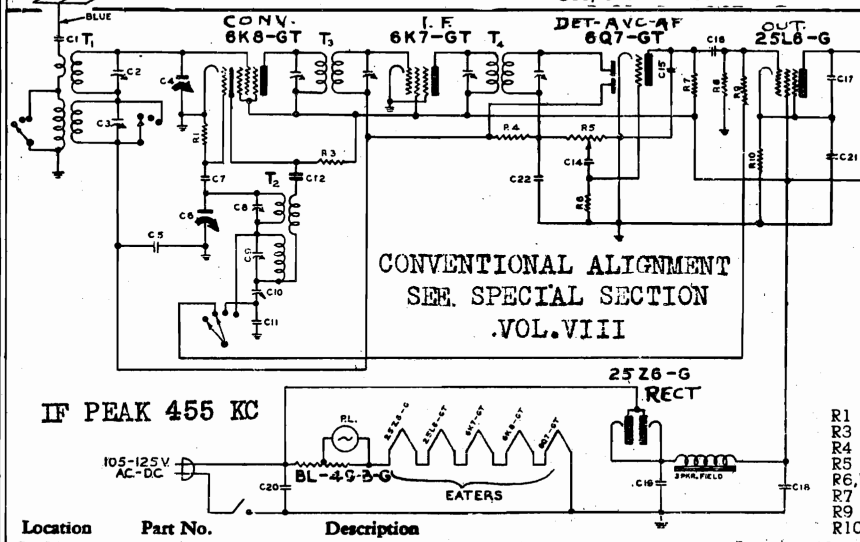


IF PEAK 455 KC

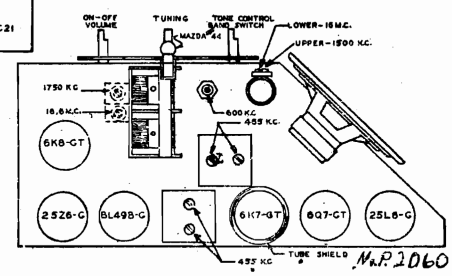
Location	Part No.	Description
R1	R-15531	Carbon res. 10K ohm ¼W20%
R2	R-15515	Carbon res. 100K ohm ¼W20%
R3	R-15511	Carbon res. 50K ohm ¼W20%
R4	R-53	Carbon res. 15K ohm ¼W20%
R5	R-15500	Carbon res. 2 meg. ¼W20%
R6	Y-VC-30	Volume Control
R7	R-79	Carbon res. 15 meg. ¼W20%
R8, R9	R-15520	Carbon res. 500K ohm ¼W20%
R10	R-80	Carbon res. 110 ohm ½W20%
C4	CM-29	Mica cond. 50 mmf 30%
C10, C12	CM-30	Mica cond. 250 mmf 30%
C1, C13, C20	C-15574	Tubular cond. .01 mfd. 400V
C11	C-15774	Tubular cond. .002 mfd. 400V
C2, C14	C-15760	Tubular cond. .02 mfd. 400V
C5, C15	C-15752	Tubular cond. .05 mfd. 200V
C19	C-15756	Tubular cond. .05 mfd. 400V
C17, C18	Y-CE-50	Electrolytic Condenser

1-6A7 CONVERTER
1-6D6 I.F. AMP.
1-75 DET. AVC. AF.
1-25L6G OUTPUT
1-25Z5 RECTIFIER
1-L49B BALLAST

MODEL 2D60, 5CAA



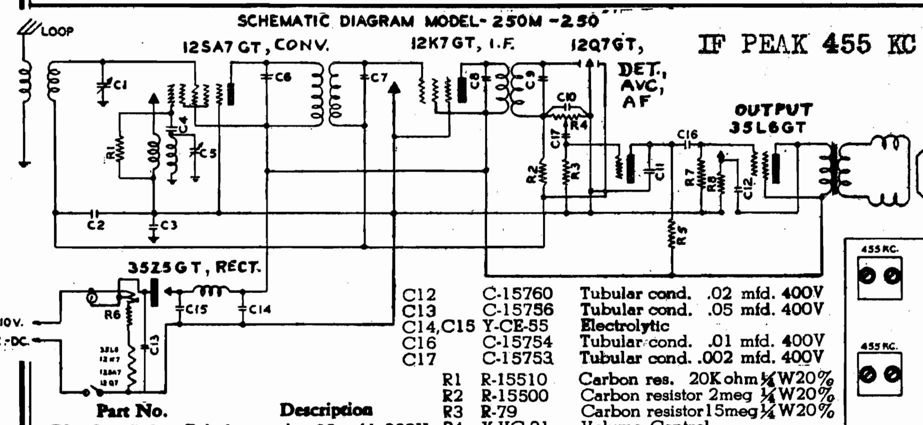
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOL. VIII



IF PEAK 455 KC

Location	Part No.	Description
R1	R-15511	Carbon res. 50K ohm ¼W20%
R3	R-15531	Carbon res. 10K ohm ¼W20%
R4	R-15500	Carbon resistor 2meg ¼W20%
R5	Y-VC-21	Volume Control and Switch
R6, R8	R-50	Carbon resistor 5meg ¼W20%
R7	R-15504	Carbon res. 150K ohm ¼W20%
R9	R-15500	Carbon res. 20K ohm ¼W20%
R10	R-80	Carbon res. 110 ohm ½W20%
C1, C12, C16, C17	C-15754	Tubular cond. .01 mfd. 400V
C4, C6	Y-CV-16A	Variable Condenser
C5	C-15752	Tubular cond. .05 mfd. 200V
C7	CM-31	Mica cond. 100 mmfd. 30%
C10	Y-CP-8	Padder Condenser
C11	CM-2	Mica cond. 4330 mmfd. 5%
C14	C-31	Tubular cond. .004 mfd. 400V
C15, C22	CM-30	Mica cond. 250 mmfd. 30%
C18, C19, C21	CE-46	Electrolytic Condenser
C20	C-15756	Tubular cond. .05 mfd. 400V
P.L.	LB-44	Mazda Bulb #44
T1	Y-ANA-10	Antenna Assembly
T2	Y-OSA-10	Oscillator Assembly
T3	Y-IFA-10	1st I.F. Transformer
T4	Y-IFA-11	2nd I.F. Transformer

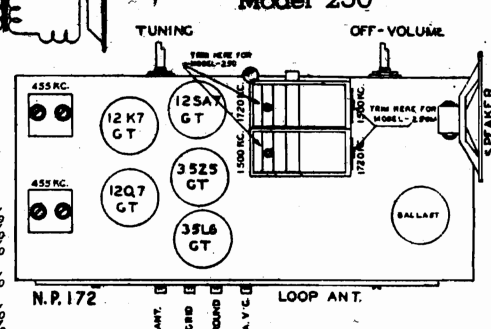
SCHEMATIC DIAGRAM MODEL-250M-250



IF PEAK 455 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

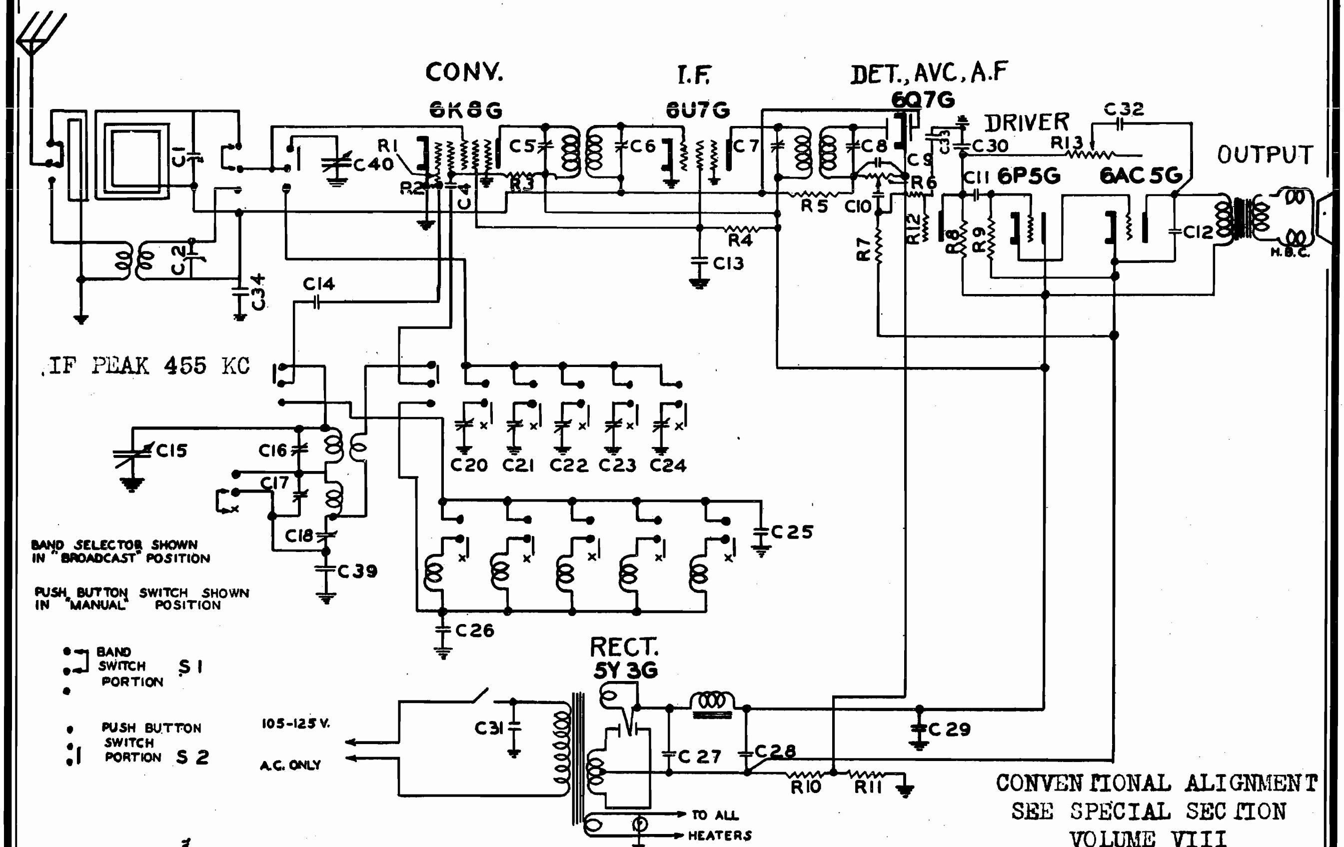
Model 250



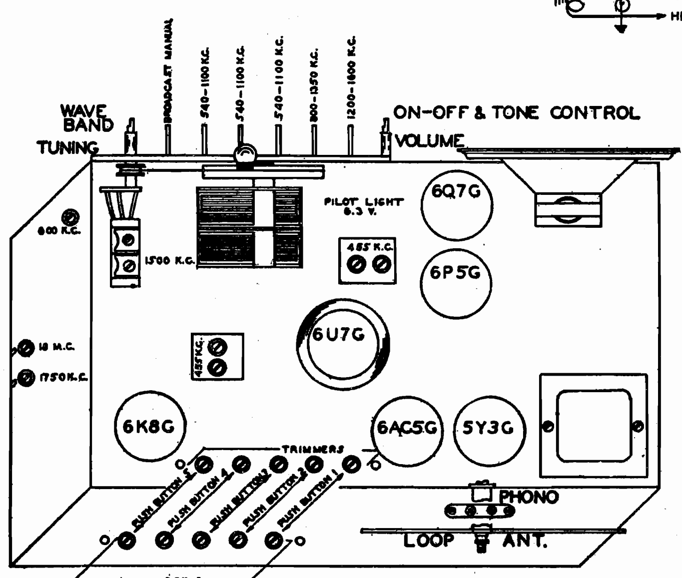
Location	Part No.	Description
C2	C-15752	Tubular cond. .05 mfd. 200V
C3	C-15751	Tubular cond. .25 mfd. 200V
C4	CM-29	Mica cond. 50 mmf. 30%
C10	CM-30	Mica cond. 250 mmf. 30%
C11	CM-31	Mica cond. 100 mmf. 30%
C12	C-15760	Tubular cond. .02 mfd. 400V
C13	C-15756	Tubular cond. .05 mfd. 400V
C14, C15	Y-CE-55	Electrolytic
C16	C-15754	Tubular cond. .01 mfd. 400V
C17	C-15753	Tubular cond. .002 mfd. 400V
R1	R-15510	Carbon res. 20K ohm ¼W20%
R2	R-15500	Carbon resistor 2meg ¼W20%
R3	R-79	Carbon resistor 15meg ¼W20%
R4	Y-VC-21	Volume Control
R5	R-15512	Carbon res. 250K ohm ¼W20%
R6	TU-83	Ballast
R7	R-15520	Carbon res. 500K ohm ¼W20%
R8	R-59	Carbon res. 110 ohm ½W10%

MODELS 2C60AP
260

MAJESTIC RADIO & TELEV. CO. CORP.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



TUBE LAYOUT— MODEL 2C60 AP-260

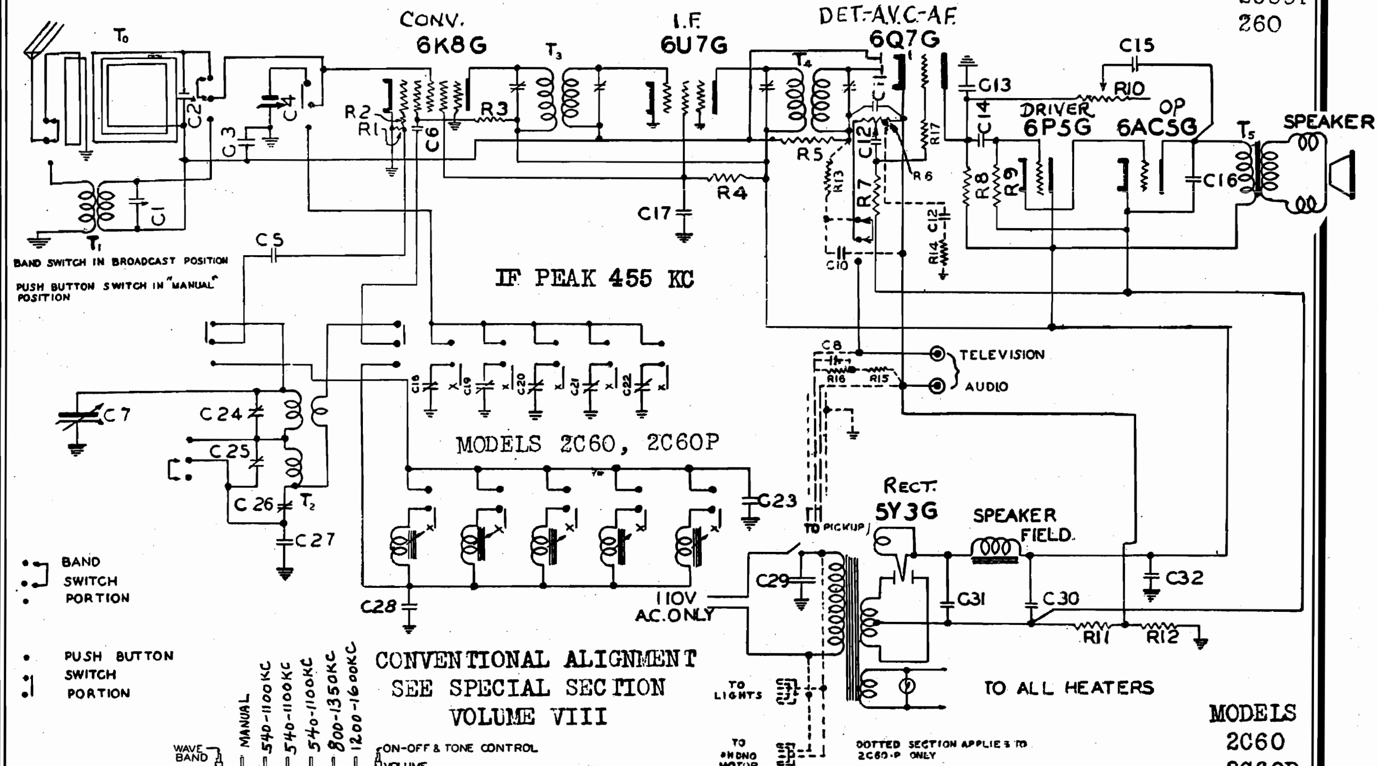
FOR SETTING PUSH BUTTONS SEE INDEX.

REPLACEMENT PARTS LIST

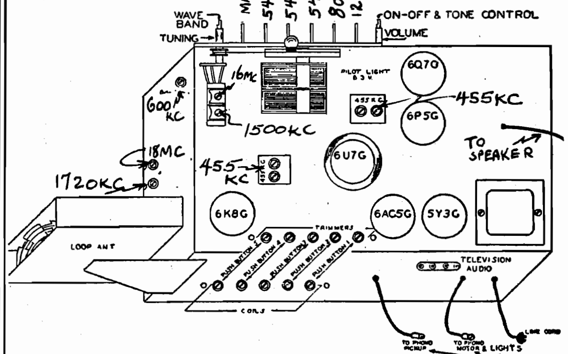
Schematic Location	*Part Number*	*Condensers*
C1, C2—C16, C17	Y-CT-24	Trimmer
C40, C15	Y-CV-33	Variable
C4, C11, C12	C-15754	.01 mfd. 400 V. Tubular
C10	C-49	.005 mfd. 400 V. Tubular
C13, C29	C-15756	.05 mfd. 400 V. Tubular
		CONDENSERS
C34	C-15752	.05 mfd. 200 V. Tubular
C9, C30	CM-31	100 mmfd. 30% Mica
C14	CM-29	50 mmfd. 30% Mica
C18	Y-CT-27	Padder Condenser
C20, C21, C22, C23, C24	Y-CT-31	Trimmer Strip
C25	CM-34	150 mmfd. 5% Silvered Mica
C26	CM-33	250 mmfd. 5% Silvered Mica
C27, C28	Y-CE-43	Electrolytic Condenser
C31	C-18	.01 mfd. 400 V. Tubular
C32, C33	CM-30	250 mmfd. 30% Mica
C39	CM-9	5500 mmfd. 5% Mica
		RESISTORS
R1	R-15601	100 ohm ¼ W 20% Carbon
R2	R-54	50K ohm ¼ W 20% Carbon
R3	R-15541	5K ohm ½ W 20% Carbon
R4	R-15544	15K ohm 1 W 20% Carbon
R5	R-15500	2 megohm ¼ W 20% Carbon
R6	Y-VC-33	Volume Control
R7, R9	R-15517	1 megohm ¼ W 20% Carbon
R8, R12	R-15512	250K ohm ¼ W 20% Carbon
R10, R11	R-87	70 ohm ¼ W 20% Carbon
		CONTROLS
R13	Y-VC-33	Tone Control
S1	Y-SW-25	2 pos. band switch
S2	Y-SW-19	6 button Switch

MAJESTIC RADIO & TELEV. CO. CORP.

MODELS 2C60
2C60P
260



MODELS
2C60
2C60P
260



TUBE LAYOUT MODELS-2C60-2C60-P

ONLY ON MODEL 2C60-P

PRE-SETTING OF PUSH BUTTONS

The push-buttons may be easily set to receive any five stations desired provided that three of them lie between 540 and 1100 KC, one of them between 800 and 1350 KC, and one of them between 1200 and 1600 KC. Note on the diagram that push button number 1 covers the range 1200-1600 KC. If the station selected lies between those frequencies then push the button in as far as possible and with a small screwdriver adjust the screw from the back of the receiver that corresponds to that button until the station desired can be heard as loudly as possible. Complete the adjustment by adjusting the corresponding trimmer from the top of the chassis until maximum volume again results. In making these adjustments, it is desirable to keep the volume control turned down to low volume. By pressing button number 2, the corresponding coil adjusting screw and trimmer condenser may be adjusted to the next station and the same process repeated for the balance of the buttons.

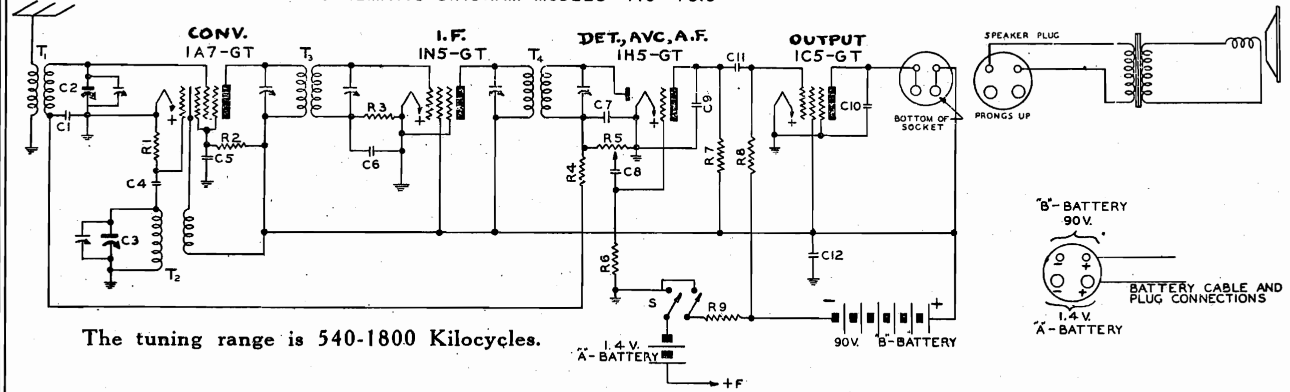
Schematic Location	*Part No.*	Condensers
C1, C2,-C24 C25	Y-CT-24	Trimmer
C7, C4	Y-CV-33	Variable Condenser
C18, C19, C20, C21, C22	Y-CT-31	Trimmer strip
C26	Y-CT-27	Padder Condenser
C3	C-15761	.1—200 V Tubular
C6, C10, C12, C14	C-15754	.01—400 V Tubular
C16	C-15769	.01—600 V Tubular
C17, C32	C-15756	.05—400 V Tubular
C29	C-18	.01—400 V Molded
C30, C31	Y-CE-43	Electrolytic Condenser (Model 2C60 only)
C30, C31	Y-CE-60	Electrolytic Condenser (Model 2C60-P only)
C5	CM-29	50 mmfd. 30% Mica
C11, C13	CM-31	100 mmfd. 30% Mica
C8, C15	CM-30	250 mmfd. 30% Mica
C23	CM-34	150 mmfd. 5% Mica
C27	CM-9	5500 mmfd. 5% Mica
C28	CM-33	250 mmfd. 5% Mica

		Resistor
R2	R-15601	100 ohm ¼ W 20% Carbon
R1, R13, R14	R-54	50K ohm ¼ W 20% Carbon
R3	R-15541	5K ohm ½ W 20% Carbon
R4	R-15544	15K ohm 1 W 20% Carbon
R5, R16	R-15500	2 megohm ¼ W 20% Carbon
R6, R10	Y-VC-33	Volume and Tone Controls (Model 2C60 only)
R6, R10	Y-VC-42	Volume and Tone Controls (Model 2C60-P only)
R7, R9	R-15517	1 megohm ¼ W 20% Carbon
R8, R15, R17	R-15512	250K ohm ¼ W 20% Carbon
R11, R12	R-87	70 ohm ¼ W 20% Crabon
		Description
To	Y-CS-100	Loop Antenna
T1	Y-CS-96	Short Wave Antenna Coil
T2	Y-CS-71	Oscillator Coil
T3	Y-CI-43	1st I.F. Transformer
T4	Y-CI-44	2nd I.F. Transformer
T5		Speaker Output Transformer
	LB-G-11W	Lights for Phono Compartment

MODELS 4C10,410
MODEL 5ADA

MAJESTIC RADIO & TELEV. CO. CORP.

SCHEMATIC DIAGRAM MODELS-410-4C10



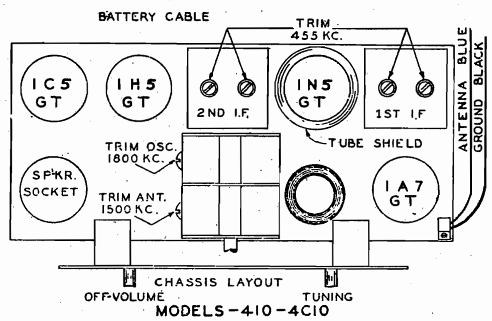
The tuning range is 540-1800 Kilocycles.

The battery packs recommended to be used:

Burgess No. 17GD60 or equivalent
Eveready No. 748 or equivalent
Ray-O-Vac No. AB-82 or equivalent

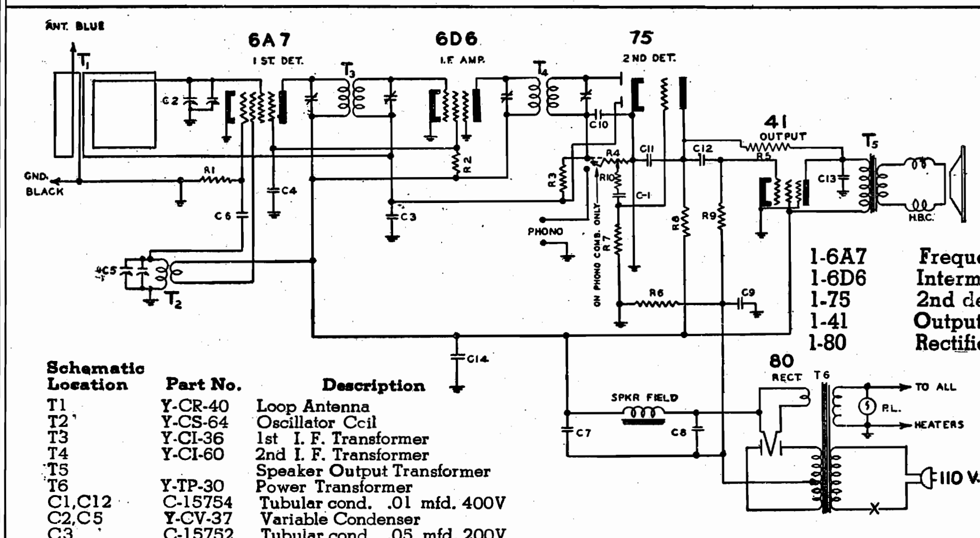
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

IF PEAK 455 KC



Schematic Location	Part No.	Description
C2,C3	Y-CV-26	Variable Condenser
C1,C5	C-15752	Tubular cond. .05 mfd. 200V
C6,C8,C11	C-15763	Tubular cond. .01 mfd. 200V
C10	C-15774	Tubular cond. .002 mfd. 400V
C12	CE-35	8 mfd. 150V Electrolytic cond.
C4,C7,C9	CM-31	Mica cond. 100 mmfd. 30%
T1	Y-CS 62	Antenna Coil
T2	Y-OSA-11	Oscillator Assembly
T3	Y-CI-29	1st I. F. Assembly
T4	Y-CI-30	2nd I. F. Assembly
R1	R-15523	Carbon res. 200Kohm¼W20%
R2	R-44	Carbon res. 70K ohm¼W10%
R3,R4	R-15500	Carbon resistor 2meg ¼W20%
R6	R-15559	Carbon resistor 3meg ¼W20%
R7	R-15520	Carbon res. 500Kohm¼W20%
R8	R-15517	Carbon resistor 1meg ¼W20%
R9	R-72	Carbon res. 600 ohm¼W20%
R5	Y-VC-43	Volume Control

MODEL 5ADA



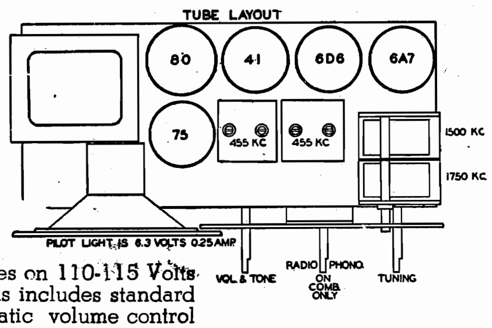
The tubes used are:

1-6A7	Frequency converter
1-6D6	Intermediate frequency amplifier
1-75	2nd detector, AVC, and audio driver
1-41	Output
1-80	Rectifier

IF PEAK 455 KC

Schematic Location	Part No.	Description
T1	Y-CR-40	Loop Antenna
T2	Y-CS-64	Oscillator Coil
T3	Y-CI-36	1st I. F. Transformer
T4	Y-CI-60	2nd I. F. Transformer
T5		Speaker Output Transformer
T6	Y-TP-30	Power Transformer
C1,C12	C-15754	Tubular cond. .01 mfd. 400V
C2,C5	Y-CV-37	Variable Condenser
C3	C-15752	Tubular cond. .05 mfd. 200V
C4	C-15756	Tubular cond. .05 mfd. 400V
C6	CM-29	Mica cond. 50 mmfd. 30%
C10,C11	CM-30	Mica cond. 250 mmfd. 30%
C7,C8,C9	Y-CE-43	Elecrolyic Condenser
C13	C-25	Tubular cond. .006 mfd. 400V
C14	C-15757	Tubular cond. .1 mfd. 400V
R1	R-15511	Carbon res. 50K ohm¼W20%
R2	R-83	Carbon res. 35K ohm 1W20%
R3	R-15500	Carbon resistor 2meg ¼W20%
R4	Y-VC-30	Volume Control
R5	R-15559	Carbon resistor 3meg ¼W20%
R6	R-117	Carbon res 275 ohm½W20%
R7	R-109	Carbon resistor 5meg ¼W20%
R8,R9	R-15520	Carbon res. 500Kohm¼W20%
R10	R-15515	Carbon res. 100Kohm¼W20%
P.L.	LB-44	Pilot Light Mazda #44

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII.

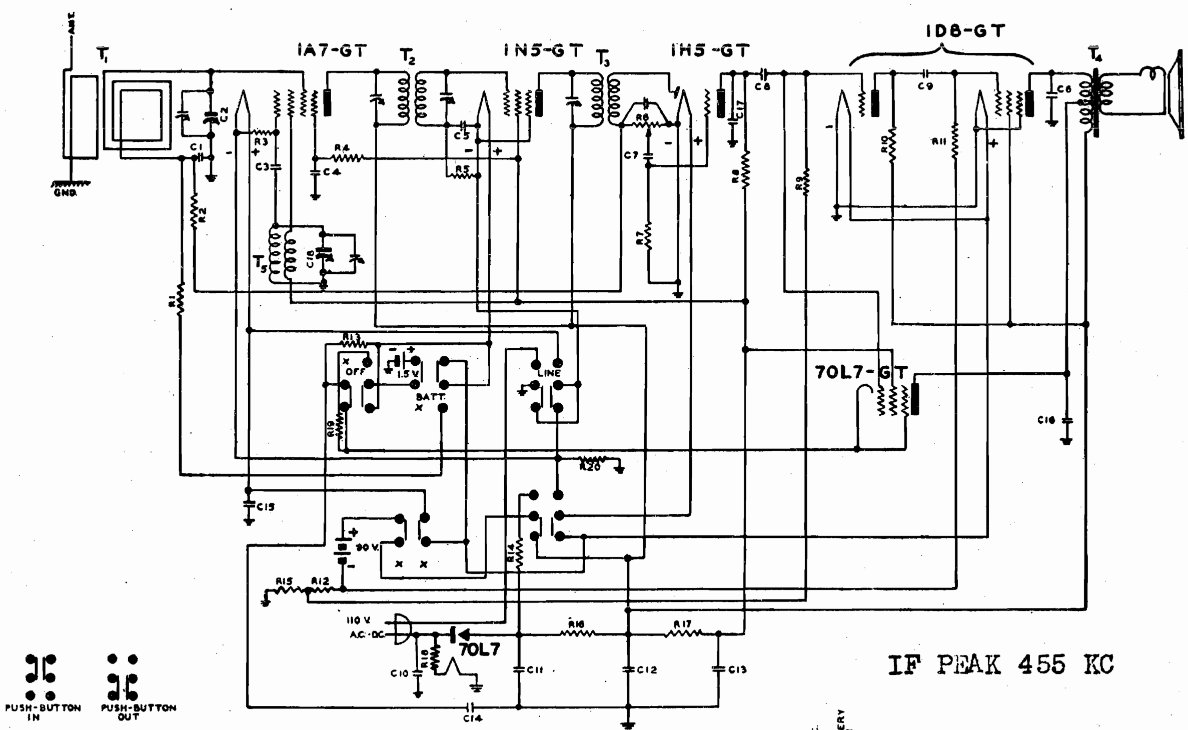


This is a five (5) tube Alternating Current (AC) receiver. This set operates on 110-115 Volts 60 Cycles current. The tuning range is from 540 to 1750 kilocycles. This includes standard broadcast and most city police stations. This set is equipped with automatic volume control and a Majestic Hi-Q Loop Antenna shielded by a Faraday screen.

MAJESTIC RADIO & TELEV. CO. CORP.

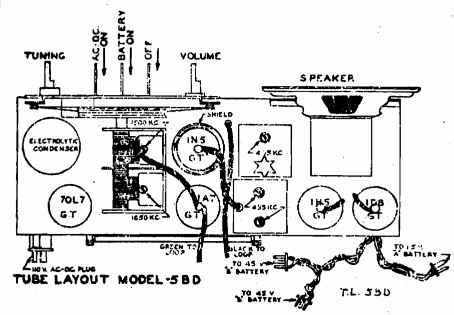
MODELS 5BD, 5BDR, 5ULBD

SCHEMATIC DIAGRAM MODEL -5BD



IF PEAK 455 KC

DIAGRAM SHOWN WITH BATTERY PUSH-BUTTON IN

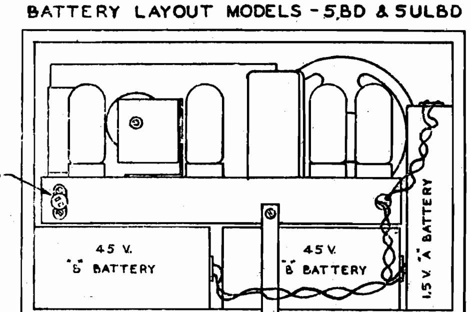


TUBE LAYOUT MODEL-5BD

T.L. 5BD

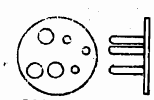
Schematic Location	Part No.	Description
C1	C-15752	Tubular cond. .05 mfd. 200V
C2,C18	Y-CV-46B	Variable Condenser
C3	CM-29	Mica cond. 50 mmfd.
C4,C5,C8		
C9,C16	C-15754	Tubular cond. .01 mfd. 400V
C6,C7	C-15753	Tubular cond. .002 mfd. 600V
C10	C-15756	Tubular cond. .05 mfd. 400V
C11	CE-62	Electr. cond. 15 mfd. 150V
C12	CE-62	Electr. cond. 40 mfd. 150V
C13	CE-62	Electr cond. 10 mfd. 150V
C14	CE-62	Electr. cond. 100 mfd. 25V
C15	C-15761	Tubular cond. .1 mfd. 200V
C17	CM-30	Mica cond. 250 mmfd.
R1	R-63	Carbon resistor 10meg ¼W20%
R2,R5	R-15500	Carbon resistor 2meg ¼W20%
R3	R-15523	Carbon res. 200Kohm ¼W20%
R4	R-15511	Carbon res. 50K ohm ¼W20%
R7	R-109	Carbon resistor 5meg ¼W20%
R8,R10,R11	R-15517	Carbon resistor 1meg ¼W20%
R9	R-15512	Carbon res. 250Kohm ¼W20%
R-15,R-19	R-15601	Carbon res. 100 ohm ¼W20%
R-13	R-28	Carbon res. 10 ohm ¼W20%
R-14	R-15542	Carbon res. 1000ohm ¼W20%
R-17	R-15570	Carbon res. 2000ohm ¼W20%
R12	R-72	Carbon res. 600ohm ¼W20%
R16	R-121	Carbon res 300ohm 1W20%
R20	R-15600	Carbon res. 200ohm ¼W20%
R6	Y-VC-38A	Volume Control
T1	Y-LOA-11	Loop Antenna
T2	Y-IFA-17	1st I. F. Assembly
T3	Y-IFA-16	2nd I. F. Assembly
T4	Y-SPA-71	Output Transformer
T5	Y OSC-11	Oscillator Coil
T6	SW-43	Push-Button Switch

BATTERY LAYOUT MODELS - 5BD & 5ULBD



FB-118

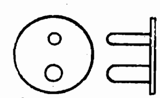
The frequency coverage is from 540 to 1650 kilocycles, i.e. from 555 to 182 meters. This includes the standard broadcast band and some police calls.



SOCKET AND PLUG DETAIL OF THE "B" BATTERIES

The tubes used are:

1—1A7GT	Converter.
1—1N5GT	I. F. Amplifier.
1—1H5GT	2nd Detector, AVC, and A. F. Amplifier.
1—1D8GT	2nd A. F. Amplifier and Output Tube Used on Battery Operation only.
1—7OL7GT	Output and Rectifier Tubes Used on Line Operation Only.

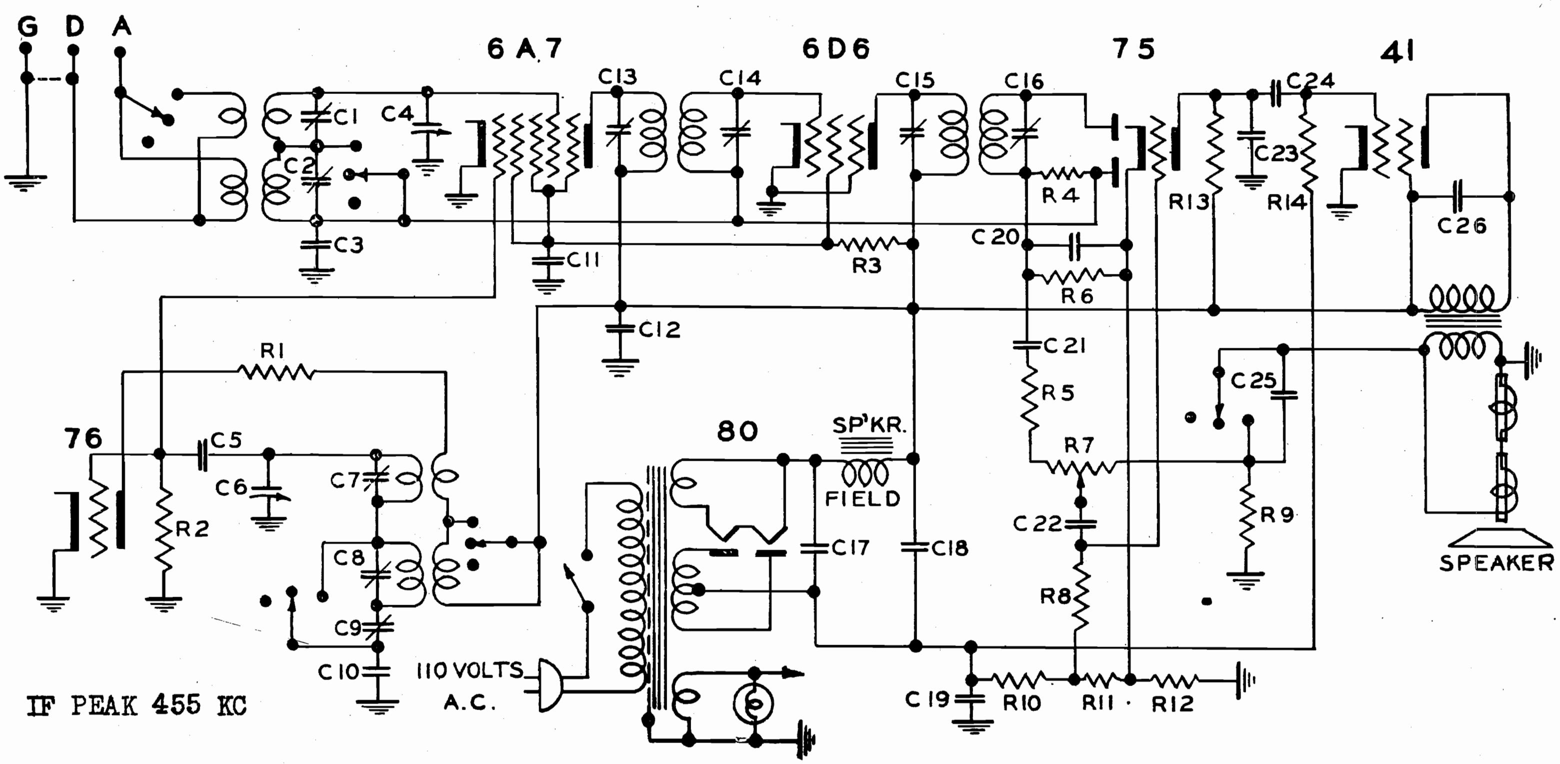


SOCKET AND PLUG DETAIL OF THE "A" BATTERY

The receiver is equipped with three push buttons. The first from the right is for line operation. The middle push button is for battery operation. The left hand push button is to turn the set off.

MODEL 62A, Series C

MAJESTIC RADIO & TELEV. CO. CORP.



IF PEAK 455 KC

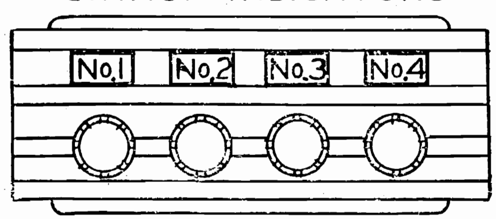
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

Schematic Location	Part No.	Description
C3	C-15752	Tubular cond. .05 mfd. 200 V
C11,C12	C-15756	Tubular cond. .05 mfd 400 V
C21,C22, C24,C26	C-15754	Tubular cond. .01 mfd. 400 V
C25	C-15772	Tubular cond. .02 mfd 200 V
C5	CM-15929	Mica cond. 50 mmf. Type "O"
C20	CM-15928	Mica cond. 250 mmf. Type "O"
C23	CM-15918	Mica cond. 100 mmf. Type "O"
C10	CM-17	Pre set mica cond. 4330 mmf. 3% 12 mfd., 300 V
C17,C18,C19	Y-CE-43	Elect. cond. 8 mfd. 300 V, 20 mfd, 25V.
C4,C6	Y-CV-19-A	Variable condenser (2 gang)
R2	R-15511	Carbon resistor 50K ¼W 20%
R3	R-69	Carbon resistor 7.5K 2 W 20%
R5,R13	R-15512	Carbon resistor 250K ¼W 20%
R6,R14	R-15520	Carbon resistor 500K ¼W 20%
R4,R8	R-15500	Carbon resistor 2 Meg ¼W 20%
R1	R-15601	Carbon resistor 100 ohms ¼W 20%
R9	R-65	Carbon resistor 10K ¼W 20%
R10,R11 R12	RC-6	Candohm resistor
R7	Y-VC-24	Volume control
C1,C2,C7,C8	Y-CP-2	Trimmer cond.
C9	Y-CP-16472	Padder cond.
C13,C14	Y-CT-1	Trimmer cond. 1st I. F.
C15,C16	Y-CT-1	Trimmer cond. 2nd I. F.

The tubes used are:

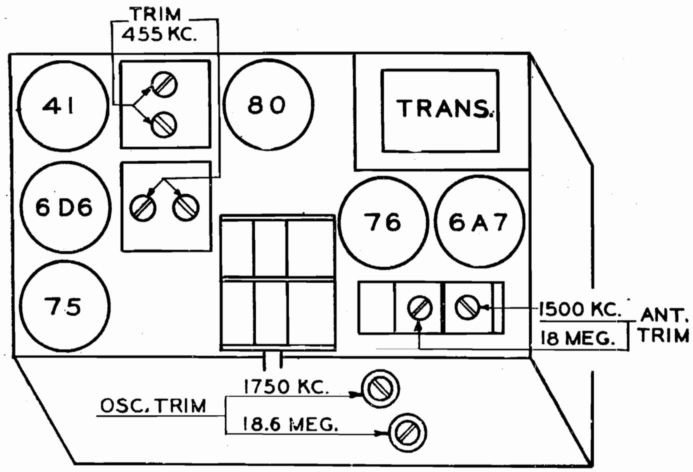
1-6A7	First detector
1-76	Oscillator
1-6D6	I. F. Amplifier
1-75	Second detector, automatic volume control and first audio amplifier
1-41	Output
1-80	Rectifier

STATION INDICATORS



STATION SELECTORS

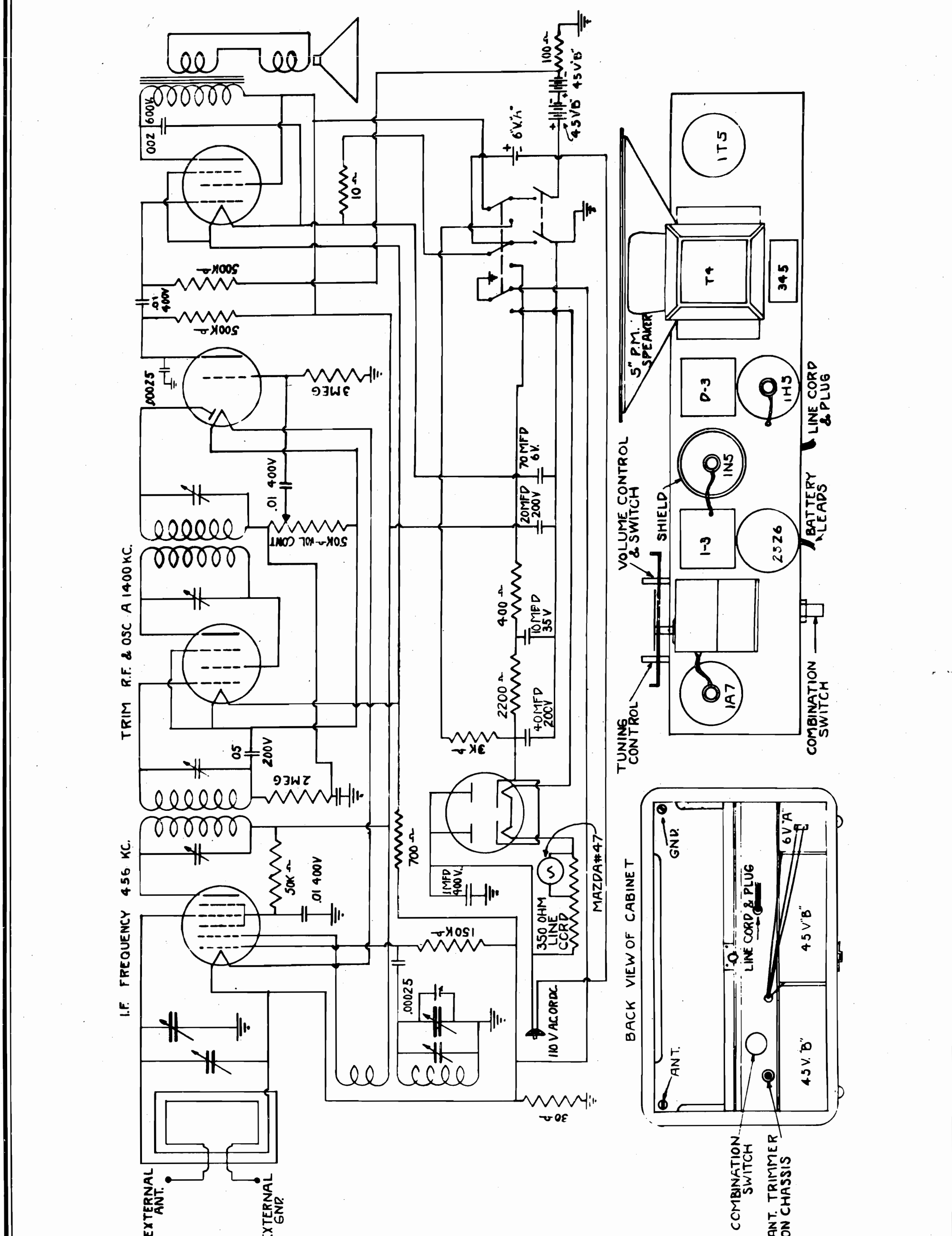
Setting Up Of Buttons see Index



CHASSIS LAYOUT

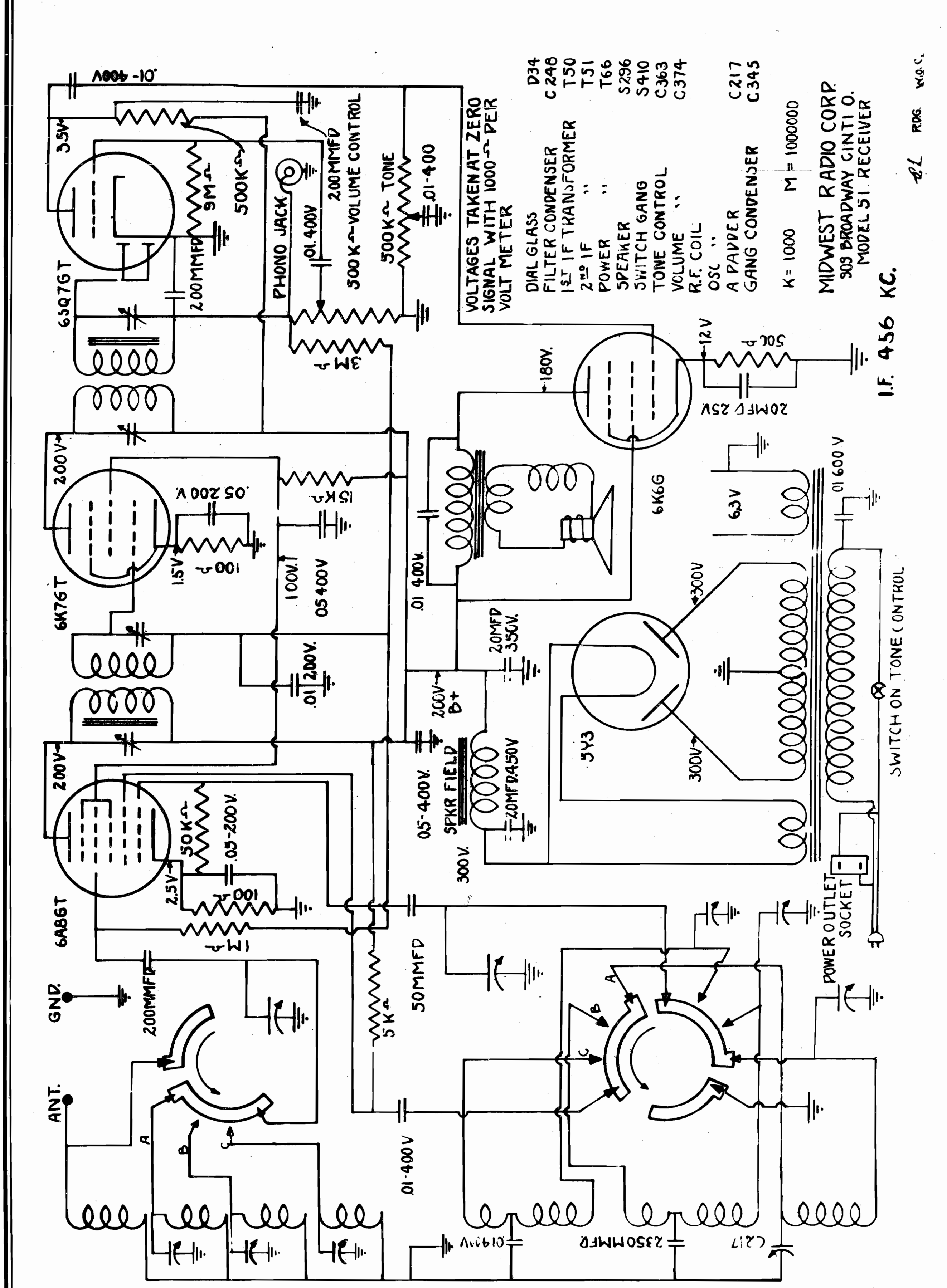
MIDWEST RADIO CORP.

MODEL 1940
Portable



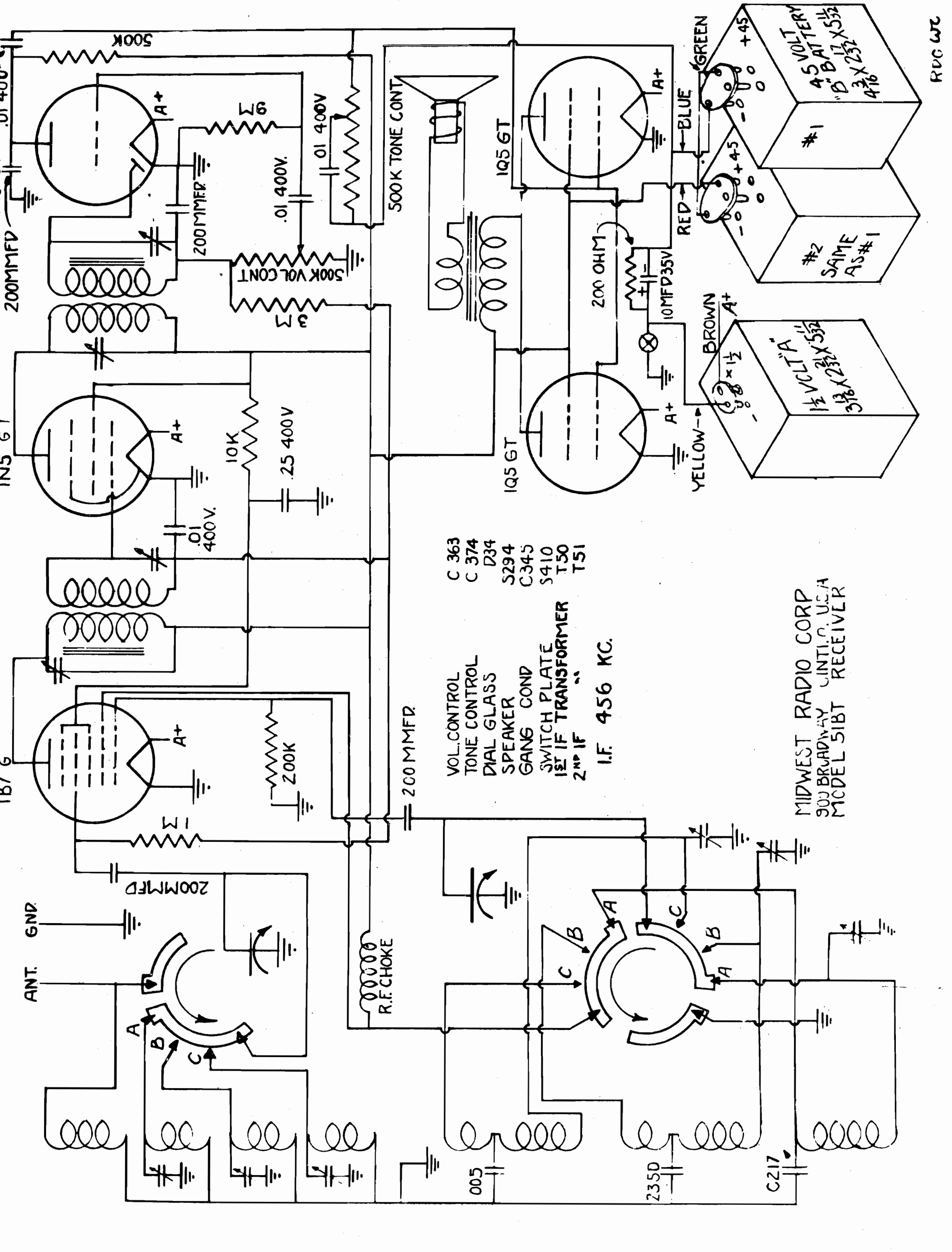
MODEL 51

MIDWEST RADIO CORP.



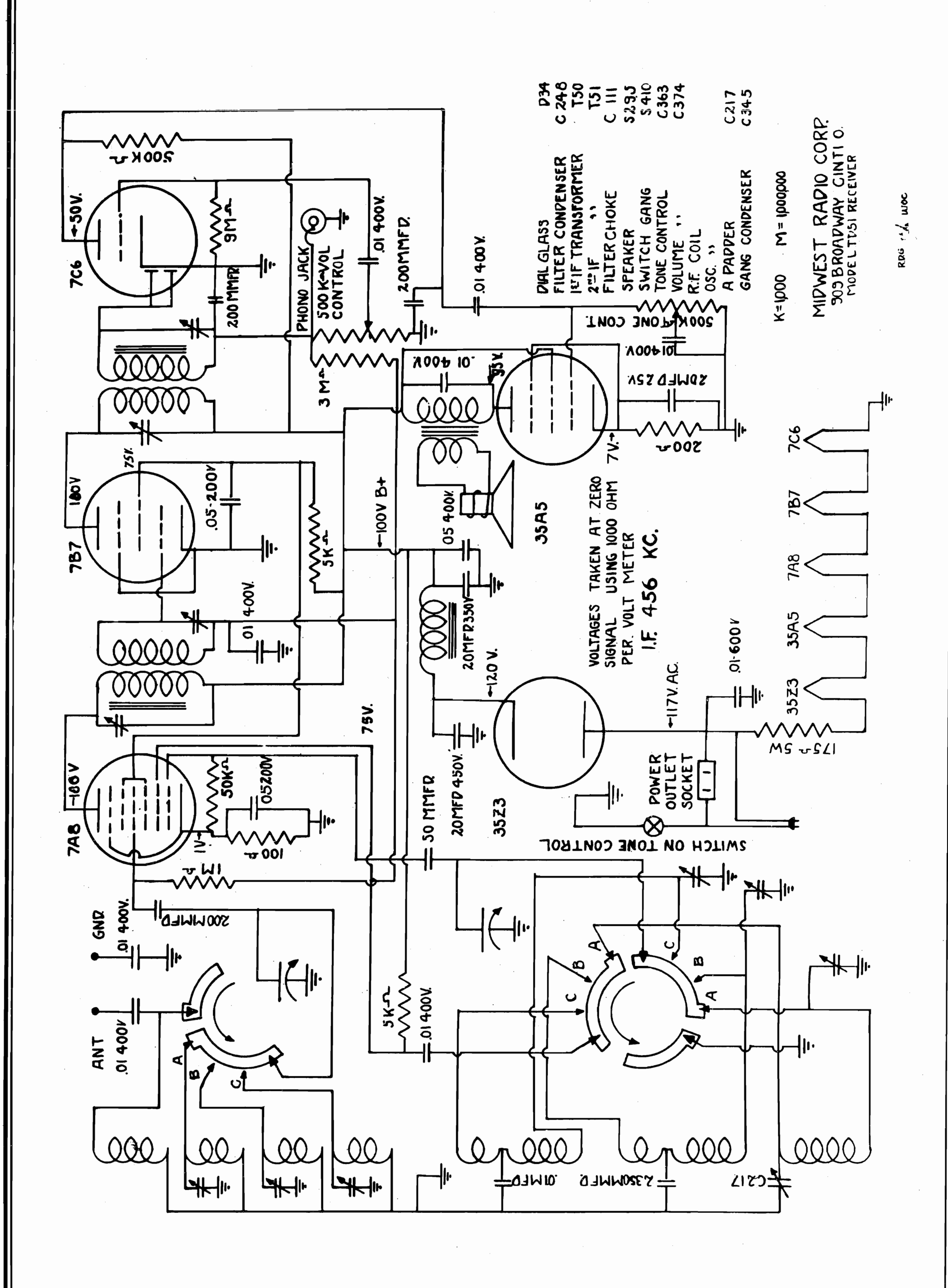
MODEL 51BT

MIDWEST RADIO CORP.



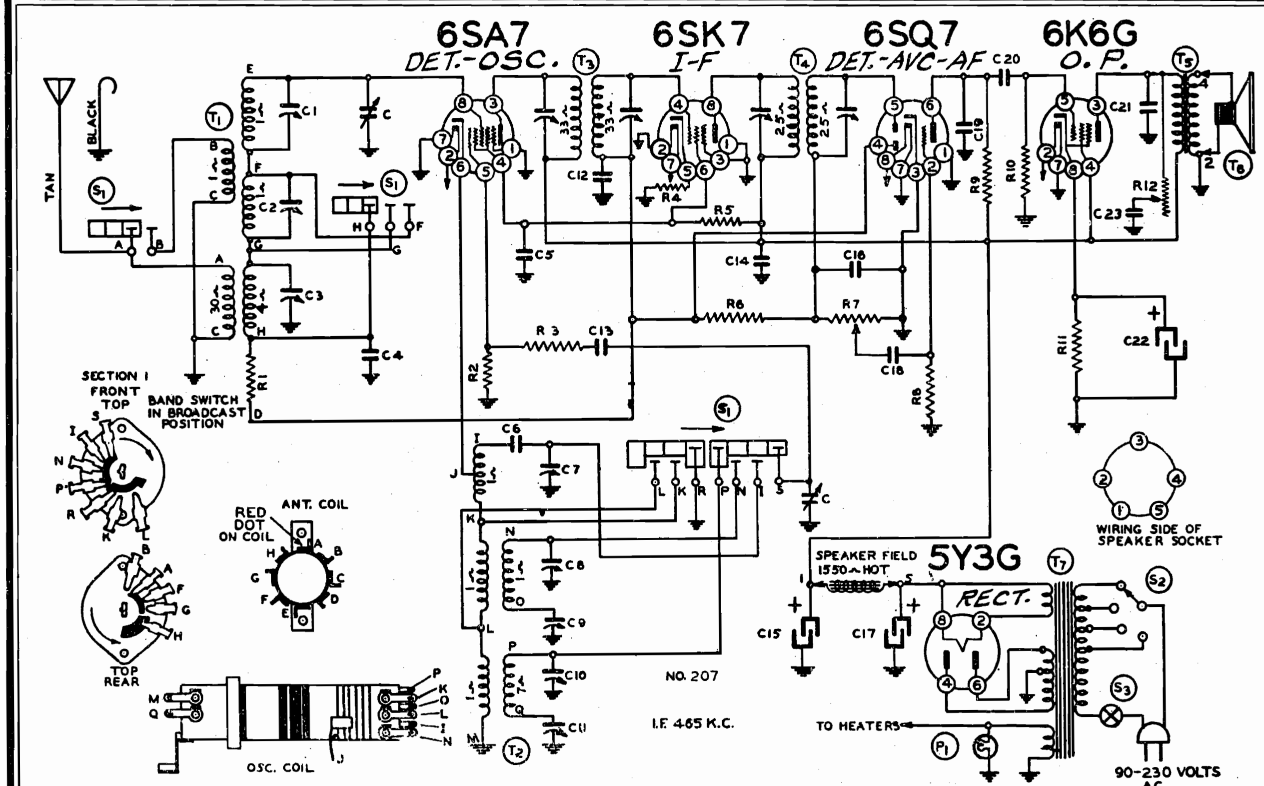
MODEL TD51

MIDWEST RADIO CORP.



MONTGOMERY WARD & CO.

MODEL 04BR-389T



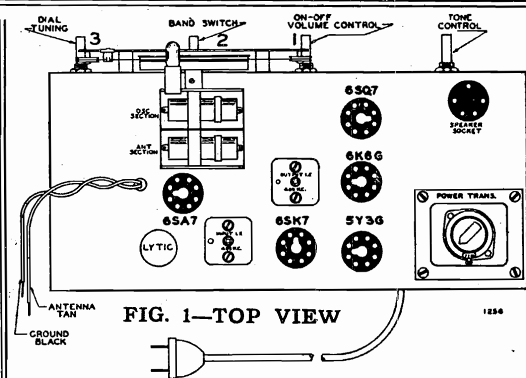


FIG. 1—TOP VIEW

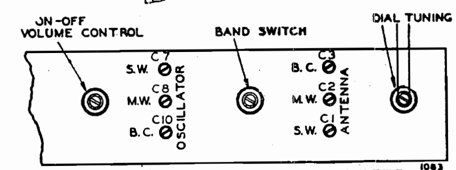


FIG. 3—FRONT OF CHASSIS

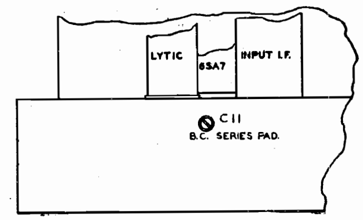


FIG. 4—REAR OF CHASSIS

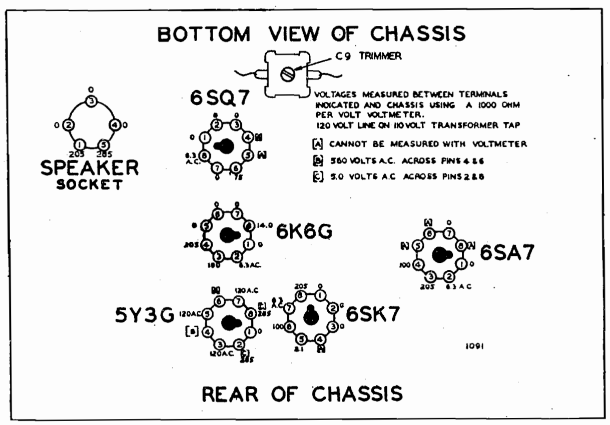


FIG. 5

SEPT. 1940

Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	BE13011	250M ohm—1/3 w.
R2	BE130194	35M ohm—1/3 w.
R3	BE130299	10 ohm—1/3 w.
R4	BE130239	250 ohm—1/3 w.
R5	BE130242	12M ohm—1 watt
R6	BE1304	3 megohm—1/3 w.
R7	BE101208	1 megohm volume control
R8	BE130223	10 megohm—1/3 w.
R9	BE13011	250M ohm—1/3 w.
R10	BE13019	1 megohm—1/3 w.
R11	BE13070	500 ohm—1/3 w.
R12	BE101237	150 ohm—Tone control
		CONDENSERS
C	BE102124	Two Gang Variable Condenser
C1	BE124124	S. W. Antenna Trimmer
C2	BE124124	M. W. Antenna Trimmer
C3	BE124124	B. C. Antenna Trimmer
C4	BE1009	.05 x 200 v.
C5	BE1001	.1 x 400 v.
C6	BE129153	.006—S. W. Padder (Set at Factory)
C7	BE124123	S. W. Oscillator Trimmer
C8	BE124123	M. W. Oscillator Trimmer
C9	BE129154	.0025 M. W. Padder
C10	BE124123	B. C. Oscillator Trimmer
C11	BE129155	B. C. Padder

Schematic Ref. No.	Part No.	Description
C12	BE10026	.02 x 400 v.
C13	BE1295	.0001 Mica
C14	BE1001	.1 x 400 v.
C15	BE119103	40 mfd. lytic
C16	BE1295	.0001 Mica
C17	BE119103	10 mfd. lytic
C18	BE10025	.002 x 600 v.
C19	BE1292	.0005 Mica
C20	BE10026	.02 x 400 v.
C21	BE910071	.004 x 600 v.
C22	BE119103	20 mfd. lytic x 25 w. v. C15, C17 and C22 in same unit
C23	BE10026	.02 x 400 v.
		PARTS
T1	BE111169	Antenna Coil
T2	BE110143	Oscillator Coil
T3	BE108169B	Input I. F.
T4	BE108170	Output I. F.
T5	BE10575	Output Transformer
T6	BE114176	6" Dynamic Speaker (1550 ohm field)
T7	BE104193	Power Transformer 40-60 cycles 90-230 volts
S1	BE125105	Band Switch
S2		Voltage Switch on Power Transformer
S3		Volume Control—On-Off switch
P1	BE10794	Pilot Light Bulb T-44

MODEL 04BR-389T

MODELS 04WG-728
04WG-732

MONTGOMERY WARD & CO.

ALIGNMENT PROCEDURE MODEL 04BR-389T

- 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., 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 I. F. Tube	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 (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	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C7) (See Fig. 3)	Short wave oscillator	See Note "A" Adjust to maximum output
	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C1) (See Fig. 3)	Short wave antenna	Adjust to maximum output
MEDIUM WAVE BAND	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 MC	Trimmers (C8, C2) (See Fig. 3)	Medium wave oscillator and antenna	Adjust to maximum output
	2.3 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 2.3 MC	Trimmer (C9) (See Fig. 5)	Medium wave osc. series pad	Adjust to maximum rock dial. (See note "B")
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Trimmer (C10) (See Fig. 3)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer (C3) (See Fig. 3)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C11) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "B")

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

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.

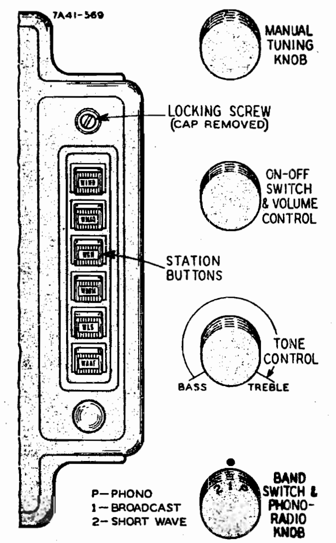
After each range is completed, repeat the procedure as a final check.

Test Frequencies Used	Kilocycles	Meters
I. F.	465	645.1
Short Wave	21000	14.2
Medium Wave	6000	50
Medium Wave	2300	130
Broadcast	1730	173.4
Broadcast	1500	200
Broadcast	600	500

BAND	FREQUENCY RANGE
Broadcast	540—1730 Kc. (555—173.4 Meters)
Medium	2.2—7.0 Mc. (136.3—42.8 Meters)
Short Wave	6.6—23.0 Mc. (45.4—13 Meters)

Power Consumption .... 55 Watts at 117 Volts

Power Output .... 1.5 Watts Undistorted, 3 Watts Maximum



Setting the Station Buttons MODELS 04WG-728, 04WG-732

Setting a Station Button

Turn the manual tuning knob so that the dial pointer moves toward 1550 KC until the stop is reached.

At the top of the escutcheon (from the front) will be seen a cap which covers a hole in the escutcheon—See illustration. Pry up this cap.

At the end of the tube in back of the hole in the escutcheon is the locking screw. Using a small handled screwdriver, unlock the mechanism by turning this screw in a counter-clockwise direction several turns.

TO SET STATIONS ACCURATELY, DO NOT JAR THE RADIO OR BUTTONS WHILE THE MECHANISM IS UNLOCKED.

Select the first station from the list you have prepared, and carefully tune in this station by rotating the manual tuning knob until the signal is clearest and strongest.

With one hand, hold the manual tuning knob to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration *all the way in.* It is better to start with the top button.

Hold *this* button all the way *in.* With the other hand, see whether or not this station is still accurately tuned in by turning the tuning knob a slight amount back and forth. ***Be sure to hold the button all the way in.***

Release the button slowly after the station is tuned in.

CAUTION—Do not touch this button again while the mechanism is unlocked as the setting may be altered.

Carefully tune in the second station on your list. Then hold the tuning knob and push the second button slowly and firmly all the way in. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Turn the manual tuning knob so that the dial pointer moves toward 1550 KC until the stop is reached. Then, with a SMALL HANDLED screwdriver, turn the locking screw in a clockwise direction until it is tight. Tighten the locking screw firmly but not excessively to avoid stripping the threads. Replace the cap over the hole.

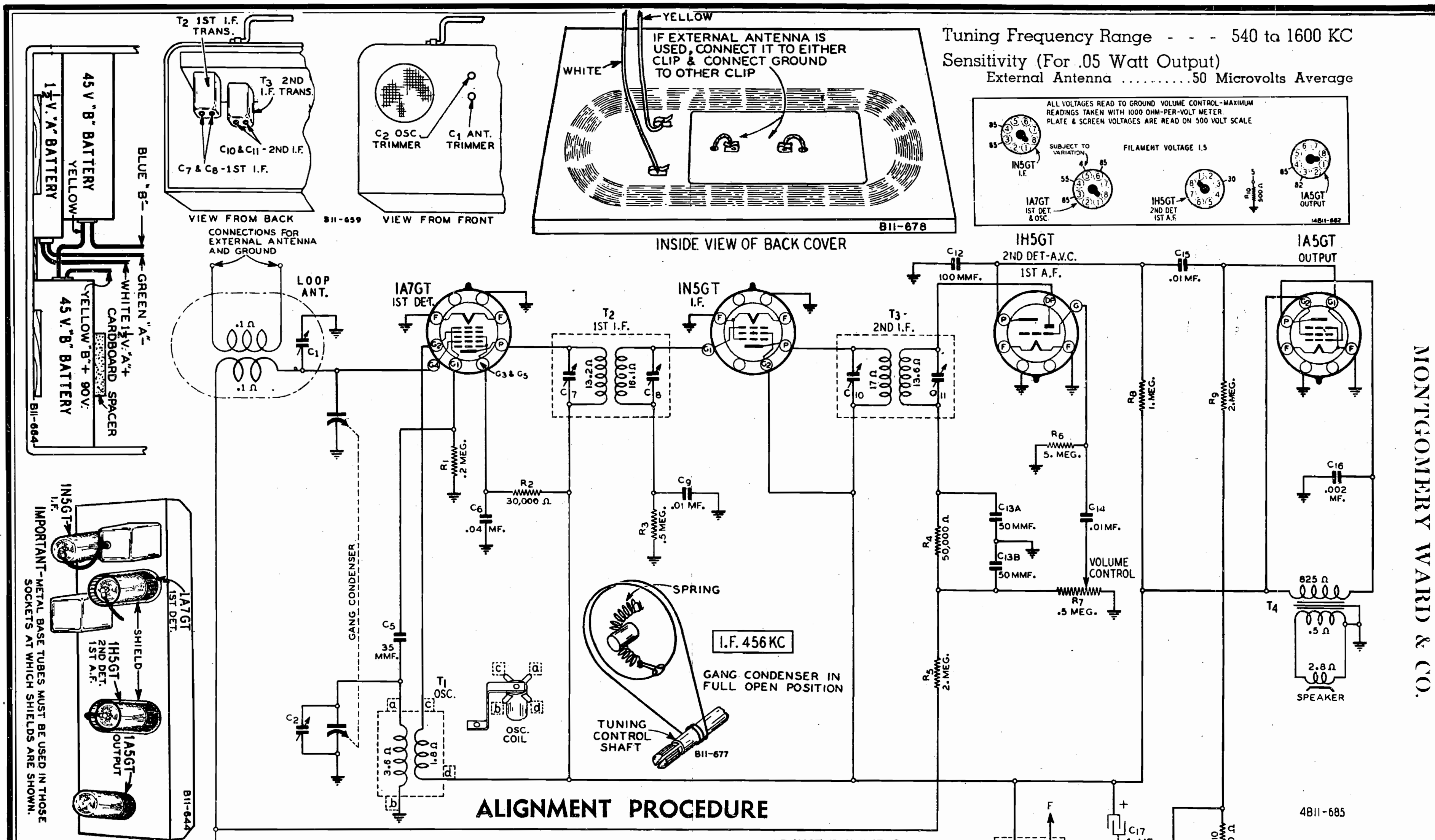
Remove the correct station call letter tabs from the sheets supplied by bending the sheet back and forth at the score mark until the tab can be broken off. Press the tab all the way to the bottom of the space provided in the button. Cover the call letter tab with a celluloid tab, pressing this in until it snaps into place.

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.

MONTGOMERY WARD & CO.

MODEL 04WG-464

Tuning Frequency Range - - - 540 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna ....50 Microvolts Average



ALIGNMENT PROCEDURE

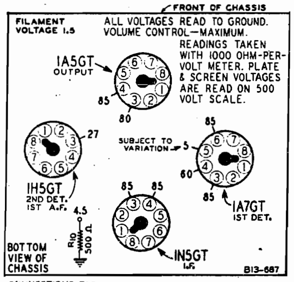
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration page 3
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C10) & (C11)
1600 KC	Signal Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C2)
1500 KC	None—See Note A		Turn rotor to max. output	Antenna (C1)

Power Output
70 Milliwatts Undistorted
160 Milliwatts Maximum
Selectivity - -
50 KC Broad at
1000 Times Signal

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, pull pointer off shaft, set pointer at the 800 KC mark and push back on shaft.

MODEL 04WG-468

MONTGOMERY WARD & CO.

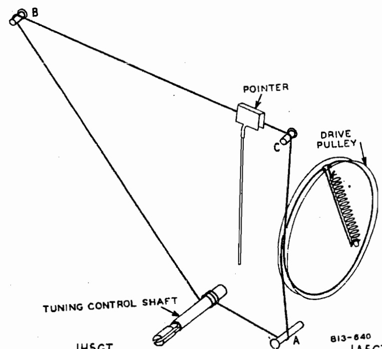


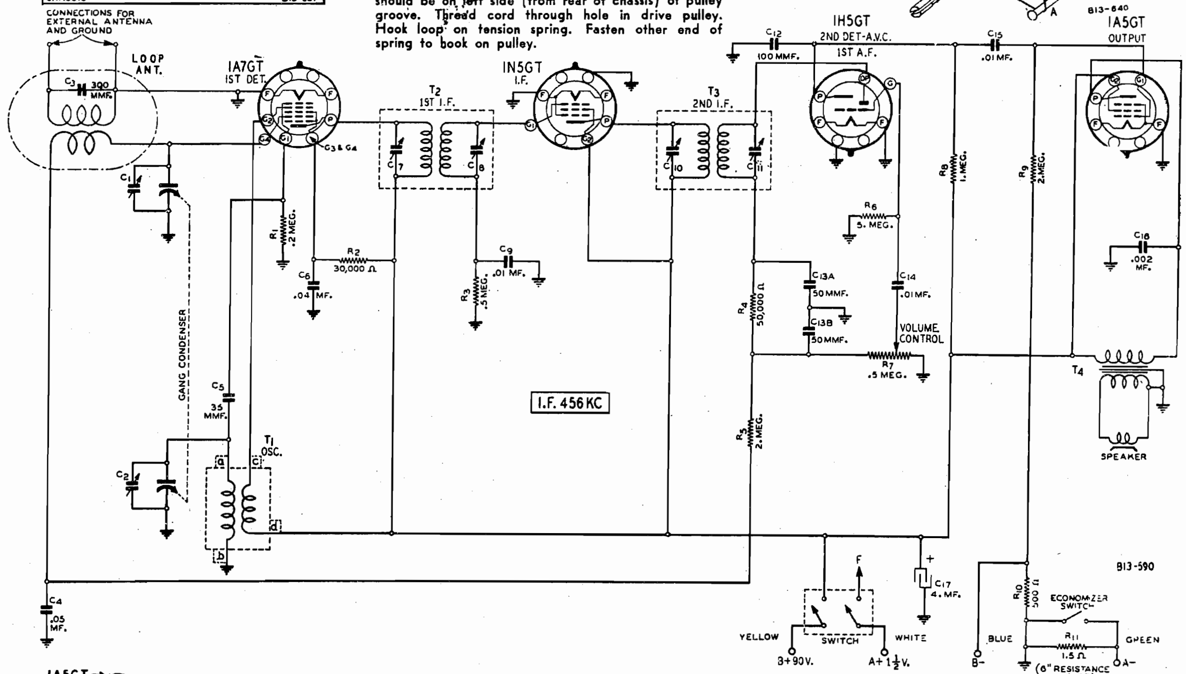
DRIVE CORD REPLACEMENT

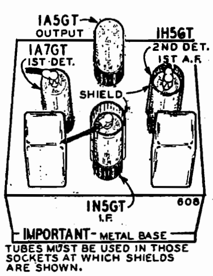
Tie a knot with a small loop at each end of new drive cord. The distance between knots should be 36¼ inches. Turn gang condenser to full open position—See illustration.

Thread one end of drive cord down through hole in groove of drive pulley. Place loop on hook on pulley. Wind other end of cord ¼ turn counter-clockwise (from pulley side of chassis) around drive pulley. Pass cord under idler stud A. Wind 3 turns clockwise (from front of chassis) around tuning control shaft. Turns should progress away from chassis.

Continue cord over idler studs B and C as shown. Then wind cord ¾ turn counter-clockwise (from drive pulley side of chassis) around drive pulley. This turn should be on left side (from rear of chassis) of pulley groove. Thread cord through hole in drive pulley. Hook loop on tension spring. Fasten other end of spring to hook on pulley.



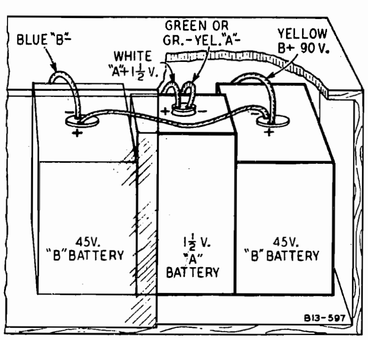




SPECIFICATIONS

Input Voltages and Currents
"A" Battery .... 1.5 Volts—.20 Amperes
"B" Batteries .... 90 Volts—9 Ma.
Power Output .... 70 Milliwatts Undistorted
160 Milliwatts Maximum
Selectivity .... 40 KC Broad at 1000 Times Signal

Intermediate Frequency .... 456 KC
Speaker .... 5" P.M. Dynamic
Tuning Frequency Range .... 528 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna .... 40 Microvolts Average



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

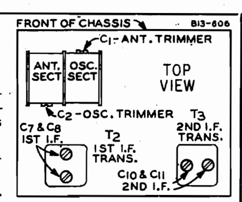
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A 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. & 100 mmf.



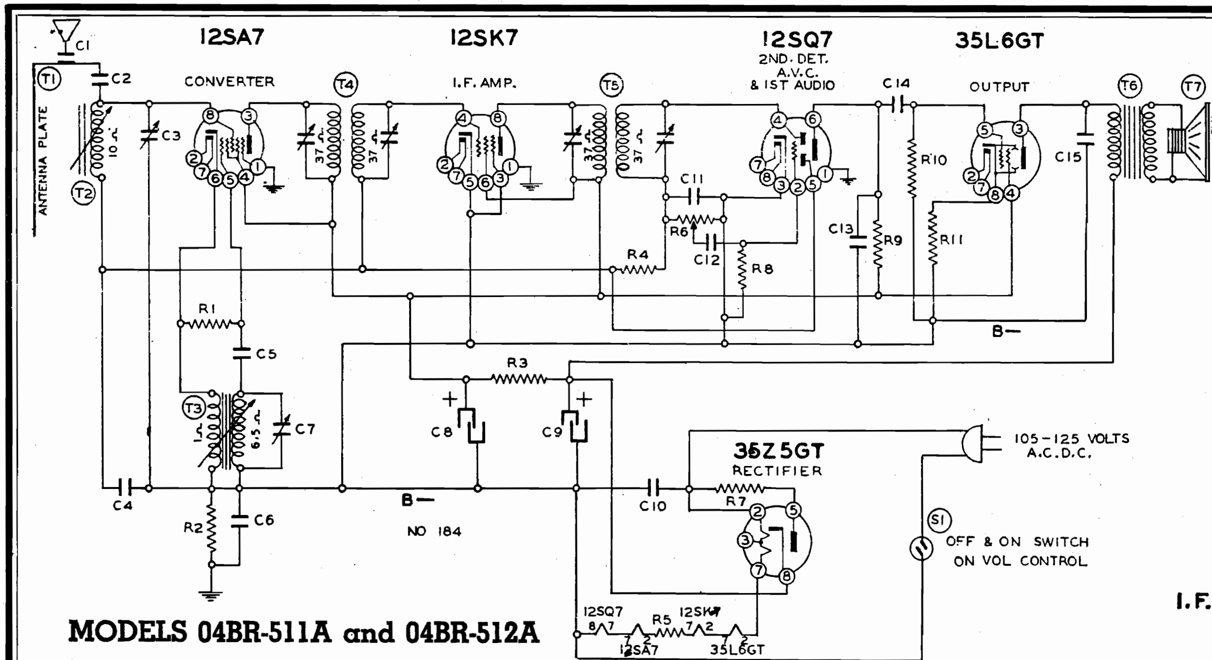
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C10) & (C11)
1600 KC	Signal Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C2)
1400 KC	External Antenna Clip On Loop —See Note A	100 mmf.	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note B	Antenna (C1)

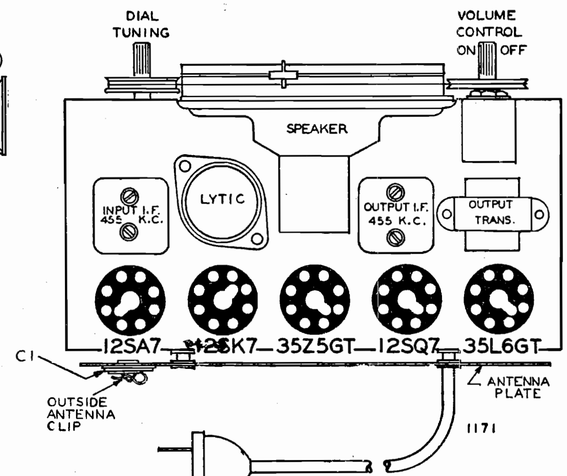
NOTE A—Re-assemble chassis in cabinet. Replace back on cabinet. Connect ground post of signal generator to external ground clip on loop.

NOTE B—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

MONTGOMERY WARD & CO.

MODELS 04BR-511A, 04BR-512A above ser.#OE428700





I.F. 455 K.C.

MODELS 04BR-511A and 04BR-512A
SERIES A (SERIAL No. OE428700 and UP)

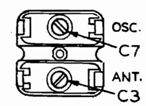
Selectivity - 85 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - - - - 535 to 1720 KC
Intermediate Frequency - - - - - - - - - - 455 KC
Speaker - - - - - - - - - - 4 in. P. M. Dynamic
Power Consumption - - - - - - - - - - 35 Watts
Power Output - - - - - 800 Milliwatts Undistorted
Sensitivity (for .05 Watts Output) - 30 Microvolts Average

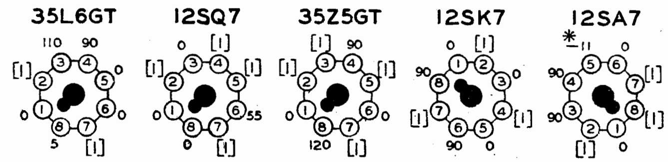
BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & B—

[1] CANNOT BE MEASURED WITH D.C.VOLTMETER.

* OSCILLATOR VOLTAGE TO BE MEASURED WITH R.F. CHOKE IN SERIES WITH VOLTMETER LEAD.



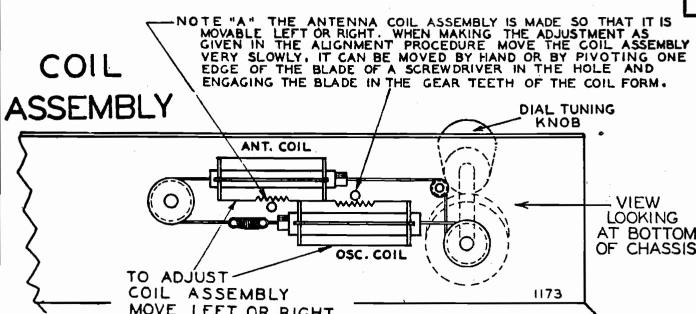


REAR OF CHASSIS

1170

COIL ASSEMBLY

NOTE "A" THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE THE COIL ASSEMBLY VERY SLOWLY. IT CAN BE MOVED BY HAND OR BY PIVOTING ONE EDGE OF THE BLADE OF A SCREWDRIVER IN THE HOLE AND ENGAGING THE BLADE IN THE GEAR TEETH OF THE COIL FORM.



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 radio, the chassis should be removed from the cabinet.

Service Notes

All voltages as indicated on the voltage chart are measured with 117 volt A.C. or D.C. line.

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

Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	BE130176	20M ohm—1/3 w.
R2	BE130100	150M ohm—1/3 w.
R3	BE130279	1M ohm—1 watt
R4	BE1304	3 megohm—1/3 w.
R5	BE130288	50 ohm—1.5 watt
R6	BE101220	500M ohm volume control and Switch
R7	BE130240	30 ohm—1/3 w.
R8	BE130257	5 megohm—1/3 w.
R9	BE130100	150M ohm—1/3 w.
R10	BE13011	250M ohm—1/3 w.
R11	BE130166	150 ohm—1/3 w.
		CONDENSERS
C1	BE131262	.00001 washer condenser (antenna clip on back plate,
C2	BE129114	.0003 mica
C3	BE124137	Trimmer on antenna coil
C4	BE1009	.05 x 200 v.
C5	BE12939	.00005 mica
C6	BE10091	.15 x 400 v.
C7	BE124137	Trimmer on Oscillator coil
C8	BE11992	20 mfd. lytic x 150 w. v.
C9	BE11992	40 mfd. lytic x 150 w. v.
C10	BE10013	.05 x 400 v.
C11	BE12912	.00025 mica
C12	BE10025	.002 x 600 v.
C13	BE1292	.0005 mica
C14	BE10011	.01 x 400 v.
C15	BE10011	.01 x 400 v.
	C3	and C7 in same unit
	C8	and C9 in same unit
		PARTS
T1	BE115597-18	Antenna plate—walnut or
	BE115597-9	Antenna plate—ivory
T2	BE111181	Antenna permeability coil
T3	BE110153	Oscillator permeability coil
T4	BE108157-H	Input I.F. Coil—455 kc.
T5	BE108157-I	Output I.F. Coil—455 kc.
T6	BE105110	Output Transformer
T7	BE114199	4" P.M. Speaker
S1		Switch on volume control

MODELS 04BR-511A
04BR-512A
above ser.#0E428700

MONTGOMERY WARD & CO.

MODEL 04BR-570A

Models No. 04BR-511A and 04BR-512A ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions

- 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-metallic screwdriver.
- Dummy antennas—.1 Mfd., and 200 Mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Trimmer (C7) (See bottom of chassis view)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Iron Cores All the way out	Trimmer (C3) (See bottom of chassis view)	Antenna	Adjust to maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See bottom of chassis view)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

Model No. 04BR-570A ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.
- 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 Mfd., and 200 Mmf.

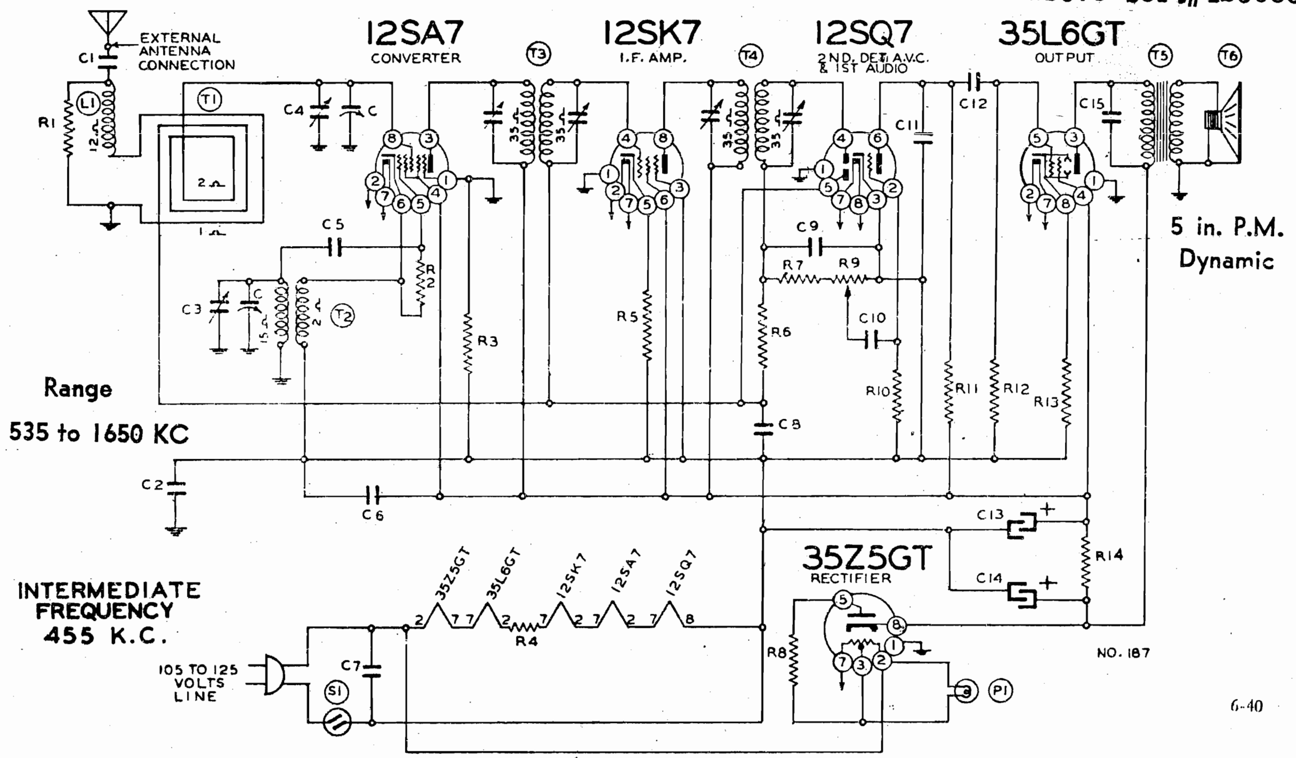
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6S7G I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6D8G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	.1 MFD.	Grid of 6D8G	Rotor full open (Plates out of mesh)	Trimmer—Top of gang (See Top View)	Oscillator	Adjust to maximum output
	1400 Kc.		(See Note "A")	Set dial at 1400 Kc.	Trimmer—Top of gang (See Top View)	Antenna	Adjust to maximum output

NOTE "A"—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.

Loop aerial should be connected when aligning receiver and should be the same distance from the chassis as when mounted in the cabinet.

MONTGOMERY WARD & CO.

MODELS 04BR-513A, 04BR-514A above ser. #428000



Power Consumption - - - - - 35 watts

Power Output - - 800 Milliwatts Undistorted

Sensitivity for 50 Milliwatt Output:

20 Microvolts Average

Selectivity - 65 KC Broad at 1000 Times Signal at 1000 KC

Loop aerial should be connected when aligning receiver.

NOTE "A"—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 "B"—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.

RESISTORS

Diagram Ref. No.	Part No.	
R1	BE130314	2200 ohm—⅓ w.
R2	BE13094	50M ohm—⅓ w.
R3	BE1309	200M ohm—⅓ w.
R4	BE130315	75 ohm—1½ w.
R5	BE130203	40 ohm—⅓ w.
R6	BE1304	3 megohm—⅓ w.
R7	BE1301	25M ohm—⅓ w.
R8	BE130215	25 ohm—⅓ w.
R9	BE101198	1 megohm volume contr
R10	BE130257	5 megohm—⅓ w.
R11	BE1303	500M ohm—⅓ w.
R12	BE1303	500M ohm—⅓ w.
R13	BE130166	150 ohm—⅓ w.
R14	BE130287	1200 ohm—1 w.

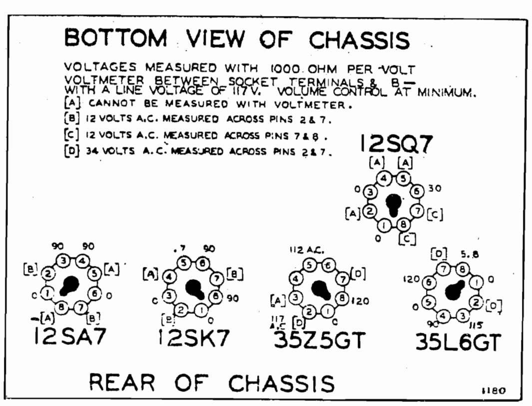
CONDENSERS

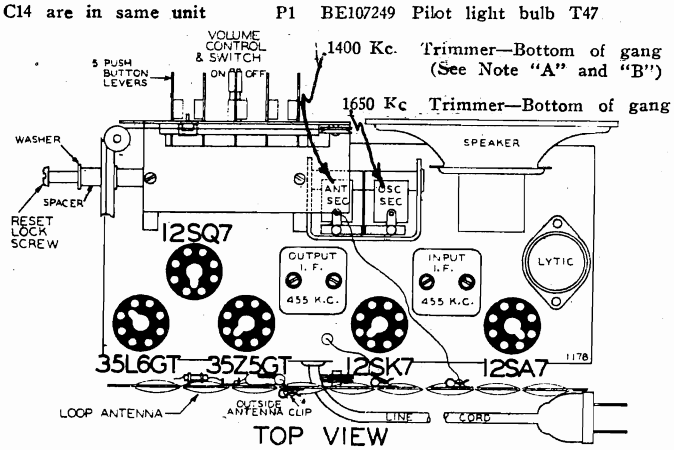
C	BE102132	2 gang variable condenser
C1	BE10011	.01 x 400 v.
C2	BE10091	.15 x 400 v.
C3		Oscillator trimmer on gang
C4		Antenna trimmer on gang
C5	BE12921	.0002 mfd. mica
C6	BE1009	.05 x 200 v.
C7	BE1001	.1 x 400 v.
C8	BE1009	.05 x 200 v.
C9	BE1295	.0001 mfd. mica
C10	BE10025	.002 x 600 v.
C11	BE12912	.00025 mfd. mica
C12	BE100106	.004 x 600 v.
C13	BE11992	20 mfd. lytic x 150 w. v.
C14	BE11992	40 mfd. lytic x 150 w. v.
C15	BE10026	.02 x 400 v.

C1³ and C14 are in same unit

PARTS

T1	BE111182	Loop antenna—complete assembly
T2	BE110145	Oscillator coil
T3	BE108140I	Input I. F.—455 kc.
T4	BE108141D	Output I. F.—455 kc.
T5	BE105104	Output Transformer
T6	BE114201	5" P. M. Speaker
L1	BE12311	Loading coil
S1		On-off switch on volume control
P1	BE107249	Pilot light bulb T47

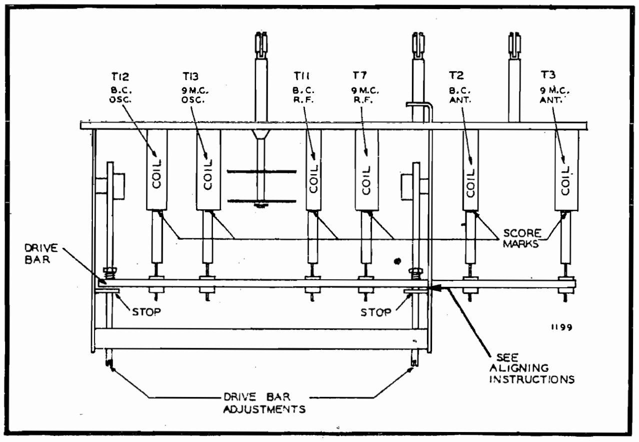




SEE MODEL NUMBERS BELOW

MONTGOMERY WARD & CO.

MODELS 675A, 676A, 903A, 907A, 904A, 906A



IRON CORE ADJUSTMENT VIEW

MODELS 903A, 907A, 904A, 906A, 1105A, 1106A

SETTING PUSHBUTTONS

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button **hard** all the way in to lock the station in place. (push directly on front of button) Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock in place when setting up the station.

To change stations simply repeat the procedure above.

REPLACING PUSH-BUTTONS

Should is ever be necessary to replace a broken or lost pushbutton you will notice they are made in two parts, a clear front and a brown body. To separate the two portions first take off the escutcheon. Push the button in—Next push the brown body of the button back until it snaps free from the clear front. You can now lift the clear portion off and take out the brown body. To replace the pushbutton, reverse the procedure.

HOW TO REMOVE CHASSIS

Should it ever be necessary to take the chassis out of the cabinet be sure to pull the plug from the light socket. Next pull the control knobs off the shafts and take the escutcheon off.

Turn the spring clips clear of the back and take the back off—be sure to disconnect the loop aerial and the speaker plug, also the plugs from the phono unit. Remove the chassis mounting screws and lift the chassis out.

SERVICE NOTES

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

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.

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 radio, the chassis should be removed from the cabinet. Although the short wave bands on this radio are of the band spread type the Alignment Procedure is not difficult. However because each short wave scale covers only a small portion of the short wave spectrum you must do the work carefully and your oscillator must be accurate.

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a gauge). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

MODELS 903A, 907A, 1105A, 1106A

PHONOGRAPH-TELEVISION AND FM. JACK

Should you wish to use an external phonograph it should be plugged into the phono jack shown in the top view—The on-off radio-phono knob on the front panel will then switch from radio to phono operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-television-FM in the top view will accommodate either the Phono or a television or FM converter.

MODELS 513A, 514A

SETTING THE AUTOMATIC PUSHBUTTONS

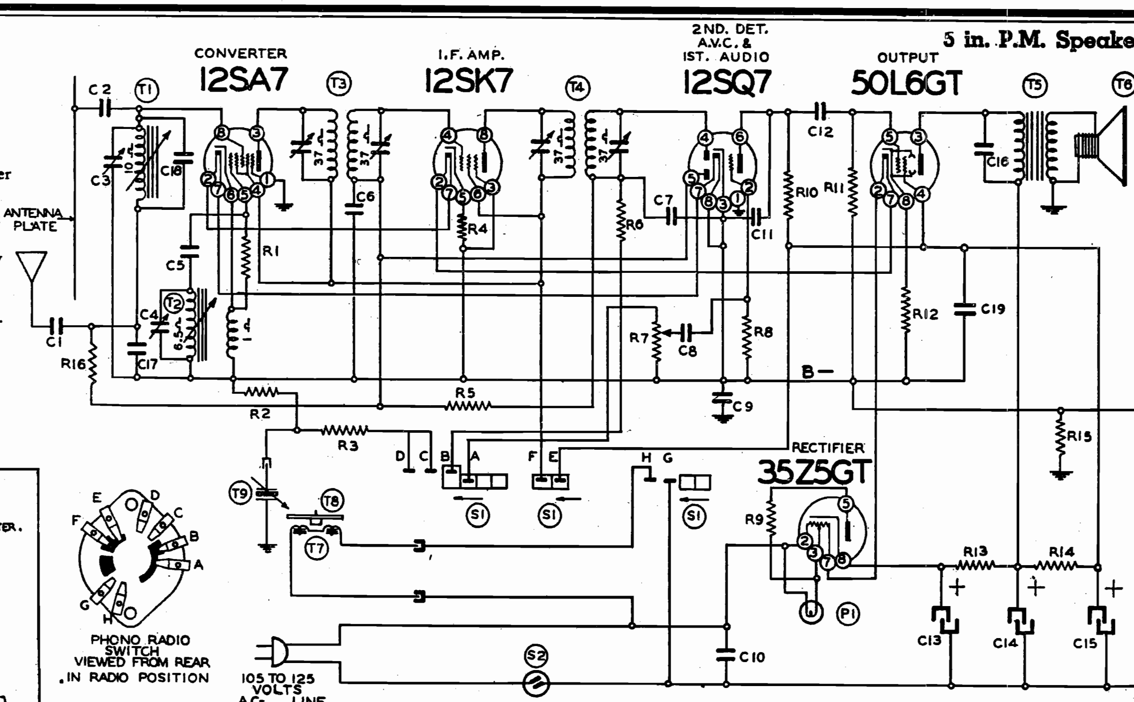
Make a list of your 5 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the front of each pushbutton.

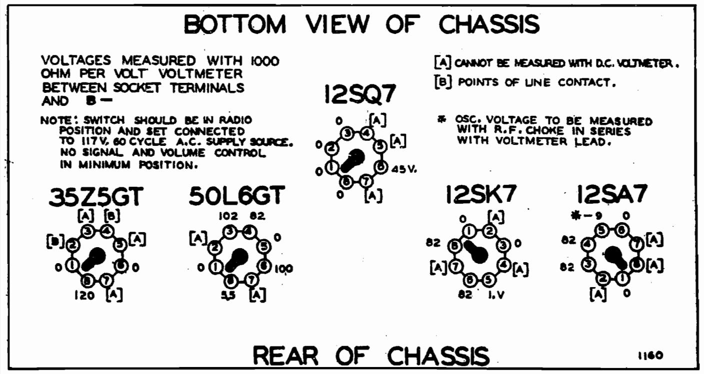
Press one of the buttons all the way down and hold it FIRMLY. Now tune in the station you want with the tuning knob. Tune back and forth until the station is clear, then release the button. NOTE: *If the tuning knob turns quite hard when the button is held down firmly (loosen the reset lock screw several turns with a screwdriver or coin (quarter).*

Continue, setting each of the remaining pushbuttons in the same way. Now turn the tuning knob all the way to the right and tighten the reset lock screw. This screw prevents the pushbuttons from slipping off the stations you have set. To change stations loosen lock screw and proceed as above.

MONTGOMERY WARD & CO. MODEL 04BR-515, A & B above ser.#0E507100

Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	BE130176	20M ohm—⅓ w.
R2	BE130118	600M ohm—⅓ w.
R3	BE130118	600M ohm—⅓ w.
R4	BE13056	100 ohm—⅓ w.
R5	BE130170	3 megohm—⅓ w.
R6	BE13012	50M ohm—⅓ w.
R7	BE101217	½ megohm—vol contr
R8	BE130257	5 megohm—⅓ w.
R9	BE130215	25 ohm—½ w.
R10	BE1309	200M ohm—⅓ w.
R11	BE13037	750M ohm—⅓ w.
R12	BE130166	150 ohm—⅓ w.
R13	BE13097	200 ohm—⅓ w.
R14	BE130287	1200 ohm—1 watt
R15	BE1309	200M ohm—⅓ w.
R16	BE1309	200M—⅓ w.
		CONDENSERS
C1	BE1295	.0001 Mica Condenser
C2	BE129114	.0003 mfd. mica
C3	BE124136	Antenna Trimmer
C4	BE124136	Oscillator Trimmer
C5	BE1295	.0001 mica
C6	BE1009	.05 x 200 v.
C7	BE1295	.0001 mica
C8	BE10025	.002 x 600 v.
C9	BE100119	.1 x 400 v.
C10	BE1001	.1 x 400 v.
C11	BE12912	.00025 mica
C12	BE10019	.006 x 600 v.
C13	BE11994	40 mfd. lytic—150 w. v.
C14	BE11994	20 mfd. lytic—150 w. v.
C15	BE11994	20 mfd. lytic—150 w. v.
C16	BE10011	.01 x 400 v.
C17	BE129162	.0008 Mica Condenser
C18	BE129163	.000025 Ceramicon Condenser
C19	BE10013	.05 x 400 v. cond.
		C3 and C4 in same unit
		C13, C14 and C15 are in same unit
		PARTS
T1	BE112767	Antenna Coil—Permeability tuning assembly complete
T2	BE112767	Oscillator Coil
T3	BE108140F	Input I. F. Coil—465 kc.
T4	BE108145D	Output I. F. Coil—465 kc.
T5	BE105108	Output Transformer
T6	BE114198	5" P.M. Speaker
T7	BE104206	Phono Motor
T8	BE12228	Turntable
T9	BE114194	Phono pick up arm
S1	BE125113	Phono Switch
S2		Switch on volume control
P1	BE107249	Pilot light T47
		T1 and T2 in same unit





I.F. 465 KC

Power Consumption - - - - - - - - - 50 Watts

Power Output - - - - 900 Milliwatts Undistorted

NO. 185

Sensitivity (for .5 Watts Output)
Broadcast Band—40 Microvolts Average

Selectivity - 65 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range - - - - - - - 535 to 1690 KC

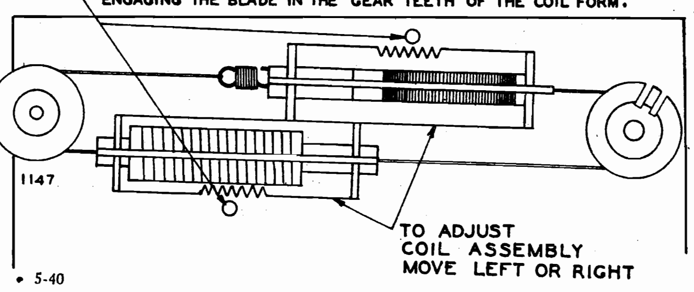
Aligning Instructions

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 radio, the chassis should be removed from the cabinet.

To remove chassis from the cabinet pull tuning knob and volume knob off their shafts. Remove the four mounting screws that hold the chassis to the cabinet. Move the chassis toward back of cabinet so that control shafts and dial assembly clear holes in cabinet, then chassis can be slipped out.

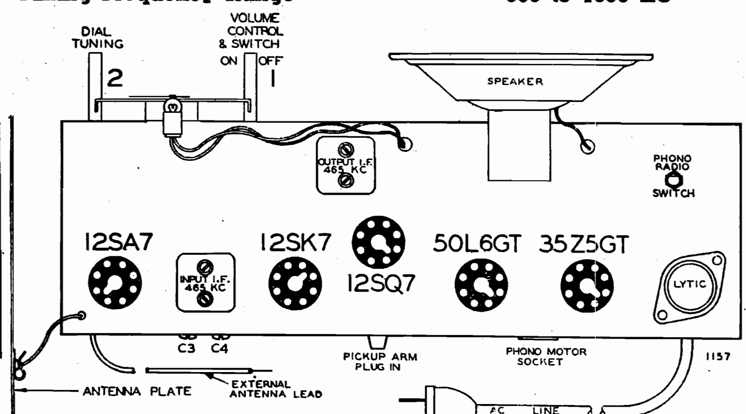
MODEL 04BR-515A (SERIAL No. OE507100 and UP)

NOTE "A" THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE THE COIL ASSEMBLY VERY SLOWLY. IT CAN BE MOVED BY HAND OR BY PIVOTING ONE EDGE OF THE BLADE OF A SCREWDRIVER IN THE HOLE AND ENGAGING THE BLADE IN THE GEAR TEETH OF THE COIL FORM.



TUNING ASSEMBLY

5-40



MODEL 04BR-515, A & B
above ser.#0E507100
MODEL 04BR-679A

MONTGOMERY WARD & CO.

Model No. 04BR-515A

- 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-metallic screwdriver.
- Dummy antennas—.1 Mfd., and 200 Mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Connect to Antenna Plate See Trimmer View	Iron Cores All the way out	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Antenna Plate See Trimmer View	Iron Cores All the way out	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1690 Kc.	.1 MFD.	Connect to Antenna Plate See Trimmer View	Iron Cores All the way out	Trimmer (C4) (See Trimmer View)	Oscillator	Adjust to maximum output
	1690 Kc.	200 MMF.	Connect to Antenna Lead See Trimmer View	Iron Cores All the way out	Trimmer (C3) (See Trimmer View)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Antenna Lead See Trimmer View	Turn Dial to 1400 Kc.	Adjust position of antenna coil right or left.	Antenna Coil Adjustment	(See Note "A") Adjust to maximum output
	1690 Kc.	200 MMF.	Connect to Antenna Lead See Trimmer View	Turn Dial to 1690 Kc.	Adjust trimmer (C3) (See Trimmer View)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable right or left. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1690 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1690 Kc.

Model Nos. 04BR-679A

- 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., 175 mmf.

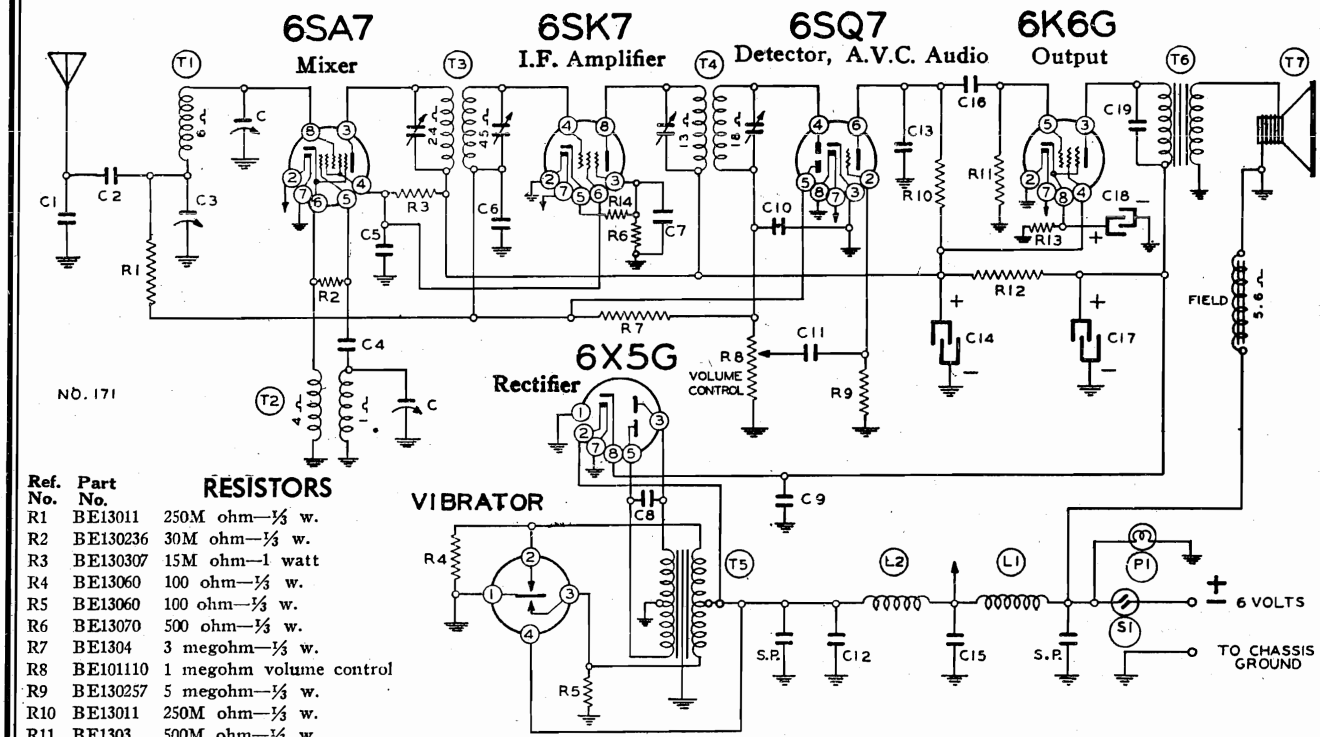
BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.5 MFD.	Grid of 6K7G I.F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	455 Kc.	.5 MFD.	Grid of 6A8G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1550 Kc.	175 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of Middle section of gang (See Fig. 2)	Oscillator	Adjust to maximum output
	1400 Kc.	175 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmers—Top of front and rear section of gang (See Fig. 2)	Antenna and R. F.	Adjust to maximum output
	600 Kc.	175 mmf.	Antenna lead	Set dial at 600 Kc.	B.C. Series Pad (See Fig. 2)	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. Trimmer is located on top of chassis along side of gang. 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. Do not bend plates of variable condenser to correct tracking.

MONTGOMERY WARD & CO.

MODEL 04BR-567A above ser.#225040



I.F. 465 K.C.

RESISTORS

Ref. No.	Part No.	
R1	BE13011	250M ohm—1/3 w.
R2	BE130236	30M ohm—1/3 w.
R3	BE130307	15M ohm—1 watt
R4	BE13060	100 ohm—1/3 w.
R5	BE13060	100 ohm—1/3 w.
R6	BE13070	500 ohm—1/3 w.
R7	BE1304	3 megohm—1/3 w.
R8	BE101110	1 megohm volume control
R9	BE130257	5 megohm—1/3 w.
R10	BE13011	250M ohm—1/3 w.
R11	BE1303	500M ohm—1/3 w.
R12	BE130199	1500 ohm—1 watt
R13	BE130308	750 ohm—1 watt
R14	BE130174	50 ohm—1/3 w.

CONDENSERS

C	BE10269	2 gang variable condenser
C1	BE1293	.00002 mica
C2	BE10055	.01 x 400 volts
C3	BE12434	Adj. Antenna Trimmer
C4	BE12921	.0002 mica
C5	BE100115	.05 x 400 v.
C6	BE1009	.05 x 200 v.
C7	BE10020	.1 x 200 v.
C8	BE10034	.005 x 1200 v.
C9	BE12912	.00025 mica
C10	BE1295	.0001 mica
C11	BE10025	.002 x 600 v.
C12	BE10031	.5 x 120 v.
C13	BE1292	.0005 mica
C14	BE119105	15 mfd. lytic x 350 w. v.
C15	BE10031	.5 x 120 v.
C16	BE10078	.01 x 200 v.
C17	BE119105	15 mfd. lytic x 350 w. v.
C18	BE119105	20 mfd. lytic x 25 w. v.
C19	BE10087	.01 x 600 v.

C14, C17 and C18 in same unit

PARTS

T1	BE11195B	Antenna Coil
T2	BE110146	Oscillator Coil
T3	BE108139	Input I.F. Coil—465 kc.
T4	BE108121B	Output I. F. Coil—465 kc.
T5	BE104131	Power Transformer
T6	BE10567	Output Transformer
T7	BE114114R	5" Dynamic Speaker (5.6 ohm field)
L1	BE10568	"A" Choke
L2	BE10566	"A" Choke
S1		Switch on volume control
P1	BE10797	Pilot light (T51) 6-8 volts
S.P.	BE11749	(2) Spark Plates

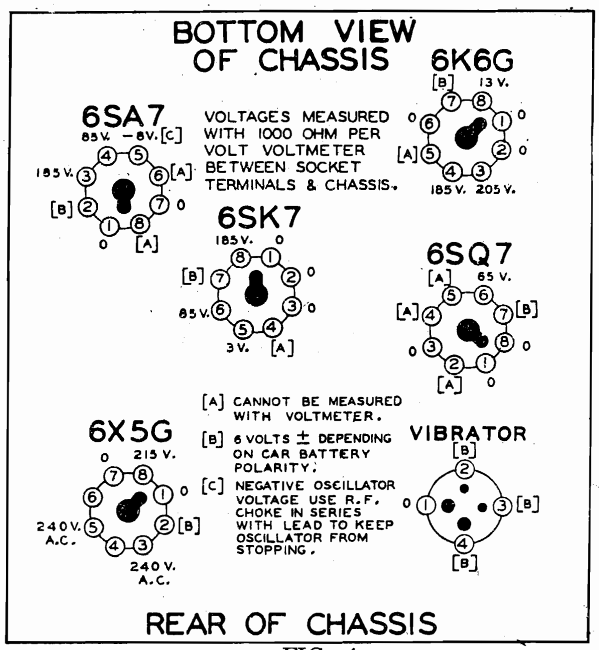


FIG. 4

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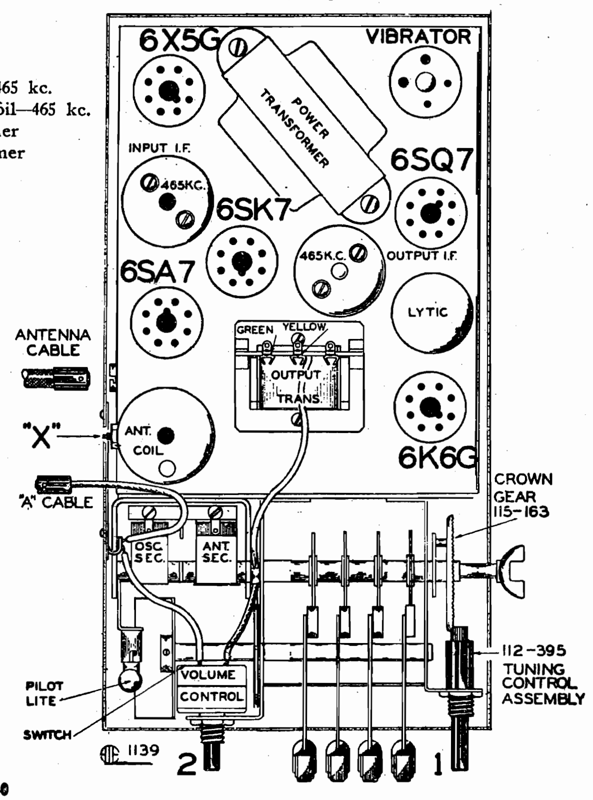


FIG. 3—TOP VIEW

MODEL 04BR-567A
above ser.#225040

MONTGOMERY WARD & CO.

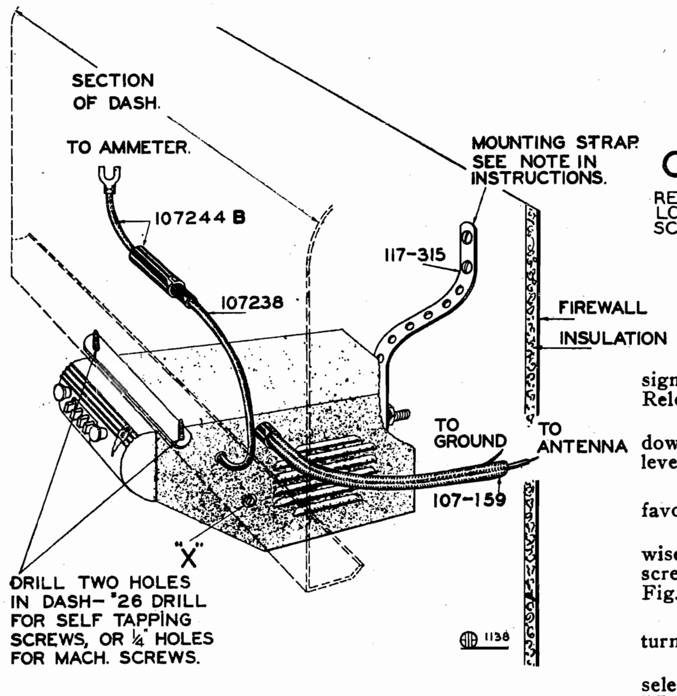


FIG. 1—GENERAL INSTALLATION VIEW

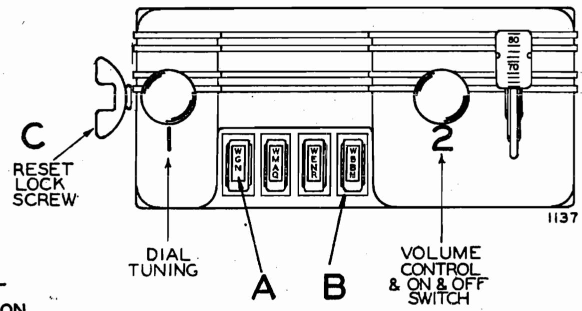


FIG. 2—FRONT VIEW

RADIO LOCATION

Determine the most desirable mounting location, (See Fig. 1—General Installation View, page 2).

In the majority of installations it will be found that the radio can be mounted under the dash panel directly to the left of the steering column.

BONDING

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. 5/8" 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.

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.

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.

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).

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

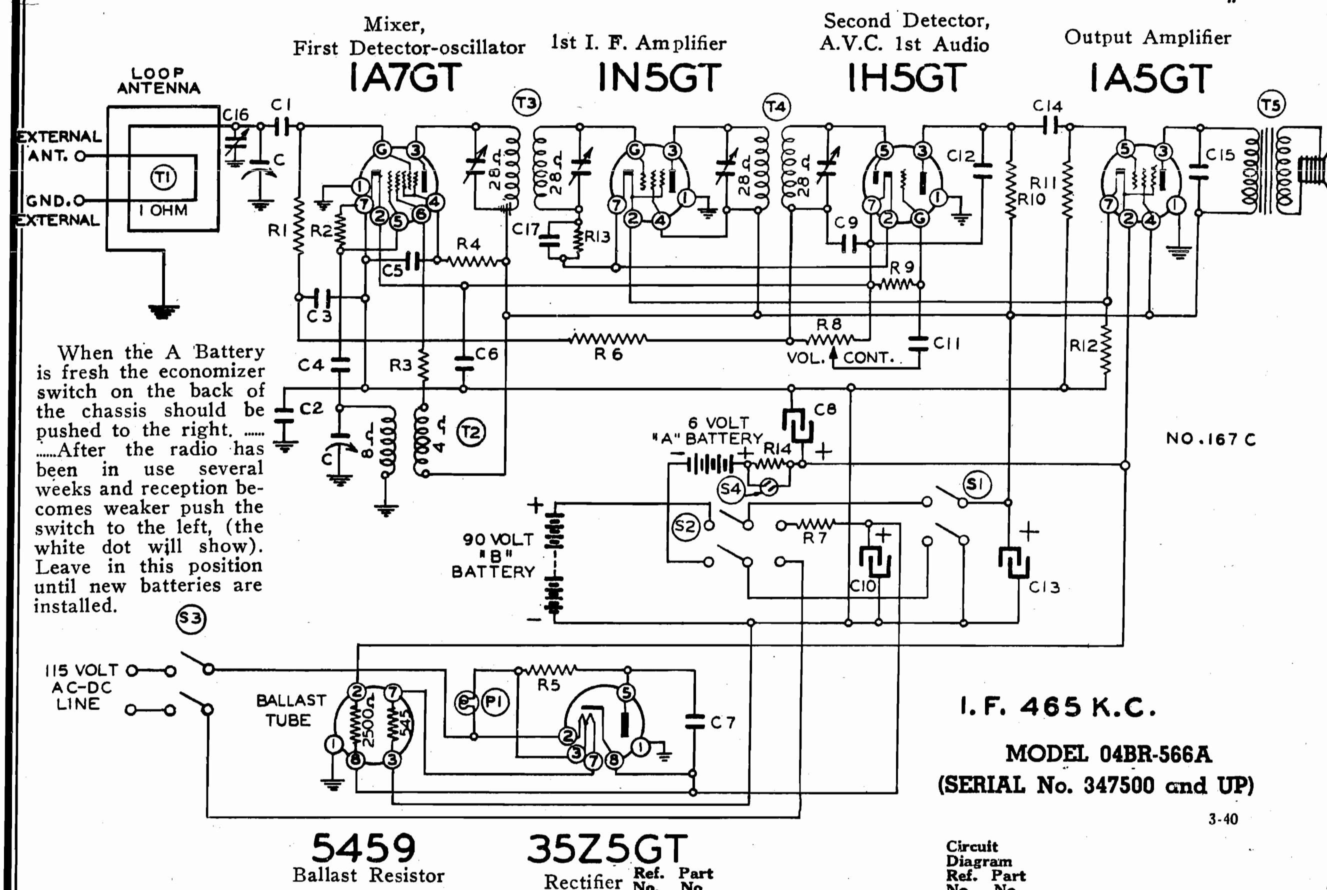
1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6SK7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108121 to resonance 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.

MONTGOMERY WARD & CO.

MODEL 04BR-566A above ser.#347500



When the A Battery is fresh the economizer switch on the back of the chassis should be pushed to the right. ....After the radio has been in use several weeks and reception becomes weaker push the switch to the left, (the white dot will show). Leave in this position until new batteries are installed.

MODEL 04BR-566A
(SERIAL No. 347500 and UP)

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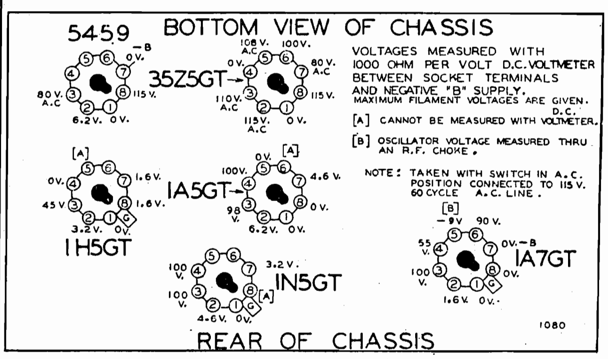

RESISTORS

Ref. No.	Part No.	
R1	BE13038	2 megohm—1/3 w.
R2	BE130266	200M ohm—1/3 w.
R3	BE13018	4M ohm—1/3 w.
R4	BE130208	40M ohm—1/3 w.
R5	BE130215	25 ohm—1/2 w.
R6	BE130170	3 megohm—1/3 w.
R7	BE130129	2500 ohm—1/3 w.
R8	BE101210	1 megohm volcontrol
R9	BE130257	5 megohm—1/3 w.
R10	BE1303	500M ohm—1/3 w.
R11	BE13038	2 megohm—1/3 w.
R12	BE13092	1M ohm—1/3 w.
R13	BE130100	150M ohm—1/3 w.
R14	BE130197	20 ohm—1/3 w.

CONDENSERS

Circuit Diagram Ref. No.	Part No.	
C	BE102125	2 gang variable cond
C1	BE12912	.00025
C2	BE100110	.2 mfd. x 400 v.
C3	BE1009	.05 x 200 v.
C4	BE12912	.00025
C5	BE1009	.05 x 200 v.
C6	BE10020	.1 x 200 v.
C7	BE10011	.01 x 400 v.
C8	BE119104	Lytic 200 mfd. x 6 w. v.
C9	BE1295	.0001 mfd.
C10	BE119104	Lytic 40 mfd. x 150 w. v.
C11	BE10025	.002 x 600 v.
C12	BE1292	.0005 mfd.
C13	BE119104	Lytic 20 mfd. x 150 w. v.
C14	BE10011	.01 x 400 v.
C15	BE10025	.002 x 600 v.
C16	BE124116	Adjustable antenna trimmer
C17	BE10026	.02 x 400 v.

C8, C10 and C13 in same unit

PARTS

Ref. No.	Part No.	
T1	BE111171	Loop Antenna
T2	BE110144	Oscillator Coil
T3	BE108171B	Input I. F. Coil—465 kc.
T4	BE108172	Output I. F. Coil—465 kc.
T5	BE114189	Speaker with output transf
S1	BE101210	Switch on volume control
S2	BE125106	Power Switch
S3	BE125107	Cut-off switch in line cord
S4	BE12588B	Battery economizer switch
P1	BE107249	Pilot light T47

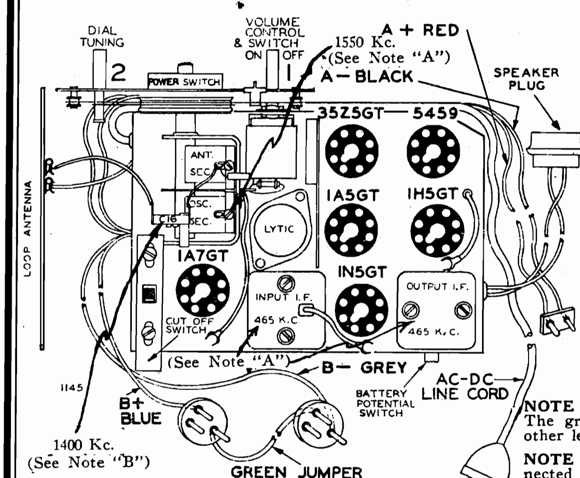

FIG. 2—TOP VIEW

Specifications

Power Consumption	**"A" Battery 50 MA; "B" Battery 8 MA. (On A.C. or D.C. 35 Watts)**
Power Output	**100 Milliwatts, Undistorted 200 Milliwatts, Maximum**
Sensitivity (for .05 Watts)	**50 Microvolts Average**
Selectivity	**52 Kc. Broad at 1000 Times Signal at 1000 Kc.**
Tuning Range	**540 to 1550 Kc.**
Intermediate Frequency	**465 Kc.**
Speaker	**5 in. P. M. Dynamic**

CONVENTIONAL ALIGNMENT

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments. The ground of the signal generator is connected to the negative "B" wire of the radio and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the ground terminal of the loop assembly. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the antenna terminal of the loop assembly.

It is important when making this adjustment that the same distance between the loop antenna and the chassis be maintained as when the chassis and loop are installed in the cabinet.

MODEL 04WG-568

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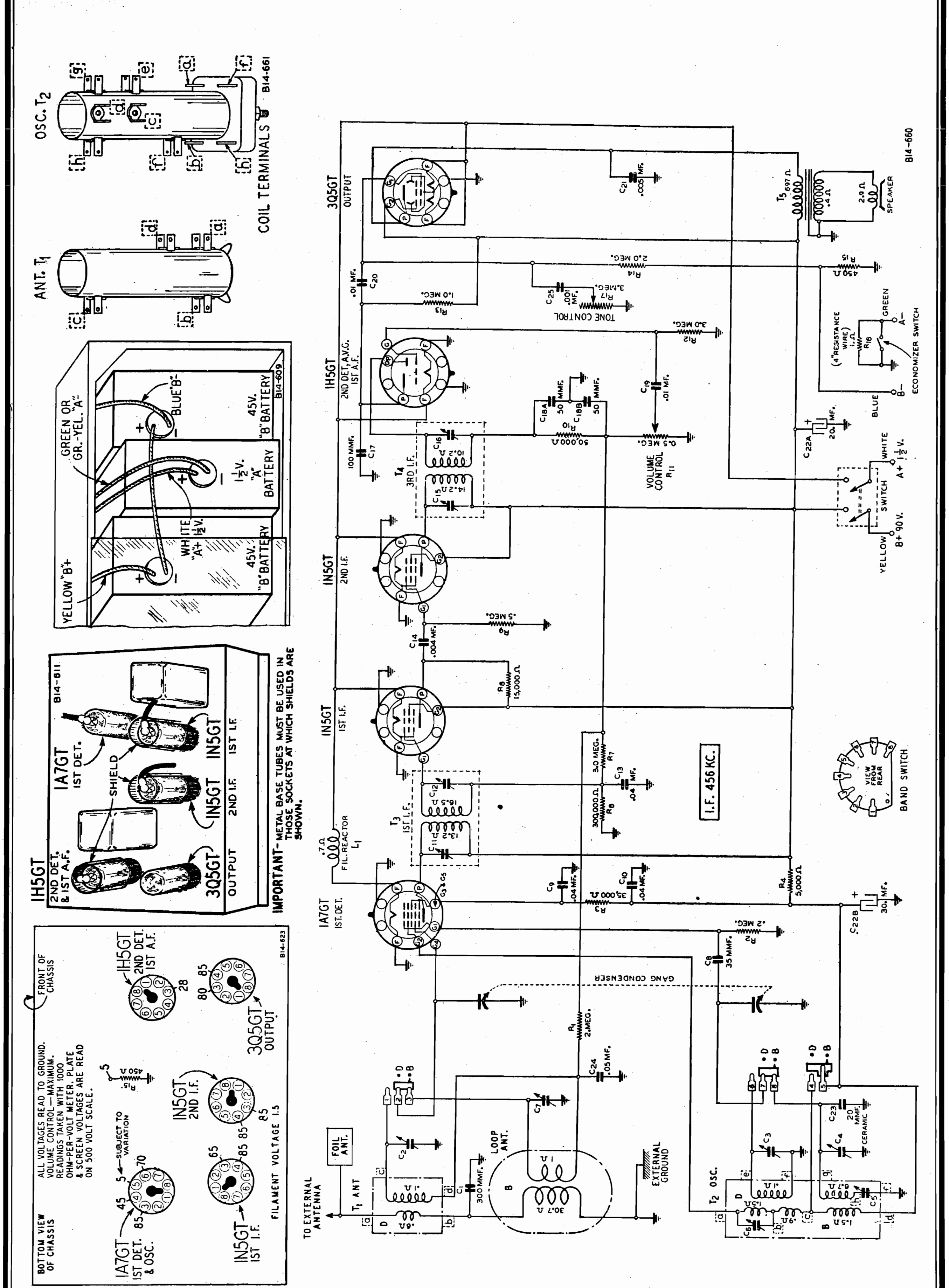

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MODEL 04WG-568

Input Voltages and Currents
"A" Battery....................1.5 Volts—.30 Amperes
"B" Battery........................90 Volts—12 Ma.
Power Output..............125 Milliwatts Undistorted
200 Milliwatts Maximum
Selectivity.....38 KC Broad at 1000 Times Signal
Intermediate Frequency.................456 KC

Speaker..........................6" P.M. Dynamic
Tuning Frequency Range
B Range........................... 528 to 1600 KC
D Range...........................5750 to 18300 KC
Sensitivity—External Antenna—(For .05 Watt output)
B Range....................... 6 Microvolts Average
D Range.......................10 Microvolts Average

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., 100 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
I. F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	3rd I.F. (C15) & (C16) 1st I.F. (C11) & (C12)
RANGE B	1600 KC	External Antenna Clip	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C4)
	1400 KC	External Antenna Clip	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C7)
	600 KC	External Antenna Clip—See Note B	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note C
RANGE D	18,300 KC	External Antenna Clip	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	16,000 KC	External Antenna Clip	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Rock Rotor—See Note C
	6000 KC	External Antenna Clip	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C6) Rock Rotor—See Note C
LOOP RANGE B	1400 KC	External Antenna Clip—See Note D	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C7)

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.

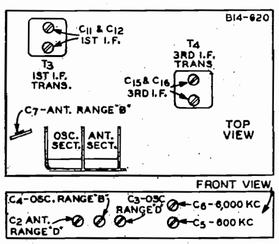
NOTE A—If the pointer is not at 1400 KC on the dial, tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale.

NOTE B—By means of wooden blocks, stand the loop aerial assembly upright exactly 3 inches from the back of the chassis.

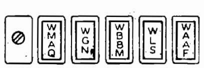
NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—Re-assemble chassis in cabinet. Replace back on cabinet. Connect ground post of signal generator to external ground clip on loop antenna.

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.



SETTING A STATION BUTTON



LOCKING SCREW

Grasp the top and bottom of the button at the left and pull it off the shaft. When this is done, the locking screw shaft will be exposed.

Insert a screwdriver in the slot of the locking screw and depress it by pressing in with the screwdriver. Loosen the locking screw by turning 3 or 4 turns in a counter-clockwise direction. Continue to press in firmly on the screwdriver, thus holding the locking screw shaft depressed. Select the first station from the list you have prepared and *carefully* tune in this station by means of the manual tuning knob until the station is clearest and strongest.

Continue to press in firmly on the screwdriver and lock the mechanism by turning the locking screw in a clockwise direction. Tighten firmly but not excessively. The station is now set on this button.

Proceed in the same manner to set stations on any of the remaining buttons.

MODEL 04WG-569

Input Voltages and Currents—Battery Operation
"A" Battery .... 6 Volts—50 Ma.
"B" Batteries ....90 Volts—9.5 Ma.
Power Consumption (At 117 volts AC Supply) 28 Watts
Power Output
Battery Operation - - - - - 70 Mw. Undistorted / 160 Mw. Maximum
AC Operation - - - - - - 70 Mw. Undistorted / 160 Mw. Maximum

Selectivity - 50 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - - 5" P.M. Dynamic
Tuning Frequency Range - - - 540 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna - - - - - 50 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

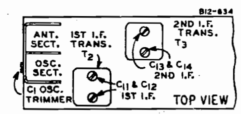
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

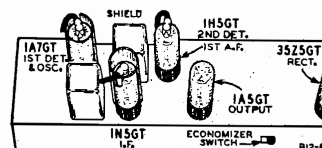
The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antenna—.1 mf.

SIGNAL GENERATOR FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below and Illustration of Back—Page 2)
456 KC	Signal Grid of 1st Det. (Top Cap)	Point "X" Prong No. 7 1H5GT—2nd Det.	.1 mf.	Turn Rotor to full open	1st I.F. (C11) & (C12) 2nd I.F. (C13) & (C14)
1600 KC	Signal Grid of 1st Det.	Same as Above	.1 mf.	Turn Rotor to full open	Oscillator (C1)
1400 KC	None—See Note A			Turn Rotor to max. output	Antenna (C2)

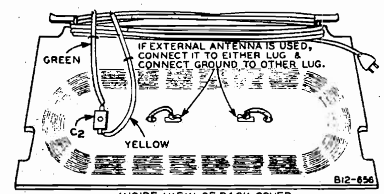
NOTE A—Chassis must be in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. The back of the cabinet must be in place. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION—Tune in an 800 KC signal. If the pointer is not at 800 KC on the dial, set pointer at the 800 KC mark on the dial scale.





IMPORTANT- METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.



INSIDE VIEW OF BACK COVER

DRIVE CORD REPLACEMENT

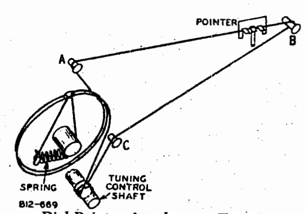
Tie a knot with a small loop at each end of new drive cord. The distance between knots should be 29¼ inches.

Thread one end of drive cord down through hole in groove of drive pulley. Place loop on hook on pulley. Turn gang condenser to completely closed position—See illustration.

Wind cord one complete turn counter-clockwise (from back of chassis) around drive pulley. Then pass cord over idler studs A, B, & C as shown.

Wind 3½ turns clockwise (from back of chassis) around tuning control shaft. These turns should progress toward chassis.

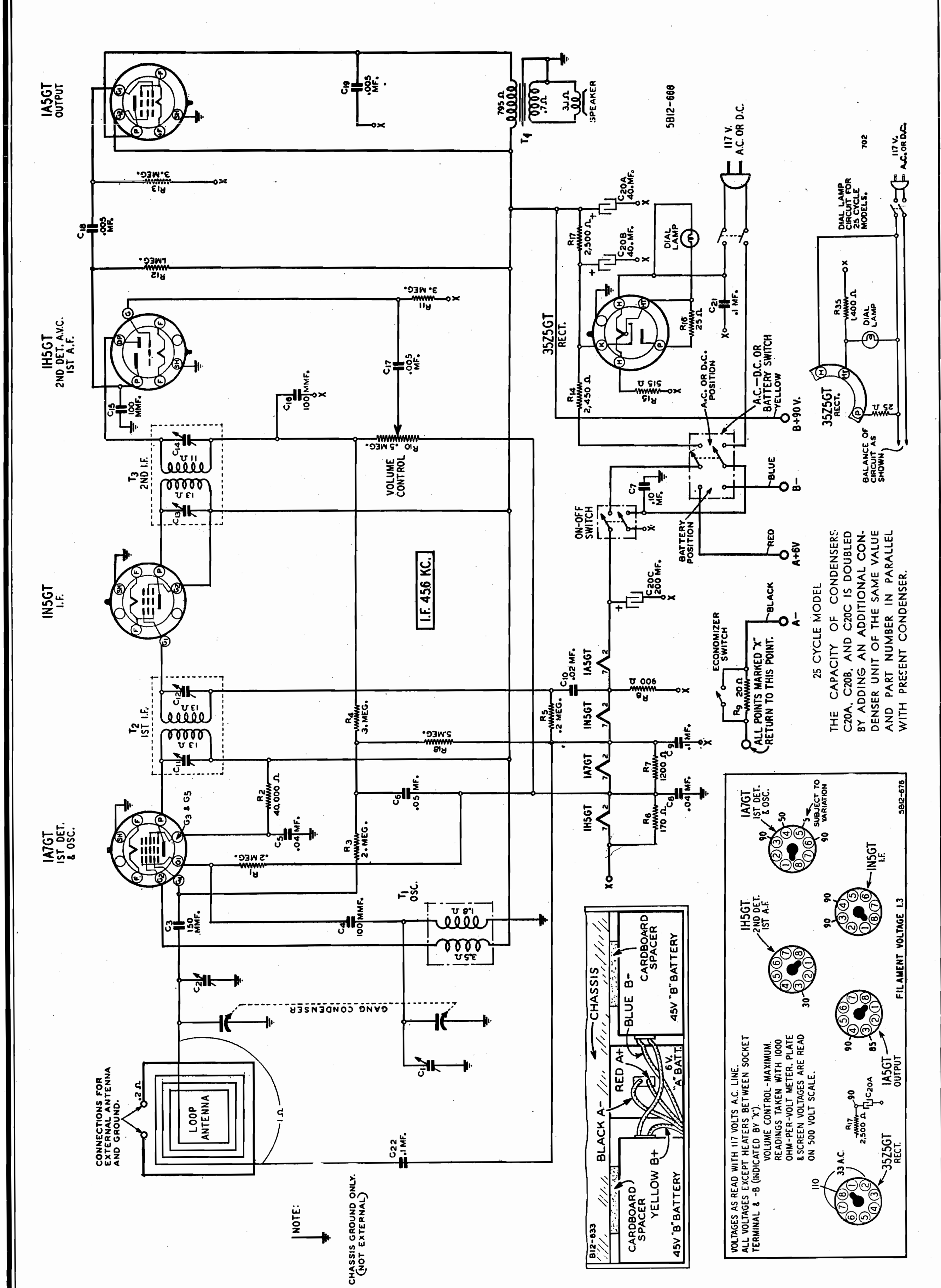
Wind 1¼ turns counter-clockwise (from back of chassis) around drive pulley. These turns should be on right side (from gang condenser side of chassis) of pulley groove and should progress toward dial mounting plate. Thread cord through hole in groove of drive pulley. Hook loop on tension spring. Wind cord around drive pulley shaft—See illustration. Fasten free end of spring to hook on pulley.



Dial Pointer Attachment—Tune in a signal of known frequency. Set pointer at this frequency mark on the dial scale. **Fasten pointer to drive cord—See illustration.**

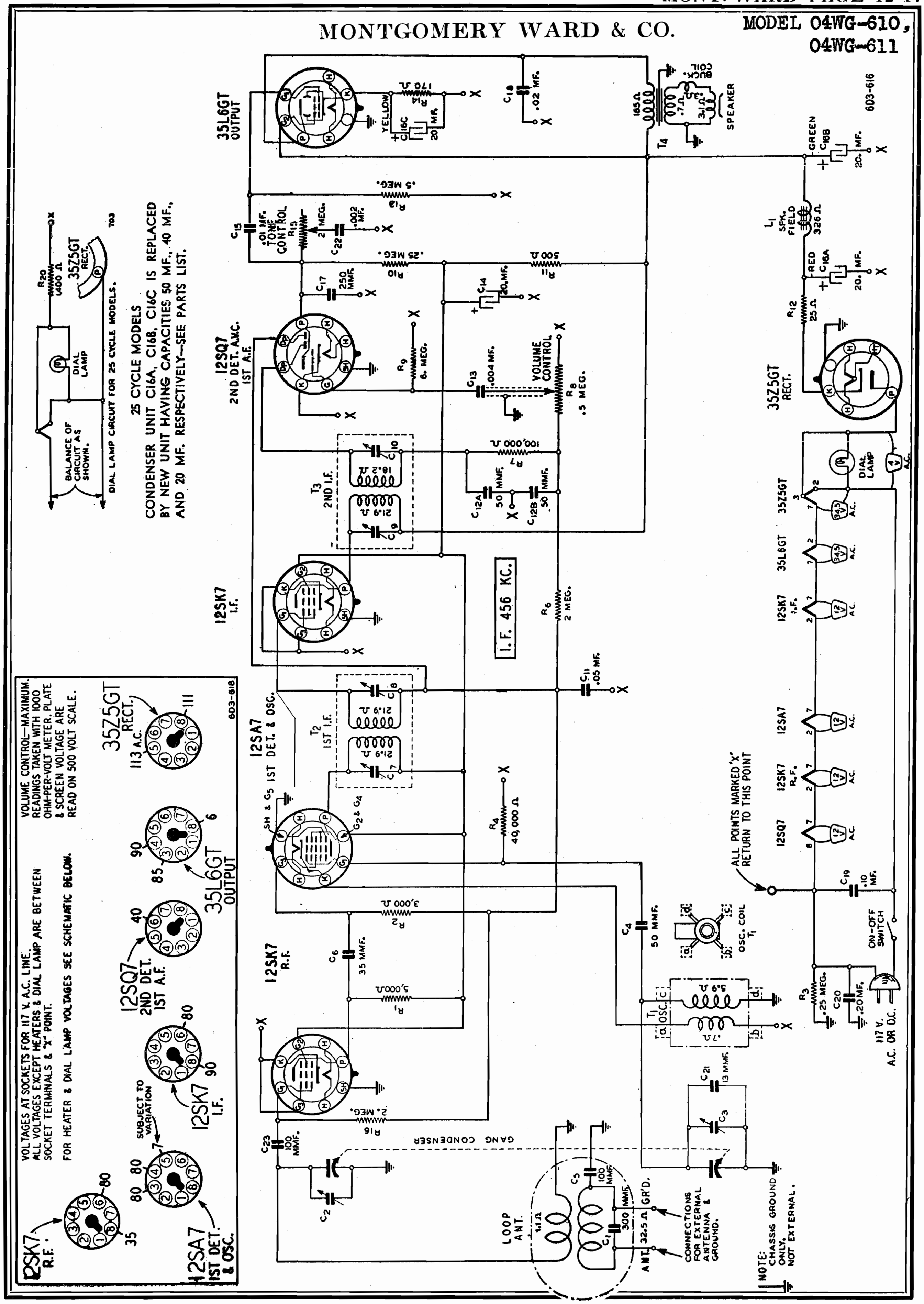
MODEL 04WG-569

MONTGOMERY WARD & CO.



MONTGOMERY WARD & CO.

MODEL 04WG-610, 04WG-611



MODELS 04WG-610, 04WG-611
04WG-612, 04WG-614

MONTGOMERY WARD & CO.

MODEL 04WG-610 MODEL 04WG-611

Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - .8 Watt Undistorted
Selectivity - - 50 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna - - - - - 10 Microvolts Average

CAUTION

The metal chassis is connected to one side of the line through a .2 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.

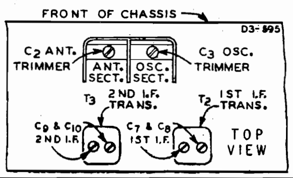
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.
The equipment in column at right is required for aligning:
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., 100 mmf.

SIGNAL GENERATOR FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Control Grid 12SK7—I.F.	Point "X" (12SK7—R.F. Prong No. 3)	.1 mf.	Turn Rotor to full open	2nd I.F. (C9) & (C10)
456 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8)
1600 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1500 KC	External Antenna Clip On Loop —See Note A	External Ground Clip On Loop	100 mmf.	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note B	Antenna (C2)

NOTE A—By means of wooden blocks, stand the loop aerial assembly upright exactly 1¼ inches from the back of the chassis.

NOTE B—If the pointer is not at 1500 KC on the dial, tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale.



SPECIFICATIONS MODEL 04WG-612

Power Consumption..28 Watts (At 117 volts AC Supply)
Power Output..................8 Watt Undistorted / 1.25 Watts Maximum
Selectivity........39 KC Broad at 1000 times Signal
Intermediate Frequency...................456 KC
Speaker.....................5" Electro-Dynamic
Tuning Frequency Range
B Range.................................528 to 1600 KC
C Range.................................2300 to 6500 KC
Sensitivity (For .05 watt output)
B Range.........................8 Microvolts Average
C Range.........................10 Microvolts Average

CAUTION

The metal chassis is connected to one side of the line through a .2 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.

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

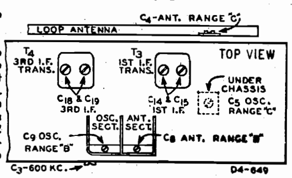
After each range is completed, repeat the procedure as a final check.

NOTE A—By means of wooden blocks, stand the loop aerial assembly upright exactly one inch from the back of the chassis.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CALIBRATION—Tune in an 800 KC signal. If pointer is not at the 800 KC mark on the dial scale, set pointer at 800 KC mark.

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.



ALIGNMENT PROCEDURE MODEL 04WG-612

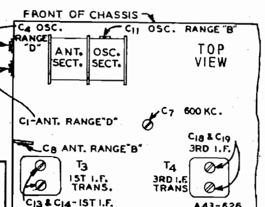
Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.
The equipment in column at right is required for aligning:
Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohm.

SIGNAL GENERATOR FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
I. F.						
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	Point "X" (12SQ7—1st A.F. Prong No. 3)	.1 mf.	B Range	Turn Rotor to full open	1st I.F. (C14) & (C15) 3rd I.F. (C18) & (C19)
RANGE B						
1600 KC	Signal Grid of 1st Det.	Point "X"	.1 mf.	B Range	Turn Rotor to full open	Oscillator Range B (C9)
1400 KC	External Antenna Clip on Loop —See Note A	External Ground Clip On Loop	100 mmf.	B Range	Turn Rotor to max. output	Antenna Range B (C8)
600 KC	External Antenna Clip —See Note A	External Ground Clip	100 mmf.	B Range	Turn Rotor to max. output	600 KC (C3) Rock Rotor—See Note B
RANGE C						
6500 KC	External Antenna Clip	External Ground Clip	400 Ohm	C Range	Turn Rotor to full open	Oscillator Range C (C5)
6000 KC	External Antenna Clip	External Ground Clip	400 Ohm	C Range	Turn Rotor to max. output	Ant. Range C (C4) Rock Rotor—See Note B

ALIGNMENT PROCEDURE MODEL 04WG-614

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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	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. (C13) & (C14) 3rd I.F. (C18) & (C19)
RANGE B					
1600 KC	External Antenna Clip	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C11)
1400 KC	External Antenna Clip	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C8)
600 KC	External Antenna Clip See Note B	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C7) Rock Rotor—See Note C
RANGE D					
8,300 KC	External Antenna Clip	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	External Antenna Clip	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note C
LOOP RANGE B					
1400 KC	External Antenna Clip See Note D	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C8)



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.

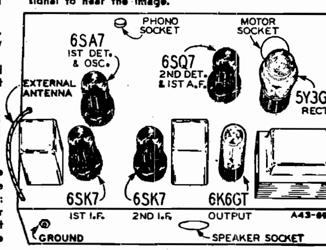
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—By means of wooden blocks, stand the loop aerial assembly upright exactly 4 inches from the back of the chassis.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—Re-assemble chassis in cabinet. Replace back on cabinet. Connect ground post of signal generator to external ground clip on loop antenna.

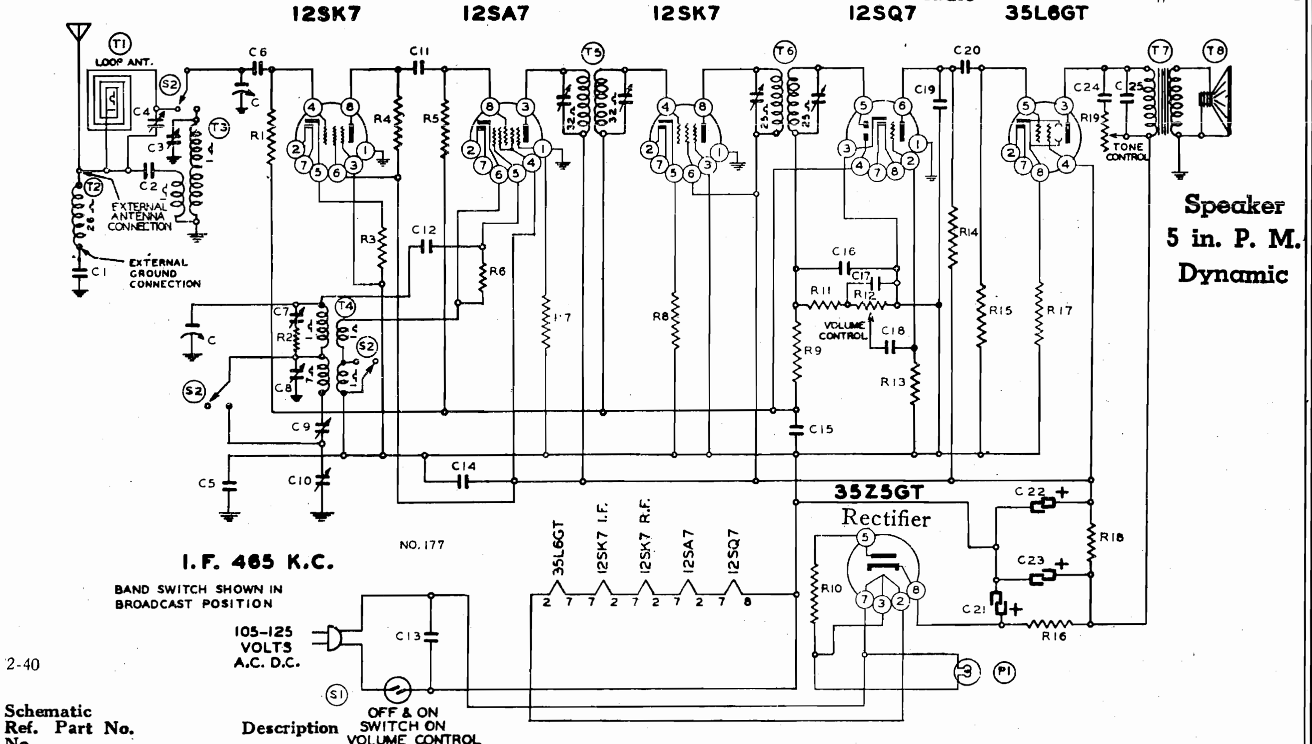
CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.



MONTGOMERY WARD & CO.

MODEL 04BR-609A Series A, Above Ser.#0B341400

R. F. Amp	Mixer, First Detector-oscillator	I. F. Amp	Second Detector, A.V.C. First Audio	Output
12SK7	12SA7	12SK7	12SQ7	35L6GT



Speaker 5 in. P. M. Dynamic

Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	BE13019	1 megohm—⅓ w.
R2	BE130166	150 ohm—⅓ w.
R3	BE130248	40 ohm—⅓ w.
R4	BE130218	5M ohm—⅓ w.
R5	BE13020	100M ohm—⅓ w.
R6	BE13012	50M ohm—⅓ w.
R7	BE1309	200M ohm—⅓ w.
R8	BE130248	40 ohm—⅓ w.
R9	BE1304	3 megohm—⅓ w.
R10	BE130215	25 ohm—½ w.
R11	BE1301	25M ohm—⅓ w.
R12	BE101195	1 megohm volume control
R13	BE130257	5 megohm—⅓ w.
R14	BE1303	500M ohm—⅓ w.
R15	BE1303	500M ohm—⅓ w.
R16	BE130296	200 ohm—1 watt
R17	BE130166	150 ohm—⅓ w.
R18	BE130287	1200 ohm—1 watt
R19	BE101194	200M ohm tone control
		CONDENSERS
C	BE102127	2 gang variable condenser
C1	BE10013	.05 x 400 v.
C2	BE12954	.003 Mica
C3	BE124127	Short Wave Band Antenna Trimmer
C4	BE124127	B.C. Antenna Trimmer
C5	BE10024	.25 x 400 v.
C6	BE1292	.0005 mica
C7	BE124125	Short Wave Band Oscillator Trimmer
C8	BE124125	B.C. Oscillator Trimmer
C9	BE124126	B.C. Oscillator Pad
C10	BE124126	Short Wave Band Oscillator Pad
C11	BE1295	.0001 Mica
C12	BE12912	.00025 mica
C13	BE1001	.1 x 400 v.
C14	BE1009	.05 x 200 v.
C15	BE1009	.05 x 200 v.
C16	BE1295	.0001 Mica
C17	BE12938	.00005 mica
C18	BE10071	.004 x 600 v.
C19	BE12912	.00025 mica
C20	BE10078	.01 x 200 v.
C21	BE11994	40 mfd.—150 w.v.
C22	BE11994	20 mfd.—150 w.v.
C23	BE11994	20 mfd.—150 w.v.
C24	BE1009	.05 x 200 v.
C25	BE10026	.02 x 400 v.

C3 and C4 in one unit   C7 and C8 in one unit
C9 and C10 in one unit   C21, C22 and C23 in same unit

Schematic Ref. No.	Part No.	Description
		PARTS
T1	BE111144	Loop Antenna Assembly
T2	BE10535	R.F. Choke
T3	BE111172	Antenna Coil
T4	BE110147	B.C. S.W. Oscillator Coil
T5	BE108140G	Input I.F. Coil—465 kc.
T6	BE108145	Output I.F. Coil—465 kc.
T7	BE10589B	Output Transformer
T8	BE114177	5 in. P.M. Speaker
S1	BE101195	Volume Control and Switch
S2	BE125108	Wave Band Change Switch
P1	BE107249	6.3 volt T47 pilot light

MODEL 04BR-609A SERIES A (SERIAL No. OB341400 and UP)

Power Consumption - - - - - - - - - 35 Watts

Power Output - - - - - - - - 1 Watt Undistorted

Sensitivity (for .5 Watts Output) - -

Broadcast Band —35 Microvolts Average

Shortwave Band—50 Microvolts Average

Selectivity - 48 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range - - - - - - 540 to 1550 KC
1.95 to 7 MC

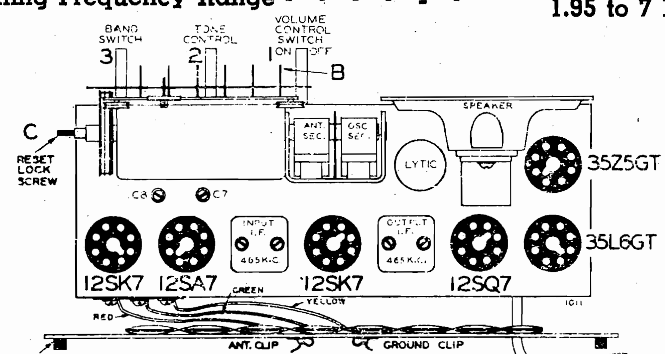


FIG. 1

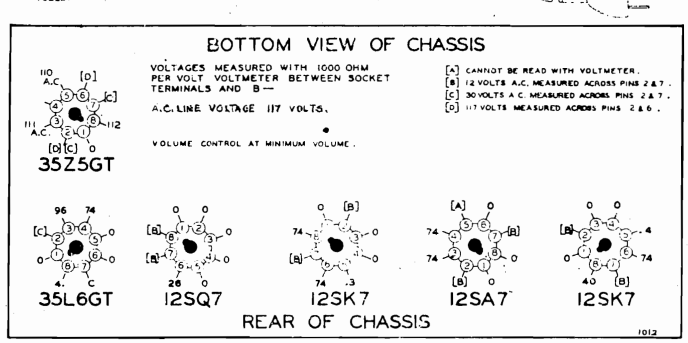


FIG. 4—BOTTOM VIEW

MODEL 04BR-609A
above ser.#0B341400

MONTGOMERY WARD & CO.

- Loop antenna connected to radio.
- Volume control—Maximum all adjustments.
- Connect radio ground 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	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SK7 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 12SA7 Mixer	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	7000 Kc.	200 mmf.	Antenna Clip	Short Wave	Rotor full open (Plates out of mesh)	Trimmer C7 (See Fig. 3)	Short Wave oscillator	Adjust to maximum output
	6000 Kc.	200 mmf.	Antenna Clip	Short Wave	Set Dial at 6 Mc.	Trimmer C3 (See Fig. 3)	Short Wave antenna	Adjust to maximum output
	2200 Kc.	200 mmf.	Antenna Clip	Short Wave	Set Dial 2.2 Mc.	Trimmer C10 (See Fig. 3)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1550 Kc.	200 mmf.	Antenna Clip	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C8 (See Fig. 3)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna Clip	Broadcast	Set Dial at 1400 Kc.	Trimmer C4 (See Fig. 3)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna Clip	Broadcast	Set Dial at 600 Kc.	Trimmer C9 (See Fig. 3)	Broadcast oscillator series pad	Adjust to maximum rock dial. (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"—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.

Procedure for Setting the Automatic Pushbuttons

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

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

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

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

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

5. Press in ALL THE WAY any one of the automatic tuner pushbuttons. Holding it in FIRMLY, tune in by means of the tuning knob (No. 4) the station you have assigned to this pushbutton. Turn the tuning knob very slowly back and forth (while still holding button in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the pushbutton.

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

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

8. Now rotate the tuning kob to the right (clockwise) as far as it will turn, and with a coin (quarter), 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 pushbuttons. (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 reset locking screw two or three 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 pushbuttons, it is due to the locking screw being too tight. Loosen the reset locking screw until the dial mechanism works freely with the tuner pushbutton pressed in.)

BE SURE TO RETIGHTEN THE RESET LOCK SCREW, otherwise the stations will not stay adjusted to the pushbuttons.

The automatic dial is now set up for quick tuning.

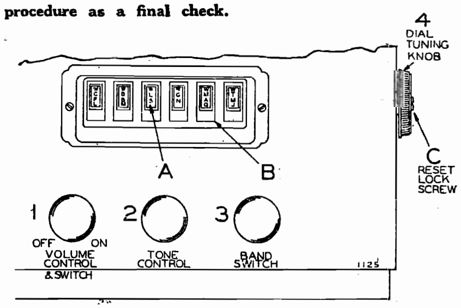


FIG. 2

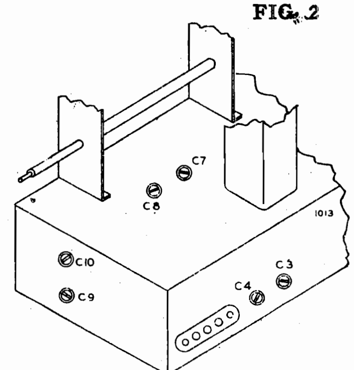


FIG. 3

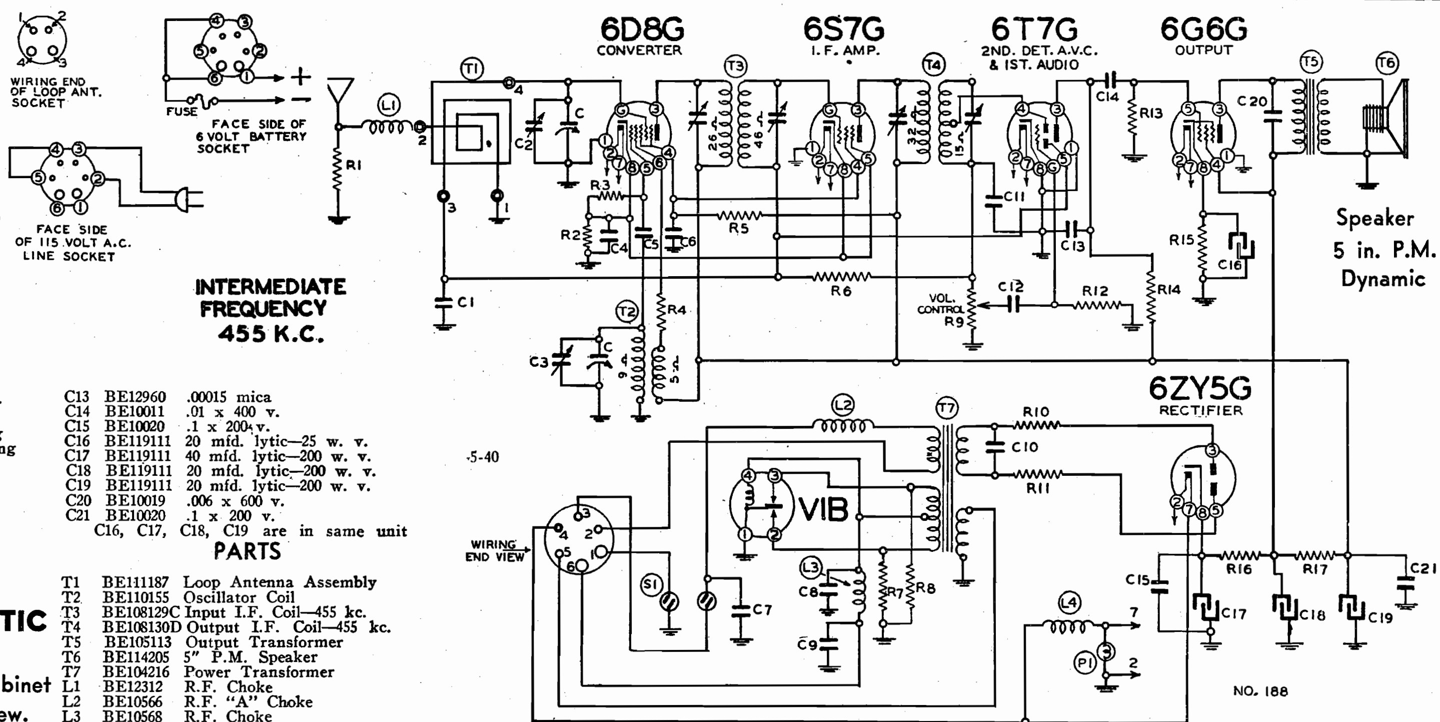
MONTGOMERY WARD & CO.

MODEL 04BR-570A
above ser.#OE528700

Schematic Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	BE13022	5M ohm—1/3 watt
R2	BE130166	150 ohm—1/3 watt
R3	BE13012	50M ohm—1/3 watt
R4	BE13026	1000 ohm—1/3 watt
R5	BE130157	12M ohm—1/3 watt
R6	BE1304	3 megohm—1/3 watt
R7	BE130168	100 ohm—1/3 watt
R8	BE130168	100 ohm—1/3 watt
R9	BE101225	1 megohm volume control
R10	BE130233	60 ohm—1/3 watt
R11	BE130233	60 ohm—1/3 watt
R12	BE130223	10 megohm—1/3 watt
R13	BE13037	750M ohm—1/3 watt
R14	BE13011	250M ohm—1/3 watt
R15	BE13079	400 ohm—1/3 watt
R16	BE130222	350 ohm—1/3 watt
R17	BE130235	1500 ohm—1/3 watt
		CONDENSERS
C	BE102134	2 gang variable condenser
C1	BE1009	.05 x 200 volts
C2		Antenna trimmer on gang
C3		Oscillator trimmer on gang
C4	BE10020	.1 x 200 v.
C5	BE1295	.0001 mica
C6	BE10020	.1 x 200 v.
C7	BE10013	.05 x 400 v.
C8	BE10031	.5 x 120 v.
C9	BE10031	.5 x 120 v.
C10	BE10073	.008 x 1200 v.
C11	BE12951	.000125 mica
C12	BE10012	.003 x 600 v.
C13	BE12960	.00015 mica
C14	BE10011	.01 x 400 v.
C15	BE10020	.1 x 200 v.
C16	BE119111	20 mfd. lytic—25 w. v.
C17	BE119111	40 mfd. lytic—200 w. v.
C18	BE119111	20 mfd. lytic—200 w. v.
C19	BE119111	20 mfd. lytic—200 w. v.
C20	BE10019	.006 x 600 v.
C21	BE10020	.1 x 200 v.

C16, C17, C18, C19 are in same unit

		PARTS
T1	BE111187	Loop Antenna Assembly
T2	BE110155	Oscillator Coil
T3	BE108129C	Input I.F. Coil—455 kc.
T4	BE108130D	Output I.F. Coil—455 kc.
T5	BE105113	Output Transformer
T6	BE114205	5" P.M. Speaker
T7	BE104216	Power Transformer
L1	BE12312	R.F. Choke
L2	BE10566	R.F. "A" Choke
L3	BE10568	R.F. Choke
L4	BE10566	R.F. "A" Choke
		On-Off Switch on Volume Control
P1	BE12626	Plug-in Vibrator Unit



SETTING THE AUTOMATIC PUSHBUTTONS

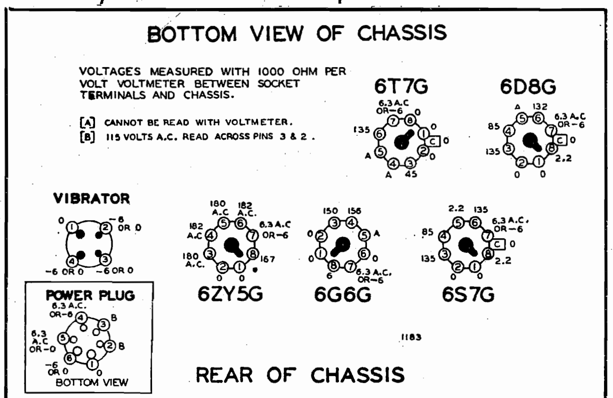
Pry out the metal button in cabinet opposite pushbutton locking screw.

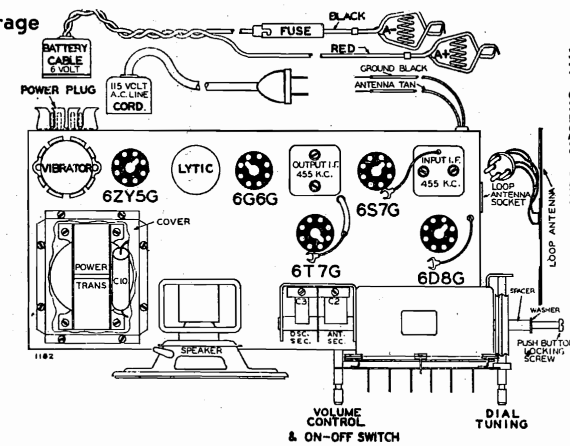
Press one of the buttons all the way down and hold it FIRMLY. Now tune in the station you want with the tuning knob. Tune back and forth until the station is clear, then release the button. NOTE: *If the tuning knob turns quite hard when the button is held down firmly, loosen the pushbutton locking screw several turns with a screwdriver.*

Continue, setting each of the remaining pushbuttons in the same way. Now turn the tuning knob all the way to the right and tighten the pushbutton locking screw. This screw prevents the pushbuttons from slipping off the stations you have set. To change stations loosen locking screw and proceed as above.

MODEL 04BR-570A (SERIAL No. OE528700 and UP)

Power Consumption	30 Watts
Battery Drain	2½ Amps
Power Output	700 Milliwatts Undistorted
Sensitivity for 50 Milliwatt Output:	15 Microvolts Average
Selectivity	50 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range	535 to 1650 KC

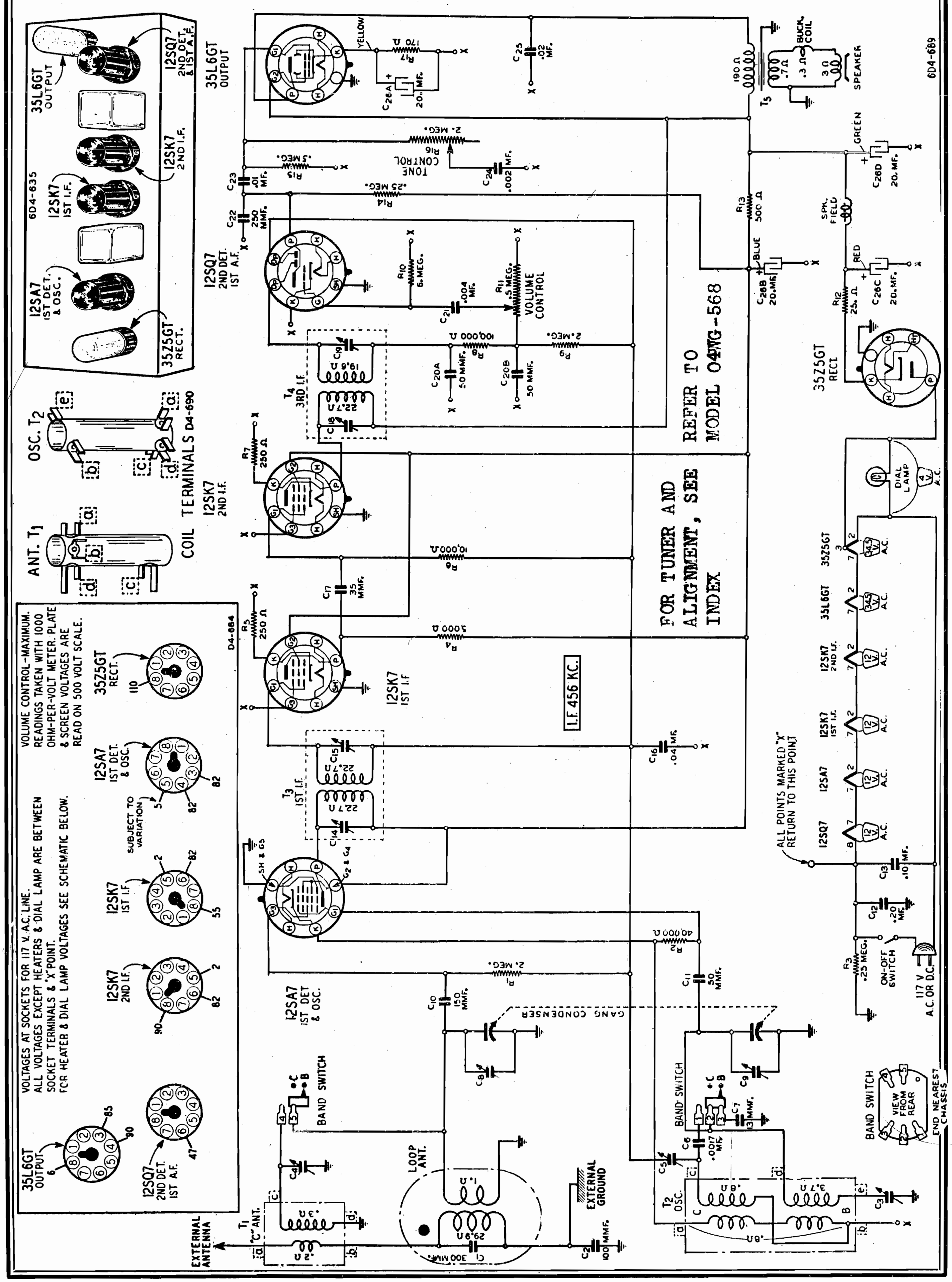




To remove the chassis pull the loop antenna plug from the chassis. Pull the pushbuttons, the tuning and volume knobs off their shafts. Take out the 4 screws in bottom of cabinet and lift chassis out.

MODEL 04WG-612

MONTGOMERY WARD & CO.



MODEL 04WG-614

MONTGOMERY WARD & CO

Power Consumption 57 Watts (At 117 volts 60 cycles)
73 Watts (Phonograph Operating)

Power Output................. 1.7 Watts Undistorted
2.5 Watts Maximum

Selectivity.....40 KC Broad at 1000 times Signal

Intermediate Frequency.................456 KC

Speaker..............6" or 8" Electro-Dynamic

Tuning Frequency Range

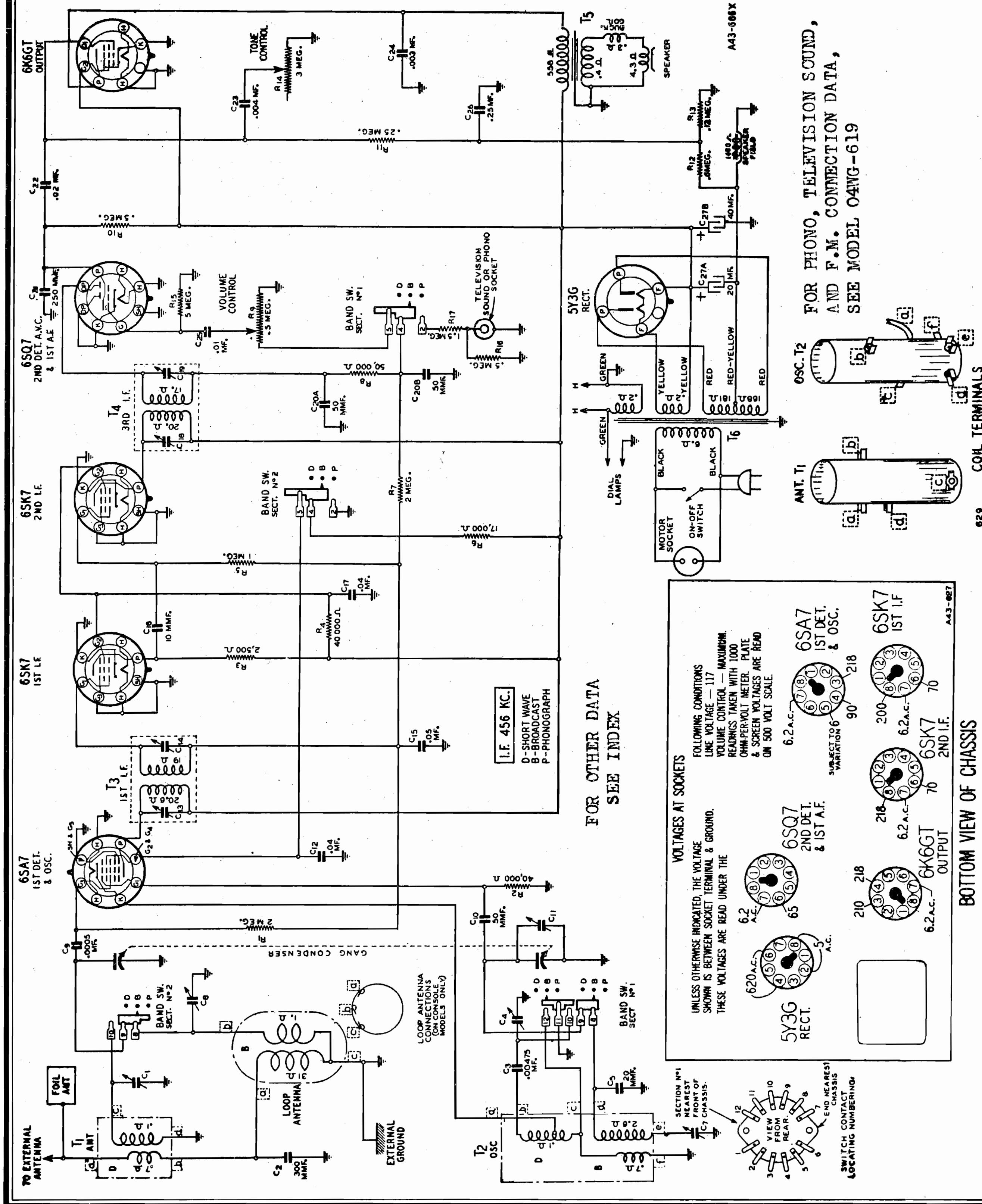
B Range.......................... 528 to 1600 KC

D Range..........................5750 to 18300 KC

Sensitivity —External Antenna—(For 0.5 Watt output)

B Range.................... 7 Microvolts Average

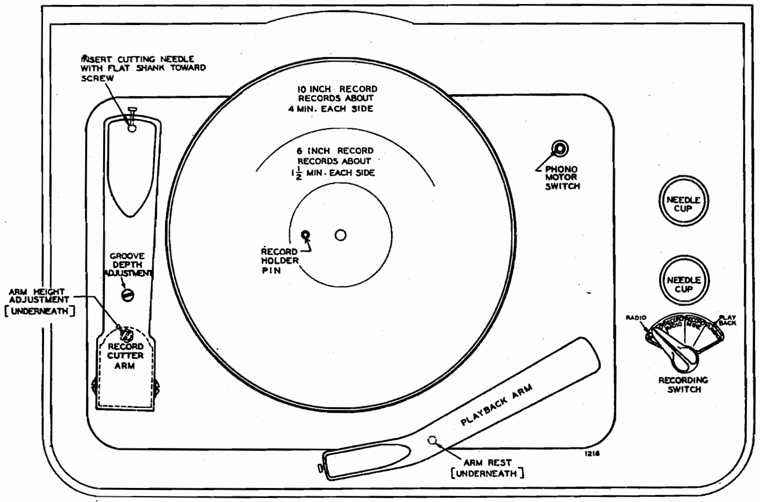
D Range....................15 Microvolts Average



MODEL 04BR-615A
above ser.#565300
MODELS 04BR-904A, 04BR-906A,
04BR-1106A

MONTGOMERY WARD & CO.

MODEL 04BR-615A (SERIAL No. 565300 and UP)
OPERATING THE PHONOGRAPH AND RECORDER



RECORDER VIEW

OPERATING THE PHONOGRAPH

Turn radio on. Turn recording switch to Playback position.

Put your record on turntable and start motor. Place playback arm on record and control tone and volume with the radio volume and tone control knobs.

RECORDING RADIO PROGRAMS

Turn the radio on and tune in the program you wish to record. Put recording switch in "Record-Radio" position. The volume will drop. Start motor and then gently lower cutting needle onto blank record, about ¼" from outer edge.

RECORDING VOICE

Turn the radio volume control nearly full on. Recording switch should be in Record "Mike" position. Start motor, and set cutting needle gently on start of record. Turn mike switch on and talk.

NOTE: The cutting arm must be raised about three inches to move it freely across the record.

HOW TO MAKE PERFECT RECORDINGS

Unpack the microphone and check to see that it is plugged into the chassis. **The microphone must be connected to the chassis at all times.**

Insert a playback needle in the playback arm.

Insert a special cutting stylus (needle) in the cutter arm. Handle this needle with care.

Be sure the needle is tight after each recording. Should it loosen during the recording, it will chatter and ruin your record.

CUTTING NEEDLE

The cutting stylus is razor sharp and must not be dropped on the record or allowed to rest on the turntable.

For best operation, the instrument should be level in all directions. To check this, place a small level, if you have one, on the turntable. If you do not have a level, a marble will do. If the marble rolls off the turntable, it is low in the direction in which it rolls. Place something under the cabinet until the machine is reasonably level.

SHAVINGS

The cutting stylus cuts out a fine shaving that is just a little thicker than a human hair. These shavings should not be allowed to gather under the cutting stylus.

While cutting, gently brush the shavings from the left side of the record in, toward the center pin, allowing them to collect there until the recording is completed.

DO NOT USE TOO MUCH VOLUME

The most frequent cause of poor recordings is too much volume or overloading. If some passages of your recording are smooth and clear while others are raspy, rough and distorted, you are probably using too much volume. Overloading occurs most often on strong passages. The remedy is to reduce the volume slightly and study the different effects of microphone technique.

Too little volume will show up when you play the record back. The volume control on playbacks will have to be turned up quite high and needle scratch will be excessive.

CUTTING ARM ADJUSTMENTS

The cutting arm is adjusted at the factory for proper operation, however, with various types of blanks this adjustment may sometimes have to be altered. **With a blank record on the table,** the height adjustment under the cutter arm should be adjusted so that the bottom of the cutting arm is ¼" from the top of the record blank. Make this measurement carefully at the front end beside the stylus screw.

The screw adjustment can be turned to raise or lower the arm.

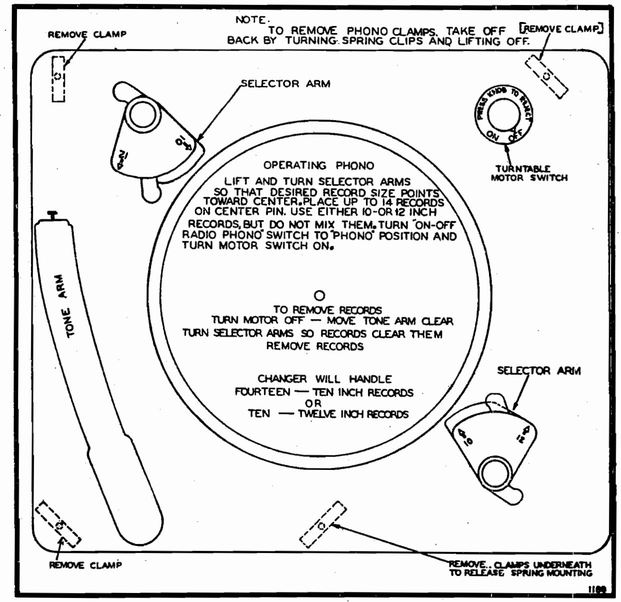
Several blank grooves should now be cut to see if the groove is the proper depth. The depth adjustment screw on the cutter arm will increase the depth of the groove if turned to the right and will decrease the groove if turned to the left.

If the groove is too shallow, the playback needle will not stay in the groove. If it is too deep, not enough wall will be left between grooves and the playback needle will break through from one track to the next after a few playings.

The proper depth of groove will leave about the same space between the groove as the groove is wide. Hold a finished record toward the light and you can usually see if the grooves are spaced correctly.

A **properly** cut groove will leave a shaving just a little heavier than a human hair.

MODEL 04BR-904A MODEL 04BR-906A MODEL 04BR-1106A
AUTOMATIC RECORD CHANGER—Operating Instructions



SETTING FOR SIZE OF RECORD

The Changer plays up to fourteen 10" or ten 12" records at one loading. **All records must be the same size for each loading.**

On each post you will see selecting arms. The position of these arms determines the setting for different size records. To set for 10 or 12 inch records, it is merely necessary to grasp the posts by the knobs at the top, lift, and turn until the 10" or 12" arrows are pointing toward the center of the turntable. When in either the 10" or 12" position, the posts will snap into place except when they are lifted by hand. Be sure to set both posts for **the same size record.**

LOADING

See that the selecting arms of both posts are turned toward the center of the turntable as indicated by the engraved arrows, and that both sets of arms are set for the same size (10" or 12") records as described in the preceding paragraph.

Place the stack of records (up to fourteen 10" or ten 12") over the center pin so that they will rest on the selecting arms.

STARTING THE CHANGER

1. Turn on the radio (allowing approximately 30 seconds for the tubes to warm up) and turn the phonograph-radio knob, to the phonograph position.

2. Turn the switch knob on the Record Changer panel to "ON". The motor will then start and the record changer will go into automatic operation of its own accord.

HOW TO REJECT A RECORD

Merely press the switch knob on the Changer panel. You can do it any time after the needle has come into contact with that record.

PLAYING INDIVIDUAL RECORDS

Should it be desired to play an individual record merely set up the machine as described above for the proper size (10" or 12" as indicated on the selecting arms), place the record on top of the arms as described under "Loading", and set the machine in operation by means of the switch knob described under "Starting the Changer." In other words, play an individual record in the same manner as you would play a stack of that size.

UNLOADING

First switch off the motor. Grasp each post by its knob at the top and turn them out of the way.

Lift the played records from the turntable. Then return the posts to the proper playing position as indicated by the arrows on the selecting arms.

The Changer may then be loaded with a new stack of records according to the size shown on the selecting arms.

TURNING OFF CHANGER

Throw Changer switch knob to "OFF" position.

Lift tone arm and place it in the rest position. (If you happen to turn off the Changer switch while the mechanism is going through a "change cycle," you will notice that it does not stop until the cycle has been completed, and the tone arm is again in playing position, at which point it is ready to be lifted to the rest position. If you prefer to turn off your Changer with the radio switch, be sure to turn it off while needle is resting upon a record; otherwise, the selecting arms cannot be correctly reset.

To avoid warping of records, never leave records resting on posts.

IF CHANGER IS LEFT RUNNING

No damage will be done if you forget to turn off Changer after it has played its entire load of records. **It will simply** repeat the last record until **stopped or** reloaded.

MONTGOMERY WARD & CO.

MODEL 04BR-615A
above ser.#565300

Diagram Ref. No.	Part No.	Description

RESISTORS

Diagram Ref. No.	Part No.	Description
R1	BE130321	3500 ohms—1/3 w.
R2	BE130197	20 ohms—1/3 w.
R3	BE1304	3 megohm—1/3 w.
R4	BE13076	30M ohms—1/3 w.
R5	BE13097	200 ohms—1/3 w.
R6	BE130165	15M ohms—1 w.
R7	BE13022	5M ohms—1/3 w.
R8	BE13019	1 megohm—1/3 w.
R9	BE13012	50M ohms—1/3 w.
R10	BE130192	2M ohms—1/3 w.
R11	BE1302	75M ohms—1/3 w.
R12	BE1301	25M ohms—1/3 w.
R13	BE1304	3 megohm—1/3 w.
R14	BE13012	50M ohms—1/3 w.
R15	BE101142	1 megohm volume control
R16	BE13028	750M ohm—1/3 w.
R17	BE130257	5 megohm—1/3 w.
R18	BE101143	Tone control
R19	BE13019	1 megohm—1/3 w.
R20	BE13011	250M ohm—1/3 w.
R21	BE1303	500M ohm—1/3 w.
R22	BE130322	10 ohm—1 w.
R23	BE130227	250 ohm—1 w.
R24	BE130203	40 ohm—1/3 w.

CONDENSERS

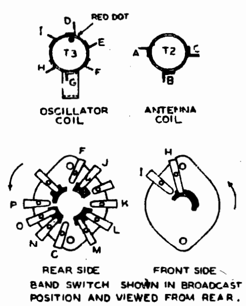
Diagram Ref. No.	Part No.	Description
C	BE102135	2 gang variable condenser
C1	BE124127	B.C. Antenna Trimmer
C2	BE124127	S.W. Antenna Trimmer
C3	BE1292	.0005 mica
C4	BE12960	.00015 mica
C5	BE124112	S.W. Oscillator trimmer
C6	BE124112	B.C. Oscillator trimmer
C7	BE124146	B.C. Oscillator series padder
C8	BE124146	S.W. Oscillator series padder
C9	BE10013	.05 x 400 v. condenser
C10	BE1009	.05 x 200 v. condenser
C11	BE12921	.0002 mica
C12	BE119114	15 mfd. x 400 v. lytic
C13	BE119114	15 mfd. x 400 v. lytic
C14	BE119114	20 mfd. x 25 v. lytic
C15	BE119114	10 mfd. x 300 v. lytic
C16	BE1292	.0005 mica
C17	BE11967	8 mfd. x 450 v. lytic
C18	BE1001	.1 x 400 v. condenser
C19	BE10011	.01 x 400 v. condenser
C20	BE129161	.0001 mica
C21	BE129161	.0001 mica
C22	BE10012	.003 x 600 v. condenser
C23	BE1292	.0005 mica
C24	BE10089	.008 x 800 v.
C25	BE1292	.0005 mica
C26	BE10026	.02 x 400 v.
C27	BE10011	.01 x 400 v.

C1 and C2 in one unit C5 and C6 in one unit
C7 and C8 in one unit C12, C13, C14 and C15 in one unit C20 and C21 in one unit

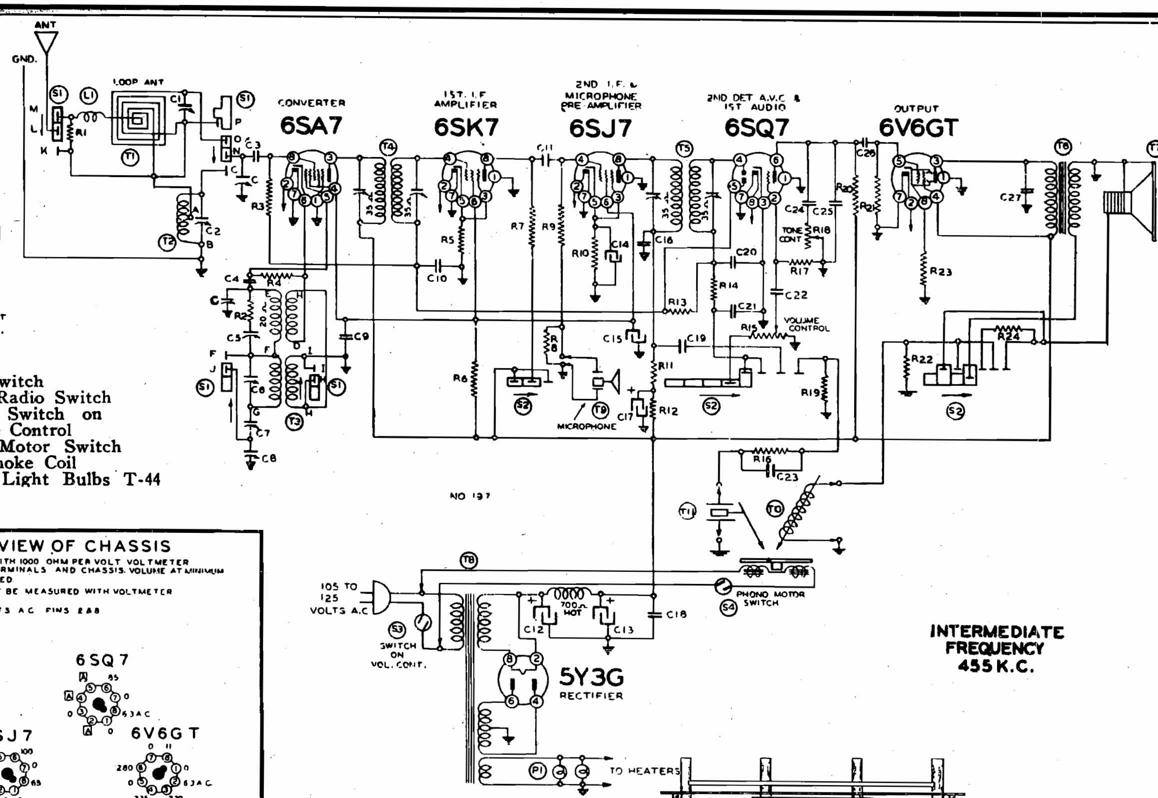
PARTS

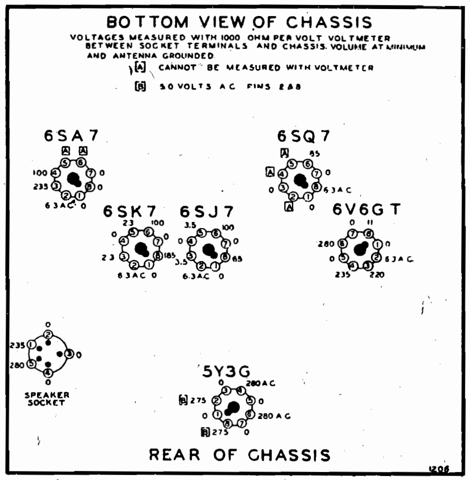
Diagram Ref. No.	Part No.	Description
T1	BE111204	Loop Antenna Assembly
T2	BE111184	S.W. Antenna Coil
T3	BE110163	B.C. S.W. Oscillator Coil
T4	BE108169D	Input I.F. Coil Complete
T5	BE108106T	Output I.F. Coil Complete
T6	BE105118	Output Transformer
T7	BE114212	6" Dynamic Speaker
T8	BE104225	Power Transformer
T9	BE114214	Microphone and Cable
T10	BE104230	Recording and playback unit complete 60 cycle
T11		Phono Pickup arm

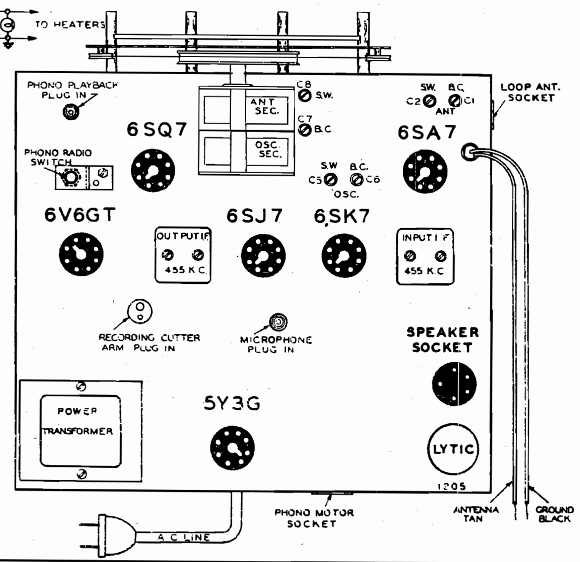
7-40



S1	BE125126	Band Switch
S2	BE125127	Phono Radio Switch
S3		On-off Switch on Volume Control
S4	BE12577	Phono Motor Switch
L1	BE12312	R.F. Choke Coil
P1	BE10794	2-Pilot Light Bulbs T-44







Power Consumption	Radio Only - - - - - -	70 Watts
	Motor Only - - - - - -	40 Watts
Power Output - - - - - - - -		2.1 Watts Undistorted
Sensitivity for 500 Milliwatt Output:		15 Microvolts Average
Selectivity - 51 KC Broad at 1000 Times Signal at		1000 KC
Tuning Frequency Range	Broadcast Band -	535 to 1600 KC
	Shortwave Band -	5.46 to 18.3 MC
Intermediate Frequency - - - - - - - - -		455 KC
Speaker - - - - - - - - -		6 in. Electro Dynamic

MODEL 04BR-615A
above ser.#565300
MODELS 04BR-675A,
04BR-676A

MONTGOMERY WARD & CO.

ALIGNMENT PROCEDURE

Model No. 04BR-615A

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.	455 Kc.	.1 MFD.	Grid of 6SJ7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C5	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C8	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C6	Broadcast oscillator	Adjust to maximum output
	535 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C7	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C7 (See Top View)	Broadcast osc. Series Pad	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." leads when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1600 and 535 K. C.).

The loop antenna should be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." terminals.

NOTE "C"—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 04BR-675A and 04BR-676A

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.	455 Kc.	.1 MFD.	Grid of 6S7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to signal
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to signal
	535 Kc.	.1 mmf.	Grid of 6SA7	Broadcast	Set Dial at 535 K. C.	Trimmer C6	Broadcast oscillator series pad	Adjust to signal
LOOP ALIGN-MENT	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 K. C.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 K. C.	Trimmer T3 (See Top View)	Iron Core Tracking Coil	Adjust to maximum output

The loop antenna should be connected to the radio when making all adjustments.—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected.

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

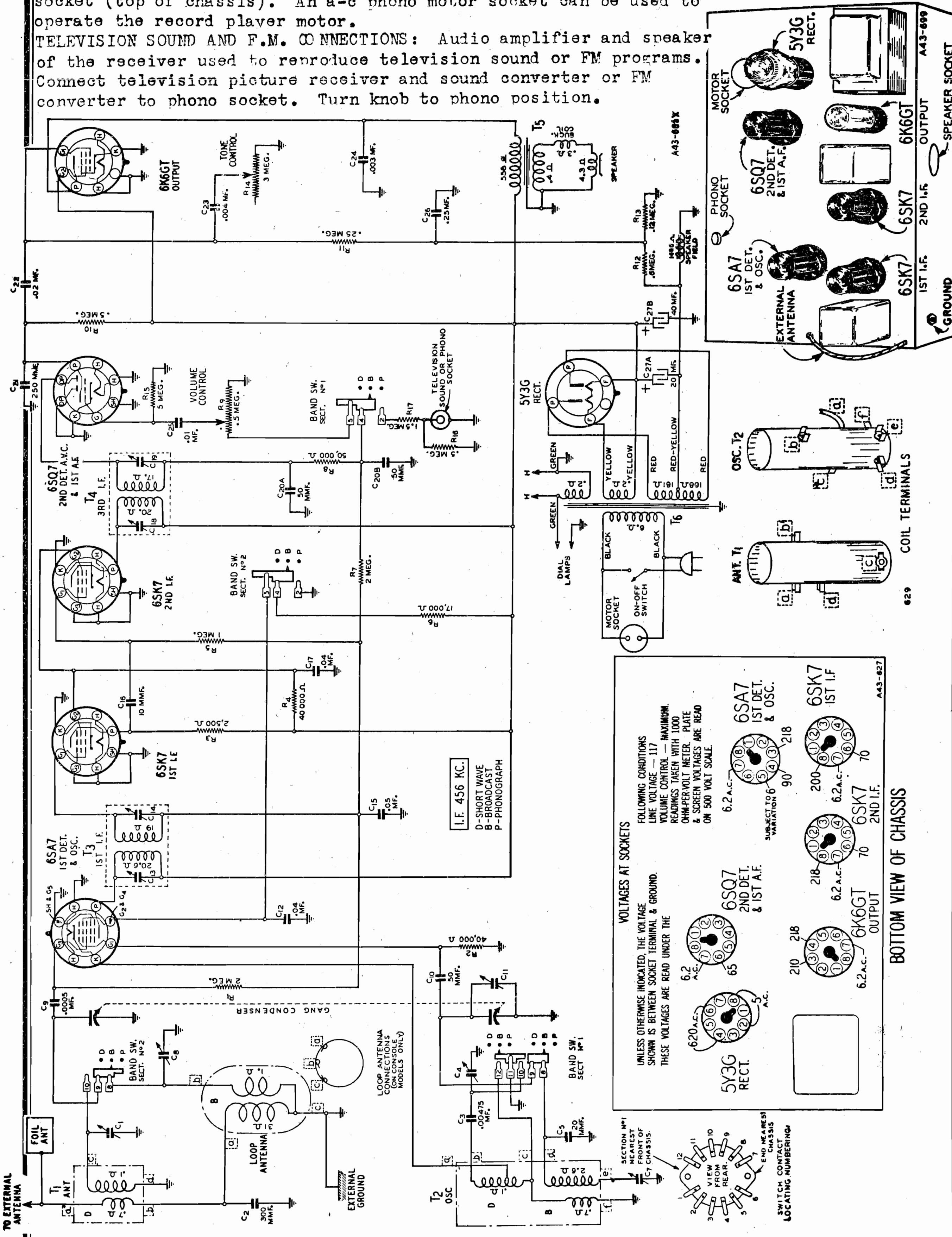
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

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

MONTGOMERY WARD & CO. MODELS 04WG-619, 04WG-621, 04WG-621NI

PHONOGRAPH CONNECTIONS: Insert phono pickup cable into phono socket (top of chassis). An a-c phono motor socket can be used to operate the record player motor.

TELEVISION SOUND AND F.M. CONNECTIONS: Audio amplifier and speaker of the receiver used to reproduce television sound or FM programs. Connect television picture receiver and sound converter or FM converter to phono socket. Turn knob to phono position.



MODELS 04WG-619, 04WG-621, 04WG-621NI

MONTGOMERY WARD & CO.

MODEL 04BR-620A

SPECIFICATIONS—Model No. 04BR-620A

Power Consumption Radio Only - - - - - - 70 Watts
Radio and Motor - - - - 90 Watts
Power Output - - - - - - - - 2.1 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 15 Microvolts Average
Selectivity - 51 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range Broadcast Band - 530 to 1600 KC
Shortwave Band - 5.46 to 18.3 MC
Intermediate Frequency - - - - - - - - 455 KC
Speaker - - - - - - - - - 8 in. Electro Dynamic

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground 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., 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.	455 Kc.	.1 MFD	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Trimmers on top (See Chassis View)	Input and Output I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	530 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C6	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Chassis View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C6 (See Chassis View)	Broadcast oscillator series pad	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND" leads when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1600 and 530 K.C.).

The loop antenna should be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." leads.

NOTE "C"—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.

SPECIFICATIONS

Power Consumption 57 Watts (At 117 volts 60 cycles)
Power Output............... 1.7 Watts Undistorted
2.5 Watts Maximum
Selectivity.....40 KC Broad at 1000 times Signal
Intermediate Frequency.................456 KC
Speaker.............6" or 8" Electro-Dynamic

Tuning Frequency Range
B Range............................ 528 to 1600 KC
D Range............................5750 to 18300 KC
Sensitivity—External Antenna—(For 0.5 Watt output)
B Range.................... 7 Microvolts Average
D Range....................15 Microvolts Average

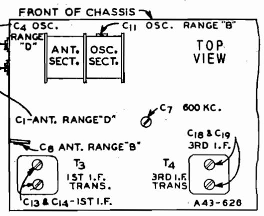
MODEL 04WG-619
" 04WG-621
" 04WG-621NI

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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Console Model—It is not necessary to remove chassis from cabinet. Merely remove chassis mounting screws so that chassis may be turned to reach oscillator trimmer on gang condenser.					
I.F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C13) & (C14) 3rd I.F. (C18) & (C19)
RANGE B					
1600 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C11)
1400 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C8)
600 KC	External Antenna Clip or Lead See Note B	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C7) Rock Rotor—See Note C
RANGE D					
18,300 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note C
LOOP RANGE B					
1400 KC	External Antenna Clip or Lead See Note D	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C8)



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 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—(Table Model) By means of wooden blocks, stand the loop aerial assembly upright exactly 4 inches from the back of the chassis.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—(Table Model) Re-assemble chassis in cabinet. Replace back on cabinet. Connect ground post of signal generator to external ground clip on loop antenna (Table Model) or ground screw on chassis (Console Model).

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.

ANTENNA

Two built-in Air Wave Aerials are used with this radio.

One of these aerials is a loop type and is used for broadcast band reception. The other is a counterpoise foil aerial and is used for reception on the short wave band. For the reception of local or nearby stations, an outside antenna and ground are usually not required.

For best reception of short wave stations, an outside antenna is recommended.

For best results, an outside antenna 50 to 60 feet long, including the lead-in, should be used.

DRIVE CORD REPLACEMENT

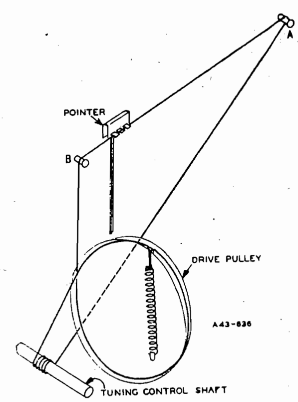
Turn gang condenser to full open position—See illustration. Use a new drive cord 42 inches in length.

Tie one end of cord to tension spring. Pass other end of cord up through hole in groove of drive pulley. Pull cord through hole until spring is flush against inside of pulley rim.

Wind cord 1/4 turn counter-clockwise (from pulley side of chassis) around drive pulley. Then wind 4½ turns clockwise (from front of chassis) around tuning control shaft. These turns should progress toward chassis. Pass cord over idler studs A and B as shown, then wind cord 3/4 turn counter-clockwise (from pulley side of chassis) around drive pulley. This turn should be on left side (from front of chassis) of pulley groove.

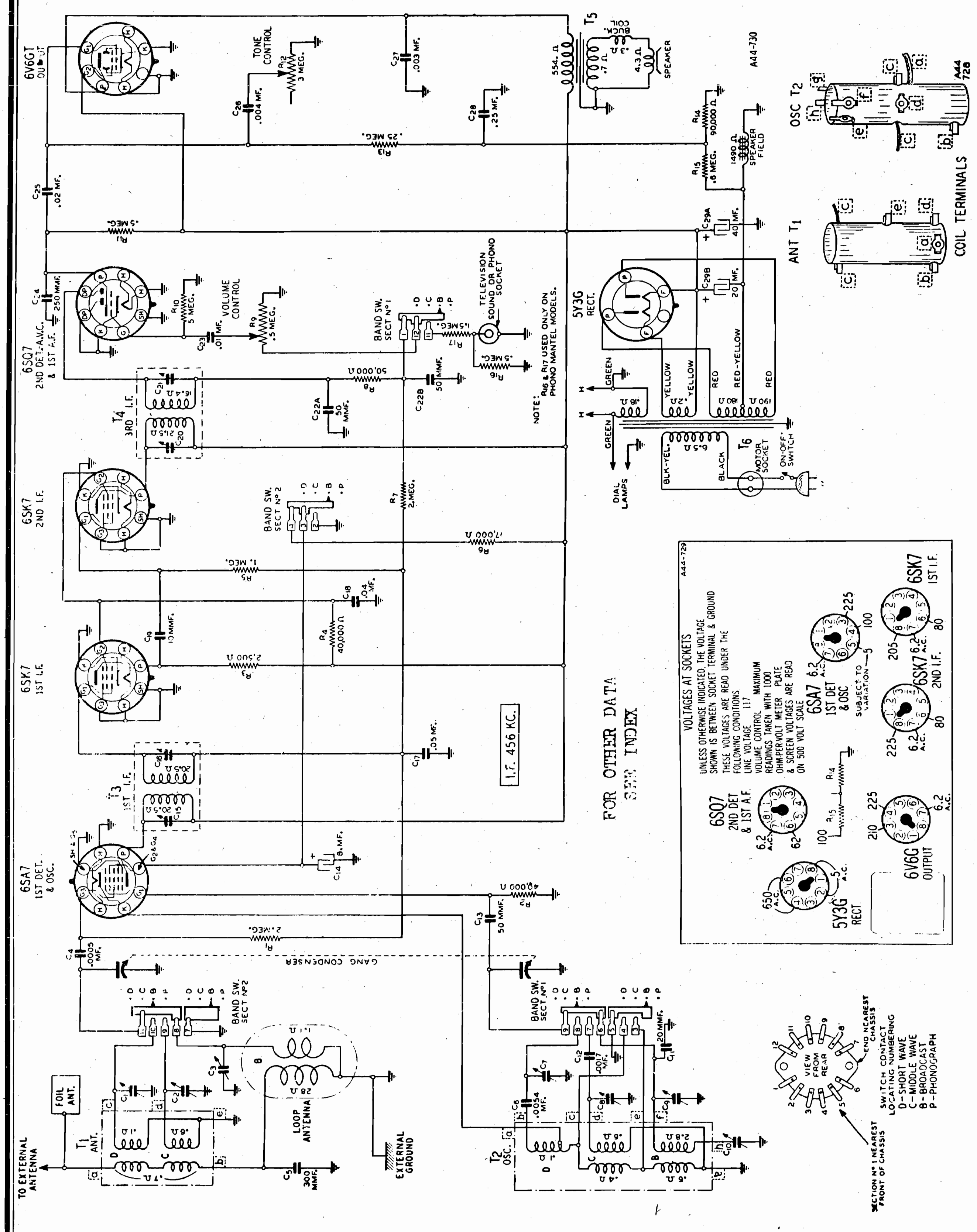
Pass cord through hole in groove of drive pulley. Tie cord to tension spring. Fasten other end of spring to hook on drive pulley.

DIAL POINTER ATTACHMENT—Tune in a signal of known frequency. Set pointer at this frequency mark on dial scale. Fasten pointer to drive cord—See illustration.



MONTGOMERY WARD & CO.

MODELS 04WG-622A, 04WG-623A



MODELS 04WG-622A, 04WG-623A
MODEL 04WG-731

MONTGOMERY WARD & CO.

SPECIFICATIONS MODEL 04WG-731

Power Consumption. . 28 Watts (At 117 volts AC Supply)
Power Output . . . . .9 Watt Undistorted
1.3 Watts Maximum
Selectivity . . . . .39 KC Broad at 1000 times Signal
Intermediate Frequency .456 KC
Speaker . . . . .6" P.M. Dynamic

Tuning Frequency Range
B Range . . . . 528 to 1600 KC
D Range . . . . .9000 to 12,200 KC

Sensitivity (For .05 watt output)
B Range . . . . 8 Microvolts Average
D Range . . . . .10 Microvolts Average

CAUTION

The metal chassis is connected to one side of the line through a .2 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.
The equipment in column at right is required for aligning:

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., 100 mmf., and 400 ohm.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR ANTENNA CONNECTION	SIGNAL GENERATOR GROUND CONNECTION	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
I. F.						
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	Point "X" {12SQ7—1st A.F. Prong No. 3}	.1 mf.	B Range	Turn Rotor to full open	1st I.F. (C15) & (C16) 3rd I.F. (C19) & (C20)
RANGE B						
1600 KC	Signal Grid of 1st Det.	Point "X"	.1 mf.	B Range	Turn Rotor to full open	Oscillator Range B (C10)
1400 KC	External Antenna Clip on Loop —See Note A	External Ground Clip On Loop	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note B	Antenna Range B (C8)
RANGE D						
10,500 KC	External Antenna Clip	External Ground Clip	400 Ohm	D Range	Turn Tuning Knob until Indicator is at 10.5 MC on Scale	Oscillator Range D (C7)
10,500 KC	External Antenna Clip	External Ground Clip	400 Ohm	D Range	Leave Setting as above	Ant. Range D (C4)

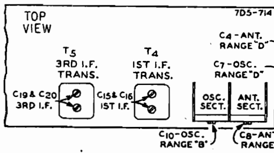
CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

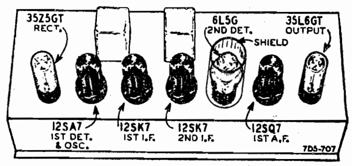
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

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

NOTE A—By means of wooden blocks, stand the loop aerial assembly upright exactly one inch from the back of the chassis.

NOTE B—If the pointer is not at 1400 KC on the dial, set pointer at this mark on the dial scale.





SPECIFICATIONS MODELS 04WG-622A, 04WG-623A

MODEL 04WG-622A
" 04WG-623A

Power Consumption 60 Watts (At 117 volts 60 cycles)
Power Output . . . . .2.5 Watts Undistorted
3.5 Watts Maximum
Selectivity . . . . .40 KC Broad at 1000 times Signal
Intermediate Frequency . . . . .456 KC
Speaker . . . . .6" Electro-Dynamic

Tuning Frequency Range
B Range . . . . 528 to 1600 KC
C Range . . . . .2200 to 7000 KC
D Range . . . . .7000 to 22000 KC

Sensitivity—External Antenna—(For 0.5 Watt output)
B Range . . . . 7 Microvolts Average
C Range . . . . 7 Microvolts Average
D Range . . . . .15 Microvolts Average

PHONOGRAPH CONNECTIONS: Insert phono pickup cable into phono socket (top of chassis). An a-c phono motor socket can be used to operate the record player motor.
TELEVISION SOUND AND F.M. CONNECTIONS: Audio amplifier and speaker of the receiver used to reproduce television sound or FM programs. Connect television picture receiver and sound converter or FM converter to phono socket. Turn knob to phono position.

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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	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. (C15) & (C16) 3rd I.F. (C20) & (C21)
RANGE B					
1600 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
1400 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range B (C3)
600 KC	External Antenna Clip or Lead See Note B	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C10) Rock Rotor—See Note C
RANGE C					
7000 KC	External Antenna Clip or Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C8)
6000 KC	External Antenna Clip or Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C2)
RANGE D					
22,000 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
21,000 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note C
LOOP RANGE B					
1400 KC	External Antenna Clip or Lead See Note D	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C3)

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.

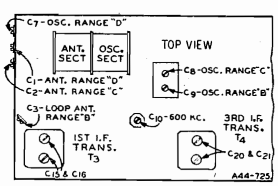
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

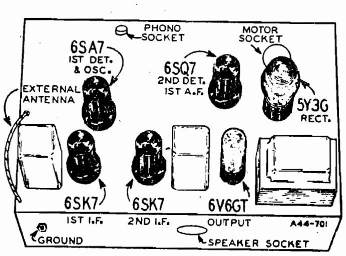
NOTE B—(Table Model) By means of wooden blocks, stand the loop aerial assembly the same distance from the back of the chassis that it is normally when the chassis is assembled in the cabinet.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—Re-assemble chassis in cabinet. Replace back on cabinet (Table Model). Connect ground post of signal generator to external ground clip on loop antenna (Table Model) or ground screw on chassis (Console Model).

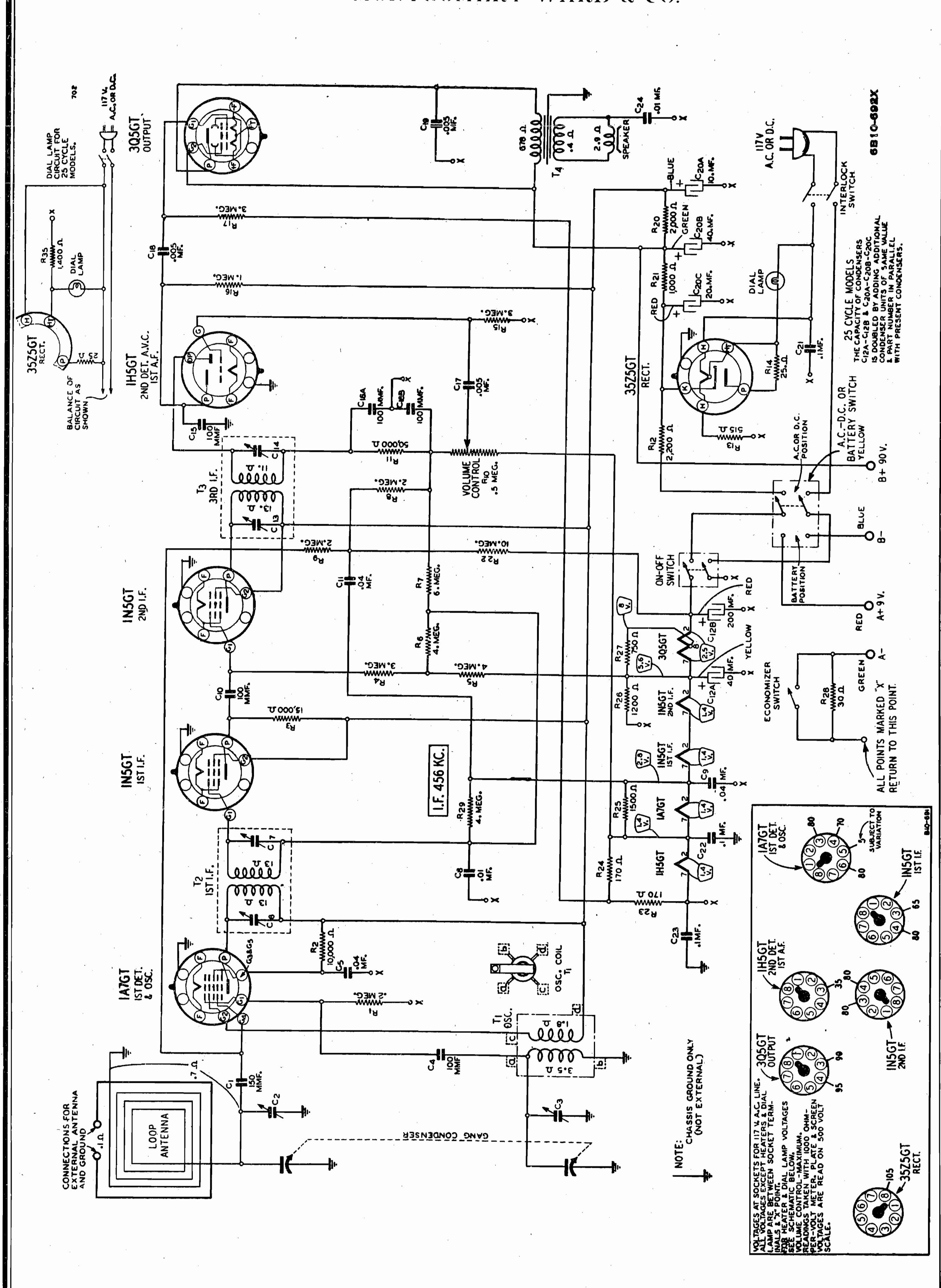
CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.





MONTGOMERY WARD & CO.

MODEL 04WG-672



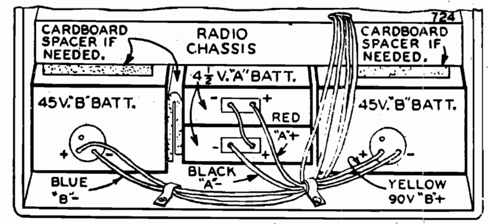
MODEL 04WG-672

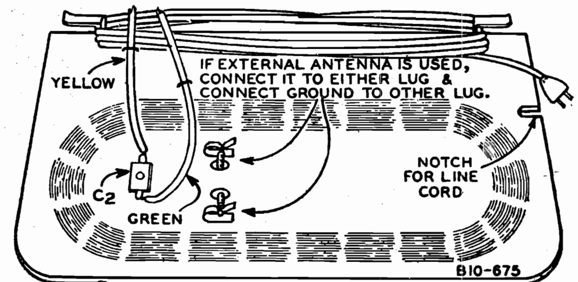
MONTGOMERY WARD & CO.

SPECIFICATIONS

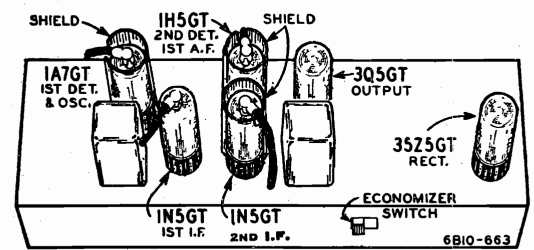
Input Voltages and Currents—Battery Operation
"A" Batteries.................. 9 Volts—50 Ma.
"B" Batteries..................90 Volts—11.5 Ma.
Power Consumption (At 117 volts AC Supply) 28 Watts
Power Output
Battery Operation - - - - 150 Mw. Undistorted, 350 Mw. Maximum
AC Operation - - - - - 200 Mw. Undistorted, 400 Mw. Maximum

Selectivity - 50 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)
External Antenna - - - 10 Microvolts Average





INSIDE VIEW OF BACK COVER



IMPORTANT - METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

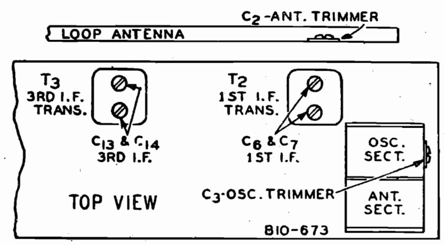
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
A 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.

SIGNAL GENERATOR					
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below)
456 KC	External Antenna Clip on Loop	External Ground Clip on Loop	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 3rd I.F. (C13) & (C14)
1600 KC	External Antenna Clip	External Ground Clip	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1400 KC	External Antenna Clip See Note A	External Ground Clip	200 mmf.	Turn Rotor to max. output	Antenna (C2)

NOTE A—Re-assemble chassis in cabinet. Close back on cabinet.

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, set the pointer at the 800 KC mark.



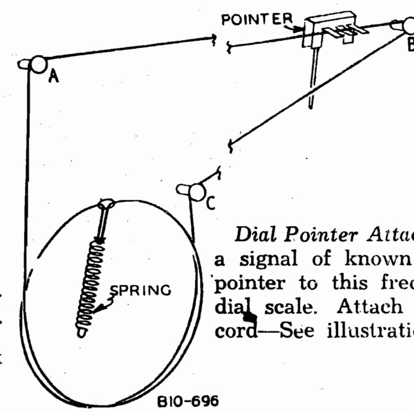
DRIVE CORD REPLACEMENT

Use a new drive cord 28 inches in length; tie one end to tension spring. Thread other end through hole in groove of drive pulley and pull spring flush against inside of pulley rim. Turn gang condenser to full open position—See illustration.

Wind cord ¾ turn clockwise (from back of chassis) around drive pulley. Pass cord over idler studs A, B, & C, as shown. Then wind cord ¾ turn clockwise (from back of chassis) around drive pulley. This turn should be on left side (from gang condenser side of chassis) of pulley groove.

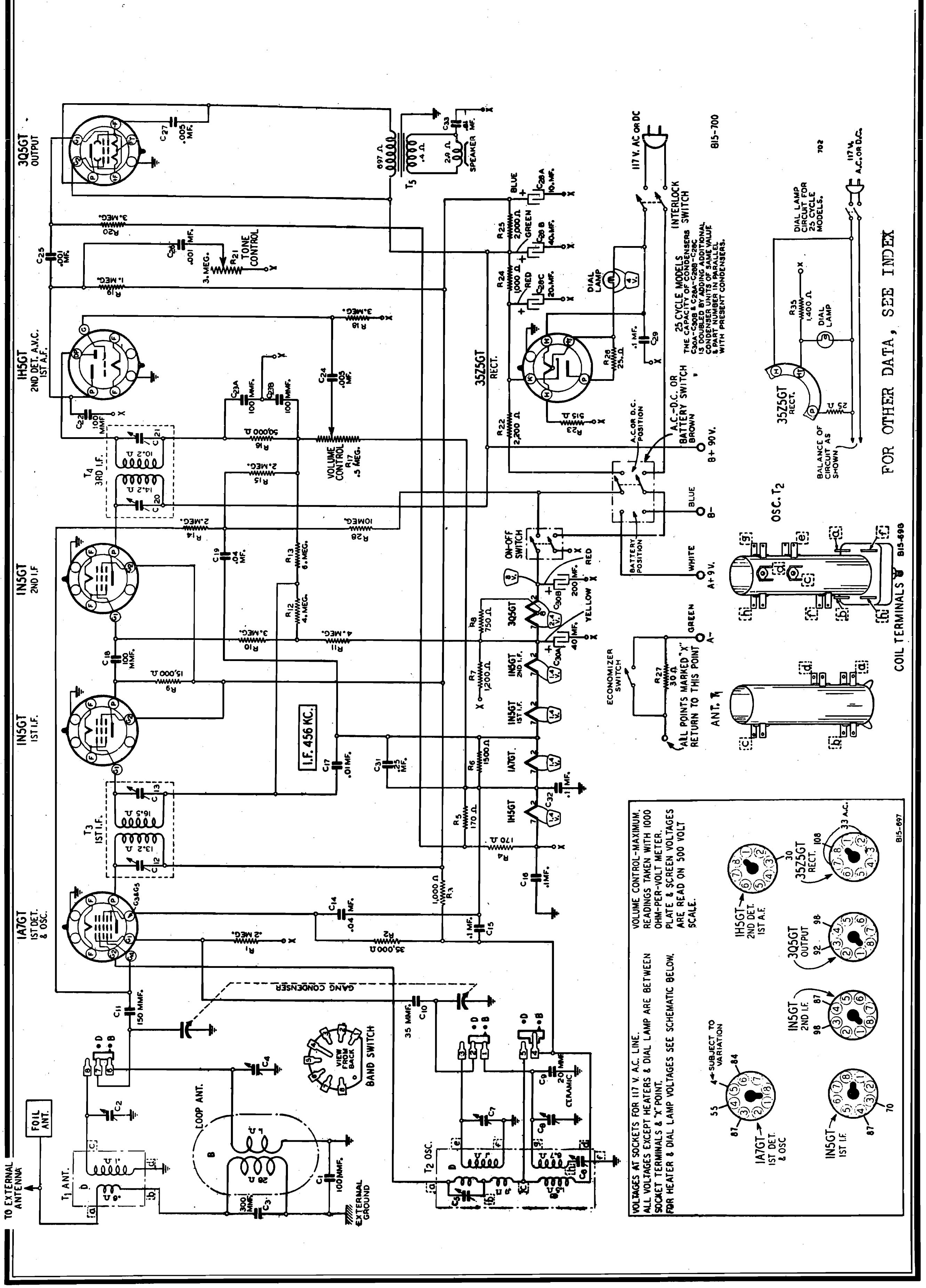
Thread cord through hole in pulley groove and tie to tension spring.

Attach other end of spring to hook on drive pulley.



Dial Pointer Attachment—Tune in a signal of known frequency. Set pointer to this frequency mark on dial scale. Attach pointer to drive cord—See illustration.

MONTGOMERY WARD & CO. MODELS 04WG-673,04WG-674



MODELS 04WG-673, 04WG-674

MONTGOMERY WARD & CO.

SPECIFICATIONS

Input Voltages and Currents—Battery Operation
"A" Battery .... 9 Volts—50 Ma.
"B" Batteries ....90 Volts—11.5 Ma.
Power Consumption (At 117 volts AC Supply) 28 Watts
Power Output
Battery Operation - - - - - - 150 Mw. Undistorted; 350 Mw. Maximum
AC Operation - - - - - - - 200 Mw. Undistorted; 400 Mw. Maximum
Selectivity - - - - 38 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - - - 456 KC
Speaker - - - - - - - - - 6" or 8" P.M. Dynamic
Tuning Frequency Range
B Range .... 528 to 1600 KC
D Range ....5750 to 18300 KC
Sensitivity—External Antenna—(For .05 Watt output)
B Range ....12 Microvolts Average
D Range......................20 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.
IMPORTANT—Follow procedure in the order shown.
The equipment in column at right 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., 100 mmf., and 400 ohms.

FREQUENCY SETTING	SIGNAL GENERATOR ANTENNA CONNECTION	SIGNAL GENERATOR GROUND CONNECTION	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER OR DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM
Loop Aerial must be connected to chassis during all adjustments. Mantel Model—Take out hinge screws from cabinet back as well as other screws and remove chassis and back intact from cabinet.						
I. F. 456 KC	External Antenna Wire	Point "X" IH5GT—2nd Det. Prong No. 7	.1 mf.	B Range	Turn Rotor to Full Open	3rd I.F. (C20) & (C21) Ist I.F. (C12) & (C13)
RANGE B 1600 KC	External Antenna Wire	External Ground Wire	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C8)
1400 KC	External Antenna Wire—See Note B	External Ground Wire	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C4)
600 KC	External Antenna Wire—See Note B	External Ground Wire	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C6) Rock Rotor—See Note C
RANGE D 18,300 KC	External Antenna Wire	External Ground Wire	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
16,000 KC	External Antenna Wire	External Ground Wire	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Rock Rotor—See Note C
6000 KC	External Antenna Wire	External Ground Wire	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C5) Rock Rotor—See Note C
LOOP RANGE B 1400 KC	External Antenna Wire—See Note D	External Ground Wire	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C4)

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

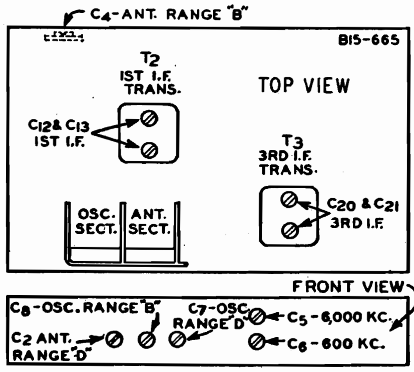
After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale.

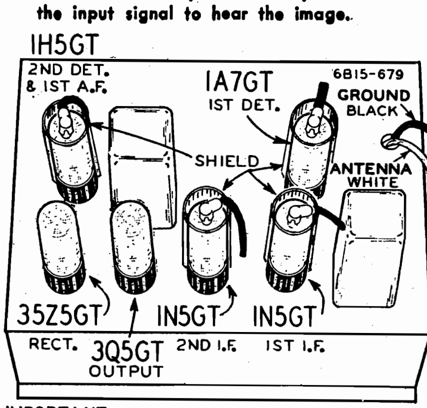
NOTE B (Mantel Model Only)—By means of wooden blocks, stand the loop aerial assembly upright exactly 1¾ inches from the back of the chassis.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—Re-assemble chassis in cabinet. Mantel Model—Replace back on cabinet. Antenna Range B trimmer may be reached through narrow slot in cabinet back.



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.



IMPORTANT- METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.

DRIVE CORD REPLACEMENT

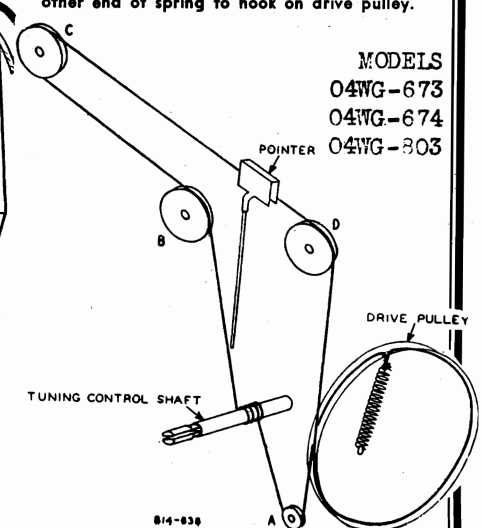
Turn gang condenser to full open position —See illustration. Use a new drive cord 42 inches in length.

Tie one end of cord to tension spring. Pass other end of cord up through hole in groove of drive pulley. Pull cord through hole until spring is flush against inside of pulley rim.

Pass cord under small pulley A—See illustration. Then wind 4 turns counter-clockwise (from back of chassis) around tuning control shaft. These turns should progress toward dial mounting plate. Pass cord over pulleys B, C, and D as shown. Then wind cord ¾ turn counter-clockwise (from drive pulley side of chassis) around drive pulley. This turn should be on left side (from back of chassis) of pulley groove.

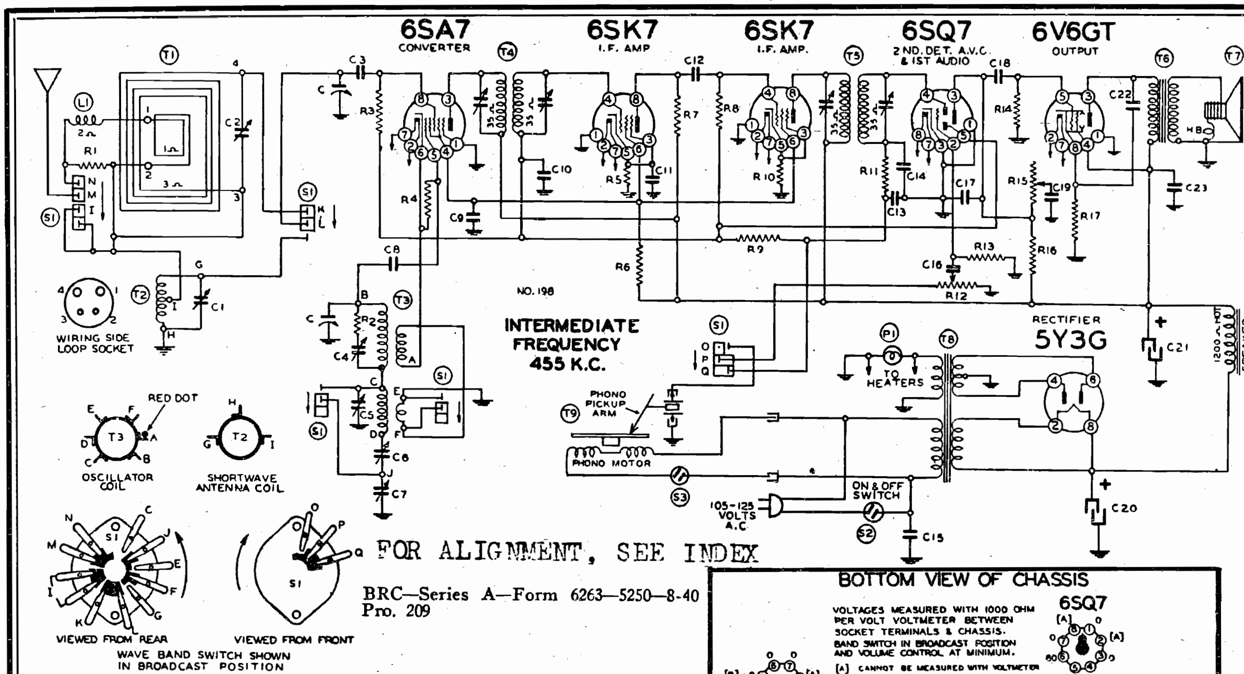
Pass cord through hole in groove of drive pulley. Tie cord to tension spring. Fasten other end of spring to hook on drive pulley.

MODELS
04WG-673
04WG-674
04WG-303



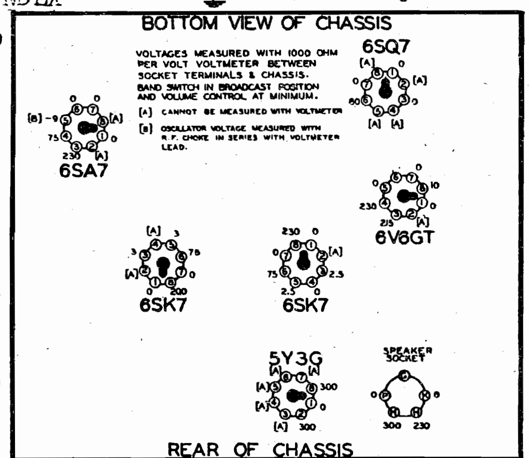
MONTGOMERY WARD & CO.

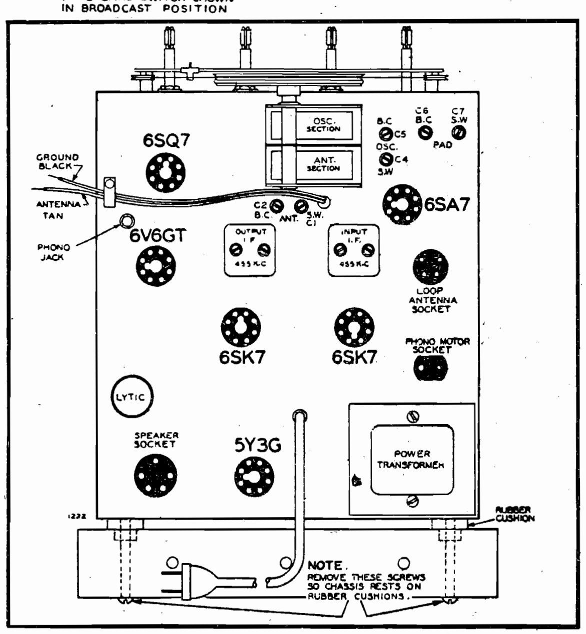
MODEL 04BR-620A



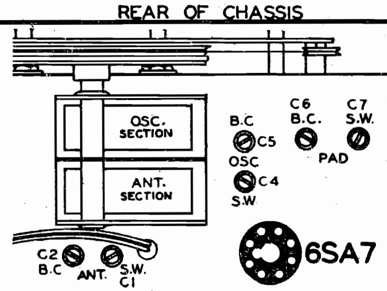
FOR ALIGNMENT, SEE INDEX

BRC—Series A—Form 6263—5250—8-40
Pro. 209





CHASSIS VIEW



TRIMMER VIEW

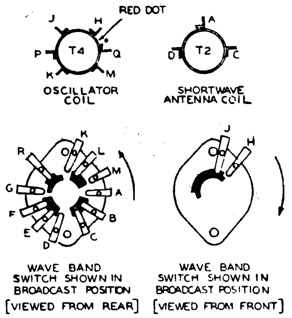
Code No.	Part No.	Description
		RESISTORS
R1	BE13071	4000 Ohm—1/3 w.
R2	BE130128	20 Ohm—1/3 w.
R3	BE13019	1 Megohm—1/3 w.
R4	BE130236	30M Ohm—1/3 w.
R5	BE130283	750 Ohm—1/3 w.
R6	BE130324	18M Ohm—1 watt
R7	BE130218	5M Ohm—1/3 w.
R8	BE13020	100M Ohm—1/3 w.
R9	BE130170	3 Megohm—1/3 w.
R10	BE130222	350 Ohm—1/3 w.
R11	BE13012	50M Ohm—1/3 w.
R12	BE101232	1 Megohm Volume Control
R13	BE130223	10 Megohm—1/3 w.
R14	BE1303	500M Ohm—1/3 w.
R15	BE101231	1 Megohm Tone Control
R16	BE130172	250M Ohm—1/3 w.
R17	BE130323	270 Ohm—1 watt
		CONDENSERS
C	BE102137	Two Gang Variable Condenser
C1	BE124149	S.W. Antenna Trimmer
C2	BE124149	B.C. Antenna Trimmer
C3	BE1292	.0005 Mica
C4	BE124142	S.W. Oscillator Trimmer
C5	BE124142	B.C. Oscillator Trimmer
C6	BE124146	B.C. Padding Condenser
C7	BE124146	S.W. Padding Condenser
C8	BE12960	150 mmfd. Mica
C9	BE10013	.05 x 400 v.
C10	BE10022	.05 x 200 v.
C11	BE1009	.05 x 200 v.
C12	BE1292	.0005 Mica
C13	BE129161	.0001 Mica
C14	BE129161	.0001 Mica
C15	BE10061	.02 x 600 v.
C16	BE10025	.002 x 600 v.
C17	BE12912	.00025 Mica
C18	BE10026	.02 x 400 v.
C19	BE10071	.004 x 600 v.
C20	BE119115	16 mfd. x 400 w. v. lytic
C21	BE119115	16 mfd. x 400 w. v. lytic
C22	BE10019	.006 x 600 v.
C23	BE1001	.1 x 400 v.

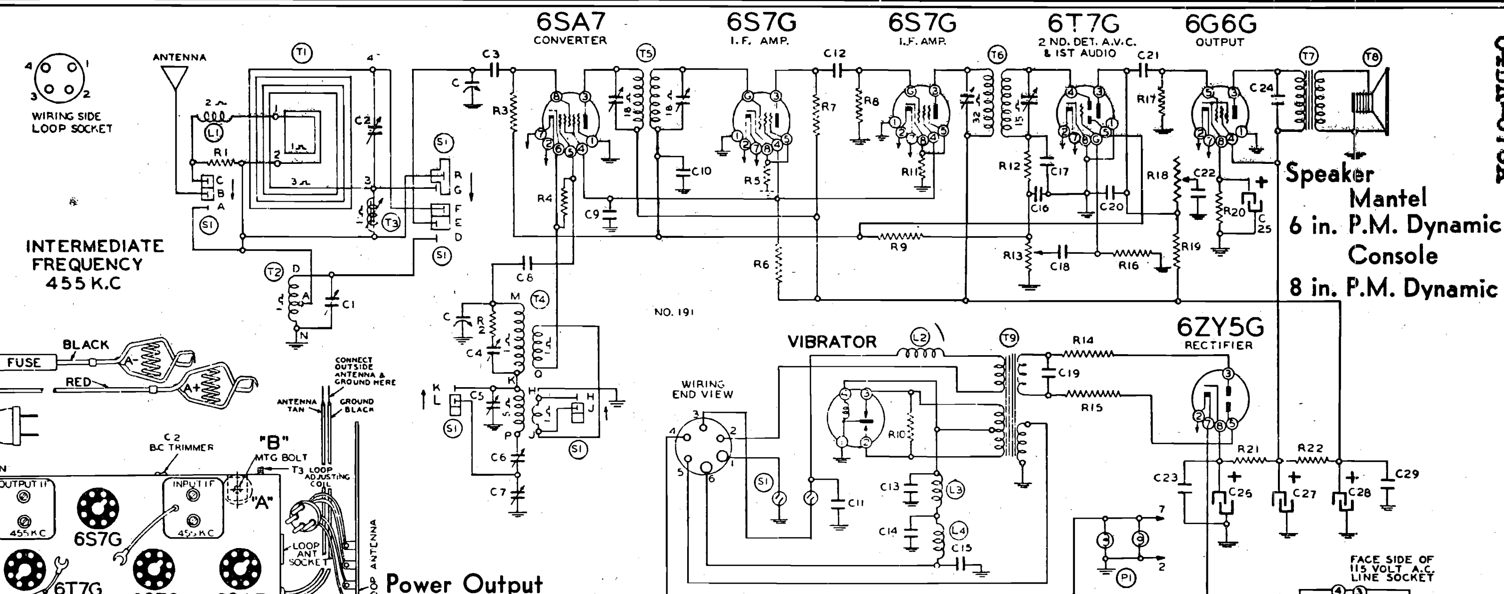
C1 and C2 are in same unit C4 and C5 in same unit
C6 and C7 are in same unit C13 and C14 in same unit
C20 and C21 are in same unit

Code No.	Part No.	Description
		PARTS
T1	BE111208	Loop Antenna Assembly
T2	BE111184	S.W. Antenna Coil
T3	BE110154	B.C. and S.W. Oscillator Coil
T4	BE108169E	Input I.F. Coil—455 kc.
T5	BE108106U	Output I.F. Coil—455 kc.
T6	BE105118	Output Transformer
T7	BE114216	8" Electro Dynamic Speaker
T8	BE104225B	60 Cycle Power Transformer
and	BE104238B	25 Cycle Power Transformer
T9	BE104228	60 Cycle Seeburg Record Changer and Phono Assembly
and	BE104229	25 Cycle Seeburg Record Changer and Phono Assembly
S1	BE125132	Phono-band Switch
S2		Switch on Volume Control
S3		Switch on Record Changer
L1	BE12312	R.F. Choke Coil
P1	BE10794	Pilot Light Bulb No. T-44

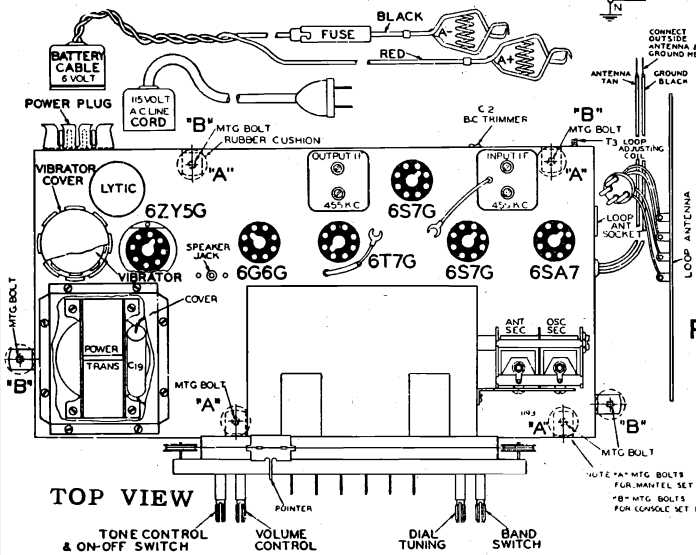
MODELS 04BR-675A, 04BR-676A

MONTGOMERY WARD & CO.





INTERMEDIATE FREQUENCY 455 K.C



TOP VIEW

Power Output

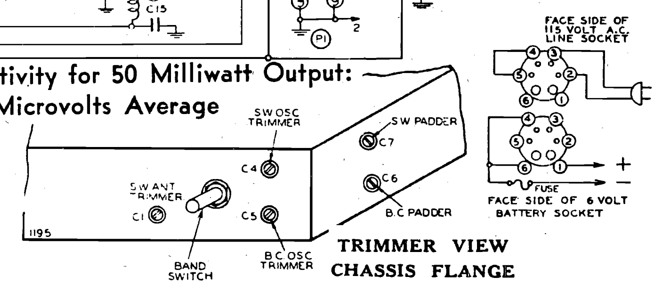
700 Milliwatts Undistorted

Power consumption

A. C. Operation - - 30 Watts

Battery Operation - 2.9 Amps

Sensitivity for 50 Milliwatt Output: 10 Microvolts Average



TRIMMER VIEW
CHASSIS FLANGE

C24	BE100106	.004 x 600 v.	
C25	BE119111	20 Mfd. Lytic x 20 w.v.	
C26	BE119111	40 Mfd. Lytic x 200 w.v.	
C27	BE119111	20 Mfd. Lytic x 200 w.v.	
C28	BE119111	20 Mfd. Lytic x 200 w.v.	
C29	BE10020	.1 x 200 v.	

C4 and C5 in one unit.
C16 and C17 in one unit.
C6 and C7 in one unit.
C25, C26, C27 and C28 in one unit

Range 535 to 1600 KC
5.6 to 18.3 MC

RESISTORS

Diagram Ref. No.	Part No.	
R1	BE130193	3M ohm—1/3 w.
R2	BE130276	10 ohm—1/3 w.
R3	BE13019	1 megohm—1/3 w.
R4	BE130236	30M ohm—1/3 w.
R5	BE13070	500 ohm—1/3 w.
R6	BE13067	9M ohm—1/3 w.
R7	BE130157	12M ohm—1/3 w.
R8	BE13019	1 megohm—1/3 w.
R9	BE130170	3 megohm—1/3 w.
R10	BE13084	200 ohm—1/3 w.
R11	BE130192	2M ohm—1/3 w.
R12	BE13020	100M ohm—1/3 w.
R13	BE101227	Volume Control
R14	BE130233	60 ohm—1/3 w.
R15	BE130233	60 ohm—1/3 w.
R16	BE130223	10 megohm—1/3 w.
R17	BE1303	500M ohm—1/3 w.
R18	BE101228	2 megohm (Tone)
R19	BE130266	200M ohm—1/3 w.
R20	BE13079	400 ohm—1/3 w.
R21	BE130222	350 ohm—1/3 w.
R22	BE130235	1500 ohm—1/3 w.

CONDENSERS

C	BE102133	2 Gang Variable Condenser
C1	BE124116	S.W. Antenna Trimmer
C2	BE124141	B.C. Antenna Trimmer
C3	BE12921	.0002 mica
C4	BE124142	S.W. Oscillator Trimmer
C5	BE124142	B.C. Oscillator Trimmer
C6	BE124140	B.C. Pad Trimmer
C7	BE124140	S.W. Pad Trimmer
C8	BE12938	.00005 mica
C9	BE10048	.25 x 200 v.
C10	BE1009	.05 x 200 v.
C11	BE10013	.05 x 400 v.
C12	BE1292	.0005 mica
C13	BE10031	.5 x 120 v.
C14	BE10031	.5 x 120 v.
C15	BE10031	.5 x 120 v.
C16	BE129161	.0001 mica
C17	BE129161	.0001 mica
C18	BE10025	.002 x 600 v.
C19	BE10073	.008 x 1200 v.
C20	BE1292	.0005 mica
C21	BE10026	.02 x 400 v.
C22	BE100106	.004 x 600 v.
C23	BE10020	.1 x 200 v.

PARTS

T1	BE111194	Loop Ant. Assembly (Mantel)
	BE111196	Loop Ant. Assembly (Console)
T2	BE111193	S.W. Ant. Coil
T3	BE111183	Loop Adj. Coil
T4	BE110160	B.C. S.W. Oscillator Coil
T5	BE108183	Input I.F. Coil—455 kc.
T6	BE108180	Output I.F. Coil—455 k.c.
T7	BE105114	Output Transformer
T8	BE114210	6" Speaker P.M. (Mantel)
	BE114211	8" P.M. Speaker (Console)
T9	BE104216	Power Transformer
S1	BE125119	Wave Band Switch
L1	BE12312	R.F. Choke Coil
L2	BE105102	"A" Choke
L3	BE10568	"A" Choke Coil
L4	BE105102	"A" Choke
P1	BE107259	(2) T47 Pilot Light Bulbs

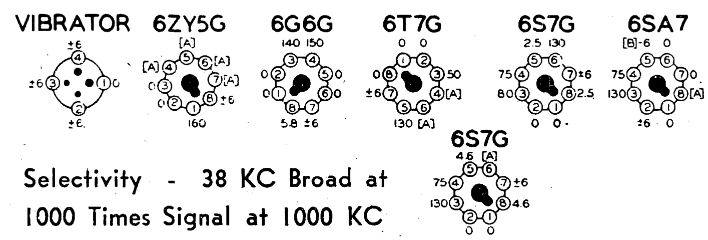
6-40

FOR OTHER DATA SEE INDEX

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS LOOP PLUGGED INTO CHASSIS AND SET TUNED OFF SIGNAL. SET OPERATING ON 6.3 VOLT STORAGE BATTERY

[A] CANNOT BE MEASURED WITH VOLTMETER.
[B] OSCILLATOR VOLTAGE MEASURED WITH R.F. CHOKE IN SERIES WITH VOLTMETER LEAD



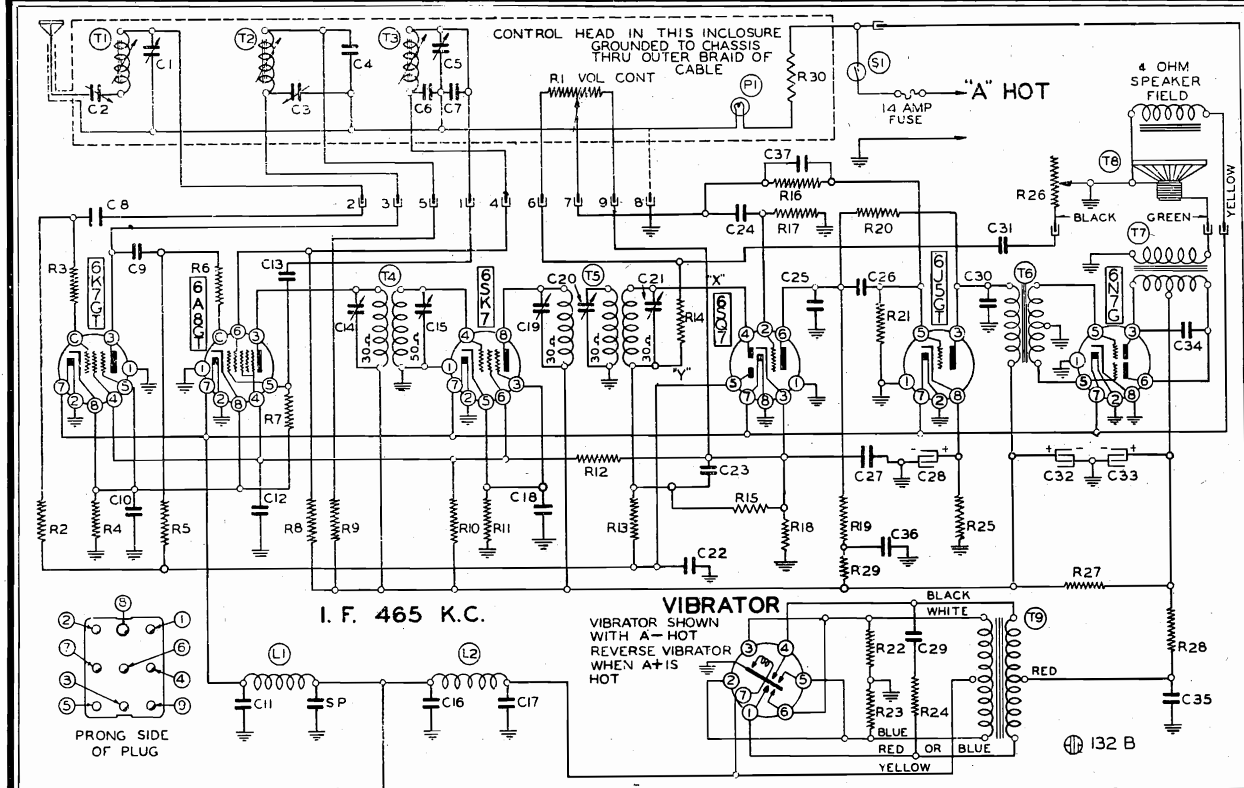
Selectivity - 38 KC Broad at 1000 Times Signal at 1000 KC

REAR OF CHASSIS

1194

MONTGOMERY WARD & CO.

MODEL 04BR-678C
above ser.#15927



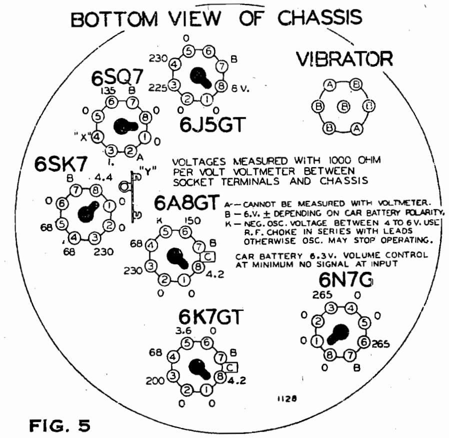


FIG. 5

CONDENSERS

C1	BE12483	Antenna Shunt Trimmer
C2	BE12481	Antenna Series Trimmer
C3	BE12480	R. F. Shunt Trimmer
C4	BE100102	.15 x 400 v.
C5	BE12480	Oscillator Shunt Trimmer
C6	BE129137	.0005 Mica
C7	BE129136	.00017 Mica
C8	BE12997	.00005 Ceramicon—5%
C9	BE1292	.0005 Mica
C10	BE11625	.05 x 200 v.
C11	BE1296	.002 Mica
C12	BE11625	.25 x 400 v.
C13	BE12912	.00025 Mica
C14		Plate Trimmer on Input I.F. Trans.
C15		Grid Trimmer on Input I.F. Trans.
C16	BE10031	.5 x 120 v.
C17	BE10031	.5 x 120 v.
C18	BE1009	.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	BE11625	.05 x 200 v.
C23	BE1295	.0001 Mica
C24	BE10011	.01 x 400 v.
C25	BE1295	.0001 Mica
C26	BE10011	.01 x 400 v.
C27	BE10026	.02 x 400 v.
C28	BE11988	20 mfd.—25 w. v. lytic
C29	BE100101	.0055 x 1600
C30	BE129114	.0003 Mica
C31	BE10047	.002 x 600 v.
C32	BE11988	15 mfd.—450 w. v. lytic
C33	BE11988	15 mfd.—450 w. v. lytic
C34	BE100103	.004 x 800 v.
C35	BE1001	.1 x 400 volt
C36	BE10013	.05 x 400 v.
C37	BE12967	.00004 Mica

PARTS

T1	BE111118	P.B. Antenna Coil Assembly Complete
T2	BE10949	P.B.R.F. Coil Assembly Complete
T3	BE110109	P.B. Oscillator Coil
T4	BE108120B	Input I.F. Coil—465 kc.
T5	BE108115B	Output I.F. Coil—465 kc.
T6	BE10584	Audio Driver Transformer
T7	BE10583	Output Transformer
T8	BE114155	8" Dynamic Speaker
T9	BE104158	Power Transformer
L1	BE10566	"A" Choke
L2	BE10519	"A" Choke
P1	BE10797	6-8 v. Pilot Light T51
S1		Off-on Switch on volume control
	BE1269	Vibrator (130 cycle synchronous).

MODEL 04BR-678C (SERIAL No. 15927 and UP)

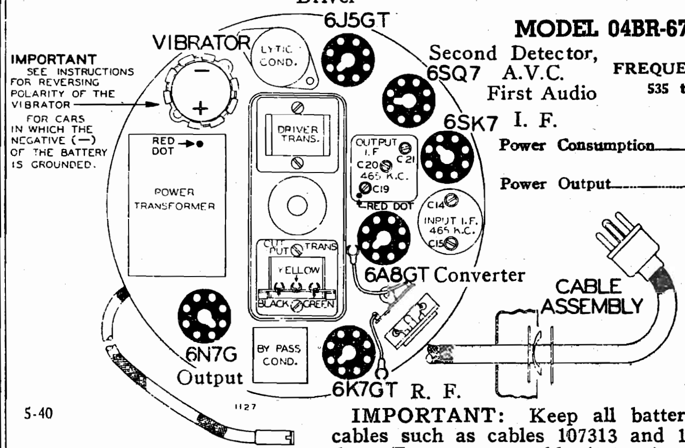
FREQUENCY RANGE
535 to 1565 Kc.

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

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

RESISTORS

R1	BE101161	1.2 megohm volume control
R2	BE13019	1 megohm—⅓ w.
R3	BE130275	500 ohm—⅓ w.
R4	BE13079	400 ohm—⅓ w.
R5	BE13019	1 megohm—⅓ w.
R6	BE130275	500 ohm—⅓ w.
R7	BE13012	50M ohm—⅓ w.
R8	BE13012	50M ohm—⅓ w.
R9	BE13021	20M ohm—⅓ w.
R10	BE130196	30M ohm—1 watt
R11	BE130235	1500 ohm—⅓ w.
R12	BE1307	40M ohm—⅓ w.
R13	BE13019	1 megohm—⅓ w.
R14	BE13020	100M ohm—⅓ w.
R15	BE130118	600M ohm—⅓ w.
R16	BE130257	5 megohm—⅓ w.
R17	BE13019	1 megohm—⅓ w.
R18	BE130101	600 ohm—⅓ w.
R19	BE13011	250M ohm—⅓ w.
R20	BE13038	2 megohm—⅓ w.
R21	BE1303	500M ohm—⅓ w.
R22	BE130269	100 ohm—⅓ w.
R23	BE130269	100 ohm—⅓ w.
R24	BE13071	4M ohm—⅓ w.
R25	BE13092	1M ohm—⅓ w.
R26	BE101162	1 megohm tone control
R27	BE130199	1500 ohm Resistor—1 watt
R28	BE130231	75 ohm—⅓ w.
R29	BE13020	100M ohm—⅓ w.
R30	BE130299	10 ohm—⅓ w.



5-40

Fig. 3—Top View of Chassis

IMPORTANT: Keep all battery connecting wires and cables such as cables 107313 and 107315 as far away from the R.F. connector cable (107231) as possible. This will reduce any interference which may be present in these battery wires from being radiated back into the R.F. connector cable 107231.

MODEL 04BR-678C
above ser.#15927

MONTGOMERY WARD & CO.

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., 125 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR 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 6A8GT	Set dial at 1400 Kc.	Trimmers C14, C15 (See Fig. 3)	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"

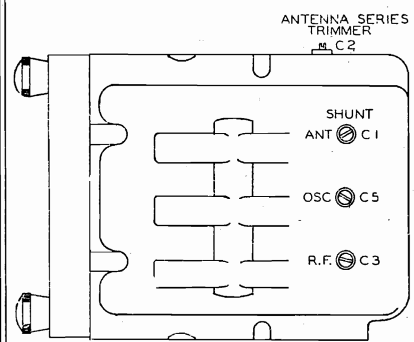


Fig. 4.—Bottom View of Remote Tuner

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:

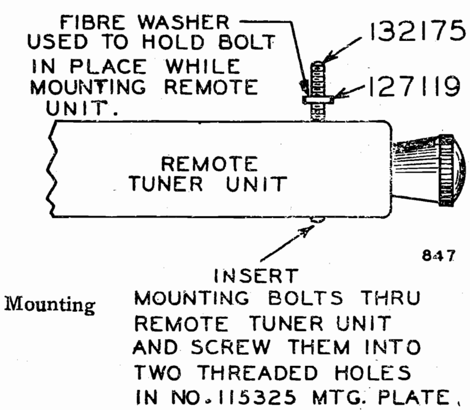
Tune in any weak station between 600 and 800 kc.

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.



Remote Mounting

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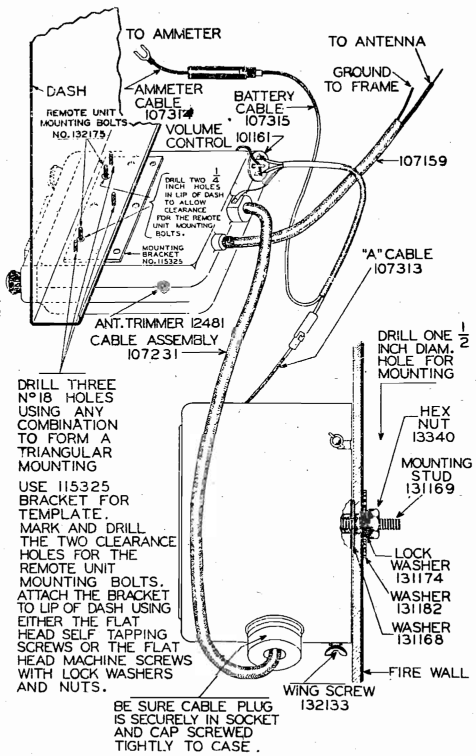


General Installation View

MONTGOMERY WARD & CO. **MODEL 04BR-678C** Above Ser.#15927

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.

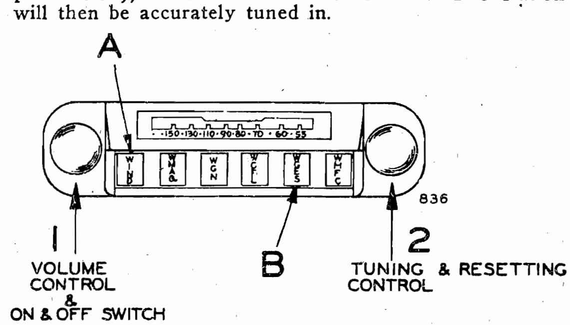


Fig. 2—Front View of Remote Tuner Unit

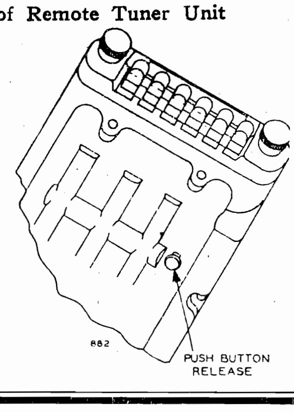


Fig. 2A—

Bottom View of Remote Tuner Unit Showing Push Button Release Pin.

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 the **pushbutton release pin** on the bottom of the tuner unit. This will trip the latching mechanism and all the **pushbuttons** will be **released to out position,** (See Fig. 2A).
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** press **the pushbutton release pin on the bottom of the tuner unit.**
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.)

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.

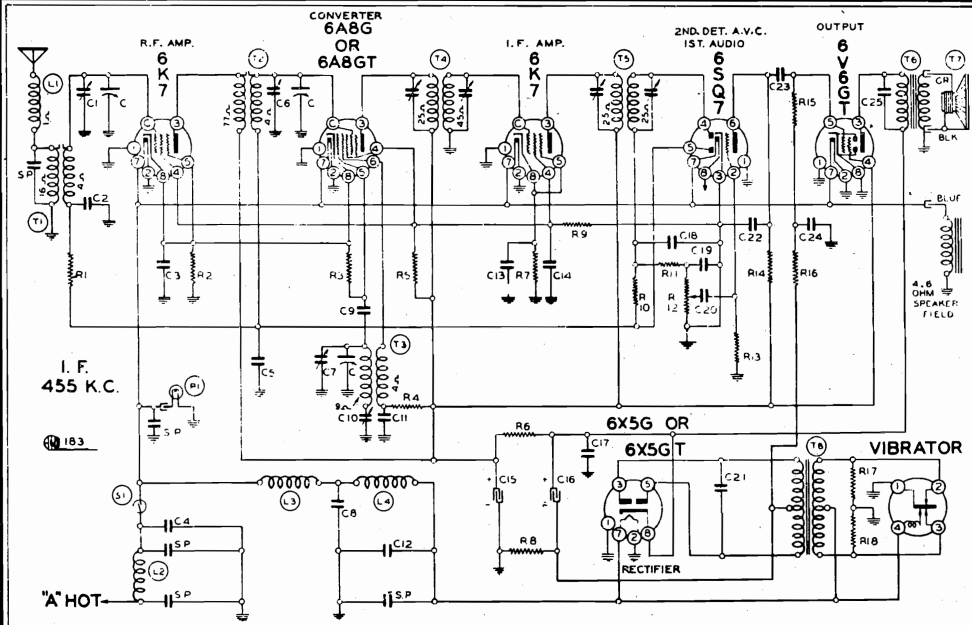
Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very **easily** by replacing with other tubes which are known to **be** good. If fuse blows out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

MODEL 04BR-679A
above ser.#5000

MONTGOMERY WARD & CO.



Schematic Ref. No.	Part No.	Description
		RESISTORS
R1	BE13020	100M ohm—1/3 w.
R2	BE13054	500 ohm—1/3 w.
R3	BE13012	50M ohm—1/3 w.
R4	BE130208	40M ohm—1/3 w.
R5	BE130196	30M ohm—1 watt
R6	BE130279	1M ohm—1 watt
R7	BE130153	700 ohm—1/3 w.
R8	BE130220	300 ohm—1 w.
R9	BE130208	40M ohm—1/3 w.
R10	BE13038	2 megohm—1/3 w.
R11	BE13012	50M ohm—1/3 w.
R12	BE10141	500M ohm volume control
R13	BE130223	10 megohm—1/3 w.
R14	BE1309	200M ohm—1/3 w.
R15	BE1305	300M ohm—1/3 w.
R16	BE130141	250M ohm—1/3 w.
R17	BE13060	100 ohm—1/3 w.
R18	BE13060	100 ohm—1/3 w.
		CONDENSERS
C	BE102100	3 gang variable condenser
C1		Antenna Trimmer on gang condenser
C2	BE10063	.05 x 200 v.
C3	BE10063	.1 x 200 v.
C4	BE10031	.5 x 120 v.
C5	BE10022	.05 x 200 v.
C6		R.F. Trimmer on gang condenser
C7		Oscillator Trimmer on gang condenser
C8	BE10031	.5 x 120 v.
C9	BE12912	.00025 mica
C10	BE12437	350 mmfd. W.C. Series Pad
C11	BE10020	.1 x 200 v.
C12	BE10031	.5 x 120 v.
C13	BE10020	.1 x 200 v.
C14	BE10053	.25 x 400 v.
C15	BE11965C	16 mfd. lytic x 350 w. v.
C16	BE11965C	16 mfd. lytic x 350 w. v.
C17	BE10011	.01 x 400 v.
C18	BE1295	.0001 mica
C19	BE1295	.0001 mica
C20	BE10025	.002 x 600 v.
C21	BE100100	.008 x 1600 v.
C22	BE12912	.00025 mica
C23	BE10019	.006 x 600 v.
C24	BE10020	.1 x 200 v.
C25	BE10019	.006 x 600 v.

C2 and C3 are in same unit
C15 and C16 in same unit

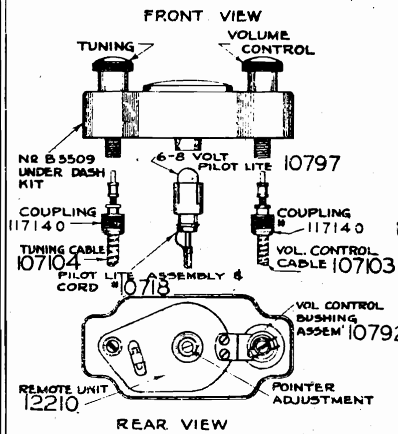
PARTS

T1	BE11171	Antenna Coil
T2	BE10935	R.F. Coil
T3	BE11057	Oscillator Coil
T4	BE10896B	Input I.F.—455 kc.
T5	BE10898	Output I.F.—455 kc.
T6	BE10561B	Output Transformer
T7	BE11459	5" Dynamic Speaker
T8	BE104159B	Power Transformer
L1	BE11176	Antenna Filter Choke
L2	BE10526	"A" Choke
L3	BE10524	"A" Choke
L4	BE10519	"A" Choke
S1		On-off switch on volume control
P1	BE10797	6-8 volt pilot light

Power Consumption	6.4 Amps AT-6.3 Volts
Power Output	2.5 Watts Undistorted
Sensitivity (for 1 Watt)	5 Microvolts Average
Selectivity - 48 Kc. Broad at 1000 Times Signal at 1000 Kc.	
Tuning Range	Broadcast 540—1550 Kc.
Intermediate Frequency	455 Kc.
Speaker	5 in. Dynamic

MODEL 04BR-679A SERIES A (SERIAL No. 5000 and UP)

FOR ALIGNMENT
SEE INDEX



4-40 FIG. 4

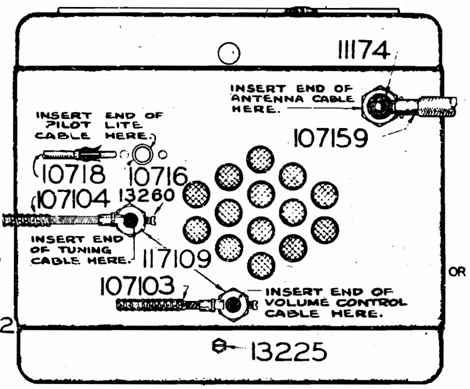


FIG. 1—SIDE VIEW

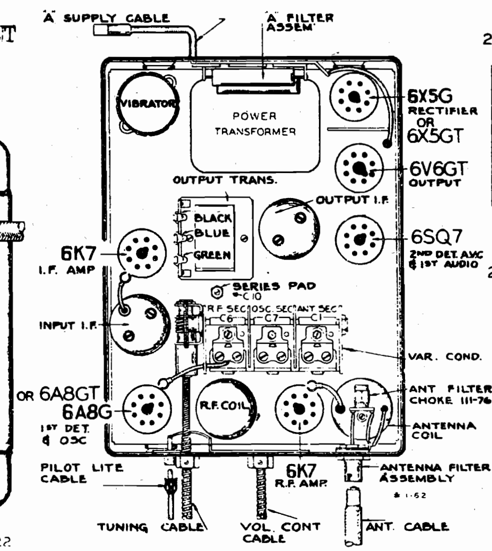
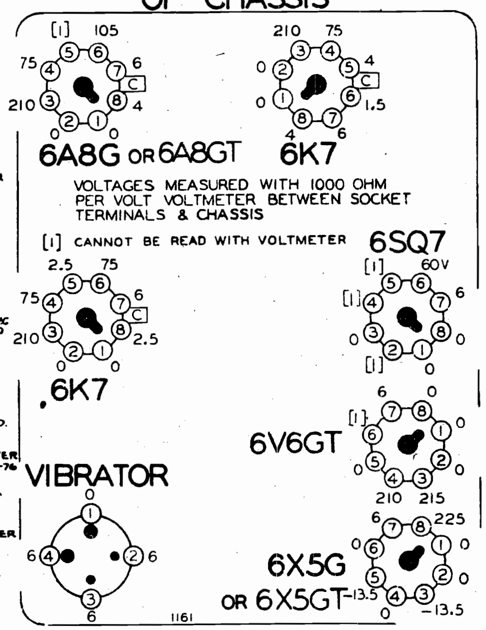


FIG. 2—TOP VIEW

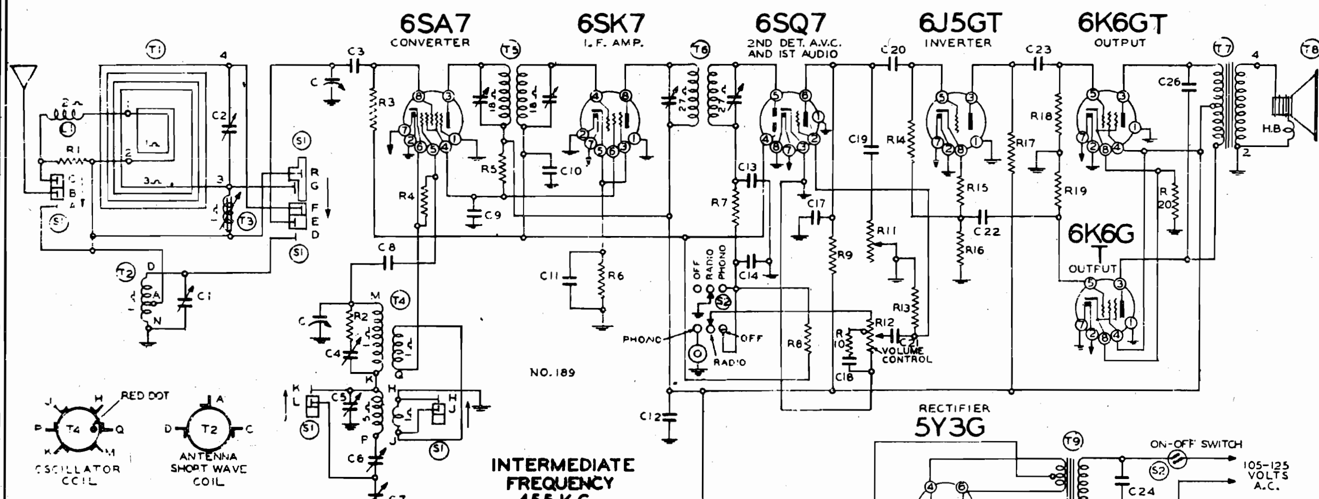
BOTTOM VIEW OF CHASSIS

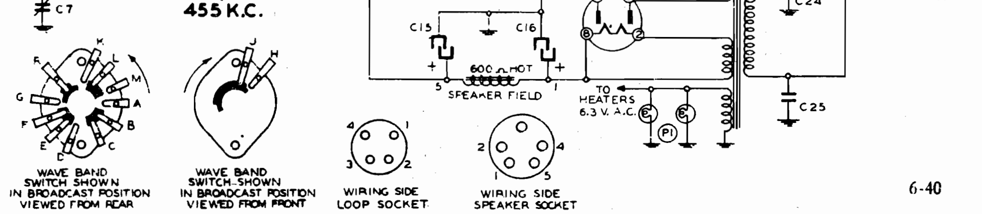


REAR OF CHASSIS

MONTGOMERY WARD & CO.

MODELS 04BR-729A, 04BR-730A
Above Ser.#0E509600





RESISTORS

Schematic Diagram Ref. No.	Part No.	Description
R1	BE13064	3500 ohm—1/3 w.
R2	BE130276	10 ohm—1/3 w.
R3	BE1304	3 megohm—1/3 w.
R4	BE130236	30M ohm—1/3 w.
R5	BE130307	15M ohm—1 w.
R6	BE13083	300 ohm—1/3 w.
R7	BE13012	50M ohm—1/3 w.
R8	BE13038	2 megohm—1/3 w.
R9	BE13011	250M ohm—1/3 w.
R10	BE130149	15M ohm—1/3 w.
R11	BE101223	Tone Control—1 megohm
R12	BE101224	Volume control—1/2 megohm
R13	BE130257	5 megohm—1/3 w.
R14	BE1303	500M ohm—1/3 w.
R15	BE130218	5M ohm—1/3 w.
R16	BE130103	100M ohm—1/3 w.
R17	BE130103	100M ohm—1/3 w.
R18	BE1303	500M ohm—1/3 w.
R19	BE1303	500M ohm—1/3 w.
R20	BE130320	320 ohm—1 w.

CONDENSERS

C	BE102133	2 gang variable condenser
C1	BE124116	Short wave antenna trimmer
C2	BE124141	B.C. Antenna Trimmer
C3	BE1292	.0005 mica
C4	BE124142	Dual Adj. Trimmer—S.W. Osc. Trimmer
C5	BE124142	Dual Adj. Trim.—B.C. Osc. Trimmer
C6	BE124140	Dual Adj. Cond.—B.C. Pad
C7	BE124140	Dual Adj. Cond.—S.W. Pad
C8	BE12960	.00015 mica
C9	BE10013	.05 x 400 v.
C10	BE1009	.05 x 200 v.
C11	BE1009	.05 x 200 v.
C12	BE1001	.1 x 400 v.
C13	BE129161	Dual—.0001 Mica
C14	BE129161	Dual—.0001 Mica
C15	BE119108	16 mfd. x 450 w.v. lytic cond.
C16	BE119108	16 mfd. x 450 w.v. lytic cond.
C17	BE1295	.0001 mica
C18	BE100120	.035 x 200 v.
C19	BE10019	.006 x 600 v.
C20	BE10026	.02 x 400 v.
C21	BE10019	.006 x 600 v.
C22	BE10013	.05 x 400 v.
C23	BE10013	.05 x 400 v.
C24	BE10061	.02 x 600 v.
C25	BE10061	.02 x 600 v.
C26	BE10019	.006 x 600 v.

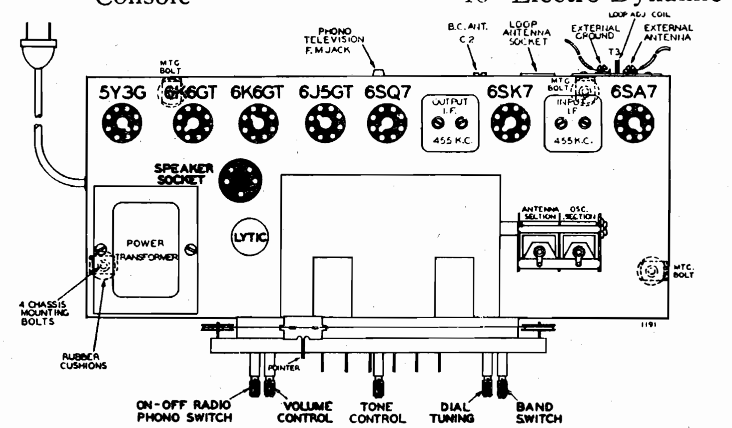
C4 and C5, C6 and C7, and C13 and C14 are in same unit.

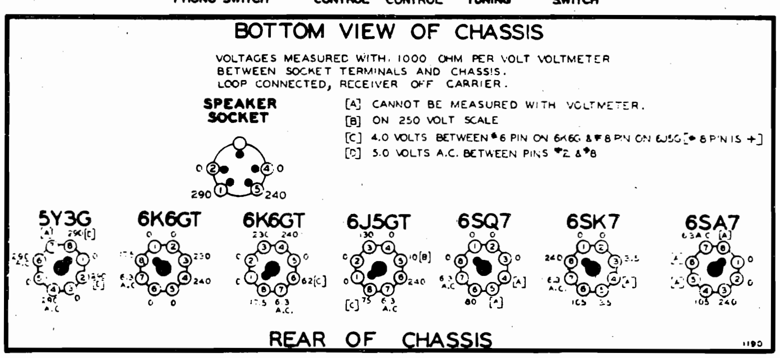
PARTS

T1	BE111185	Loop Antenna Assembly
	BE111186	Round loop antenna assembly
T2	BE111184	Short Wave Antenna Coil
T3	BE111183	Loop Adj. Coil
T4	BE110154	B.C.—S.W. Oscillator coil
T5	BE108178	Input I.F. Coil—455 kc.
T6	BE108179	Output I.F. Coil—455 kc.
T7	BE105112	Output Transformer
T8	BE114203	6" Dynamic Speaker
	BE114204	10" Dynamic Speaker
T9	BE104212	Power Transformer
L1	BE12312	R.F. Choke Coil
S1	BE125119	Wave Band Switch
S2	BE125120	Radio-Phono On-off switch
P1	BE10794	(2) Pilot light bulbs T-44

MODEL 04BR-729A and 04BR-730A (SERIAL NO. OE509600 AND UP)

Power consumption		75 Watts
Power Output		3 Watts Undistorted
Sensitivity for 500 Milliwatt Output:		20 Microvolts Average
Selectivity - 45 KC Broad at 1000 Times Signal at 1000 KC		
Tuning Frequency Range	Broadcast	535 to 1600 KC
	Shortwave	5.4 to 18.4 MC
Speaker	Mantel	6" Electro Dynamic
	Console	10" Electro Dynamic





MODELS 04BR-729A,04BR-730A
above ser.#0E509600

MONTGOMERY WARD & CO.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground 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., 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.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	535 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Set Dial at 532 K.C.	Trimmer C6	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T3 (See Top View)	Iron Core Tracking Coil	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1600 and 535 K. C.).

The loop antenna should be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." terminals.

NOTE "C"—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.

HOW TO REMOVE CHASSIS

Should it ever be necessary to take the chassis out of the cabinet be sure to first pull the plug from the light socket. Next pull off all control knobs and take off the escutcheon. Pull out the loop aerial and speaker plugs, then remove the 4 chassis mounting screws and lift the chassis out.

NOTE—On the Mantel Model it is necessary to remove the screws and take the back off.

PHONOGRAPH-TELEVISION OR FM. JACK

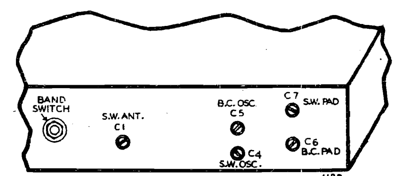
Should you wish to use an external phonograph it should be plugged into the phono jack shown in the top view—The on-off radio-phono knob on the front panel will then switch from radio to phono operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-television-FM in the top view will accomodate either the Phono or a television or FM converter.

PUSHBUTTON TUNING

Pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button **hard** all the way in to lock the station in place. (push directly on front of button) Continue setting each pushbutton in the same way.



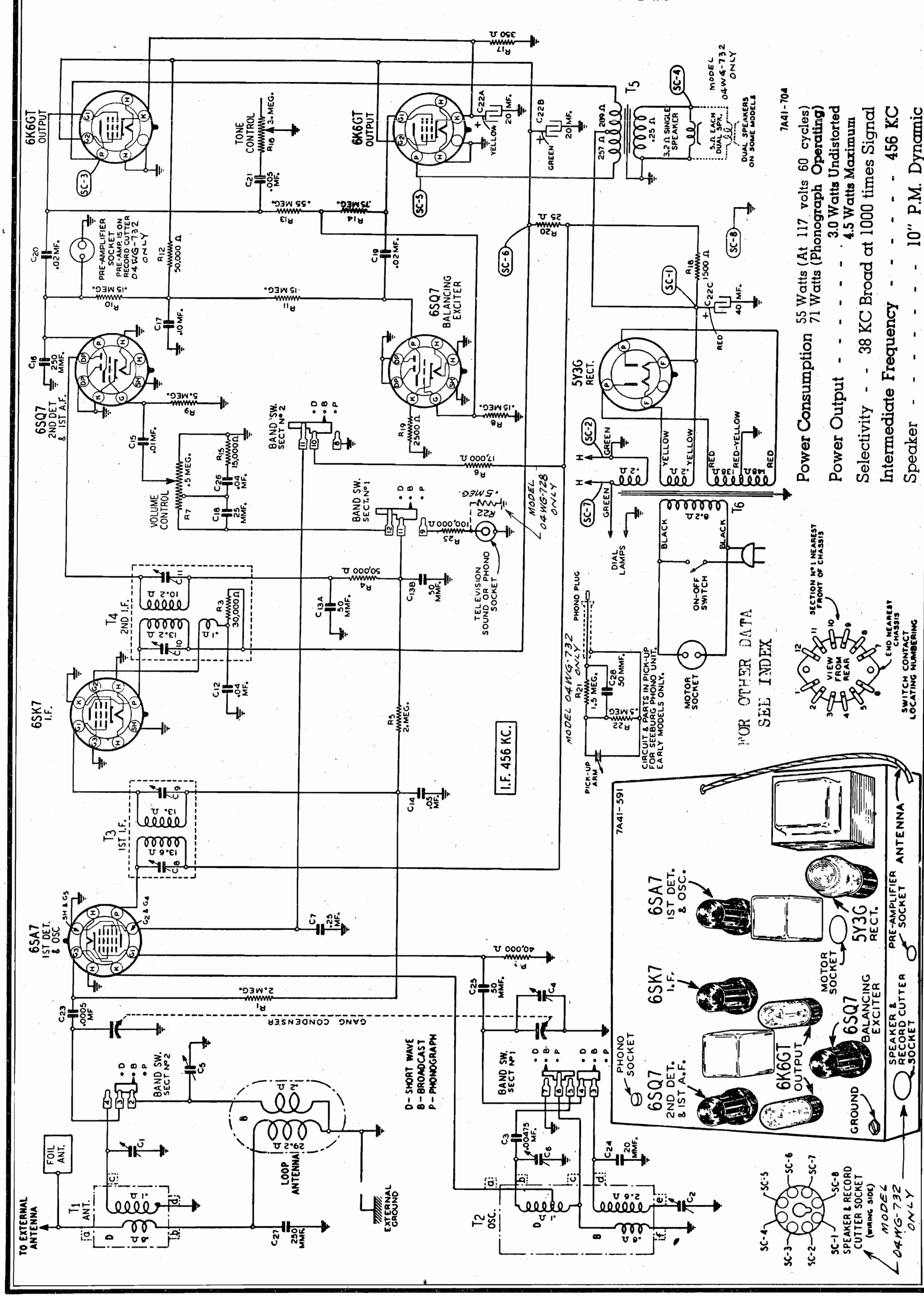
TRIMMER VIEW FRONT CHASSIS FLANGE

Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.

MONTGOMERY WARD & CO.

MODELS 04WG-728, 04WG-732



MODELS 04WG-728, 04WG-732

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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Remove chassis and top plate from cabinet as explained in the article on this subject. Remove top plate from chassis. Then place chassis on a stand in such a way that the loop connection plugs can be reinserted in the loop sockets on the chassis.					
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C8) & (C9) 2nd I.F. (C10) & (C11)
RANGE B 1600 KC (1550 KC, MODEL 04WG-728)	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C4)
1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C5)
600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C2) Rock Rotor—See Note B
RANGE D 18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C6)
17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B 1400 KC See Note C	None See Note C		B Range	Turn Rotor to Max. Output	Ant. Range B (C5)

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—Reinstall set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from loop in cabinet.

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.

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.

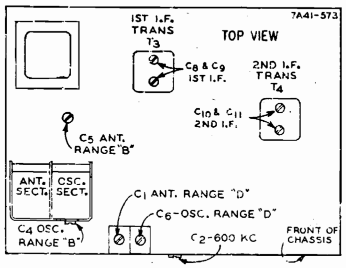
Tuning Frequency Range

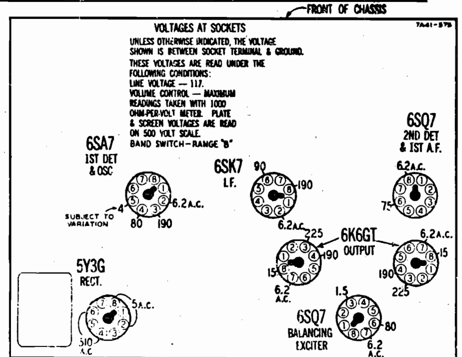
B Range.... 528 to 1600 KC
D Range.... 5750 to 18300 KC

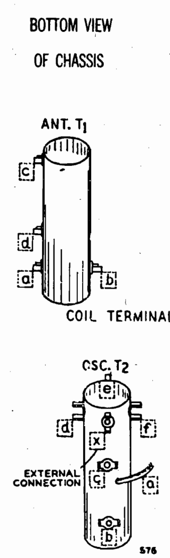
Sensitivity—External Antenna—

(For 0.5 Watt Output)

B Range . . . .15 Microvolts Average
D Range . . . .45 Microvolts Average







Drive Cord Replacement

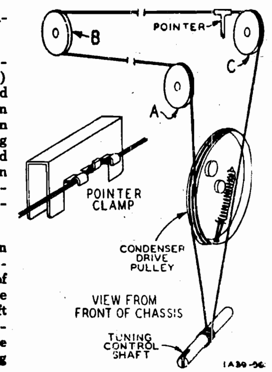
Use a drive cord approximately 70 inches in length. Tie a large knot with a small loop at one end of the new drive cord. Thread other end of cord up through hole in rim of condenser drive pulley. Pull cord through hole until large knot is flush against pulley rim.

Turn gang condenser to completely closed position.

Wind ¼ turn in a clockwise direction (from right side of chassis) around condenser drive pulley. Wind cord over pulleys A and B as shown in illustration. Pass cord between dial lamp brackets and mounting plate and then over pulley C. Wind 4½ turns in a clockwise direction (from front of chassis) around tuning control shaft. Turns should progress toward the chassis.

Turn gang condenser to full open position. Wind 1¼ turns in a clockwise direction (from right side of chassis) around condenser drive pulley. This turn should be at left side (from front of chassis) of pulley groove. Pass cord through hole in pulley rim. Secure tension spring to cord loop. Knot other end of cord to spring. Stretch spring and secure free end to hook on drive pulley.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.



Operating the Automatic Phonograph

The operation of the phonograph is simple but the phonograph instruction folder packed with this instruction book should be carefully read and understood before an attempt is made to place the record changer in operation.

The record changer is entirely automatic in its action after it has started operating. Any number up to fourteen 10 inch or ten 12 inch records may be played consecutively without need of attention by the listener. Standard 10 inch or 12 inch records may be used but *only one size may be played at a time*. Each record must have a run-off groove so that the record changer will operate properly. This groove is the one which carries the tone arm toward the center of the record after the record has stopped playing.

The volume and tone controls are used in the same manner for phonograph reproduction as they are for radio reception—See article "Operating the Radio."

To Turn the Phonograph On

Turn the on-off switch knob to the right.

A click will be heard and the dial will light. Wait 30 seconds for the tubes to heat.

Turn the Phonograph-Radio knob, to the phonograph (P) position—See illustration.

For detailed instructions regarding the operation of the automatic record changer, see the phonograph instruction folder.

To Turn the Phonograph Off

The instructions for turning off the automatic record changer are given in the article "Turning Off Changer" in the phonograph instruction folder. Be sure to turn the radio on-off switch knob to the left. A click will be heard and the dial lamps will be off.

Home Recorder - Television - Frequency Modulation

Home Recorder

This radio is designed so that you may take advantage of a *new* and extremely interesting form of entertainment. By replacing the record changer unit in this radio with a unit which includes a record cutter and a record changer, the new world of making your own records is opened to you.

Your favorite radio programs, comedy, dance or symphony may be permanently recorded. By means of a microphone attachment, voice or music of your own production may be recorded.

For detailed information regarding this record cutter unit, get in touch with your local Montgomery Ward store or the nearest Mail Order House.

Television Sound Connections

If Television programs ever become available in your community, the audio amplifier and speaker of this radio may be used to reproduce Television sound in conjunction with any "Television Picture Receiver and Sound Converter."

On the top of the chassis base is a socket to which is connected the phono cable shielded pin tip. Upon removal of this pin tip, the connector on the cable from a television receiver can be inserted in the socket. (The cable connector must be a single shielded pin tip type, Part No. 6A224.)

When Television sound reproduction is desired, the Phonograph-Radio knob should be turned to the Phonograph (P) position. For radio reception, the knob should be in one of the two Radio positions.

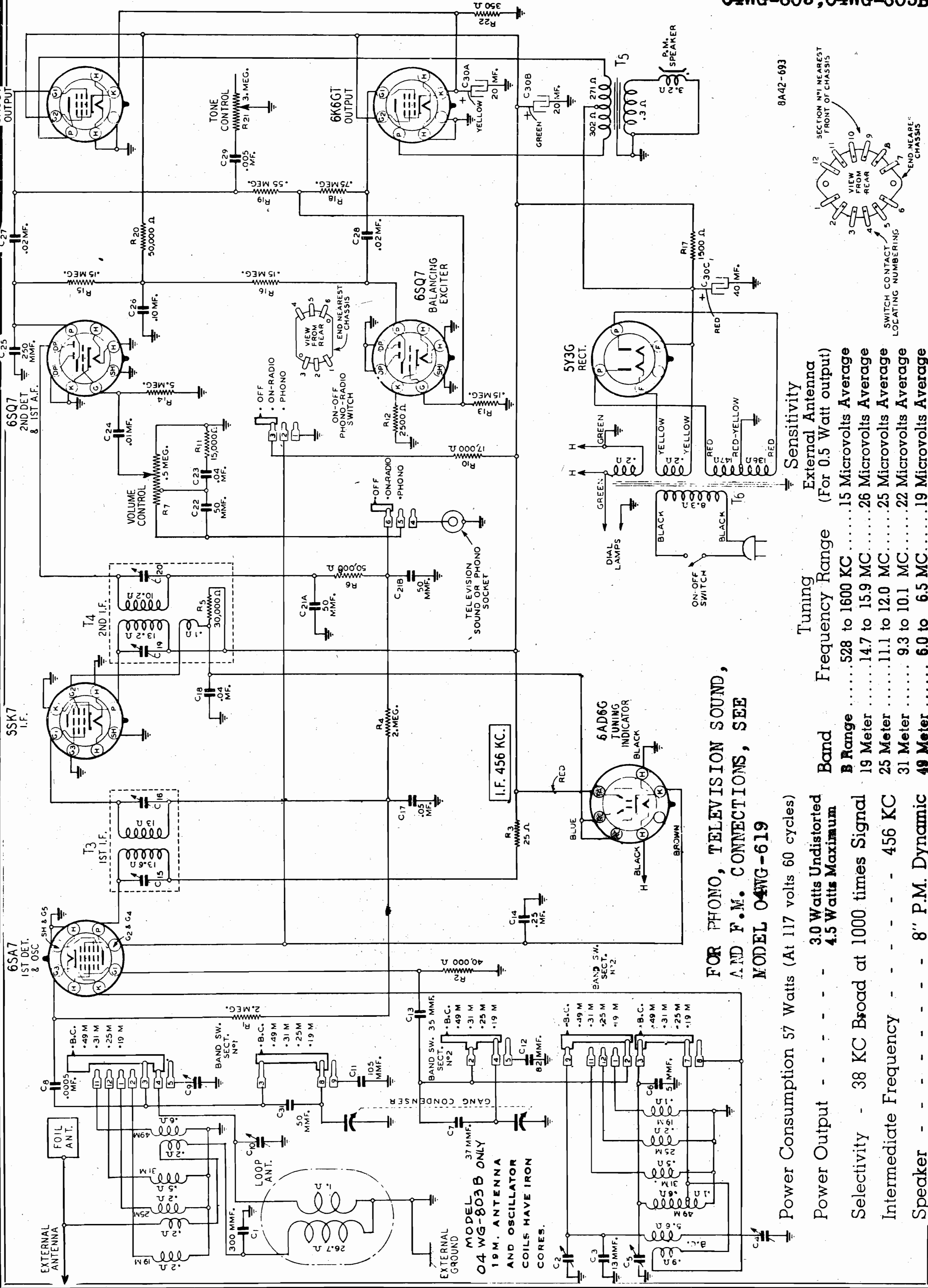
Frequency Modulation Connections

If Frequency Modulated programs ever become available in your community, the audio amplifier and speaker of this radio may be used to reproduce these programs in conjunction with any Frequency Modulation Converter.

The connection to the chassis is exactly the same as explained in the preceding article "Television Sound Connections."

When Frequency Modulated programs are desired, the Phonograph-Radio knob should be turned to the Phonograph (P) position. For radio reception, the knob should be in one of the two Radio positions.

MONTGOMERY WARD & CO. MODELS 04WG-803, 04WG-803B



FOR PHONO, TELEVISION SOUND, AND F.M. CONNECTIONS, SEE MODEL 04WG-619

Band	Tuning Frequency Range	Sensitivity External Antenna (For 0.5 Watt output)
B Range	528 to 1600 KC	15 Microvolts Average
19 Meter	14.7 to 15.9 MC	26 Microvolts Average
25 Meter	11.1 to 12.0 MC	25 Microvolts Average
31 Meter	9.3 to 10.1 MC	22 Microvolts Average
49 Meter	6.0 to 6.5 MC	19 Microvolts Average

Power Consumption 57 Watts (At 117 volts 60 cycles)

Power Output - - - - - - 3.0 Watts Undistorted, 4.5 Watts Maximum

Selectivity - 38 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - 456 KC

Speaker - - - - - - - 8" P.M. Dynamic

MODELS 04WG-803, 04WG-803B

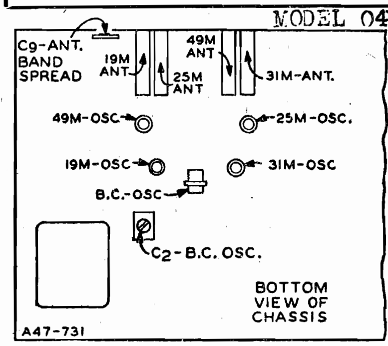
MONTGOMERY WARD & CO.

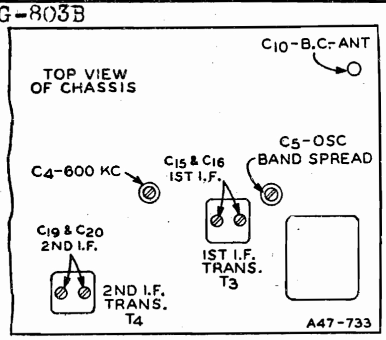
Volume Control—Maximum All adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

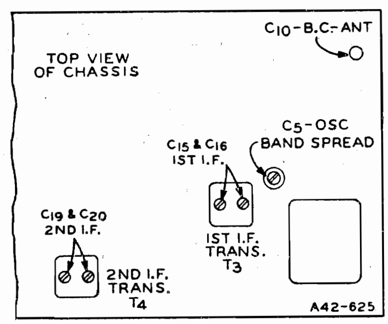
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Remove chassis from cabinet but do not disconnect leads to loop aerial.					
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C19) & (C20)
RANGE B 1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C2)
1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C10)
600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C4) Rock Rotor—See Note B
SHORT WAVE BANDS 6300 KC	Antenna Lead	400 Ohm	49 Meter	Turn Tuning Knob until Pointer is at 6.3 MC	Oscillator Band Spread (C5)
6300 KC	Antenna Lead	400 Ohm	49 Meter	Leave Setting as above	Antenna Band Spread (C9)
LOOP RANGE B 1400 KC	Antenna Lead See Note C	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C10)

MODEL 04WG-803B





MODEL 04WG-803



CAUTION—Two of the coils in the band spread coil assembly, the 19 Meter Antenna and Oscillator coils, have adjustable iron cores in the "B" and later issues of this model. One of the adjusting screws extends out from the front panel of the chassis base at the left of the band switch. The other adjusting screw extends up from the chassis base in back of the tuning condenser.

DO NOT CHANGE THE POSITION OF THESE ADJUSTING SCREWS as they have been properly set at the factory and cannot be satisfactorily re-adjusted in the field.

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.

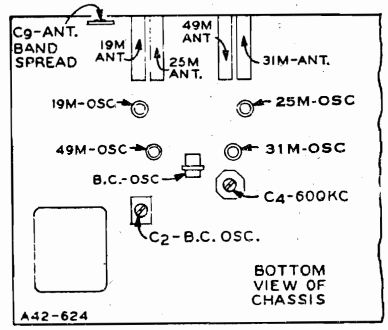
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

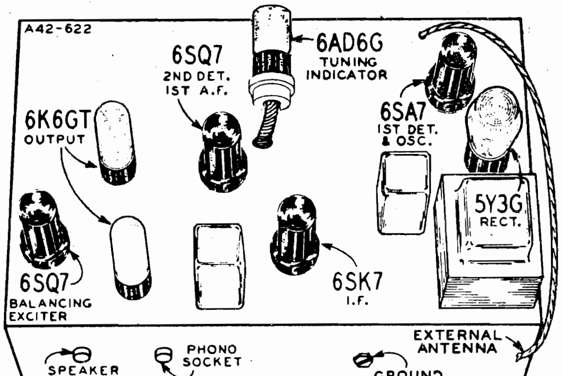
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

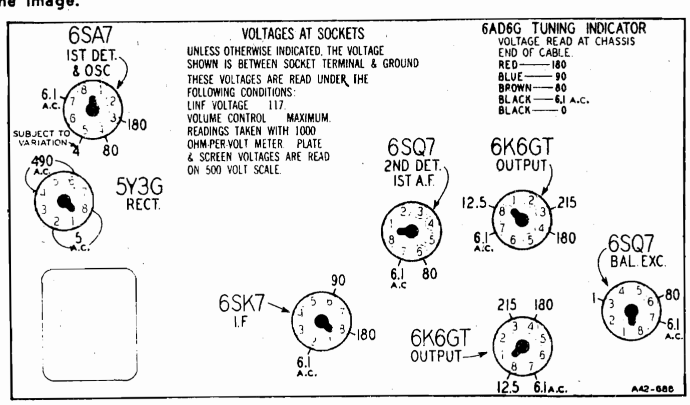
NOTE C—Re-assemble chassis in cabinet.

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 04WG-803







MONTGOMERY WARD & CO. MODELS 04BR-903A, 04BR-907A above ser. #519000

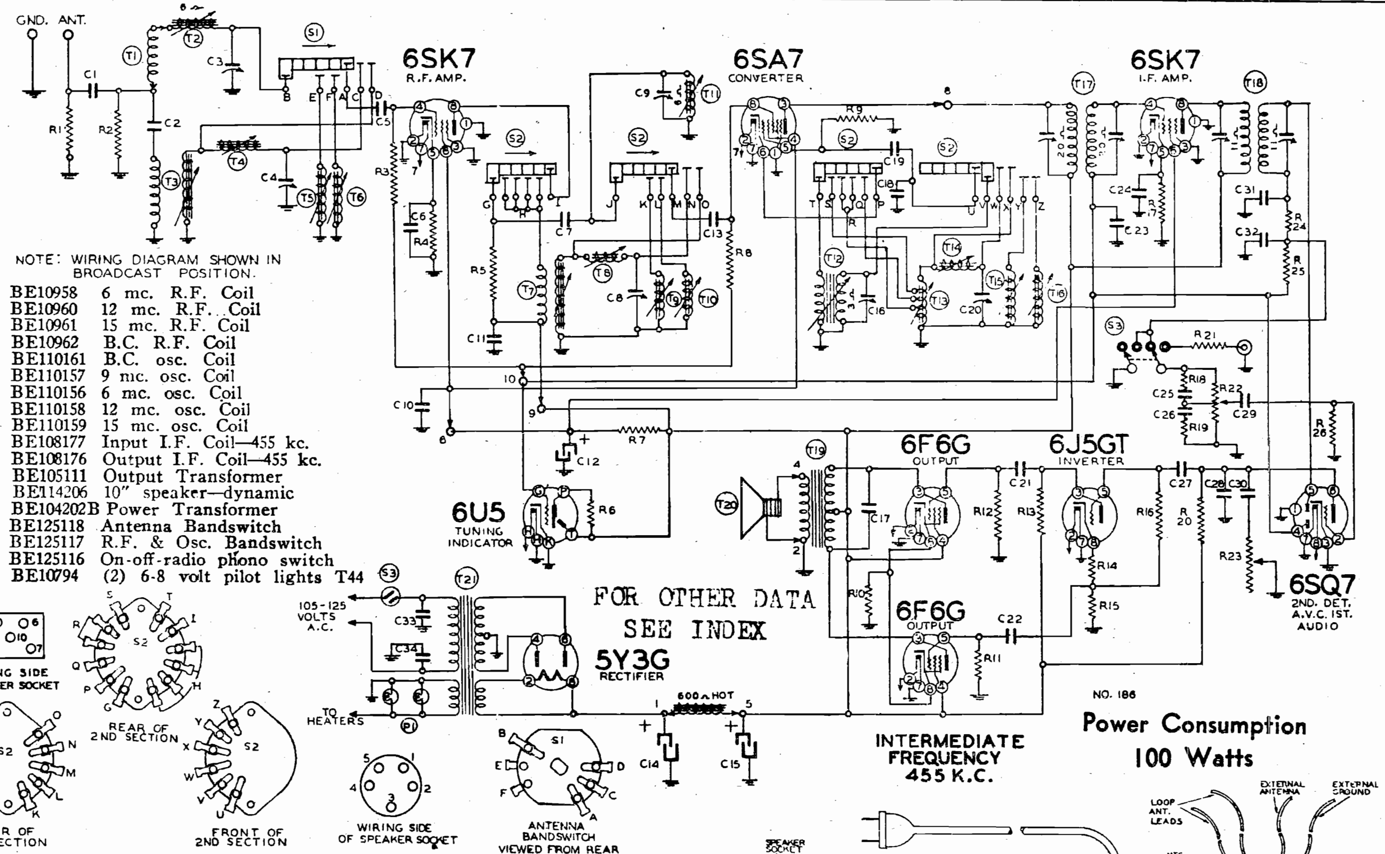
Diagram Ref. No.	Part No.	RESISTORS
R1	BE1301	25M ohm—⅓ w.
R2	BE1301	25M ohm—⅓ w.
R3	BE13019	1 megohm—⅓ w.
R4	BE130239	250 ohm—⅓ w.
R5	BE130218	5M ohm—⅓ w.
R6		1 megohm—in tuning indicator cable
R7	BE10662	12,500 ohm—3 w.
R8	BE13019	1 megohm—⅓ w.
R9	BE130232	25M ohm—⅓ w.
R10	BE130220	300 ohm—1 w.
R11	BE1303	500M ohm—⅓ w.
R12	BE1303	500M ohm—⅓ w.
R13	BE130103	100M ohm—⅓ w.
R14	BE130218	5M ohm—⅓ w.
R15	BE130103	100M ohm—⅓ w.
R16	BE13019	1 megohm—⅓ w.
R17	BE13070	500 ohm—⅓ w.
R18	BE13011	250M ohm—⅓ w.
R19	BE130149	15M ohm—⅓ w.
R20	BE13011	250M ohm—⅓ w.
R21	BE1303	500M ohm—⅓ w.
R22	BE101221	½ megohm (volume
R23	BE101226	1 megohm (tone)
R24	BE13012	50M ohm—⅓ w.
R25	BE1304	3 megohm—⅓ w.
R26	BE130257	5 megohm—⅓ w.

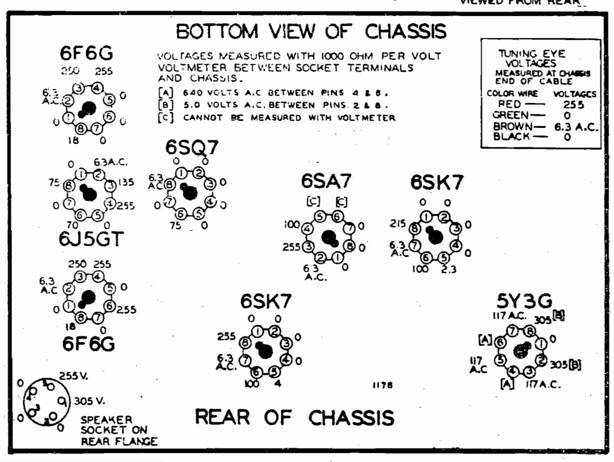
CONDENSERS

C1	BE1292	.0005 mica
C2	BE10047	.002 x 600 v.—10%
C3	BE124143	B.C. Antenna Trimmer
C4	BE124143	9 mc. Antenna Trimmer
C5	BE1292	.0005 mica
C6	BE10020	.1 x 200 v. tubular
C7	BE129168	.00001 mica
C8	BE124138	9 mc. R.F. Trimmer
C9	BE124139	B.C. R.F. Trimmer
C10	BE10074	.1 x 400 v.
C11	BE10074	.1 x 400 v.
C12	BE119109	10.0 x 350 w.v.
C13	BE1292	.0005 mica
C14	BE119109	15.0 x 450 w.v.
C15	BE119109	15.0 x 450 w.v.
C16	BE124144	B.C. Oscillator trimmer
C17	BE10071	.004 x 600 v.
C18	BE129167	.0002 silver mica
C19	BE129165	.00005 mica
C20	BE124145	9 mc. osc. trimmer
C21	BE10013	.05 x 400 v.
C22	BE1009	.05 x 200 v.
C23	BE10026	.02 x 400 v.
C24	BE10020	.1 x 200 v.
C25	BE129114	.0003 mica
C26	BE100122	.03 x 200 v.
C27	BE10026	.02 x 400 v.
C28	BE12921	.0002 mica
C29	BE10019	.006 x 600 v.
C30	BE10019	.006 x 600 v.
C31	BE129165	.00005 mica
C32	BE129165	.00005 mica
C33	BE10061	.02 x 600 v. Bakelite
C34	BE10061	.02 x 600 v. Bakelite

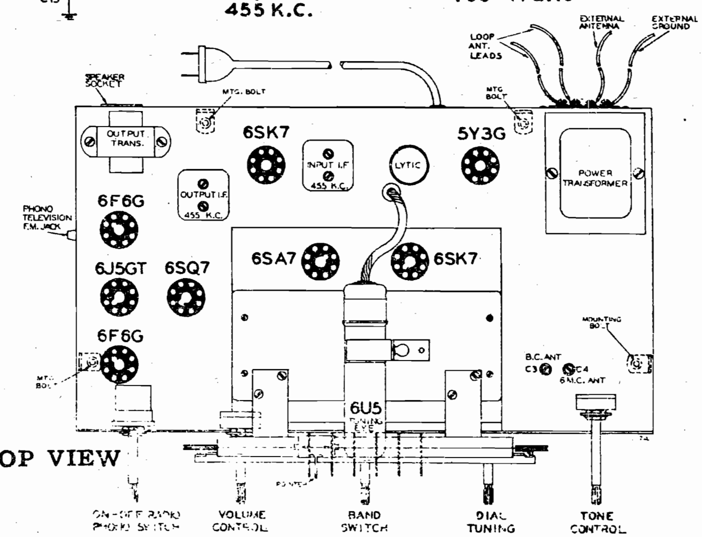
PARTS

T1	BE111188	Loop Antenna Assembly for 62903
	BE111201	Loop Antenna Assembly for 62907
T2	BE111195	B.C. Antenna Coil
T3	BE111190	9 mc. Antenna Coil
T4	BE111189	6 mc. Antenna Coil
T5	BE111191	12 mc. Antenna Coil
T6	BE111192	15 mc. Antenna Coil
T7	BE10959	9 mc. R.F. Coil
T8	BE10958	6 mc. R.F. Coil
T9	BE10960	12 mc. R.F. Coil
T10	BE10961	15 mc. R.F. Coil
T11	BE10962	B.C. R.F. Coil
T12	BE110161	B.C. osc. Coil
T13	BE110157	9 mc. osc. Coil
T14	BE110156	6 mc. osc. Coil
T15	BE110158	12 mc. osc. Coil
T16	BE110159	15 mc. osc. Coil
T17	BE108177	Input I.F. Coil—455 kc.
T18	BE108176	Output I.F. Coil—455 kc.
T19	BE105111	Output Transformer
T20	BE114206	10" speaker—dynamic
T21	BE104202B	Power Transformer
S1	BE125118	Antenna Bandswitch
S2	BE125117	R.F. & Osc. Bandswitch
S3	BE125116	On-off-radio phono switch
P1	BE10794	(2) 6-8 volt pilot lights T44





7-40



MODELS 04BR-903A,04BR-907A
above ser.#519000
MODELS 04BR-904A,04BR-906A,
04BR-1105A,04BR-1106A .

MONTGOMERY WARD & CO

ALIGNMENT PROCEDURE Model No. 04BR-903A and 04BR-907A, 04BR-904A and 04BR-906A, 04BR-1105A, 04BR-1106A.

- Tone control—Treble
- 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.

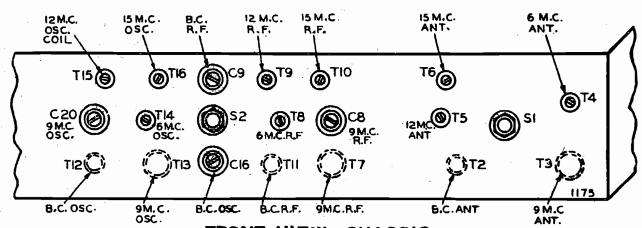
The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metalic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (2nd I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
04BR-1106A 04BR-1105A ONLY	455 Kc.	.1 MFD.	Grid of 6SK7 (1st I.F.)	Broadcast	Set Dial at 1600 Kc.	Three Trimmers on Top	Interstage I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

SPECIFICATIONS

Model No. 04BR-903A and 04BR-907A
Model No. 04BR-904A and 04BR-906A

Power Output - - - - 5 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - 10 in. Electro Dynamic



FRONT VIEW CHASSIS
TRIMMER VIEW

Model No. 04BR-904A and 04BR-906A
HOME RECORDING

This radio is designed so you can replace the present record changer unit with one that also includes a recording arm.

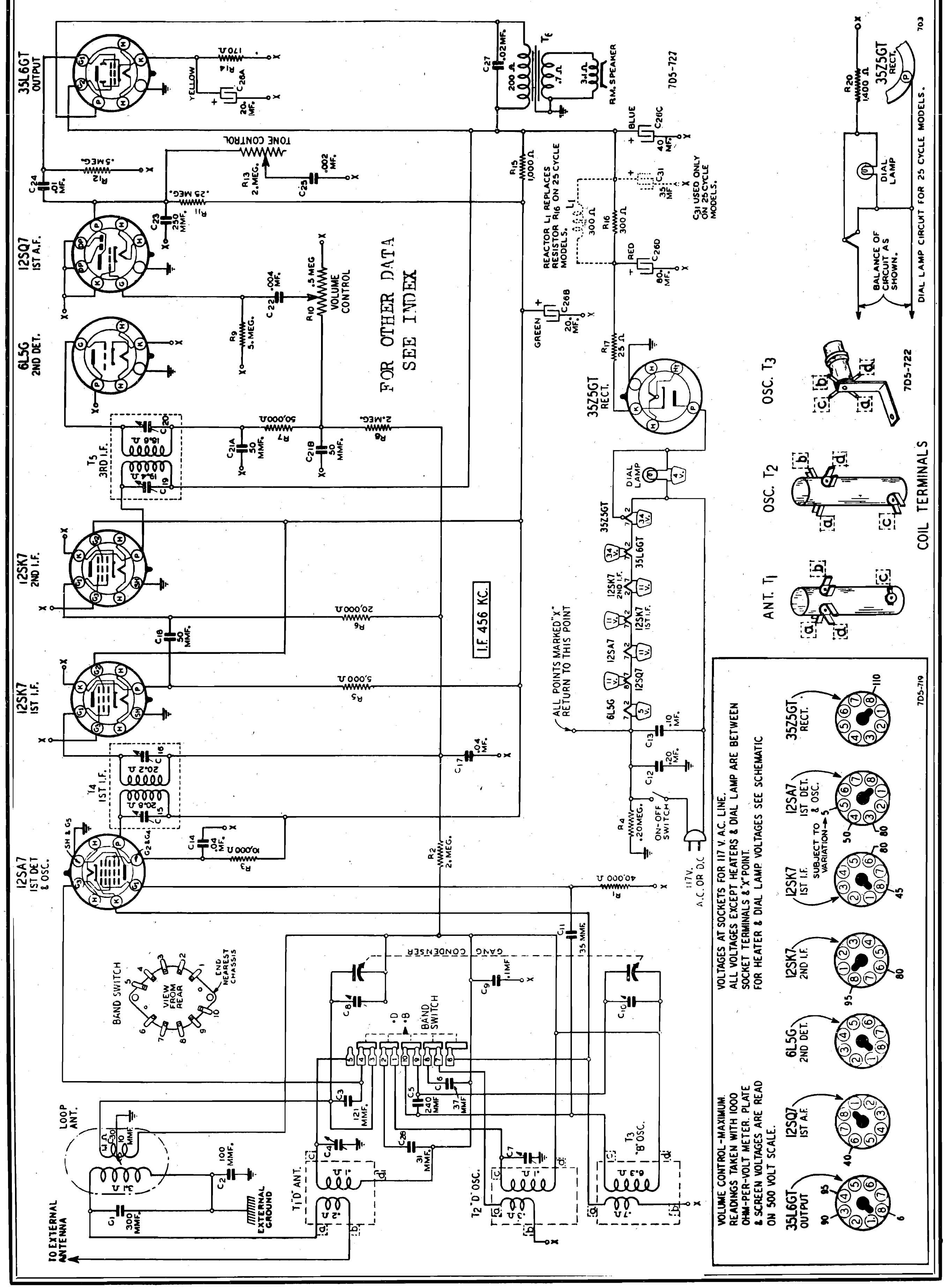
SPECIFICATIONS

Model No. 04BR-1105A
Model No. 04BR-1106A

Power Consumption - - - - - - 120 Watts
Power Output - - - - 10 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 27 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - 12 in. Electro Dynamic

MONTGOMERY WARD & CO.

MODEL 04WG-731

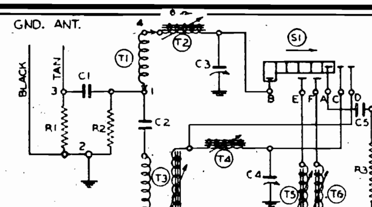


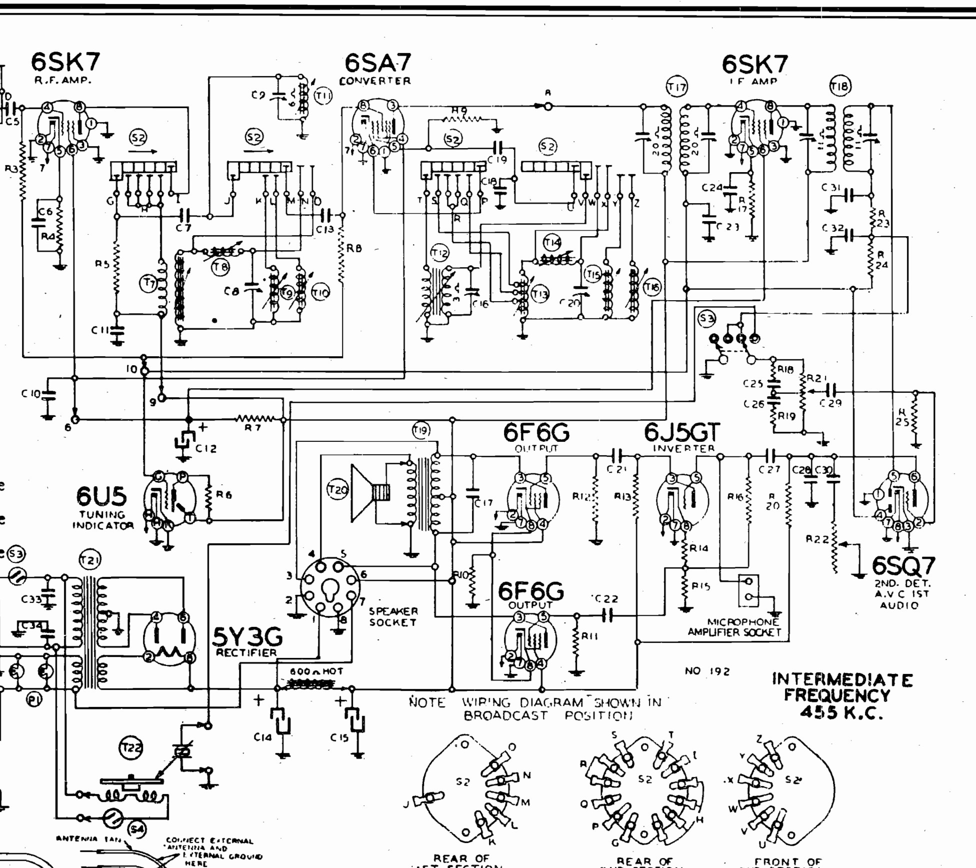
MODELS 04BR-904A, 04BR-906A

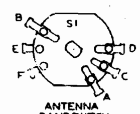
MONTGOMERY WARD & CO.

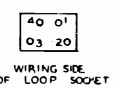
Diagram Ref. No.	Part No.	Description
RESISTORS		
R1	BE1301	25M ohm—⅓ w.
R2	BE1301	25M ohm—⅓ w.
R3	BE13019	1 megohm—⅓ w.
R4	BE130239	250 ohm—⅓ w.
R5	BE130218	5M ohm—⅓ w.
R6		1 megohm—in tuning indicator cable
R7	BE10662	12,500 ohm—3 watts
R8	BE13019	1 megohm—⅓ w.
R9	BE130232	25M ohm—⅓ w.
R10	BE130220	300 ohm—1 watt
R11	BE1303	500M ohm—⅓ w.
R12	BE1303	500M ohm—⅓ w.
R13	BE130103	100M ohm—⅓ w.
R14	BE130218	5M ohm—⅓ w.
R15	BE130103	100M ohm—⅓ w.
R16	BE13019	1 megohm—⅓ w.
R17	BE13070	500 ohm—⅓ w.
R18	BE13011	250M ohm—⅓ w.
R19	BE130149	15M ohm—⅓ w.
R20	BE13011	250M ohm—⅓ w.
R21	BE101221	½ megohm volume control
R22	BE101226	1 megohm tone control
R23	BE13012	50M ohm—⅓ w.
R24	BE1304	3 megohm—⅓ w.
R25	BE130257	5 megohm—⅓ w.
CONDENSERS		
C1	BE1292	.0005 mica
C2	BE10047	.002 x 600 v.—10%
C3	BE124143	B.C. Antenna Trimmer
C4	BE124143	9 mc. antenna trimmer
C5	BE1292	.0005 mica
C6	BE10020	.1 x 200 v. tubular
C7	BE129168	.00001 Mica
C8	BE124138	9 mc. R.F. Trimmer
C9	BE124139	B.C. R.F. Trimmer
C10	BE10074	.1 x 400 v.
C11	BE10074	.1 x 400 v.
C12	BE119109	10.0 x 350 w. v.
C13	BE1292	.0005 mica
C14	BE119109	15.0 x 450 w. v.
C15	BE119109	15.0 x 450 w. v.
C16	BE124144	B.C. Oscillator trimmer
C17	BE10071	.004 x 600 v.
C18	BE129167	.0002 silver mica
C19	BE129165	.00005 mica
C20	BE124145	9 mc. osc. trimmer
C21	BE10013	.05 x 400 v.
C22	BE1009	.05 x 200 v.
C23	BE10026	.02 x 400 v.
C24	BE10020	.1 x 200 v.
C25	BE129114	.0003 mica
C26	BE100122	.03 x 200 v.
C27	BE10026	.02 x 400 v.
C28	BE12921	.0002 mica
C29	BE10019	.006 x 600 v.
C30	BE10019	.006 x 600 v.
C31	BE129165	.00005 mica
C32	BE129165	.00005 mica
C33	BE10061	.02 x 600 v. bakelite
C34	BE10061	.02 x 600 v. bakelite
		C12, C14 and C15 in same unit
		C31 and C32 in same unit
PARTS		
T1	BE111198	Loop antenna assembly for Model 62904
	BE111199	Loop antenna assembly for Model 62906
T2	BE111195	B.C. Antenna Coil
T3	BE111190	9 mc. Antenna Coil
T4	BE111189	6 mc. Antenna Coil
T5	BE111191	12 mc. Antenna Coil
T6	BE111192	15 mc. Antenna Coil
T7	BE10959	9 mc. R.F. Coil
T8	BE10958	6 mc. R.F. Coil
T9	BE10960	12 mc. R.F. Coil
T10	BE10961	15 mc. R.F. Coil
T11	BE10962	B.C. R.F. Coil
T12	BE110161	B.C. Osc. Coil
T13	BE110157	9 mc. Osc. Coil
T14	BE110156	6 mc. Osc. Coil
T15	BE110158	12 mc. Osc. Coil
T16	BE110159	15 mc. Osc. Coil
T17	BE108177	Input I.F. Coil—455 kc.
T18	BE108176	Output I.F. Coil—455 kc.
T19	BE105111	Output Transformer
T20	BE114208	10 in. speaker—dynamic
T21	BE104202B	Power Transformer 50-60 cycle
	BE104203B	Power Transformer—25 cycle
T22	BE104221	Automatic Record Changer—complete 60 cycle
	BE104226	Automatic Record Changer—complete 25 cycle
	BE104227	Automatic Record Changer—complete 50 cycle
S1	BE125118	Antenna Bandswitch
S2	BE125117	R.F. & Osc. Bandswitch
S3	BE125116	On-off—radio phono switch
S4		Switch on record changer
P1	BE10794	(2) 6-9 volt pilot lights T44
P2	BE10794	Indicator light T44

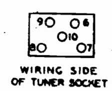
FOR OTHER DATA SEE INDEX



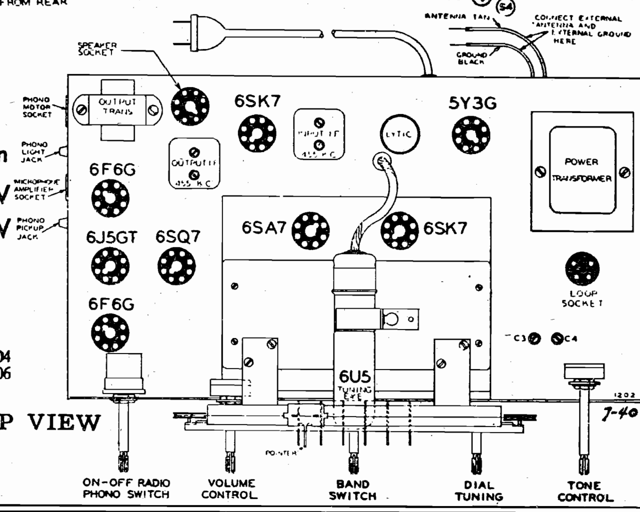




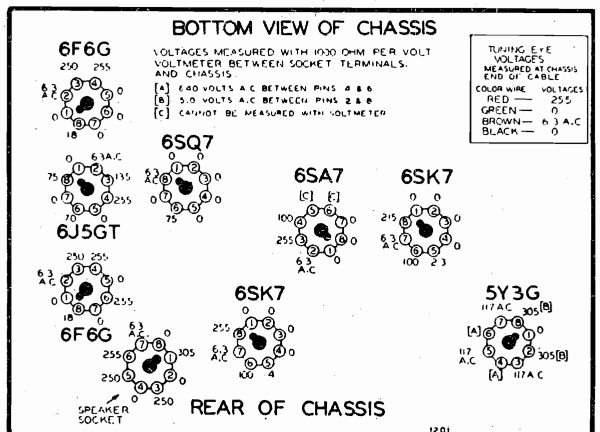




Power Consumption
Radio Only 100 W
Motor Only 20 W



TOP VIEW



MONTGOMERY WARD & CO.

MODEL 04BR-1105A
above ser.#532000

FOR OTHER DATA SEE INDEX

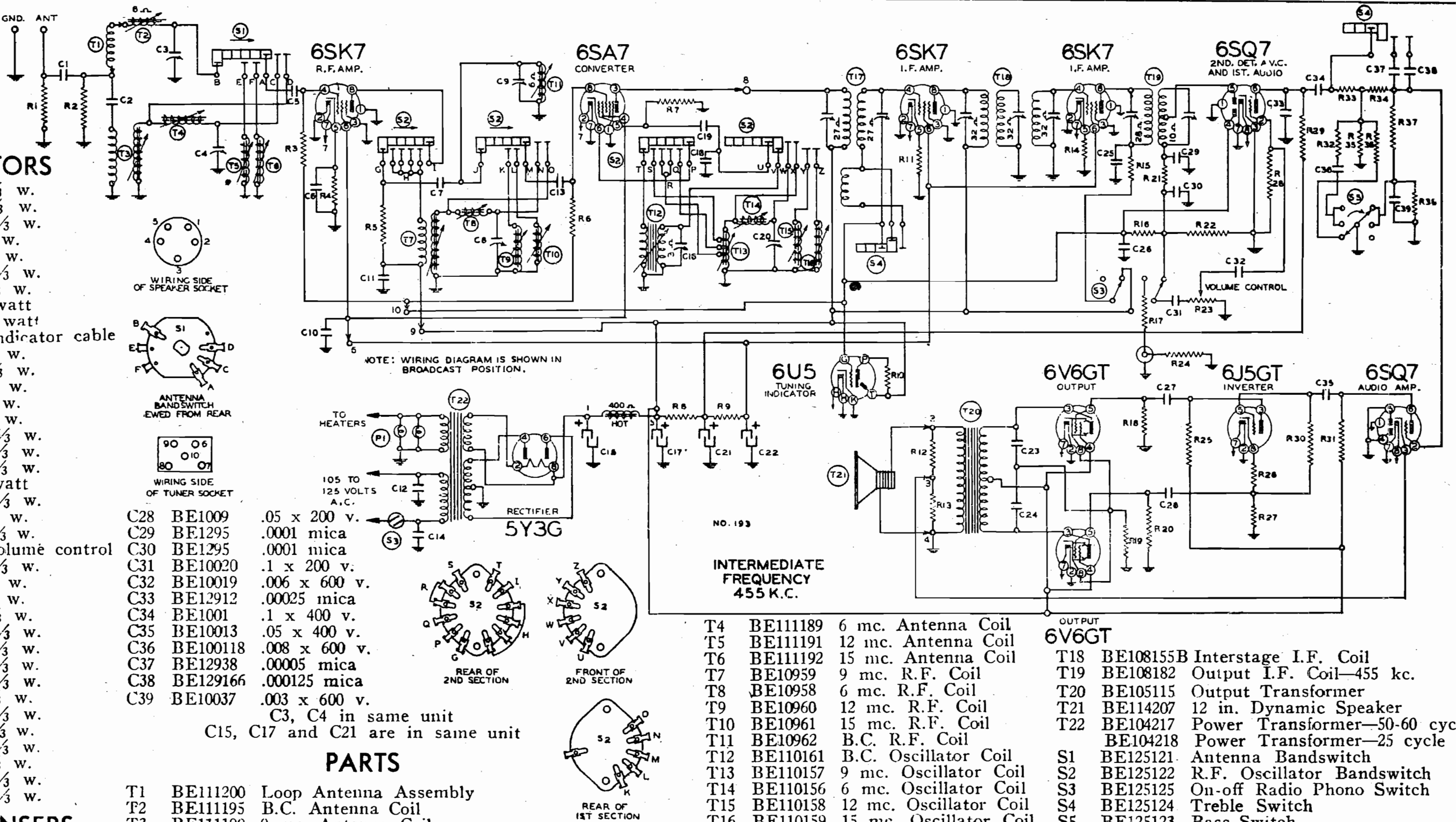
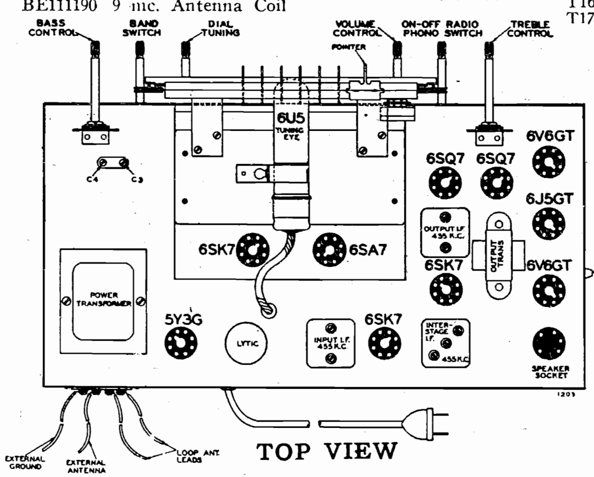


Diagram Ref. No.	Part No.	
RESISTORS		
R1	BE130232	25M ohm—1/3 w.
R2	BE130232	25M ohm—1/3 w.
R3	BE13019	1 megohm—1/3 w.
R4	BE130239	250 ohm—1/3 w.
R5	BE130218	5M ohm—1/3 w.
R6	BE13019	1 megohm—1/3 w.
R7	BE130232	25M ohm—1/3 w.
R8	BE130318	6M ohm—2 watt
R9	BE130319	10M ohm—2 watt
R10		1 megohm in tuning indicator cable
R11	BE13013	1100 ohm—1/3 w.
R12	BE13082	10M ohm—1/3 w.
R13	BE130235	1500 ohm—1/3 w.
R14	BE130192	2M ohm—1/3 w.
R15	BE130192	2M ohm—1/3 w.
R16	BE13019	1 megohm—1/3 w.
R17	BE1303	500M ohm—1/3 w.
R18	BE1303	500M ohm—1/3 w.
R19	BE130317	250 ohm—2 watt
R20	BE1303	500M ohm—1/3 w.
R21	BE13094	50M ohm—1/3 w.
R22	BE130316	120M ohm—1/3 w.
R23	BE101229	500M ohm volume control
R24	BE1303	500M ohm—1/3 w.
R25	BE13094	50M ohm—1/3 w.
R26	BE130218	5M ohm—1/3 w.
R27	BE13094	50M ohm—1/3 w.
R28	BE130257	5 megohm—1/3 w.
R29	BE130172	250M ohm—1/3 w.
R30	BE1303	500M ohm—1/3 w.
R31	BE130172	250M ohm—1/3 w.
R32	BE130232	25M ohm—1/3 w.
R33	BE13080	150M ohm—1/3 w.
R34	BE130309	350M ohm—1/3 w.
R35	BE130172	250M ohm—1/3 w.
R36	BE13066	75M ohm—1/3 w.
R37	BE13080	150M ohm—1/3 w.
R38	BE130146	2 megohm—1/3 w.
CONDENSERS		
C1	BE1292	.0005 mica
C2	BE10047	.002 x 600 v.
C3	BE124143	B.C. Antenna Trimmer
C4	BE124143	9 mc. Antenna Trimmer
C5	BE1292	.0005 mica
C6	BE10020	.1 x 200 v. tubular
C7	BE129168	.00001 mica
C8	BE124138	9 mc. R.F. Trimmer
C9	BE124139	B.C. R.F. Trimmer
C10	BE10074	.1 x 400 v.
C11	BE10074	.1 x 400 v.
C12	BE10061	.02 x 600 v.
C13	BE1292	.0005 mica
C14	BE10061	.02 x 600 v.
C15	BE119112	30.0 mfd. lytic
C16	BE124144	B.C. Oscillator Trimmer
C17	BE119112	30.0 mfd. lytic x 450 w.v.
C18	BE129167	.0002 silver mica
C19	BE129165	.00005 mica
C20	BE124145	9 mc. oscillator trimmer
C21	BE119112	10.0 mfd. lytic
C22	BE11969	16 mfd. x 350 w.v.
C23	BE10065	.015 x 600 v.
C24	BE10065	.015 x 600 v.
C25	BE1001	.1 x 400 v.
C26	BE10020	.1 x 200 v.
C27	BE10013	.05 x 400 v.
C28	BE1009	.05 x 200 v.
C29	BE1295	.0001 mica
C30	BE1295	.0001 mica
C31	BE10020	.1 x 200 v.
C32	BE10019	.006 x 600 v.
C33	BE12912	.00025 mica
C34	BE1001	.1 x 400 v.
C35	BE10013	.05 x 400 v.
C36	BE100118	.008 x 600 v.
C37	BE12938	.00005 mica
C38	BE129166	.000125 mica
C39	BE10037	.003 x 600 v.

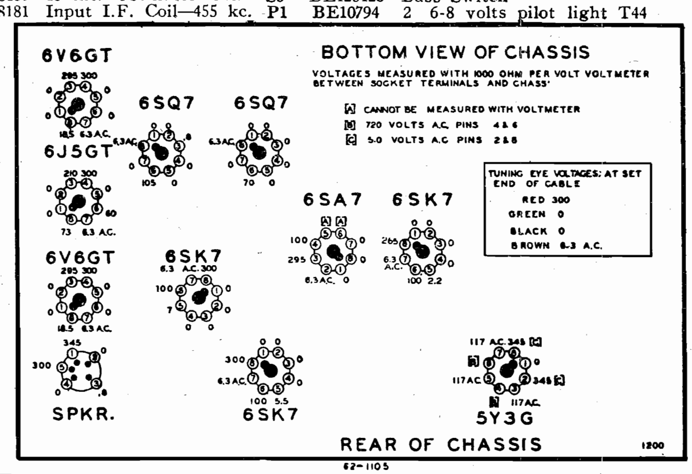
C3, C4 in same unit
C15, C17 and C21 are in same unit

PARTS

T1	BE111200	Loop Antenna Assembly
T2	BE111195	B.C. Antenna Coil
T3	BE111190	9 mc. Antenna Coil
T4	BE111189	6 mc. Antenna Coil
T5	BE111191	12 mc. Antenna Coil
T6	BE111192	15 mc. Antenna Coil
T7	BE10959	9 mc. R.F. Coil
T8	BE10958	6 mc. R.F. Coil
T9	BE10960	12 mc. R.F. Coil
T10	BE10961	15 mc. R.F. Coil
T11	BE10962	B.C. R.F. Coil
T12	BE110161	B.C. Oscillator Coil
T13	BE110157	9 mc. Oscillator Coil
T14	BE110156	6 mc. Oscillator Coil
T15	BE110158	12 mc. Oscillator Coil
T16	BE110159	15 mc. Oscillator Coil
T17	BE108181	Input I.F. Coil—455 kc.
T18	BE108155B	Interstage I.F. Coil
T19	BE108182	Output I.F. Coil—455 kc.
T20	BE105115	Output Transformer
T21	BE114207	12 in. Dynamic Speaker
T22	BE104217	Power Transformer—50-60 cycles
	BE104218	Power Transformer—25 cycle
S1	BE125121	Antenna Bandswitch
S2	BE125122	R.F. Oscillator Bandswitch
S3	BE125125	On-off Radio Phono Switch
S4	BE125124	Treble Switch
S5	BE125123	Bass Switch
P1	BE10794	2 6-8 volts pilot light T44



TOP VIEW



REAR OF CHASSIS

7-40

MODEL 04BR-1106A above ser.#535050

MONTGOMERY WARD & CO.

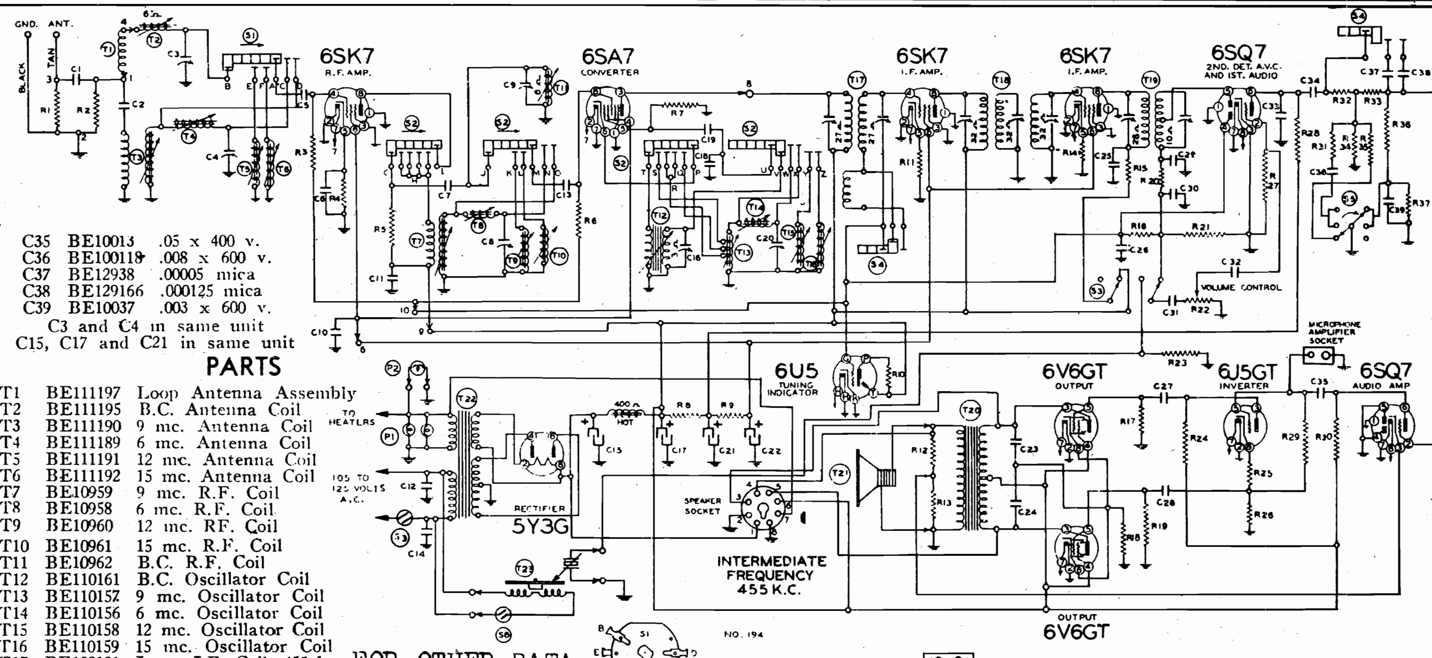


Diagram Ref. No.	Part No.	RESISTORS
R1	BE130232	25M ohm—1/3 w.
R2	BE130232	25M ohm—1/3 w.
R3	BE13019	1 megohm—1/3 w.
R4	BE130239	250 ohm—1/3 w.
R5	BE130218	5M ohm—1/3 w.
R6	BE13019	1 megohm—1/3 w.
R7	BE130232	25M ohm—1/3 w.
R8	BE130318	6M ohm—2 watt
R9	BE130319	10M ohm—2 watt
R10		1 megohm in tuning indicator cable
R11	BE13013	1100 ohm—1/3 w.
R12	BE13082	10M ohm—1/3 w.
R13	BE130235	1500 ohm—1/3 w.
R14	BE130192	2M ohm—1/3 w.
R15	BE130192	2M ohm—1/3 w.
R16	BE13019	1 megohm—1/3 w.
R17	BE1303	500M ohm—1/3 w.
R18	BE130317	250 ohm—2 watt
R19	BE1303	500M ohm—1/3 w.
R20	BE13094	50M ohm—1/3 w.
R21	BE130316	120M ohm—1/4 w.
R22	BE101229	500M ohm
R23	BE1303	500M ohm—1/3 w.
R24	BE13094	50M ohm—1/3 w.
R25	BE130218	5M ohm—1/3 w.
R26	BE13094	50M ohm—1/3 w.
R27	BE130257	5 megohm—1/3 w.
R28	BE130172	250M ohm—1/3 w.
R29	BE1303	500M ohm—1/3 w.
R30	BE130172	250M ohm—1/3 w.
R31	BE130232	25M ohm—1/3 w.
R32	BE13080	150M ohm—1/3 w.
R33	BE130309	350M ohm—1/3 w.
R34	BE130172	250M ohm—1/3 w.
R35	BE13066	75M ohm—1/3 w.
R36	BE13080	150M ohm—1/3 w.
R37	BE130146	2 megohm—1/3 w.

CONDENSERS

C1	BE1292	.0005 mica
C2	BE10047	.002 x 600 v.
C3	BE124143	B.C. Antenna Trimmer
C4	BE124143	9 mc. Antenna Trimmer
C5	BE1292	.0005 mica
C6	BE10020	.1 x 200 v. tubular
C7	BE129168	.00001 mica
C8	BE124138	9 mc. R.F. Trimmer
C9	BE124139	B.C. R.F. Trimmer
C10	BE10074	.1 x 400 v.
C11	BE10074	.1 x 400 v.
C12	BE10061	.02 x 600 v.
C13	BE1292	.0005 mica
C14	BE10061	.02 x 600 v.
C15	BE119112	30.0 mfd. lytic
C16	BE124144	B.C. Oscillator Trimmer
C17	BE119112	30.0 mfd. lytic x 450 w. v.
C18	BE129167	.0002 silver mica
C19	BE129165	.00005 mica
C20	BE124145	9 mc. oscillator trimmer
C21	BE119112	10.0 mfd. lytic
C22	BE11969	16 mfd. x 350 w. v.
C23	BE10065	.015 x 600 v.
C24	BE10065	.015 x 600 v.
C25	BE1001	.1 x 400 v.
C26	BE10020	.1 x 200 v.
C27	BE10013	.05 x 400 v.
C28	BE1009	.05 x 200 v.
C29	BE1295	.0001 mica
C30	BE1295	.0001 mica
C31	BE10020	.1 x 200 v.
C32	BE10019	.006 x 600 v.
C33	BE12912	.00025 mica
C34	BE1001	.1 x 400 v.
C35	BE10013	.05 x 400 v.
C36	BE100118	.008 x 600 v.
C37	BE12938	.00005 mica
C38	BE129166	.000125 mica
C39	BE10037	.003 x 600 v.

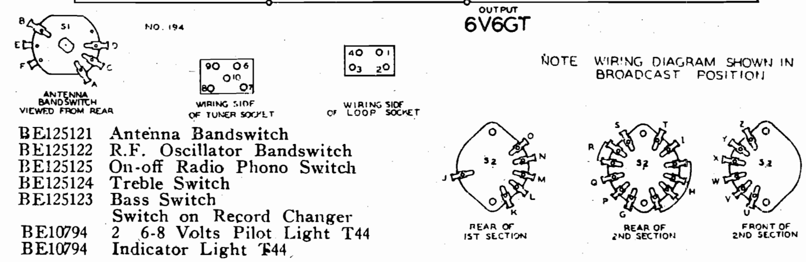
C3 and C4 in same unit
C15, C17 and C21 in same unit

PARTS

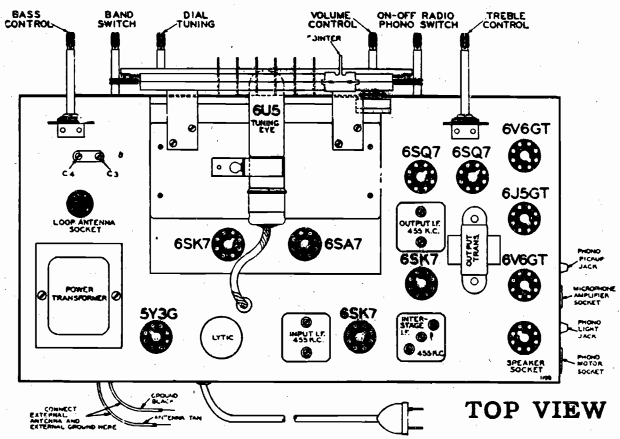
T1	BE111197	Loop Antenna Assembly
T2	BE111195	B.C. Antenna Coil
T3	BE111190	9 mc. Antenna Coil
T4	BE111189	6 mc. Antenna Coil
T5	BE111191	12 mc. Antenna Coil
T6	BE111192	15 mc. Antenna Coil
T7	BE10959	9 mc. R.F. Coil
T8	BE10958	6 mc. R.F. Coil
T9	BE10960	12 mc. RF. Coil
T10	BE10961	15 mc. R.F. Coil
T11	BE10962	B.C. R.F. Coil
T12	BE110161	B.C. Oscillator Coil
T13	BE110157	9 mc. Oscillator Coil
T14	BE110156	6 mc. Oscillator Coil
T15	BE110158	12 mc. Oscillator Coil
T16	BE110159	15 mc. Oscillator Coil
T17	BE108181	Input I.F. Coil—455 kc.
T18	BE108155B	Interstage I.F. Coil
T19	BE108182	Output I.F. Coil—455 kc.
T20	BE105115	Output Transformer
T21	BE114209	12 in. Dynamic Speaker
T22	BE104217	Power Transformer—50/60 Cycles
	BE104218	Power Transformer—25 Cycle
T23	BE104227	Automatic Record Changer, Roberts 50 Cycle Complete with Turntable
	BE104226	Automatic Record Changer, Roberts 25 Cycle, Complete with Turntable
	BE104221	Automatic Record Changer, Roberts 60 Cycle, Complete with Turntable
S1	BE125121	Antenna Bandswitch
S2	BE125122	R.F. Oscillator Bandswitch
S3	BE125125	On-off Radio Phono Switch
S4	BE125124	Treble Switch
S5	BE125123	Bass Switch
S6		Switch on Record Changer
P1	BE10794	2 6-8 Volts Pilot Light T44
P2	BE10794	Indicator Light T44

FOR OTHER DATA
SEE INDEX

NO. 194

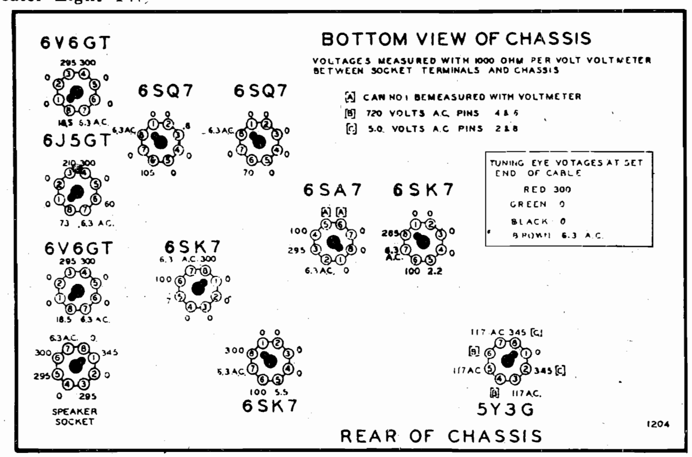


NOTE WIRING DIAGRAM SHOWN IN BROADCAST POSITION



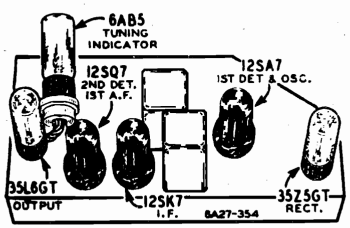
TOP VIEW

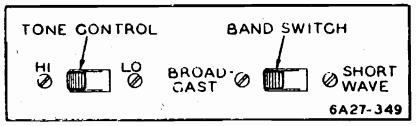
6-40



MONTGOMERY WARD & CO.

MODEL 93WG-604, 93WG-605



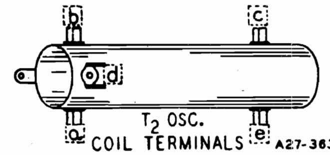


BACK PANEL OF CHASSIS

Power Consumption - 28 Watts (At 117 volts AC Supply)

Power Output - - - - - - .8 Watt Undistorted; 1.25 Watts Maximum

Selectivity - - 50 KC Broad at 1000 times Signal



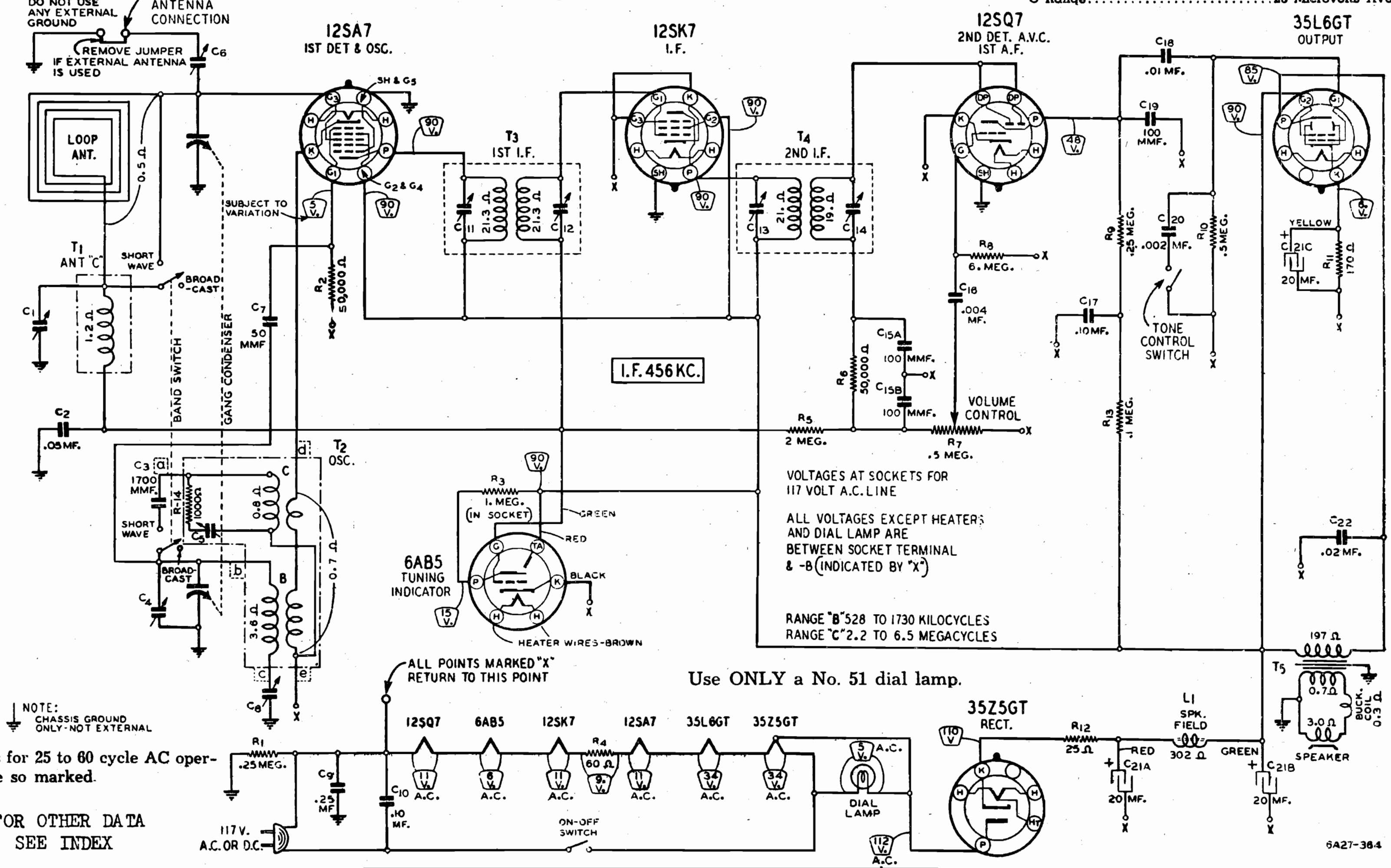
T_2 OSC. COIL TERMINALS

MODEL 93WG-604
" 93WG-605

TO REDUCE MODULATION HUM:
Insulate dial-lamp clip from mounting bracket.
Return condenser C2 to B- (point X on schematic) instead of to chassis ground.
Dress lead from condenser C16 to volume control as far as possible from heater leads.

Tuning Frequency Range
B Range........... 528 to 1730 KC
C Range.... ......2200 to 6500 KC

Sensitivity (For .05 watt output)
B Range.........................35 Microvolts Average
C Range.........................25 Microvolts Average



Use ONLY a No. 51 dial lamp.

Radios for 25 to 60 cycle AC operation are so marked.

FOR OTHER DATA SEE INDEX

MODEL 93WG-604, 93WG-605 MONTGOMERY WARD & CO.

Setting a Station Button

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

At the right side of the cabinet (from the front) will be seen a cap which covers a hole in the cabinet—See illustration. Pry off this cap, being careful not to scratch the cabinet. Removal of the cap will expose a large locking screw. Using a screwdriver, loosen the mechanism by turning this screw in a counter-clockwise direction. The screw will turn easily until the dial stops rotating. Then exert a slight amount of additional pressure and continue to turn the screw about one and one-half complete turns.

With one hand, hold the manual tuning control to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration *all the way down.* It will go down easily at first and then a firm gentle pressure must be applied to push it down the rest of the way. It is better to start with the left hand button.

Hold *this* button all the way down. With the other hand, see whether or not this station is still accurately tuned in by moving the tuning control a slight amount back and forth while observing the tuning eye. *Be sure to hold the button all the way down.*

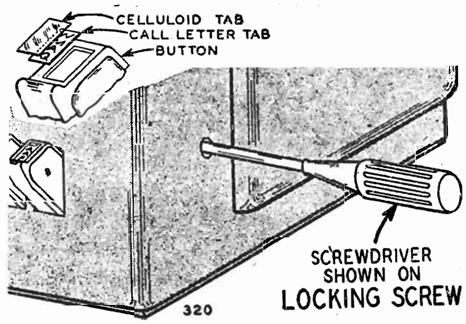
Release the button after the station is tuned in.

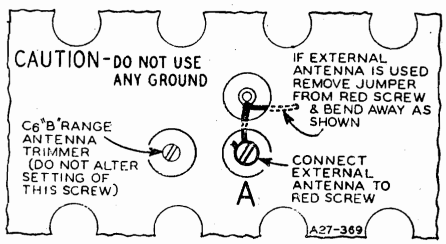
Carefully tune in the second station on your list. Then hold the tuning control and push the second button slowly and firmly all the way down. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Do this by turning the locking screw in a clockwise direction until it is tight. It will turn easily until the dial stops rotating—then additional pressure must be exerted. Tighten firmly but not excessively. Replace the cap over the hole.

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.





ALIGNMENT PROCEDURE

Remove Jumper on Loop Antenna for All Adjustments.

Volume Control—Maximum All Adjustments.

Connect Ground Post of Signal Generator to B—(12SK7—Prong No. 3) in Chassis.

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 Antenna—.1 mf.

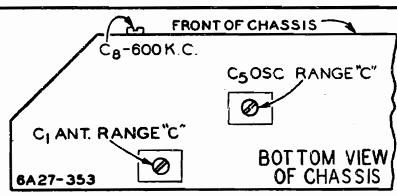
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustrations)
I. F.					
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	.1 mf.	B Range	Turn Rotor to full open	1st I.F. (C11) & (C12) 2nd I.F. (C13) & (C14)
RANGE B					
1730 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to full open	Oscillator Range B (C4)
1500 KC	Red Antenna Screw at Back of Loop	.1 mf.	B Range	Turn Rotor to max. output	Antenna Range B (C6)—See Illustration Page 1
600 KC	Same as Above	.1 mf.	B Range	Turn Rotor to max. output	600 KC (C8) Rock Rotor—See Note A
RANGE C					
6500 KC	Same as Above	.1 mf.	C Range	Turn Rotor to full open	Oscillator Range C (C5)
6000 KC	Same as Above	.1 mf.	C Range	Turn Rotor to max. output	Ant. Range C (C1) Rock Rotor—See Note A

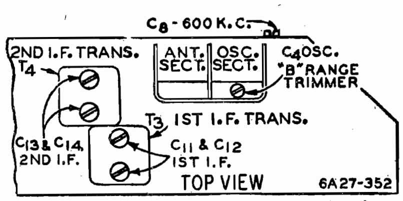
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

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

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

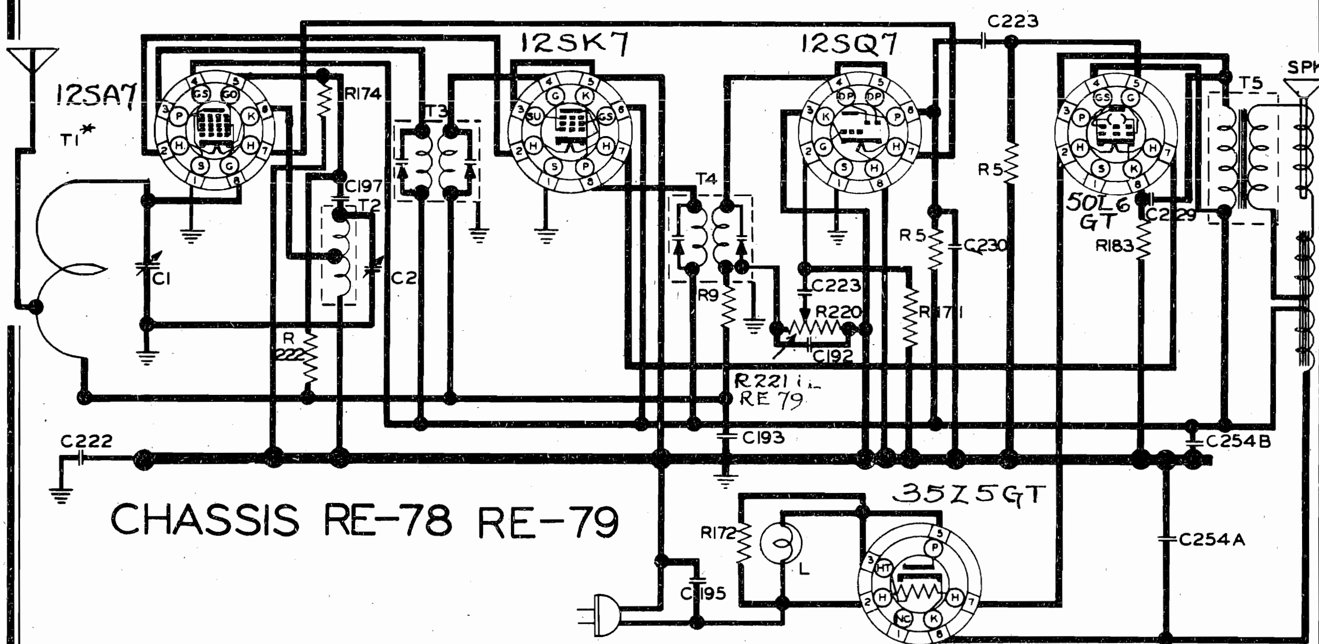
CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.





NOBLITT-SPARKS INDUSTRIES, INC.

MODELS 622, 622A, Ch. RE-78
632, Ch. RE-79
Chassis RE-91



CHASSIS RE-78 RE-79

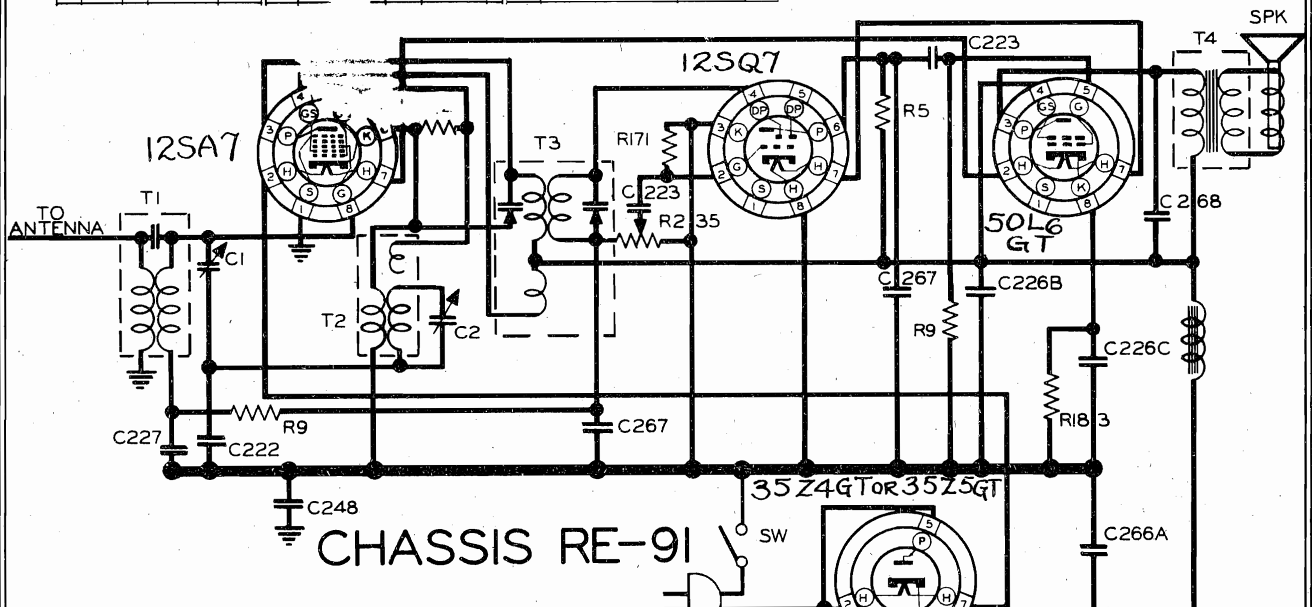
RESISTORS			
R	OHM	W	PART NO
220	1 M	V.C.	17-16876
5	500K	1/4	17-2070
183	150	1/4	17-14316
174	20 K	1/4	17-14291
172	100	1/4	17-14289
222	10 M	1/4	17-14377
9	1 M	1/4	17-2080
	In Chassis RE-79		
221	1 M	V.C.	17-16899

CONDENSERS			
C	CAPACITY	VOLT	PART NO
1	TWO GANG		17-16841
2	VARIABLE		
254A	20 MFD.	150	17-14376
254B	10 MFD.	150	
192	.00025	600	17-14273
195	.05	400	17-14276
222	.2	400	17-14317
229	.02	400	17-14327
223	.002	400	17-14318
193	.05	200	17-14274
197	.0001	600	17-14278
230	.000[illegible]	400	17-14328

TRANSFORMERS		
T	TYPE	PART NO
1	ANTENNA LOOP	00-16882
2	OSCILLATOR COIL	00-16891
3	FIRST I.F. COIL	00-16885
4	SECOND I.F. COIL	00-16886
5	OUTPUT TRANSF.	00-16883
*In	Chassis RE79	*
1	ANT. LOOP	00-16900

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO
L	DIAL LIGHT BULB MAZDA #47	17-16378
P	LINE CORD & PLUG ASSY	17-16874
SPK	SPEAKER ASSY.	17-16867

I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA



CHASSIS RE-91

CONDENSERS			
C	CAPACITY	VOLT	PART NO.
222	.2	400	17-14317
227	.05	200	17-14323
248	.05	400	17-14366
223	.002	400	17-14318
268	.03	400	17-14392
1	TWO GANG		17-17115
2	VARIABLE		
266A	20 MFD.	150	17-14390
266B	10 MFD.	150	
266C	20 MFD.	25	
267	.0005	400	17-14391
	.0005	400	

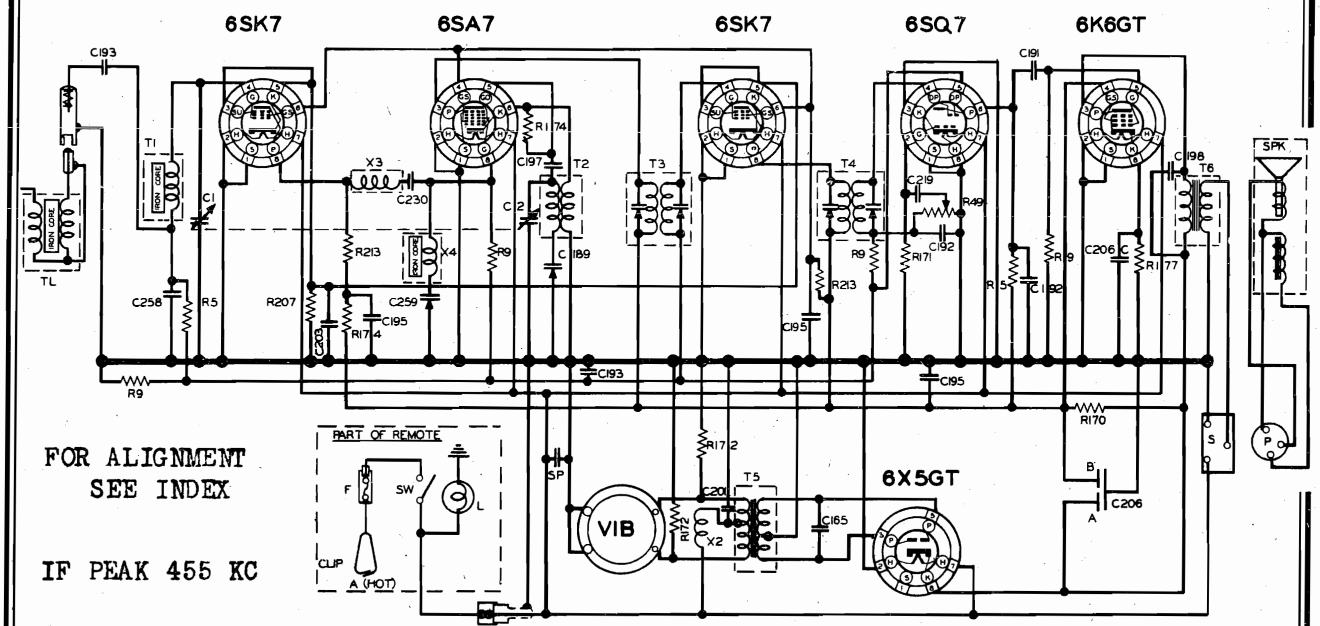
MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
T1	ANTENNA COIL	00-17130
T2	OSCILLATOR COIL	00-17119
T3	I.F. COIL	00-17120
T4	OUTPUT TRANSFORMER	00-17131
SPK.	SPEAKER	17-17132

FREQUENCY RANGE
1750 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA

RESISTORS			
R	OHM	W	PART NO.
174	20 K.	1/4	17-14291
9	1 M.	1/4	17-2080
171	15 M.	1/4	17-14288
5	500K.	1/4	17-2070
183	150	1/4	17-14316
235	2 M.	V.C.	17-17117

MODEL 720 Ch.RE-86

NOBLITT-SPARKS INDUSTRIES, INC.



FOR ALIGNMENT SEE INDEX

IF PEAK 455 KC

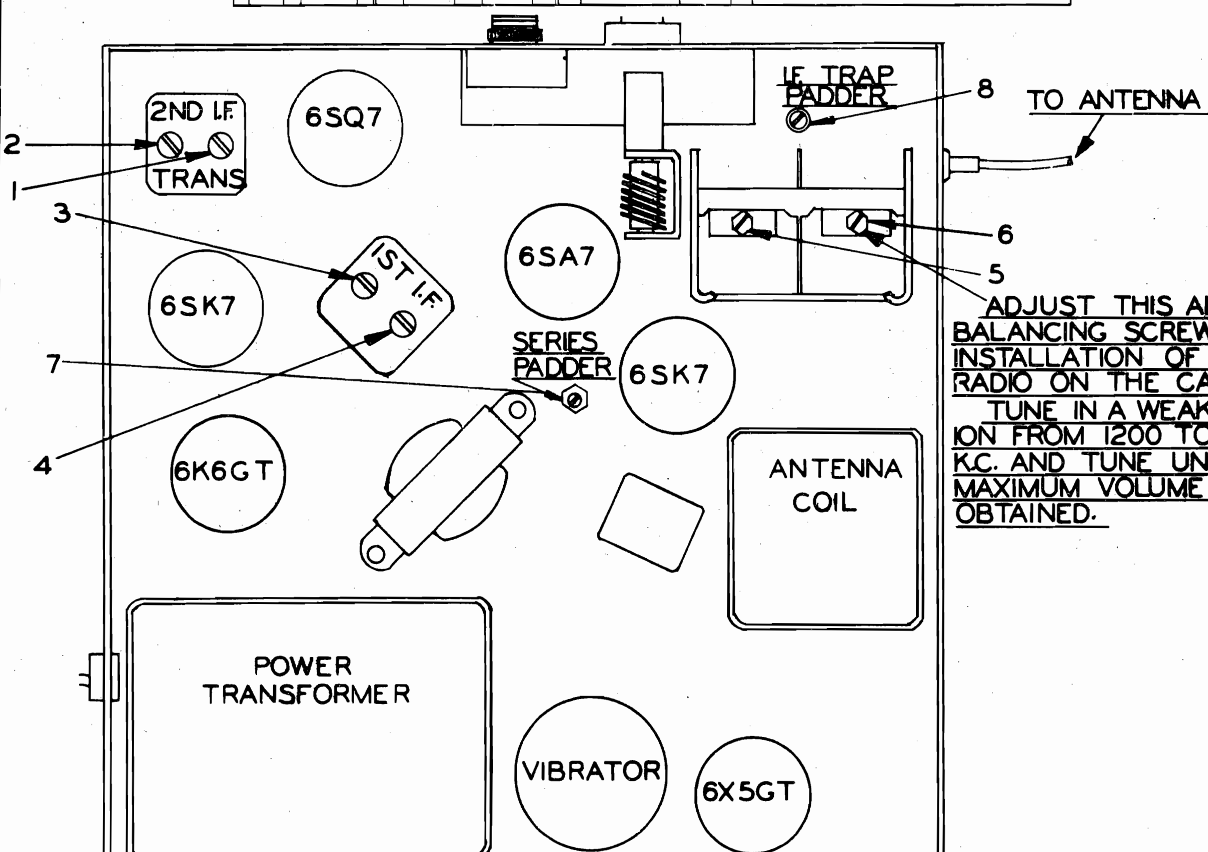
RESISTORS				
R	OHMS	W	PART NO	
5	500K	1/4	17-2070	
9	1 M	1/4	17-2080	
49	500K	V C	17-14558	
170	800	1	17-14287	
171	15 M	1/4	17-14288	
172	100	1/4	17-14289	
174	20K	1/4	17-14291	
177	650	1/4	17-14298	
213	10K	1/4	17-14389	
207	300	1/4	17-14381	

CONDENSERS				
C	CAPACITY	VOLT	PART NO	
1	TWO-GANG		17-16254	
2	VARIABLE			
185	.005	1200	17-14230	
189	400-600MMFD	PAD	17-14266	
191	.01	400	17-14272	
192	.00025	600	17-14273	
193	.05	200	17-14274	
195	.05	400	17-14276	
219	.003	200	17-14312	
203	.2	200	17-16242	
206A	10 MFD.	300	17-14297	
206B	10 MFD.	300		
206C	20 MFD.	15		
230	.0005	400	17-14328	
258	.004	600	17-14381	
201	.5	150	17-14285	
259	4-40 MMFD.	PAD	17-14383	
197	.0001	600	17-14278	
198	.005	400	17-14279	

CHOKES & TRANSFORMERS			
T-X	TYPE	PART NO	
1	ANTENNA COIL	00-16219	
2	OSCILLATOR	00-17000	
3	FIRST I.F. COIL	00-17007	
4	SECOND I.F. COIL	00-17008	
5	POWER TRANSFORMER	00-18265	
6	OUTPUT TRANSFORMER	00-18288	
X	CHOKES		
2	SUPPRESSION CHOKE	29-13459	
3	TRAP CHOKE	00-16982	
4	TRAP CHOKE	00-16982	

MISCELLANEOUS UNITS			
SYMBOL	DESCRIPTION	PART NO	
F	FUSE - 20 AMPS	17-2228	
L	DIAL LIGHT BULB - MAZDA NO. 51	17-13904	
P	SPEAKER PLUG	17-4780	
S	SPEAKER SOCKET	17-15831	
SPK	SPEAKER ASSEMBLY	17-18517	
SW	POWER SWITCH	——	
TL	TRANSMISSION LINE	00-16989	
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

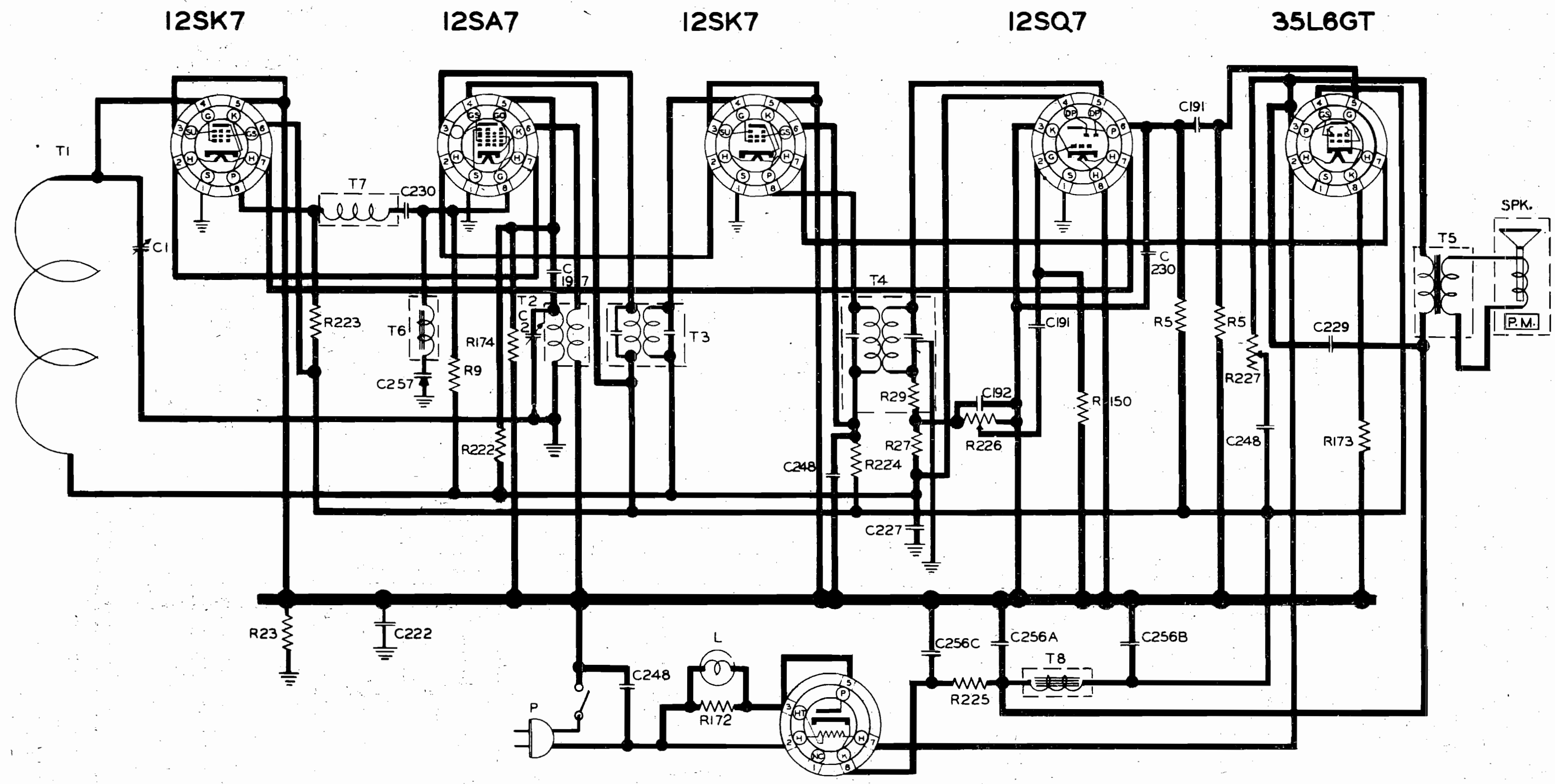


ADJUST THIS ANTENNA BALANCING SCREW AFTER INSTALLATION OF THE RADIO ON THE CAR.
TUNE IN A WEAK STATION FROM 1200 TO 1400 K.C. AND TUNE UNTIL MAXIMUM VOLUME IS OBTAINED.

NOBLITT-SPARKS INDUSTRIES, INC.

MODELS 722, 722A, 732
Ch. RE-80

ARVIN HOME RADIO CHASSIS RE-80



RESISTORS			
R	OHM	W	PART NO
223	4000	1/4	17-16967
23	250 K	1/4	17-3011
9	1 M	1/4	17-2080
222	10 M	1/4	17-16966
174	20 K	1 4	17-14291
172	100	1/4	17-14289
225	15	1/4	17-16969
224	15 K	1/4	17-16968
27	2 M	1/4	17-4788
29	50 K	1/4	17-2080
150	5 M	1/4	17-14242
5	500 K	1/4	17-2070
173	200	1/4	17 14290
226	250 K	V.C.	17-16950
227	100 K	T.C.	17-16951

CONDENSERS			
C	CAPACITY	VOLT	PART NO.
230	.0005	400	17-14328
222	.2	400	17-14317
197	.0001	600	17-14278
248	.05	400	17-14366
227	.05	200	17-14323
192	.00025	600	17-14273
256 A	40 MFD.	150	17-16918
256 B	20 MFD.	50	
256 C	10 MFD.	150	
191	.01	400	17-4272
1	TWO GANG		17-16949
2	VARIABLE		
257	4-40 MMFD.	PAD.	17-14378
229	.02	400	17-14327

TRANSFORMERS		
T	DESCRIPTION	PART NO.
1	ANTENNA LOOP	17-16974
2	OSCILLATOR COIL	00-16912
3	FIRST I.F. COIL	00-16913
4	SECOND I.F. COIL	00-17005
5	OUTPUT TRANSFORMER	00-16915
6	TRAP CHOKE	00-16926
7	SERIES CHOKE	00 16927
8	IRON CORE "B" CHOKE	00-16954

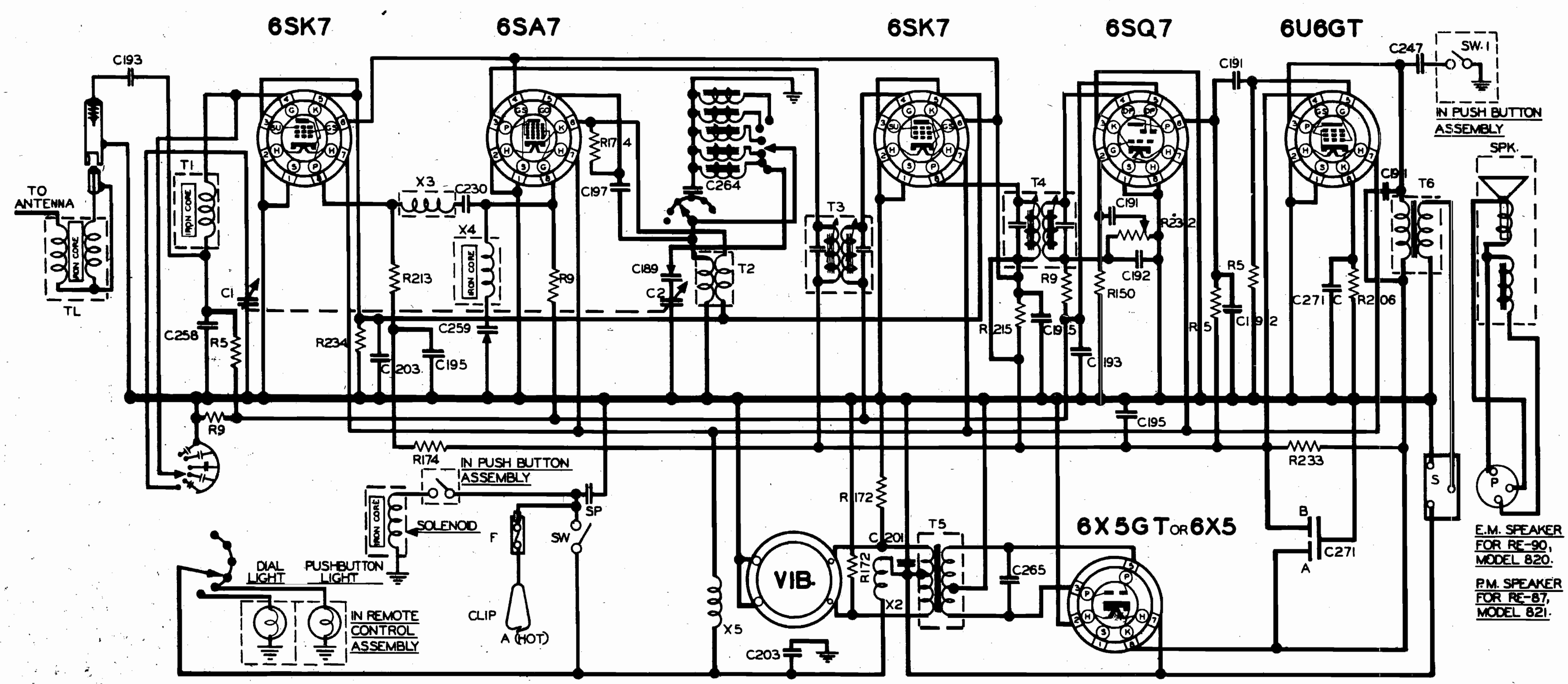
MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
L	PILOT LIGHT MAZDA 47	17-16378
SPK	SPEAKER 6 P M	17-16892
R 226	VOLUME CONTROL & SW	17-16950
R 227	TONE CONTROL	17-16951
P	LINE CORD & PLUG ASSY	17-16844

IF PEAK 455 K.C.
BALANCE 1400 KC.-CHECK AT 600 KC.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA

MODEL 820 Ch.RE-90
MODEL 821 Ch.RE-87

NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN CAR RADIO — CHASSIS RE-90 & RE-87



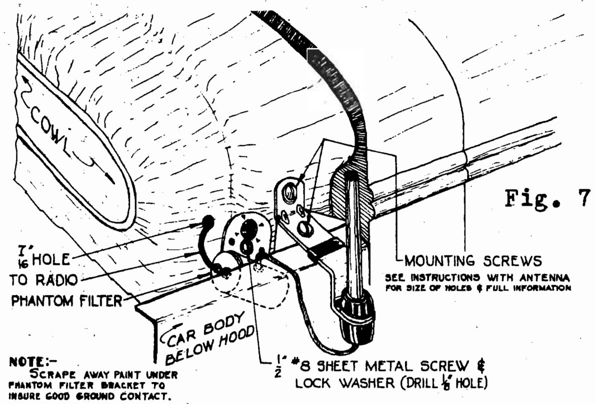


Fig. 7

TRI-MOUNT ANTENNA NO. A30—"ALLIGATOR" MOUNTING ILLUSTRATED
MAY BE ALSO MOUNTED WITH SINGLE "UNDERHOOD" BRACKET OR "HINGE-PIN" BRACKET

RESISTORS

R	OHMS	W	PART NO.
5	500 K.	1/4	17-2070
9	1M.	1/4	17-2080
232	250 K.	V.C.	17-17056
150	5 M	1/4	17-14242
215	5000	1/4	17-14371
172	100	1/4	17-14289
174	20 K.	1/4	17-14291
208	300	1/4	17-14360
213	10 K.	1/4	17-14369
234	180	1/4	17-14389
233	3000	1	17-14388

CONDENSERS

C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		17-16254
2	VARIABLE		
265	.01	1600	17-14387
189	400-600MMFD.	PAD.	17-14266A
191	.01	400	17-14272
192	.00025	600	17-14273
193	.05	200	17-14274
195	.05	400	17-14276
258	.004	600	17-14381
203	.2	200	17-16242
271 A	20 MFD.	300	17-14396
271 B	10 MFD.	300	
271 C	20 MFD.	25	
201	.5	150	17-14285
259	440 MMFD.	PAD.	17-14383
197	.0001	600	17-14278
247	.04	400	17-14363
230	.0005	400	17-14328
264	.00035	PAD.	17-14386

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.
1	ANTENNA COIL	00-17072
2	OSCILLATOR COIL	00-17133
3	FIRST I.F. COIL	00-17074
4	SECOND I.F. COIL	00-17075
5	POWER TRANSF.	00-17073
6	OUTPUT TRANSF.	00-17076
X	CHOKES	
2	SUPPRESSION CHOKE	29-18308
3	TRAP CHOKE	00-18982
4	TRAP CHOKE	00-18982
5	HASH CHOKE	29-17111

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO
F	FUSE - 20 AMPS	17-2225
L	DIAL LIGHT BULB - MAZDA # 51	17-13904
P	SPEAKER PLUG	17-4780
S	SPEAKER SOCKET	17-15831
SPK.	SPEAKER ASSEMBLY RE-90 MODEL 820	17-17114
SW.	POWER SWITCH	——
TL.	TRANSMISSION LINE	00-16989
SP.	SPARK PLATE	——
VIB.	VIBRATOR	17-14747
SW. 1	TONE CONTROL SWITCH	——
SPK.	SPEAKER ASSEMBLY RE-87 MODEL 821	17-17168

I.F. PEAK 455 K.C.
FREQUENCY RANGE 1575 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA.

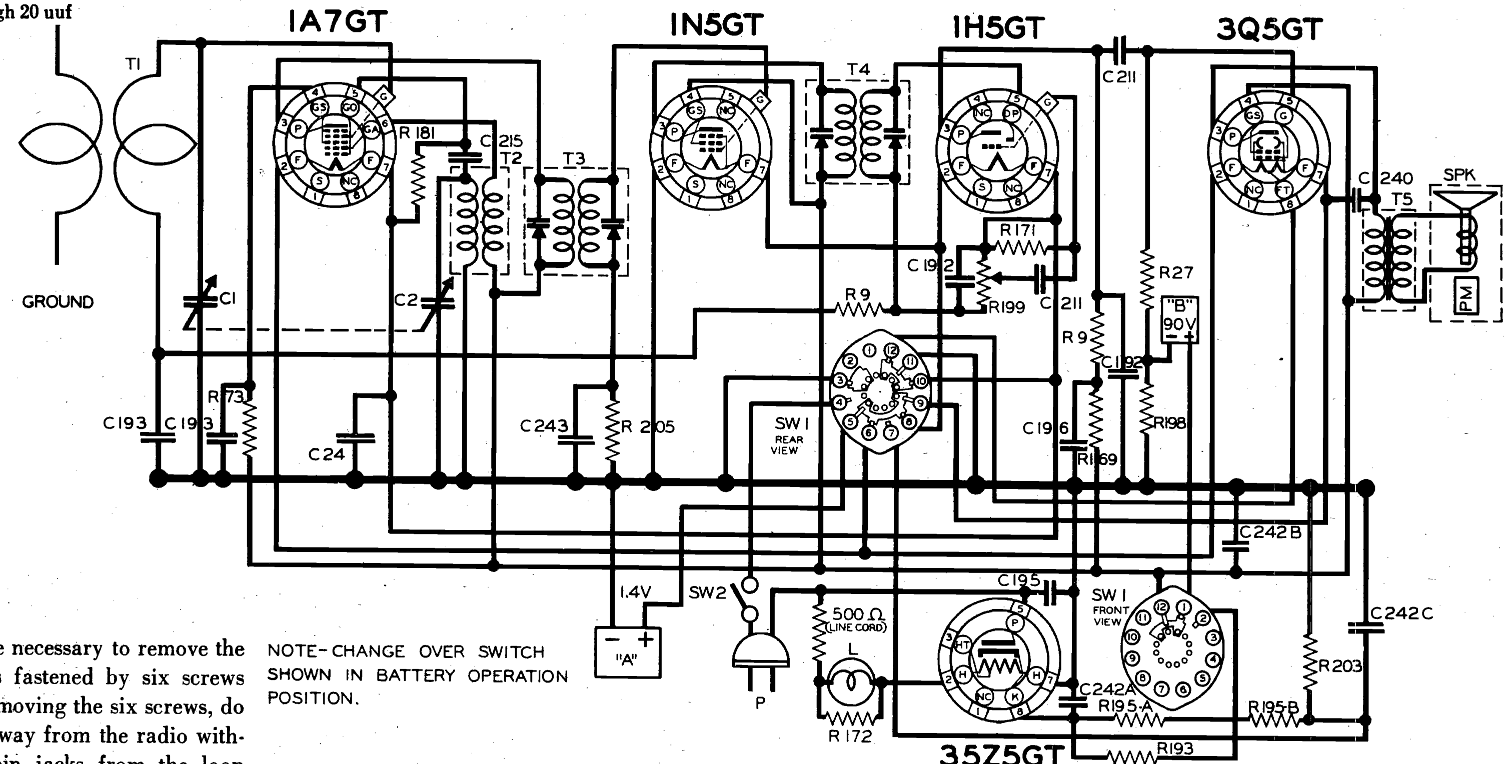
MODEL 822 Ch. RE-82

NOBLITT-SPARKS INDUSTRIES, INC.

All sensitivities given for 50 milliwatts output = .4 volts across Voice Coil.

Operation No.	Connect Bal. Oscillator to	Balance Oscillator Frequency	Adjust	Dial Setting
1	1A7 Grid	455 kc	1st & 2nd I. F. Trimmers	550 kc
2	Ant Post Through 20 uuf	1400 kc	Osc. Trimmer	1400 kc
3	Ant Post Through 20 uuf	1400 kc	Ant Trimmer	1400 kc

RADIO CHASSIS RE-82



NOTE-CHANGE OVER SWITCH SHOWN IN BATTERY OPERATION POSITION.

Installation of Batteries:

To install batteries it will be necessary to remove the back of the cabinet which is fastened by six screws (three on each side). After removing the six screws, do not attempt to pull the back away from the radio without first disconnecting the pin jacks from the loop antenna.

When the back has been removed, turn the cabinet upside down (handle to the bottom).

Note the battery cable extending from the right side of the chassis. This cable terminates in one two-prong plug for the long "A" battery and two three-prong plugs for the smaller "B" batteries.

RESISTORS

R	OHM	W	PART NO.
9	1M	1/4	17-2080
27	2M	1/4	17-4788
73	30K	1/4	17-4276
169	150K	1/4	17-14282
171	15M	1/4	17-14288
172	100	1/4	17-14289
181	100K	1/4	17-14303
195A	460	2 3/4	17-14351
195B	1500	5 1/4	
198	400	1/4	17-14343
199	1M	V.C.	17-14350
203	450	1/4	17-14354
193	2K	1/4	17-14337
205	3M	1/4	17-14358

CONDENSERS

C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		17-16549
2	VARIABLE		
192	.00025	600	17-14273
193	.05	200	17-14274
195	.05	400	17-14276
198	.1	200	17-14277
211	.01	200	17-14306
215	.0001	600	17-14310
24	.5	200	17-14040A
240	.003	400	17-14348
242A	40	150	17-14353
242B	20	150	
242C	100	25	
243	.002	200	17-14357

TRANSFORMERS

T	TYPE	PART NO.
1	ANTENNA LOOP	00-16973
2	OSCILLATOR COIL	00-16404
3	FIRST I.F.	00-16578
4	SECOND I.F. COIL	00-16579
5	OUTPUT TRANS.	00-16566

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.
A	1.5 VOLT "A" BATTERY	17-16563
B	TWO 45 VOLT "B" BATTERIES	17-16562
L	DIAL LIGHT BULB - MAZDA 47	17-16378
P	LINE CORD & PLUG ASSEMBLY	17-16492
SPK	SPEAKER ASSEMBLY - 5" PERMANENT MAGNET	17-16613
SW1	AC DC - BATTERY SWITCH	17-16564
SW2	VOLUME CONTROL & LINE SWITCH	17-14350

I.F. PEAK 455 K.C.

BALANCE 1400 K.C. - CHECK AT 600 K.C.

NOBLITT-SPARKS INDUSTRIES, INC., COLUMBUS, INDIANA.

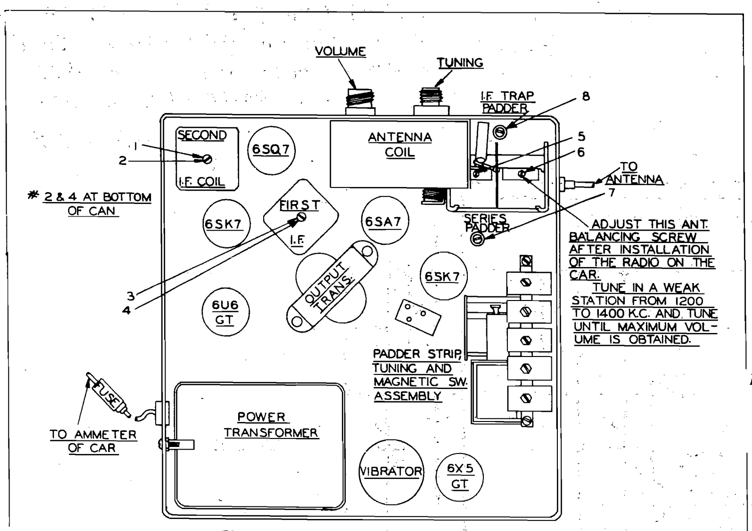
MODEL 720
MODEL 820
MODEL 821

NOBLITT-SPARKS INDUSTRIES, INC.

IMPORTANT: Before attempting to balance radio, be sure the Automatic Station Selector (push button control) is set to *"DIAL"* position.

All sensitivities given for 1 watt output equals 1.65 V. across voice coil.

Operation No.	*Connect Bal. Oscillator to*	*Bal. Oscillator Frequency*	*Adjust Padder No.*	*Dial Setting*	*Sensitivity*
1	6SA7 Grid	455 kc.	1,2,3 & 4	550 kc	50uv
2	Ant. Coupler Through 20 uuf	455 kc.	8	550 kc	min. sig
3	Through 20 uuf	1400 kc.	5, then 6	1400 kc	10 uv
4	Through 20 uuf	600 kc.	7	600 kc	10 uv



Synchronizing Station Selector Controls

(1) Disconnect the push button control cable (cloth covered cable) by pulling out the plug from the radio case.

(2) Turn on the power switch and set the Automatic Station Selector Control to "Dial" position -- that is, to the position where the word "Dial" appears at the window of the control.

(3) Plug the cloth covered cable back into the radio.

The three preceding steps will have synchronized the Automatic Station Selector control system so that the numerals on the control dial correspond to the positions of the magnetic tuning switch in the radio.

The remote control Automatic Station Selector can be set to tune in five broadcast stations (preferably powerful local stations) of your choice. The dial of the control unit carries the numbers 1 to 5 to designate the stations.

To tune in stations with push buttons

(1) Set the Automatic Station Selector to position No. 1 (the numeral "1" appearing on the dial of the control unit). With the Selector in this position the set may be tuned to any station whose broadcast frequency lies between 900 and 1600 kilocycles.

(2) Remove the Slot Cover on the front of the set below the speaker grille for access to the Oscillator Adjustment Screws and Antenna Trimmers, by adjustment of which the tuning is accomplished. See *Fig.7.*

(3) Adjust (with screwdriver) Oscillator Adjustment Screw No. 1A *(see Fig. 7)* until the broadcast signal of the desired station is received. Turning the Oscillator Adjustment Screws in a clockwise direction lowers the frequency and turning in a counter clockwise direction increases the frequency.

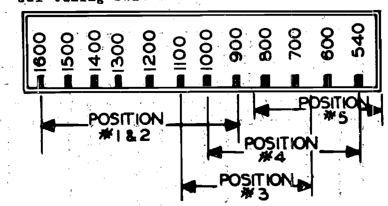
(4) Adjust Antenna Trimmer No. 1B to position where maximum volume is attained. The entire range of the Antenna Trimmers is covered within three counter clockwise turns of the screw from tight position. *Do not back screws out more than three turns.* Clockwise rotation lowers the frequency. Counter clockwise rotation increases the frequency.

The preceding instructions outline completly the steps for setting up station selector position No. 1. For positions No. 2, No.3, No.4 and No.5 the same general proceedure is to be used.

Below is a table showing five Station Selector positions, the kilocycle range covered by each position and the Oscillator screws and Antenna Trimmers by adjustment of which any desired station within the given range may be tuned in.

It will be noted that, even though the power switch is off and the radio not playing, when the control button is pushed there will be a clearly audible "click" in the radio. This sound is made by the magnetic switch which is always energized regardless of whether or not the radio is turned on. In other words, this sound denotes normal functioning of the automatic control system.

If at any time the Station Selector controls become non-synchronous due to improper operation of the push button or operation of the push button when the control cable is disconnected, synchronism may again be restored by repeating the 3 steps outlined under the heading *"Synchronizing the Station Selector Controls"* after making sure that the radio is turned on and the pilot light is lit in the manual tuning dial, indicating that the manual tuning switch control is "switched-in".



Position of Automatic Station Selector	*Broadcast Range In Kilocycles*	*Oscillator Screw To Select Station*	*Antenna Trimmer To Adjust for Maximum Volume*
1	900 to 1600	1A	1B
2	900 to 1600	2A	2B
3	650 to 1100	3A	3B
4	540 to 1000	4A	4B
5	535 to 850	5A	5B

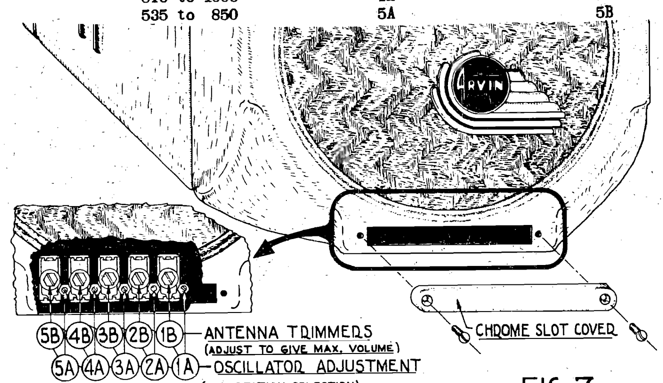
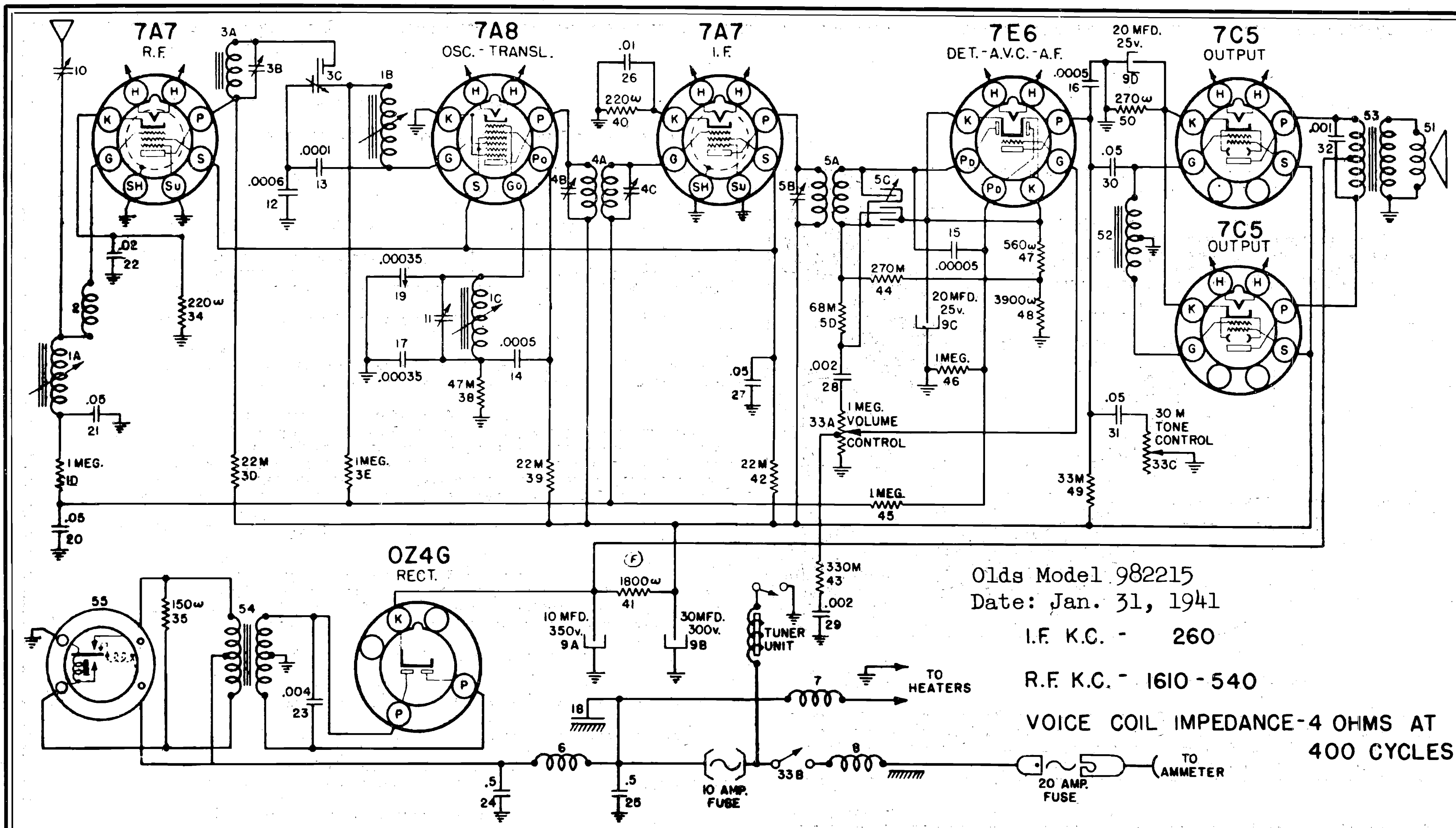


FIG.7

MODEL 982215

OLDSMOBILE DIV.—GEN. MOTORS



Olds Model 982215
Date: Jan. 31, 1941

I.F. K.C. - 260

R.F. K.C. - 1610 - 540

VOICE COIL IMPEDANCE - 4 OHMS AT 400 CYCLES

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.).

The Antenna System used with these receivers is of the extension rod type, mounting through the cowl of the body by the use of special insulators, conforming to the contour of the cowl. Raising and lowering of the rod is accomplished by means of a remote control on the instrument panel.

MODEL 982215

OLDSMOBILE DIV.—GEN. MOTORS

CIRCUIT ALIGNMENT

All of the adjustable condensers in this receiver are very accurately adjusted at the factory and will need no further adjustment (excepting antenna condenser "G") unless tampered with or a defective coil has been replaced. If realignment is found to be necessary, the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

DO NOT ATTEMPT TO PEAK THE I-F STAGES OF THIS RECEIVER WITHOUT CAREFULLY NOTING THE INSTRUCTIONS BELOW:

1. Aligning I-F Stages at 260 Kilocycles

   (a) Turn volume control to the maximum position.

   (b) Connect the signal lead of the test oscillator through a .1 mfd. condenser to terminal X, which is the grid prong of the 7A8 tube.

   (c) Connect the ground lead of the test oscillator to the chassis frame.

   (d) Connect the output meter across the speaker voice coil at the terminal board mounted on the speaker.

   (e) Set the test oscillator to exactly 260 Kilocycles.

   (f) Adjust the trimmers "A", "B", "C" and "D" on the I-F Transformers 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 a readable indication on the output meter.

2. Aligning at 1610 Kilocycles

   (a) Remove the signal lead of the test oscillator from the grid of the 7A8 tube and connect to the antenna terminal of the receiver THROUGH a .000075 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .000075 mfd. mica condenser be used when aligning the antenna stage of these receivers in order that this circuit can be made to track properly.)

   (b) Loosen lock screw "E" and tune the receiver by means of the manual control to the extreme high frequency position, against the stop, and tighten screw "E".

   (c) Set the test oscillator to 1610 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.)

   (e) Adjust the antenna compensating condenser "G" for maximum output.

   (f) Adjust the R.F. trimmer condenser "J" for maximum output.

3. Adjusting the I-F Wave Trap

   (a) Leave the test oscillator lead the same as for aligning at 1610 K.C.

   (b) Set the test oscillator to exactly 260 K.C.

   (c) Adjust the trimmer "H" for minimum deflection on the output meter. (It may be necessary to increase the signal from the test oscillator when making this adjustment.)

NOTE: With permeability tuning it is necessary to adjust the capacity at only one frequency. The coils are so wound that tracking is automatic and the usual low frequency adjustments are not necessary.

If the entire alignment procedure has been accomplished accurately, the receiver should be uniformly sensitive over the entire frequency range.

Lock screw "E" maintains the location of the mechanical stop at the high frequency end of the band.

New frequency assignments to 1600 K.C. make it desirable for the receiver to cover this range, but due to local ordinances it is not permissible in all locations. The high frequency stop is set at 1560 K.C. in production and after aligning the receiver, reset the stop to this frequency which is accomplished by loosening lock screw "E", tune in manually to 1560 K.C. and tighten screw.

Where ordinances permit, the high frequency stop may be set at any frequency up to 1600 K.C.

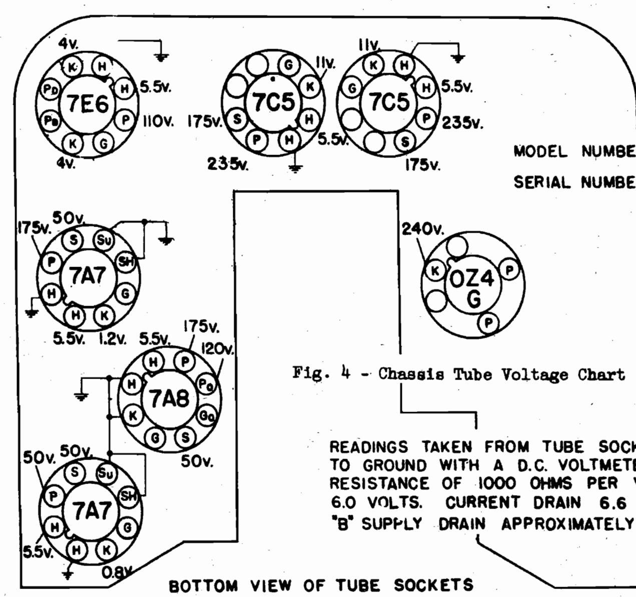
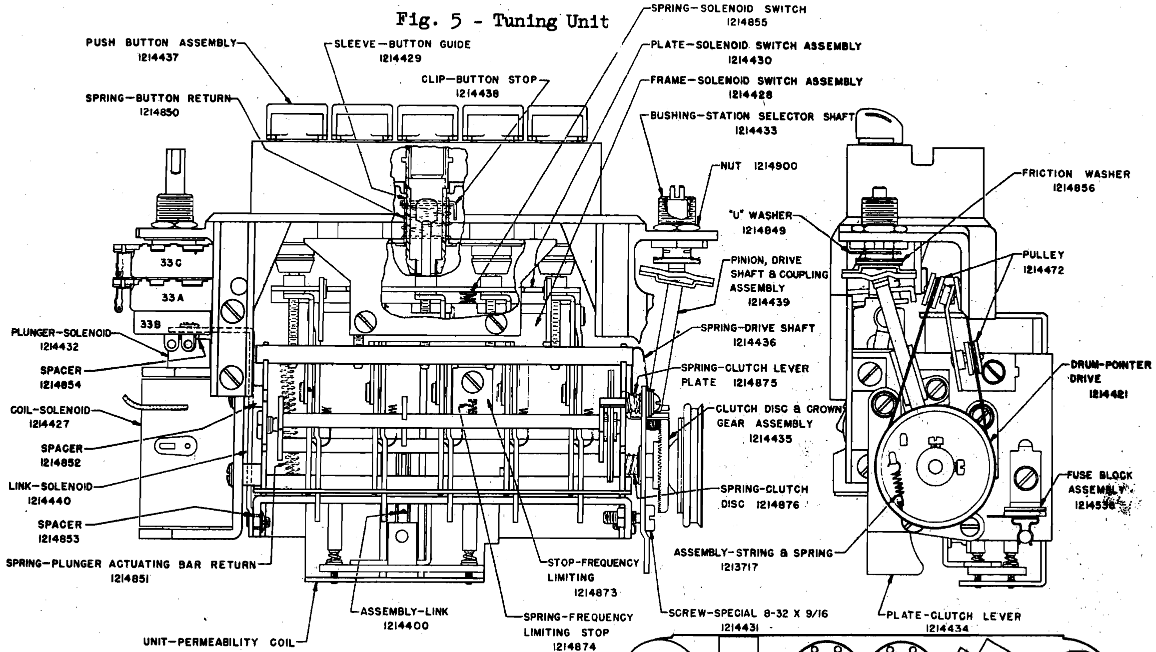


Fig. 4 - Chassis Tube Voltage Chart

OLDSMOBILE DIV.—GEN. MOTORS

Fig. 5 - Tuning Unit



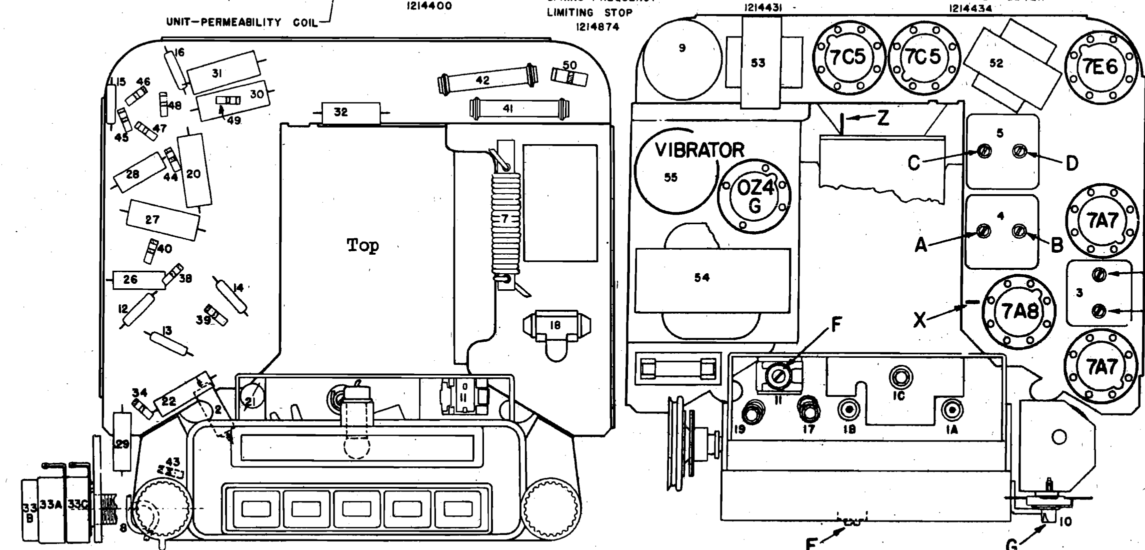


Fig. 1 - Chassis Parts Layout - 982215

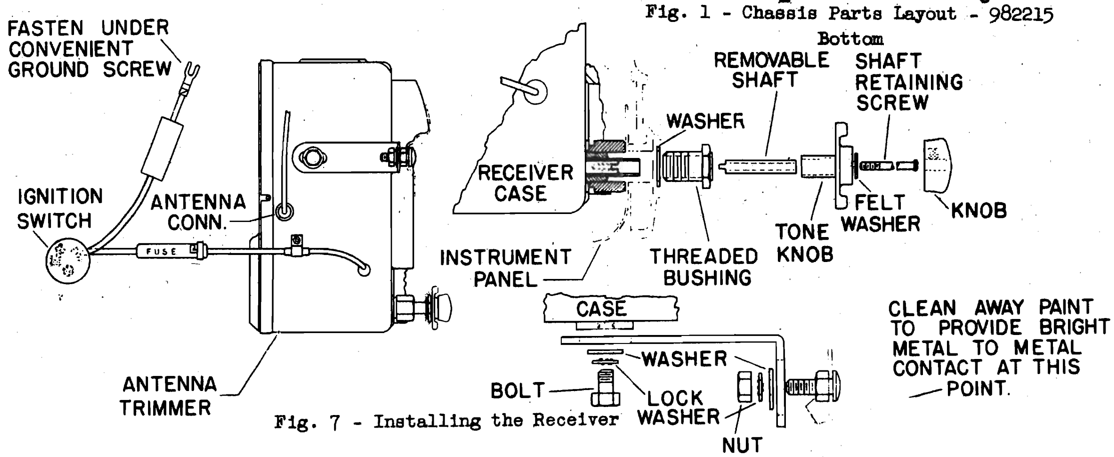
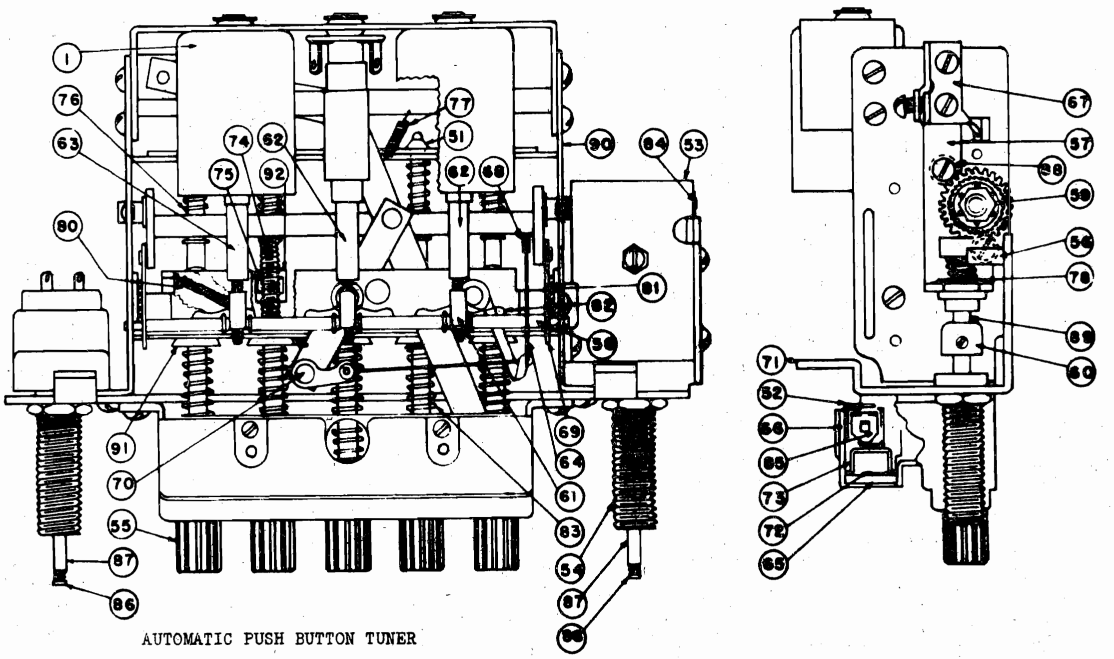


Fig. 7 - Installing the Receiver

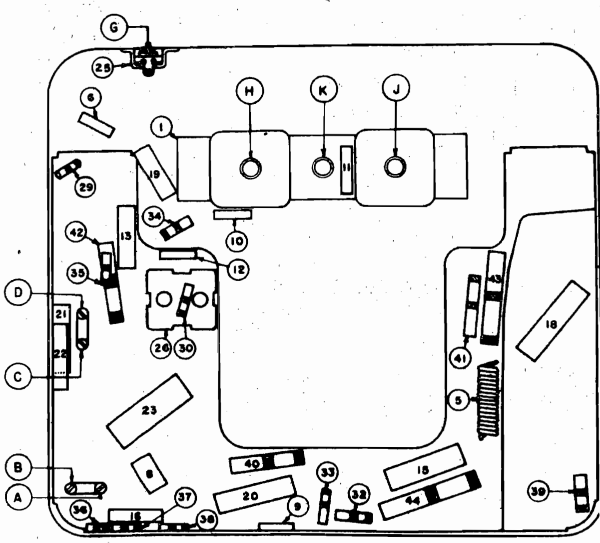
MODEL 982216

OLDSMOBILE DIV.—GEN. MOTORS

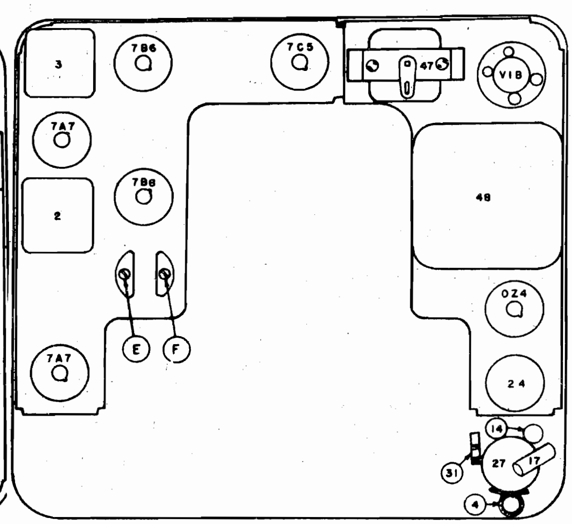


AUTOMATIC PUSH BUTTON TUNER

The iron cored automatic tuner consists of three coils with variable iron cores actuated by a rugged mechanical device for varying the position of the cores in the coils. Changing the position of the cores changes the inductance of the antenna, R.F. and oscillator coils, and provides a means of tuning the radio over the entire broadcast band. A special compensating condenser is employed in the oscillator circuit to prevent the set from drifting off station due to normal variations in car voltage and radio temperatures.



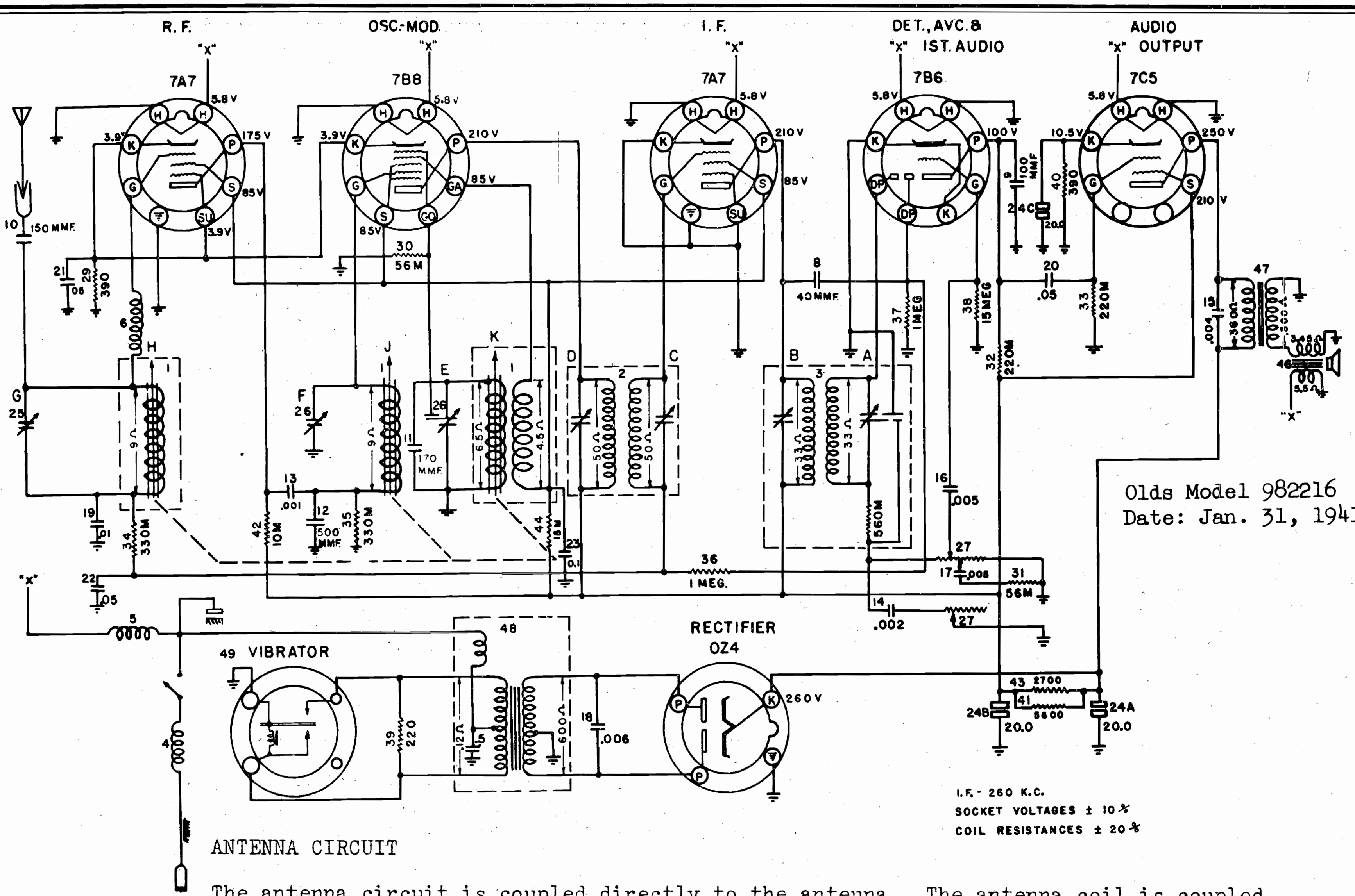
Bottom



Top

MODEL 982216

OLDSMOBILE DIV.—GEN. MOTORS



Olds Model 982216
Date: Jan. 31, 1941

I.F. - 260 K.C.
SOCKET VOLTAGES ± 10%
COIL RESISTANCES ± 20%

ANTENNA CIRCUIT

The antenna circuit is coupled directly to the antenna. The antenna coil is coupled to the grid of the R.F. amplifier through a high frequency filter which minimizes ignition and other high frequency interferences. Due to the antenna circuit being directly coupled to the antenna, the antenna adjustment screw must be adjusted to give maximum volume when the receiver is tuned to a weak station which is received between 130 and 150 on the dial.

OLDSMOBILE DIV.—GEN. MOTORS

CIRCUIT ALIGNMENT

Alignment Procedure: The trimmer condensers in this receiver have been carefully adjusted at the factory and should require no further adjustment (except the antenna trimmer) unless tampered with or a defective coil has been replaced. It is advisable not to attempt any adjustment unless it is definitely known that an adjustment is necessary.

An accurately calibrated test oscillator or signal generator and an output meter must be used to align the receiver circuits correctly. To make all alignment adjustments the front and back covers must be removed. All trimmers are readily accessible. The antenna trimmer is adjusted through a hole in the end of the case.

Due to the fact that the iron cores have been sealed in place at the factory only the trimmer adjustments as outlined under capacity alignment should be made unless the coils of the iron cored tuning unit are changed.

CAPACITY ALIGNMENT

1. I.F. Alignment at 260 K.C.
   - (a) Connect an output meter across the speaker voice coil, leaving speaker connected.
   - (b) Connect the ground lead of the signal generator to the chassis frame.
   - (c) Connect the signal lead of the signal generator to the 7B8 tube grid side of the R.F. Trimmer Condenser F through a 0.1 mfd. condenser.
   - (d) Turn set volume control on full and tone control to the extreme treble end. Set the signal generator at 260 K.C. Tune the receiver to a frequency where no squeals or beat notes may be heard and so that when the tuning control is moved in narrow limits no appreciable change in output may be noted.
   - (e) Adjust the I.F. trimmers A, B, C, and D for maximum output.
2. Alignment at 1560 K.C.
   - (a) Connect the signal lead of the signal generator to the receiver antenna connection through a 75 mmfd condenser.
   - (b) Turn the manual tuning control of the receiver to the stop at the extreme high frequency end of the dial.
   - (c) Set the signal generator to 1560 K.C.
   - (d) Adjust the oscillator trimmer "E" for maximum output.
   - (e) Adjust the R.F. trimmer "F" for maximum output.
   - (f) Adjust the antenna trimmer "G" for maximum output.
3. Alignment at 1400 K.C.
   - (a) Set the signal generator to 1400 K.C.
   - (b) Turn the receiver to the signal and readjust the trimmers F and G for maximum output. Signal generator signal should be as low as possible and still give a satisfactory meter reading.

   This type of tuning circuit does not require alignment at 600 K.C.
4. Alignment with Car Antenna

   Antenna trimmer G must be adjusted to match car antenna when receiver is installed; use a weak station signal near 1400 K.C. The antenna should be fully extended when making this adjustment.

CAPACITY AND INDUCTANCE ALIGNMENT

To be used only when there is definite evidence of iron cores being out of adjustment.

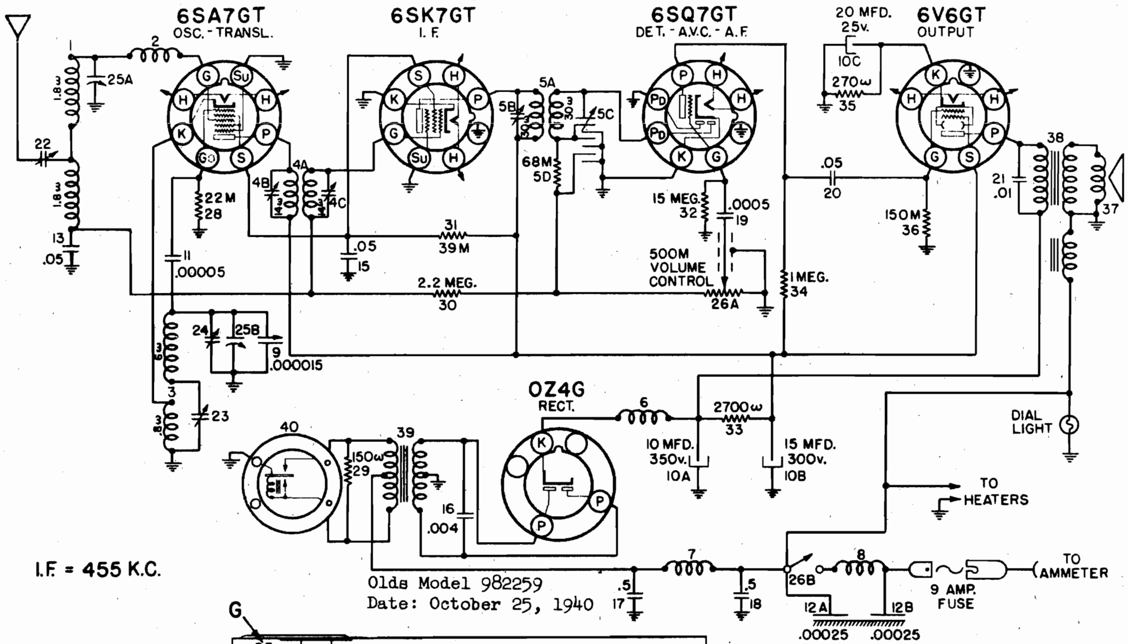
1. I.F. Alignment at 260 K.C.

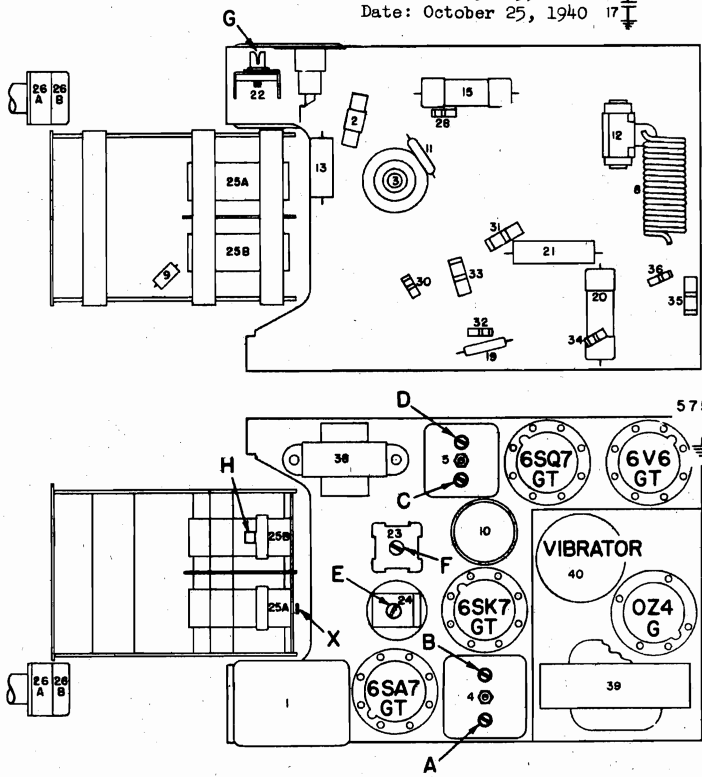
   Follow the procedure as outlined under I.F. Alignment at 260 K.C. Capacity Alignment.
2. Alignment at 1560 K.C.
   - (a) Connect the signal lead of the signal generator to the antenna connection of the set through a 70 mmfd condenser.
   - (b) Set signal generator to 1560 Kilocycles.
   - (c) Rotate the manual tuning mechanism until the high frequency stop is reached. Mechanically align the iron cores K, H, and J by setting each core so that its front edge sticks out 1-1/16" from the end of the coil form and the antenna and R.F. cores H and J stick out 1-13/32" from the end of the respective coil windings.
   - (d) Adjust the oscillator trimmer E, R.F. trimmer F, and antenna trimmer G for maximum output.
3. Alignment at 1400 K.C.
   - (a) Set signal generator to 1400 K.C. and tune set to this signal.
   - (b) Adjust the R.F. core J for maximum output.
   - (c) Adjust the antenna core H for maximum output.
4. Realignment at 1560 and 1400 K.C.
   - (a) Repeat alignment of trimmer E and trimmers F and G at 1560 K.C.
   - (b) Repeat alignment of cores H and J at 1400 K.C. Apply shellac to the core screws sealing the adjustment.
5. Alignment with Car Antenna

   Antenna trimmer G must be adjusted to match car antenna when receiver is installed; use a weak station signal near 1400 K.C. The antenna should be fully extended when making this adjustment.

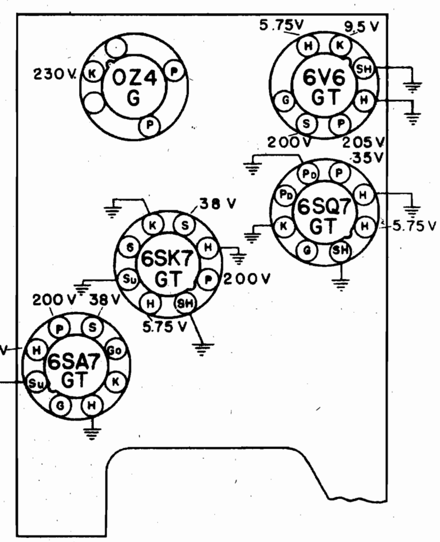
MODEL 982259

OLDSMOBILE DIV.—GEN. MOTORS





Chassis Parts Layout



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. ALL VOLTAGES EXCEPT THE HEATER VOLTAGES MEASURED ON THE 0-250 VOLT SCALE

"A" BATTERY 6.0 VOLTS. CURRENT DRAIN 6.0 AMP

"B" SUPPLY DRAIN APPROXIMATELY 45 M.A.

MODEL NUMBER -- 982259

SERIAL NUMBER -- 687C101 & UP

TUBE COMPLEMENT — 6SA7GT, 6SK7GT, 6SQ7GT, 6V6GT, OZ4G.

BATTERY CURRENT — 6.0 AMPERES

B+ VOLTS — 230 VOLTS

I.F. K.C. — 455

R.F. K.C. - 1560 TO 540

VIBRATOR TYPE - NON SYNCHRONOUS

OLDSMOBILE DIV.—GEN. MOTORS

1. Aligning I-F Stages at 455 Kilocycles

(a) Connect the signal lead of the test oscillator to terminal "X" on variable condenser 25-A (See Parts Layout), which is the grid lead of the 6SA7GT tube, through a .1 mfd. condenser.

(b) Connect the ground lead of the test oscillator to the chassis frame.

(c) Connect the output meter across the voice coil of the speaker.

(d) Set the test oscillator to exactly 455 K.C.

(e) Turn volume control to maximum.

(f) 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 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 "H" (See Parts Layout).

(c) Set the test oscillator to 1560 Kilocycles.

(d) Adjust the condenser "E" (See Parts Layout) 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 the Antenna Stage

(a) Remove the signal lead of the test oscillator from the grid of the 6SA7GT tube and connect to the Antenna Terminal of the receiver THROUGH a .000075 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .000075 mfd. mica condenser be used when aligning the antenna stage of these receivers 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 Antenna Trimmer "G" (See Parts Layout) for maximum output.

4. Aligning at 600 Kilocycles

Peak the oscillator padding 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 adjust the oscillator padding condenser "F" (See Parts Layout) 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.

(e) After the above operation turn the condenser rotor plates to the high frequency stop position. Check the 1560 K.C. setting and if necessary readjust trimmer "E". Then return to 1400 K.C. for final antenna trimmer adjustment.

NOTE: If the entire alignment procedure has been accomplished correctly, the receiver should be uniformly sensitive over the entire frequency range.

In addition to manual tuning, there are four push buttons which may be adjusted to tune-in the local broadcasting stations.

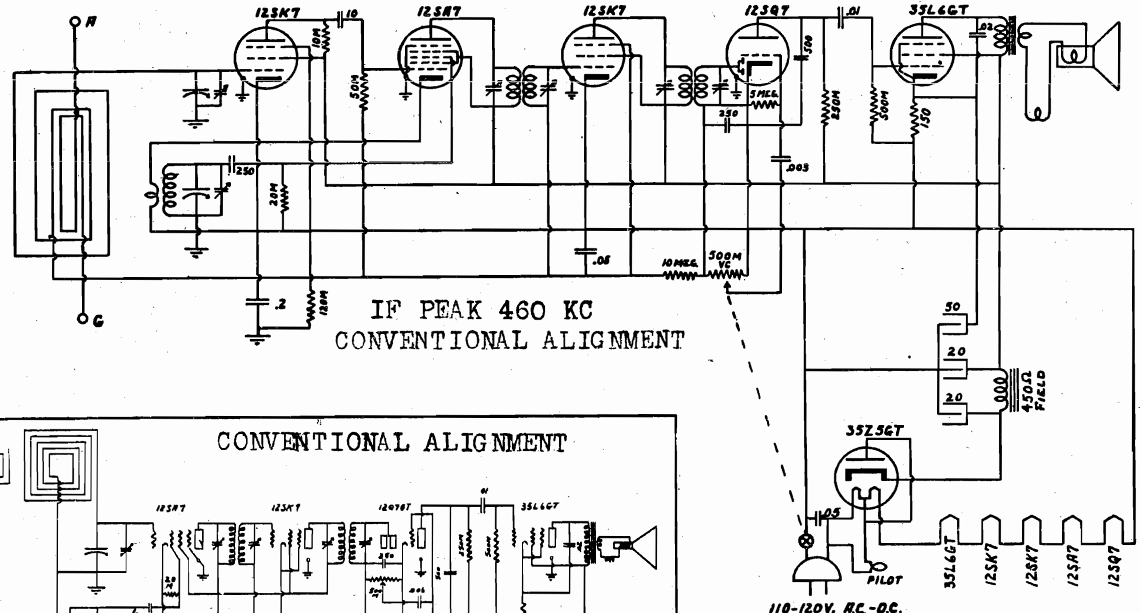
It is not necessary to set the buttons in order of broadcasting stations frequency, but for convenience it is desirable.

To adjust the buttons, proceed as follows:

1. Turn on receiver for ten minutes or more.
2. Loosen the four push buttons by turning each button counter clockwise about half a turn.
3. Tune in the first desired station manually and press in the first push button as far as it will go.
4. With the button held all the way in, tighten it gently. Then release it and tighten it securely.
5. Proceed in the same manner for the remaining stations.
6. After all of the buttons have been adjusted, recheck the setting. Push each button and see if the station may be tuned-in more accurately manually. If so, loosen button and re-set it.
7. A station setting may be changed at any time by loosening the push button, tuning in the new station and resetting the button.
8. After the push buttons have been adjusted, insert the call letter tabs for the stations in their proper places above the buttons.

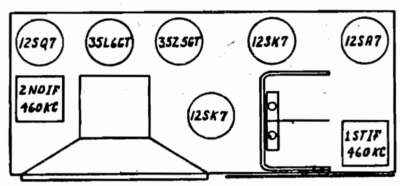
PACKARD BELL CO.

MODEL 5D
MODEL 6A
MODEL 56

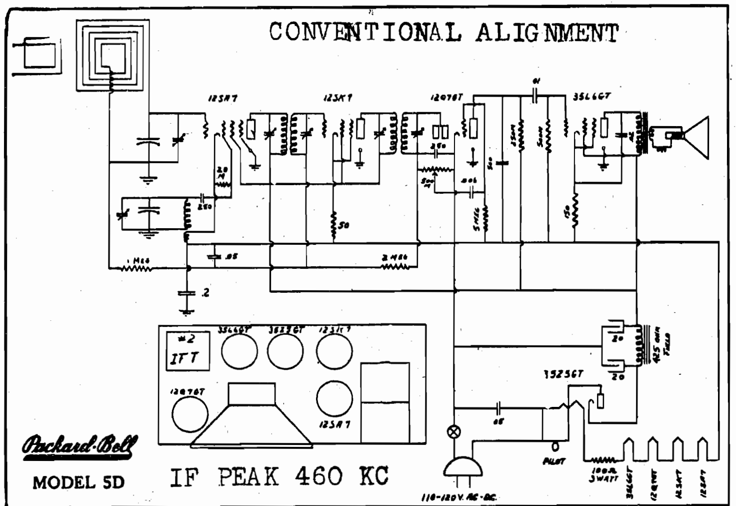


IF PEAK 460 KC
CONVENTIONAL ALIGNMENT

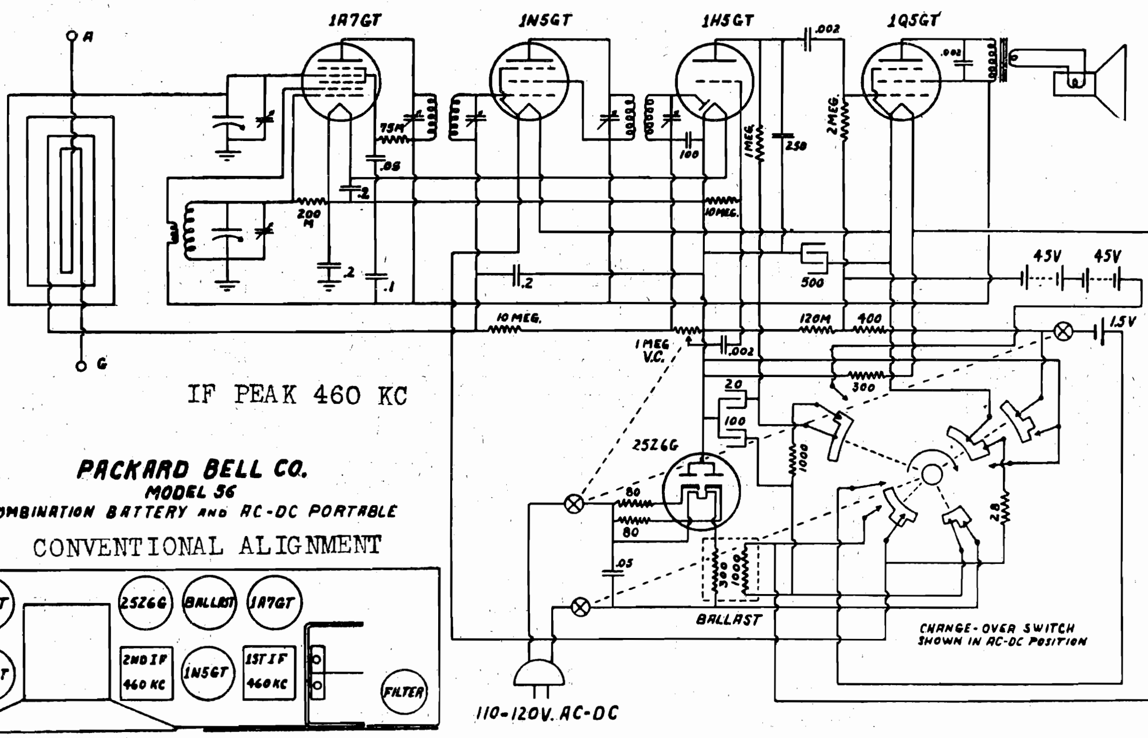
PACKARD BELL CO.
MODEL 6A



CONVENTIONAL ALIGNMENT



Packard-Bell
MODEL 5D
IF PEAK 460 KC



IF PEAK 460 KC

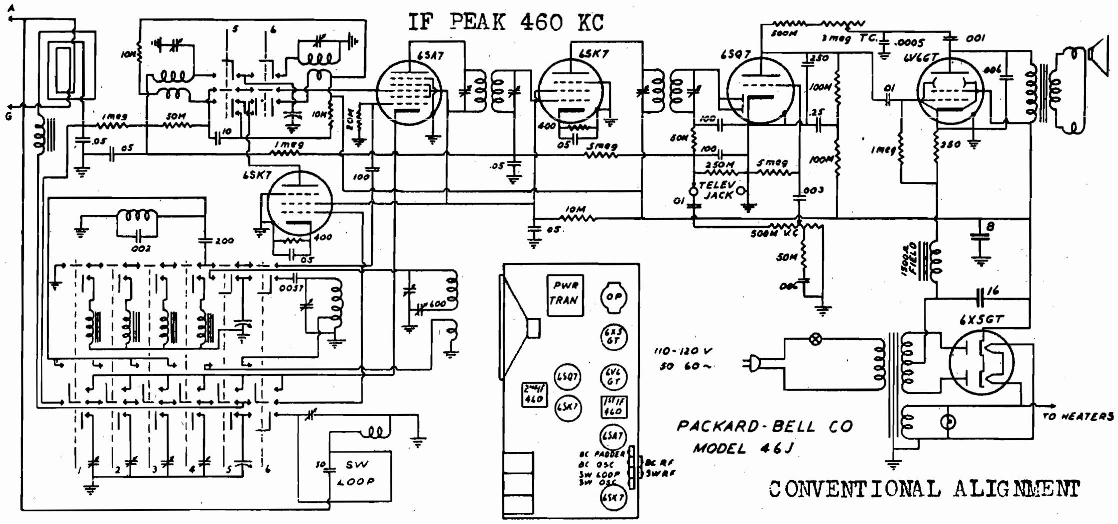
PACKARD BELL CO.
MODEL 56
COMBINATION BATTERY AND AC-DC PORTABLE

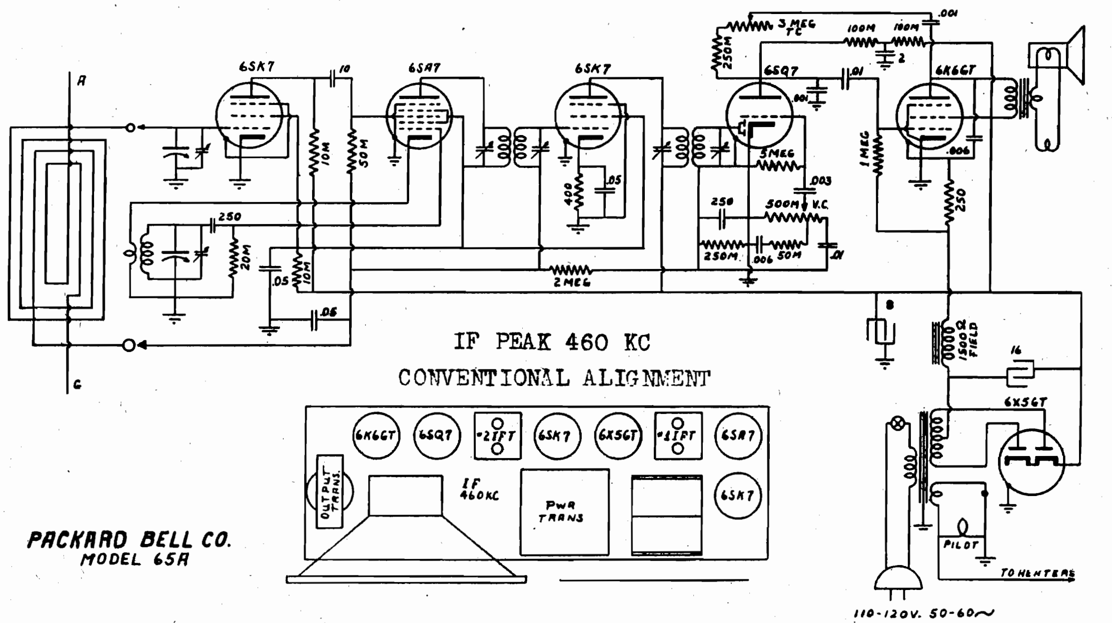
CONVENTIONAL ALIGNMENT

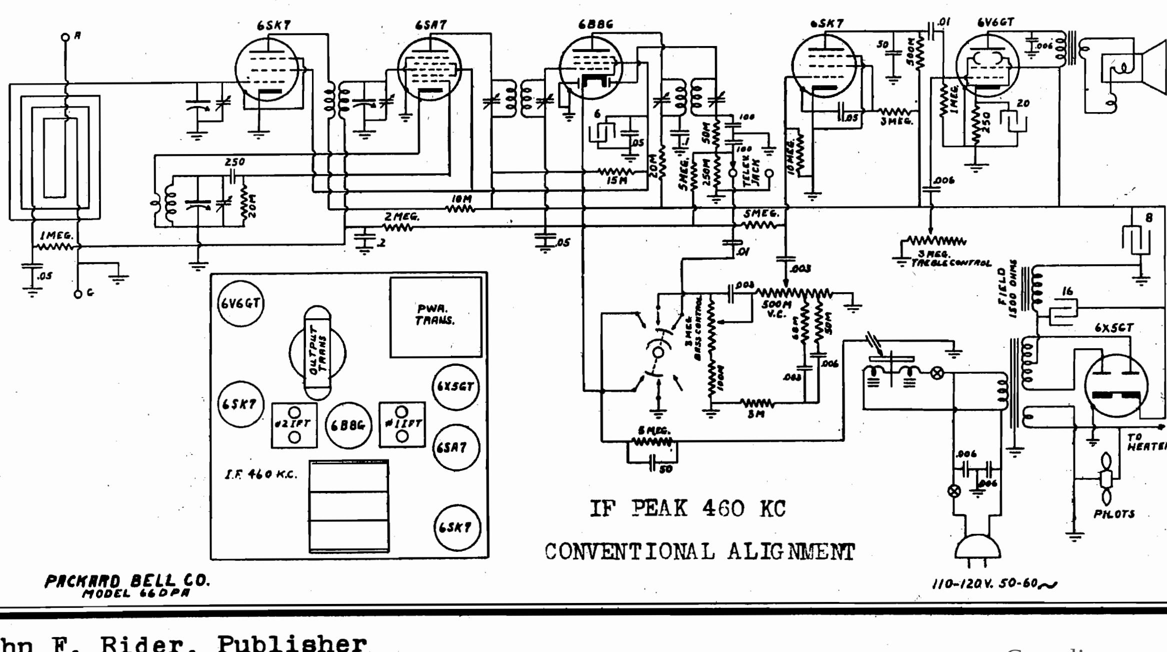
1Q5GT
25Z6G
BALLAST
1A7GT
1H5GT
2ND IF 460 KC
1N5GT
1ST IF 460 KC
FILTER

MODEL 46J
MODEL 65A
MODEL 66DPA

PACKARD BELL CO.

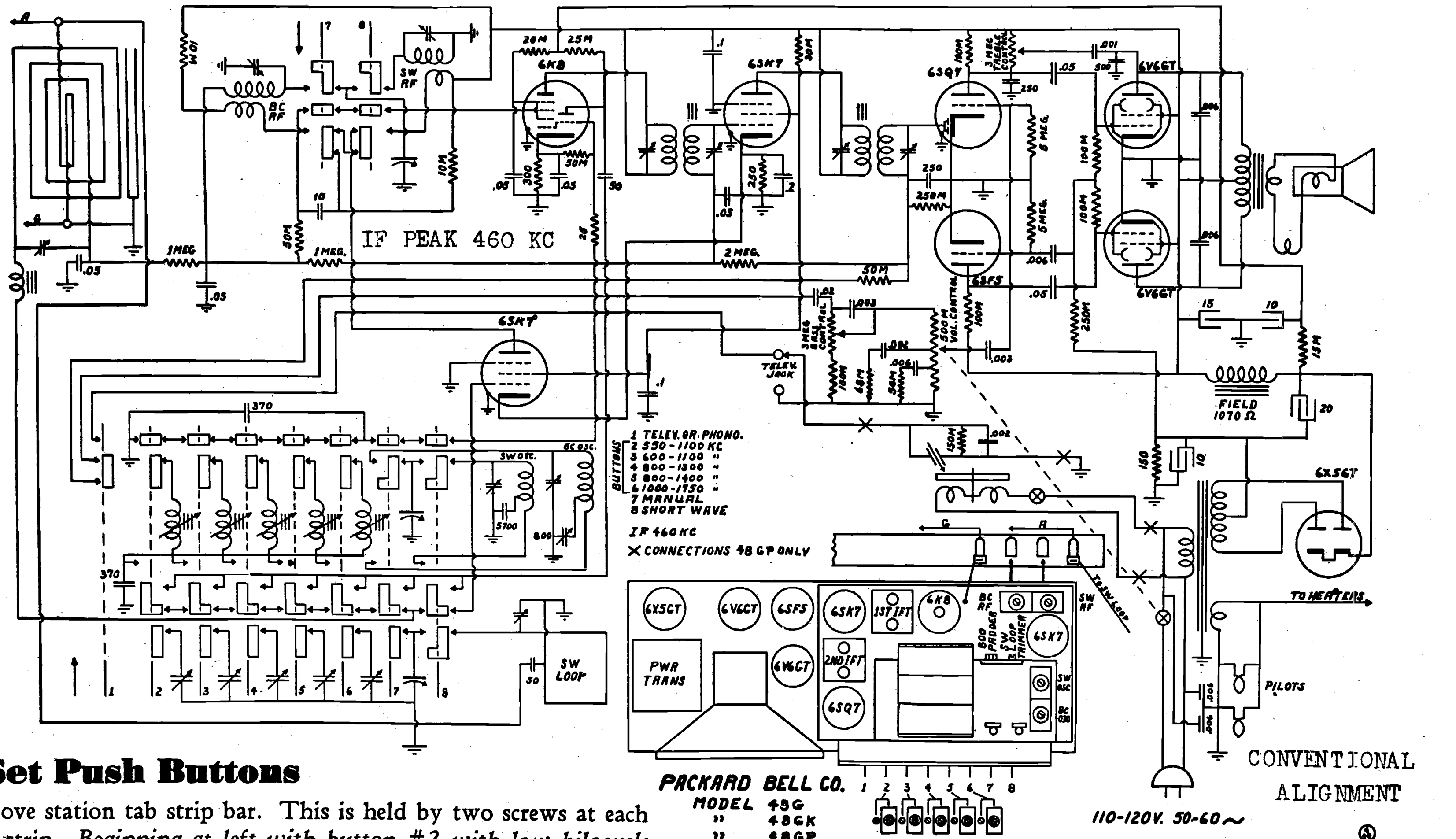






PACKARD BELL CO.

MODELS 48G,48GK,48GP



6-40

To Set Push Buttons

Remove station tab strip bar. This is held by two screws at each end of strip. *Beginning at left with button #2 with low kilocycle frequency stations,* five stations may be set on buttons in the order of their kilocycle frequency as follows:

Tune and play the station desired on manual tuning, (7th button) for identification purposes. Now, push button #2 "in." Using small screw driver, rotate #2 brass selector screw (oscillator) until desired station is heard with maximum volume. Then rotate #2 chrome selector screw (loop trimmer) until station is heard best.

Repeat this procedure for each of the other four broadcast station buttons using corresponding selector and trimmer screws until a total of five stations have been set.

SELECTOR AND TRIMMER SCREWS (UNDER TAB STRIP BAR)

Low Frequency Stations on This End	#2	#3	#4	#5	#6	High Frequency Stations on This End
	● ○	● ○	● ○	● ○	● ○	

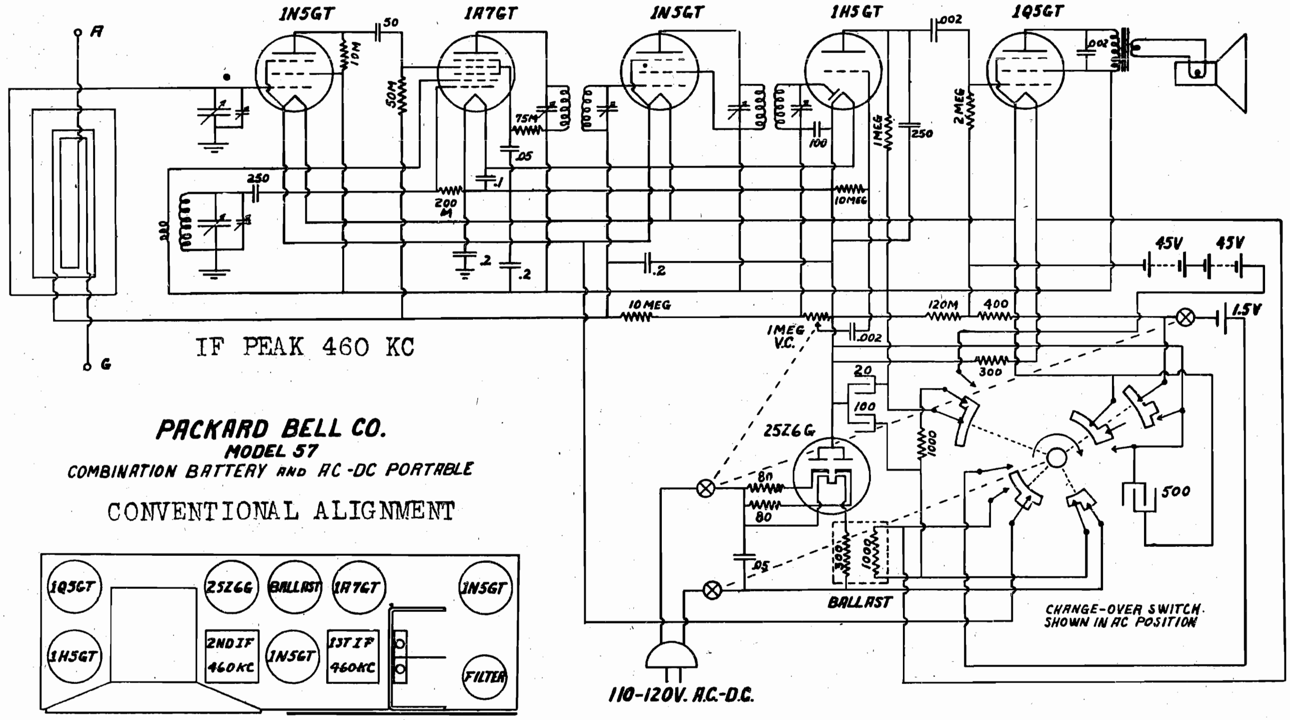
● INDICATES BRASS SCREW ○ INDICATES CHROME SCREW

PUSH BUTTONS

Button #1	#2	#3	#4	#5	#6	#7	#8
Phonograph or Television	Broadcast Station	Broadcast Station	Broadcast Station	Broadcast Station	Broadcast Station	Manual Dial Tuning	Shortwave Tuning

MODELS 57,57A

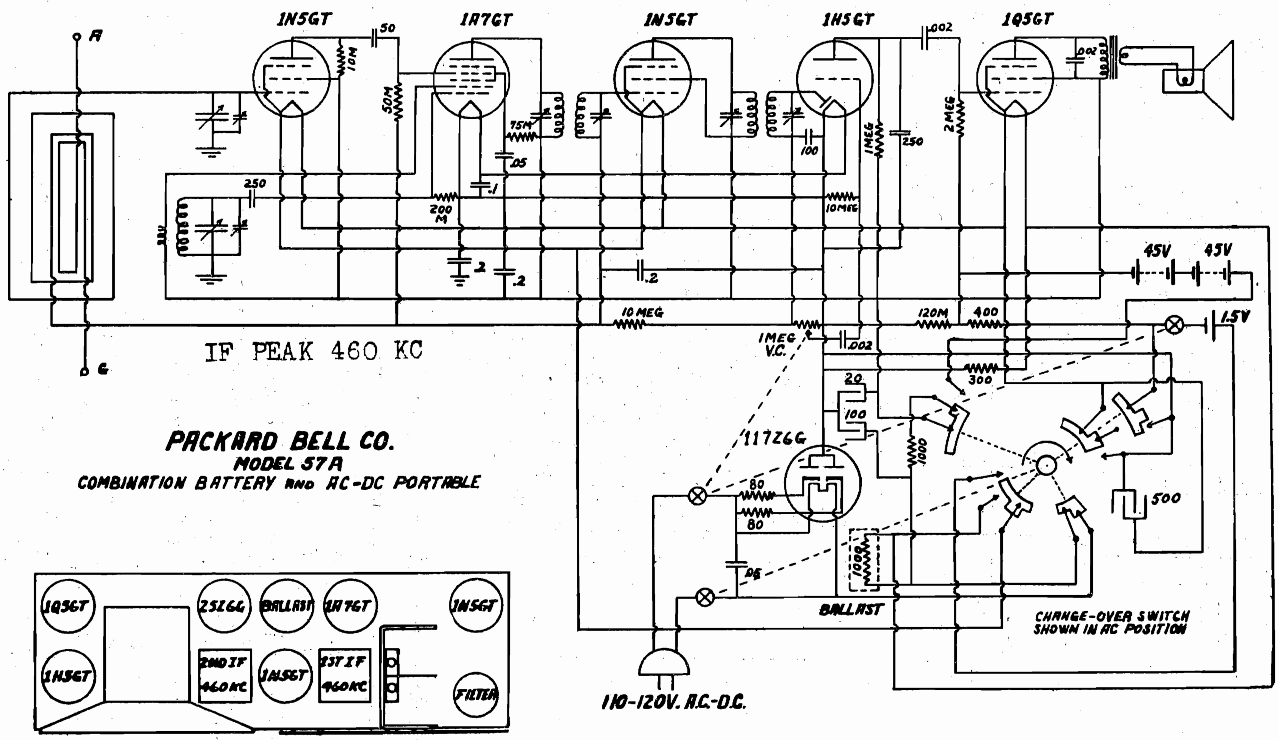
PACKARD BELL CO.



IF PEAK 460 KC

PACKARD BELL CO.
MODEL 57
COMBINATION BATTERY AND AC-DC PORTABLE

CONVENTIONAL ALIGNMENT

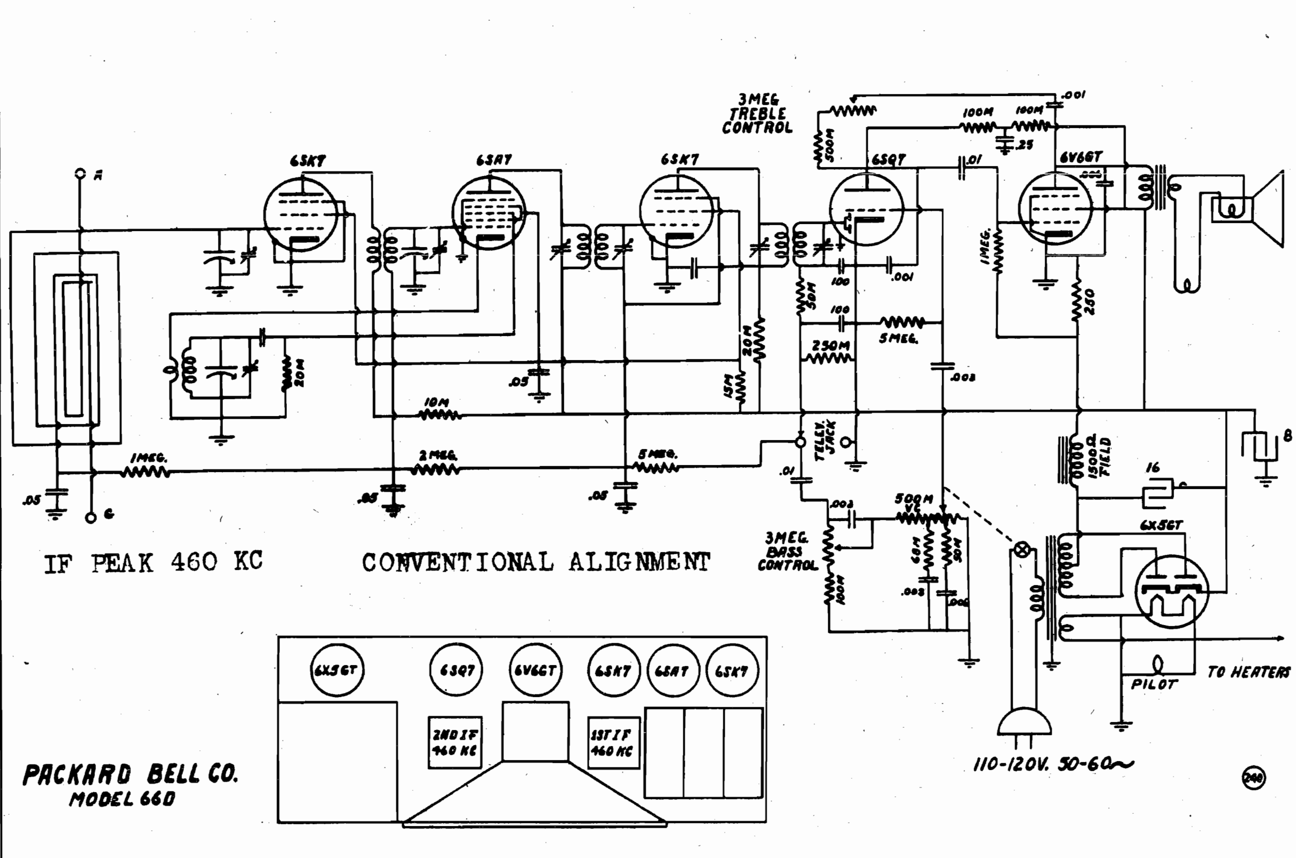


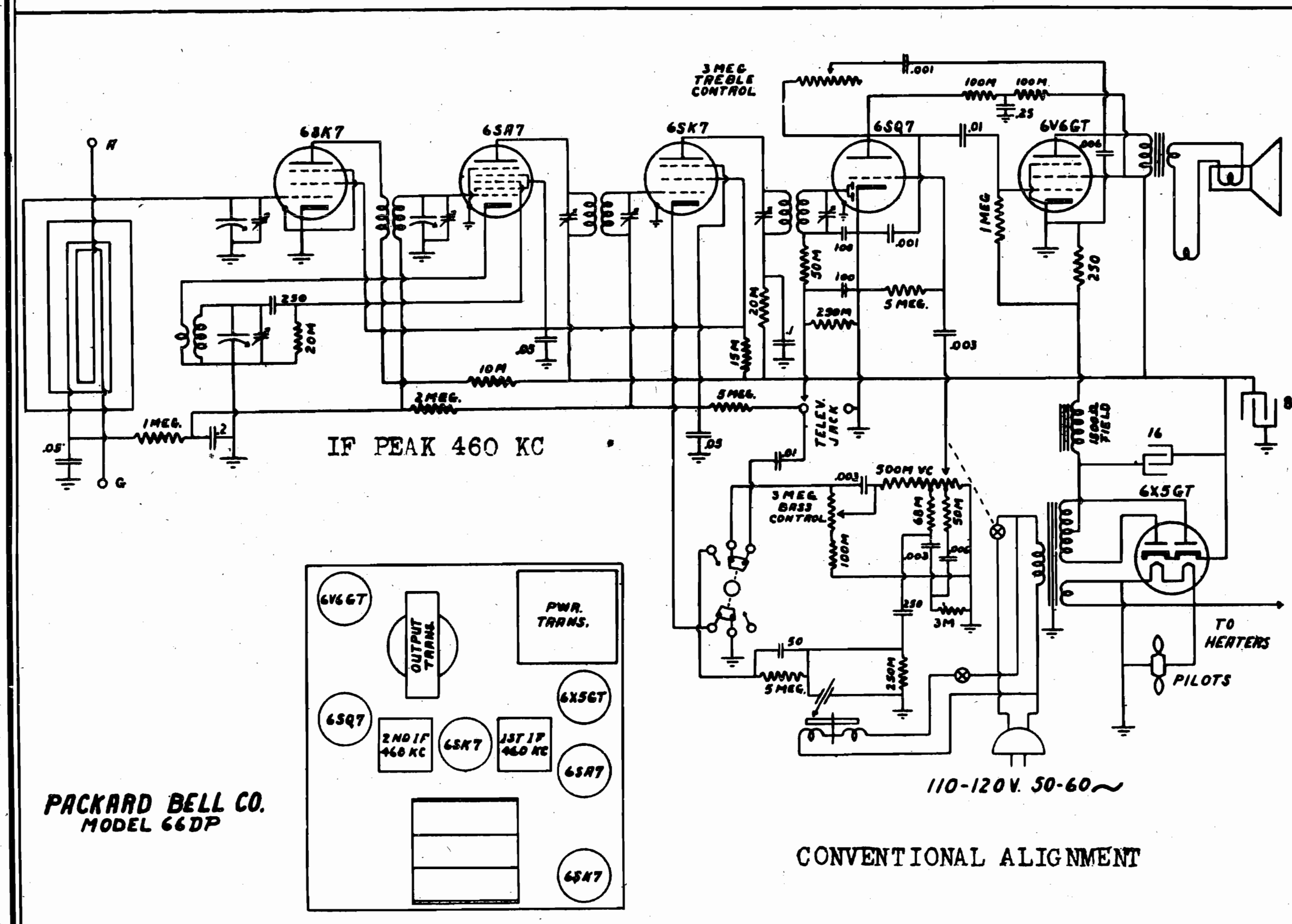
IF PEAK 460 KC

PACKARD BELL CO.
MODEL 57A
COMBINATION BATTERY AND AC-DC PORTABLE

PACKARD BELL CO.

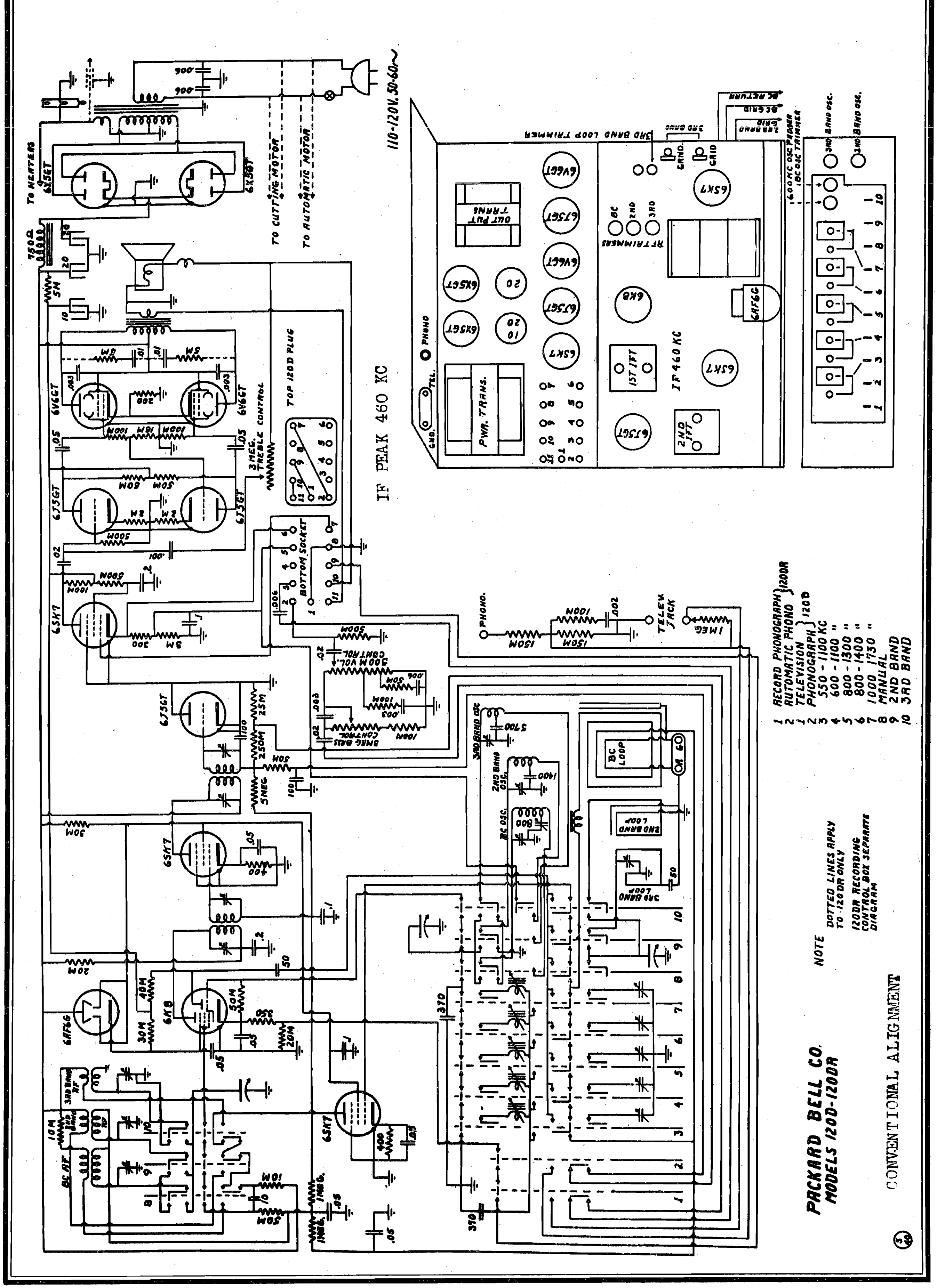
MODELS 66D, 66DP





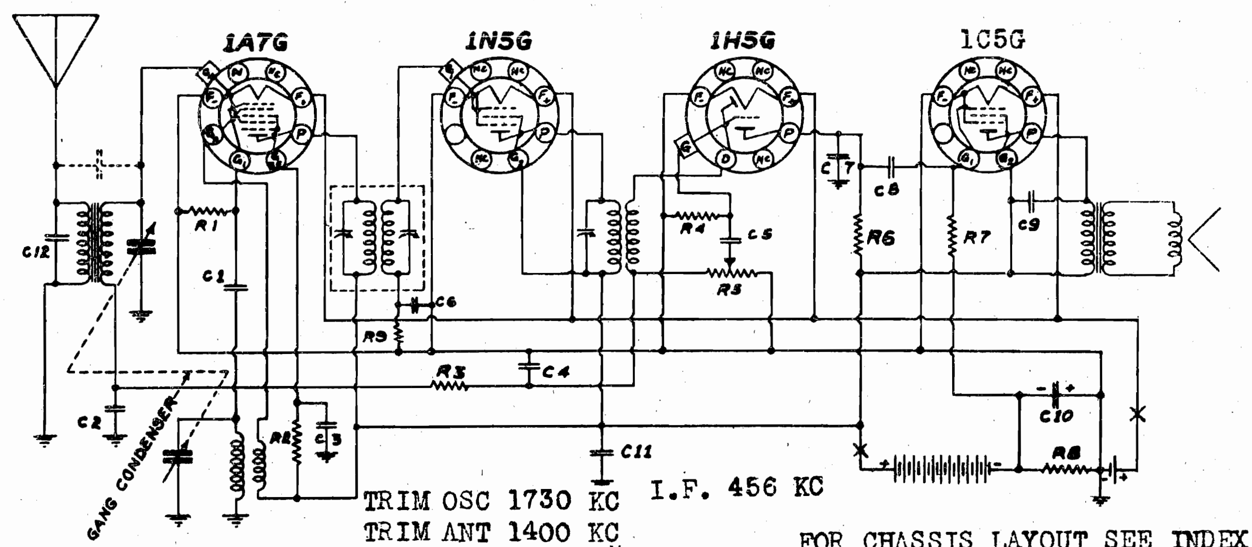
MODELS 120D, 120 DR

PACKARD BELL CO.



PARKER McCRORY MFG. CO.

1940 DeLuxe MODEL 4A
1939 ROYAL MODEL 4A
1939 MASTERPIECE 6C



TRIM OSC 1730 KC
TRIM ANT 1400 KC

I.F. 456 KC

FOR CHASSIS LAYOUT SEE INDEX

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

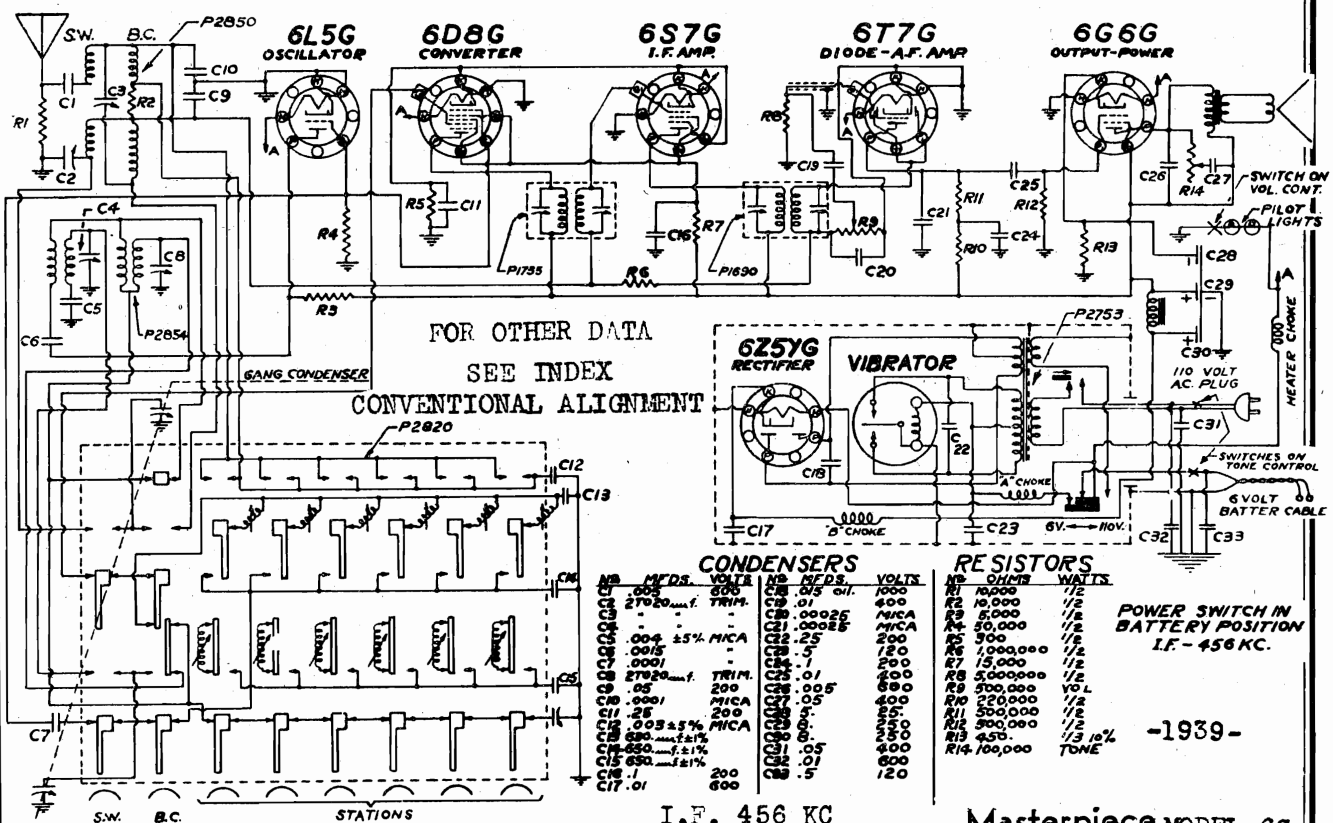
RESISTORS

Nº	OHMS	WATTS	Nº	OHMS	WATTS
R1	200,000	¼	R6	250,000	¼
R2	70,000	¼	R7	500,000	¼
R3	1 MEG.	¼	R8	600	¼
R4	2 MEG.	¼	R9	2 MEG.	¼
R5	500,000	VOL. CONTROL			

-1939-

Royal Model 4A

1Q5G used in place of 1C5G in the 1940 DeLuxe Model
CONVENTIONAL ALIGNMENT



FOR OTHER DATA
SEE INDEX
CONVENTIONAL ALIGNMENT

CONDENSERS

Nº	MFDS.	VOLTS	Nº	MFDS.	VOLTS
C1	.005	600	C18	.015 oil.	1000
C2	2TO20 mmf.	TRIM.	C19	.01	400
C3	-	-	C20	.00025	MICA
C4	-	-	C21	.00025	MICA
C5	.004 ±5%	MICA	C22	.25	200
C6	.0015	-	C23	.5	120
C7	.0001	-	C24	.1	200
C8	2TO20 mmf.	TRIM.	C25	.01	400
C9	.05	200	C26	.005	600
C10	.0001	MICA	C27	.05	400
C11	.25	200	C28	5.	25.
C12	.003±5%	MICA	C29	8.	250
C13	680 mmf.±1%		C30	8.	250
C14	650 mmf.±1%		C31	.05	400
C15	650 mmf.±1%		C32	.01	600
C16	.1	200	C33	.5	120
C17	.01	600			

RESISTORS

Nº	OHMS	WATTS
R1	10,000	1/2
R2	10,000	1/2
R3	5,000	1/2
R4	50,000	1/2
R5	300	1/2
R6	1,000,000	1/2
R7	15,000	1/2
R8	5,000,000	1/2
R9	500,000	VOL
R10	220,000	1/2
R11	500,000	1/2
R12	500,000	1/2
R13	450.	1/3 10%
R14	100,000	TONE

POWER SWITCH IN BATTERY POSITION
I.F. - 456 KC.

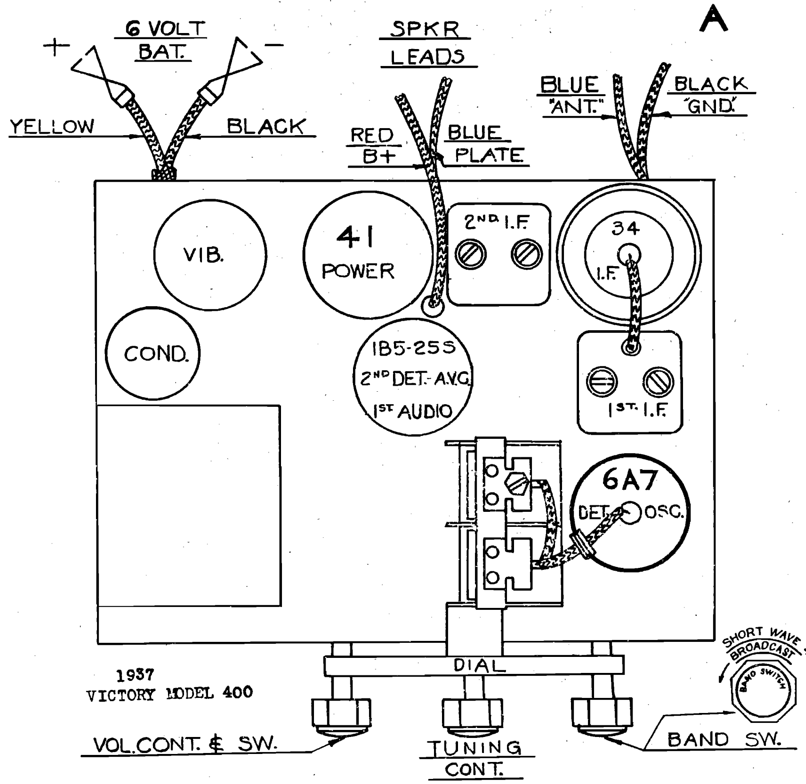
-1939-

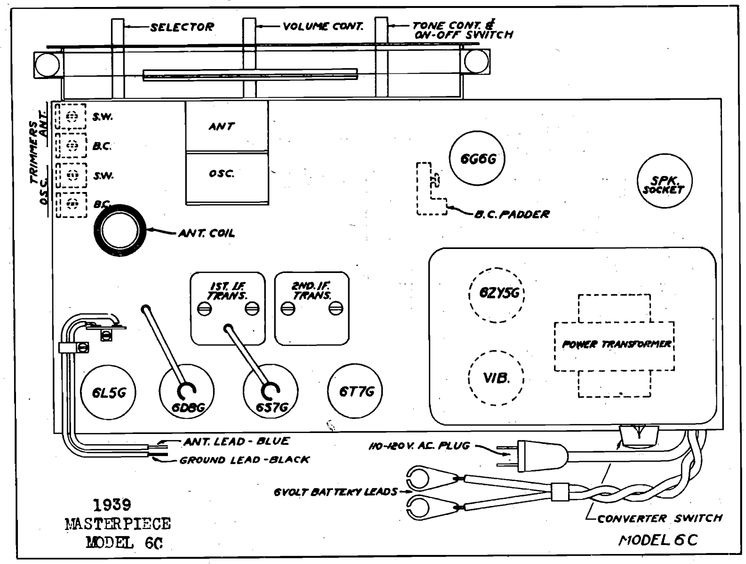
I.F. 456 KC

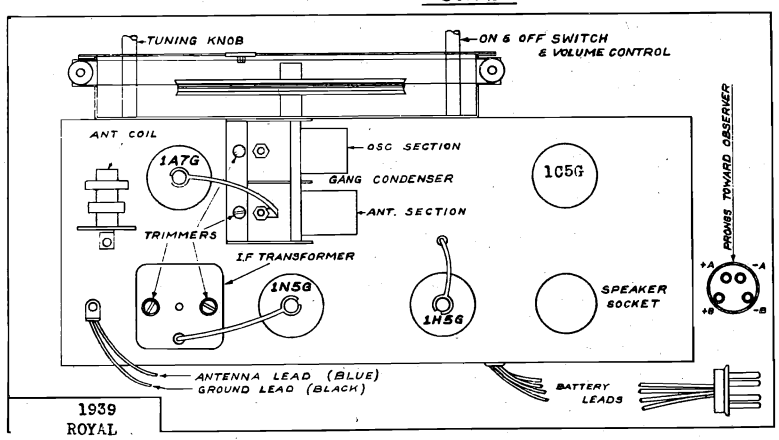
Masterpiece MODEL 6C

1939 ROYAL MODEL 4A
1939 MASTERPIECE 6C
1937 VICTORY MODEL 400

PARKER McCRORY MFG. CO.







PROCEDURE FOR SETTING UP

AUTOMATIC PUSH BUTTONS

1939
MASTERPIECE

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.

NOTE: It is advisable to retain the call letter sheet in case of station change later on.

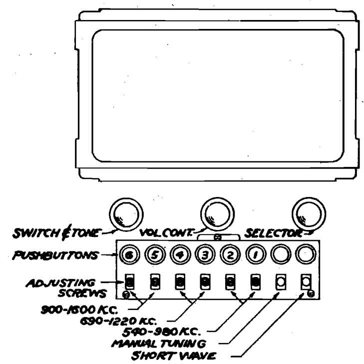
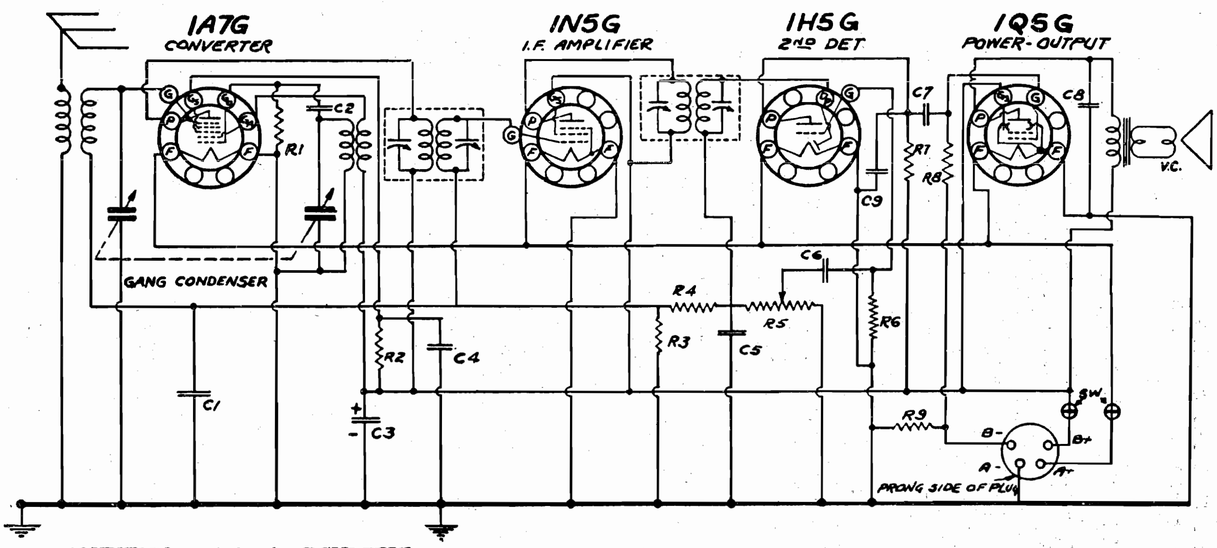


Fig. 1

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.

PARKER McCRORY MFG. CO.

1940 ROYAL MODEL 4J
1940 IMPERIAL TABLE MODEL 7C



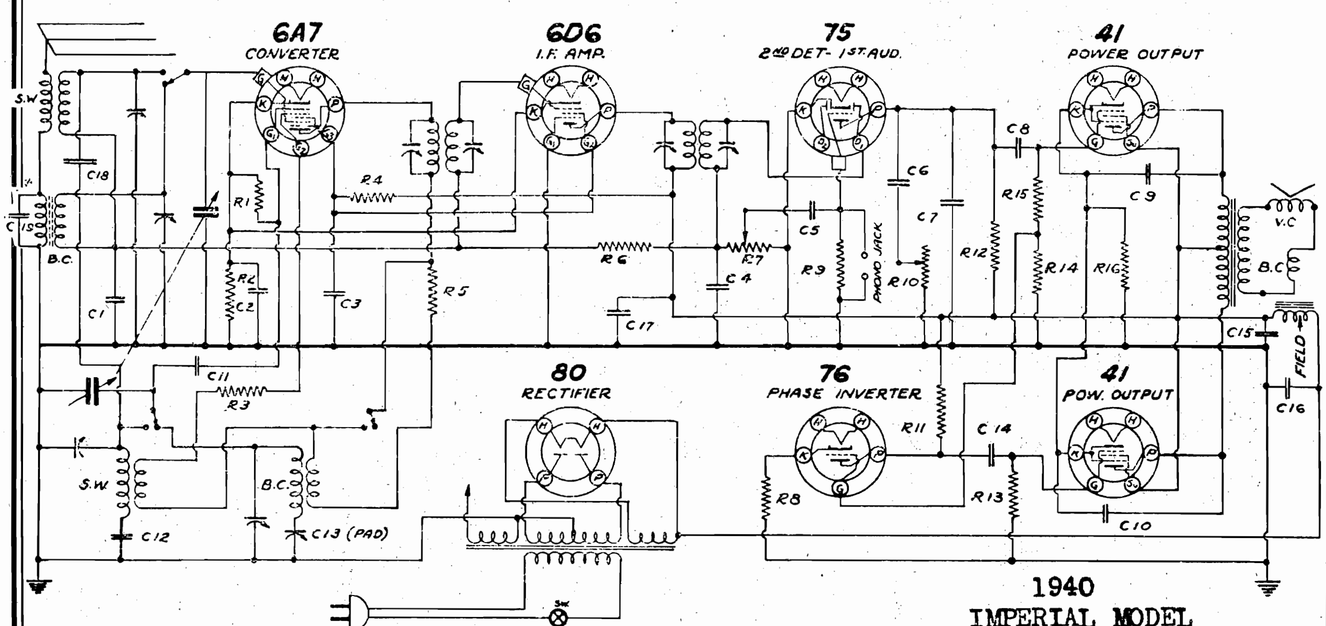
CONVENTIONAL ALIGNMENT - TRIM OSC 1730 KC, ANT 1400 KC

CAPACITORS						RESISTORS					
NO.	MFDS	VOLTS	NO.	MFDS	VOLTS	NO.	OHMS	WATTS	NO.	OHMS	WATTS
C1	.05	200	C6	.01	400	R1	200,000	1/2	R6	2,000,000	1/2
C2	.00005	MICA	C7	.01	400	R2	70,000	1/2	R7	500,000	1/2
C3	4.0 (ELECT.)	150	C8	.002	400	R3	2,000,000	1/2	R8	1,000,000	1/2
C4	.05	200	C9	.00025	MICA	R4	2,000,000	1/2	R9	440	1/2
C5	.00025	MICA				R5	500,000	V.C.			

1940
ROYAL MODEL 4J

I.F. 455 K.C.

CONVENTIONAL ALIGNMENT



1940
IMPERIAL MODEL
7C

I.F.- 455 K.C.

BAND SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF TUBE SOCKETS SHOWN
GANG CONDENSER CAPACITY 443 mmfds.

CAPACITORS						RESISTORS					
No.	MFDS	VOLTS	No.	MFDS	VOLTS	No.	OHMS	WATTS	No.	OHMS	WATTS
C1	.05	200	C11	.0001	MICA	R1	50,000	1/2	R11	50,000	1/2
C2	.25	200	C12	.004±5%	MICA	R2	200	1/2	R12	250,000	1/2
C3	.05	400	C13	300-600 mmfd	PADDER	R3	250	1/2	R13	500,000	1/2
C4	.00025	MICA	C14	.01	400	R4	20,000	1/2	R14	100,000	1/2
C5	.01	400	C15	10.0	350	R5	1,000	1/2	R15	400,000	1/2
C6	.005	600	C16	10.0	350	R6	2 MEG	1/2	R16	300	1/2
C7	.00025	MICA	C17	.05	400	R7	500,000	VOL. CON.			
C8	.01	400	C18	GIMMICK		R8	3,000	1/2			
C9	.005	600	C19	.0001	MICA	R9	.5 MEG	1/2			
C10	.005	600				R10	500,000	TONE CON.			

FOR OTHER DATA SEE INDEX

1940 IMPERIAL
TABLE MODEL 7C

PARKER McCRORY MFG. CO.

1940 IMPERIAL
CONSOLE MODEL 7H

SERVICE INFORMATION
1940 IMPERIAL TABLE MODEL 7C

SPEAKER (Part No. P3499) 6" Dynamic

Field resistance	1500 ohms
D.C. voice coil resistance	3.2 ohms
Voice coil impedance at 400 cycles	3.8 ohms

Voltages—Line 115 volts A.C. Power consumption 60 watts. Volume control maximum. Meter 20,000 ohms per volt.

6A7 tube

Plate (P) to ground	190 volts
Screen grid (G3) to ground	94 volts
Anode grid (G2) to ground	183 volts
Cathode (K) to ground	3½ volts

6D6 tube

Plate (P) to ground	190 volts
Screen grid (G2) to ground	94 volts
Cathode (K) to ground	3½ volts

75 tube

Plate (P) to ground	85 volts

76 tube

Plate (P) to ground	103 volts
Cathode (K) to ground	5 volts

41 tube

Plate (P) to ground	181 volts
Screen grid (G2) to ground	190 volts
Cathode (K) to ground	12 volts

80 tube

Filament (F) to ground	260 volts

Short Wave Antenna Coil (Part No. P3378)

Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, AVC; No. 2, Ant; No. 3, Grid; No. 4, Ground.

Primary—No. 2 and No. 4—Resistance .3 ohm
Secondary—No. 1 and No. 3—Resistance .07 ohm

Broadcast Antenna Coil (Part No. G6031)

Looking at the connection end in a clockwise direction starting at the mounting strip the terminals are: No. 1, AVC; No. 2, grid; No. 3, Ant.; No. 4, ground. No. 4 is grounded to the mounting strip.

Primary—No. 3 and No. 4—Resistance 27.1 ohms
Secondary—No. 1 and No. 2—Resistance 1.9 ohms

Short Wave Oscillator Coil (Part No. P3198)

Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, Plate; No. 2, B+; No. 3, Grid; No. 4, Pad.

Primary—No. 1 and No. 2—Resistance .4 ohm
Secondary—No. 3 and No. 4—Resistance .07 ohm

Broadcast Oscillator Coil (Part No. P3535)

Looking at the connection end in a clockwise direction starting at the mounting lug side (with dot) the connections are: No. 1, B+; No. 2, Grid; No. 3, Plate; No. 4, Pad.

Primary—No. 1 and No. 3—Resistance 1.1 ohms
Secondary—No. 2 and No. 4—Resistance 4.7 ohms

First I.F. Transformer (Part No. P3334)

Primary—Blue white, plate; red white B+.
Resistance 23.8 ohms
Secondary—White, grid; black white,
AVC—Resistance 24.1 ohms

Second I.F. Transformer (Part No. P2606)

Primary—Blue white, plate; red white B+.
Resistance 15.1 ohms
Secondary—White, grid; black white,
AVC—Resistance 11.8 ohms

Power Transformer (Part No. P3511)

Primary—115 volt, 60 cycle; black leads;
Resistance 7.4 ohms
Secondary—6.3 volt filament; black leads. (Sleeved). Resistance .25 ohm
Secondary—5 volt rectifier filament; yellow leads. Resistance .22 ohm
Secondary—High voltage; red leads.
Resistance 500.5 ohms
High voltage center tap; green lead.
Resistance to one side 242.7 ohms
Resistance to other side 258.4 ohms

SERVICE INFORMATION
1940 IMPERIAL CONSOLE MODEL 7H

TUNING DRIVE

If the drive shaft slips when using manual tuning, push this drive shaft toward the power transformer until it clicks and then loosen the two set screws holding the driven wheel in place on the gang condenser shaft. (See Fig. 2.) Move this wheel in or out on the shaft so it is 1/16 of an inch from the rubber ring on the drive shaft. CAUTION, do not turn it on the shaft as this would cause the dial pointer setting to be incorrect. Turning the drive shaft should now cause it to make a firm contact with the driven wheel and then, when this shaft is pushed toward the power transformer, if it swings free of the driven wheel, the adjustment is correct. The driven wheel should now be firmly secured to the gang condenser shaft by means of the set screws.

SPEAKER (Part No. P3388) 8" Dynamic

Field resistance	1400 ohms
D.C. voice coil resistance	2.3 ohms
Voice coil impedance at 400 cycles	2.5 ohms

Voltages—Line 115 volts AC. Power consumption 75 watts. Volume control maximum. Meter 1000 ohms per volt.

6A7 tube

Plate (P) to ground	195 volts
Screen grid (G3) to ground	95 volts
Anode grid (G2) to ground	187 volts
Cathode (K) to ground	3½ volts

6D6 tube

Plate (P) to ground	195 volts
Screen grid (G2) to ground	95 volts
Cathode (K) to ground	3½ volts

75 tube

Plate (P) to ground	75 volts

76 tube

Plate (P) to ground	100 volts
Cathode (K) to ground	5 volts

41 tube

Plate (P) to ground	184 volts
Screen grid (G2) to ground	196 volts
Cathode (K) to ground	13.5 volts

80 tube

Filament (F) to ground	302 volts

Short Wave Antenna Coil (Part No. P3378)

Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1 AVC; No. 2, Ant; No. 3, Grid; No. 4, Ground.

Primary—No. 2 and No. 4—Resistance .3 ohm
Secondary—No. 1 and No. 3—Resistance .07 ohm

Short Wave Oscillator Coil (Part No. P3198)

Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, Plate; No. 2, B+; No. 3, Grid; No. 4, Pad.

Primary—No. 1 and No. 2—Resistance .4 ohm
Secondary—No. 3 and No. 4—Resistance .07 ohm

Broadcast Oscillator Coil (Part No. P3535)

Looking at the connection end in a clockwise direction starting at the mounting lug side (with dot) the connections are: No. 1, B+; No. 2, Grid; No. 3, Plate; No. 4, Pad.

Primary—No. 1 and No. 3—Resistance 1.1 ohms
Secondary—No. 2 and No. 4—Resistance 4.7 ohms

First I.F. Transformer (Part No. P 3334)

Primary—Blue white, plate; red white B+.
Resistance 23.8 ohms
Secondary—White, grid; black white,
AVC—Resistance 24.1 ohms

Second I.F. Transformer (Part No. P 2606)

Primary—Blue white, plate; red white B+.
Resistance 15.1 ohms
Secondary—White, grid; black white,
AVC—Resistance 11.8 ohms

Power Transformer (Part No. P 3329)

Primary—115 volt, 60 cycle; black leads;
Resistance 7.4 ohms
Secondary—6.3 volt filament; black leads. (Sleeved). Resistance .25 ohm
Secondary—5 volt rectifier filament; yellow leads. Resistance .22 ohm
Secondary—High voltage; red leads.
Resistance 500.5 ohms
High voltage center tap; green lead.
Resistance to one side 242.7 ohms
Resistance to other side 258.4 ohms

Loop Antenna

Since the loop antenna acts also as the broadcast antenna coil the set will not operate properly with the loop antenna disconnected.

ALIGNMENT DATA

I.F. ALIGNMENT

Adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Adjust the signal generator to 1730 KC and connect the output to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the oscillator trimmer to receive this signal. The oscillator and antenna trimmers may be reached by removing the dial escutcheon (See index for trimmer locations.) The next step is to set the signal generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. Next, re-set the dial pointer on the receiver and the signal generator to 600 KC. Slowly increase or decrease the oscillator padding condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.

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.

SHORT WAVE BAND ALIGNMENT

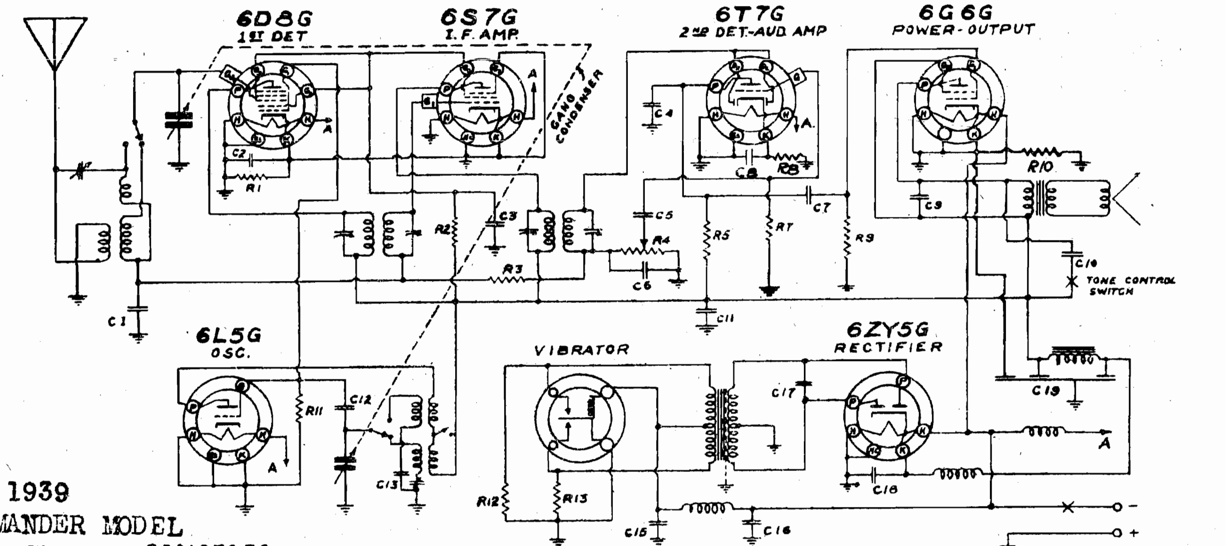
The short wave band is adjusted by setting the signal generator to 18100 KC and connecting the output to the antenna lead through a 400 ohm resistor. Set the gang at minimum and adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust 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.

ALIGNMENT- MODEL 7H

Because of the built-in loop antenna, it is necessary to align this receiver while in the cabinet. Otherwise the procedure is the same as for the Model 7C described above. Trim the broadcast band oscillator at 1550 KC instead of 1730 Kc.

PARKER McCRORY MFG. CO.

1939 COMMANDER MODEL 6D
1940 IMPERIAL CONSOLE MODEL 7H



1939
COMMANDER MODEL
6D

RESISTORS

NO.	OHMS	WATTS	SPL. TOL.
1	500	1/4	± 10%
2	15,000	1/4	
3	1 MEG	1/4	
4	500,000	1/4	(VOL. CON.)
5	150,000	1/4	
7	1,000,000	1/4	
8	10,000	1/4	
9	400,000	1/4	
10	500	1/4	
11	40,000	1/4	
12	150	1/4	
13	150	1/4	

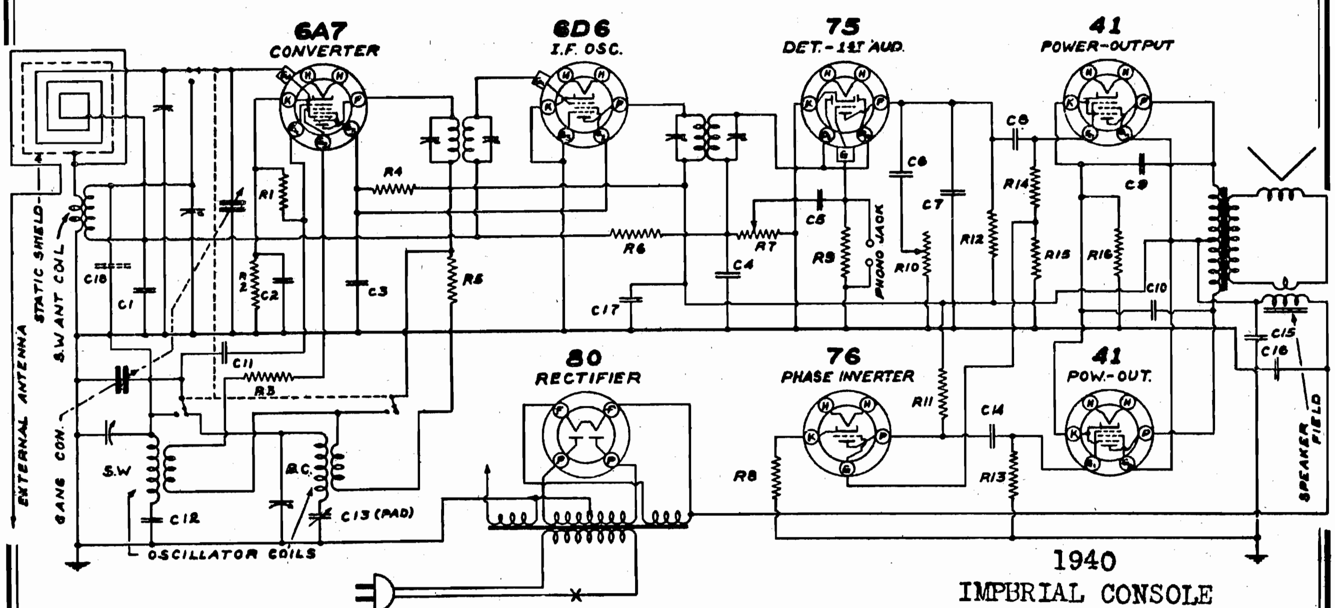
CONDENSERS

NO.	CAP.-MFD.	TYPE	NO.	CAP.-MFD.	TYPE
1	.05	200 V.	11	.1	200 V.
2	.25	200 V.	12	.00005	MICA
3	.1	200 V.	13	.004 (±5%)	MICA
4	.00025	MICA	14		
5	.01	400 V.	15	.5	50 V.
6	.00025	MICA	16	.5	50 V.
7	.01	400 V.	17	.015	1000 V.
8	.5	200 V.	18	.01	400 V.
9	.005	600 V.	19	8-8	200 W.V.
10	.02	400 V.		5	25 W.V.

SWITCHES IN BROADCAST POSITION

I.F. 456 K.C.

FOR OTHER DATA
SEE INDEX



1940
IMPERIAL CONSOLE
MODEL 7H

CAPACITORS

NO.	MFDS.	VOLTS	NO.	MFDS.	VOLTS
C1	.05	200	C10	.005	600
C2	.25	200	C11	.0001	MICA
C3	.05	400	C12	.004 ±5%	MICA
C4	.00025	MICA	C13	300-600 μμfds.	
C5	.01	400	C14	.01	400
C6	.005	600	C15	10.0	350
C7	.00025	MICA	C16	10.0	350
C8	.01	400	C17	.05	400
C9	.005	600	C18	GIMMICK	

RESISTORS

NO.	OHMS	WATTS	NO.	OHMS	WATTS
R1	50,000	1/2	R10	500,000	TONE CON.
R2	300	1/2	R11	50,000	1/2
R3	250	1/2	R12	250,000	1/2
R4	20,000	1/2	R13	500,000	1/2
R5	1,000	1/2	R14	400,000	1/2
R6	2 MEG.	1/2	R15	100,000	1/2
R7	500,000	VOL. CON.	R16	300	1/2
R8	3,000	1/2			
R9	5 MEG.	1/2			

I.F. - 456 K.C

SWITCHES SHOWN IN BROADCAST POSITION

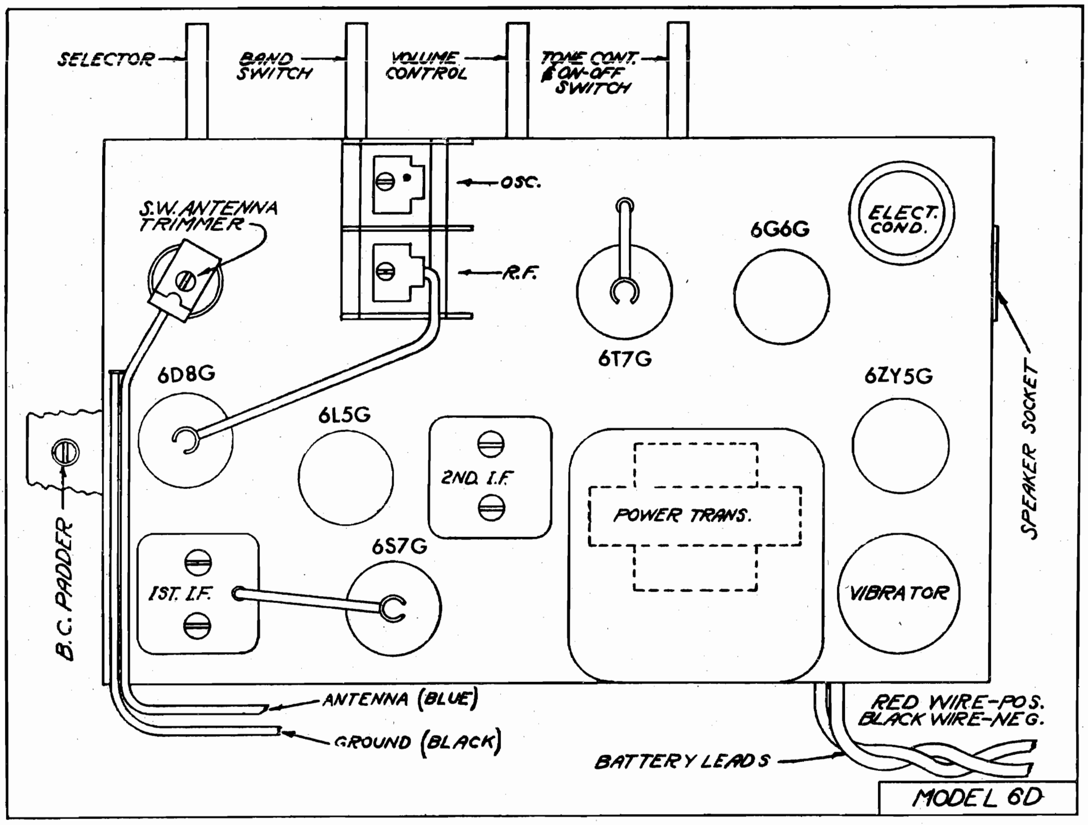
BOTTOM VIEW OF SOCKETS SHOWN.

GANG CONDENSER CAPACITY 443 μμfds.

FOR OTHER DATA
SEE INDEX

1939 COMMANDER
MODEL 6D

PARKER McCRORY MFG. CO.



CHASSIS LAYOUT
1939 COMMANDER MODEL 6D

ALIGNMENT DATA AND SERVICING

1939 COMMANDER MODEL 6D

GENERAL DATA The alignment of this receiver requires the use of a test oscillator which will cover the frequencies of 456, 600, 1400, 1730, 6000, 16,000 and 18,100 KC and an output meter which is to be connected across the primary or secondary of the output transformer. 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, the Short Wave Band 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 of test oscillator or signal generator 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 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 Broadcast "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 Broadcast "antenna" trimmer to a maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver.

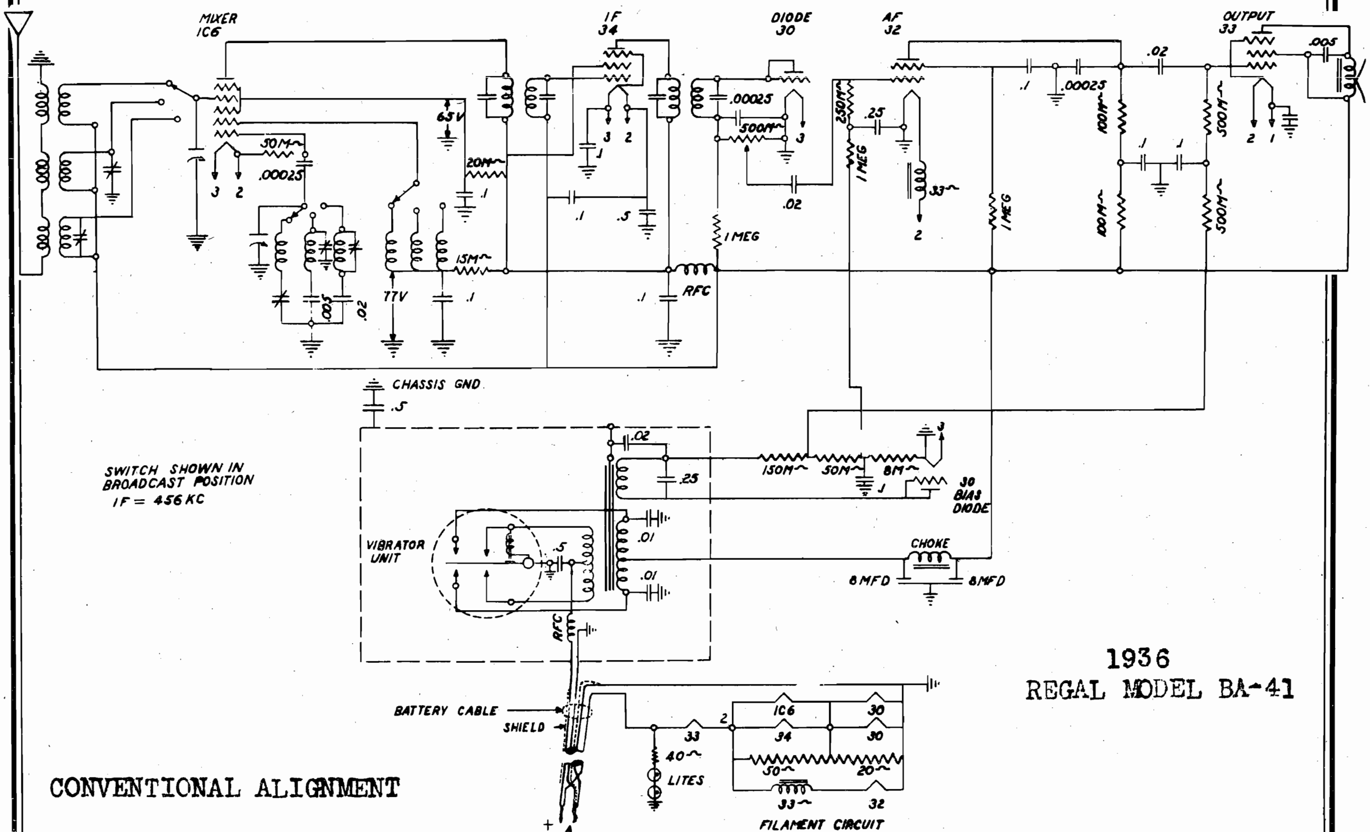
Note: Approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across 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 antenna. 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.

SHORT WAVE BAND ALIGNMENT The short wave band is adjusted by setting the generator to 18,100 KC and tuning in the signal. Adjust the "short wave antenna" 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.

1936 REGAL MODEL BA-41

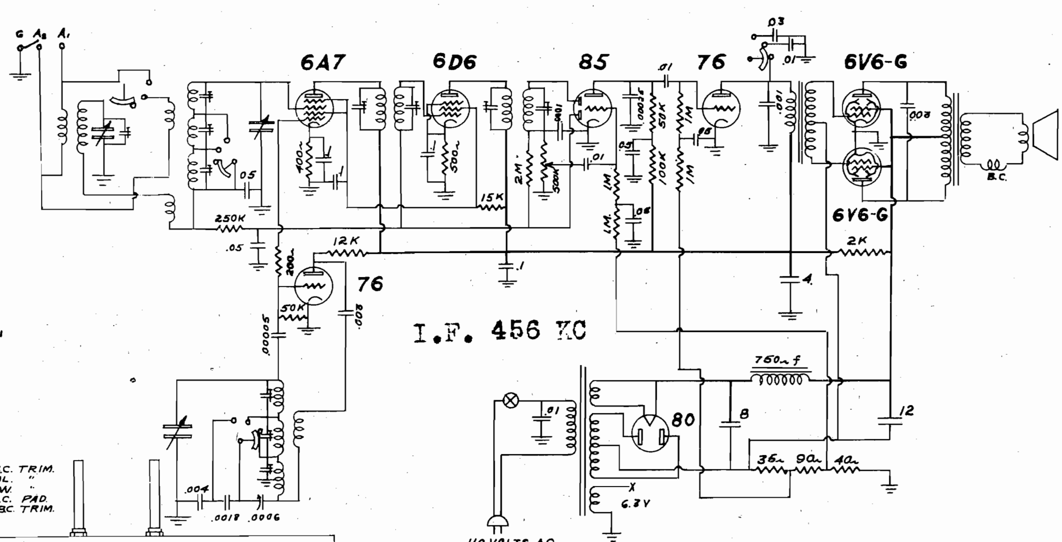
PARKER McCRORY MFG. CO.

1936 ROYAL MODEL 630



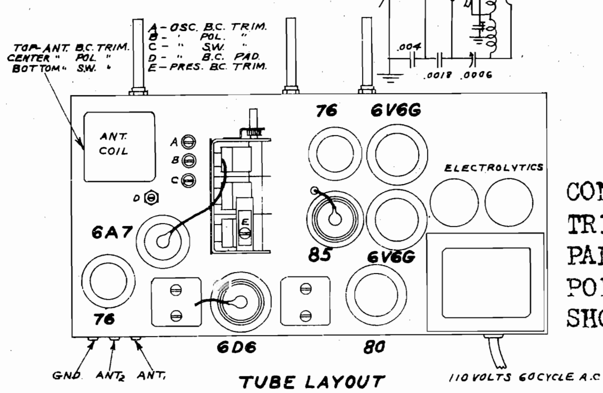
1936
REGAL MODEL BA-41

CONVENTIONAL ALIGNMENT



1938
ROYAL MODEL
630

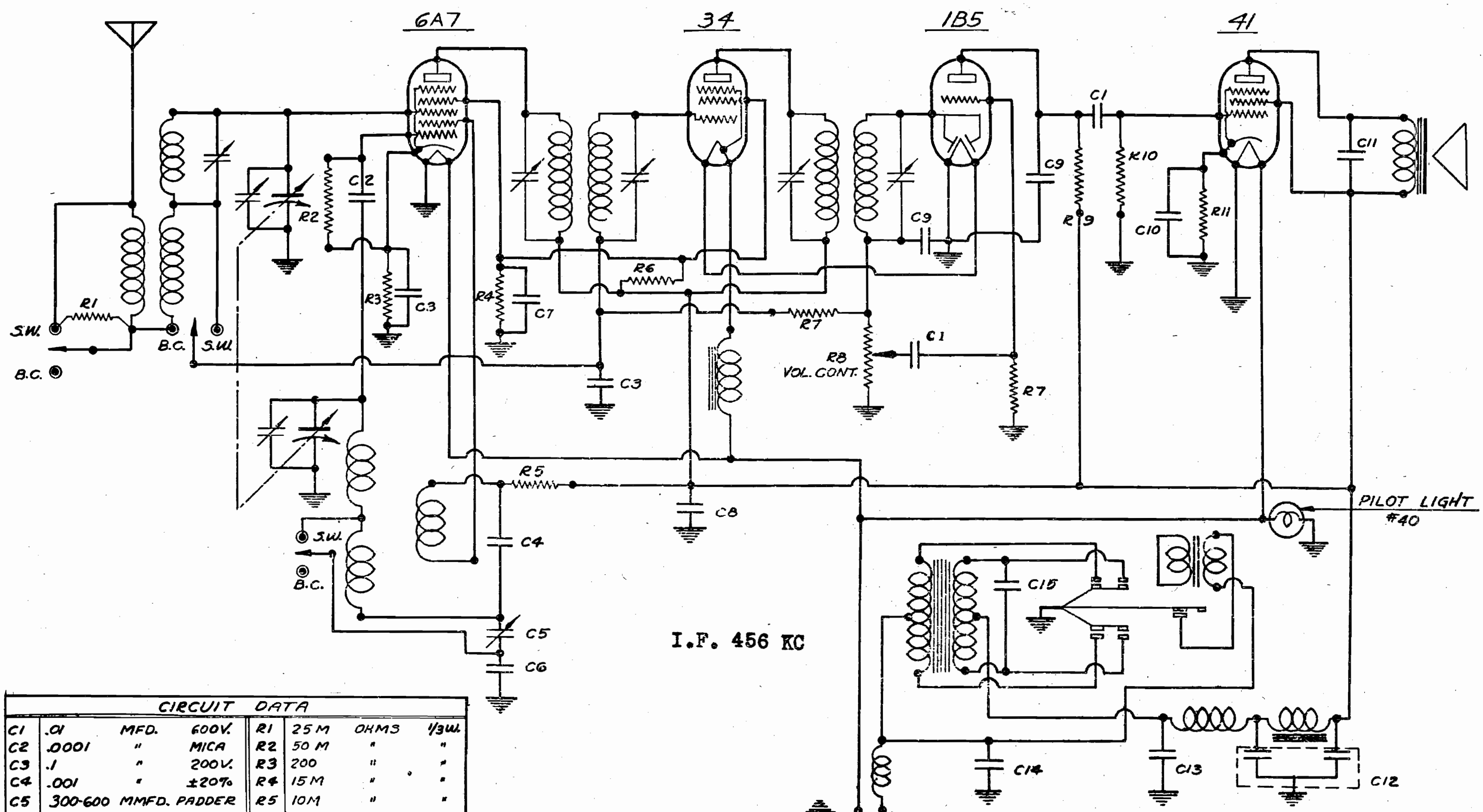
I.F. 456 KC



CONVENTIONAL I.F. ALIGNMENT
TRIM OSC(BC) 1700 KC. TRIM ANT(BC) 1400 KC
PAD(BC) 600 KC.
POLICE BAND-PEAK TRIMMER B at 6 MC
SHORT-WAVE BAND- PEAK C AND ANT-SW 18MC

1937 VICTORY
MODEL 400

PARKER McCRORY MFG. CO.



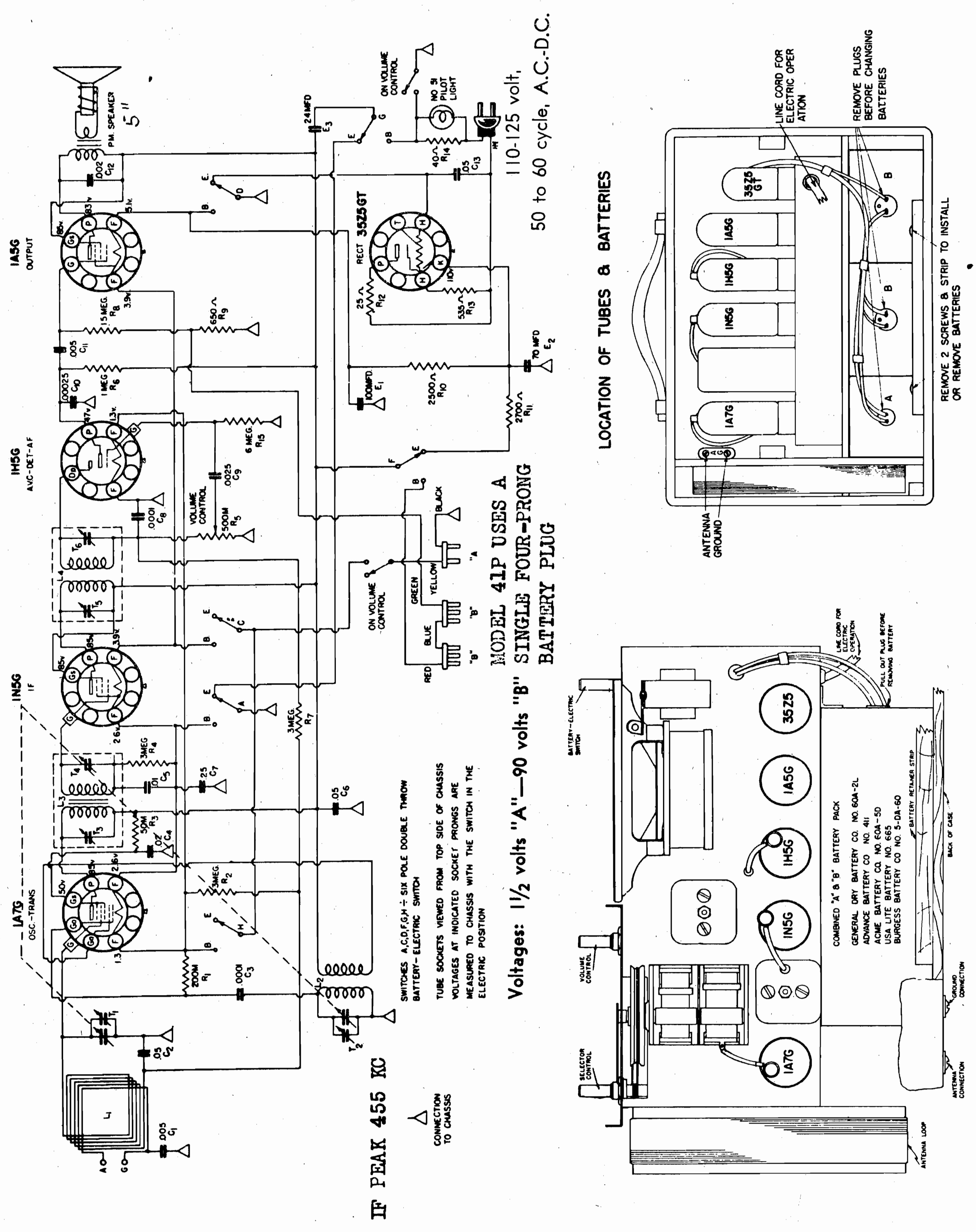
CIRCUIT	DATA						
C1	.01	MFD.	600V.	R1	25M	OHMS	1/3W.
C2	.0001	"	MICA	R2	50 M	"	"
C3	.1	"	200V.	R3	200	"	"
C4	.001	"	±20%	R4	15M	"	"
C5	300-600	MMFD.	PADDER	R5	10M	"	"
C6	.002	MFD.	±5%	R6	10M	"	1/2W.
C7	.1	"	400V.	R7	1 MEGOHM		1/3W.
C8	.25	"	400V.	R8	500M	OHM	VOL. CONT.
C9	.00025	"	MICA	R9	100M	OHMS	1/3W.
C10	12	"	25V.	R10	500M	"	"
C11	.006	"	600V.	R11	800	"	"
C12	8X8	"	150V.				
C13	.01	"	400V.				
C14	.5	"	180V.				
C15	.0075	"	1000V.				

FOR TUBE LAYOUT
SEE INDEX

CONVENTIONAL ALIGNMENT PROCEDURE
SEE 1938 MODEL PARMAK MASTERPIECE
TRIM BC OSC 1700 KC, TRIM ANT 1400 KC
POLICE BAND- PEAK ANT TRIMMER 6MC

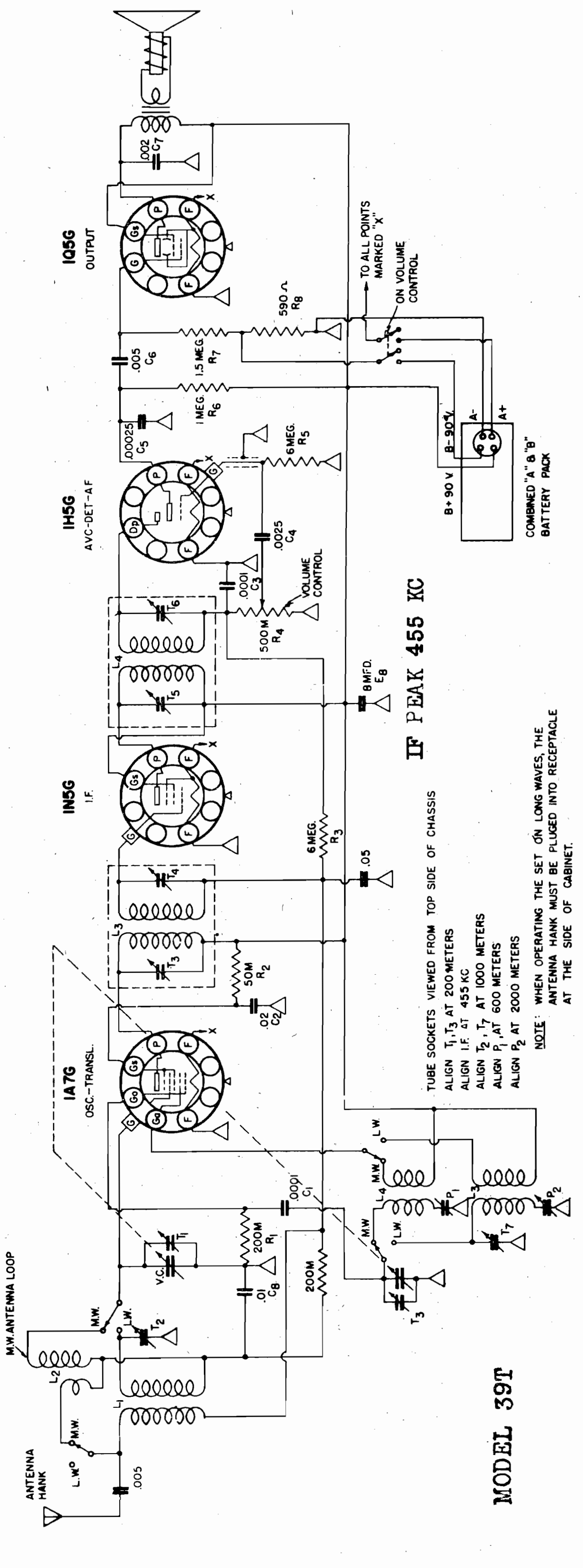
MODEL 41P
MODEL 342P

PATHE

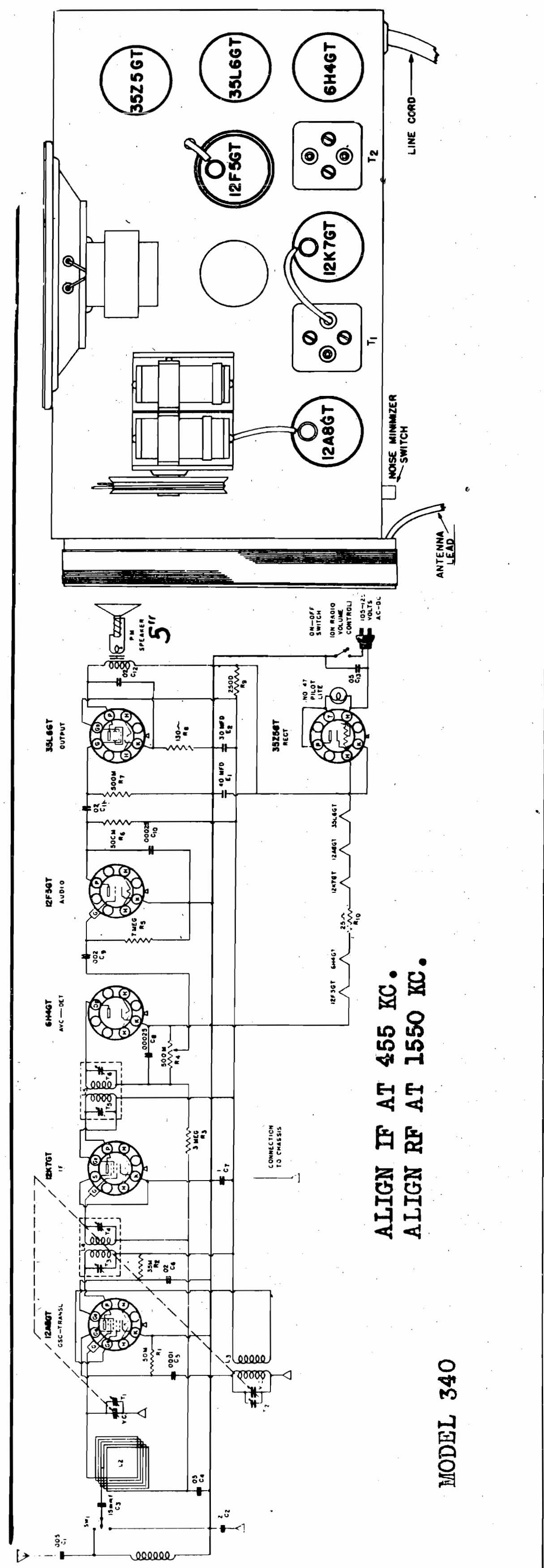


MODEL 39T
MODEL 340

PATHE



MODEL 39T

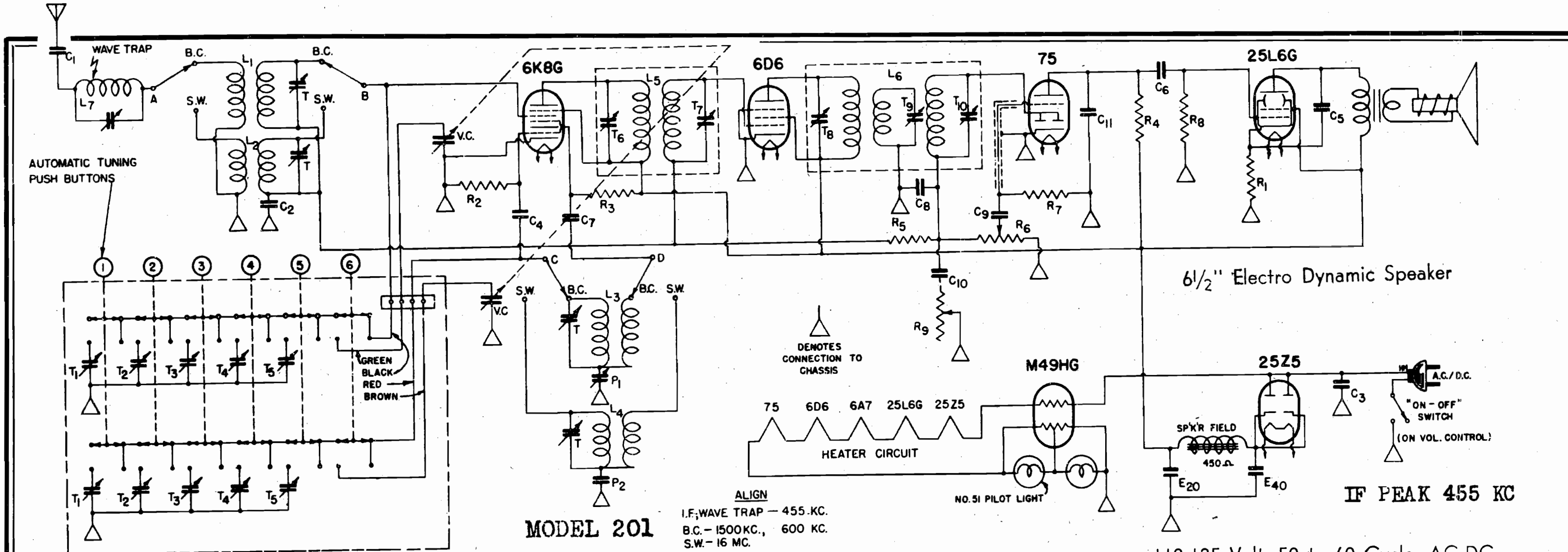


ALIGN IF AT 455 KC.
ALIGN RF AT 1550 KC.

MODEL 340

MODEL 102
MODEL 201

PATHE



MODEL 201

ALIGN
I.F. WAVE TRAP — 455 KC.
B.C. — 1500 KC., 600 KC.
S.W. — 16 MC.

110-125 Volt, 50 to 60 Cycle, AC-DC

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	

SWITCHES - A, B, C, D, - FOUR POLE DOUBLE THROW WAVE BAND SWITCH

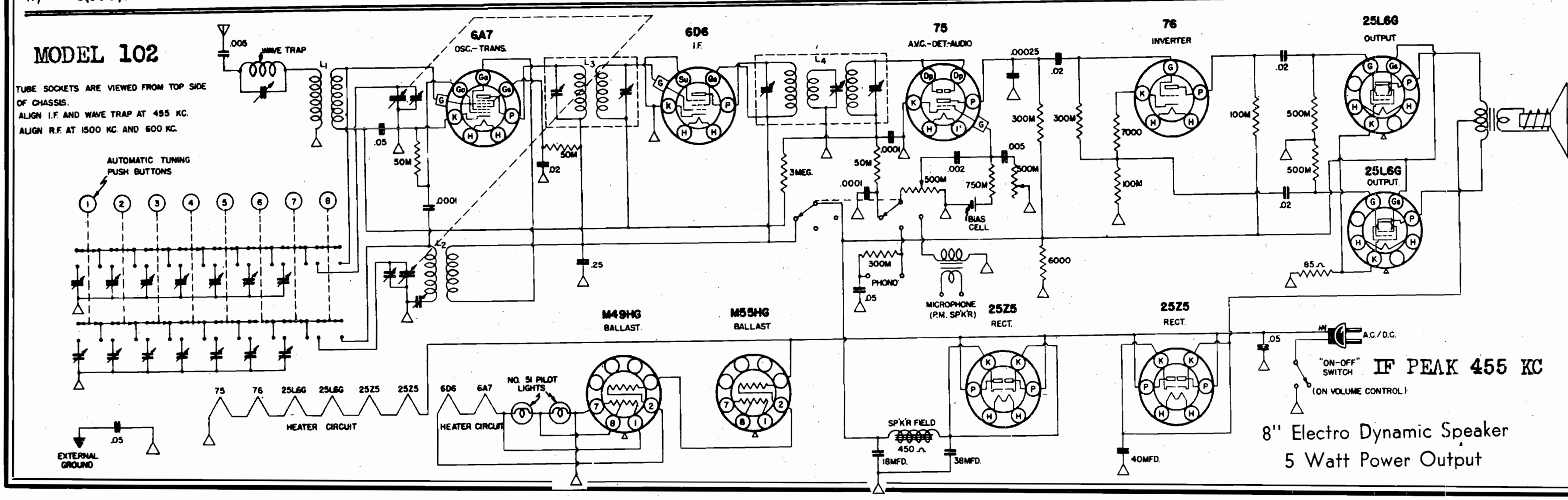
L_1 - B.C. ANTENNA COIL
L_2 - S.W. ANTENNA COIL
L_3 - B.C. OSCILLATOR COIL
L_4 - S.W. OSCILLATOR COIL
L_5 - 455 KC. INPUT I.F.
L_6 - 455 KC. TRIPLE TUNED OUTPUT I.F.
L_7 - 455 KC. WAVE TRAP

P_1 - 500 MMF. MAXIMUM PADDER
P_2 - 3800 MMF. FIXED PADDER

E_{20} - 20 MFD. 150 VOLTS
E_{40} - 40 MFD " "

T - 3-35 MMF. TRIMMER

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 -	.01	-	"
C_8 -	.00025	-	MICA
C_9 -	.002	-	200 V.
C_{10} -	.005	-	400 V.
C_{11} -	.00025	-	MICA

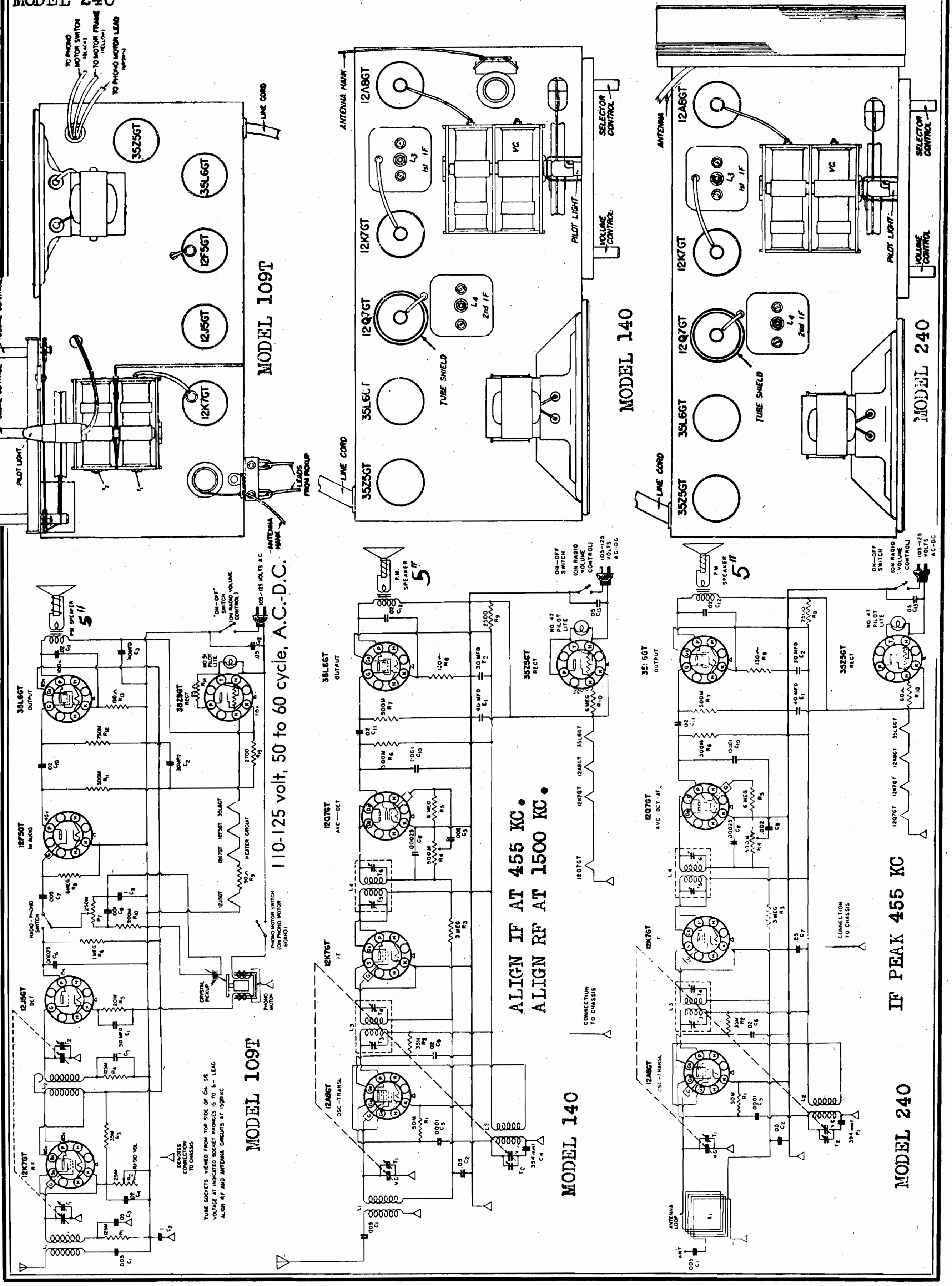


MODEL 102

TUBE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS.
ALIGN I.F. AND WAVE TRAP AT 455 KC.
ALIGN R.F. AT 1500 KC. AND 600 KC.

MODEL 109T
MODEL 140
MODEL 240

PATHE



PHILCO RADIO & TELEVISION CORP.

SEE MODELS BELOW

MODELS TH-9, TH-18, TH-22, PT-25 (121-122); PT-27 (121-122) PT-29-31-37-38-39-45-47-49-51-53

CONNECTING ALIGNING INSTRUMENTS

AUDIO OUTPUT METER: If an aligning indicator of this type is used, connect it to the plate and screen terminals of the output tube.

VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an aligning indicator, make either of the following connections:

1—Attach the negative terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to (B—) of the receiver. (Cathode 7C6)

2—An aligning adaptor, Philco Part No. 45-2767 can be obtained from your Philco Distributor for use with the vacuum tube voltmeter. To use the adaptor, remove the second detector 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 vacuum tube voltmeter to the black wire of the adaptor.

SIGNAL GENERATOR: When adjusting the I. F. padders, the high side of the signal generator is connected through a .004 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis. It may be necessary when adjusting these models to reverse the power plug to eliminate hum.

The R. F. and oscillator padders are aligned with the high side of the signal generator connected to the antenna of the receiver through a 100 mmfd. condenser.

After connecting the aligning instruments, adjust the compensators on all models in the order as shown in the tabulation below. The first and second I. F. transformers in all models are located on the top and bottom sections of the chassis respectively. The "antenna" and "oscillator" padders are located on the tuning condenser.

Models PT-25-27-29-31-39-45-47-49-51

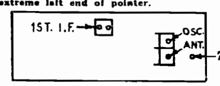
Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Condenser	470 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max.	1st & 2nd I. F.	Push in "Dial" button on push-button models
2	Ant. Ter.	1700 K. C.	1700 K. C.	Vol. Max.	"Osc."	Note A and B
3	Ant. Ter.	1500 K. C.	1500 K. C.	Vol. Max.	"Ant."	

Models TH-18, TH-18E, PT-37-38-53

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Condenser	455 K. C.	Tuning Cond. Closed	Vol. Max. Range Sw. Brdcst.	1st & 2nd I. F.	
2	Aerial with 400 ohm Dummy	18 M. C.	18 M. C.	Range Sw. Brdcst.	3B, 3A on Tuning Condenser	
3	Aerial with 100 mmfd Dummy	1500 K. C.	1500 K. C.	Range Sw. Brdcst.	13 Shunt Padder	
4	Aerial with 100 mmfd Dummy	580 K. C.	580 K. C.	Range Sw. Brdcst.	13 Series Padder	Roll Tuning Conds. when Adjusting Padder
5	Aerial with 100 mmfd Dummy	1500 K. C.	1500 K. C.	Range Sw. Brdcst.	13 Shunt Padder	

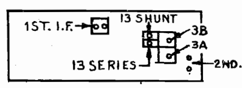
NOTE A—DIAL CALIBRATION: The dial pointers are adjusted by closing the tuning condenser (plates fully meshed) and setting the pointers slightly below the top edge of the brown center line at the extreme left end of pointer.

NOTE B—The Police Band on Models PT-29-31-49 and 51 is automatically adjusted when the "Brdcst" Band is adjusted.



PADDER LOCATIONS
Models PT-25-27-29-31-39-45-47-49-51

PADDER LOCATIONS
Models TH-18, TH-18E, PT-37-38-53



MODELS TH-14, TH-15, TH-16, TH-17, PT-26-28-33-41 (121-122); 46-48-50-57, PT-61 (121-122); and 65-66-69 (121-122)

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Condenser .004 mfd. Dummy	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max.	1st and 2nd I. F. Trans.	Push in "Dial" Button on Push-Button Models
2	Ant. Terminal on loop 100 mmfd. Dummy Note B	1500 K. C.	1500 K. C.	Vol. Max.	"Osc." "Ant."	Note A

NOTE A—DIAL CALIBRATION: The dial pointers are adjusted by closing the tuning condenser (plates fully meshed) and setting the pointers slightly below the top edge of the brown center line at the extreme left end of pointer.

NOTE B—Models PT-26, PT-28, PT-46, PT-48: Aerial padder must be adjusted with the loop connected and the set assembled in cabinet. The aerial connection on these models is the wire at the rear of the tuning condenser which is attached to the chassis. Remove wire lug from chassis and connect the 100 mmfd. condenser.

MODELS TP-20, TP-21, PT-35-36-43, Codes 121-122; and 55-59-67

Procedure PT-35 and PT-59

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Condenser .004 mfd. Dummy	470 K. C.	Tuning Condenser Closed	Vol. Max.	1st and 2nd I. F. Trans.	Press in "Dial" Button on Push-Button Models
2	Ant. Terminal 100 mmfd. Dummy	1720 K. C.	Note A	Vol. Max.	Osc.	Note A
3	Ant. Terminal 100 mmfd. Dummy	1500 K. C.	Note B	Vol. Max.	Ant.	Note B

Procedure TP-20, PT-43 (121, 122)-36-55-67

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Condenser .004 mfd. Dummy	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max.	1st and 2nd I. F. Trans.	Press in "Dial" Button on Push-Button Models
2	Ant. Terminal on Back of Loop .100 mmfd. Dummy	1600 K. C.	Note A	Vol. Max.	Osc.	Note A
3	Ant. Terminal on Back of Loop .100 mmfd. Dummy	1500 K. C.	Note B	Vol. Max.	Ant.	Note B Note C

NOTE A — Turn the tuning condenser to the extreme high frequency position (all plates out of mesh). Insert a .064 (four thousandths) gauge between the stationary and rotor plates of the oscillator condenser (end where both sections enter). If the gauge is not handy, a piece of bond writing paper can be used. After inserting gauge, turn the rotor toward the low frequency end so that both rotor and stator touch gauge. Then remove gauge, being careful not to disturb condenser setting. Adjust "oscillator" padder for maximum output with the 1600 K. C. signal or 1720 K. C. signal indicated in the tabulation.

NOTE B — Turn signal generator to 1500 K. C. and tune receiver tuning condenser for maximum reading on this signal, then adjust the antenna padder for maximum output.

Place set in cabinet so that the tuning arm on the tuning condenser engages the dial pointer on the cabinet. After placing receiver in the cabinet and it is found that the dial pointer does not track properly with station signals, the dial can be calibrated as follows: Set the signal generator to 900 K. C. and tune receiver until signal shows maximum reading on the output meter. The dial pointer is then set to this signal by inserting a screw driver to the adjustment screw on the tuning condenser pulley. Loosen screw and slightly turn dial so that it reads 900 K. C. then retighten screw. When doing this, however, precaution should be taken so that the tuning condenser is not disturbed while dial is being adjusted and screw is being tightened or loosened.

In Models PT-36 and PT-43, Code 122, the dial pointer is simply pushed onto the tuning condenser shaft, and does NOT require the adjustment as given in the paragraph above.

NOTE C — Model 36 antenna padder must be adjusted with the loop connected and assembled in the cabinet.

SETTING AND OPERATING ELECTRIC PUSH-BUTTON TUNING

MODELS TP-21, PT-45-46-47-48-57-65 and 67 PT-49, PT-51, PT-59, TH-15, AND TH-17

Select five of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Place the call letters in the windows below the buttons, making sure that each respective button covers the frequency of the station for which it is to be used. The frequencies of the popular stations in your vicinity may be found by consulting any station list. The frequency range of the buttons and corresponding padders is as follows:

Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range	Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1 2	Ant. Osc.	1	540 to 1030 kilocycles	7 8	Ant. Osc.	4	900 to 1470 kilocycles
3 4	Ant. Osc.	2	650 to 1100 kilocycles	9 10	Ant. Osc.	5	1160 to 1600 kilocycles
5 6	Ant. Osc.	3	740 to 1240 kilocycles			6	Dial

The left-hand button looking at the front of the cabinet corresponds to the two right-hand padder screws looking at the rear and covers the lowest frequency range.

With the Dial button depressed, tune in the station whose call letters appear above the left-hand button. Then depressing the left-hand button, tune in this station by rotating the No. 2 "OSC" screw (next to the right end of the unit looking at the rear of the chassis.) (Note: Inherent characteristics of these padders may cause some of them to cover a lower range than required to cover the broadcast band. This may cause the radio to howl or flutter when a station button is depressed. To correct this, loosen the "ANT" padder corresponding to the depressed station button). Turn the "OSC" screw slowly and listen carefully or the station signal may be passed without hearing it. After the "OSC" screw has been adjusted for maximum volume, the corresponding "ANT" screw should be adjusted for maximum. For some stations, it may be necessary to re-adjust the "OSC" screw after the "ANT" screw has been set. Switching from the "Dial" to the automatic push button will enable you to make sure you have the correct station tuned in. When the first station has been set, the same procedure should be followed for the remaining buttons, first tuning in the desired station by means of the "Dial" control, then adjust the push-button.

To tune the radio with the "Push-Buttons", simply press in the button which is under the call letters of the desired station. Your station will be received instantly. The volume of the program may be controlled with the manual volume control.

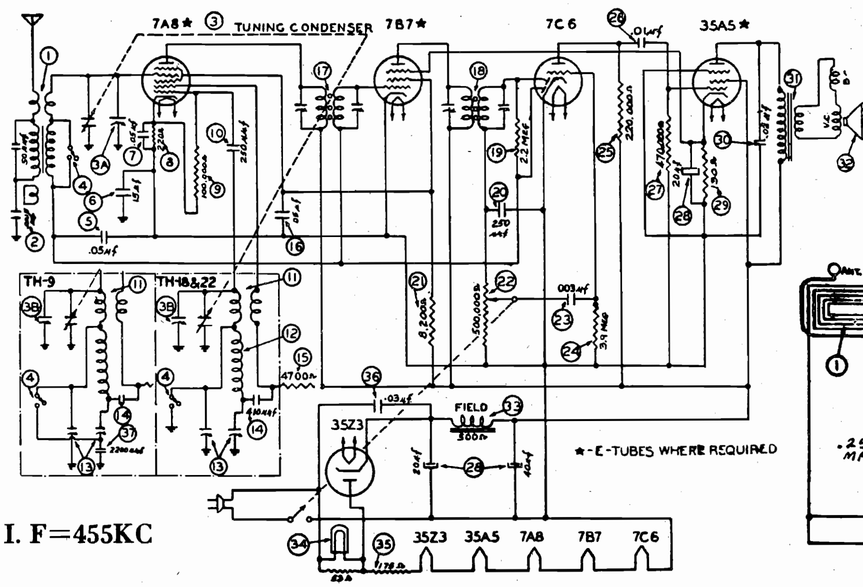
While the above procedure is satisfactory in setting up push-buttons for stations, a very accurate adjustment can be obtained with a vacuum tube voltmeter. The instructions for using a vacuum tube voltmeter will be found below under "Using Vacuum Tube Voltmeter for Aligning Compensators and Adjusting Push-Buttons".

MODELS TH-9, TH-18, TH-22
MODELS TH-14, TH-16
MODEL TP-20

PHILCO RADIO & TELEVISION CORP.

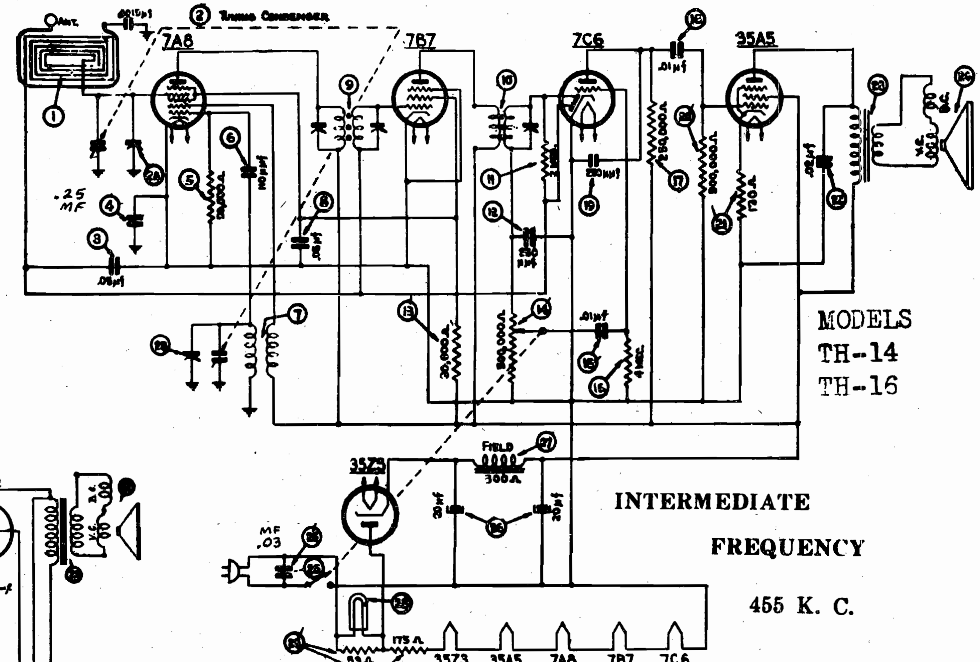
TH-9	— 540 — 1720 K. C.	3.0 — 10 M. C.
TH-18	— 540 — 1720 K. C.	5.5 — 19 M. C.
TH-22	— 540 — 1720 K. C.	7.0 — 24 M. C.

These models are similar with the exception of the tuning frequency ranges and cabinets.



I. F=455KC

MODELS TH-9, TH-18, TH-22



MODELS TH-14 TH-16

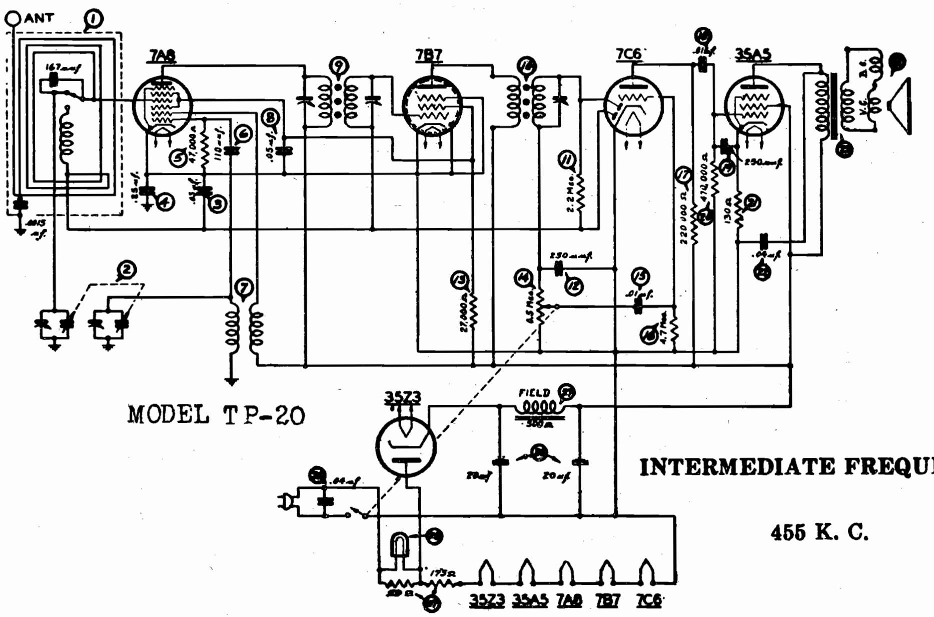
INTERMEDIATE FREQUENCY

455 K. C.

Models TH-14 and TH-16 are five tube, superheterodyne radios covering a frequency range from 540 to 1580 K. C.

These models are similar with the exception of the cabinets.

FOR OTHER DATA, SEE INDEX



MODEL TP-20

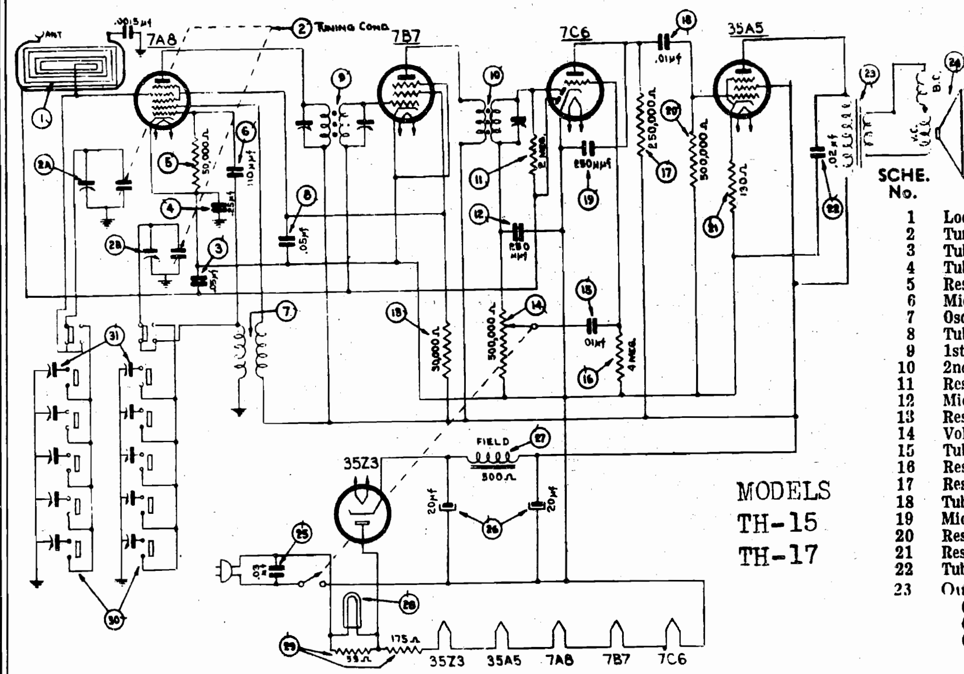
INTERMEDIATE FREQUENCY

455 K. C.

Model TP-20 is a five tube, superheterodyne radio covering a frequency range from 540 to 1580 K. C. on the broadcast band and 2.3 to 2.5 M. C. on the local police tuning range.

PHILCO RADIO & TELEVISION CORP.

MODELS TH-15, TH-17
MODEL TP-21



MODELS
TH-15
TH-17

Models TH-15 and TH-17 are five tube, electric push-button tuning, superheterodyne radios with a manual tuning range covering 540 to 1580 K. C.

These models are similar with the exception of the cabinet.

SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	32-3186
2	Tuning Condenser	31-2371
3	Tubular Condenser (.05 mf., 200 v.)	40-4519S
4	Tubular Condenser (.25 mf., 400 v.)	30-4604S
5	Resistor (50,000 ohms, 1/3 watt)	33-350244
6	Mica Condenser (110 mmf.)	30-1031
7	Oscillator Transformer	32-3152
8	Tubular Condenser (.05 mf., 200 v.)	30-4519S
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2 megs., 1/3 watt)	33-520244
12	Mica Condenser (250 mmf.)	30-1032
13	Resistor (30,000 ohms, 1/3 watt)	33-330244
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 v.)	30-4479S
16	Resistor (4 megs., 1/3 watt)	33-540244
17	Resistor (250,000 ohms, 1/3 watt)	33-425244
18	Tubular Condenser (.01 mf., 400 v.)	30-4572S
19	Mica Condenser (250 mmf.)	30-1032
20	Resistor (500,000 ohms, 1/3 watt)	33-450244
21	Resistor (130 ohms, 1/2 watt)	33-113336
22	Tubular Condenser (.02 mf., 400 v.)	30-4516S
23	Output Transformer	
	(for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
24	Speaker	36-1469
	Cone Assembly	
	(for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-2)	36-4132
	(for Speaker 36-1469-9)	36-4113
25	Tubular Condenser (.03 mf., 400 v.)	30-4449S
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil — Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Push Button Switch	42-1485
31	Padding Condenser Strip	31-6296

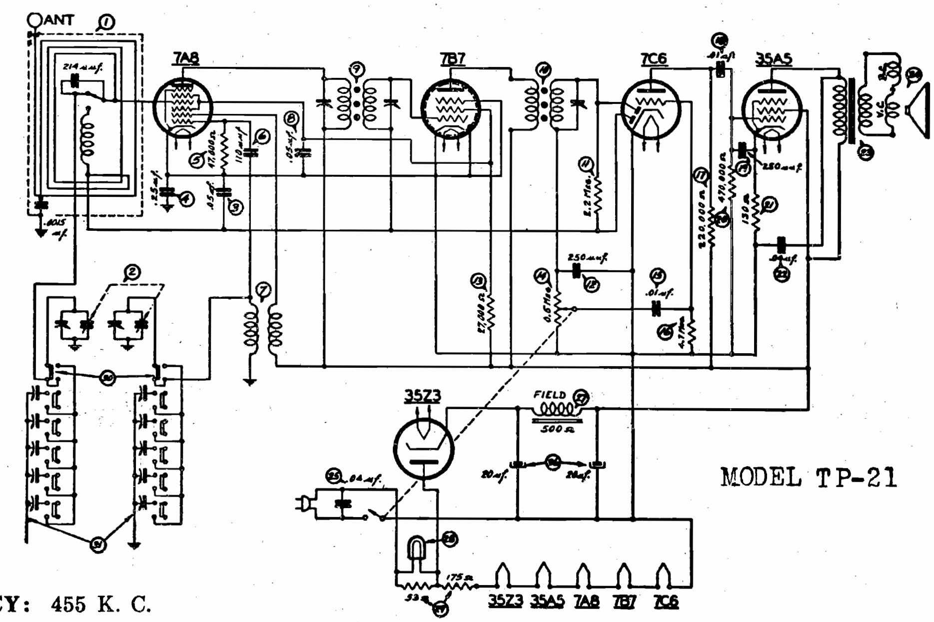
MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cable (Power)	L-3183
Cabinet (TH-15)	10376A
Cabinet Back (TH-15)	27-9358
Cabinet (TH-17)	10379A
Cabinet Back (TH-17)	27-4822
Clip (Coil Mounting)	28-5002
Dial	27-5499
Dial Window	27-5472
Drive Cord (Dial)	31-2358

INTERMEDIATE FREQUENCY: 455 K. C.

Six electric push-buttons are provided on this model. Five are used for stations and one push-button for selecting dial tuning. The push buttons cover a frequency range as follows: 540 to 1600 kilocycles.

FOR OTHER DATA SEE INDEX



MODEL TP-21

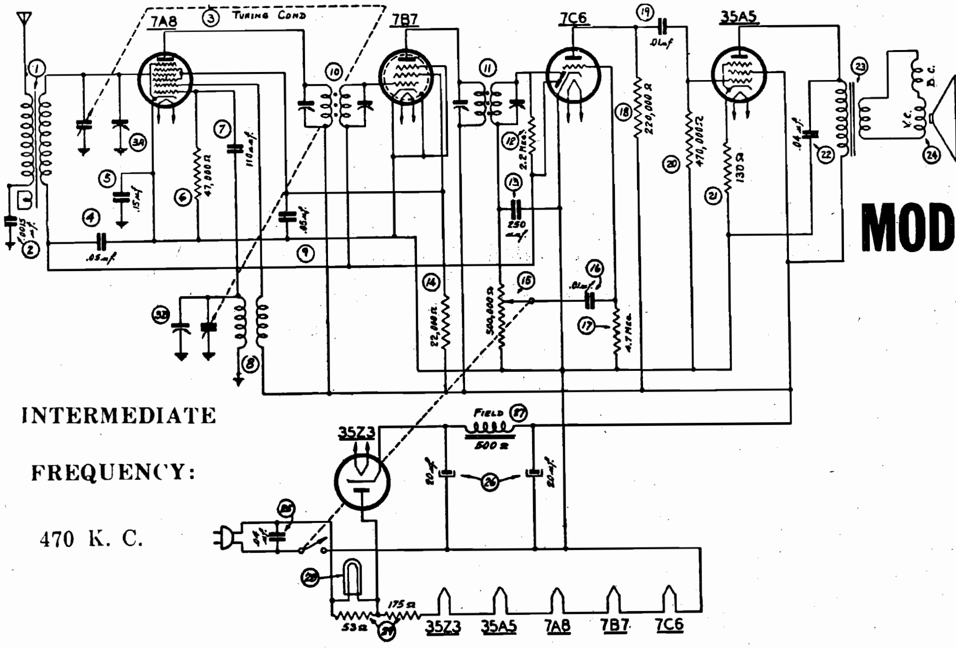
Model TP-21 is a five tube, electric push-button tuning superheterodyne radio with a manual tuning range covering 540 to 1580 K.

Six electric push-buttons are provided on this model. Five are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

INTERMEDIATE FREQUENCY: 455 K. C.

MODELS PT25,
PT27 (121, 122), PT39
MODELS PT26, PT28, PT36

PHILCO RADIO & TELEVISION CORP.



INTERMEDIATE
FREQUENCY:
470 K. C.

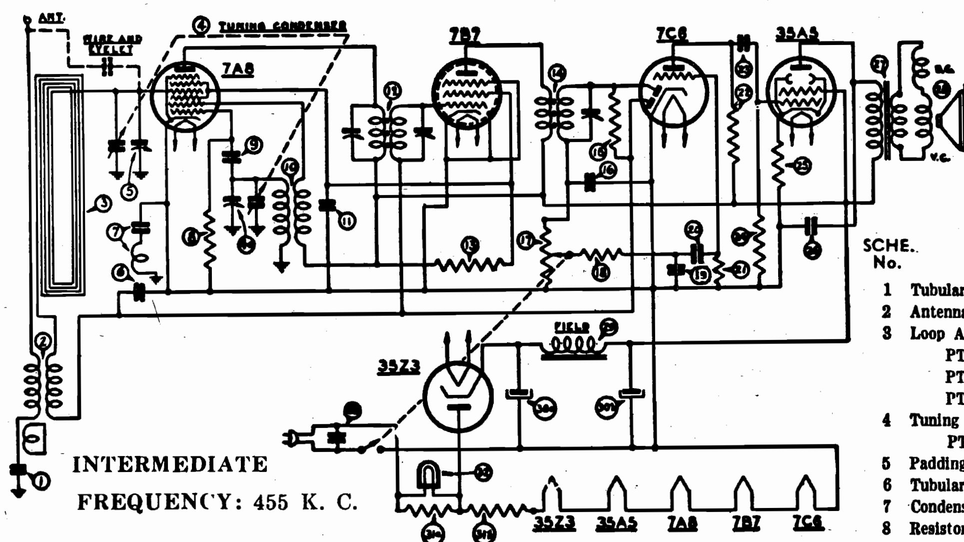
FOR ALIGNMENT, SEE INDEX

CIRCUIT DESIGN: Models PT-25, Codes 121 and 122, Pt-27, Codes 121 and 122, and PT-39 are five tube superheterodyne radios covering a frequency range from 540 to 1720 K. C. These models are similar with the exception cf the cabinets. Codes 121 and 122 of Models PT-25 and PT-27 differ also in the type of cabinet used.

MODELS PT-25, PT-27, Codes 121-122; and PT-39

POWER SUPPLY: The receivers are designed for operation on either a 115 volt alternating current (A. C.) or 115 volt direct current (D. C.) power supplies.

Models PT-26, PT-28 and PT-36 are five tube superheterodyne radios covering a tuning frequency range from 540 to 1580 K. C. and designed with a built-in loop aerial for portable use. To obtain maximum performance, however, in steel reinforced buildings, apartment houses, hotels and other shielded locations where signal strength is weak, provisions are also provided at the rear of the cabinet for an outside aerial.



INTERMEDIATE
FREQUENCY: 455 K. C.

MODEL PT-26

MODEL PT-28

MODEL PT-36

SCHE. No.	DESCRIPTION	PART No.
1	Tubular Condenser (.0015 mf., 200V)	30-4555S
2	Antenna Transformer	32-3394
3	Loop Antenna — Part of cabinet and loop Assy.	
	PT-26	76-1005
	PT-28	76-1013
	PT-36	76-1014
4	Tuning Condenser — PT-26 & PT-28	31-2439
	PT-36	31-2443
5	Padding Condenser	31-6344
6	Tubular Condenser (.1 mf., 200V)	30-4499S
7	Condenser & Choke Assy.	76-1019
8	Resistor (22,000 ohms, ¼ watt)	33-322154
9	Mica Condenser (110 mmf.)	30-1130
10	Oscillator Transformer	32-3182
11	Tubular Condenser (.05 mf., 200V)	30-4519S
12	1st I. F. Transformer	32-3390
13	Resistor (22,000 ohms, ½ watt)	33-322334
14	2nd I. F. Transformer	32-3391
15	Resistor (2.2 meg., ¼ watt)	33-522154
16	Mica Condenser (250 mmf.)	61-0033
17	Volume Control (500,000 ohms)	33-5306
18	Resistor (47,000 ohms, ¼ watt)	33-347154
19	Mica Condenser (250 mmf.)	61-0033
20	Tubular Condenser (.01 mf., 200V)	30-4479S
21	Resistor (4.7 meg., ¼ watt)	33-547154
22	Resistor (220,000 ohms, ¼ watt)	33-422154
23	Tubular Condenser (.01 mf., 400V)	30-4572S
24	Resistor (470,000 ohms, ¼ watt)	33-447154
25	Resistor (130 ohms, ½ watt)	33-113336
26	Tubular Condenser (.04 mf., 400V)	30-4119S
27	Output Transformer—Part of Speaker No. 36-1469	
28	Speaker	36-1469
29	Field Coil—Part of Speaker No.	36-1469
30	Electrolytic Condenser (20-20 mf., 150V)	30-2382
31	Line Resistor	33-3307
32	Pilot Lamp	34-2068
33	Tubular Condenser (.04 mf., 400V)	30-4119S

PHILCO RADIO & TELEVISION CORP.

MODELS PT29, PT31
MODELS PT33,
PT41 (121, 122),
PT61 (121, 122)

Models PT-29 and PT-31 are five tube superheterodyne radios covering a frequency range from 540 to 1720 K. C. on the broadcast band and 2.3 to 2.5 megacycles (M. C.) on the local police range. These models are similar with the exception of the cabinets.

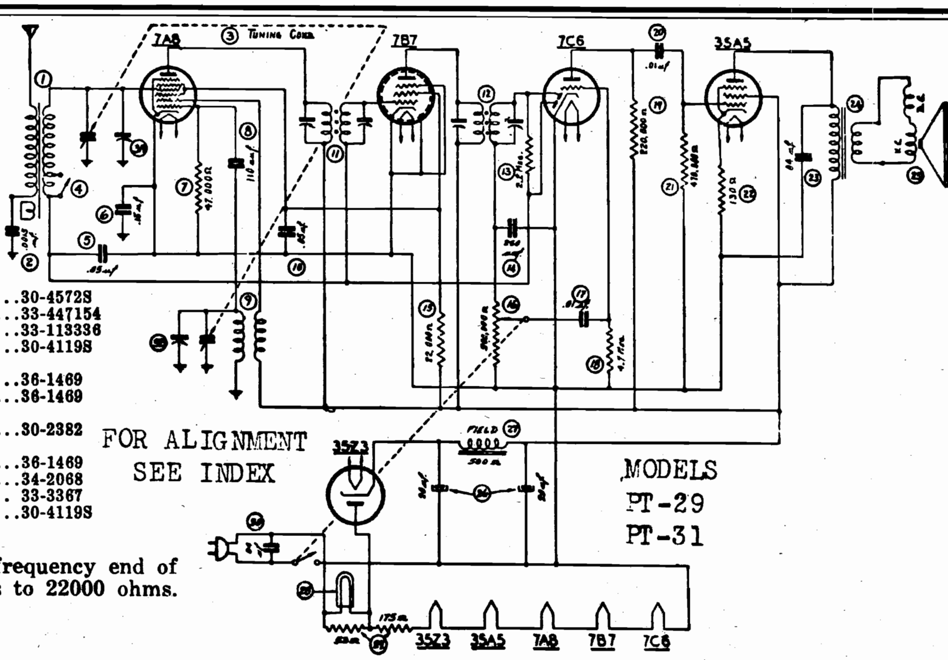
INTERMEDIATE

FREQUENCY: 470 K. C.

No.	Part	Part No.
1	Antenna Transformer	32-3164
2	Tubular Condenser (.0015 mf., 200 v.)	30-4555S
3	Tuning Condenser	31-2427
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200 v.)	30-4519S
6	Tubular Condenser (.15 mf., 400 v.)	30-4505S
7	Resistor (47,000 ohms, ¼ watt)	33-347154
8	Mica Condenser (110 mmf.)	30-1130
9	Oscillator Transformer	32-3152
10	Tubular Condenser (.05 mf., 200 v.)	30-4519S
11	1st I. F. Transformer	32-3149
12	2nd I. F. Transformer	32-3150
13	Resistor (2.2 meg., ¼ watt)	33-522154
14	Mica Condenser (250 mmf.)	61-0033
15	Resistor (22,000 ohms, ½ watt)	33-322334
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200 v.)	30-4479S
18	Resistor (4.7 meg., ¼ watt)	33-547154
19	Resistor (220,000 ohms, ¼ watt)	33-422154
20	Tubular Condenser (.01 mf., 400 v.)	30-4572S
21	Resistor (47,000 ohms, ¼ watt)	33-447154
22	Resistor (130 ohms, ½ watt)	33-113336
23	Tubular Condenser (.04 mf., 400 v.)	30-4119S
24	Output Transformer Part of Speaker No.	36-1469
25	Speaker	36-1469
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil Part of Speaker, Part Number	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.04 mf., 400 v.)	30-4119S

PRODUCTION CHANGE

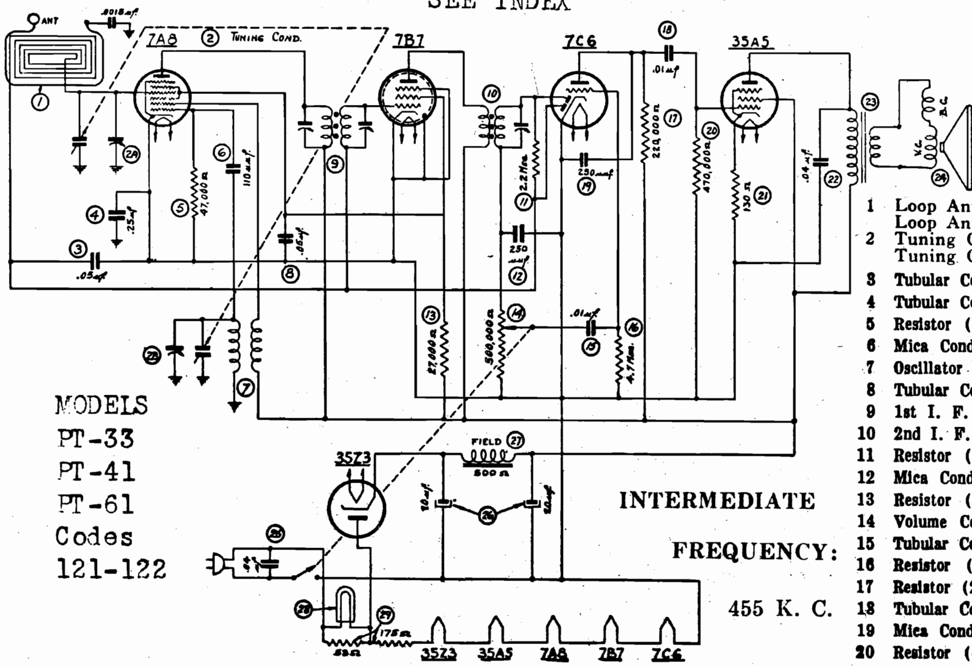
To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.



FOR ALIGNMENT
SEE INDEX

MODELS
PT-29
PT-31

FOR ALIGNMENT
SEE INDEX



MODELS
PT-33
PT-41
PT-61
Codes
121-122

INTERMEDIATE

FREQUENCY:

455 K. C.

Models PT-33, PT-41, Codes 121 and 122, PT-61, Codes 121 and 122, are five tube superheterodyne radios covering a frequency range from 540 to 1580 kilocycles (K. C .)

No.	Part	Part No.
1	Loop Antenna Assem. (Code 121)	38-9858
	Loop Antenna Assem. (Code 122)	32-3179
2	Tuning Condenser (Code 121)	31-2429
	Tuning Condenser (Code 122)	31-2448
3	Tubular Condenser (.05 mf., 200 V.)	30-4519S
4	Tubular Condenser (.25 mf., 400 V.)	30-4604S
5	Resistor (47,000 ohms, ¼ watt)	33-347154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3182
8	Tubular Condenser (.05 mf., 200 V.)	30-4519S
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327334
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 V.)	30-4479S
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 V.)	30-4572S
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 V.)	30-4119S
23	Output Transformer Part of Speaker No. 36-1469-1	32-8047
	Part of Speaker No. 36-1469-9	32-8044
	Part of Speaker No. 36-1469-2	32-8044
24	Speaker	36-1469
25	Tubular Condenser (.04 mf., 400 V.)	30-4119S
26	Electrolytic Condenser (20-20 mf., 150 V.)	30-2382
27	Field Coil	Part of Speaker No. 36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367

PRODUCTION CHANGES

Several parts were changed in these models and the code numbers changed from 121 to 122. These changes are as follows:

MODEL PT-41

	Code 121	Code 122
Dial	27-5554	27-5570
Instructions	39-6570	39-6710
Loop Aerial Assembly	38-9858	32-3179
Tuning Condenser	31-2429	31-2448

MODEL PT-61

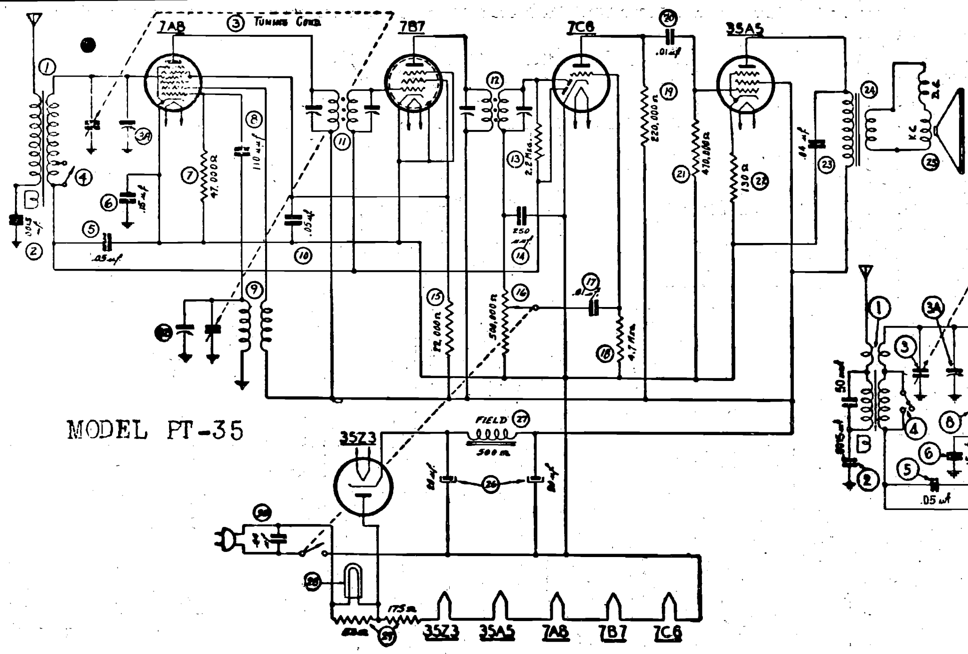
	Code 121	Code 122
Dial	27-5554	27-5570
Instructions	39-6570	39-6710
Loop Aerial Assembly	38-9858	32-3179
Tuning Condenser	31-2429	31-2448

MODEL PT-35
MODEL PT-50
MODELS PT-37, PT-38, PT-53

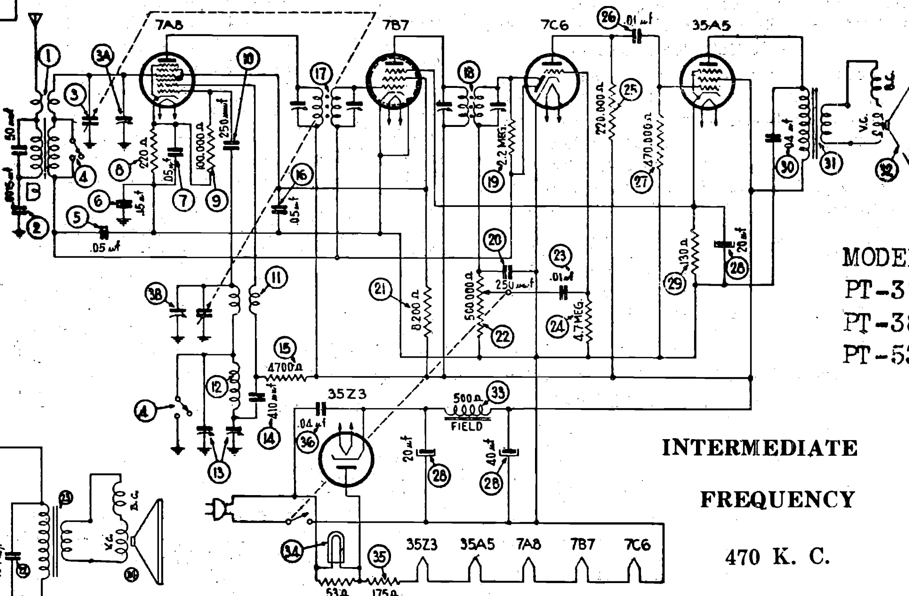
PHILCO RADIO & TELEVISION CORP.

Model PT-35 is a five tube superheterodyne radio, covering a frequency range from 540 to 1720 kilocycles (K. C.) on the broadcast band and 2.3 to 2.5 megacycles (M. C.) on the local police band.

INTERMEDIATE FREQUENCY: 470 K. C.



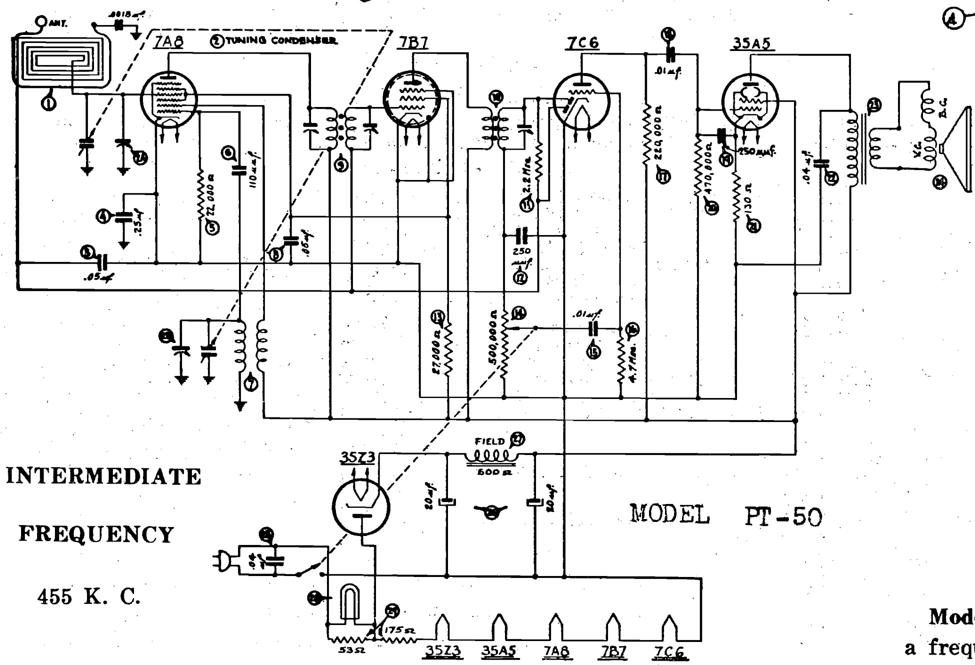
MODEL PT-35



MODELS
PT-37
PT-38
PT-53

INTERMEDIATE FREQUENCY

470 K. C.



MODEL PT-50

INTERMEDIATE

FREQUENCY

455 K. C.

Models PT-37 and PT-53 are five tube superheterodyne radios covering a tuning frequency range from 540 to 1720 kilocycles (K. C.) on the broadcast band and 5.5 to 19 megacycles (M. C.) on the short wave band. These models are similar with the exception of the cabinet.

Model PT-38 is a five tube superheterodyne radio, covering a frequency range from 540 to 1720 kilocycles (K. C.) on the broadcast band and from 5.5 to 19 megacycles (M. C.) on the short-wave band.

FOR OTHER DATA SEE INDEX

Model PT-50 is a five-tube superheterodyne radio covering a frequency range from 540 to 1580 kilocycles (K. C.)

PHILCO RADIO & TELEVISION CORP. MODELS PT-43 (121, 122), PT-55
MODELS PT-45, PT-47

Models PT-43 and PT-55 are five tube superheterodyne radios, covering a frequency range from 540 to 1580 kilocycles (K. C.) on the broadcast band and 2.3 to 2.5 megacycles (M. C.) on the local police police range.

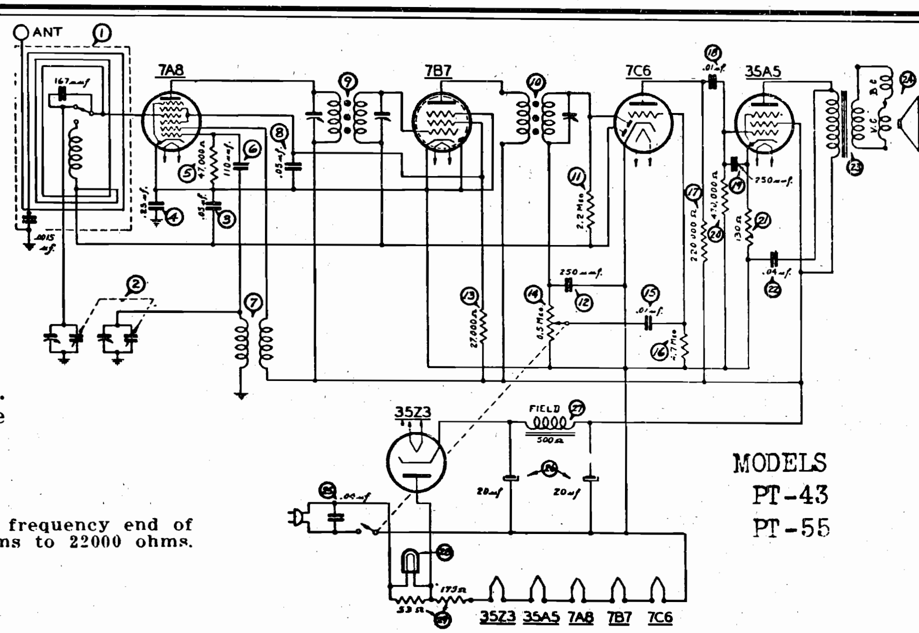
These models are similar with the exception of the cabinets. The circuit diagram and parts list shown below apply to both models.

INTERMEDIATE FREQUENCY: 455 K. C.

One 7A8, converter; one 7B7, I. F. amplifier; one 7C6, 2nd detector, 1st audio, A. V. C.; one 35A5, audio output and one 35Z3, rectifier.

PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.



MODELS
PT-43
PT-55

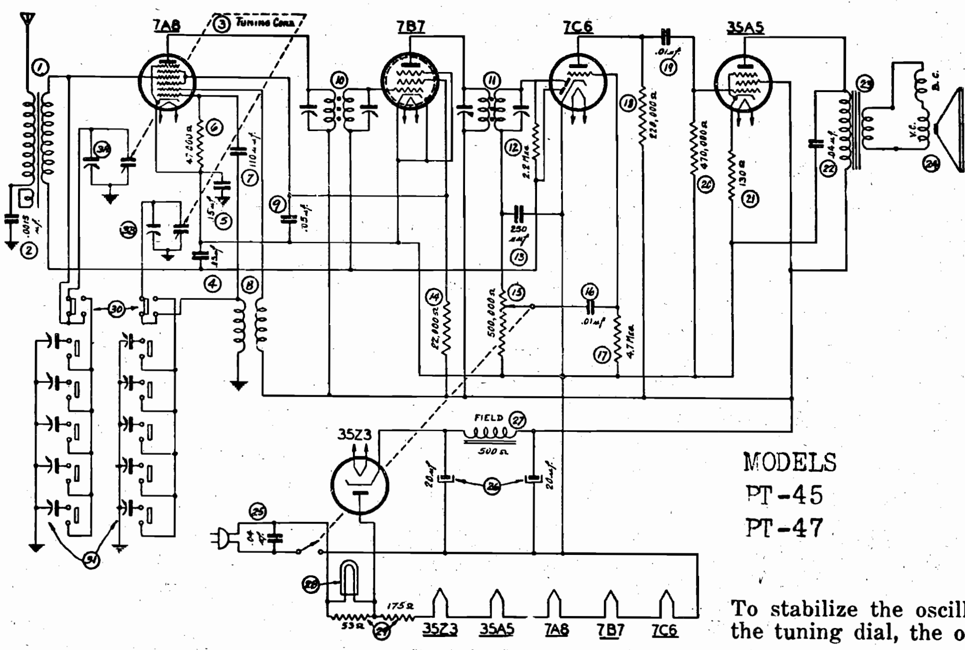
FOR OTHER DATA AND TUNER, SEE INDEX

PRODUCTION CHANGES

MODEL PT-43

Code number changed from 121 to 122 in addition to several part changes. These are as follows:

	Code 121	Code 122
Loop Aerial Ass'y	38-9936	32-3402
Tuning Condenser	31-2436	31-2446



MODELS
PT-45
PT-47

Models PT-45 and PT-47 are five tube electric push-button tuning, superheterodyne radios with a manual tuning range covering 540 to 1720 kilocycles (K. C.)

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

The procedure for adjusting and operating the electric push-buttons for stations will be found on page 10.

INTERMEDIATE FREQUENCY: 470 K. C.

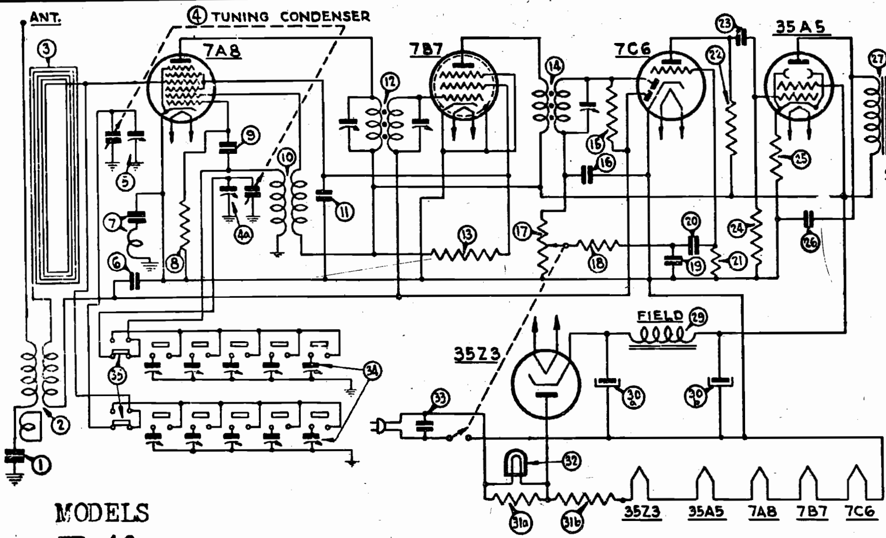
One 7A8, converter; one 7B7, I. F. amplifier; one 7C6, 2nd detector, 1st audio, A. V. C.; one 35A5, audio output and one 35Z3, rectifier.

PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

MODELS PT-46, PT-48
MODELS PT-49, PT-51

PHILCO RADIO & TELEVISION CORP.



MODELS
PT-46
PT-48

Models PT-46 and PT-48 are five tube electric push-button tuning superheterodyne radios with a manual tuning range covering 540 to 1580 K. C.

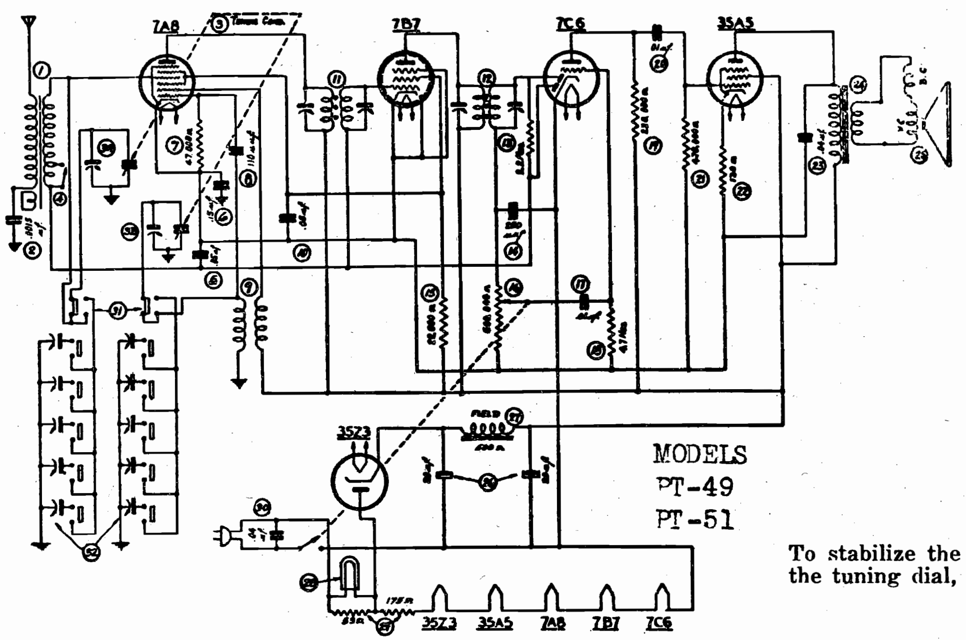
These models are similar with the exception of the cabinets.

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1580 kilocycles.

SCHE. No.	DESCRIPTION	PART No.
1	Tubular Condenser (.0015 mf., 200 v.)	30-4555
2	Antenna Transformer	32-3394
3	Loop Antenna — Part of Cabinet and Loop Assy.	
	PT-46	76-1015
	PT-48	76-1016
4	Tuning Condenser (PT-46 and PT-48)	31-2445
5	Padding Condenser	31-6344
6	Tubular Condenser (.1 mf., 200 v.)	30-4499
7	Condenser & Choke Assy.	76-1019
8	Resistor (22,000 ohms, ¼ watt)	33-322154
9	Mica Condenser (110 mmf.)	30-1130
10	Oscillator Transformer	32-3152
11	Tubular Condenser (.05 mf., 200 v.)	30-4519
12	1st I. F. Transformer	32-3390
13	Resistor (22,000 ohms, ½ watt)	33-322334
14	2nd I. F. Transformer	32-3391
15	Resistor (2.2 meg., ¼ watt)	33-522154
16	Mica Condenser (250 mmf.)	61-0033
17	Volume Control (500,000 ohms)	33-5306
18	Resistor (47,000 ohms, ¼ watt)	33-347154
19	Mica Condenser (250 mmf.)	61-0033
20	Tubular Condenser (.01 mf., 200 v.)	30-4479
21	Resistor (4.7 meg., ¼ watt)	33-547154
22	Resistor (220,000 ohms, ¼ watt)	33-422154
23	Tubular Condenser (.01 mf., 400 v.)	30-4572
24	Resistor (470,000 ohms, ¼ watt)	33-447154
25	Resistor (130 ohms, ½ watt)	33-113336
26	Tubular Condenser (.04 mf., 400 v.)	30-4119
27	Output Transformer	
	(for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
28	Speaker	36-1469
29	Field Coil	Part of Speaker No. 36-1469
30	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
31	Line Resistor	33-3367
32	Pilot Lamp	34-2068
33	Tubular Condenser (.04 mf., 400 v.)	30-4119
34	Padding Condenser Strip	31-6324
35	Push Button Switch	42-1485

INTERMEDIATE FREQUENCY: 455 K. C.

FOR OTHER DATA AND TUNER, SEE INDEX



MODELS
PT-49
PT-51

One 7A8, converter; one 7B7, I. F. amplifier; one 7C6, 2nd detector, 1st audio, A. V. C.; one 35A5, audio output and one 35Z3, rectifier.

Models PT-49 and PT-51 are five tube electric push button tuning superheterodyne radios with a manual tuning covering 540 to 1720 K. C. on the broadcast range and 2.3 to 2.5 megacycles (M. C.) on the local police range. These models are similar with the exception of the cabinet.

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

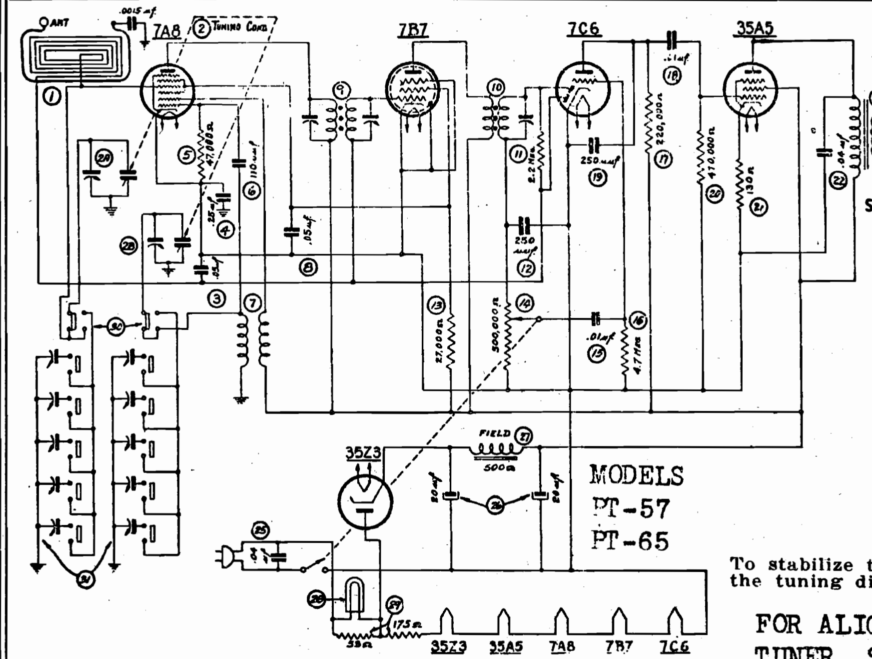
INTERMEDIATE FREQUENCY: 470 K. C.

PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

PHILCO RADIO & TELEVISION CORP.

MODELS PT-57, PT-65
MODEL PT-59



MODELS
PT-57
PT-65

Models PT-57 and PT-65 are five tube electric push-button tuning superheterodyne radios with a manual tuning range covering 540 to 1580 K. C.

The models are similar with the exception of the cabinets

INTERMEDIATE FREQUENCY: 455 K. C.

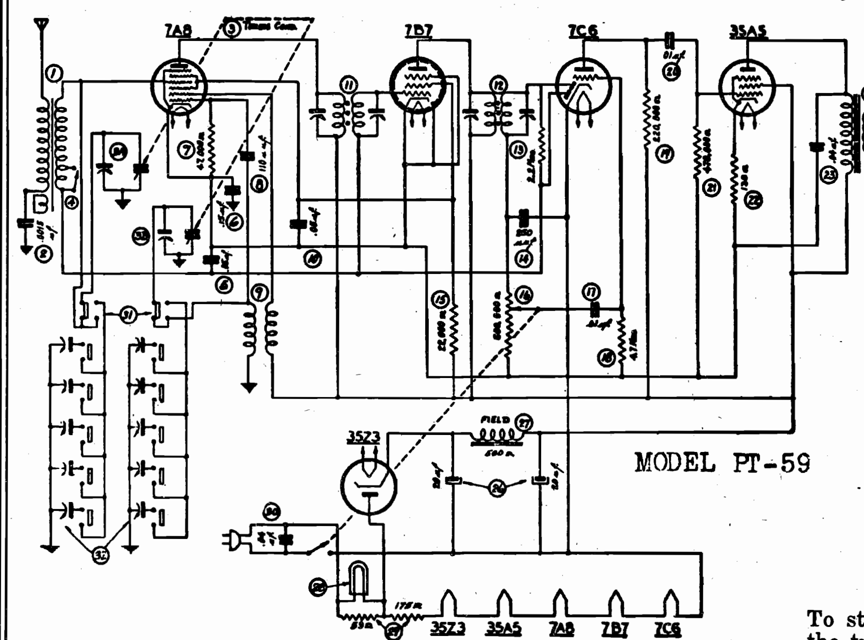
SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	38-9859
2	Tuning Condenser	31-2430
3	Tubular Condenser (.05 mf., 200 v.)	30-4519S
4	Tubular Condenser (.25 mf., 400 v.)	30-4604S
5	Resistor (47,000 ohms, ¼ watt)	33-347154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3152
8	Tubular Condenser (.05 mf., 200 v.)	30-4519S
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327334
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 v.)	30-4479S
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 v.)	30-4572S
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 v.)	30-4119S
23	Output Transformer	
	(for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
24	Speaker	36-1469
25	Tubular Condenser (.04 mf., 400 v.)	30-4119S
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil—Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Push Button Switch	42-1485
31	Padding Condenser Strip	31-6296

PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

FOR ALIGNMENT AND TUNER, SEE INDEX

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.



MODEL PT-59

Model PT-59 is a five tube electric push-button tuning superheterodyne radio with a manual tuning covering 540 to 1720 K. C. on the broadcast range and 2.3 to 2.5 megacycles (M. C.) on the local police range.

INTERMEDIATE FREQUENCY: 470 K. C.

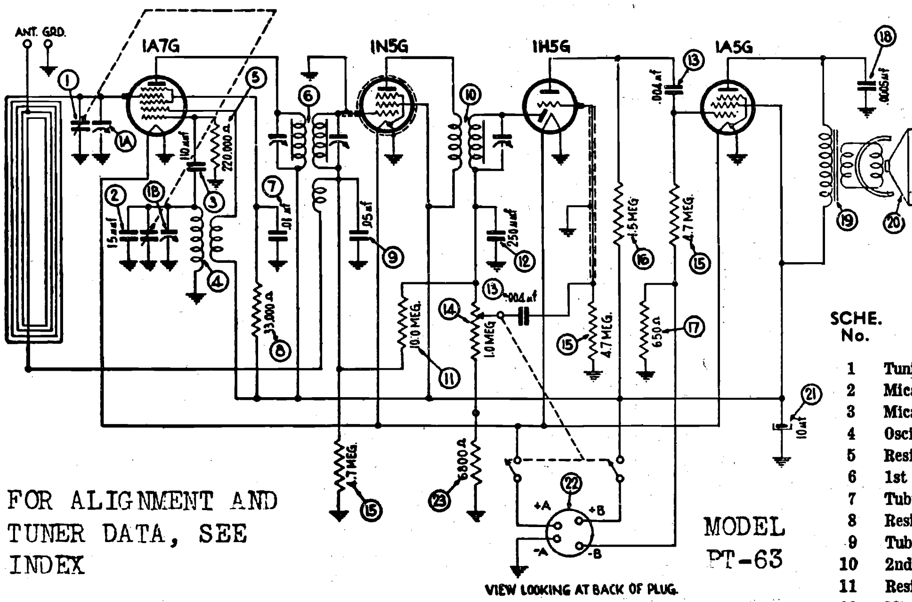
SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3164
2	Tubular Condenser (.0015 mf., 200 v.)	30-4555S
3	Tuning Condenser	31-2435
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200 v.)	30-4519S
6	Tubular Condenser (.15 mf., 400 v.)	30-4505S
7	Resistor (47,000 ohms, ¼ watt)	33-347154
8	Mica Condenser (110 mmf.)	30-1130
9	Oscillator Transformer	32-3152
10	Tubular Condenser (.05 mf., 200 v.)	30-4519S
11	1st I. F. Transformer	32-3149
12	2nd I. F. Transformer	32-3150
13	Resistor (2.2 meg., ¼ watt)	33-522154
14	Mica Condenser (250 mmf.)	61-0033
15	Resistor (22,000 ohms, ½ watt)	33-322334
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200 v.)	30-4479S
18	Resistor (4.7 meg., ¼ watt)	33-547154
19	Resistor (220,000 ohms, ¼ watt)	33-422154
20	Tubular Condenser (.01 mf., 400 v.)	30-4572S
21	Resistor (470,000 ohms, ¼ watt)	33-447154
22	Resistor (130 ohms, ½ watt)	33-113336
23	Tubular Condenser (.4 mf., 400 v.)	30-4119S
24	Output Transformer	
	(for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
25	Cone Assembly	
	(for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-2)	36-4132
	(for Speaker 36-1469-9)	36-4113
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil Part of Speaker, Part No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.04 mf., 400 v.)	30-4119S

PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

MODEL PT-63
MODEL PT-66

PHILCO RADIO & TELEVISION CORP.



FOR ALIGNMENT AND TUNER DATA, SEE INDEX

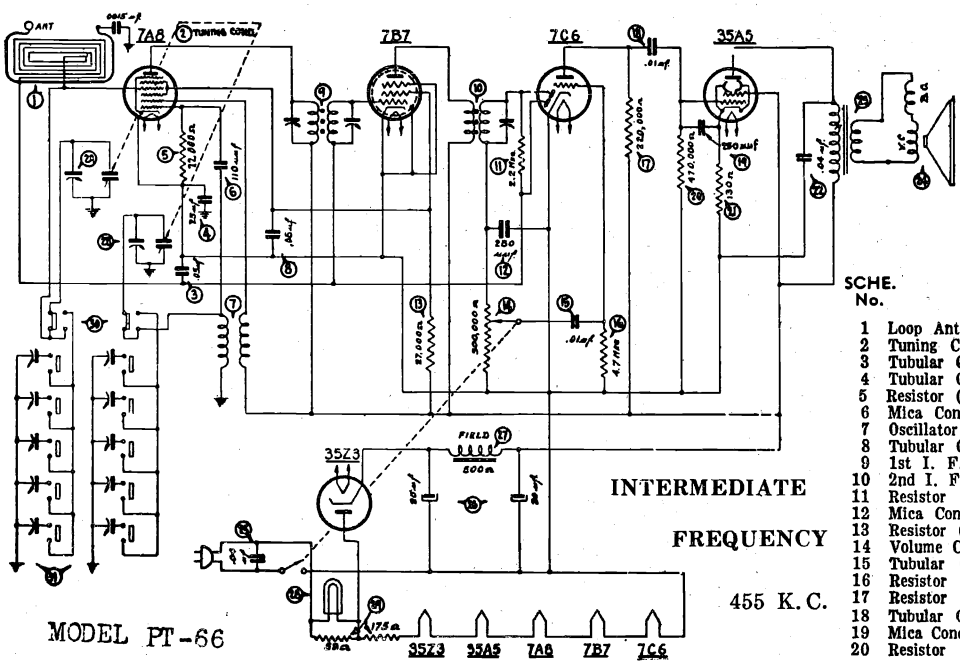
MODEL PT-63

Model PT-63 is a four tube portable battery operated superheterodyne receiver designed for reception of standard broadcast stations. In addition other features included are a loop aerial built into the cabinet, extremely sensitive permanent magnet field speaker, automatic volume control and pentode audio output. INTERMEDIATE FREQUENCY: 455 K. C.

TUNING RANGE: 540 to 1550 K. C.

BATTERY CURRENT: "A" 200 M. A. "B" 5.6 M. A.

SCHE. No.	DESCRIPTION	PART No.
1	Tuning Condenser	31-2432
2	Mica Condenser (15 mmf.)	61-0038
3	Mica Condenser (110 mmf.)	30-1031
4	Oscillator Transformer	32-3277
5	Resistor (220,000 ohms ¼ watt)	33-422154
6	1st I. F. Transformer	32-3265
7	Tubular Condenser (.01 mf. 400 v.)	30-4572S
8	Resistor (33,000 ohms ¼ watt)	33-333154
9	Tubular Condenser (.05 mf., 200 v.)	30-4519S
10	2nd I. F. Transformer	32-3266
11	Resistor (10 megs. ¼ watt)	33-610154
12	Mica Condenser (250 mmf.)	61-0033
13	Tubular Condenser (.004 mf., 400 v.)	30-4578S
14	Volume Control	33-5331
15	Resistor (4.7 megs. ¼ watt)	33-547154
16	Resistor (1.5 meg. ¼ watt)	33-515154
17	Resistor (650 ohms ½ watt)	33-165326
18	Mica Condenser (.0005 mf.)	30-1114
19	Output Transformer	32-8062
20	Speaker	36-1481
	Cone Assembly (for Speaker 36-1481-3)	36-4121
21	Electrolytic Condenser	30-2396
22	Battery Cable	41-3487
23	Resistor (6800 ohms ¼ watt)	33-268154



INTERMEDIATE FREQUENCY 455 K.C.

MODEL PT-66

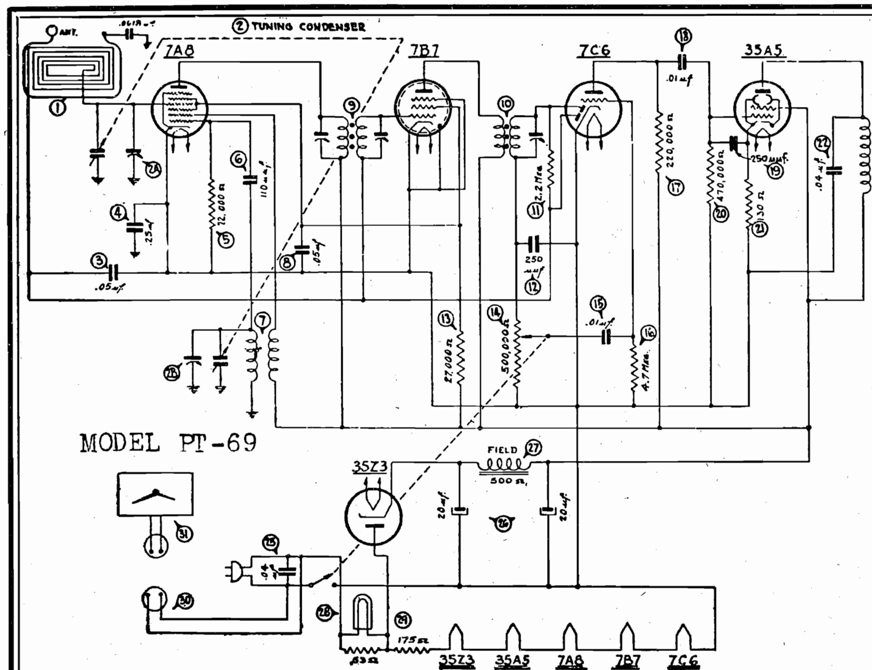
Model PT-66 is a five tube, electric push-button tuning, superheterodyne radio with a manual tuning range covering 540 to 1580 K. C.

Six electric push-buttons are provided on this model. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	32-3186
2	Tuning Condenser	31-2449
3	Tubular Condenser (.05 mf., 200 v.)	30-4519
4	Tubular Condenser (.25 mf., 400 v.)	30-4604
5	Resistor (22,000 ohms, ¼ watt)	33-322154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3152
8	Tubular Condenser (.05 mf., 200 v.)	30-4519
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327334
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 v.)	30-4479
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 v.)	30-4572
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 v.)	30-4119
23	Output Transformer	
	(for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-9)	32-8044
	(for Speaker 36-1469-2)	32-8044
24	Speaker	36-1469
	Cone Assembly	
	(for Speaker 36-1469-9)	36-4113
	(for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-2)	36-4132
25	Tubular Condenser (.04 mf., 400 v.)	30-4119
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil—Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Push Button Switch	42-1485
31	Padding Condenser Strip	31-6296

PHILCO RADIO & TELEVISION CORP.

MODEL PT-67
MODEL PT-69 (121, 122)



INTERMEDIATE FREQUENCY: 455 K. C.

MODEL PT-69

Several parts were changed in this model and the code number changed from 121 to 122. These changes are as follows:

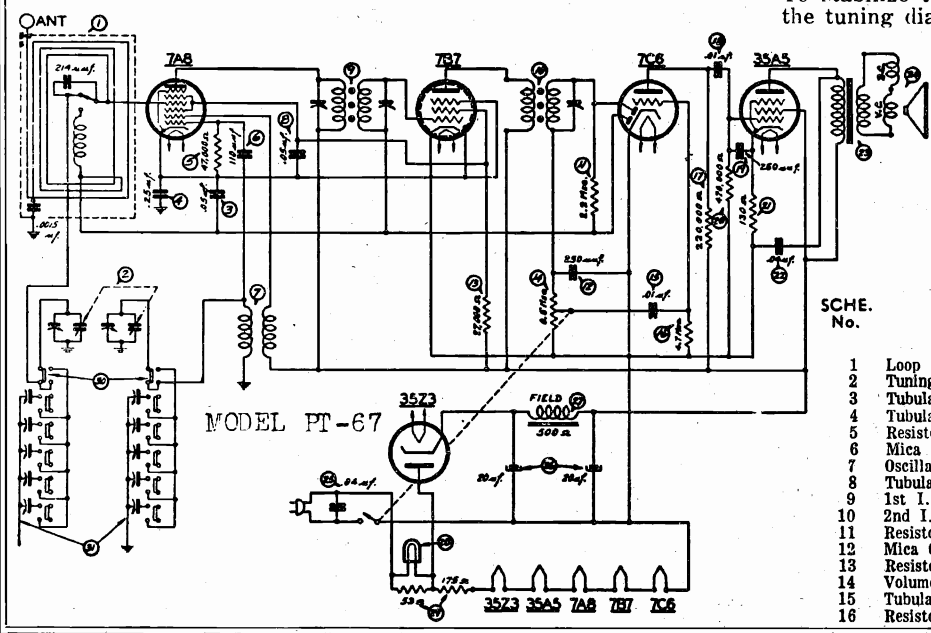
	Code 121	Code 122
Dial	27-5554	27-5570
Instructions	39-6573	39-6712
Loop Aerial Ass'y	38-9858	32-3179
Tuning Condenser	31-2429	31-2448

MODEL PT-69

SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	
	(Code 121)	38-9858
	(Code 122)	32-3179
2	Tuning Condenser (Code 121)	31-2429
	Tuning Condenser (Code 122)	31-2448
3	Tubular Condenser (.05 mf., 200 v.)	30-4519
4	Tubular Condenser (.25 mf., 400 v.)	30-4604
5	Resistor (22,000 ohms, ¼ watt)	33-322154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3182
8	Tubular Condenser (.05 mf., 200 v.)	30-4519
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327334
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 v.)	30-4479
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 v.)	30-4572
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 v.)	30-4119
23	Output Transformer	
	(for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
24	Speaker	36-1469
25	Tubular Condenser (.04 mf., 400 v.)	30-4119
26	Electrolytic Condenser	
	(20-20 mf., 150 v.)	30-2382
27	Field Coil	
	Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Connector Cable	41-3484
31	Complete Clock	
	(For 50 Cycle operation)	45-2778
	(For 60 Cycle operation)	45-2779

PRODUCTION CHANGE MODELS PT-67, PT-69

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.



Model PT-67 is a five tube electric push-button tuning, superheterodyne radio with a manual tuning range covering 540 to 1580 K. C. on the broadcast band and 2.3 to 2.5 M. C. on the local police range.

Six electric push-buttons are provided on this model. Five push-buttons are used for selecting stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

MODEL PT-67

SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	38-9937
2	Tuning Condenser	31-2437
3	Tubular Condenser (.05 mf., 200 v.)	30-4519S
4	Tubular Condenser (.25 mf., 400 v.)	30-4604S
5	Resistor (47,000 ohms, ¼ watt)	33-347154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3152
8	Tubular Condenser (.05 mf., 200 v.)	30-4519S
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327334
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 v.)	30-4479S
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 v.)	30-4572S
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 v.)	30-4119S
23	Output Transformer	
	(for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
24	Speaker	36-1469
25	Tubular Condenser (.04 mf., 400 v.)	30-4119S
26	Electrolytic Condenser	
	(20-20 mf., 150 v.)	30-2382
27	Field Coil ......Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Push Button Switch	42-1485
31	Padding Condenser Strip	31-6324

MODEL 40-74
MODEL 40-84

PHILCO RADIO & TELEVISION CORP.

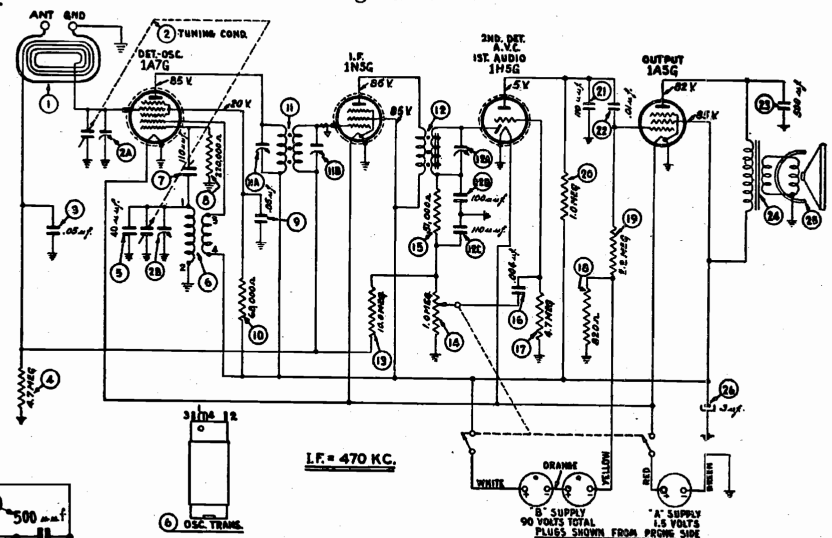
The R. F. and I. F. aligning procedure for this model is the same as that listed for Model 40-81 in Vol. XI with the exception of the padder numbers. Model 40-74 I. F. padders are 12A, 11B and 11A. The R. F. padder located on the bottom of the condenser and reached through the bottom of the cabinet are 2B oscillator and 2A (aerial).

BATTERY DRAIN:
"A" 200 M. A.; "B" 7.2 M. A.

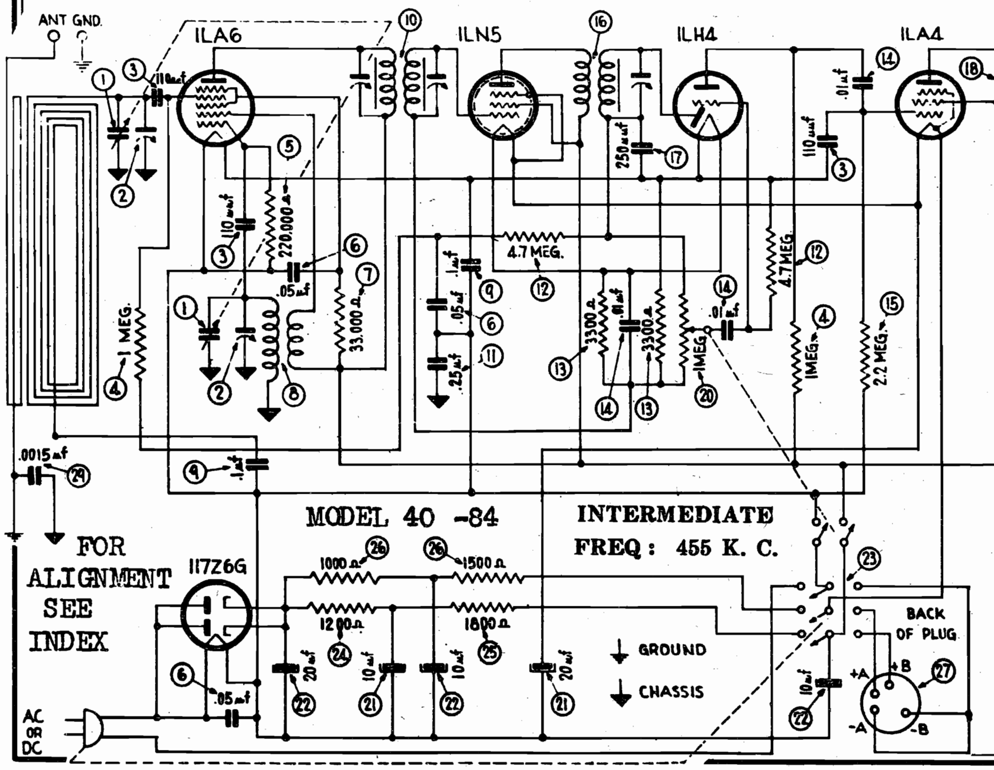
TUNING RANGE:
530 to 1600 K. C.

TYPE OF CIRCUIT: Model 40-74 is a portable, four-tube, battery operated superheterodyne radio, designed with a built-in loop aerial. Connections are also provided for an external aerial and ground.

1	Loop Assembly	40-6421		
2	Tuning Condenser	31-2403		
3	Tubular Condenser (.05 mfd.)	30-4519		
4	Resistor (4.7 meg., ½ watt)	33-547339		
5	Mica Condenser (40 mmfd.)	30-1095		
6	Oscillator Transformer	32-3274		
7	Mica Condenser (110 mmfd.)	30-1031		
8	Resistor (220,000 ohms, ½ watt)	33-422339		
9	Tubular Condenser (.05 mfd.)	30-4444		
10	Resistor (68,000 ohms, ½ watt)	33-368339		
11	First I. F. Transformer Assembly	32-3103		
12	Second I. F. Trans. Assembly	32-3176		
12-C	Mica Conddenser (110 mmfd.)	30-1031		
13	Resistor (10.0 meg., ½ watt)	33-610339		
14	Volume Control (1.0 meg.)	33-5310		
15	Resistor (51,000 ohms, ½ watt)	33-351339		
16	Tubular Condenser (.004 mfd.)	30-4578		
17	Resistor (4.7 meg., ½ watt)	33-547339		
18	Resistor (820 ohms, ½ watt)	33-182339		
19	Resistor (2.2 meg., ½ watt)	33-522339		
20	Resistor (1.0 meg., ½ watt)	33-510339		
21	Mica Condenser (110 mmfd.)	30-1031		
22	Tubular Condenser (.01 mfd.)	30-4572		
23	Mica Condenser (500 mmfd.)	30-1114		
24	Output Transformer	32-8096		
25	Cone and Voice Coil Assembly (Speaker Part No. 36-1482-3)	36-4121		
26	Electrolytic Condenser (3 mfd.)	30-2359		



SCHEMATIC DIAGRAM MODEL 40-74



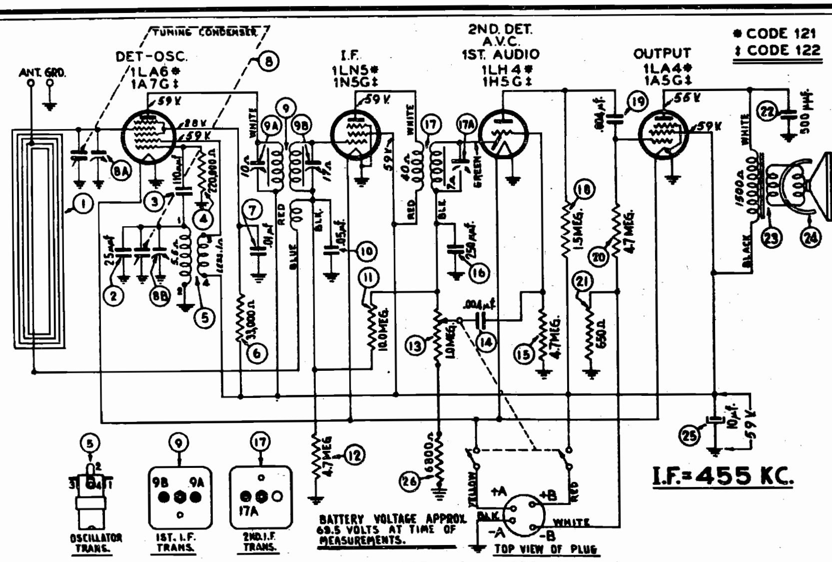
Model 40-84 is a portable five (5) tube A.C.-D.C. power line or battery operated superheterodyne radio. This model covers a tuning frequency range of 540 K. C. to 1550 K. C.

(22) To operate the radio on 115 volt A.C. or D.C. power supply, insert the power line cord plug into the socket on the back of the chassis. This plug-in arrangement automatically disconnects the A.-B. battery from the circuits of the set.

SCHE. No.	DESCRIPTION	PART No.
1	Tuning Condenser	31-2438
2	Trimmer Condenser	31-6211
3	Mica Condenser	30-1130
4	Resistor (¼ watt, 1 meg.)	33-510154
5	Resistor (¼ watt, 220,000 ohms)	33-422154
6	Tubular Condenser (.05 mfd., 400 V.)	30-4518
7	Resistor (¼ watt, 33,000 ohms)	33-333154
8	Oscillator Coil	32-3385
9	Tubular Condenser (.1 mfd., 400 V.)	30-4455
10	1st I. F. Transformer	32-3384
11	Tubular Condenser (.25 mfd., 400 V.)	32-4448
12	Resistor (¼ watt, 4.7 megs.)	33-547154
13	Resistor (¼ watt, 10,000 ohms)	33-310154
14	Tubular Condenser (.01 mfd., 400 V.)	30-4572
15	Resistor (¼ watt, 2.2 meg.)	33-522154
16	2nd I. F. Transformer	32-3266
17	Mica Condenser (250 mmf.)	61-0033
18	Mica Condenser (500 mmf.)	30-1114
19	Output Transformer	32-8100
20	Volume Control	33-5375
21	Electrolytic Condenser (20-10 mfd., 150 V.)	30-2453
22	Electrolytic Condenser (10-10 mfd., 150 V.; 20 mfd., 25 V.)	30-2452
23	Automatic T. P. D. T. Switch	42-1553
24	Resistor (½ watt, 1200 ohms)	33-212334
25	Resistor (½ watt, 1800 ohms)	33-218334
26	Filament Resistor	33-3387
27	Battery Cable	41-3526
28	Speaker	36-1476
	Cone Assembly (for Speaker 36-1476-3)	36-4121
29	Tubular Condenser (.0015 mfd., 200 V.)	30-4555

PHILCO RADIO & TELEVISION CORP.

MODEL 40-81 (121, 122)
MODEL 40-81T, CSL
MODEL 40-82 (121)
MODEL 40-83



SCHEMATIC DIAGRAM MODEL 40-81 CODES 121 & 122.

Models 40-81, Codes 121 and 122 are 4 tube portable battery operated superheterodyne receivers. These receivers are similar with the exception of the type tubes used. Incorporated in the receivers is a self-contained loop aerial and an extremely sensitive permanent magnet field speaker. In addition terminals are provided for connection an outside aerial and ground. The receiver is operated from a self-contained A-B battery pack.

TUNING RANGE: 540 to 1550 K. C.

INTERMEDIATE FREQUENCY: 455 K. C.

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Part of Cabinet)	10413A
2	Mica Condenser (15 mmfd.)	61-0038
3	Mica Condenser (110 mmfd.)	30-1031
4	Resistor (220,000 ohms, ½ watt)	33-422339
5	Oscillator Transformer	32-3277
6	Resistor (33,000 ohms, ½ watt)	33-333339
7	Tubular Condenser (.01 mfd.)	30-4572
8	Tuning Condenser Assembly	31-2432
9	1st I. F. Transformer Assembly	32-3265
10	Tubular Condenser (.05 mfd.)	30-4519
11	Resistor (10.0 meg., ½ watt)	33-610339
12	Resistor (4.7 meg., ½ watt)	33-547339
13	Volume Control and On-Off Switch	33-5331
14	Tubular Condenser (.004 mfd.)	30-4578
15	Resistor (4.7 meg., ½ watt)	33-547339
16	Mica Condenser (250 mmfd.)	61-0033
17	2nd I. F. Transformer Assembly	32-3266
18	Resistor (1.5 meg., ½ watt)	33-515339
19	Tubular Condenser (.004 mfd.)	30-4578
20	Resistor (4.7 meg., ½ watt)	33-547339
21	Resistor (650 ohms, ½ watt)	33-165326
22	Mica Condenser (500 mmfd.)	30-1114
23	Output Transformer	32-8062
24	Cone and Voice Coil Assembly (Speaker Part No. 36-1481-3)	36-4121
25	Electrolytic Condenser (10 mfd., 150 V.)	30-2396
26	Resistor (6800 ohms, ½ watt)	33-268339

DESCRIPTION	PART No.
Knobs (Volume and Tuning)	27-4876
Pointer	27-4891
Speaker	36-1481
Shield (Tube, Code 122)	56-1566
Sockets (Loktal, Code 121)	55-0576
Sockets (Octal, Code 122)	27-6133
Spring (Drive Cord)	28-8751
Tuning Shaft Assembly	36-9878

MODEL 40-82

Knobs	27-4876
Pointer	27-4891
Scale	27-5561
Tuning Condenser	31-2432
Grille Screen	56-1255
Cabinet	10450A

MODEL 40-81T, CSL

Cabinet	10413C
Dial	27-5561
Knob Assembly	27-4876
Pointer	27-4891

This model is the same as 40-81, Code 122, with the exception of the above parts.

FOR ALIGNMENT SEE INDEX

BATTERY CURRENT:
"A" Battery, 200 M. A.

"B" Battery, 5.6 M. A.

Model 40-82, Code 121, is a 4-tube portable battery operated superheterodyne radio and covers the standard broadcast frequency range from 540 to 1550 K. C. This Model is similar to Philco Model 40-81, Code 122, with the exception of the cabinet, and several of the replacement parts.

The following service data listed for Model 40-81, Code 122, also applies to Model 40-82, Code 121. The parts used in 40-82 which differ from those shown for Model 40-81, Code 122, are as follows:

Knobs	27-4876
Pointer	27-4891
Scale	27-5561
Tuning Condenser	31-2432
Grille Screen	56-1255
Cabinet	10450A

MODEL 40-83

Model 40-83 is similar to Model 40-81, Code 122, with the exception of the following parts:

Grille Screen	56-1539
Scale	27-5550
Pointer	56-1326

The service data listed for Model 40-81, Code 122, applies to Model 40-83.

MODEL 40-81, CODES 121-122

To improve the padding at 1500 K. C., condenser (2) 25 mmfd. Part No. 30-1137 changed to 15 mmfd. Part No. 61-0038.

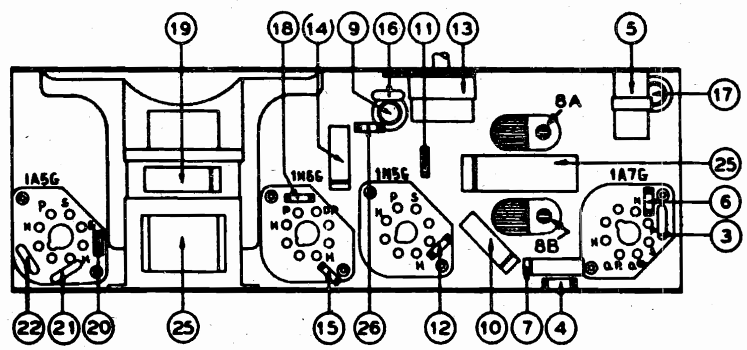
Tuning condenser, dial scale, and pointer changed on later production receivers. These changes are as follows:

		Early Production	Later Production
(8)	Tuning Condenser	31-2402	31-2432
	Dial Scale	27-5538	27-5561
	Pointer	56-1326	27-4891

MODEL 40-81, CODE 122

To improve the operating characteristics of the receiver at 550 K. C. and prevent oscillation the following items should be observed:

1. The loop wire going to the 1A7 grid, the wire from the 1A7 grid to the wiring panel and the wire from the tuning condenser antenna section lug to the wiring panel must be kept as far away from the 1A7 tube as is possible.
2. The second I. F. Shield must be tightly fastened to the sub-base so that no openings exist between the base and the bottom of the shield.



PART LOCATIONS, UNDERSIDE OF CHASSIS, MODEL 40-81

MODEL 40-90
MODEL 40-95 (121, 122)

PHILCO RADIO & TELEVISION CORP.

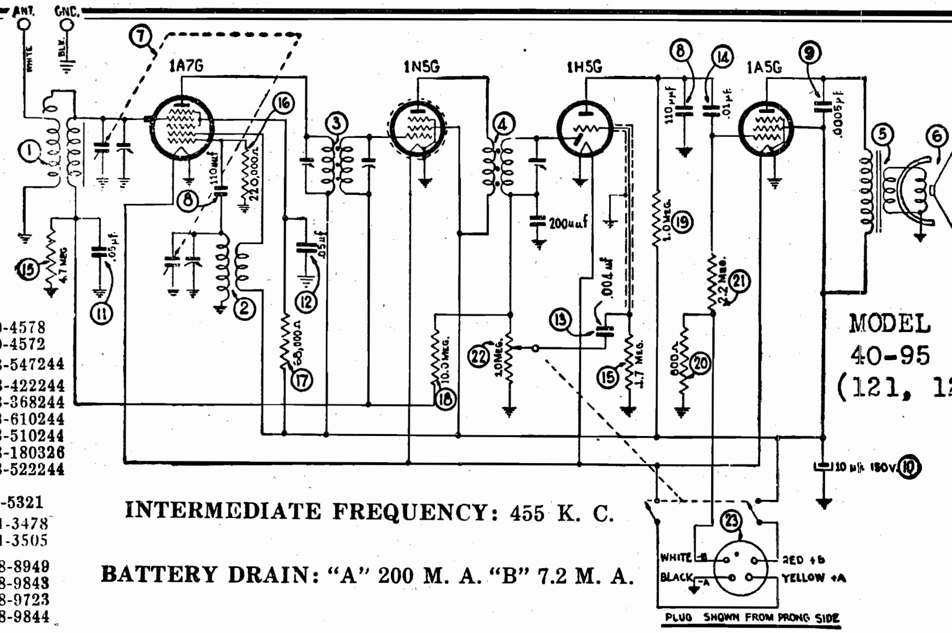
PRODUCTION CHANGES

The two codes of this model differ only in cabinets, speakers, and cables as shown below:

Code 121		Code 122
36-1477-3	Speaker	35-1488-3
36-4121	Cone Assembly	36-4129
41-3478	Battery Cable	41-3505
	Speaker Socket	27-6115
32-8051	Output Transformer	32-8051

MODEL 40-95

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3183
2	Oscillator Transformer	32-3184
3	1st I. F. Transformer	32-3198
4	2nd I. F. Transformer	32-3199
5	Output Transformer (Code 121)	32-8051
	Output Transformer (Code 122)	32-8051
6	Speaker (Code 121)	36-1477-3
	Speaker (Code 122)	36-1488-3
	Cone Assembly (for Speaker 36-1477-3)	36-4121
	(for Speaker 36-1488-3)	36-4129
7	Tuning Condenser	31-2373
8	Moulded Mica Condenser (110 mmf.)	30-1031
9	Moulded Mica Condenser (500 mmf.)	30-1114
10	Electrolytic Condenser (10 mf., 150 v)	30-2396
11	Tubular Condenser (.05 mf., 200 v)	30-4519S
12	Tubular Condenser (.05 mf., 200 v)	30-4444
13	Tubular Condenser (.004 mf., 400v)	30-4578
14	Tubular Condenser (.01 mf.)	30-4572
15	Resistor (4.7 meg., 1/3 watt)	33-547244
16	Resistor (220,000 ohms, 1/3 watt)	33-422244
17	Resistor (68,000 ohms, 1/3 watt)	33-368244
18	Resistor (10 meg., 1/3 watt)	33-610244
19	Resistor (1 meg., 1/3 watt)	33-510244
20	Resistor (800 ohms, 1/2 watt)	33-180326
21	Resistor (2.2 meg., 1/3 watt)	33-522244
22	Volume Control (1 meg., with D.P.S.T. Switch)	33-5321
23	Battery Cable (Code 121)	41-3478
	Battery Cable (Code 122)	41-3505
	Flag Arm Spring	28-8949
	Flag Arm Transfer Lever Assembly	38-9843
	Flag Cam Assembly	38-9723
	Flag Assembly	38-9844



MODEL 40-95 (121, 122)

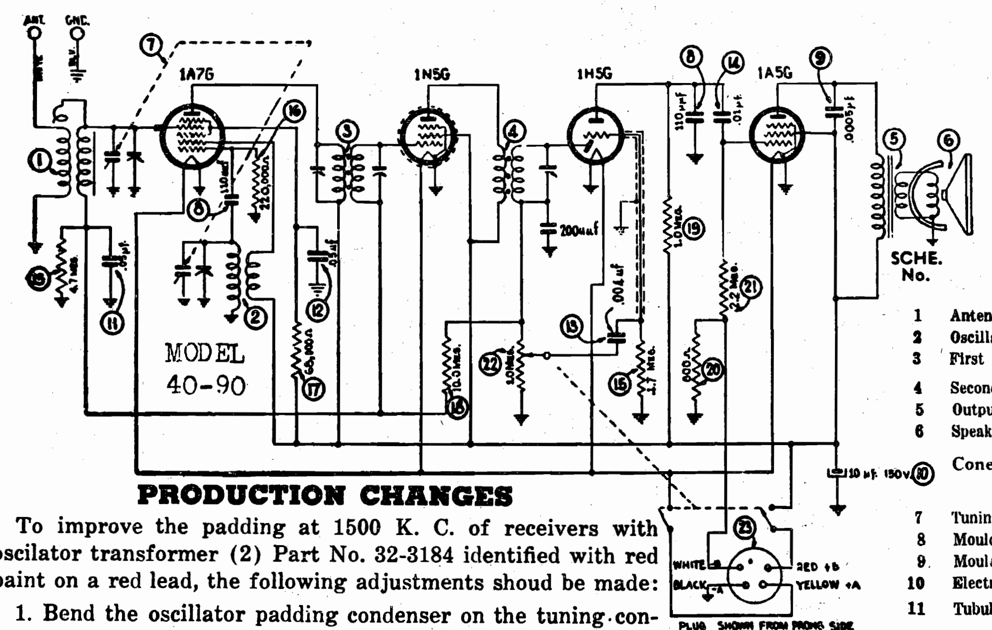
INTERMEDIATE FREQUENCY: 455 K. C.

BATTERY DRAIN: "A" 200 M. A. "B" 7.2 M. A.

Model 40-95 is a four (4) tube battery operated superheterodyne radio covering a tuning frequency range from 540 to 1720 K. C.

FOR ALIGNMENT, SEE INDEX

Model 40-90 is a four (4) tube battery operated superheterodyne radio covering a tuning frequency range from 540 to 1720 K. C.



MODEL 40-90

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3183
2	Oscillator Transformer	32-3184
3	First I. F. Transformer	32-3180
4	Second I. F. Transformer	32-3181
5	Output Transformer	32-8061
6	Speaker	36-1476
	Cone Assembly (for Speaker 36-1476-3)	36-4121
7	Tuning Condenser	32-2372
8	Moulded Mica Condenser (110 mmf.)	30-1031
9	Moulded Mica Condenser (500 mmf.)	30-1114
10	Electrolytic Condenser (10 mf., 150 v.)	30-2396
11	Tubular Condenser (.05 mf., 200 v.)	30-45198
12	Tubular Condenser (.05 mf., 200 v.)	30-4444
13	Tubular Condenser (.004 mf., 400 v.)	30-4578
14	Tubular Condenser (.01 mf.)	30-4572
15	Resistor (4.7 meg., 1/3 watt)	33-547244
16	Resistor (220,000 ohms, 1/3 watt)	33-422244
17	Resistor (68,000 ohms, 1/3 watt)	33-368244
18	Resistor (10 meg., 1/3 watt)	33-610244
19	Resistor (1 meg., 1/3 watt)	33-510244
20	Resistor (800 ohms, 1/2 watt)	33-180326
21	Resistor (2.2 meg., 1/3 watt)	33-522244
22	Volume Control (1 meg., with D.P.S.T. Switch)	33-5312
23	Battery Cable	41-3477
	Flag Arm Spring	28-8947
	Flag Cam Assembly	38-9723
	Flag Assembly	38-9838

PRODUCTION CHANGES

To improve the padding at 1500 K. C. of receivers with oscilator transformer (2) Part No. 32-3184 identified with red paint on a red lead, the following adjustments shoud be made:

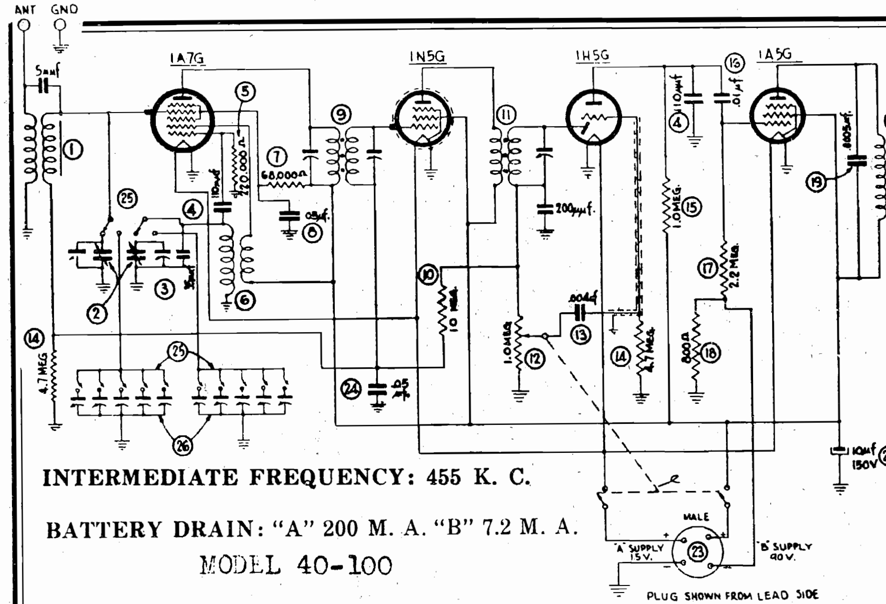
1. Bend the oscillator padding condenser on the tuning condenser back after removing the screw and mica.
2. Set the top of the pointer even with the bottom of the 1500 K. C. division line with set tuned to 1500 K. C.

INTERMEDIATE FREQUENCY: 455 K. C.

Battery Drain "A" 200 M. A. "B" 7.2 M. A.

PHILCO RADIO & TELEVISION CORP.

MODEL 40-100(121, 122)
MODEL 40-105



INTERMEDIATE FREQUENCY: 455 K. C.

BATTERY DRAIN: "A" 200 M. A. "B" 7.2 M. A.

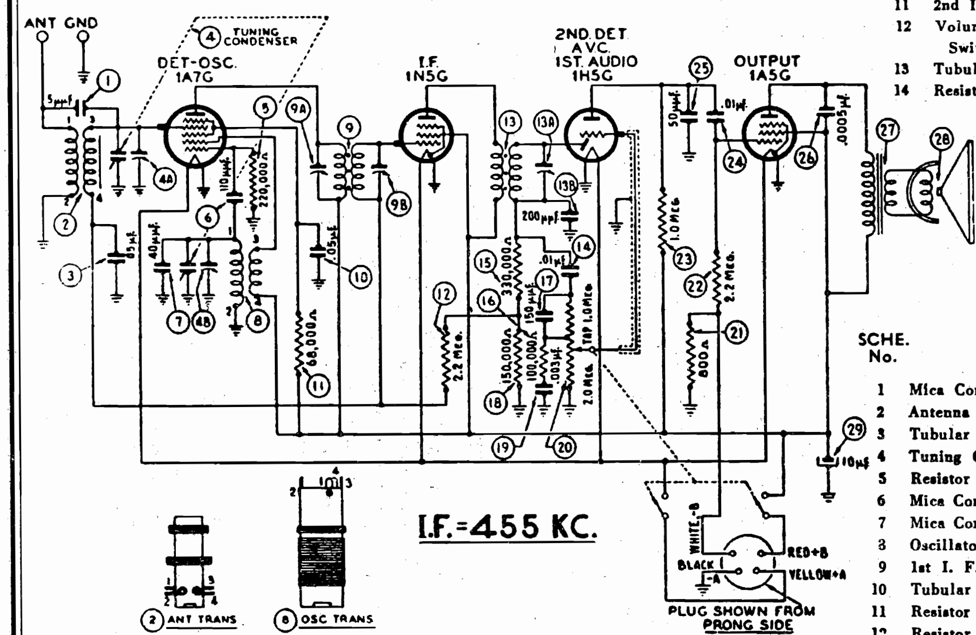
MODEL 40-100

Model 40-100 is a four (4) tube battery operated superheterodyne receiver with electric push-button tuning. This model covers a tuning frequency range of 540 to 1720 K. C. Features of design included in this model are: low current drain tube; automatic volume control and pentode audio output. The differences in the "codes" of this model are in the cabinets. Code 121 is assembled in a table model cabinet and Code 122 in a floor model.

ELECTRIC PUSH-BUTTON TUNING: Five (5) push-buttons are used for the broadcast stations and one push-button for selecting "dial tuning." The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3248
2	Variable Condenser	31-2384
3	Silver Mica Condenser	30-1113
4	Molded Mica Condenser (110 mmf.)	30-1031
5	Resistor (220,000 ohms., ⅛ watt)	33-422244
6	Oscillator Transformer	32-3214
7	Resistor (68,000 ohms., ⅛ watt)	33-368244
8	Tubular Condenser (.05 mf., 200 v.)	30-4444
9	1st I. F. Transformer	32-3198
10	Resistor (10 meg., ⅛ watt)	33-610244
11	2nd I. F. Transformer	32-3199
12	Volume Control (1 meg. and D. P. S. T. Switch)	33-5321
13	Tubular Condenser (.004 mf., 400 v.)	30-4578
14	Resistor (4.7 meg., ⅛ watt)	33-547244
15	Resistor (1 meg., ⅛ watt)	33-510244
16	Tubular Condenser (.01 mf., 400 v.)	30-4572
17	Resistor (2.2 meg., ⅛ watt)	33-522244
18	Resistor (800 ohms., ½ watt)	33-180326
19	Molded Mica Condenser (500 mmf.)	30-1114
20	Output Transformer	32-8051
21	Speaker	36-1477
22	Electrolytic Condenser (10 mf., 150 v.)	30-2396
23	Battery Cable	41-3478
24	Tubular Condenser (.05 mf., 200 v.)	30-4519S
25	Push Button Switch	42-1835
26	Push Button Condenser Strip	31-6309
..	Flag Arm Spring	28-8949
..	Flag Arm Transfer Lever Assembly	38-9843
..	Flag Cam Assembly	38-9723
..	Flag Assembly	38-9844

FOR ALIGNMENT AND TUNER, SEE INDEX



SCHEMATIC DIAGRAM MODEL 40-105

BATTERY CURRENT DRAIN: "A" 200 M. A. "B" 8 M. A.

Model 40-105 is a four (4) tube battery operated superheterodyne radio covering a tuning frequency range from 540 to 1720 K. C.

SCHE. No.	DESCRIPTION	PART No.
1	Mica Condenser (5 mmf.)	30-1097
2	Antenna Transformer	32-3248
3	Tubular Condenser (.05 mfd.)	30-4519
4	Tuning Condenser Assembly	31-2384
5	Resistor (220,000 ohms, ½ watt)	33-422339
6	Mica Condenser (110 mmf.)	30-1130
7	Mica Condenser (40 mmf.)	30-1132
8	Oscillator Transformer	32-3214
9	1st I. F. Transformer Assembly	32-3198
10	Tubular Condenser (.05 mf.)	30-4444
11	Resistor (68,000 ohms, ½ watt)	33-368339
12	Resistor (2.2 megs., ½ watt)	33-522339
13	2nd I. F. Transformer Assembly	32-3199
14	Tubular Condenser (.01 mf.)	30-4572
15	Resistor (330,000 ohms, ½ watt)	33-433339
16	Resistor (100,000 ohms, ½ watt)	33-410339
17	Mica Condenser (150 mmf.)	30-1033
18	Resistor (150,000 ohms, ½ watt)	33-415339
19	Tubular Condenser (.003 mf.)	30-4469
20	Volume Control (2.0 meg.)	33-5326
21	Resistor (800 ohms, ½ watt)	33-180326
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Resistor (1.0 meg., ½ watt)	33-510339
24	Tubular Condenser (.01 mf.)	30-4572
25	Mica Condenser (50 mmf.)	30-1029
26	Mica Condenser (.0005 mf.)	30-1114
27	Output Transformer	32-7984
28	Speaker	36-1410
29	Electrolytic Condenser (10 mf., 150 v.)	30-2396

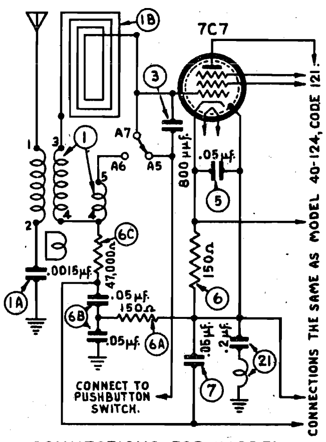
SEE MODELS BELOW

PHILCO RADIO & TELEVISION CORP.

SETTING AND OPERATING ELECTRIC PUSH-BUTTON TUNING

In order to adjust the electric automatic tuning push-button accurately for reception of broadcast stations, a signal generator, such as Philco Model 077, and a padding screw driver, Philco Part No. 45-2610, are required. With this equipment at hand, proceed as follows:—

1 — Select five (5); seven (7) or eight (8) of the most popular stations received in the locality (depending on the number of push-buttons on the model to be adjusted). 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 station in the extreme right button. Each push-button is adjusted by two set screws. These set screws are located on the rear of the chassis or push-button unit. Each set of screws is numbered and covers a frequency range as follows:—



CONNECTIONS FOR MODEL 40-124 CODE 122.

FREQUENCY RANGES OF PUSH-BUTTONS

Models 40-100, 40-110

Push-Button	Frequency Range
1	540-1030 K. C.
2	650-1100 K. C.
3	650-1100 K. C.
4	740-1240 K. C.
5	1160-1600 K. C.
6	Dial

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 40-160, 40-165

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 40-124, 40-125, 40-135, 40-145, 40-503, 40-506, 40-507, 40-525 (121), 40-526 (121)

Push-Button	Frequency Range
1	540-1030 K. C.
2	650-1100 K. C.
3	740-1240 K. C.
4	900-1470 K. C.
5	1160-1600 K. C.
6	Dial

Models 40-150, 40-155, 40-180, 40-185, 40-190, 40-508, 40-509

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 "Osc." and Ant." set-screws No. 1; the next push-button by "Osc." and "Ant." set screws No. 2, and the remaining push-buttons in order.

2 — Turn the receiver "on" and set the "Tuning Range Selector" or push-button for "Dial" tuning.

3 — Set up the Model 077 signal generator about 3 feet from the receiver and connect a loop aerial (made from a few turns of wire 12 inches in diameter) 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".

4 — Manually tune in on the radio the first station to be set up; (usually No. 1 push-button first). 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.

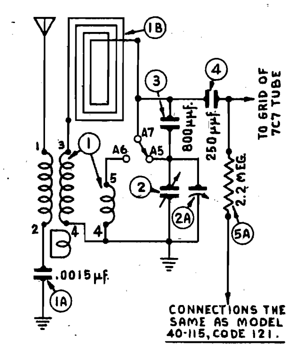
5 — Turn the receiver tuning range selector to "push-button" and press in No. 1 button. (Models without a tuning range selector, simply press in push-button to be set up). Using the insulated screw driver, turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; then turn signal generator indicator off the frequency of the station.

6 — Readjust No. 1 "Osc." and "Ant." screws until the station is heard clearly and distinctly. The adjustment of No. 1 push-button is then complete. After setting up the first station the same procedure as outlined above is used for the remaining stations.

While the above procedure is satisfactory in setting up push-buttons for stations, a very accurate adjustment can be obtained with a vacuum tube voltmeter. The instructions for using a vacuum tube voltmeter will be found on page 10 under "Using Vacuum Tube Voltmeter for Aligning Compensators and Adjusting Push-Buttons."

When any of these models are to be set up to receive the sound of a television program, tuned in by special type Philco television sets, or if they are to be used in conjunction with a Philco Record Player, push-button No. 1 should be used. To adjust the push-button on these instruments, the same procedure as outlined above is used.

Further details for setting up this receiver for operation with Philco Television sets and Record Players are supplied with the instruments.



CONNECTIONS FOR MODEL 40-115 CODE 122.

FEBRUARY, 1940.

MODEL 40-115, CODE 122

Model 40-115, Code 122, is similar to Code 121 with the addition of a loop aerial mounted inside the cabinet and several part changes in the aerial circuit. These changes are shown in the following circuit diagram and parts list. The service information in RIDER MANUAL VOL. XI for Model 40-115, Code 121, with these changes, applies to Model 40-115, Code 122.

SCHEMATIC NUMBER	DESCRIPTION	PART No. CODE 122
1	Antenna Transformer	32-3404
1A	Tubular Condenser (.0015 mfd.)	30-4555
1B	Loop Assembly	32-3405
2	Tuning Condenser	31-2450
3	Mica Condenser (800 mmfd.)	30-1135
	Cabinet	10432B

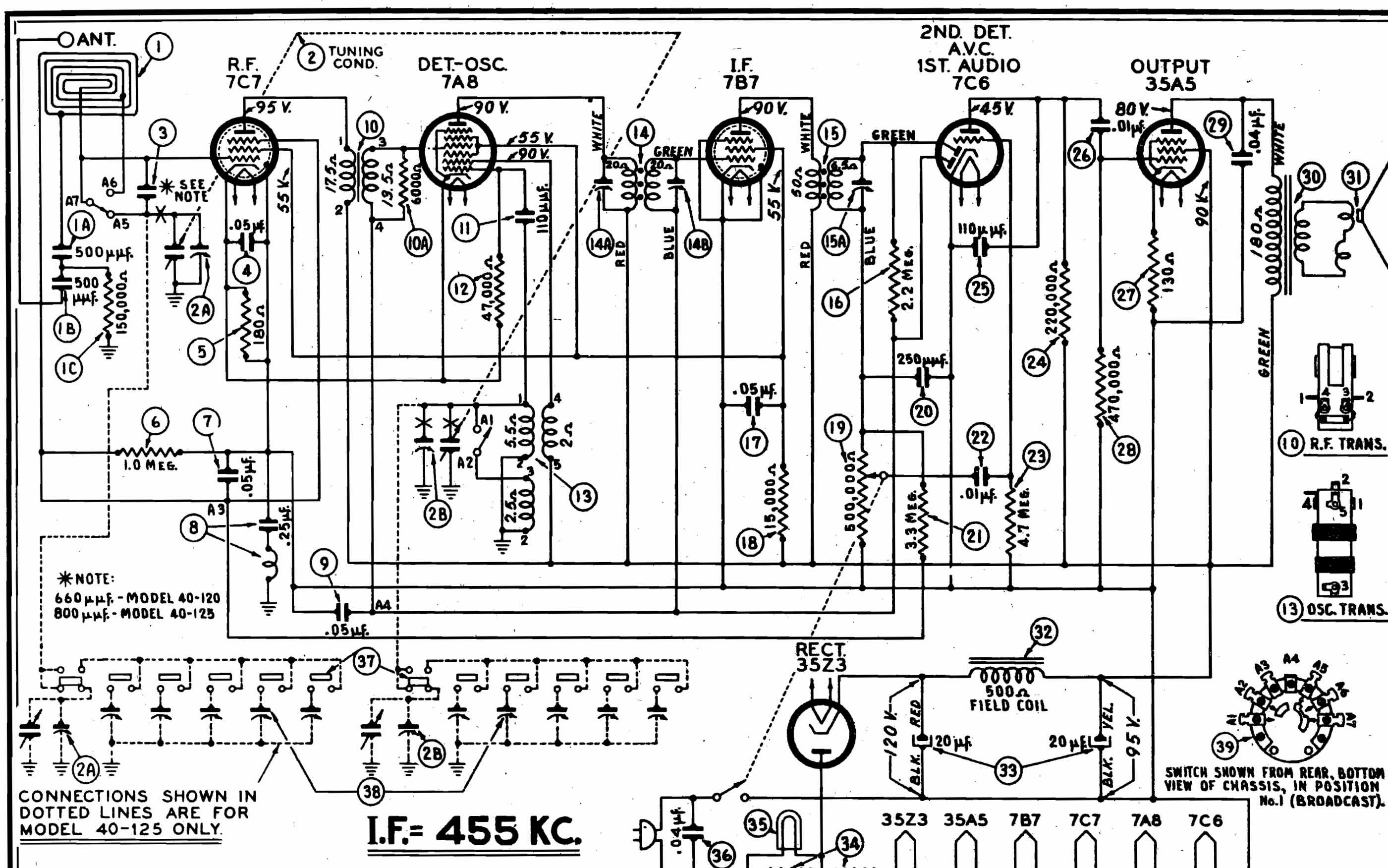
MODEL 40-124, CODE 122

Model 40-124, Code 122, is similar to Code 121 with the addition of a loop aerial mounted inside the cabinet and several part changes in the aerial circuit. These changes are shown in the following circuit diagram and parts list. The service information in RIDER'S VOLUME XI, for Model 40-124, Code 121, with these changes, applies to Model 40-124, Code 122.

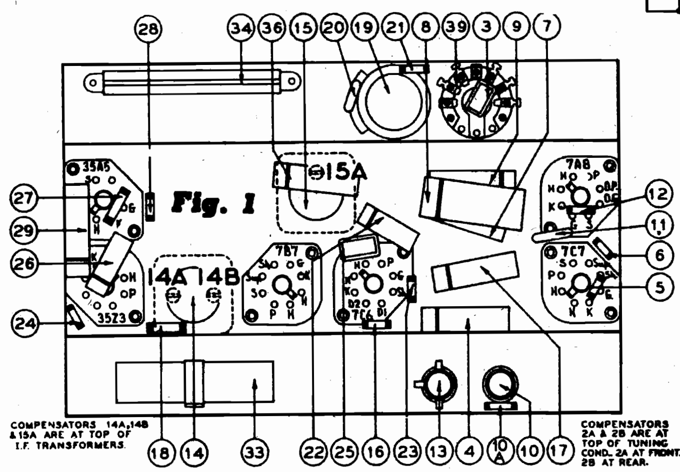
SCHEMATIC NUMBER	DESCRIPTION	PART No. CODE 122
1	Antenna Transformer	32-3404
1A	Tubular Condenser (.0015 mfd.)	30-4555
1B	Loop Assembly	32-3411
2	Tuning Condenser	31-2450
3	Mica Condenser (800 mmfd.)	30-1135
4	Not used.	
5	Tubular Condenser (.05 mfd.)	30-4519
6	Resistor (150 ohm, ½ watt)	33-115336
6A	Resistor (150 ohm, ½ watt)	33-115336
6B	Tubular Condenser (.05, .05 mfd.)	30-4522
6C	Resistor (47,000 ohms, ½ watt)	33-347339
7	Tubular Condenser (.05 mfd.	30-4519
21	Choke and Condenser Assembly (.2 mfd.)	76-1034

PHILCO RADIO & TELEVISION CORP.

MODELS 40-120
40-125



I.F.= 455 KC.



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-3190
	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

Cabinet	10390A
Escutcheon Plate (Pushbutton)	28-5742
Escutcheon Pins	W-1074
Knobs (Pushbutton)	27-4824
Tab (Dial)	27-5526
Tab Kit	40-6473

FOR ALIGNMENT AND TUNER, 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.

TUNING RANGE:

540 to 1600 K. C. 1.6 to 3.3 M. C.

POWER SUPPLY: 115 volts A. C. or D. C. current.

POWER CONSUMPTION: 28 watts.

AUDIO OUTPUT: 1 watt.

PHILCO RADIO & TELEVISION CORP.

ALIGNING PROCEDURE

MODELS 40-81, 40-82, 40-83, 40-84, 40-88, 40-90, 40-95, 40-100, 40-105, 40-110

CONNECTING THE ALIGNING METERS

Audio Output Meter: If an audio output meter is used, connect it across the plate and screen terminals of the output tubes. Adjust the meters to use the 0 to 10 scale.

Vacuum Tube Voltmeter: If a vacuum tube voltmeter is used as an aligning indicator, the negative (—) terminal is connected to the A. V. C. circuit of the receiver through a 2 meg. resistor. The positive (+) terminal is connected to the chassis or ground.

Signal Generator: When adjusting the I. F. padders the high side of the signal generator is connected through a .1 mfd. condenser to the loop tuning condenser stator lug which connects to the grid of the first tube. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders of the portable models a loop aerial is made from a few turns of wire and connected to the signal generator output terminals. The signal generator is then placed a few feet from the set. The loop aerial of the receiver must be assembled in the cabinet, together with the battery when adjusting the R. F. padders. The R. F. padding condensers can be reached from the bottom of the cabinet.

When aligning the R. F. padders of the battery models using an aerial, connect the signal generator as given in the column "Output Connections to Receiver" with a dummy aerial as indicated.

Models 40-81, Codes 121, 122, 40-82, 40-83, 40-84, PT-63, 40-74

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators	SPECIAL INSTRUCTIONS
1	See Paragraph on Signal Generator above	455 K. C.	580 K. C.	Vol. Max.	17A, 9B, 9A	See Paragraph on Signal Generator above
2	Use Loop on Generator	1500 K. C. 1400KC (40-84)	1500 K. C. 1400KC (40-84)	Vol. Max.	8B, 8A	Padder location Fig. 1 Note A

Model 40-88, Code 121

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators	SPECIAL INSTRUCTIONS
1	See Signal Generator Paragraph above	455 K. C.	580 K. C.	Vol. Max.	21A, 20B, 20A	
2	Use Loop on Generator	18 M. C.	18 M. C.	Vol. Max. Range Switch "S. W."	8B	Note A
3	Use Loop	1400 K. C.	1400 K. C.	Range Switch "Brdcst"	12, Screw, 8A	
4	Use Loop	580 K. C.	580 K. C.	Range Switch "Brdcst"	12A, Nut	Roll Tuning Condenser
5	Use Loop	1400 K. C.	1400 K. C.	Range Switch "Brdcst"	12, Screw, 8A	
6	Use Loop	18 M. C.	18 M. C.	Range Switch "S. W."	3	See Paragraph on Signal Generator above

Model 40-90

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dummy Aerial	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Padders	SPECIAL INSTRUCTIONS
1	1A7 Grid	.004 mfd.	455 K. C.	580 K. C.	Vol. Max.	On 1st and 2nd I. F. Trans.	Note B
2	Aerial	225 mmfd.	1500 K. C.	1500 K. C.	Vol. Max.	Osc. Ant. on Tuning Conds.	Note B Note A

Models 40-95, 40-100, 40-105

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dummy Aerial	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Padders	SPECIAL INSTRUCTIONS
1	1A7 Grid	.004 mfd.	455 K. C.	580 K. C.	Vol. Max.	On 1st and 2nd I. F. Trans.	Note B
2	Aerial	225 mmfd.	1500 K. C.	1500 K. C.	Vol. Max.	Osc. Ant. on Tuning Conds.	Note B Note A

Model 40-110

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dummy Aerial	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Padders	SPECIAL INSTRUCTIONS
1	Aerial	Note A	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	18A, 17A, 17B	Manual Push-button "IN"
2	Aerial	400 ohms	18 M. C.	18 M. C.	Vol. Max. Range Switch "S. W."	4A	Note B
3	Aerial	225 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	7 screw, 4B	Note B
4	Aerial	225 mmfd.	580 K. C.	580 K. C.	Range Switch "Brdcst"	7A (nut)	Roll Tuning Condenser
5	Aerial	400 ohms	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	7 screw	

NOTE A — DIAL CALIBRATION: Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dot below 550 K. C.

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 (530 K. C.).

PRODUCTION CHANGES

MODEL 40-120

Tuning condenser (2) changed from Part No. 31-2388 to Part No. 31-2423. The new condenser uses a rear mounting grommet, Part No. 27-4610, and sleeve, Part No. 28-5583.

MODEL 40-125

Tuning condenser (2) changed from Part No. 31-2397 to Part No. 31-2424. The new condenser uses a rear mounting grommet, Part No. 27-4610, and sleeve, Part No. 28-5583.

MODELS 40-120 and 40-125

Operations in Order	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	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. 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.

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.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-150
40-155

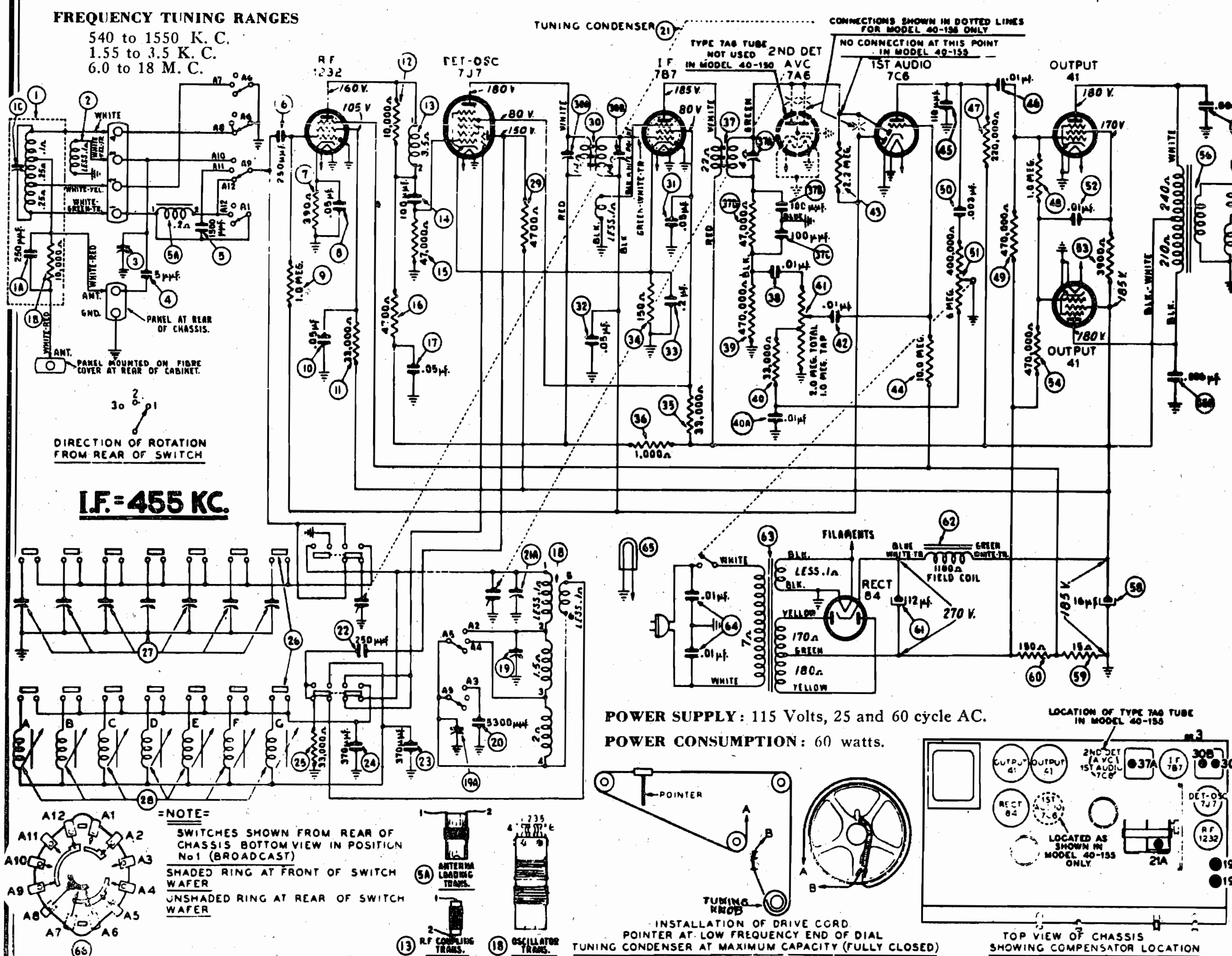


Fig. 1. Schematic diagram, models 40-150, 40-155

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 Record Player or in combination with Philco Television sets for reception of television sound programs.

In general, these models are similar with the exception of the number of tubes used and cabinet design. Model 40-150 employs seven (7) tubes and Model 40-155, eight (8) tubes.

PRODUCTION CHANGES

MODEL 40-150

Beginning with Run 1 receivers the converter tube was changed from a 7J7 loktal type to a 6J8G octal type. Tube sockets changed from Part 27-6129 loktal to 27-6120 octal.

Run 2 — New resistor Part No. 33-115339, 150 ohms connected in series with 6J8G tube plate. Change made to stabilize oscillator action at 18 M. C.

Cathode resistor (34) changed from Part No. 33-115339 to 33-115336.

Power transformer Part No. changed from 32-8065 to 32-8052.

Run 3 — Receivers marked with this run number have the converter changed from a 6J8G to a 7J7 loktal type tube as indicated in Service Bulletin. When this change was made. the resistor Part No. 33-115336 in Run 2 was removed.

Shortwave loop changed from Part No. 38-9884 to 38-9935.

MODEL 40-155

Run 1 — Beginning with Run 1 receivers the converter tube was changed from a 7J7 loktal type to a 6J8G octal type. Tube sockets changed from Part 27-6129 (loktal) to 27-6120 octal.

Shortwave loop (2) changed from Part No. 38-9884 to Part No. 38-9335.

Run 2 — New resistor Part No. 33-115339. 150 ohms connected in series with 6J8G tube plate. Change made to stabilize oscillator action at 18 M. C.

Cathode resistor (34) Part No. 33-115339 changed to wirewound type Part No. 33-115336.

Power transformer changed from Part No. 32-8065 to Part No. 32-8052.

Run 3 — Receivers marked with this run number have the converter tube changed from a type 6J8G octal tube to a 7J7 loktal tube. When this change was made the resistor Part No. 33-115339 added in Run 2 was removed.

MODELS 40-150, 40-155

To prevent oscillation at the low end of the broadcast band the 2nd I. F. transformer (37) changed from Part No. 32-3246 to Part No. 32-3383.

Loop assembly (1) (Broadcast) Part No. 38-9894 is changed to Part No. 38-9994, a production design change.

The physical location of condenser (4) as shown in Fig. 2 of the service bulletin has been changed to prevent oscillation at 540 K. C. The condenser is now wired to a three lug wiring panel between the range switch and volume control. The antenna lead is connected to one lug of this panel. This change is made on all sets marked Run No. 6.

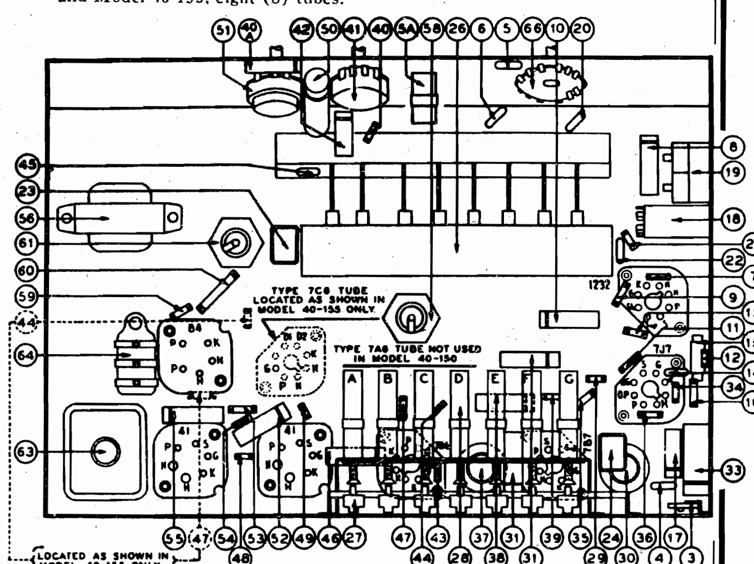


Fig. 2. Part locations, underside of chassis.

MODEL 40-158 (121)

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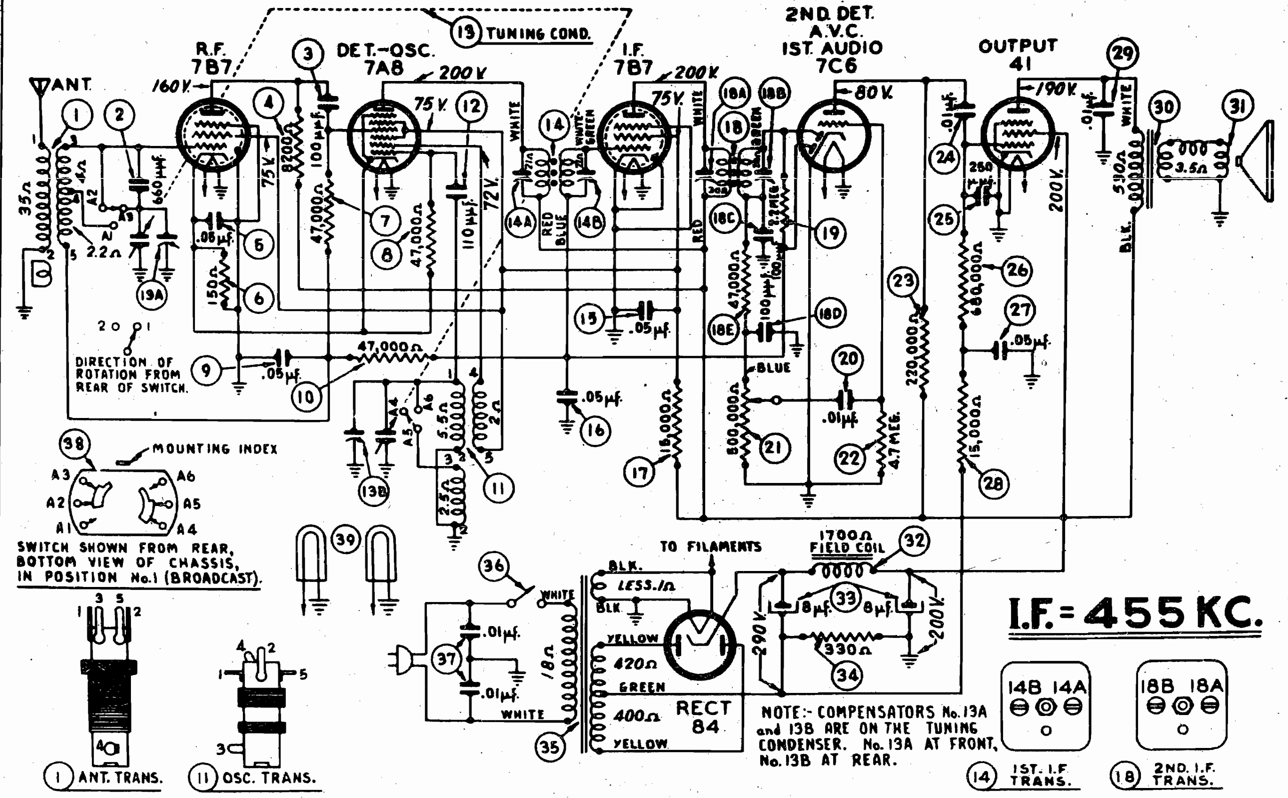


1	Antenna Transformer	32-3303
2	Mica Condenser (660 mmfd.)	30-1136
3	Mica Condenser (100 mmfd.)	30-1128
4	Resistor (8200 ohms, ½ watt)	33-282339
5	Tubular Condenser (.05 mfd.)	30-4519
6	Resistor (150 ohms, ½ watt)	33-115339
7	Resistor (47,000 ohms, ½ watt)	33-347339
8	Resistor (47,000 ohms, ½ watt)	33-347339
9	Tubular Condenser (.05 mfd.)	30-4519
10	Resistor (47,000 ohms, ½ watt)	33-347339
11	Oscillator Transformer	32-3255
12	Mica Condenser (110 mmfd.)	30-1130
13	Tuning Condenser Assembly	31-2418
14	1st I. F. Transformer Assy.	32-3361
15	Tubular Condenser (.05 mfd.)	30-4519
16	Tubular Condenser (.05 mfd.)	30-4519
17	Resistor (15,000 ohms, 1 watt)	33-315439
18	2nd I. F. Transformer Assembly	32-3211
19	Resistor (2.2 meg., ½ watt)	33-522339
20	Tubular Condenser (.01 mfd.)	30-4572
21	Volume Control (500,000 ohms)	33-5319
22	Resistor (4.7 meg., ½ watt)	33-547339
23	Resist. (220,000 ohms, ½ watt)	33-422339
24	Tubular Condenser (.01 mfd.)	30-4572
25	Mica Condenser (250 mmfd.)	61-0033
26	Resist. (680,000 ohms, ½ watt)	33-468339
27	Tubular Condenser (.05 mfd.)	30-4519
28	Resist. (15,000 ohms, ½ watt)	33-315339
29	Tubular Condenser (.01 mfd.)	30-4501
30	Output Transformer	32-8056
31	Cone and Voice Coil Assembly (Speak r Part No. 36-1480-3)	36-4086
32	Field Coil (Replace Speaker Part No. 36-1480)	
33	Elec. Cond. (8-8 mfd., 450 V.)	30-2447
34	Resistor (330 ohms, 1 watt)	33-133439
35	Power Transformer (115-130 V., 50-60 cycles)	32-8055
	(115-130 V., 25 cycle)	32-8076
36	A. C. Switch	42-1545
37	Bakelite Cond. (.01-.01 mfd.)	3903-DG
38	Wave Switch	42-1494
39	Pilot Lamps	34-2064

MISCELLANEOUS PARTS

Bezel	27-4842
Cabinet	10398C
Cable and Plug (Power Supply)	L-3199
Clip (Coil Mounting)	28-5002
Dial	27-5551
Drive Cord Assembly (Tuning Condenser)	31-2400
(Pointer Operation)	31-2382
Insulating Bushing (Dr. Shaft)	27-9437
Knobs (A. C. Switch, Volume, Tuning and Wave Switch)	27-4332
Pilot Lamp Socket Assembly	38-9904
Pointer	56-1479
Rubber Insulator (Drive Shaft)	27-9432
Socket (5 prong, type 84 tube)	27-6035
Socket (6 prong, type 41 tube)	27-6036
Socket (Loktal)	27-6131
Spring (Drive Cord, Tuning)	27-8751
Spring (Drive Cord, Pointer)	27-8953
Spring (Dr. Shaft, Grounding)	27-8955
Tuning Drive Drum Assembly	38-9883
Tuning Shaft	56-6052
Washer ("C" type, tun. shaft)	28-2043

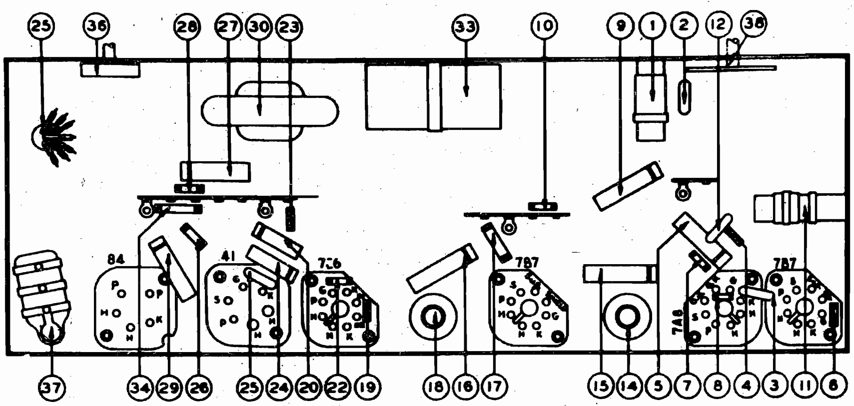


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

Opera-tions in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compen-sators in Order	
1	Antenna Terminal	455 K. C.	580 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	18A, 18B 14A, 14B	Note A
2	Antenna Terminal	1500 K. C.	1500 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	13B, 13A Note B	

NOTE A — 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, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B — The oscillator padder (13B) and antenna padder (13A) are located on top of the tuning condenser (13B) at the rear and (13A) at the front of the tuning condenser.

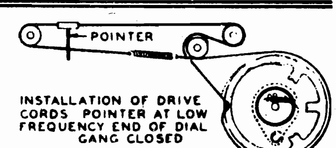
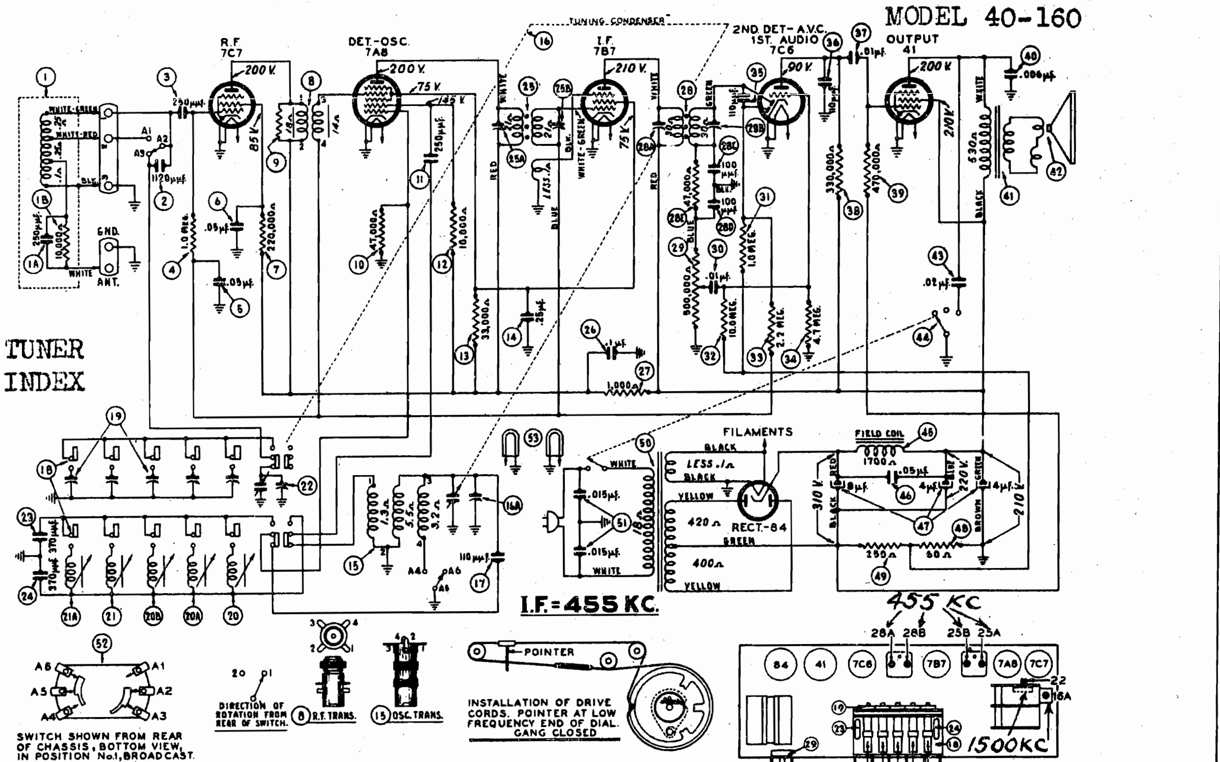


FIG. 1.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-130, 40-135, 40-170CS
MODEL 40-140, 40-145
MODEL 40-160

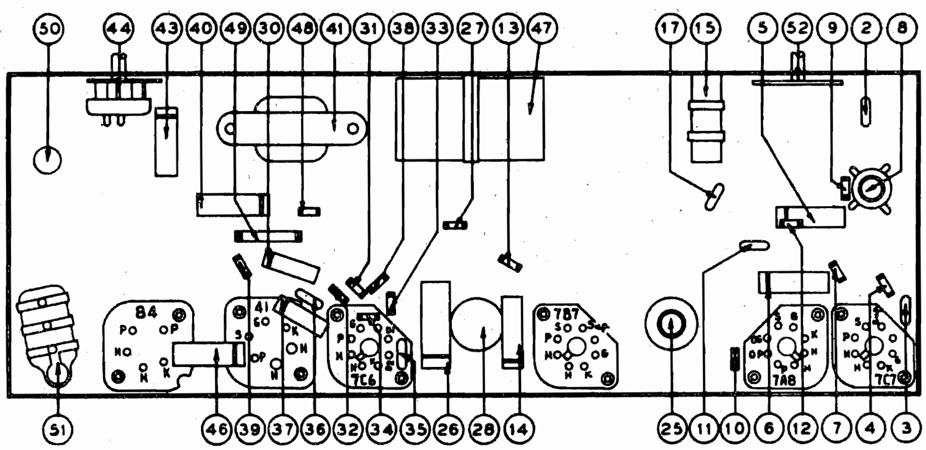
FOR TUNER SEE INDEX



SCHEMATIC DIAGRAM MODEL 40-160

Run 3—To prevent oscillation on push-button tuning, resistors (9) **Part No.** 33-268339 were removed from R. F. transformer (9) secondary. A new resistor Part No. 33-260339 is now added across primary winding of the same transformer.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL.VIII



40-170CS

Models 40-135 and 40-170 are similar in design with the exception of the cabinets, speakers, and several circuit changes. The Service information for Model 40-135 covers the Model 40-170 with the exception of the part changes listed below.

Sche. No.	Description	Part No.
1	Loop Assembly	38-9985
3	Mica Condenser	30-1140
30	Tubular Condenser (.006 mfd., 600 V.)	30-4504
31	Tubular Condenser (.02 mfd., 600 V.)	30-4599
34	Cone and Voice Coil Assembly (For Speaker Part No. 36-1480-3)	36-4086
	Cable (A. C.)	L-3240
	Cabinet	10453A
	Speaker	36-1480

PRODUCTION CHANGES

MODELS 40-130 RUN 3, 40-135, 40-170CS

To prevent oscillation at the low end of the broadcast band and 2nd I. F. transformer (21) changed from Part No. 32-3281 to Part No. 32-3382.

MODEL 40-170CS

The speaker, Part No. 36-1480-3 and cone assembly, Part No. 36-4086 listed in No. 1 change notice for Model 40-170CS has been changed on later production receivers to speaker 36-1480-4. The cone assembly for this new speaker is 36-4136.

PRODUCTION CHANGES

MODEL 40-140

Dial Scale changed from Part No. 27-5507 to Part No. 27-5552.
Tone Control (27) changed from Part No. 42-1496 to 33-5333.

MODEL 40-145

Dial Scale changed from Part No. 27-5507 to Part No. 27-5552.
Tone Control (27) changed from Part No. 42-1496 to 33-5333.

MODELS 40-140, 40-145

Operating on 115 Volt, 25 Cycle and 220 Volt, 60 Cycle Current

To operate Model 40-140 and 40-145 on 115 volts, 25 cycle current the power transformer (52) Part No. 32-8064, 115 volts, 60 cycle listed in the Service Bulletin, must be changed to Part No. 32-8075, 115 volts, 25 cycle. In addition, Electrolytic Condenser (49) Part No. 30-2409, 12 mfd., 400 volts must be changed to Part No. 30-2438, 20 mfd., 400 volts.

Model 40-140 can be operated on 220 volts, 60 cycle current by changing the power transformer (52), Service Bulletin 328, from Part No. 32-8064, 115 volts, 60 cycle to Part No. 32-8093, 220 volts, 60 cycle. The new transformer Part No. 32-8093 can be operated on either 115 or 220 volts, 60 cycle current by connecting the primary wiring as listed below:

Power Supply: 220 Volts—Red and Yellow to White. 110 Volts—Red to White.
Connect together: 220 Volts—Black and White to Red. 110 Volts—Black and White to Re and Yellow.

To prevent oscillation at the low end of the broadcast band the 2nd I. F. transformer (33) changed from Part No. 32-3281 to Part No. 32-3382.

The cabinet and B. C. loop assembly was changed on late production receivers as follows:

Model 40-140	Original Part No.	New Part No.
Cabinet	10395A	10464A
B. C. Loop	38-9892	76-1009

Model 40-145	Original Part No.	New Part No.
Cabinet	10395B	10464B
B. C. Loop	38-9892	76-1009

MODEL 40-165
MODELS 40-180,
40-185, 40-190

PHILCO RADIO & TELEVISION CORP.

MODEL 40-165 PRODUCTION CHANGES

Run 1 — Beginning with Run 1 receivers the converter tube was changed from a 7J7 loktal type to a 6J8G octal type. Tube sockets change from 27-6129 loktal to 27-6120 octal.

Run 2 — Additional condenser Part No. 30-4123 added across condenser (54) to reduce hum.

Run 3 — 6J8G converter tube socket Part No. 27-6120 reversed 180 degrees to prevent oscillation at 18 M. C. This reversed the position of the socket as wired in Run 1 receiver.

Run 4 — Converter tube changed back to a 7J7 loktal type from a 6J8G tube. This change makes the set correspond to the circuit diagram in the Service Bulletin.

S. W. loop assembly in Model 40-165K is Part No. 38-9968. This differs from loops used in the "F" cabinet.

For other data, see Index

MODELS 40-180, 40-185, 40-190

In general, these models are similar with the exception of the number of tubes used and the 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.

MODELS 40-180, 40-185, 40-190

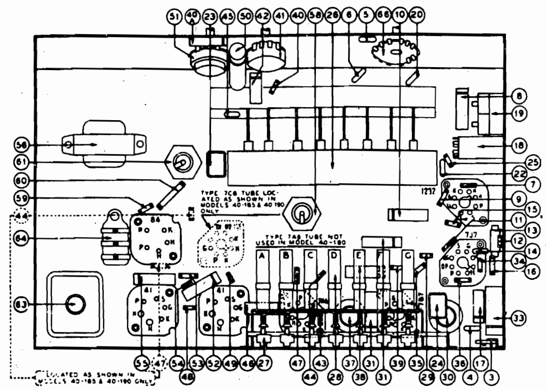


Fig. 1 — Part locations underside of chassis

PRODUCTION CHANGES

MODEL 40-180

Run 4 — Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type.

Run 5 — A new resistor Part No. 33-115339 not shown on diagram of Service Bulletin was added in series with plates of tre 6J8G tube. This change made to improve oscillator action at 18 M. C.

Cathode resistor (34) changed from Part No. 33-115339 carbon type to Part No. 33-115336 wirewound.

MODEL 40-185

Run 4 — Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type. Tube sockets changed from Part No. 27-6129 to Part No. 27-6120.

MODEL 40-190

Run 4 — Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type. Tube sockets changed from Part No. 27-6129 to Part No. 27-6120.

Run 5 — A new resistor Part No. 33-115339 not shown on diagram of the Service Bulletin was added in series with the plates of the 6J8G tube. This change was made to improve oscillation action at 18 M.C.

Cathode resistor (34) changed from Part No. 33-115339 carbon type to Part No. 33-115336 wirewound.

MODELS 40-180, 40-190

To prevent oscillation at the low end of the broadcast band the 2nd I. F. transformer (37) changed from Part No. 32-3246 to Part No. 32-3383.

The physical location of condenser (4) as shown in Fig. 2 of the Service Bulletin has been changed to prevent oscillation at 540 K. C. The condenser is now wired to a three lug wiring panel between the range switch and the volume control. The antenna lead is connected to one lug of the panel. This change is made on all sets marked Run No. 9, Model 40-180 and Run No. 10, Mod~l 40-190.

MODELS 40-185, 40-190

Beginning with Run "8" receivers the converter tube is changed from a type 6J8G octal to a 7J7 loktal. Tube sockets changed from Part No. 27-6120 to 27-6129 loktal.

This change reverses the change made on Run "4" receivers.

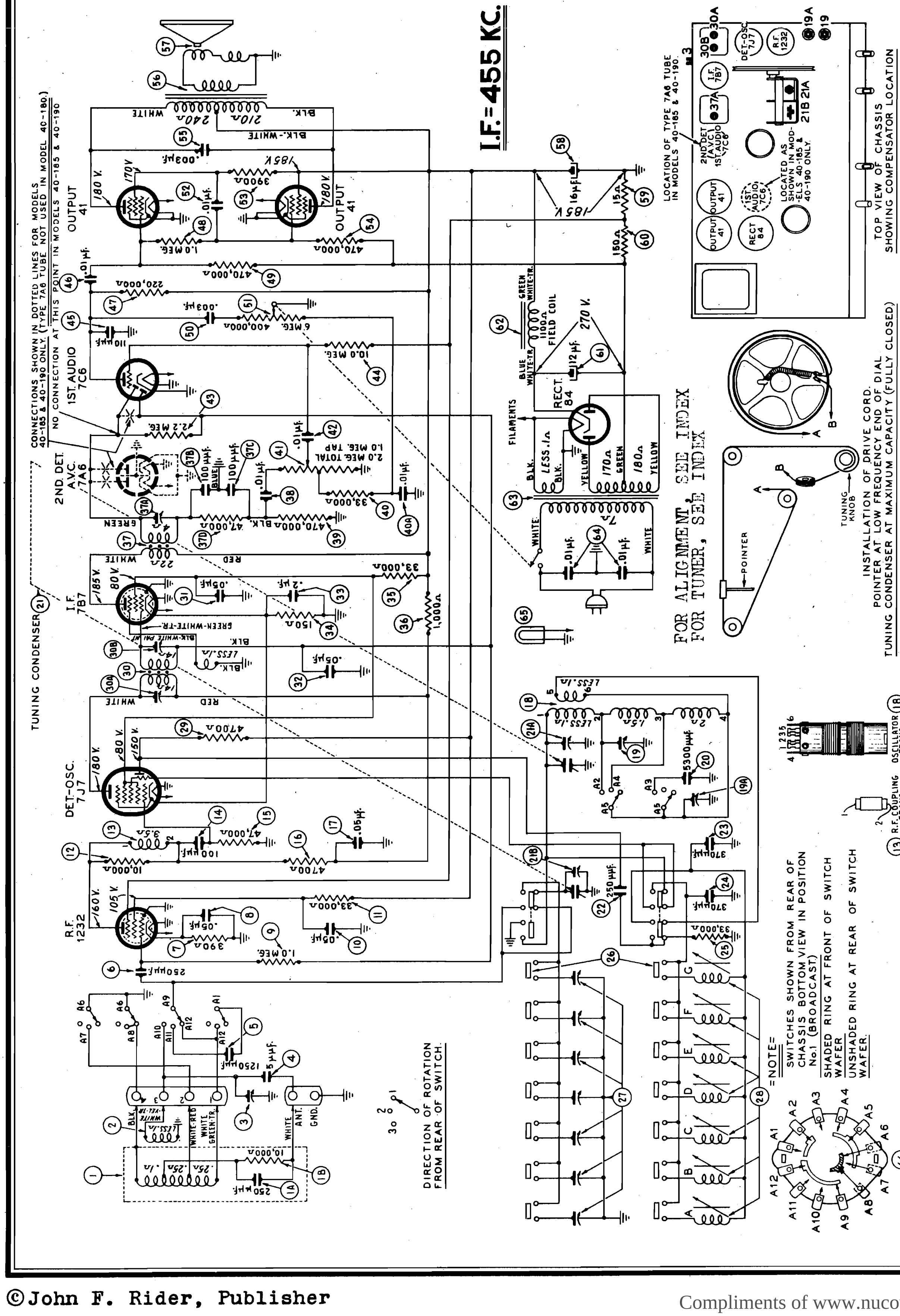
SCHE. No.	DESCRIPTION	PART No.
1	Loop Ass'y (Broadcast)	38-9880
1A	Mica Cond. (250 mmfd.)	61-0033
1B	Resistor (10,000 ohms, ½ watt)	33-310339
2	Loop Ass'y (Short Wave)	38-9884
3	Compensator	31-6308
4	Mica Cond. (5 mmfd.)	30-1097
5	Mica Cond. (1250 mmfd.)	5886
6	Mica Cond. (250 mmfd.)	61-0033
7	Resistor (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	
28B	Coil No. 2 } 540-1060 K. C.	32-3042
28C	Coil No. 3	
28D	Coil No. 4	
28E	Coil No. 5 } 650-1110 K. C.	32-3042
28F	Coil No. 6	
28G	Coil No. 7 } 920-1600 K. C.	32-3041
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 Speaker, Part No. 36-1479)	
63	Power Transformer	
	(115 Volts, 50 to 60 Cycle)	32-8052
	(115 Volts, 25 Cycle)	32-8086
	(120/240 Volts, 60 Cycle)	32-8092
64	Line Cond., (Bakelite, .01-.01 mfd.)	3903-DG
65	Pilot Lamp	34-2210
66	Wave Switch	42-1490

MISCELLANEOUS PARTS

Bezel Ass'y	40-6489
Bezel Gasket	27-9175
Cable & Plug (Power Supply)	L-3199
Cabinet Model 40-180	10372B
Cabinet Model 40-185	10400A
Cabinet Model 40-190	10391A
Clip (Coil mtg.)	28-5003
Dial	27-5508
Dial Tuning Drum Ass'y	38-9856
Drive Cord Ass'y	31-2383
Knobs (Tuning, Tone, Volume, Wave Switch)	27-4332
Knobs (Pushbuttons)	27-4852
Pilot Lamp Socket Ass'y	38-9607
Pointer	56-1516
Screws (Bezel mtg.)	W-1834FG1
Spring (Drive Cord)	28-8913
Spring (Dial Background Plate mtg.)	28-8908
Socket (Type 84 Tube)	27-6035
Socket (Type 41 Tube)	27-6036
Socket (Loktal, Type 7J7 Tube)	27-6129
Socket (Loktal, Type 7A6, 7C6 Tubes)	27-6131
Speaker	36-1479
Tab (Dial)	27-5530
Tab (Television)	27-9449
Tab Kit	40-6475
Tuning Shaft Ass'y	38-9874
Washer	
("C" Type, Tuning Shaft Ass'y)	28-2043
(Spring Type, Tuning Shaft Ass'y)	28-4186

PHILCO RADIO & TELEVISION CORP.

MODELS 40-180, 40-185, 40-190



SCHEMATIC DIAGRAM MODELS 40-180, 40-185 & 40-190

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."

MODELS 40-195
40-200
40-201(121, 122)

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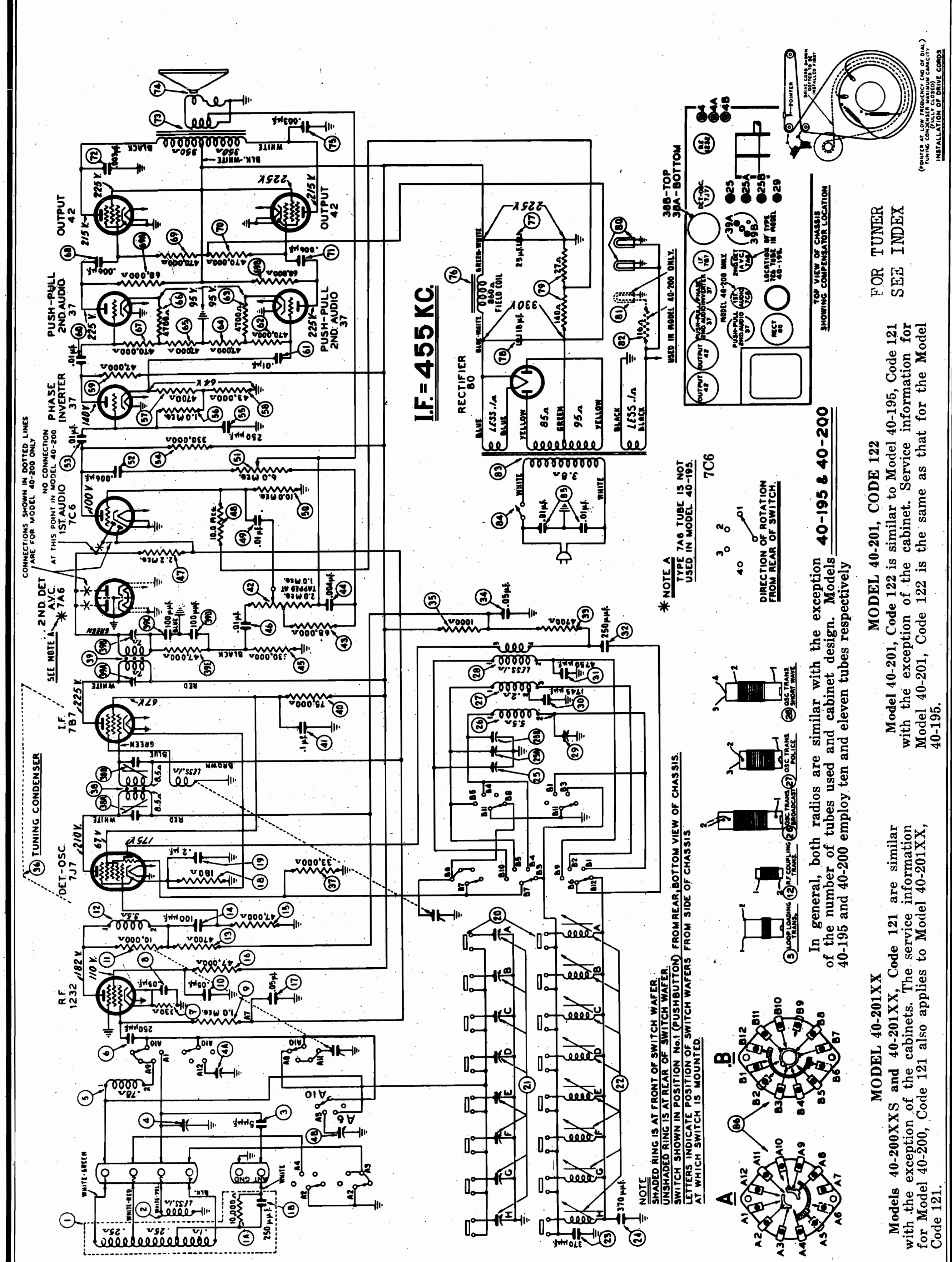


FOR TUNER SEE INDEX

40-195 & 40-200

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

MODEL 40-201, CODE 122

Model 40-201, Code 122 is similar to Model 40-195, Code 121 with the exception of the cabinet. Service information for Model 40-201, Code 122 is the same as that for the Model 40-195.

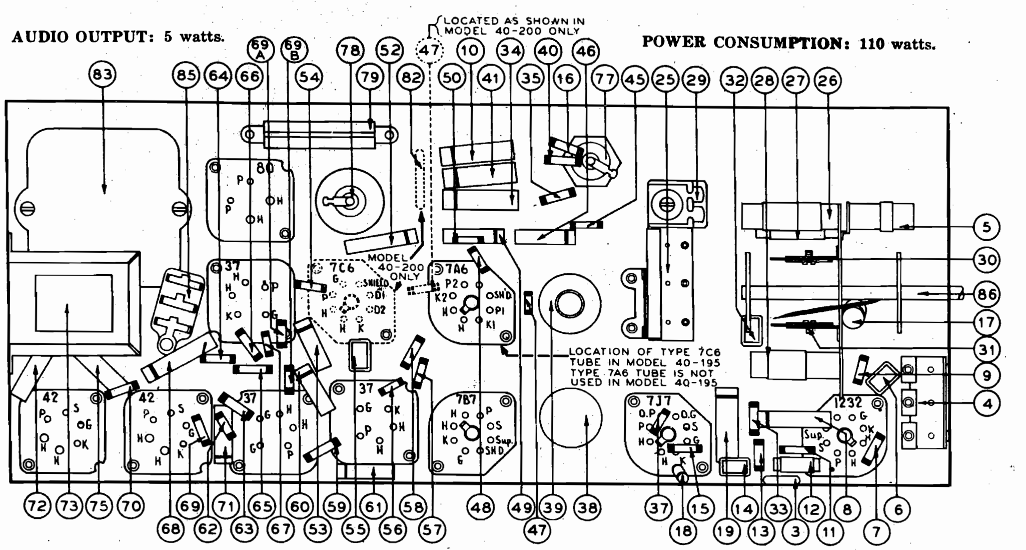
MODEL 40-201XX

Models 40-200XXS and 40-201XX, Code 121 are similar with the exception of the cabinets. The service information for Model 40-200, Code 121 also applies to Model 40-201XX, Code 121.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-195
40-200
40-201(121, 122)

AUDIO OUTPUT: 5 watts. POWER CONSUMPTION: 110 watts.



PRODUCTION CHANGES

MODEL 40-195

Run 2—A mica condenser Part No. 61-0038 was added to the police band and oscillator padder (25A) to improve padding of the circuit.

Run 4—Beginning with Run 4 receiver the converter tube was changed from a type 7J7 loktal to a 6J8G octal. Tube sockets changed from Part No. 27-6129 to 27-6120.

Run 5—To improve the operating characteristics of the set, screen by-pass condenser ( ) was changed from .05 mfd. Part No. 30-4518 to .01 mfd. Part No. 30-4572.

Run 6—A resistor, 27 ohms Part No. 33-027339 was connected in series with the oscillator grid circuit of sets using the 6J8G tube. This change was made to improve the oscillator performance.

MODEL 40-200

Run 3—A mica condenser Part No. 62-0038 was added to the police band oscillator padder (25A) to improve padding of the circuit.

Run 4—Beginning with Run 4 receiver the converter tube was changed from a type 7J7 loktal to a 6J8G octal. Tube sockets changed from Part No. 27-6129 to 27-6120.

Runs 5 and 6—Same as Model 40-195.

MODELS 40-195, 40-200

Beginning with Run "7" receivers the converter tube is changed from a type 6J8G octal to a 7J7 loktal. The tube sockets are changed from Part No. 27-6120 to Part No. 27-6129.

This change is the reverse of the change made on Run "4" receivers.

MODELS 40-195, 40-200, 40-201

To improve the padding at 1500 K. C. a mmfd. condenser Part No. 30-1097 was connected in parallel with compensator (25B). This change is on all sets marked Run 8.

To prevent low frequency rumble at various points on the dial scale, another condenser Part No. 30-4334, .004 mfd. was connected in parallel with the present condenser (44) in the bass compensation circuit.

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.

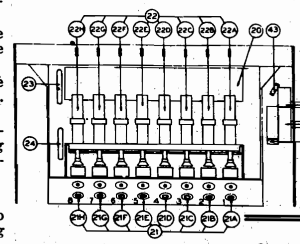


Fig. 3

MODELS 40-195, 40-200 and 40-201, Codes 121-122

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.

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.

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

MODELS 40-215RX
40-217RX

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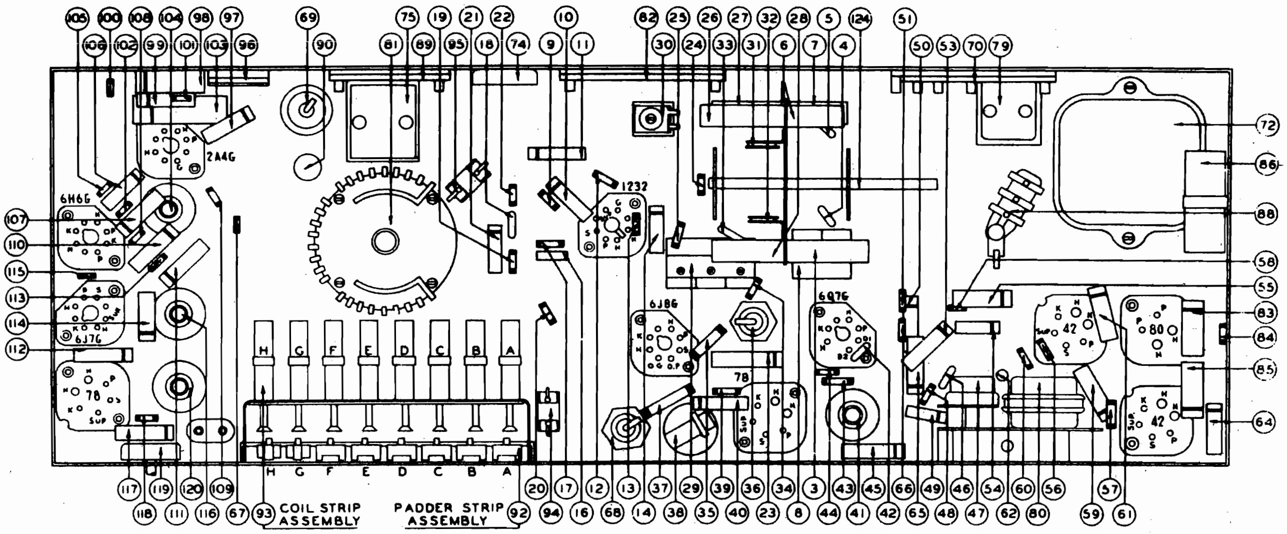


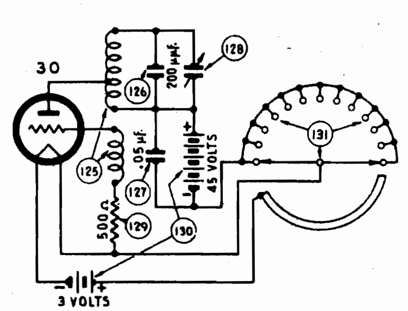
FIG. 2. REPLACEMENT PARTS, UNDERSIDE OF CHASSIS.

REPLACEMENT PARTS

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Broadcast)	38-9882
1A	Resistor (10,000 ohms, 1/2 watt)	33-310339
1B	Mica Condenser (250 mmfd.)	61-0033
2	Loop Assembly (Short Wave)	38-9977
2A	Compensator	31-6328
3	Short Wave Series Transformer	32-3378
4	Mica Condenser (5 mmfd.)	30-1097
5	Mica Condenser (250 mmfd.)	61-0033
6	Broadcast Series Transformer	32-3376
7	Police Shunt Transformer	33-3377
8	Compensator (2 section)	31-6339
9	Resistor (82,000 ohms, 1/2 watt)	33-382339
10	Tubular Condenser (.05 mfd.)	30-4123
11	Tubular Condenser (.05 mfd.)	30-4444
12	Resistor (1.0 meg., 1/2 watt)	33-510339
13	Resistor (330 ohms, 1/2 watt)	33-133339
14	Tubular Condenser (.05 mfd.)	30-4444
15	Tuning Condenser Assembly	31-2433
16	Peaking Transformer	32-3372
17	Resistor (10,000 ohms, 1/2 watt)	33-310339
18	Mica Condenser (100 mmfd.)	30-1128
19	Resistor (4700 ohms, 1/2 watt)	33-247339
20	Resistor (1000 ohms, 1/2 watt)	33-210339
21	Tubular Condenser (.05 mfd.)	30-4123
22	Resistor (47,000 ohms, 1/2 watt)	33-347339
23	Tubular Condenser (.05 mfd.)	30-4123
24	Resistor (33,000 ohms, 1/2 watt)	33-333339
25	Resistor (27 ohms, 1/2 watt)	33-027339
26	Oscillator Transformer (Broadcast)	32-3373
27	Oscillator Transformer (Police)	32-3374
28	Oscillator Transformer (Short Wave)	32-3375
29	Compensator (3 section)	31-6338
30	Compensator	31-6230
31	Tracking Condenser (Police, 1330 mmfd.)	31-6286
32	Tracking Condenser (Short Wave, 6100 mmfd.)	31-6341
33	Mica Condenser (250 mmfd.)	61-0033
34	Resistor (10,000 ohms, 1/2 watt)	33-310339
35	Resistor (15,000 ohms, 1 watt)	33-315439
36	Electrolytic Condenser (4 mfd., 250 V.)	30-2334
37	Resistor (5000 ohms, 3 watts)	33-250639
38	1st I. F. Transformer Assembly	32-3089
39	Resistor (390 ohms, 1/2 watt)	33-139339
40	Tubular Condenser (.05 mfd.)	30-4444
41	2nd I. F. Transformer Assembly	32-2645
41E	Resistor (51,000 ohms, 1/2 watt)	33-351339
41F	Resistor (330,000 ohms, 1/2 watt)	33-433339
42	Mica Condenser (110 mmfd.)	30-1031
43	Resistor (2.0 meg., 1/2 watt)	33-520339
44	Resistor (1.0 meg., 1/2 watt)	33-510339
45	Tubular Condenser (.01 mfd.)	30-4479
46	Mica Condenser (50 mmfd.)	30-1029
47	Volume Control (2.0 meg.)	33-5300
48	Resistor (70,000 ohms, 1/2 watt)	33-370339
49	Tubular Condenser (.004 mfd.)	30-4334
50	Tubular Condenser (.015 mfd.)	30-4358
51	Resistor (1.0 meg., 1/2 watt)	33-510339
52	Tone Control (3.0 meg.)	33-5287
53	Tubular Condenser (.02 mfd.)	30-4481
54	Tubular Condenser (.006 mfd.)	30-4445
55	Tubular Condenser (.03 mfd.)	30-4517
56	Resistor (490,000 ohms, 1/2 watt)	33-449339
57	Resistor (330,000 ohms, 1/2 watt)	33-433339
58	Resistor (99,000 ohms, 1/2 watt)	33-339339
59	Tubular Condenser (.01 mfd.)	30-4501
60	Resistor (3500 ohms, 1/2 watt)	33-235339
61	Tubular Condenser (.01 mfd.)	30-4501
62	Output Transformer	32-7997
63	Cone and Voice Coil Assembly (Speaker Part No. 36-1450-2)	36-4089
	(Speaker Part No. 36-1450-4)	36-4111
64	Tubular Condenser (.01 mfd.)	30-4501
65	Tubular Condenser (.1 mfd.)	30-4499
66	Resistor (1.0 meg., 1/2 watt)	33-510339
67	Resistor (3000 ohms, 1/2 watt)	33-230339
68	Electrolytic Condenser (25 mfd., 300 V.)	30-2360
69	Electrolytic Condenser (18 mfd., 475 V.)	30-2200
70	Resistor (Wirewound, Bias)	33-3361
71	Field Coil (Replace Spkr. Part No. 36-1450)	
72	Power Trans. (115 V., 50-60 cycles)	32-7999
	Power Trans. (115 V., 25-40 cycles)	32-8013
73	Bypass Condenser (.05 mfd., 110 V. Plug)	30-4576
74	Choke Coil	32-1281
75	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
76	Resistor (16 ohms, Pilot Lamp)	33-016439
77	Pilot Lamp (Bullseye)	34-2210
78	Pilot Lamps (Dial)	34-2064
79	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
80	Motor Assembly (Volume Control, 60 cycles)	35-1151
	(110 volts, 25 cycles)	35-1152
80A	Switch (Volume Control Motor)	42-1469
81	Rotary Switch (Stepper Unit)	42-1468
82	Resistor (10 ohms, wirewound)	33-3363
83	Tubular Condenser (.1 mfd.)	30-4499
84	Resistor (150 ohms, 1/2 watt)	33-115339
85	Tubular Condenser (.1 mfd.)	30-4499
86	Electrolytic Condenser (30 mfd., 30 V.)	30-2361
87	Stepper Unit (Complete)	38-9689
87A	Spark Filt. Assy. (Inside of Stepper Unit)	38-9898
87B	Spark Filter Choke	32-3276
87C	Tubular Condenser (.05 mfd.)	30-4444
87D	Tubular Condenser (.05 mfd.)	30-4444
87E	Resistor (100 ohms, 1/2 watt)	33-110339
88	Bakelite Condenser (.05 mfd.)	3615-SG
89	Resistor (150 ohms, wirewound)	33-3362
90	Electrolytic Condenser (16 mfd., 150 V.)	30-2387
91	Pilot Lamps (Station Indicator)	34-2064
92	Compensator Strip (Pushbuttons)	31-6264
92A	Compensator No. 1	
92B	Compensator No. 2 540-1030 K. C.—Part of 92	
92C	Compensator No. 3	
92D	Compensator No. 4 670-1130 K. C.—Part of 92	
92E	Compensator No. 5	
92F	Compensator No. 6 900-1470 K. C.—Part of 92	
92G	Compensator No. 7	
92H	Compensator No. 8 1100-1600 K. C.—Part of 92	
93	Elec. Pushbutton Trans. Assy. (8 Trans.)	32-3091
93A	Oscillator Transformer No. 1	
93B	Oscillator Transformer No. 2 540-1030 K. C.	32-3042
93C	Oscillator Transformer No. 3	
93D	Oscillator Transformer No. 4 670-1160 K. C.	32-3042
93E	Oscillator Transformer No. 5	
93F	Oscillator Transformer No. 6 900-1470 K. C.	32-3041
93G	Oscillator Transformer No. 7	
93H	Oscillator Transformer No. 8 1100-1600 K. C.	32-3041
94	Silver Mica Cond. (370 mmfd.)	30-1110
95	Silver Mica Cond. (370 mmfd.)	30-1110
96	Choke Coil	32-1281
97	Tubular Condenser (.05 mfd.)	30-4123
98	Tubular Condenser (.05 mfd.)	30-4123
99	Tubular Condenser (.1 mfd.)	30-4499
100	Resistor (4000 ohms, 1/2 watt)	33-240339
101	Resistor (51,000 ohms, 1/2 watt)	33-351339
102	Resistor (120,000 ohms, 1/2 watt)	33-412339
103	Tubular Condenser (.5 mfd.)	30-4551
104	No. 3 Control Amplifier Transformer	32-3275
105	Resistor (750,000 ohms, 1/2 watt)	33-475339
106	Tubular Condenser (.02 mfd.)	30-4516
107	Tubular Condenser (.1 mfd.)	30-4455
108	Resistor (150,000 ohms, 1/2 watt)	33-415339
109	Resistor (2700 ohms, 1/2 watt)	33-227339
110	Tubular Condenser (.05 mfd.)	30-4123
111	Tubular Condenser (.05 mfd.)	30-4123
112	Tubular Condenser (.05 mfd.)	30-4123
113	Resistor (1.5 meg., 1/2 watt)	33-515339
114	Tubular Condenser (.05 mfd.)	30-4519
115	Resistor (99,000 ohms, 1/2 watt)	33-399339
116	No. 2 Control Amplifier Transformer	32-3087
117	Tubular Condenser (.05 mfd.)	30-4444
118	Resistor (300 ohms, 1/2 watt)	33-130339
119	Sensitivity Control (50,000 ohms)	33-5295
120	No. 1 Control Amplifier Transformer	32-3086
121	Silver Mica Cond. (155 mmfd.)	30-1121
122	Compensator (Secondary Inductor)	31-6268
123	Secondary Inductor (Remote Tuning)	40-6414
124	Wave Switch	42-1550
	Wireless Remote Control Unit	45-2709
125	Primary Inductor	32-3097
126	Silver Mica Cond. (200 mmfd.)	30-1115
127	Tubular Condenser (.05 mfd.)	30-4519
128	Compensator (Primary Inductor)	31-6268
129	Resistor (500 ohms, 1/2 watt)	33-150339
130	Remote Control Battery Pack	41 8023
131	Dial Unit (Pulser)	38-9704

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	56-1509
Bezel Gasket and Staple Assembly	38-9734
Cabinet (Model 40-215RX)	104028
Cabinet (Model 40-217RX)	104038
Cable (Power Supply)	L-3176
Dial	27-5563
Drive Cord (Tuning Condenser)	31-2315
Drive Cord (Pointer Operation)	31-2320
Disc (Tuning)	27-4766
Disc (Volume)	27-4765
Disc (Wave Switch)	27-4767
Disc (Tone Control)	27-4764
Knob (Sensitivity Control)	27-4326
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Lamp Jewel (Bullseye)	27-4777
Socket (4 prong, type 80 tube)	27-6044
Socket (6 prong, type 42 & 78 tubes)	27-6036
Socket (Octal, type 6J7G tube)	27-6057
Socket (Octal, type 6H6G, 2A4G & 6Q7G tubes)	27-6088
Socket (Octal, type 6J8G tube)	27-6099
Socket (Loktal, type 1232 tube)	27-6129
Spring (Drive Cords)	28-8913
Speaker	36-1450
Washer (Keyed Washer, Tuning Disc)	56-1029



SCHEMATIC DIAGRAM OF WIRELESS REMOTE CONTROL UNIT

FIG. 3. SCHEMATIC DIAGRAM, WIRELESS REMOTE CONTROL.

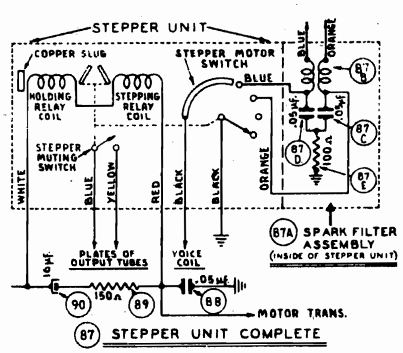
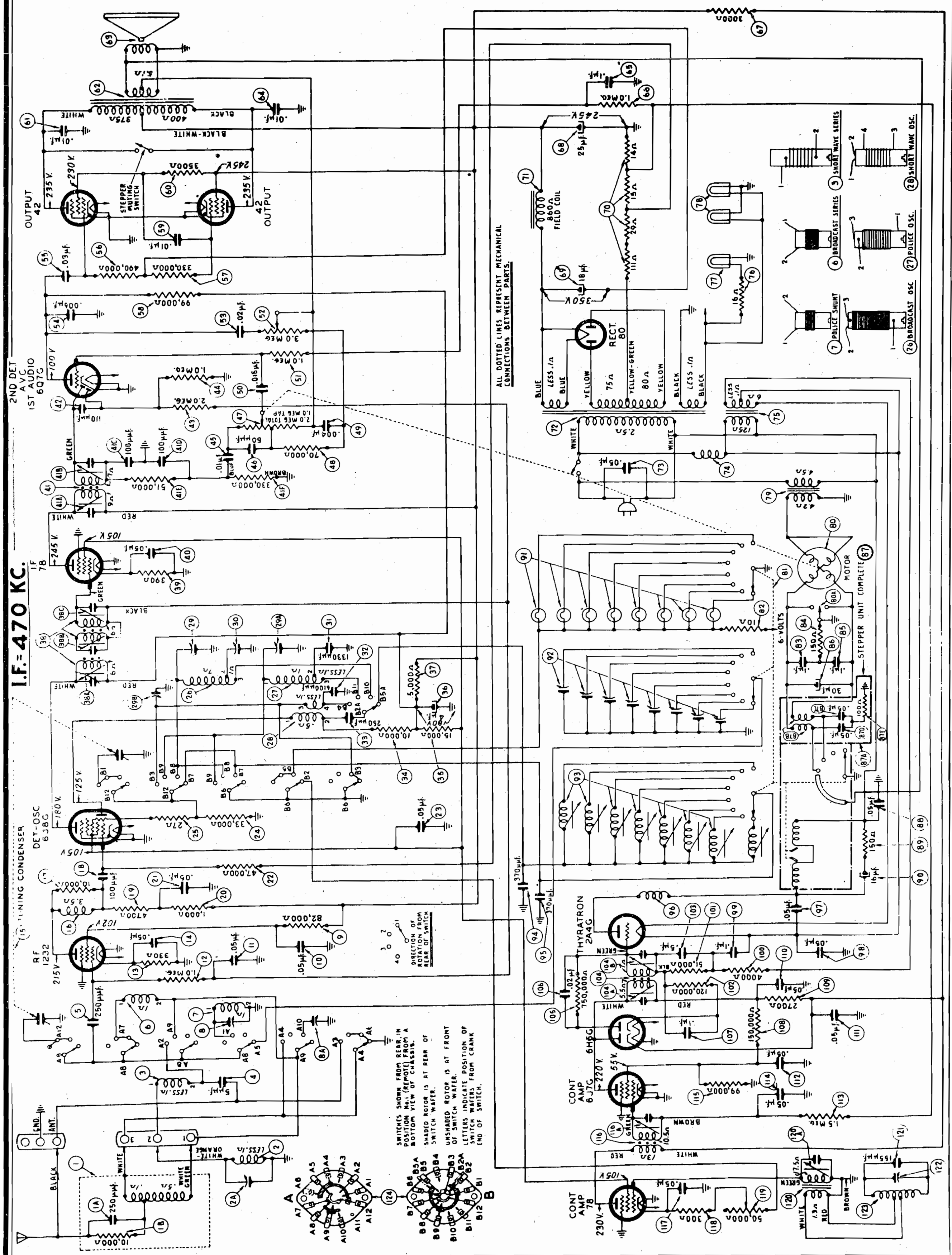


FIG. 4. WIRING OF STEPPER UNIT, WIRELESS REMOTE CONTROL.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-215RX
40-217RX



MODELS 40-215RX
40-217RX

PHILCO RADIO & TELEVISION CORP.

SPECIFICATIONS

Models 40-215, code 121, and 40-217, code 121, are twelve (12) tube super-heterodyne radios employing Philco Wireless Remote Control and a Built-in Super-Aerial System. Three tuning ranges are also provided for reception of standard, Police and Short Wave Broadcast stations. These models are also designed to receive the sound of a television program, tuned in by Philco Television Sets and can be set up for use with a Wireless Record Player.

The Wireless Remote Control will automatically tune in eight (8) broadcast stations, increase and decrease volume and turning off the radio without any connections between the set and the control unit.

The Built-in Super-Aerial System eliminates an outside aerial and ground. Included in the Built-in Super Aerial System is a statically shielded loop for broadcast band reception and a short wave broadcast 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 addition, other features of design are; automatic volume control, continuously variable tone control, bass compensation, and degenerated push-pull pentode audio output. Outside aerial connections are also provided for remote localities where station signal strength is exceptionally weak.

POWER SUPPLY: 115 volts, 60 cycles.
This model can also be operated on a 115 volt, 25 cycle power supply, changing the power transformers and several parts as indicated on the replacement parts on page 79.

FREQUENCY TUNING RANGES:
540 to 1520 K. C. 1.4 to 3.6 M. C. 6.0 to 18 M. C.

INTERMEDIATE FREQUENCY: 470 K. C.

PHILCO TUBES USED: Receiver—1232, R. F. Amplifier; 6J8G, Detector Oscillator; 78, I. F. Amplifier; 6Q7G, 2nd Detector, A. V. C., 1st Audio; two 42, Push-Pull Audio Output; 80, Rectifier.
Control Frequency Amplifier—78, 6J7G, 6H6G, 2A4G.
Wireless Remote Control—Type 30 tube.

AUDIO OUTPUT: 7 Watts.

CABINET DIMENSIONS:	Height	Width	Depth
Model 40-215	38"	30"	15⅝"
Model 40-217	36¼"	35"	14¾"

CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the grid of the 78 I. F. tube. The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.
2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of one of the 42 tubes. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the R. F. and I. F. compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 5, page 80. 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 the grid of the tubes. 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.

RECEIVER CIRCUIT ADJUSTMENTS — Models 40-215, 40-217

Operation	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	78 I. F. Grid	470 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	41A, 41B	Turn Out 38B Full
2	6J8G Det. Osc. Grid	470 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	38A, 38C, 38B	Note A
3	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Vol. Max. Range Switch "Short Wave"	29B, 2A	Note C, Note D 2A on SW Loop
4	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	29, 8A	Note A
5	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	30	Rollgang
6	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	29	
7	Use Loop on Generator	3.5 M. C.	3.5 M. C.	Vol. Max. Range Switch "Police"	29A, 8	Note B

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 and dial pointer is shown in Fig. 1.

NOTE B—See Wireless Remote Control Amplifier adjustments.

NOTE C—If two peaks (signals) are observed on the aligning meter when adjusting the oscillator padder No. 29B, tune the padder to the second peak from the maximum capacity position (screw all the way in).

NOTE D—If two peaks (signals) are observed on the aligning meter when adjusting the loop padder 2A, tune the padder to the first peak signal from the maximum capacity position (screw all the way in). When adjusting the padders to this first peak roll the tuning condenser (rock) slightly back and forth to obtain the maximum readings on the aligning meter.

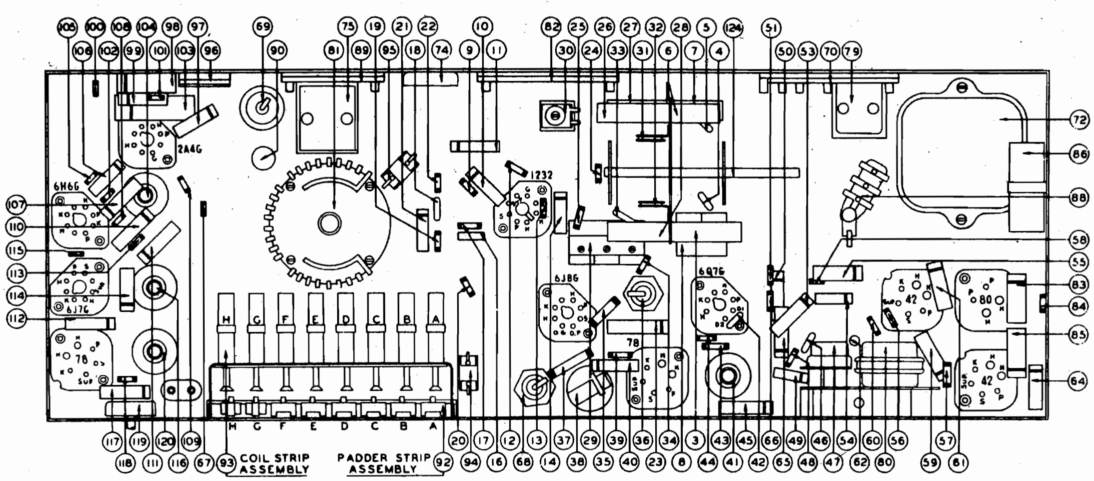
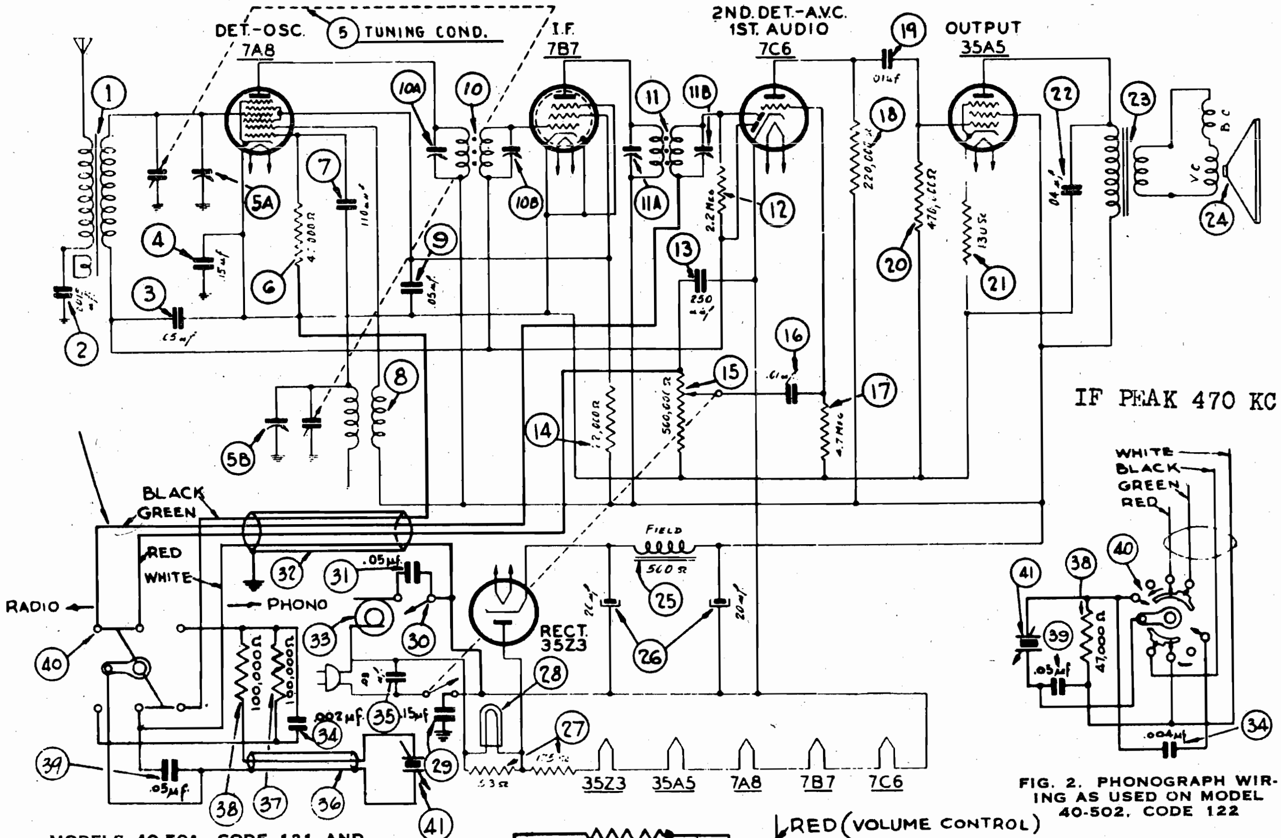


FIG. 2. REPLACEMENT PARTS, UNDERSIDE OF CHASSIS.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-501 (121)
40-502 (121, 122)



IF PEAK 470 KC

FIG. 2. PHONOGRAPH WIRING AS USED ON MODEL 40-502, CODE 122

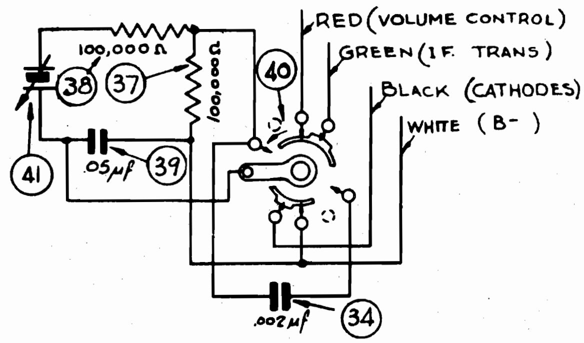


FIG. 1. PHONOGRAPH WIRING AS USED ON MODEL 40-502, CODE 121

MODELS 40-501, CODE 121 AND 40-502, CODES 121 AND 122

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3151
2	Condenser (.0015 mfd., 200 volts)	30-4555
3	Condenser (.05 mfd., 400 volts)	30-4519
4	Condenser (.15 mfd., 400 volts)	30-4505
5	Tuning Condenser	31-2354
5A	Antenna Compensator, Part of 5	
6	Resistor (47,000 ohms, Model 40-502)	33-347339
7	Condenser (110 mmfd.)	30-1130
8	Oscillator Transformer	32-3152
9	Condenser (.05 mfd., 200 volts)	30-4519
10	1st I. F. Transformer	32-3149
11	2nd I. F. Transformer	32-3150
12	Resistor (2.2 megohms)	33-522339
13	Condenser, Mica (250 mmfd.)	61-0033
14	Resistor (22,000 ohms, Model 40-502, Code 122)	33-322339
15	Volume Control	33-5306
16	Condenser (.01 mfd., 200 volts)	30-4479
17	Resistor (4.7 megohms, Model 40-502, Code 122)	33-547339
18	Resistor (220,000 ohms, Model 40-502, Code 122)	33-422339
19	Condenser, Tubular (.01 mfd., 400 volts)	30-4572
20	Resistor (470,000 ohms, Model 40-502, Code 122)	33-447339
21	Resistor (130 ohms)	33-113339
22	Condenser (.02 mfd., 400 volts)	30-4516
23	Output Transformer	
	For use with Speaker 36-1469-1	32-8057
	For use with Speaker 36-1469-9	32-8044
24	Cone Assembly for Speaker 36-1469-1	36-4115
	Cone Assembly for Speaker 36-1469-9	36-4113
25	Field Coil—Replace Speaker 36-1469	
26	Electrolytic Condenser (20-20 mfd.)	30-2382
27	Resistor	33-3367
28	Pilot Lamp	34-2068
29	Condenser (.15 mfd.)	
30	Motor Switch (40-501, 121, 40-502, 121-122)	42-1521
31	Condenser, Tubular (.05 mfd.)	30-4518
32	Radio-Phono Cable, Model 40-501	L-3192
	Radio-Phono Cable, Model 40-502, Code 121-122	L-3206
33	Motor (115 volts, 60 cycle)	
	40-501, Code 121, 40-502, Code 121	35-1158
	40-502, Code 122	35-1216
34	Condenser (.002 mfd., 40-501, 40-502, Code 121)	30-4579
	Condenser (.004 mfd., 40-502, Code 122)	30-4578
35	Condenser (.03 mfd., 400 volts)	30-4449
36	Pickup Cable	
37	Resistor (100,000 ohms, 40-501, Code 121, 40-502, Code 121)	33-410339
38	Resistor (100,000 ohms, 40-501, 40-502, Code 121)	33-410339
	Resistor (47,000 ohms, 40-502, Code 122)	33-347339
39	Condenser, Tubular (.05 mfd., 400 volts)	30-4519
40	Radio-Phono Switch	
	(Model 40-501)	42-1523
	(Model 40-502, Code 121-122)	42-1524
41	Pickup Crystal Cartridge	
	40-501, 40-502, Code 121	415-1027
	40-502, Code 122	35-2069

Operations in Order	SIGNAL GENERATOR Output Connections to Receiver	SIGNAL GENERATOR Dial Setting	RECEIVER Dial Setting	RECEIVER Control Setting	RECEIVER Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Cond.	470 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max.	11A, 11B 10A, 10B	
2	Ant. Ter.	1700 K. C.	1700 K. C.	Vol. Max.	5B	Note A
3	Ant. Ter.	1500 K. C.	1500 K. C.	Vol. Max.	5A	

NOTE A — DIAL CALIBRATION: The dial pointer is adjusted by closing the tuning condenser (plates fully meshed) and setting the pointer on the dot below 55 on the dial.

PRODUCTION CHANGES

MODELS 40-501, CODE 121; 40-502, CODES 121-122

Beginning with sets marked Run 2, resistor (6) 47000 ohms, Part No. 33-347339 was changed to 22000 ohms, Part No. 33-322339. This change was made to stabilize oscillator circuit.

Output Transformer for Speaker Part No. 36-1469-1 listed as Part No. 32-8057 should be Part No. 32-8047.

MODEL 40-502, Code 122

Motor (33) 115 volts, 60 cycle, Part No. 35-1216 changed to Part No. 35-1222. The turntable for the new motor is Part No. 35-3044.

MODEL 40-504
MODELS 40-525,
40-526, 40-527

PHILCO RADIO & TELEVISION CORP.

REPLACEMENT PARTS — Models 40-525, 40-526, 40-527

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	38-9897
1A	Compensator	31-6308
1B	Mica Condenser (250 mmfd.)	61-0033
1C	Resist. (10,000 ohms, ½ watt)	33-310339
2	Mica Condenser (250 mmfd.)	61-0033
3	Mica Condenser (1120 mmfd.)	30-1140
4	Tubular Condenser (.05 mfd.)	30-4518
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Condenser (.05 mfd.)	30-4518
7	Resis. (270,000 ohms, ½ watt)	33-427339
8	R. F. Transformer	32-3283
9	Tuning Condenser	31-2374
10	Resistor (5600 ohms, ½ watt)	33-256339
11	Resist. (47,000 ohms, ½ watt)	33-347339
12	Mica Condenser (250 mmfd.)	61-0033
13	Tubular Condenser (.05 mfd.)	30-4518
14	Tubular Condenser (.05 mfd.)	30-4518
15	Resist. (10,000 ohms, ½ watt)	33-310339
16	Mica Condenser (250 mmfd.)	61-0033
17	Oscillator Transformer	32-3212
18	1st I. F. Trans. Assembly	32-3210
19	Resistor (27,000 ohms, 1 watt)	33-327439
20	Resistor (1,000 ohms, ½ watt)	33-210339
21	2nd I. F. Trans. Assembly	32-3281
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Tubular Condenser (.01 mfd.)	30-4572
24	Volume Control (.5 meg.)	33-5332
25	Resistor (4.7 meg., ½ watt)	33-547339
26	Mica Condenser (250 mmfd.)	61-0033
27	Tubular Cond. (.004 mfd.)	30-4578
28	Resistor (1.0 meg., ½ watt)	33-510339
29	Resis. (330,000 ohms, ½ watt)	33-433339
30	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Condenser (.02 mfd.)	30-4481
32	Tone Control & On-Off Switch	42-1520
33	Output Transformer	32-8063
34	Cone & Voice Coil Assembly: For Speaker 36-1480-3	36-4086
35	Field Coil (Replace Spkr. Part No. 36-1480)	
36	Electrolytic Condenser (4 mfd., 400 V.)	30-2401
37	Electrolytic Condenser (12-20 mfd., 475 V.)	30-2437
38	Resistor (39 ohms, ½ watt)	33-039339
39	Resistor (220 ohms, 1 watt)	33-122431
40	Power Transformer (115 V., 50-60 cycles)	32-8064
41	Bakelite Cond. (.01-.01 mfd.)	3903-DG
42	Pilot Lamps	34-2064
43	Wave Switch	42-1494
44	Pushbutton Switch	42-1528
45	Padder Strip	31-6315
46	Motor Switch	42-1548
47	Motor (110 volts, 60 cycles)	35-1204
48	Switch (Part of 46)	
49	Crystal Cartridge (Pickup)	35-2030
50	Pickup Cable Assembly	
	Switch Section	41-3508
	Changer	318-1775
51	Radio-Phono Switch	42-1551
52	Cable (Radio-Phono Switch)	L-3217
53	Condenser (.05 mfd.)	30-4518

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Automatic Record Changer	35-1180
Cabinet	10452-A
Cable (Power)	L-3199
Cable (Speaker)	41-3329
Cable (Radio-Phono)	L-3217
Dial Scale	27-5506
Drive Cord (Pointer Drive)	31-2399
Drive Cord (Cond. Drive)	31-2400
Drive Drum (Tuning)	38-9883
Escutcheon (Station Tabs)	28-5742
Knobs (Vol., Tone., Wave Sw.)	27-4332
Knob (Pushbutton Switch)	27-4824
Knob (Phono Off-On)	27-4627
Pilot Light Socket Assy.	38-9904
Pointer	56-1532
Shaft (Tuning)	318-1506
Spring (Cond. Drive Cord)	28-8751
Spring (Pointer Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker	36-1480
Sockets	55-0575
Tab (Dial)	27-5526
Tab (Television)	27-8450
Tab Kit (Station Call Letters)	40-6473

MOUNTING PARTS

DESCRIPTION	PART No.
Nail Escutcheon Mounting	W-1074
Nut Speaker Mounting	W-124FA3
Nut Phono Switch Mtg.	W-684FA4
Screw (Chassis Mounting)	W-2068
Screw (Speaker Plug)	W-1714
Washer (Chassis Mounting)	W-410FA3
Washer (Speaker Mounting)	27-7467
"C" Washer (Tuning Shaft)	28-2043

MODEL 40-526

SCHE. No.	DESCRIPTION	PART No.
21	2nd I. F. Transformer Assembly	32-3382
46	Motor Switch	42-1536
47	Motor (110 volts, 60 cycles)	35-1225
48	Switch (pick-up shorting—is not used in Model 40-526)	
49	Crystal Cartridge (Pick-up)	35-2069
	Rubber Washer (Motor Board Mtg.)	27-4201
	Rubber Bushing (Motor Board Mtg.)	27-4202
	Plug Motor Connecting (Motor Board)	27-4863
	Connector (Pick-up Lead)	27-7133
	Connector Housing (Pick-up Lead)	28-1270
	Sleeve (Motor Board Mounting)	28-2257
	Pick-up and Tone Arm Complete	35-2064
	Speaker	36-1480
	Motor Connecting Plug and Wires (Chassis)	41-3507
	Turntable	35-3045

MODEL 40-527, Code 121

SCHE. No.	DESCRIPTION	PART No.
34	Cone Assem. (for Speaker 36-1491-2)	36-4133
	Cabinet	10465A
51	Phono-Radio Switch	42-1523
	Speaker	36-1491
	Knob (Phono Off-On Switch)	27-4627
	Pilot Lamp Asstmbly (Cabinet)	38-9939
	Connector	27-7133
	Housing	28-1270
	Cable (Pick-up)	L-3195

MODEL 40-525

Model 40-525 is a combination radio-phonograph consisting of a six tube electric push-button tuning superheterodyne radio receiver and an automatic record changer. The radio receiver contains six (6) electric push-buttons; five (5) of the push-buttons are used for reception of stations and one (1) to select manual tuning (Dial). The Specifications with the exception of those listed below are the same as Model 40-135.

The Automatic Record Changer, Philco Part No. 35-1180, plays twelve 10-inch records or ten 12-inch records at one loading.

MODEL 40-526, Code 121

Model 40-526, Code 121, is similar to Model 40-525, Code 121, with the exception of the cabinet and phonograph mechanism. A manually operated tone arm and pick-up is used in the Model 40-526. The same radio set is incorporated in both models.

The circuit diagram and replacement parts for Model 40-525, Code 121, apply also to Model 40-526. There are several part changes, however, which differ from those of Model 40-525. These parts are as follows:

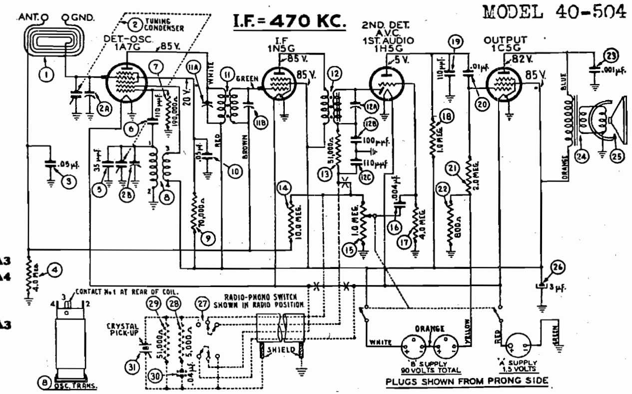
MODEL 40-527, Code 121

Model 40-527, Code 121, is similar to Model 40-525, Code 121, with the exception of the cabinet, speaker and several parts. The service information for the Model 40-525, Code 121, also applies to Model 40-527, Code 121.

Model 40-504 is a portable battery operated combination phonograph and radio. The radio consists of a four tube superheterodyne circuit covering a frequency range from 540 to 1600 K. C. A loop aerial is also built into the cabinet for portable use in addition to connections for an external aerial

INTERMEDIATE FREQUENCY: 470 K. C.
BATTERIES REQUIRED: "A" Philco Type P-94, "B" Philco Type P-305
BATTERY DRAIN: "A" 240 M. A.; "B" 8.5 M. A.

MODEL 40-504



SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	40-6421
2	Tuning Condenser	31-2322
3	Tubular Cond. (.05 mfd.)	30-4519
4	Resistor (4.0 meg., ½ watt)	33-540339
5	Mica Cond. (35 mmfd.) mounted at top of tuning condenser	30-1095
6	Mica Cond. (110 mmfd.)	30-1031
7	Resistor (190,000 ohms, ½ watt)	33-419339
8	Oscillator Trans.	32-3118
9	Resistor (70,000 ohms, ½ watt)	33-370339
10	Tubular Cond. (.05 mfd.)	30-4444
11	1st I. F. Trans. Assy.	32-3103
12	2nd I. F. Trans. Assy.	32-3176
12C	Mica Cond. (110 mmfd.)	30-1031
13	Resistor (51,000 ohms, ½ watt)	33-351339
14	Resistor (10.0 meg., ½ watt)	33-610339
15	Volume Control (1.0 meg.)	33-5310
16	Tubular Cond. (.004 mfd.)	30-4578
17	Resistor (4.0 meg., ½ watt)	33-540339
18	Resistor (1.0 meg., ½ watt)	33-510339
19	Mica Cond. (110 mmfd.)	30-1031
20	Tubular Cond. (.01 mfd.)	30-4572
21	Resistor (2.0 meg., ½ watt)	33-520339
22	Resistor (800 ohms, ½ watt)	33-180339
23	Tubular Cond. (.001 mfd.)	30-4201
24	Output Trans. (Spkr. No. 36-1451-3)	32-8036
25	Cone & Voice Coil Assy. (Spkr. No. 36-1451-3)	36-4090
26	Electrolytic Cond. (3 mf., 150 V.)	30-2359
27	Radio-Phono Switch	42-1501
28	Resistor (5000 ohms, ½ watt)	33-250339
29	Resistor (51,000 ohms, ½ watt)	33-351339
30	Tubular Cond. (.04 mfd.)	30-4119
31	Crystal Pick-up (less tone arm)	35-2033
	Pick-up and tone arm complete	35-2036
	Tone arm (less pick-up)	35-2037

MODEL 40-504

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 in Order	SPECIAL INSTRUCTIONS
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.

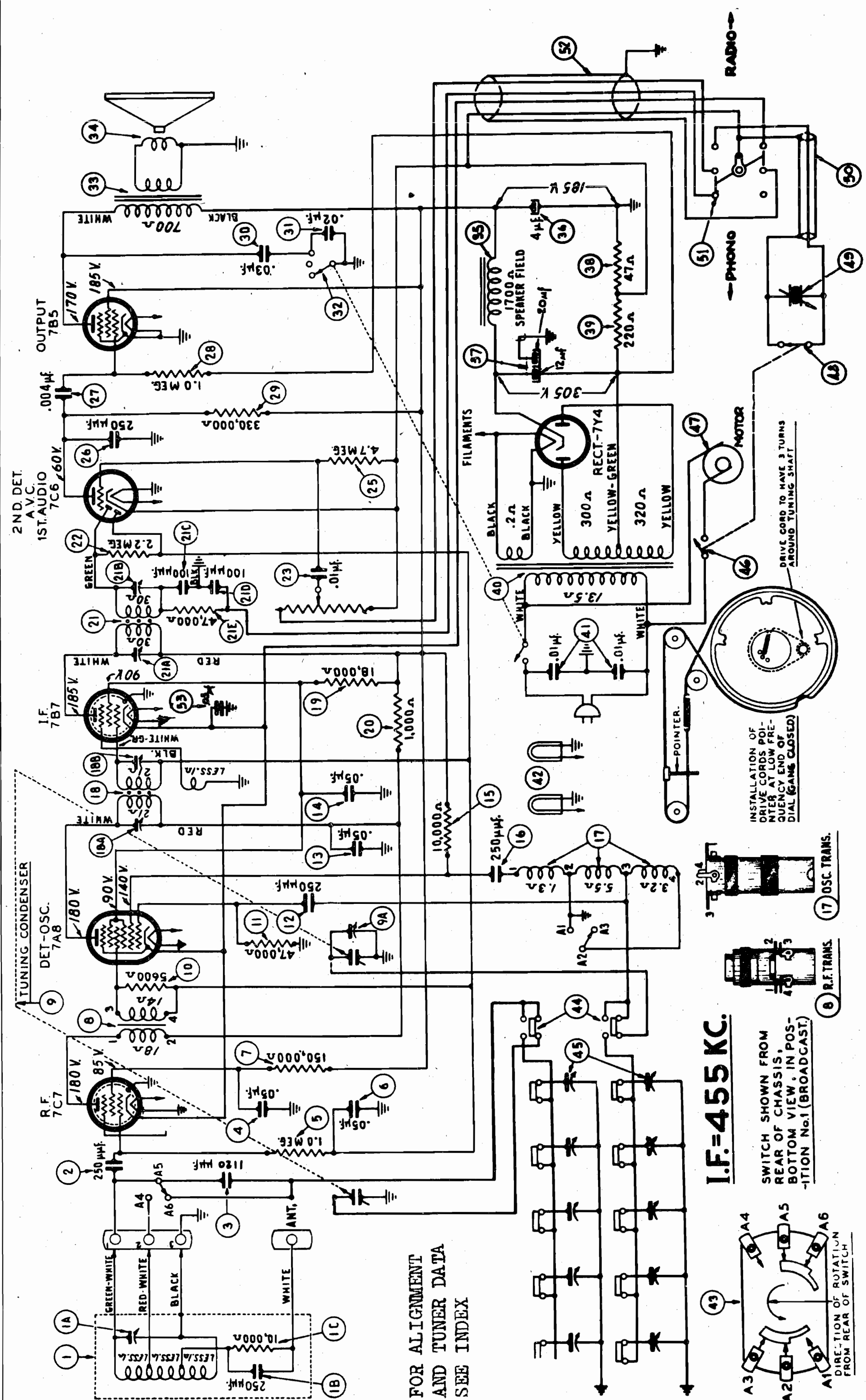
NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: Turn the tuning condenser to maximum capacity (plates fully meshed). With tuning condenser in this position set the pointer 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.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-525, 40-526, 40-527



MODEL 40-525
RADIO-PHONOGRAPH

To prevent oscillation at the low end of the Broadcast Band, the 2nd I. F. Transformer (21) Part No. 32-3281 is changed to Part No. 32-3382.

To stabilize the R. F. circuit and prevent oscillation, the cathode of the 7C7 R. F. tube is removed from the common connection of the R. F., I. F. and converter cathodes and connected directly to the ground. See diagram on page 9. Sets with this change marked "Run No. 3".

MODELS 40-525, 40-526

The cabinet and speaker of these models were changed in later production. The part number changes are as follows:

	Early Production	Later Production
Cabinet Model (40-526)	10452B	10452D
Cabinet Model (40-525)	10452A	10452C
Baffle and Silk Assembly	40-6512	40-6582
Speaker	36-1480	36-1491
Cone and Voice Coil Assembly		
(For Speaker 36-1480-3)		36-4086
(For Speaker 36-1480-4)		36-4136
(For Speaker 36-1491-2)		36-4133
(For Speaker 36-1491-4)		36-4147

MODELS 40-508, 40-509, 40-515

PHILCO RADIO & TELEVISION CORP.

Models 40 - 508 and 40 - 509 are radio-phonograph combinations consisting of an 8 tube electric push button tuning superheterodyne radio and an automatic record changer. The same radio receiver is used in each model. The automatic record changer and cabinet, however, are different.

Model 40 - 508 employs an improved type automatic record changer, Philco Part No. 35 - 1180, which plays twelve 10" records or ten 12" records at one loading.

Model 40 - 509 incorporates the Philco Inter-Mix Record Changer Part No. 35 - 1176. This record changer plays fourteen 10" and 12" records intermixed, or fifteen 10" or thirteen 12" records at one loading.

The radio receiver of these models contains 8 electric push buttons; 6 of the electric push buttons are used for reception of stations, one for television sound and one to switch to dial tuning.

In addition, the Philco Built-In Super Aerial System is included in these models. This system eliminates an outside aerial and reduces local static interference to a minimum. Included in the Built-In Super Aerial System is a statically shielded loop for broadcast band reception and a shortwave 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. Outside aerial connections are also provided for remote localities where signal strength is weak.

POWER SUPPLY: 115 volts, 60 cycle A. C.

POWER CONSUMPTION:

Model 40-508—90 watts.

Model 40-509—110 watts.

TUNING RANGES: Three

540 to 1550 K. C. 1.5 to 3.4 M. C. 6 to 18 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 2 watts.

Replacement Parts — Models 40 - 508, 40 - 509

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9940
1A	Mica Cond. (250 mmfd.)	61-0033
1B	Resistor (10,000 ohms, 1/2 watt)	33-310339
2	Loop Assy. (Short Wave)	38-9941
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, 1/2 watt)	33-139339
8	Tubular Cond. (.05 mfd.)	30-4444
9	Resistor (1.0 meg., 1/2 watt)	33-510339
10	Tubular Cond. (.05 mfd.)	30-4123
11	Resistor (33,000 ohms, 1/2 watt)	33-333339
12	Resistor (10,000 ohms, 1/2 watt)	33-310339
13	R. F. Coupling Trans.	32-3194
14	Mica Cond. (100 mmfd.)	30-1128
15	Resistor (47,000 ohms, 1/2 watt)	33-347339
16	Resistor (4700 ohms, 1/2 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. Assy.	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, 1/2 watt)	33-333339
26	Push Button Switch	42-1489
27	Padder Strip (Push Buttons)	31-6299
28	Coil Strip Assy.	
28A	Coil No. 1	
28B	Coil No. 2 } 540-1060 K. C.	32-3042
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, 1/2 watt)	33-247339
30	1st I. F. Trans. Assy.	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, 1/2 watt)	33-115339
35	Resistor (33,000 ohms, 1/2 watt)	33-333339
36	Resistor (1000 ohms, 1/2 watt)	33-210339
37	2nd I. F. Trans. Assy.	32-3246
38	Tubular Cond. (.01 mfd.)	30-4479
39	Resistor (470,000 ohms, 1/2 watt)	33-447339
40	Resistor (220,000 ohms, 1/2 watt)	33-420339
40A	Tubular Cond. (.001 mfd.)	30-4453
41	Volume Control (2.0 meg.)	33-5275
42	Tubular Cond. (.01 mfd.)	30-4479
43	Resistor (2.2 megs, 1/2 watt)	33-522339
44	Resistor (10.0 meg., 1/2 watt)	33-610339
45	Mica Cond. (110 mmfd.)	30-1130
46	Tubular Cond. (.002 mfd.)	30-4579
47	Resistor (100,000 ohms, 1/2 watt)	33-410339
48	Resistor (470,000 ohms, 1/2 watt)	33-447339
49	Resistor (4700 ohms, 1/2 watt)	33-247339
50	Tubular Cond. (.004 mfd.)	30-4456
51	Tone Control and On-Off Switch	33-5314
52	Resistor (47,000 ohms, 1/2 watt)	33-347339
53	Tubular Cond. (.004 mfd.)	30-4456
54	Resistor (470,000 ohms, 1/2 watt)	33-447339
55	Resistor (470,000 ohms, 1/2 watt)	33-447339
56	Resistor (47,000 ohms, 1/2 watt)	33-347339
57	Tubular Cond. (.004 mfd.)	30-4456
58	Tubular Cond. (.003 mfd.)	30-4469
59	Output Transformer	32-8070
60	Cone and Voice Coil Assy. (Spkr. Part No. 36-1450-2)	36-4089
61	Tubular Cond. (.003 mfd.)	30-4469
62	Resistor (6800 ohms, 1/2 watt)	33-268339
63	Tubular Cond. (.05 mfd.)	30-4123
64	Electrolytic Cond. (16 mfd., 300 V.)	30-2412
65	Resistor (18 ohms, 1/2 watt)	33-018351
66	Resistor (180 ohms, 1 watt)	33-118451
67	Electrolytic Cond. (12 mfd., 450 V.)	30-2413
68	Field Coil (Replace Spkr. Part No. 36-1450)	
69	Power Trans. (115 V., 50-60 cycles)	32-8069
70	Bakelite Cond. (.01-.01 mfd.)	3903-DG
71	Crystal Cartridge (40-508, 40-509)	35-2030
72	Pilot Lamp (Chassis)	34-2210
72A	Pilot Lamp (Cabinet)	34-2210
73	Tubular Cond. (.01 mfd.)	30-4581
74	Resistor (330,000 ohms, 1/2 watt)	33-433339
75	Phono Pickup Cable (40-508)	41-3514
	Phono Pickup Cable (40-509)	41-3511
76	Resistor (10,000 ohms, 1/2 watt)	33-310339
77	Toggle Switch (Model 40-509)	42-1503
78	Phono Motor (Model 40-509)	35-1177
79	Parallel Switch Assy. (Model 40-509)	42-1555

MISCELLANEOUS PARTS

Automatic Record Changer (Model 40-509, Additional Parts Bulletin 332)	35-1176
Automatic Record Changer (Model 40-508, Additional Parts Bulletin 337)	35-1180
Bezel Assembly	40-6489
Bezel Gasket	27-9175
Cable Speaker (Model 40-508)	41-3489
Cable Speaker (Model 40-509)	41-3488
Cable (Chassis to Changer, Model 40-509)	41-3501
Cable (Power)	L-3199
Cable (Chassis to Changer, Model 40-508)	41-3516
Cabinet (Model 40-508)	10410A
Cabinet (Model 40-509)	
Dial Scale	27-5508
Drive Cord	31-2383
Drive Cord Drum Assy.	38-9856
Jewel (Cabinet Pilot Lamp)	27-4777
Knob Assy. (Tuning, Tone, Vol.)	27-4332
Knob (Push-Button)	27-4866
Motor (Automatic Record Changer Model 40-509)	35-1177
Pointer	56-1516
Pilot Lamp	34-2210
Shaft (Tuning)	38-9874
Socket Assembly Cabinet	38-9939
Socket Assy. (Pilot Lamp, Chassis)	38-9807
Socket (Loktal)	27-6131
Socket (Loktal)	27-6129
Socket (42 tubes)	27-6036
Socket (80 tubes)	27-6044
Speaker	36-1450
Terminal Panel (Phono)	38-9918
Terminal Panel (Loop)	38-9870
Tab Television	27-8449
Tab Dial	27-5530
Tab Kit	40-6475

MODEL 40-515, CODE 121
SERVICE INFORMATION

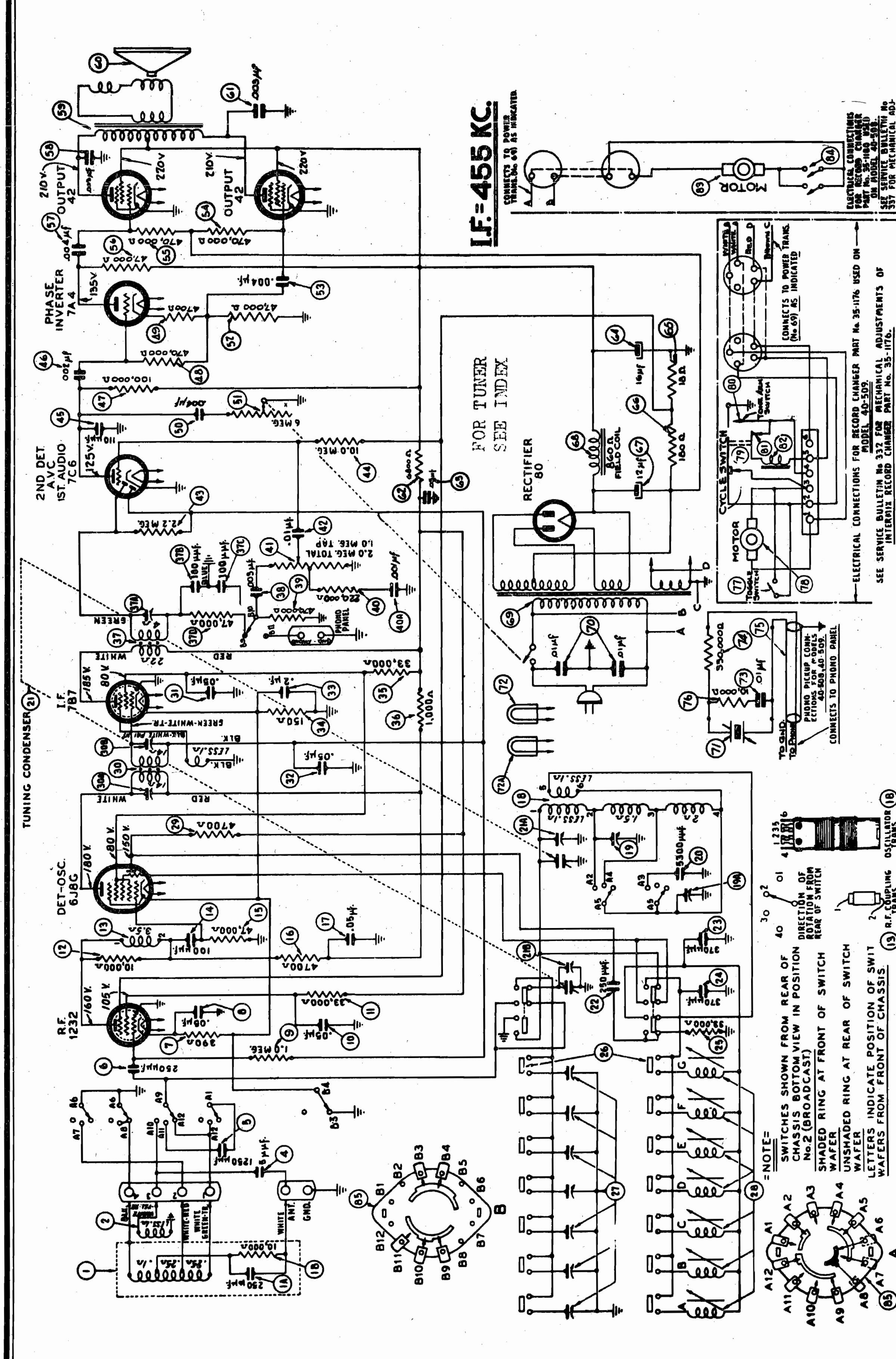
Model 40-515, Code 121 is a radio phonograph combination similar to Model 40-509, Code 121, with the exception of the cabinets. The service information listed in Radio Service Bulletin No. 323A for Model 40-509, also applies to Model 40-515 P-W, and P-M with the part changes as follows:

Cable Assembly (Power from chassis to changer)	41-3506
Cable and Plug (Speaker)	41-3515
Cable Assembly (Terminal Strip Changer)	41-3510
Cable and Plug Assembly (Motor)	41-3523
Cabinet Walnut (40-515 P-W)	10471A
Cabinet Maghogany (40-515 P-M)	10471B
Pilot Lamp Socket Assembly	38-9922

SCHE. No.	DESCRIPTION	PART No.
80	Tone Arm Switch Contact Spring Blade	56-1663
80	Tone Arm Switch Adjusting Screw	W-2100
81	Reject Switch (Part of 79)	
82	Reject Solenoid	42-1552
83	Phono Motor (40-508)	35-1204
84	On-Off Switch (Phono Motor)	42-1548
85	Wave Switch (Tuning Ranges)	42-1530

PHILCO RADIO & TELEVISION CORP.

MODELS 40-508
40-509



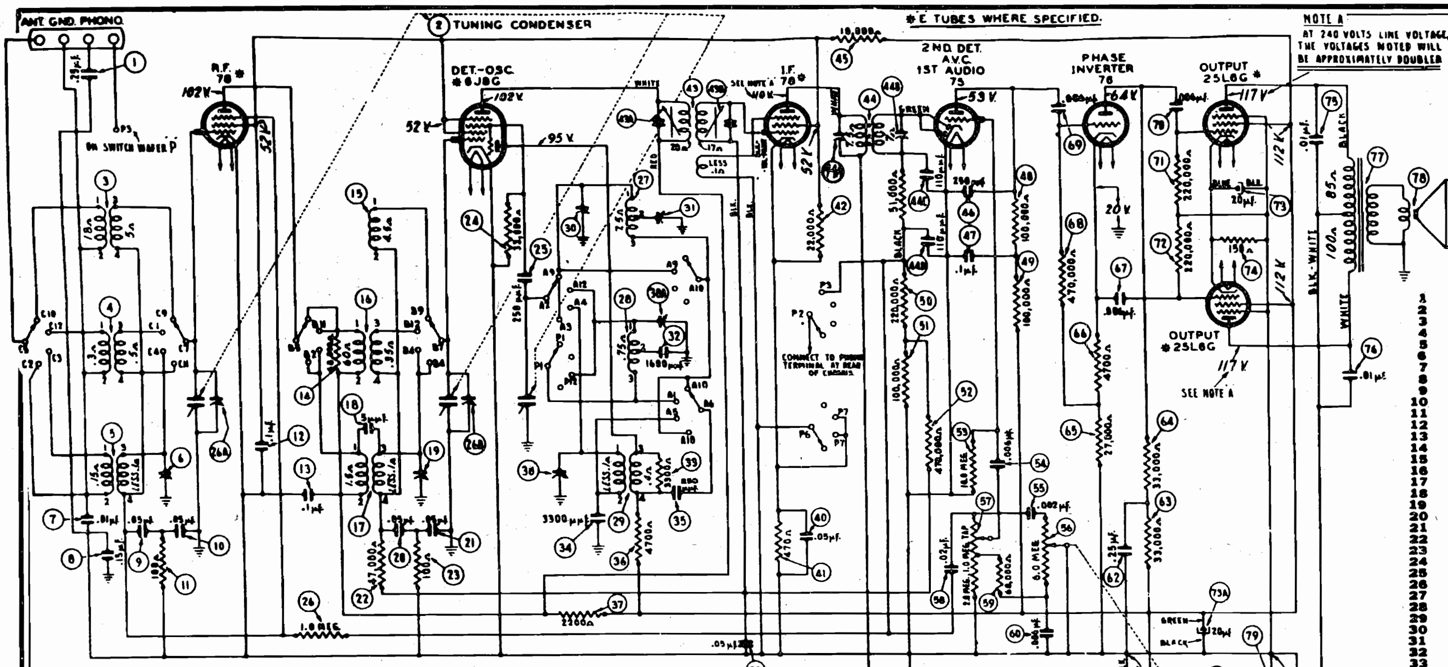
MODELS 40-508, 40-509

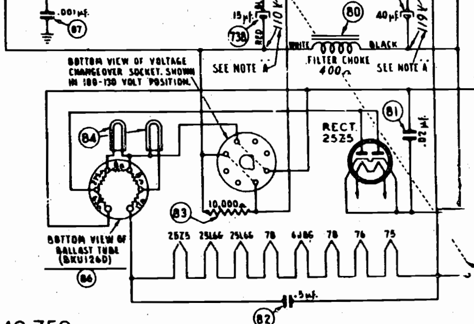
Beginning with Run "5" receivers, the converter tube is changed from a type 6J8G octal to a 7J7 loktal. The tube sockets are changed from Part No. 27-6120 to Part No. 27-6129.

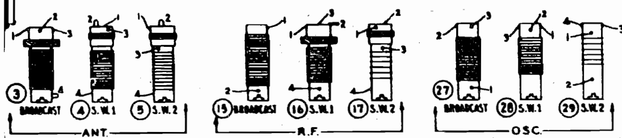
The 2nd I. F. transformer (37) beginning with Run "6" receivers was changed from Part No. 32-3246 to Part No. 32-3383.

MODEL 40-756 (121)

PHILCO RADIO & TELEVISION CORP.







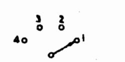
TUNING RANGES:

530 to 1720 K. C.

2.3 to 7.4 M. C.

7.3 to 22 M. C.

I.F.= 455 KC.



DIRECTION OF ROTATION FROM REAR OF SWITCH.

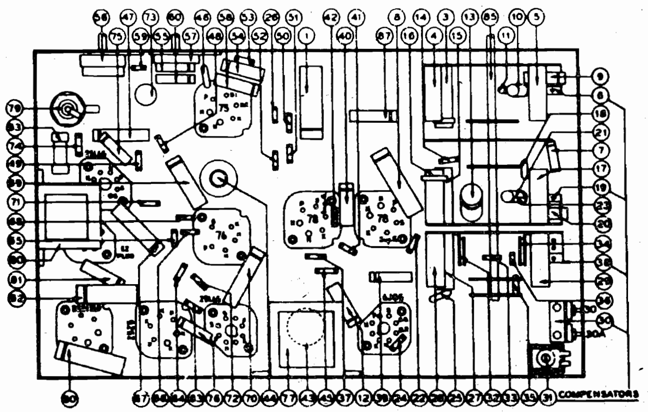
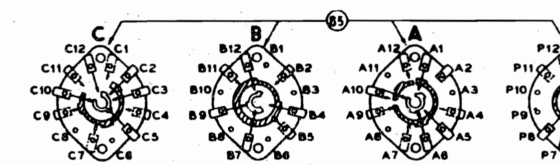


FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

POWER SUPPLY: 100-130 or 200-260 volt, A. C. or D. C. current. The voltage ranges are selected by inserting the changeover plug as indicated on top of the chassis.

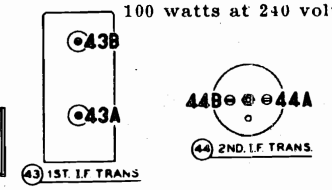
MODEL 40-756

TUBES: 78E, R. F. Amplifier; 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio and A. V. C.; 76, Phase Inverter; two 25L6EG, Pentode Audio Output; BKU126D, Ballast Tube; and 25Z5, Rectifier.



SWITCHES SHOWN IN POSITION No. 1, (BROADCAST)
SHADED RING IS AT FRONT OF SWITCH WAFER.
UNSHADED RING IS AT REAR OF SWITCH WAFER.
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, (BOTTOM VIEW)

POWER CONSUMPTION:
50 watts at 120 volts.
100 watts at 240 volts.



	DESCRIPTION	PART No.
1	Tubular Condenser (.25 mfd.)	30-4589
2	Tuning Condenser Assembly	31-2386
3	Antenna Transformer (Broadcast)	32-2588
4	Antenna Transformer (Short Wave 1)	32-3093
5	Antenna Transformer (Short Wave 2)	32-2885
6	Compensator	31-6288
7	Tubular Condenser (.01 mfd.)	30-4572
8	Tubular Condenser (.15 mfd.)	30-4600
9	Tubular Condenser (.05 mfd.)	30-4519
10	Tubular Condenser (.05 mfd.)	30-4519
11	Resistor (100 ohms, ½ watt)	33-110336
12	Tubular Condenser (.1 mfd.)	30-4586
13	Tubular Condenser (.1 mfd.)	30-4611
14	Resistor (68,000 ohms, ½ watt)	33-368339
15	R. F. Transformer (Broadcast)	32-2379
16	R. F. Transformer (Short Wave 1)	32-3099
17	R. F. Transformer (Short Wave 2)	32-3165
18	Mica Condenser (5 mmfd.)	30-1120
19	Compensator	31-6288
20	Tubular Condenser (.05 mfd.)	30-4519
21	Tubular Condenser (.05 mfd.)	30-4519
22	Resistor (47,000 ohms, ½ watt)	33-347339
23	Resistor (100 ohms, ½ watt)	33-110336
24	Resistor (33,000 ohms, ½ watt)	33-333339
25	Mica Condenser (250 mmfd.)	30-1119
26	Resistor (1.0 meg., ½ watt)	33-510339
27	Oscillator Transformer (Broadcast)	32-2120
28	Oscillator Transformer (Short Wave 1)	32-3094
29	Oscillator Transformer (Short Wave 2)	32-2889
30	Compensator (2 section)	31-6287
31	Compensator	31-6289
32	Tracking Condenser (1600 mmfd.)	31-6282
33	Resistor (3300 ohms, ½ watt)	33-233339
34	Tracking Condenser (3300 mmfd.)	31-6283
35	Mica Condenser (250 mmfd.)	30-1119
36	Resistor (4700 ohms, ½ watt)	33-247339
37	Resistor (2200 ohms, ½ watt)	33-222339
38	Compensator	31-6288
39	Tubular Condenser (.05 mfd.)	30-4519
40	Tubular Condenser (.05 mfd.)	30-4519
41	Resistor (470 ohms, ½ watt)	33-147336
42	Resistor (22,000 ohms, ½ watt)	33-322339
43	1st I. F. Transformer Assembly	32-3187
44	2nd I. F. Transformer Assembly	32-3133
45	Resistor (10,000 ohms, ½ watt)	33-310339
46	Mica Condenser (250 mmfd.)	30-1119
47	Tubular Condenser (.1 mfd.)	30-4586
48	Resistor (100,000 ohms, ½ watt)	33-410339
49	Resistor (100,000 ohms, ½ watt)	33-410339
50	Resistor (220,000 ohms, ½ watt)	33-422339
51	Resistor (100,000 ohms, ½ watt)	33-410339
52	Resistor (470,000 ohms, ½ watt)	33-447339
53	Resistor (10.0 meg., ½ watt)	33-610339
54	Tubular Condenser (.006 mfd.)	30-4583
55	Tubular Condenser (.002 mfd.)	30-4579
56	Tone Control and On-Off Switch	33-5299
57	Volume Control (2.0 meg.)	33-5304
58	Tubular Condenser (.02 mfd.)	30-4584
59	Resistor (68,000 ohms, ½ watt)	33-368339
60	Tubular Condenser (.006 mfd.)	30-4583
61	Removed in first production	
62	Tubular Condenser (.25 mfd.)	30-4588
63	Resistor (33,000 ohms, ½ watt)	33-333339
64	Resistor (33,000 ohms, ½ watt)	33-333339
65	Resistor (27,000 ohms, ½ watt)	33-327339
66	Resistor (4700 ohms, ½ watt)	33-247339
67	Tubular Condenser (.006 mfd.)	30-4610
68	Resistor (470,000 ohms, ½ watt)	33-447339
69	Tubular Condenser (.006 mfd.)	30-4610
70	Tubular Condenser (.006 mfd.)	30-4610
71	Resistor (220,000 ohms, ½ watt)	33-422339
72	Resistor (220,000 ohms, ½ watt)	33-422339
73	Electrolytic Condenser (15 mfd., 300 V.; 20 mfd., 150 V.; 20 mfd.)	30-2446
74	Resistor (150 ohms, 1 watt)	33-115439
75	Tubular Condenser (.01 mfd.)	30-4581
76	Tubular Condenser (.01 mfd.)	30-4581
77	Output Transformer	32-8072
78	Cone and Voice Coil Assembly (Speaker Part No. 36-1455-3)	36-4107
	(Speaker Part No. 36-1456-3)	36-4108
79	Electrolytic Condenser (40 mfd., 300 V.)	30-2373
80	Filter Choke	32-8029
81	Tubular Condenser (.02 mfd.)	30-4599
82	Tubular Condenser (.5 mfd.)	30-4590
83	Resistor (10,000 ohms, 3 watt)	33-3366
84	Pilot Lamps	34-2068E
85	Wave Switch	42-1474
86	Ballast Tube (BKU126D)	34-2228
87	Tubular Condenser (.001 mfd.)	30-4592

PHILCO RADIO & TELEVISION CORP.

MODEL 40-756
MODEL 40-780
(121, 251)

MODEL 40-756

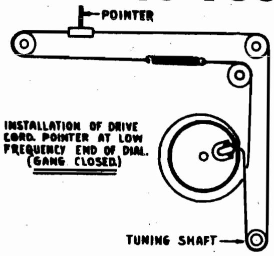


FIG. 2. TUNING DRIVE CORD AND POINTER ARRANGEMENT.

Operations in Order	SIGNAL GENERATOR Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	**Model 40-756** RECEIVER Dial Setting	Control Settings	Adjust Compensators	SPECIAL INSTRUCTIONS
1	6J8G Grid and Ground	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	44A, 44B, 43A, 43B	
2	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	30, 26B, 26A	Note B
3	Ant. & Grnd.	200 mmfd.	580 K. C.	580 K. C.	Vol. Max.	31	Roll Gang Repeat Operation 2
4	Ant. & Grnd.	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	30A	Roll Gang
5	Ant. & Grnd.	400 ohms	21 M. C.	21 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	38, 19, 6	Note C

NOTE A—The "Dummy Antenna" consists of a condenser or resistance 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: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (38) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 20.090 M. C.

MODEL 40-780, Codes 121-251

Signal Generator: The signal generator is connected to the receiver as indicated in the tabulations below under "output connections to receiver". A Dummy Antenna is also required. This is listed under column, "Dummy Antenna, Note A".

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the Det-Osc. tube grid (6J8EG). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the other end of the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of one of the 6V6EG tubes. Adjust the meter of the 0 to 30 volt A. C. scale.

After connecting the aligning meters, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in the schematic diagram. If the aligning meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	RECEIVER Dial Setting	Control Settings	Adjust Compensators	SPECIAL INSTRUCTIONS
1	6J8G Grid and Ground	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone Treble	38A, 37A, 37B, 36A, 36C	Note D
2	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	27, 26B, 26A	Note B
3	Antenna and Ground	200 mmfd.	580 K. C.	580 K. C.	Vol. Max.	31	Roll Gang
4	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max.	27, 26B, 26A	
5	Antenna and Ground	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	27A	Roll Gang
6	Antenna and Ground	400 ohms	20 M. C.	20 M. C.	Vol. Max. Tone Treble Range Switch "S.W.2"	33, 18, 5	Note C

NOTE A—The "Dummy Antenna" consists of a condenser or resistance 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.

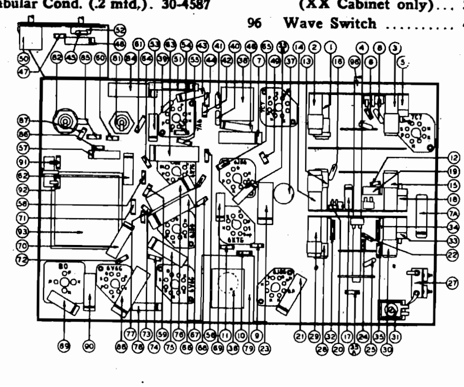
NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (33) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 19.090 M. C.

NOTE D—Before adjusting padders 38A, 37A, 37B, 36A, 36C, turn padder 36B all the way out. After the padders are adjusted to maximum, then adjust padder 36B for maximum.

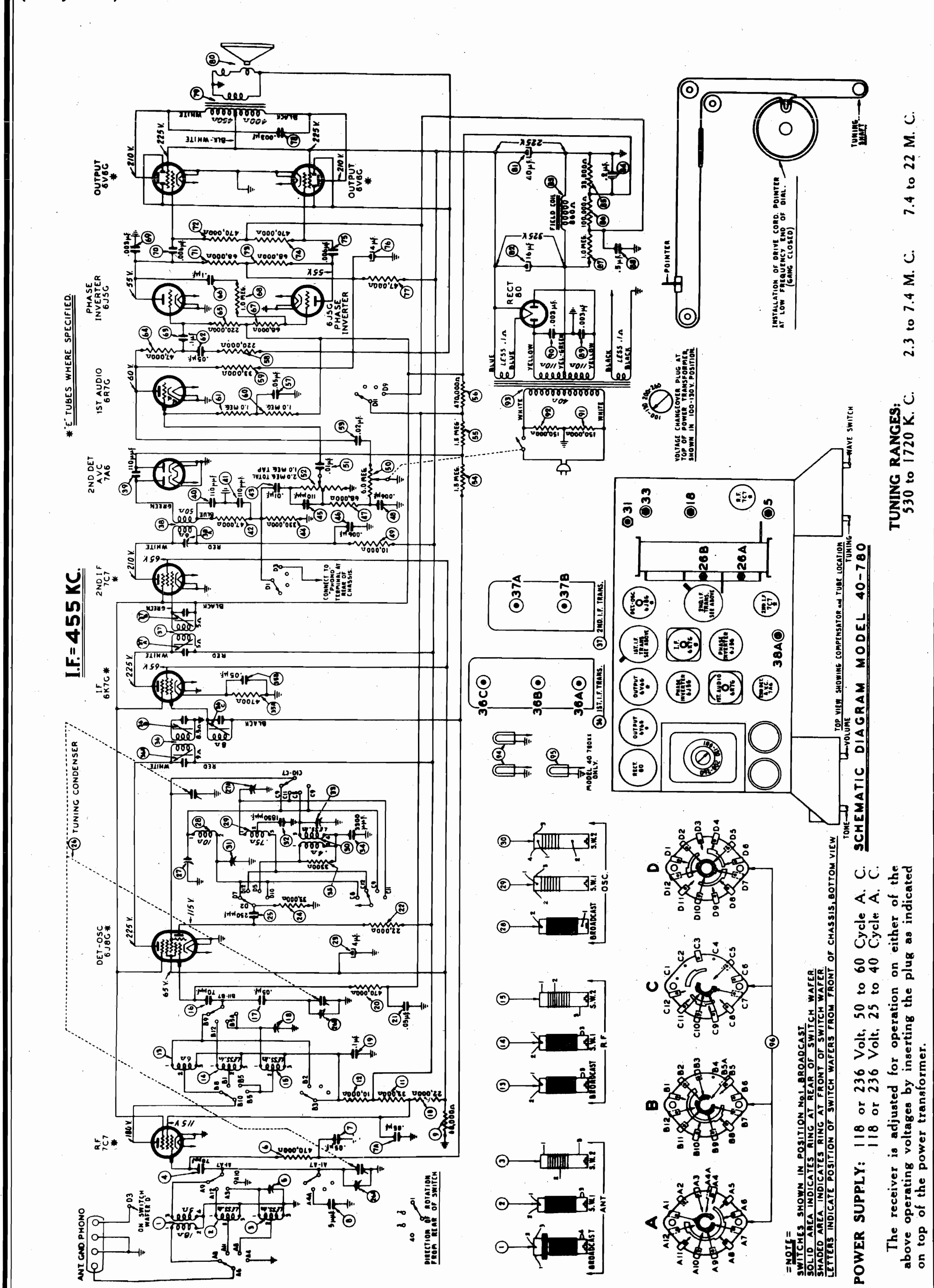
REPLACEMENT PARTS
Model 40-780

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Trans. (Brdcst)	32-2588
2	Antenna Trans. (S.W.1)	32-3191
3	Antenna Trans. (S.W.2)	32-3196
4	Mica Cond. (70 mmfd.)	30-1117
5	Compensator	31-6288
6	Resistor (470,000 ohms, ½ watt)	33-447339
7	Tubular Cond. (.05 mfd.)	30-4609
7A	Tubular Cond. (.05 mfd.)	30-4518
8	Mica Cond. (5 mmfd.)	30-1120
9	Resistor (68,000 ohms, ½ watt)	33-368339
10	Resistor (22,000 ohms, ½ watt)	33-322339
11	Resistor (33,000 ohms, ½ watt)	33-333339
12	Resistor (10,000 ohms, 1 watt)	33-310439
13	R. F. Trans. (Broadcast)	32-3189
14	R. F. Trans. (S.W.1)	32-3190
15	R. F. Trans. (S.W2)	32-3197
16	Mica Cond (70 mmfd.)	30-1117
17	Tubular Cond. (.05 mfd.)	30-4519
18	Compensator	31-6288
19	Tubular Cond. (.1 mfd.)	30-4611
20	Resistor (470,000 ohms, ½ watt)	33-447339
21	Tubular Cond. (.05 mfd.)	30-4609
22	Resistor (22,000 ohms, ½ watt)	33-322339
23	Electrolytic Condenser (4 mfd., 300 V.)	30-2415
24	Resistor (33,000 ohms, ½ watt)	33-333339
25	Mica Cond. (250 mmfd.)	30-1119
26	Tuning Cond. Assy.	31-2386
27	Compensator (2 section)	31-6287
28	Oscillator Trans. (Brdct)	32-3254
29	Oscillator Trans. (S.W.1)	32-3094
30	Oscillator Trans. (S.W.2)	32-3102
31	Compensator	31-6289
32	Tracking Condenser (1850 mmfd.)	31-6310
33	Compensator	31-6288
34	Tracking Condenser (3300 mmfd.)	31-6311
35	Resistor (3300 ohms, ½ watt)	33-233339
35A	Resistor (4700 ohms, ½ watt)	33-247339
35B	Tubular Cond. (.05 mfd.)	30-4519
36	1st I. F. Trans. Assy.	32-3284
37	2nd I. F. Trans. Assy.	32-3285
38	3rd I. F Trans. Assy.	32-3286
39	Mica Cond. (110 mmfd.)	30-1118
40	Mica Cond. (110 mmfd.)	30-1118
41	Mica Cond. (110 mmfd.)	30-1118
42	Resistor (47,000 ohms, ½ watt)	33-347339
43	Tubular Cond. (.01 mfd.)	30-4581
44	Resistor (330,000 ohms, ½ watt)	33-433339
45	Mica Cond. (110 mmfd.)	30-1118
46	Tubular Con. (.006 mfd.)	30-4591
47	Resistor (68,000 ohms, ½ watt)	33-368339
48	Tubular Con. (.006 mfd.)	30-4583
49	Resistor (10,000 ohms, ½ watt)	33-310339
50	Tone Control and On-Off Switch	33-5335
51	Tubular Cond. (.01 mfd.)	30-4581
52	Vol. Control (2.0 meg.)	33-5334
53	Tubular Cond. (.02 mfd.)	30-4516
54	Resistor (1.5 meg., ½ watt)	33-515339
55	Resistor (1.5 meg., ½ watt)	33-515339
56	Resistor (470,000 ohms, ½ watt)	33-447339
57	Tubular Cond. (.05 mfd.)	30-4519
58	Resistor (220,000 ohms, ½ watt)	33-422339
59	Resistor (33,000 ohms, ½ watt)	33-333339
60	Resistor (1.0 meg., ½ watt)	33-510339
61	Resistor (1.0 meg., ½ watt)	33-510339
62	Tubular Cond. (.05 mfd.)	30-4518
63	Tubular Cond. (.1 mfd.)	30-4611
64	Resistor (47,000 ohms, ½ watt)	33-347339
65	Resistor (220,000 ohms, ½ watt)	33-422339
66	Tubular Cond. (.1 mfd.)	30-4611
67	Resistor (68,000 ohms, ½ watt)	33-368339
68	Resistor (1.0 meg., ½ watt)	33-510339
69	Tubular Con. (.003 mfd.)	30-4582
70	Tubular Con. (.006 mfd.)	30-4610
71	Resistor (68,000 ohms, ½ watt)	33-368339
72	Resistor (470,000 ohms, ½ watt)	33-447339
73	Resistor (68,000 ohms, ½ watt)	33-368339
74	Resistor (470,000 ohms, ½ watt)	33-447339
75	Tubular Con. (.006 mfd.)	30-4610
76	Electrolytic Condenser (4 mfd., 300 V.)	30-2415
77	Resistor (47,000 ohms, ¼ watt)	33-347339
78	Tubular Con. (.003 mfd.)	30-4582
79	Output Transformer	32-8058
80	Cone and Voice Coil Assy. (Spr. Pt. No. 36-1459-2)	36-4106
	(Spr. Pt. No. 36-1460-3)	36-4105
81	Electrolytic Condenser (40 mfd., 300 V.)	30-2366
82	Electrolytic Condenser (16 mfd., 400 V.)	30-2364
83	Field Coil (Replace Spkr.)	
84	Tubular Cond. (.2 mfd.)	30-4587
85	Resistor (33,000 ohms, ½ watt)	33-333339
86	Resistor (100,000 ohms, ½ watt)	33-410339
87	Resistor (1.0 meg., ½ watt)	33-510339
88	Tubular Cond. (.5 mfd.)	30-4590
89	Tubular Con. (.003 mfd.)	30-4608
90	Tubular Con. (.003 mfd.)	30-4608
91	Resistor (150,000 ohms, ½ watt)	33-415339
92	Resistor (150,000 ohms, ½ watt)	33-415339
93	Power Trans. (100-130 V., 200-260 V., 50-60 cycles)	32-8007
94	Pilot Lamps (Dial)	34-2064E
95	Pilot Lamp (XX Cabinet only)	34-2210E
96	Wave Switch	42-1525



MODEL 40-780
(121, 251)

PHILCO RADIO & TELEVISION CORP.



* "E" TUBES WHERE SPECIFIED

I.F.=455 KC.

SCHEMATIC DIAGRAM MODEL 40-780

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.4 to 22 M. C.

=NOTE=
SWITCHES SHOWN IN POSITION No.1 BROADCAST.
SOLID AREA INDICATES RING AT REAR OF SWITCH WAFER.
SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER.
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS, BOTTOM VIEW

POWER SUPPLY: 118 or 236 Volt, 50 to 60 Cycle A. C.
118 or 236 Volt, 25 to 40 Cycle A. C.

The receiver is adjusted for operation on either of the above operating voltages by inserting the plug as indicated on top of the power transformer.

PHILCO RADIO & TELEVISION CORP. MODEL 40-2710

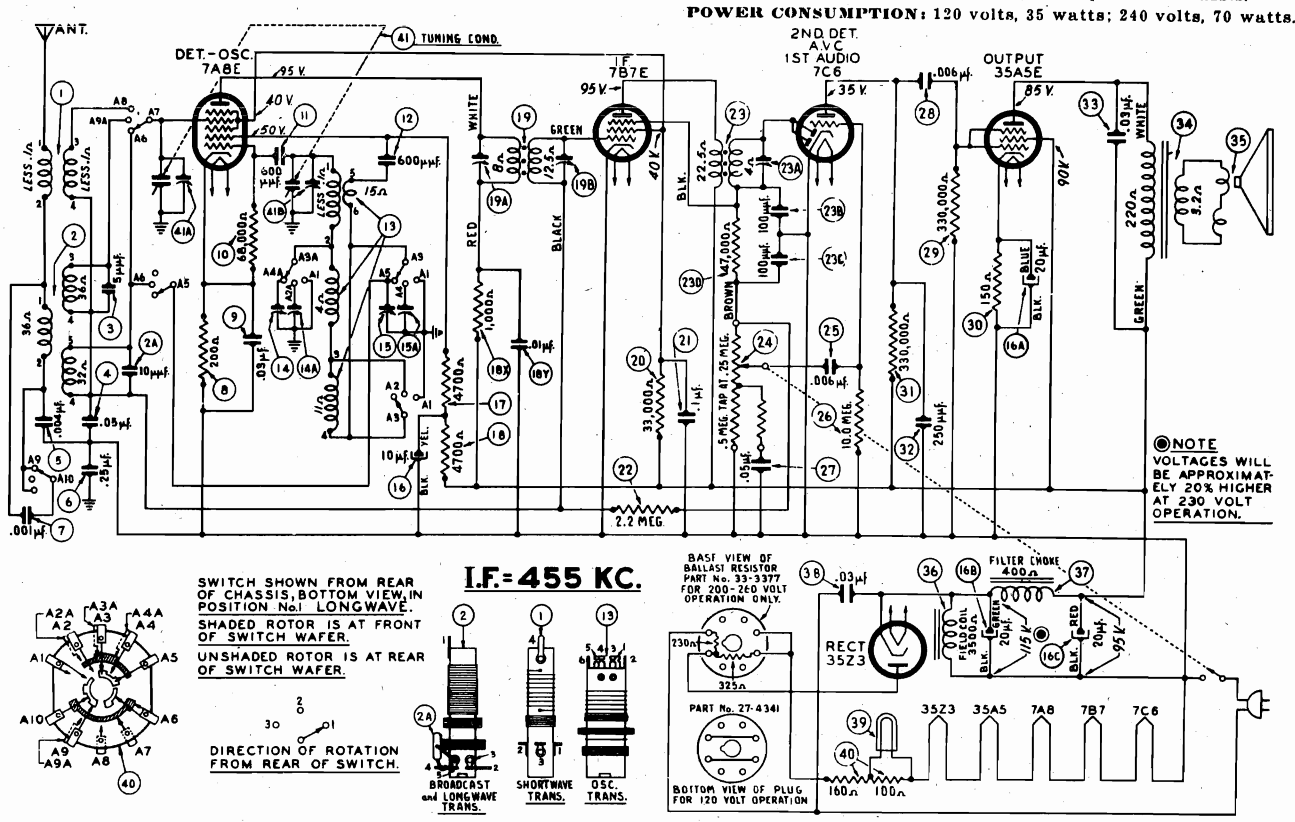
TUNING RANGES:
530 to 1720 K. C. 150 to 390 K. C. 7.2 to 24 M. C.

I. F. FREQUENCY: 455 K. C.

AUDIO OUTPUT: 1 watt.

POWER SUPPLY: 100-130 or 200-260 volts A. C. or D. C. To operate the receiver on 200-260 volts A. C. or D. C. requires the use of a Ballast resistor, Part No. 33-3377 which can be obtained from your distributor. The Ballast resistor is inserted in the socket provided on the top of the chassis.

POWER CONSUMPTION: 120 volts, 35 watts; 240 volts, 70 watts.



SCHEMATIC DIAGRAM MODEL 40-2710

Replacement Parts — Model 40-2710

SCHE. No.	DESCRIPTION	PART No.
1.	Antenna Trans. (Short Wave)	32-3381
2	Antenna Transformer (Broadcast, Long Wave)	32-3370
2A	Mica Condenser (10 mmfd., Part of No. 2)	30-1124
3	Mica Condenser (5 mmfd.)	30-1120
4	Tubular Condenser (.05 mfd.)	30-4609
5	Tubular Condenser (.004 mfd.)	30-4578
6	Tubular Condenser (.25 mfd.)	30-4589
7	Tubular Condenser (.001 mfd.)	30-4601
8	Resistor (200 ohms, ½ watt)	33-120339
9	Tubular Condenser (.03 mfd.)	30-4585
10	Resistor (68,000 ohms, ½ watt)	33-368339
11	Mica Condenser (600 mmfd.)	30-1154
12	Mica Condenser (600 mmfd.)	30-1154
13	Oscillator Transformer	32-3371
14	Compensator (2 section)	31-6337
15	Compensator	31-6044
16	Electrolytic Condenser (20, 20, 20, 10 mfd., 250 V.)	30-2436
17	Resistor (4700 ohms, ½ watt)	33-247339
18	Resistor (4700 ohms, ½ watt)	33-247339
18X	Resistor (1000 ohms, ½ watt)	33-210339
18Y	Tubular Condenser (.01 mfd.)	30-4581
19	1st I. F. Transformer Assembly	32-3297
20	Resistor (33,000 ohms, ½ watt)	33-333339
21	Tubular Condenser (.1 mfd.)	30-4586
22	Resistor (2.2 meg., ½ watt)	33-522339
23	2nd I. F. Transformer Assembly	32-2674
24	Volume Control and On-Off Switch (.5 meg.)	33-5336
25	Tubular Condenser (.006 mfd.)	30-4583
26	Resistor (10.0 meg., ½ watt)	33-610339
27	Tubular Condenser (.05 mfd.)	30-4519
28	Tubular Condenser (.006 mfd.)	30-4610
29	Resist. (330,000 ohms, ½ watt)	33-433339
30	Resistor (150 ohms, ½ watt)	33-115339
31	Resist. (330,000 ohms, ½ watt)	33-433339
32	Mica Condenser (250 mmfd.)	30-1119
33	Tubular Condenser (.03 mfd.)	30-4585
34	Output Transformer	32-8095
35	Cone and Voice Coil Assembly (Spkr. Part No. 36-1486-2)	36-4126
36	Field Coil (Replace Speaker Part No. 36-1486)	
37	Filter Choke	32-8073
38	Tubular Condenser (.03 mfd.)	30-4520
39	Pilot Lamp	34-2068E
40	Filament Resistor (Wirewound)	33-3372
41	Tuning Condenser Assembly	31-2410
42	Wave Switch	42-1549
	MISCELLANEOUS PARTS	
	Acetate Window	27-5370
	Ballast Resistor (200-260 V. operation)	33-3377
	Changeover Plug (Voltage, 115-130 V. operation)	27-4341
	Cabinet	10313B
	Cable and Plug (Power Supply)	L-2289
	Dial	27-5566
	Drive Cord Assembly	31-2415
	Knobs (Volume, Tuning, Wave Switch)	27-4632
	Pointer	28-5201
	Pilot Lamp Assembly	38-9127
	Socket (Loktal Tubes)	27-6131
	Socket (8 prong, Ballast Resis.)	27-6058
	Spring (Drive Cord)	28-8953
	Spring Clip (Mtg. and Trans.)	28-5002
	Spring Clip (Mtg. Osc. Trans.)	28-5003
	Speaker	36-1486
	Tube Shield	56-1566
	Tube Shield Clip	56-1567
	Tuning Drum	31-1283
	Tuning Shaft & Bracket Assy.	38-9888

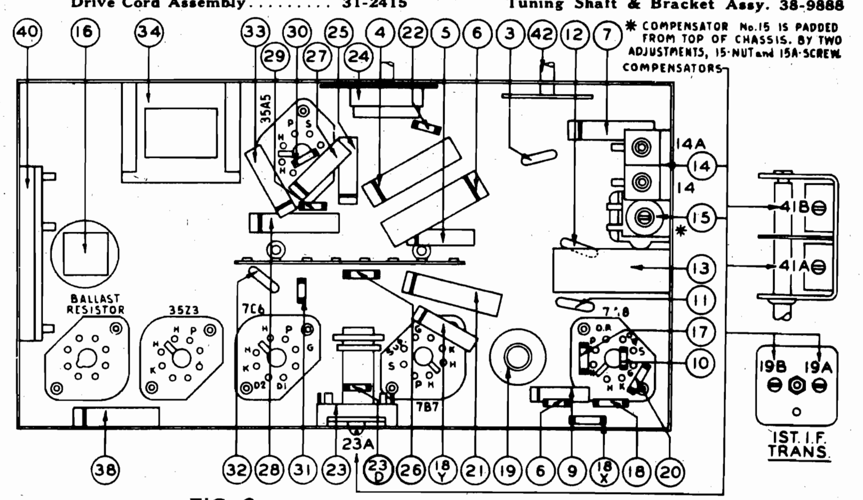


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

MODEL 40-2710
MODEL 40-2725

PHILCO RADIO & TELEVISION CORP.

MODEL 40-2710 CONNECTING ALIGNING INSTRUMENTS

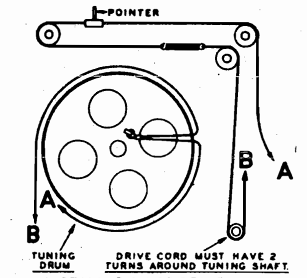
Signal Generator: The signal generator is connected to the receiver as indicated in the tabulations below under "Output Connections to Receiver." A dummy antenna is also required. This is listed under column, "Dummy Antenna, Note A."

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit with the Philco aligning adaptor, Part No. 45-2767, as follows:

Remove the 7C6 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.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 35A5 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.



INSTALLATION OF DRIVE CORD POINTER AT LOW FREQUENCY END OF DIAL GANG CLOSED

FIG. 1. DIAL CALIBRATION.

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	Antenna	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	23A, 19A, 19B	
2	Ant. & Grnd.	400 ohms	21 M. C.	21 M. C.	Range Switch "S.W."	41B, 41A	Notes B-C
3	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	14A	
4	Ant. & Grnd.	200 mmfd.	580 K. C.	580 K. C.	Range Switch "Brdcst"	15A (Nut)	Roll Gang
5	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	14A	
6	Ant. & Grnd.	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	14	
7	Ant. & Grnd.	200 mmfd.	175 K. C.	175 K. C.	Range Switch "L.W."	15 (Screw)	
8	Ant. & Grnd.	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	14	

NOTE A — The "Dummy Antenna" consists of a condenser or resistance 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: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (41B) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 20.090 M. C.

Model 40-2725 CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.
2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 41 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. 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	
1	6J8G	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	38B, 38A, 32B, 32A	
2	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	27, 22B, 22A	Note B
3	Antenna and Ground	200 mmfd.	580 K. C.	580 K. C.	Range Switch "Brdcst"	23	
4	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	27, 22B, 22A	
5	Antenna and Ground	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	27A	
6	Antenna and Ground	200 mmfd.	175 K. C.	175 K. C.	Range Switch "L.W."	28	
7	Antenna and Ground	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	27A	
8	Antenna and Ground	400 ohms	21 M. C.	21 M. C.	Range Switch "S.W."	29, 15, 5	Note C

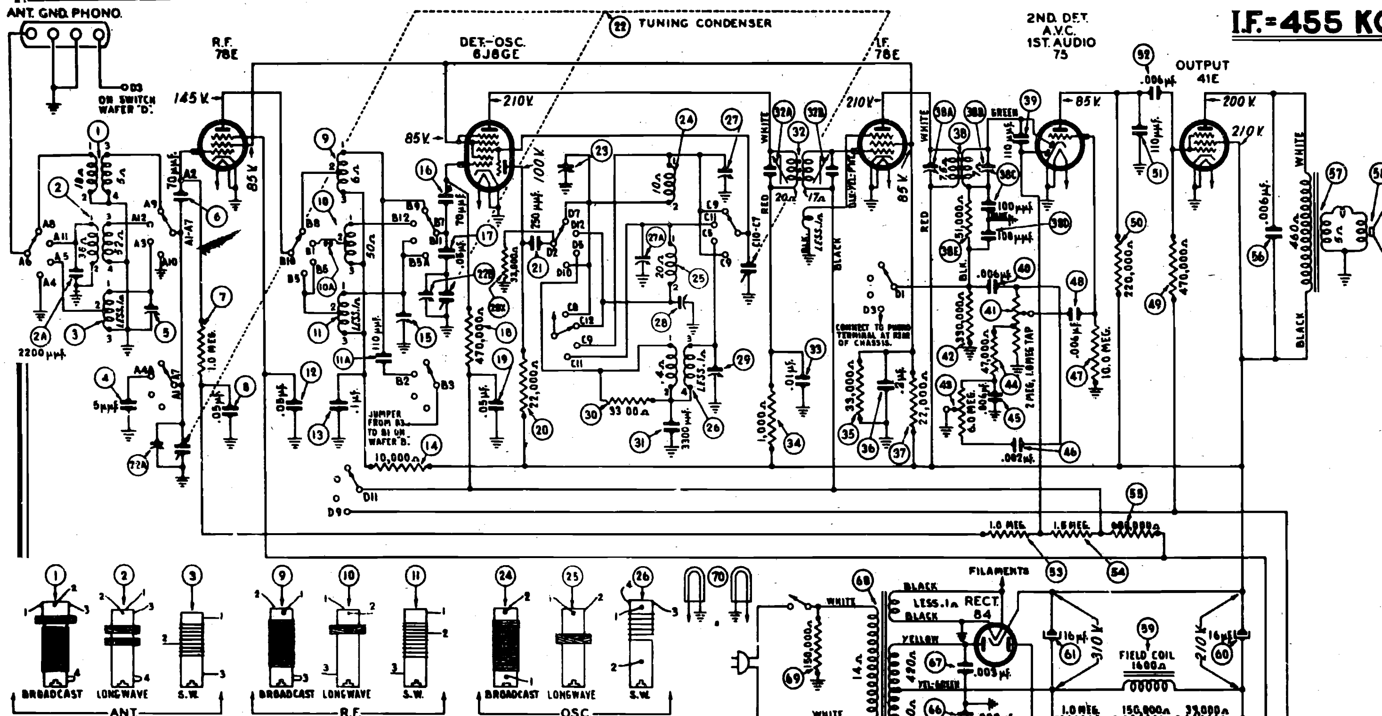
NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

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: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale. See Schematic Diagram.

NOTE C — When adjusting compensator (29) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 20.090 M. C.

PHILCO RADIO & TELEVISION CORP.

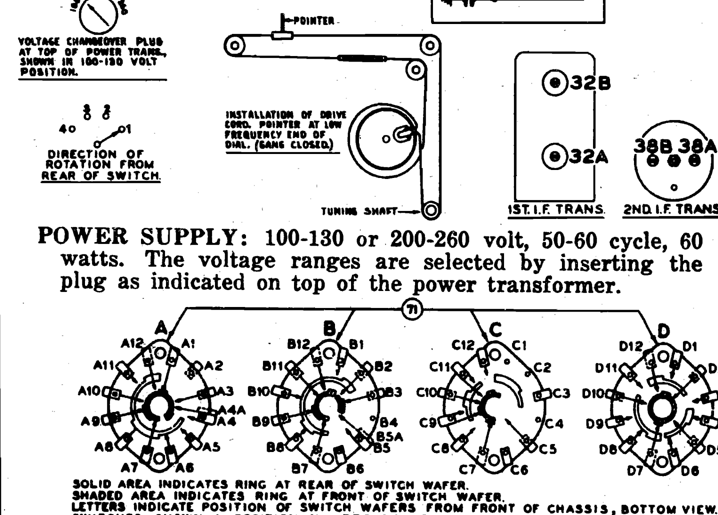
MODEL 40-2725 (121)



I.F. = 455 KC

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-2588
2	Antenna Transformer (Long Wave)	32-3368
2A	Mica Condenser (2200 mmfd.)	30-1125
3	Antenna Transformer (S. W. 2)	32-3196
4	Tubular Condenser (5 mmfd.)	30-1120
5	Compensator (Antenna S. W. 2)	31-6288
6	Mica Condenser (70 mmfd.)	30-1117
7	Resistor (1.0 meg., 1/2 watt)	33-510339
8	Tubular Condenser (.05 mfd.)	30-4609
9	R. F. Transformer (Broadcast)	32-3189
10	R. F. Transformer (Long Wave)	32-3369
10A	Suppressor Coil	32-3352
11	R. F. Transformer (S. W. 2)	32-3197
11A	Mica Condenser (110 mmfd.)	30-1118
12	Tubular Condenser (.05 mfd.)	30-4519
13	Tubular Condenser (.1 mfd.)	30-4611
14	Resistor (10,000 ohms, 1 watt)	33-310439
15	Compensator (R. F., S. W. 2)	31-6288
16	Mica Condenser (70 mmfd.)	30-1117
17	Tubular Condenser (.05 mfd.)	30-4519
18	Resistor (470,000 ohms, 1/2 watt)	33-447339
19	Tubular Condenser (.05 mfd.)	30-4609
20	Resistor (22,000 ohms, 1/2 watt)	33-322339
20X	Resistor (33,000 ohms, 1/2 watt)	33-333339
21	Mica Condenser (250 mmfd.)	30-1119
22	Tuning Condenser Assembly	31-2386
23	Compensator (Broadcast series)	31-6287
24	Oscillator Transformer (Broadcast)	32-3254
25	Oscillator Transformer (Long Wave)	32-3137
26	Oscillator Transformer (S. W. 2)	32-3102
27	Compensator (Broadcast shunt)	31-6337
27A	Compensator (Long Wave, Part of No. 27)	
28	Tracking Condenser (Long Wave)	31-6297
29	Compensator (S. W. 2)	31-6288
30	Resistor (3300 ohms, 1/2 watt)	33-233339
31	Tracking Condenser (3300 mmfd.)	31-6311
32	1st I. F. Transformer Assembly	32-3187
33	Tubular Condenser (.01 mfd.)	30-4572
34	Resistor (1,000 ohms, 1/2 watt)	33-210339
35	Resistor (33,000 ohms, 1/2 watt)	33-333339
36	Tubular Condenser (.2 mfd.)	30-4587
37	Resistor (22,000 ohms, 1 watt)	33-322439
38	2nd I. F. Transformer Assembly	32-3133
39	Mica Condenser (110 mmfd.)	30-1118
40	Tubular Condenser (.006 mfd.)	30-4583
41	Volume Control (2 meg.)	33-5298
42	Resistor (330,000 ohms, 1/2 watt)	33-433339
43	Tone Control and On-Off Switch	33-5299
44	Resistor (47,000 ohms, 1/2 watt)	33-347339
45	Tubular Condenser (.006 mfd.)	30-4583
46	Tubular Condenser (.002 mfd.)	30-4579
47	Resistor (10.0 meg., 1/2 watt)	33-610339
48	Tubular Condenser (.006 mfd.)	30-4583
49	Resistor (470,000 ohms, 1/2 watt)	33-447339
50	Resistor (220,000 ohms, 1/2 watt)	33-422339
51	Mica Condenser (110 mmfd.)	30-1118
52	Tubular Condenser (.006 mfd.)	30-4610
53	Resistor (1.0 meg., 1/2 watt)	33-510339
54	Resistor (1.5 meg., 1/2 watt)	33-515339
55	Resistor (680,000 ohms, 1/2 watt)	33-468339
56	Tubular Condenser (.006 mfd.)	30-4591
57	Output Transformer	32-8018
58	Cone and Voice Coil Assembly (Speaker Part No. 36-1452-2)	36-4103
59	Field Coil (Replace Spkr. Part No. 36-1452)	
60	Electrolytic Condenser (16 mfd., 300 V.)	30-2319
61	Electrolytic Condenser (16 mfd., 400 V.)	30-2364
62	Resistor (39,000 ohms, 1/2 watt)	33-339339
63	Resistor (150,000 ohms, 1/2 watt)	33-415339
64	Resistor (1.0 meg., 1/2 watt)	33-510339
65	Tubular Condenser (.2 mfd.)	30-4587
66	Tubular Condenser (.003 mfd.)	30-4608
67	Tubular Condenser (.003 mfd.)	30-4608
68	Power Transformer (100-130 V., 200-260 V., 50-60 cycles)	32-8006
69	Resistor (150,000 ohms, 1/2 watt)	33-415339
70	Pilot Lamps	34-2064E
71	Wave Switch	42-1504

I. F. FREQUENCY: 455 K. C.



POWER SUPPLY: 100-130 or 200-260 volt, 50-60 cycle, 60 watts. The voltage ranges are selected by inserting the plug as indicated on top of the power transformer.

AUDIO OUTPUT: 2.5 watts.

TUNING RANGES:
150 to 390 K. C.
530 to 1720 K. C.
7.3 to 22 M. C.

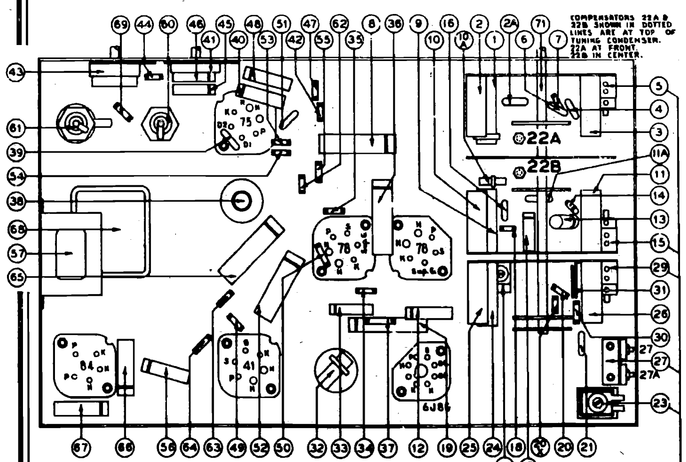


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

MODEL RP-1 (123) PHILCO RADIO & TELEVISION CORP.

SPECIFICATIONS

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.

The unit is designed to operate on various power supplies as follows:

110 volts, 60 cycles; 110 volts, 25 cycles; 220 volts, 60 cycles.

To operate on any one of these power supplies, it is necessary that the proper power transformer and turntable motor is used as indicated in the parts list below.

To operate the unit: — 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 K. C. (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, turn 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 K. C. and 580 K. C. 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 most cases it is preferable to use different receptacles for record player and radio.

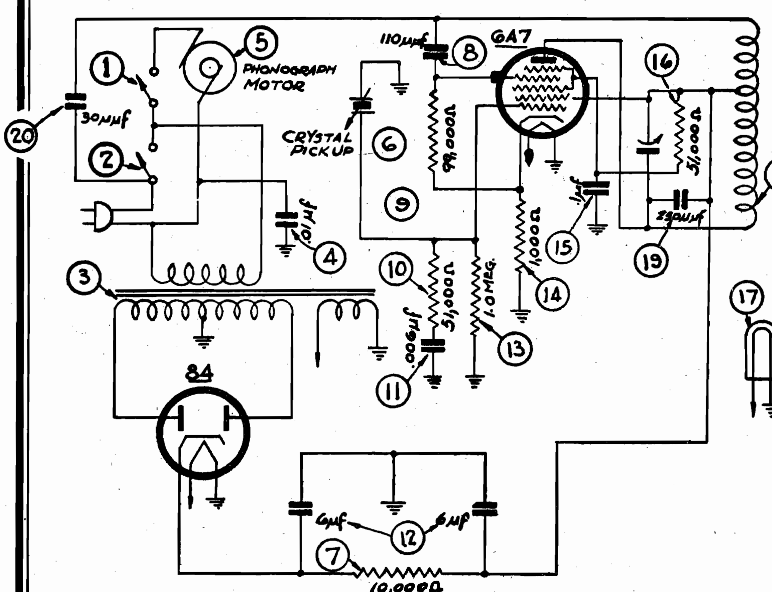
No definite rule can be established for the relative location of the record player to your radio; individual trial will establish best location. However, in general, satisfactory operation may be obtained up to a distance of fifty (50) feet, provided local noise conditions are not too severe.

PRODUCTION CHANGES

Master On-Off switch changed from Part No. 42-1406 to 42-1562.

Two types of motor and turntable assemblies were used on this model. The part numbers are as follows:

Motor — 110 volts, 60 cycles 35-1222
Motor — 110 volts, 60 cycles 35-1216
Turntable for Motor 35-1222 35-3044
Turntable for motor 35-1216 35-1217



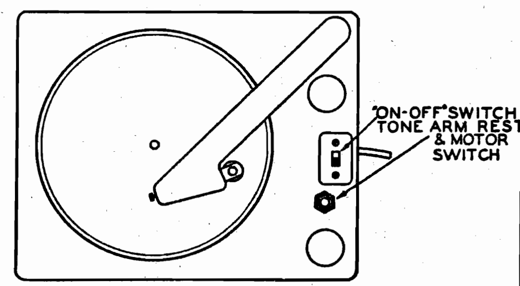


DIAGRAM A

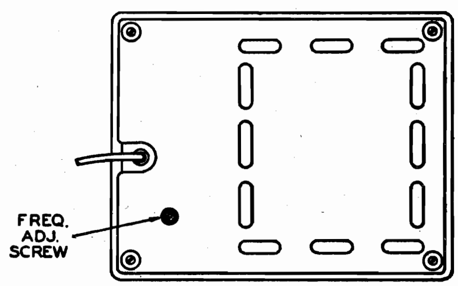


DIAGRAM B

REPLACEMENT PARTS

SCHE. No.	DESCRIPTION	PART No.
1	Motor Switch	42-1557
2	Master Switch	42-1562
3	Power Trans. (110 V., 60 cycles)	32-8043
4	Line Condenser (.01 mf., 600 V.)	3903-SG
	Power Trans. (110 V., 25 cycles)	32-8049
5	Motor (110 V., 60 cycles)	35-1222
	Motor (110 V., 60 cycles)	35-1216
	Motor (110 V., 25 cycles)	315-1004
	Motor (220 V., 60 cycles)	315-1005
	Motor (220 V., 50 cycles)	315-1006
6	Crystal Pickup and Tone Arm	35-2068
	Crystal Cartridge	35-2069
7	Filter Resistor (10,000 ohms, ½ watt)	33-310344
8	Oscillator Grid Cond. (110 mmf.)	30-1031
9	Oscillator Grid Resistor (99,000 ohms, ½ watt)	33-399344

SCHE. No.	DESCRIPTION	PART No.
10	Comp. Resistor (51,000 ohms, ½ watt)	33-351344
11	Comp. Cond. (.006 mf., 200 V.)	30-4467
12	Electrolytic Condenser (6 mf., 6 mf., 150 V., 60 cy.)	30-2388
	(6 mf., 6 mf., 150 V., 25 cy.)	35-2394
13	Grid Resistor (1 meg., ½ watt)	33-510344
14	Cathode Bias Resistor (1000 ohms, ½ watt)	33-210344
15	Screen By-Pass (.1 mf., 200 V.)	30-4499-S
16	Screen Resistor (51,000 ohms, ½ watt)	33-351344
17	Pilot Light (6-8 V., 250 amp.)	34-2064
18	Oscillator Coil & Padder Assem.	32-3218
19	Mica Condenser (250 mmf.)	30-1032
20	Coupling Condenser (30 mmf.)	30-1059

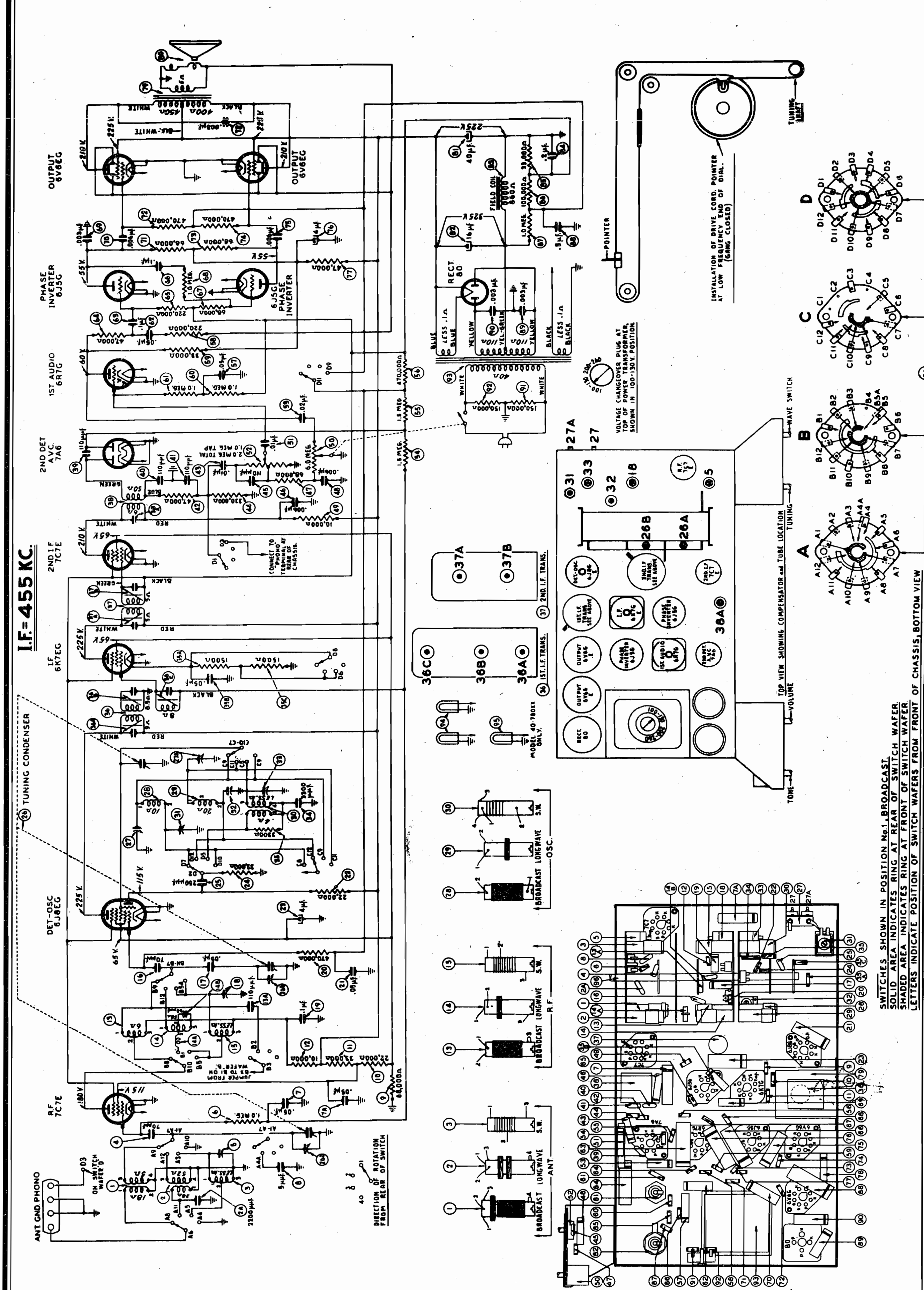
MISCELLANEOUS PARTS

SCHE. No.	DESCRIPTION	PART No.
	Cable (Power)	L-2778
	Cover (Bottom of Cabinet)	27-9326
	Cabinet	10459
	Mounting Feet Cabinet	27-4817
	Switch Plate	56-1383
	Socket (5 prong)	27-6035
	Socket (7 prong)	27-6037
	Turntable (for Motor 35-1222)	35-3044
	Turntable (for Moton 35-1216)	35-1217
	Turntable (for Motor 315-1004)	35-1004

Two types of 110 volt, 60 cycle motors were used on this model, when ordering be sure correct turntable is ordered for motor.

PHILCO RADIO & TELEVISION CORP.

MODEL 40-2780



MODEL 40-2780

PHILCO RADIO & TELEVISION CORP.

TYPE CIRCUIT: Model 40-2780, code 121, is an Eleven (11) Tube A. C. operated Superheterodyne radio. The features of design included in this model are three (3) tuning ranges for reception of standard, long wave and short wave broadcast stations; connections for attaching a high impedance electric phonograph pick-up; automatic volume control; continuously variable tone control; bass compensation and a degenerated push-pull audio output circuit.

POWER SUPPLY: 118 or 236 Volt, 50 to 60 Cycle A. C.
118 or 236 Volt, 25 to 40 Cycle A. C.

The receiver is adjusted for operation on either of the above operating voltages by inserting the plug as indicated on top of the power transformer.

TUNING RANGES:
150 to 390 K. C. 530 to 1720 K. C. 7.4 to 22 M. C.

Opera-tions in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8EG Grid	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	38A, 37A, 37B, 36A, 36C, 36B	Note D
2	Antenna to Ground	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	27, 26B, 26A	Note B
3	Antenna to Ground	200 mmfd.	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	31	Roll Gang
4	Antenna to Ground	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	27, 26B, 26A	
5	Antenna to Ground	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	27A	
6	Antenna to Ground	200 mmfd.	175 K. C.	175 K. C.	Range Switch "L.W."	32	
7	Antenna to Ground	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	27A	
8	Antenna to Ground	400 ohms	20 M. C.	20 M. C.	Range Switch "S.W."	33, 18, 5	Note C

NOTE A—The "Dummy Antenna" consists of a condenser or resistance 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: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale. See Schematic Diagram for dial pointer cord adjustment.

NOTE C—When adjusting compensator (33) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 19.090 M. C.

NOTE D—Before adjusting padders 38A, 37A, 37B, 36A, 36C, turn padder 36B all the way out. After the padders are adjusted to maximum, then adjust padder 36B for maximum.

REPLACEMENT PARTS

Model 40-2780

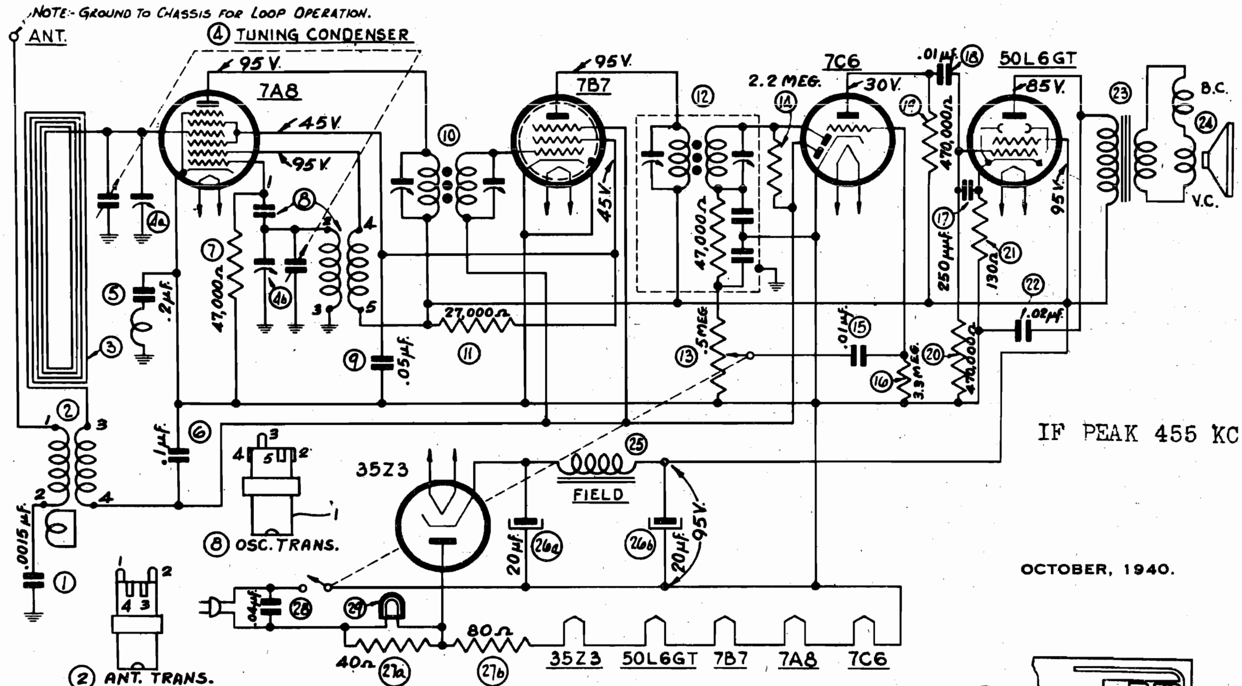
SCHE. No.	DESCRIPTION	PART No.
1	Antenna Trans. (Brdcst)	32-2588
2	Ant. Tran. (Long Wave)	32-3368
2A	Mica Cond. (2200 mmfd.)	30-1125
3	Antenna Trans. (S.W.2)	32-3196
4	Mica Cond. (70 mmfd.)	30-1117
5	Compensator	31-6288
6	Resist. (1.0 meg., ½ watt)	33-510339
7	Tubular Cond. (.05 mfd.)	30-4609
7A	Tubular Cond. (.05 mfd.)	30-4518
8	Mica Cond. (5 mmfd.)	30-1120
9	Resistor (68,000 ohms, ½ watt)	33-368339
10	Resistor (22,000 ohms, ½ watt)	33-322339
11	Resistor (33,000 ohms, ½ watt)	33-333339
12	Resistor (10,000 ohms, 1 watt)	33-310439
13	R. F. Trans. (Broadcast)	32-3189
13A	Mica Cond. (110 mmfd.)	30-1118
14	R. F. Tran. (Long Wave)	32-3369
14A	Suppressor Coil	32-3352
14B	Mica Cond. (60 mmfd.)	30-1040
15	R. F. Trans. (S.W2)	32-3197
16	Mica Cond (70 mmfd.)	30-1117
17	Tubular Cond. (.05 mfd.)	30-4519
18	Compensator	31-6288
19	Tubular Cond. (.1 mfd.)	30-4611
20	Resistor (470,000 ohms, ½ watt)	33-447339
21	Tubular Cond. (.05 mfd.)	30-4609
22	Resistor (22,000 ohms, ½ watt)	33-322339
23	Electrolytic Condenser (4 mfd., 300 V.)	30-2415
24	Resistor (33,000 ohms, ½ watt)	33-333339
25	Mica Cond. (250 mmfd.)	30-1119
26	Tuning Cond. Assy.	31-2386
27	Compensator (2 section)	31-6337
28	Oscillator Trans. (Brdct)	32-3254
29	Osc. Tran. (Long Wave)	32-3137
30	Oscillator Trans. (S.W.2)	32-3102
31	Compensator	31-6289
32	Compensator	31-6297
33	Compensator	31-6288
34	Tracking Condenser (3300 mmfd.)	31-6311
35	Resistor (3300 ohms, ½ watt)	33-233339
35A	Resistor (1500 ohms, ½ watt)	33-215339
35B	Tubular Cond. (.05 mfd.)	30-4519
35C	Resistor (1500 ohms, ½ watt)	33-215339
36	1st I. F. Trans. Assy.	32-3284
37	2nd I. F. Trans. Assy.	32-3285
38	3rd I. F Trans. Assy.	32-3286
39	Mica Cond. (110 mmfd.)	30-1118
40	Mica Cond. (110 mmfd.)	30-1118
41	Mica Cond .(110 mmfd.)	30-1118
42	Resistor (47,000 ohms, ½ watt)	33-347339
43	Tubular Cond. (.01 mfd.)	30-4581
44	Resistor (330,000 ohms, ½ watt)	33-433339
45	Mica Cond. (110 mmfd.)	30-1118
46	Tubular Con. (.006 mfd.)	30-4591
47	Resistor (68,000 ohms, ½ watt)	33-368339
48	Tubular Con. (.006 mfd.)	30-4583
49	Resistor (10,000 ohms, ½ watt)	33-310339
50	Tone Control and On-Off Switch	33-5335
51	Tubular Cond. (.01 mfd.)	30-4581
52	Vol. Control (2.0 meg.)	33-5334
53	Tubular Cond. (.02 mfd.)	30-4516
54	Resistor (1.5 meg., ½ watt)	33-515339
55	Resistor (1.5 meg., ½ watt)	33-515339
56	Resistor (470,000 ohms, ½ watt)	33-447339
57	Tubular Cond. (.05 mfd.)	30-4519
58	Resistor (220,000 ohms, ½ watt)	33-422339
59	Resistor (33,000 ohms, ½ watt)	33-333339
60	Resistor (1.0 meg., ½ watt)	33-510339
61	Resistor (1.0 meg., ½ watt)	33-510339
62	Tubular Cond. (.05 mfd.)	30-4518
63	Tubular Cond. (.1 mfd.)	30-4611
64	Resistor (47,000 ohms, ½ watt)	33-347339
65	Resistor (220,000 ohms, ½ watt)	33-422339
66	Tubular Cond. (.1 mfd.)	30-4611
67	Resistor (68,000 ohms, ½ watt)	33-368339
68	Resistor (1.0 meg., ½ watt)	33-510339
69	Tubular Con. (.003 mfd.)	30-4582
70	Tubular Con. (.006 mfd.)	30-4610
71	Resistor (68,000 ohms, ½ watt)	33-368339
72	Resistor (470,000 ohms, ½ watt)	33-447339
73	Resistor (68,000 ohms, ½ watt)	33-368339
74	Resistor (470,000 ohms, ½ watt)	33-447339
75	Tubular Con. (.006 mfd.)	30-4610
76	Electrolytic Condenser (4 mfd., 300 V.)	30-2415
77	Resistor (47,000 ohms, ½ watt)	33-347339
78	Tubular Con. (.003 mfd.)	30-4582
79	Output Transformer	32-8058
80	Cone and Voice Coil Assy. (Spr. Pt. No. 36-1459-2)	36-4106
	(Spr. Pt. No. 36-1460-3)	36-4105
81	Electrolytic Condenser (40 mfd., 450 V.)	30-2445
82	Electrolytic Condenser (16 mfd., 300 V.)	30-2412
83	Field Coil (Replace Spkr.)	
84	Tubular Cond. (.2 mfd.)	30-4587
85	Resistor (33,000 ohms, ½ watt)	33-333339
86	Resistor (100,000 ohms, ½ watt)	33-410339
87	Resistor (1.0 meg., ½ watt)	33-510339
88	Tubular Cond. (.5 mfd.)	30-4590
89	Tubular Con. (.003 mfd.)	30-4608
90	Tubular Con. (.003 mfd.)	30-4608
91	Resistor (150,000 ohms, ½ watt)	33-415339
92	Resistor (150,000 ohms, ½ watt)	33-415339
93	Power Trans. (100-130 V., 200-260 V., 50-60 cycles)	32-8007
94	Pilot Lamps (Dial)	34-2064E
95	Pilot Lamp (XX Cabinet only)	34-2210E
96	Wave Switch	42-1525

MISCELLANEOUS PARTS

Description	Part No.
Bezel	56-1222
Cable and Plug (Power Supply)	L-3238
Spec. Export A.C. Plug	L-1367
Cabinet (40-2780T)	10419B
Cabinet (40-2780XX)	10421B
Dial	27-5558
Drive Cord Assy. (Dial)	31-2407
Felt Strip (Bezel Mtg.)	27-8225
Gasket (Dial Mtg.)	27-9258
Knob (Tuning)	27-4330
Knob (Tuning)	27-4862
Knob (Volume and Wave Switch)	27-4332
Knob (Tone Control)	27-4872
Pointer	56-1276

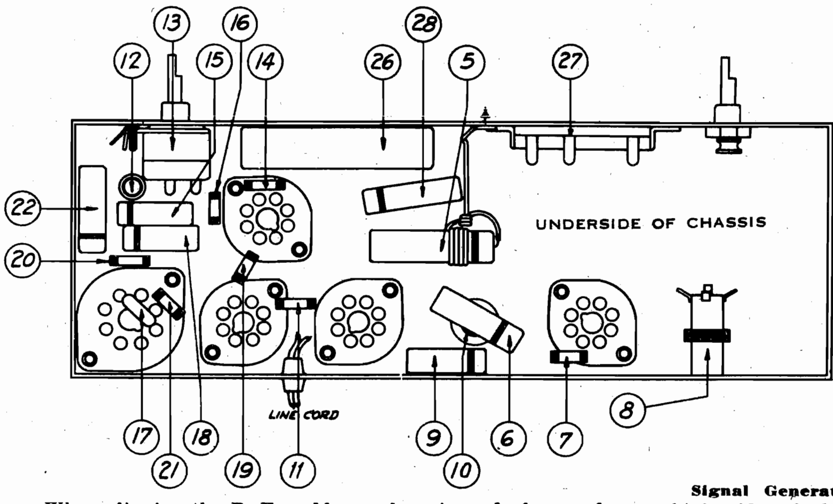
PHILCO RADIO & TELEVISION CORP.

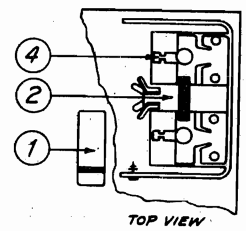
MODELS PT2, PT6

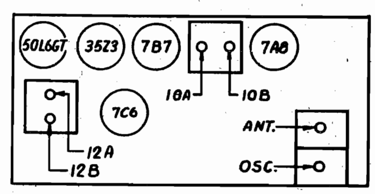


IF PEAK 455 KC

OCTOBER, 1940.







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 signal generator is then placed close to the loop of the radio.

Signal Generator: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcst.	12A, 12B, 10A, 10B	Note B
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcst.	(4B, Note C)	Note A
3	Loop see above instructions	1500 K. C	1500 K. C.	Vol. Max. Range Switch Brdcst.	(4A, Note D)	

NOTE A: DIAL POINTER CALIBRATION—In order to adjust the receiver correctly, the pointer must be adjusted to track properly with the tuning condenser. To do this, turn the tuning condenser to the maximum capacity (plates fully meshed). With the condenser in this position, set the tuning pointer on the first small line stamped in the scale plate on the left side.

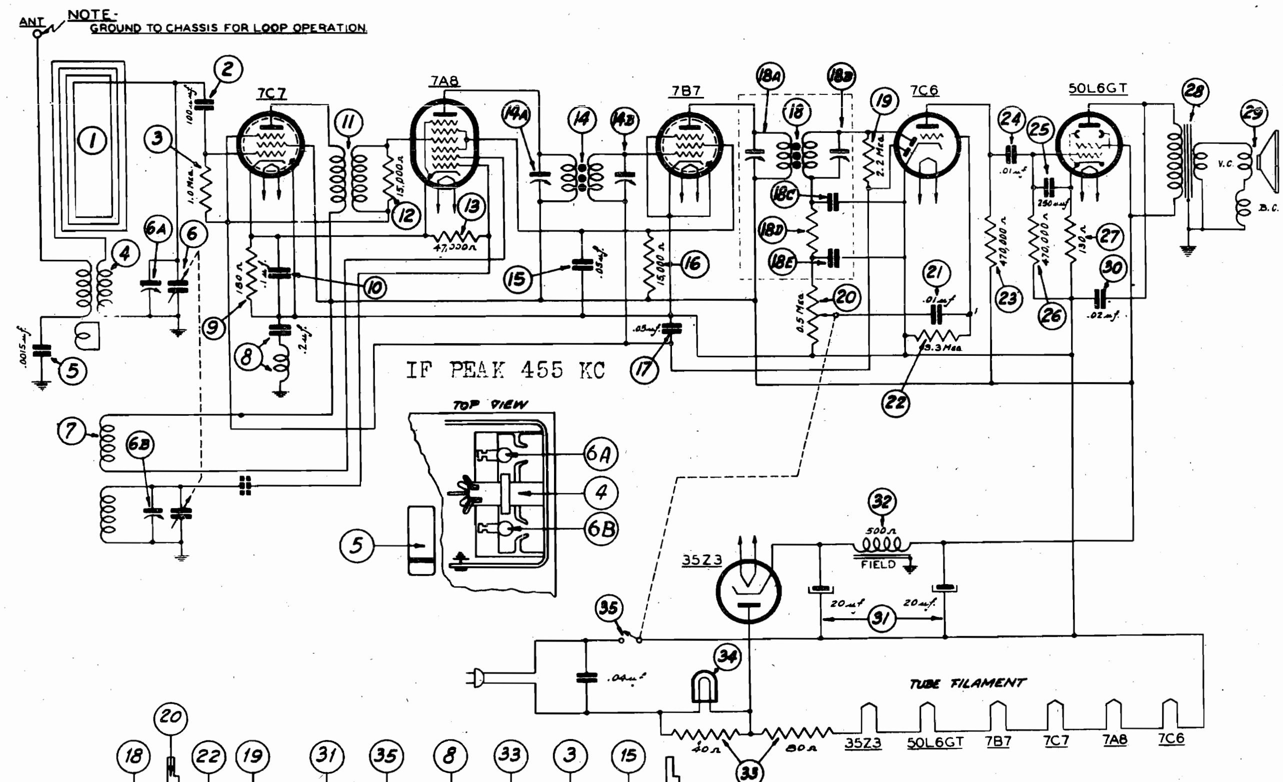
NOTE B—Before adjusting compensators, turn down (10B) to tight position. Then adjust the compensators for maximum output in the following order: 12A, 12B, 10A and 10B.

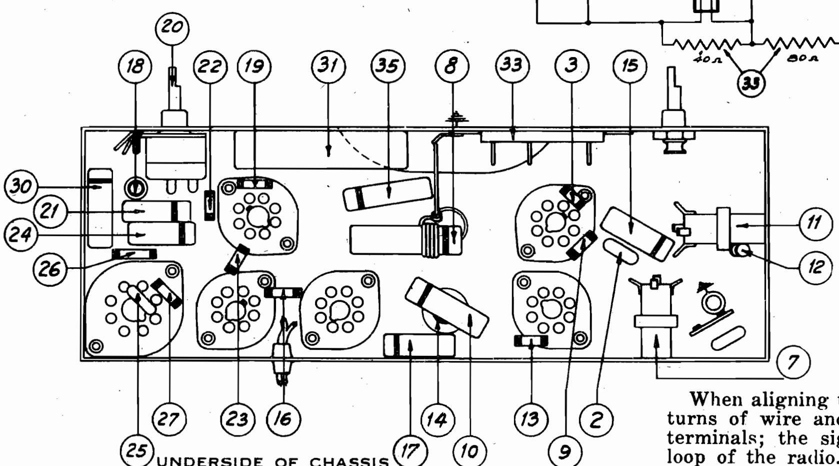
NOTE C—Turn tuning condenser until dial pointer is on the first small line stamped in the scale plate from right side of chassis. Adjust padder (4B) to maximum at this point.

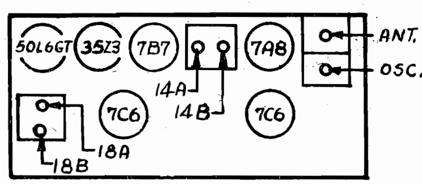
NOTE D—Turn tuning condenser until dial pointer is on the second small line stamped in the scale plate from right side of chassis. Adjust padder (4A) to maximum at this point.

MODEL PT12

PHILCO RADIO & TELEVISION CORP.







OCTOBER. 1940.

Signal Generator. When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled. Locations are shown on Schematic.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcst.	18A, 18B, 14A, 14B	Note B
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcst.	(6B, Note C)	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcst.	(6A, Note D)	

NOTE A: DIAL POINTER CALIBRATION—In order to adjust the receiver correctly, the pointer must be adjusted to track properly with the tuning condenser. To do this, turn the tuning condenser to the maximum capacity (plates fully meshed). With the condenser in this position, set the tuning pointer on the first small line stamped in the scale plate on the left side.

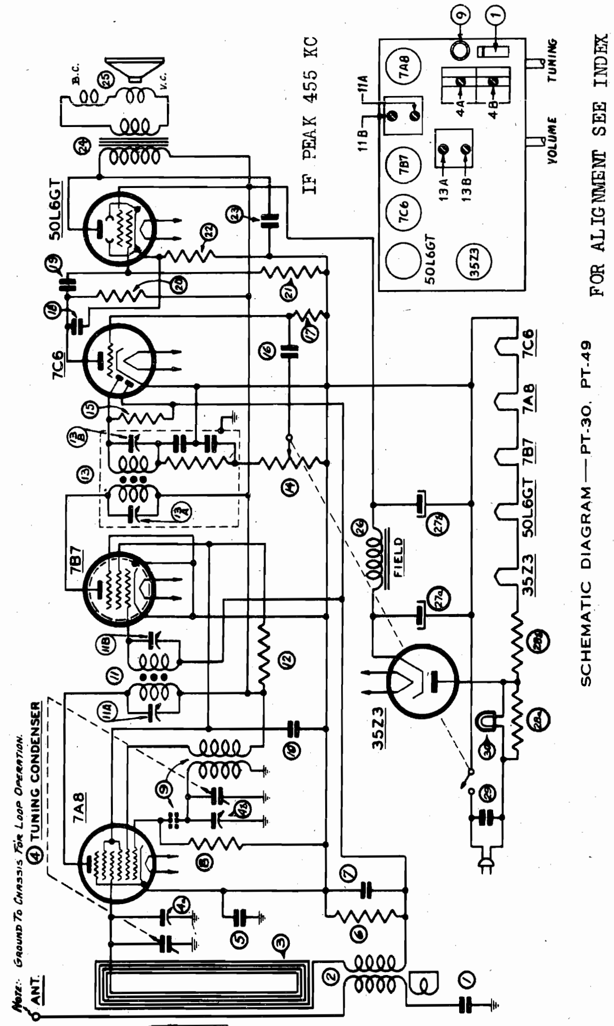
NOTE B—Before adjusting compensators, turn down (14B) to tight position. Then adjust the compensators for maximum output in the following order: 18A, 18B, 14A and 14B.

NOTE C—Turn tuning condenser until dial pointer is on the first small line stamped in the scale plate from right side of chassis. Adjust padder (6B) to maximum at this point.

NOTE D—Turn tuning condenser until dial pointer is on the second small line stamped in the scale plate from right side of chassis. Adjust padder (6A) to maximum at this point.

PHILCO RADIO & TELEVISION CORP.

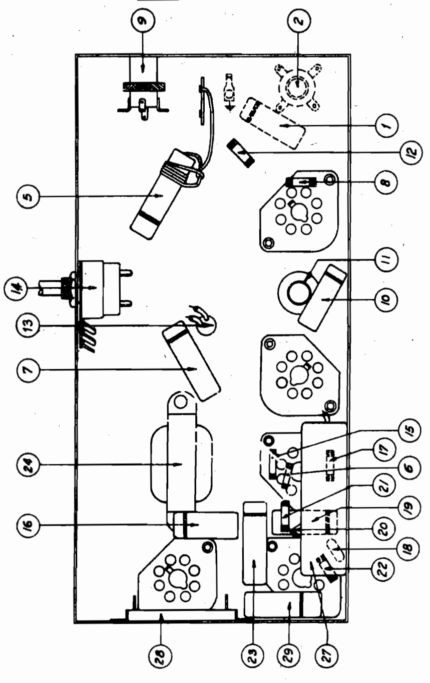
MODELS PT30, PT49
MODELS PT42, PT44



IF PEAK 455 KC

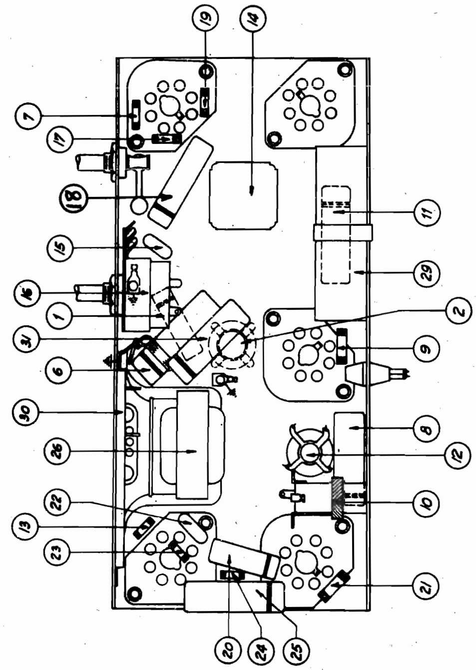
FOR ALIGNMENT SEE INDEX

SCHEMATIC DIAGRAM — PT-30, PT-49

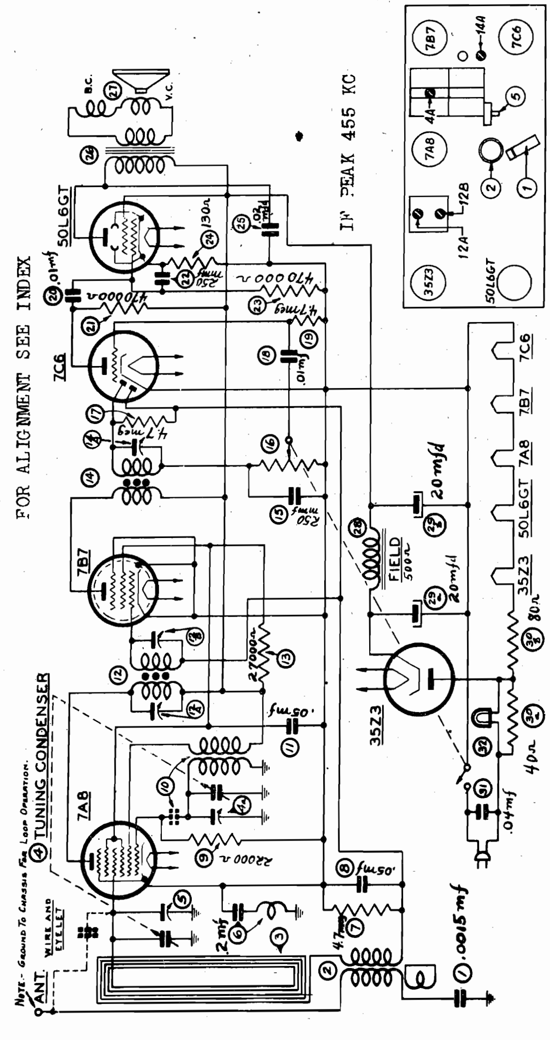


PART LOCATIONS — UNDERSIDE OF CHASSIS PT-30, PT-49

AUGUST, 1940.



PART LOCATIONS — UNDERSIDE OF CHASSIS PT-42, PT-44



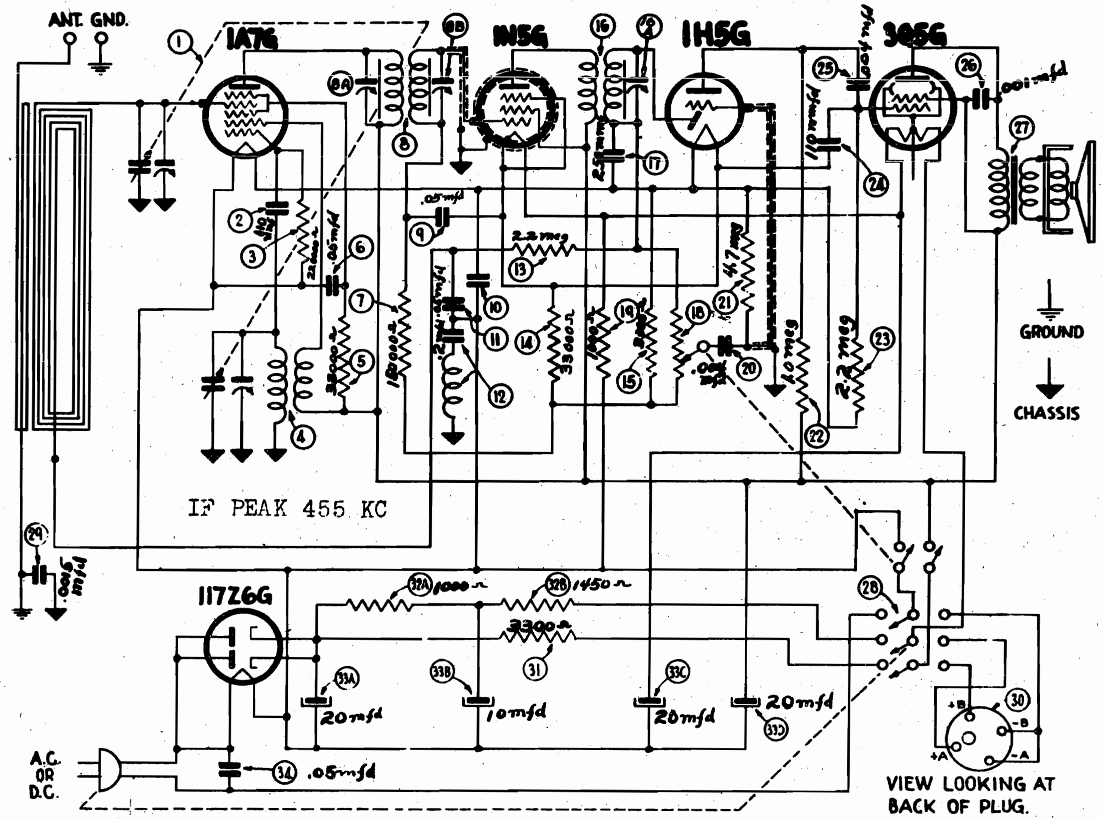
IF PEAK 455 KC

FOR ALIGNMENT SEE INDEX

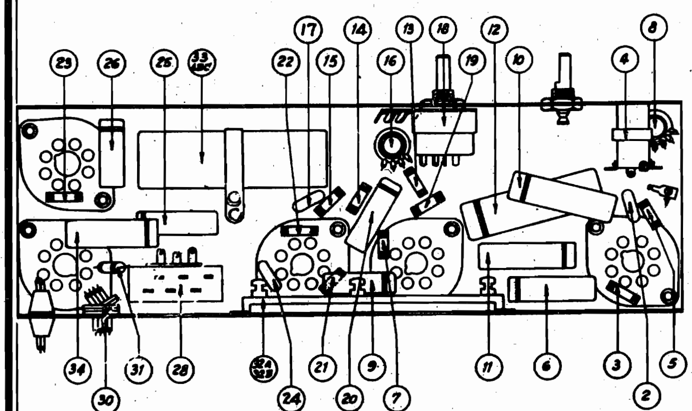
SCHEMATIC DIAGRAM — PT-42, PT-44

MODEL PT87
MODELS PT30,
PT42, PT44, PT49

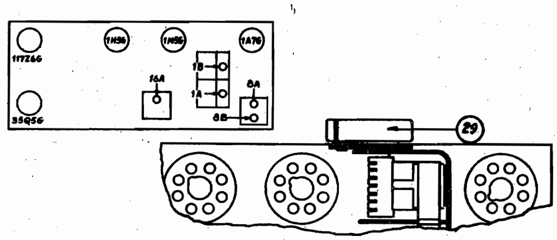
PHILCO RADIO & TELEVISION CORP.



SCHEMATIC DIAGRAM — PT-87



PART LOCATIONS — UNDERSIDE OF CHASSIS PT-87



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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approxiamtely the same position around or near the chassis as when assembled.

After connecting the aligning instruments adjust the compensators as shown in the tabulation below.

If the indicating meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

MODELS PT30, PT42, PT44, PT49, PT87

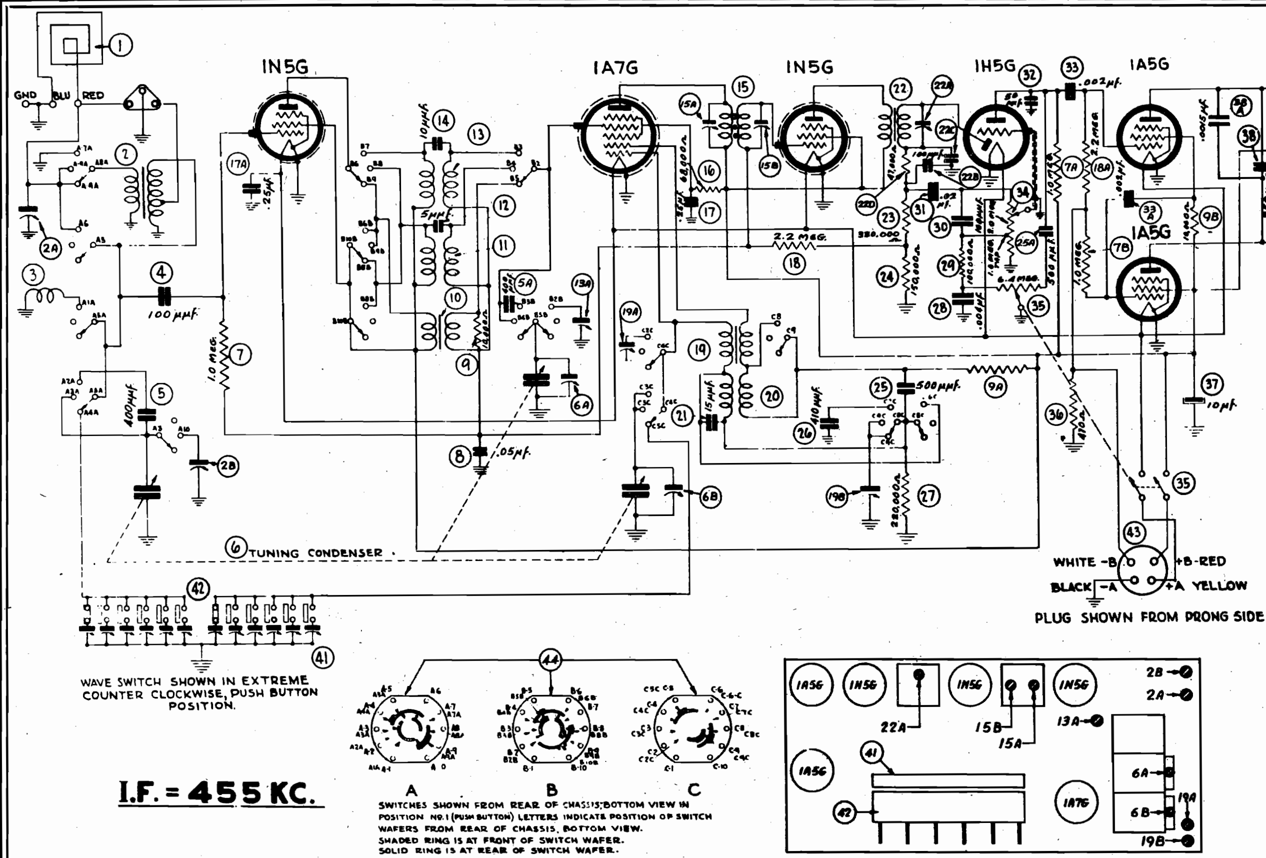
Operations in Order	SIGNAL GENERATOR		RECEIVER					SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order			
					PT-30, 49	PT-42, 44	PT-87	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol Max. Range Switch Brdcst.	11B, 11A 13A, 13B	12A, 12B 14A	8A, 8B 16A	Note B
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcst.	4B	4A	1B	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcst.	4A	5	1A	

NOTE A: — 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, set the tuning pointer on the small dot below 550 K. C.

NOTE B: — When adjusting the I. F. compensators of Models PT-30 and PT-49, turn compensator (11B) clockwise to the tight position and pad compensators 11A, 13A and 13B to maximum output, then pad 11B to maximum.

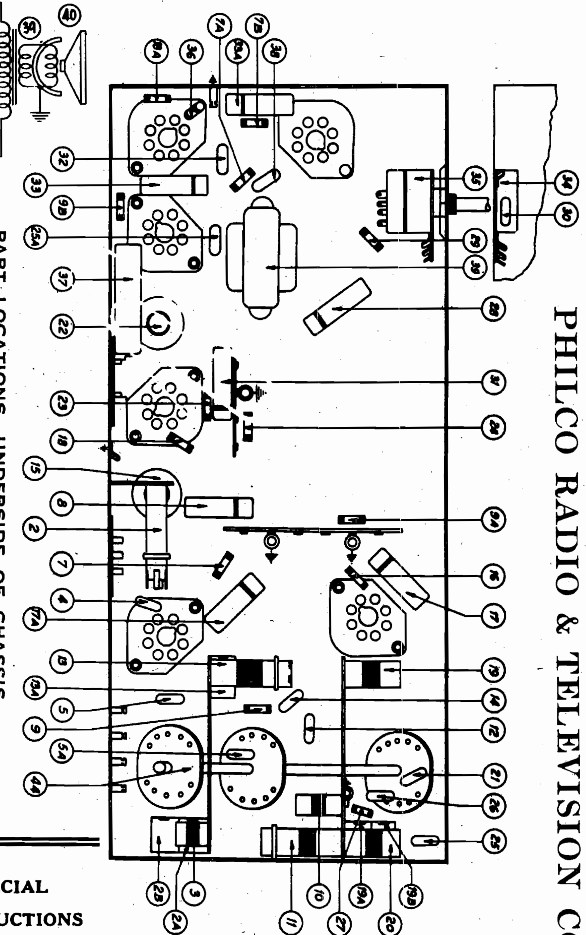
MODEL 41-110

PHILCO RADIO & TELEVISION CORP.



I.F. = 455 KC.

SCHEMATIC DIAGRAM — MODEL 41-110



PART LOCATIONS, UNDERSIDE OF CHASSIS

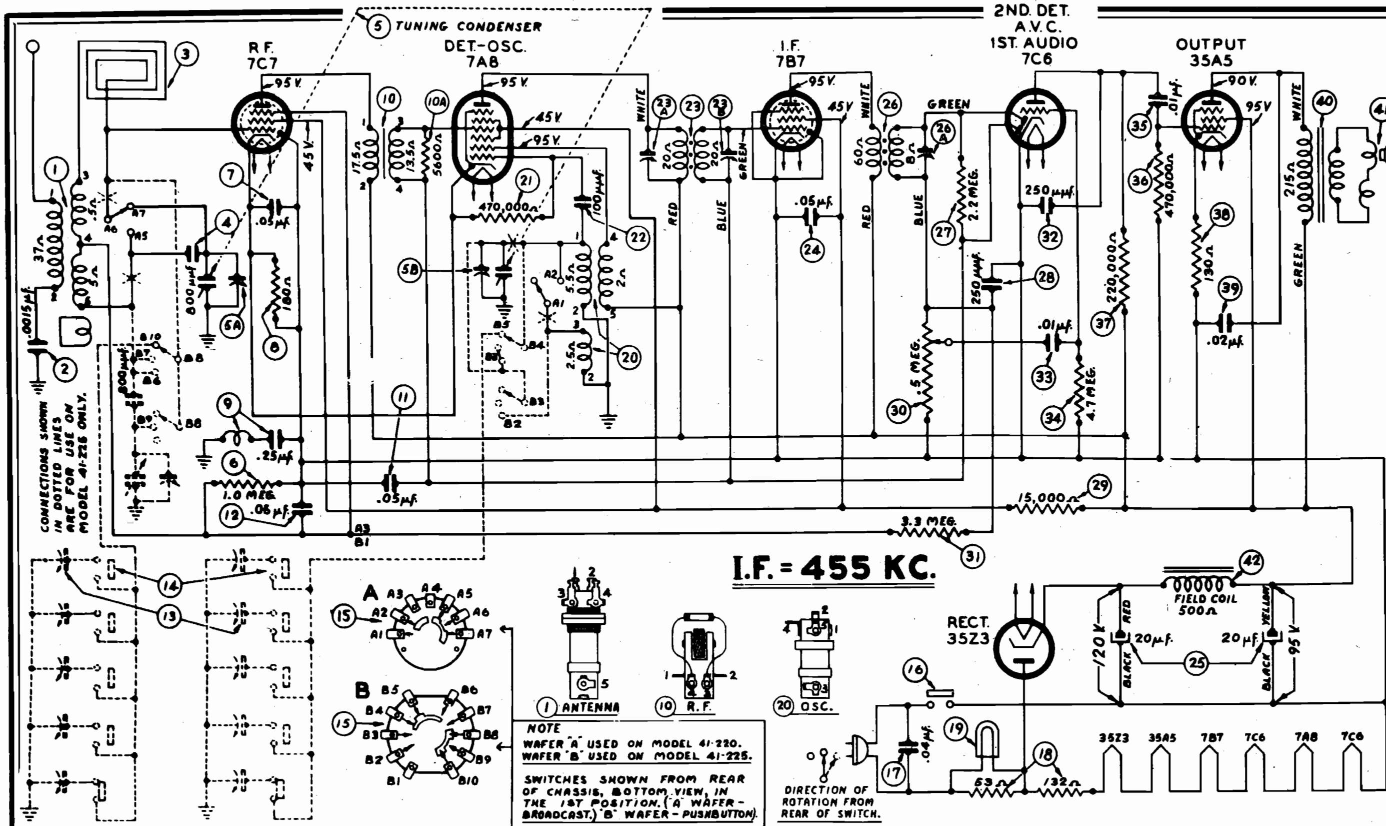
Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections	Dummy Aerial	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	1A7G (Grid)	.1 mmfd.	455 K. C.	540 K. C.	Vol. Max. Range Switch Brdcst.	15A, 15B 22A	
2	Aerial Connection Receiver	225 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcst.	Osc., R. F., aerial 6B, 6A, 2B	
3	Aerial Connection Receiver	225 mmfd.	580 K. C.	580 K. C.	Vol. Max. Range Switch Brdcst.	19B	Roll Gang
4	Aerial Connection Receiver	Recheck Operation No. 2					
5	Aerial Connection Receiver	400 Ohms	12 M. C.,	12 M. C.	Range Switch S. W.	Osc., R. F., Ant. 19A, 13A, 2A	

NOTE A: DIAL CALIBRATION: Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dash below 540 K. C.

AUGUST, 1940.

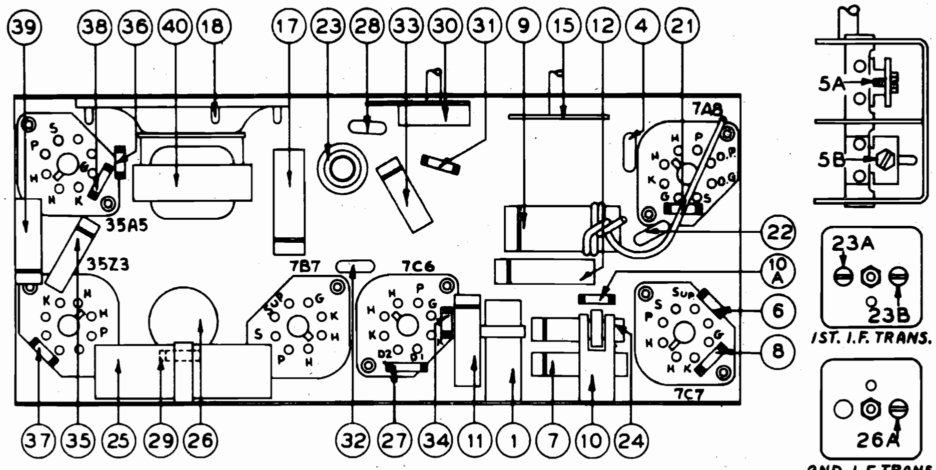
MODELS 211-220,
41-225

PHILCO RADIO & TELEVISION CORP.



SCHEMATIC DIAGRAM MODELS 41-220 & 41-225

JULY, 1940.



FOR ALIGNMENT, SEE INDEX

SCHE. No.	DESCRIPTION	PART No.
1	Aerial Transformer	32-3404
2	Condenser (.0015 mfd., 200 volts)	30-4555
3	Loop Aerial (Model 41-220)	32-3521
	Loop Aerial (Model 41-225)	32-3480
4	Mica Condenser (800 mmfd.)	60-180127
5	Tuning Condenser (Model 41-220)	31-2492
	Tuning Condenser (Model 41-225)	31-2493
6	Resistor (1 megohm)	33-510339
7	Condenser (.05 mfd., 200 volts)	30-4519
8	Resistor (180 ohms)	33-118336
9	Condenser (.25 mfd.) and Choke	38-9851
10	R. F. Transformer	32-3273
10B	Resistor (5600 ohms) Part of 10	
11	Condenser (.05 mfd., 200 volts)	30-4519
12	Condenser (.05 mfd., 200 volts)	30-4519
13	Compensator Assembly (Push-buttons) Model 41-225 Only	31-6376
14	Push-button Switch Assembly (Model 41-225 Only)	42-1591
15	Range Switch (Model 41-220)	42-1505
	Range Switch (Model 41-225)	42-1590
16	Off-On Switch (Part of 14)	
17	Condenser (.04 mfd., 400 volts)	30-4119
18A	Resistor (53-132 ohms)	33-3375
19	Pilot Lamp	34-2068
20	Oscillator Transformer	32-3256
21	Resistor (47,000 ohms)	33-347339
22	Condenser (100 mmfd.)	60-110157
23	1st I. F. Transformer	32-3489
24	Condenser (.05 mfd.)	30-4519
25A	Electrolytic Cond. (20 mfd., 20 mfd.)	30-2403
25B	Electrolytic Cond. (20 mfd., Part of 25A)	
26	2nd I. F. Transformer	32-3304
27	Resistor (2.2 megohm)	33-522154
28	Mica Condenser (250 mmfd.)	60-125157
29	Resistor (15,000 ohms)	33-315339
30	Volume Control (Model 41-220)	33-5404
	Volume Control (Model 41-225)	33-5411
31	Resistor (3.3 megohm)	33-533339
32	Condenser (100 mfd.)	61-0033
33	Condenser (.01 mfd., 200 volts)	30-4479
34	Resistor (4.7 megohms)	33-547154
35	Condenser (.01 mfd., 400 volts)	30-4572
36	Resistor (470,000 ohms)	33-447339
37	Resistor (220,000 ohms)	33-422339
38	Resistor (130 ohms)	33-113336
39	Condenser (.02 mfd., 400 volts)	30-4516
40	Output Transformer	32-8144
41	Cone Assembly (for Speaker 36-1512-9)	36-4167
42	Field Coil (Replace Speaker 36-1512)	

Model 41-220, is manually tuned and employs two tuning ranges covering 540 to 1600 K. C. and 1.6 to 3.3 M. C.

Model 41-225 has Electric Push-button tuning in addition to Manual tuning and two tuning ranges covering the same frequencies as Model 41-220. The electric push-button mechanism consists of six (6) push-buttons. One push-button is used to turn the power source OFF and ON and the remaining five (5) for automatically tuning in broadcasting stations.

PHILCO RADIO & TELEVISION CORP.

MODELS 41-220, 41-225
MODEL 41-RP6

Model 41-RP-6 is a remote type record player which can be used in conjunction with any standard broadcast radio to reproduce phonograph records.

POWER SUPPLY: 115 volts, 60 cycle, A. C.

POWER CONSUMPTION: 30 watts.

This model may be also operated on a 115 volts, 50 cycle power supply by changing the motor as indicated in the parts list.

PHILCO TUBES USED: 6A7, Oscillator; 84, Rectifier.

OPERATION

Place record on turntable and slide "Off-On Switch" (Figure 1) 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.

Tune the radio 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.

OPERATION VERY CLOSE TO THE RECEIVER: A range switch will be found on the lower side of the drawer. (See Figure 2). If the player is installed very close to the receiver, slide this switch to the "near" position for best tone quality. When the player is more than a short distance from the receiver, with the switch in the "near" position, the noise in the receiver will be louder than the music from the record. In this case, leave the range switch in the "distant" position. After the best position for the range switch is determined, it is not necessary to change it as long as the player and receiver are not moved. Note after changing position of switch it is advisable to either retune the record player or the radio.

INTERFERENCE

If interference from broadcasting stations is encountered, the frequency of the unit can be changed to any other frequency between 530 KC. and 570 KC. by removing snap button and adjusting small screw indicated in Diagram "A". 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 most cases it is preferable to use different receptacles 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 comfortable listening distance, provided local noise conditions are not too severe.

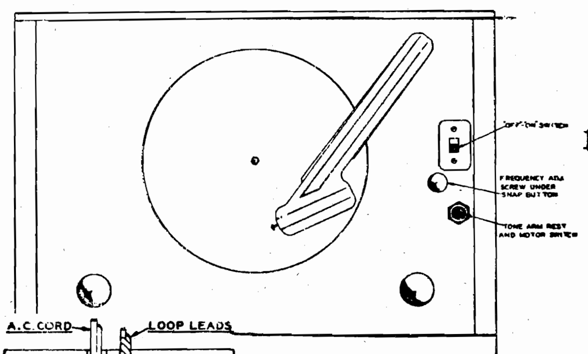


FIGURE 1

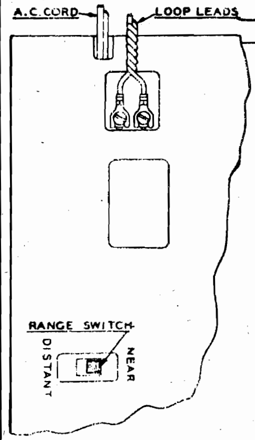
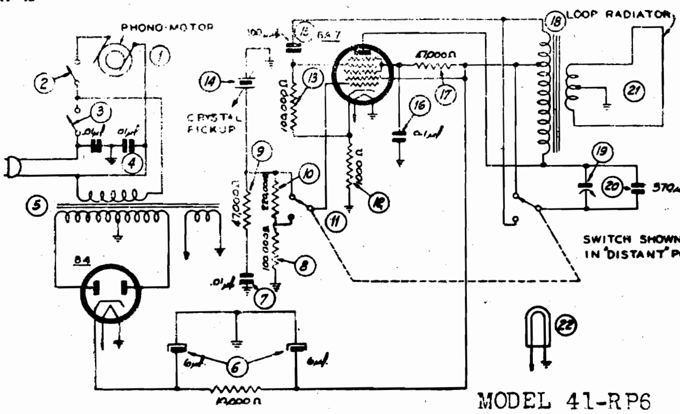


FIGURE 2



MODEL 41-RP6

Schem. No.	Description	Part No.
1	Phono-motor (115 volts, 60 cycles)	35-1240
	Screw (Mtg.)	W-89
	Turntable	35-3047
2	Motor Switch	42-1651
3	Master "On-Off" Power Switch	42-1562-2
4	Line Filter Condenser (.01-.01 mfd.)	3903-DG
5	Power Transformer (115 volts, 60 cycle)	32-8043
6	Electrolytic Condenser (6-6 mfd.)	30-2388
	Clamp	56-1346
7	Condenser (.01 mfd.)	30-4572
8	Resistor (100,000 ohms)	33-410339
9	Resistor (47,000 ohms)	33-347339
10	Resistor (220,000 ohms)	33-422339
11	Range Switch	42-1657
12	Resistor (1,000 ohms)	33-210339
13	Resistor (100,000 ohms)	33-410339
14	Crystal Pickup (Complete)	35-2476
	Bumper (Pickup Arm)	54-4070
15	Condenser (100 mmfd.)	60-110157
16	Condenser (.1 mfd.)	30-4455
17	Resistor (47,000 ohms)	33-347339
18	Coupling Transformer	32-3646
	Clip Mtg.	28-5002
19	Compensator	31-6268
20	Silver Mica Condenser (370 mmfd.)	30-1110
21	Loop Aerial	Consists of short piece of wire
22	Pilot Lamp	34-2064
	Cabinet	10534A
	Screw (Chassis Mtg.)	W-218
	Washer (Chassis Mtg.)	W-751
	Bottom Cover	27-9858
	Cable (Power)	L-2778
	Needle Kit	40-6458
	Screw (Chassis Mtg.)	W-218
	Socket (5-prong)	27-6035
	Socket (7-prong)	27-6037

MODELS 41-220, 41-225

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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond.	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch "Brdcst"	26A, 23B, 23A	
2	Loop—See above Instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch "Brdcst"	5B Tuning Condenser	Note A
3	Loop—See above Instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	5A Tuning Condenser	

NOTE A — 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, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

MODELS 41-221
41-226
MODEL 41-231

PHILCO RADIO & TELEVISION CORP.

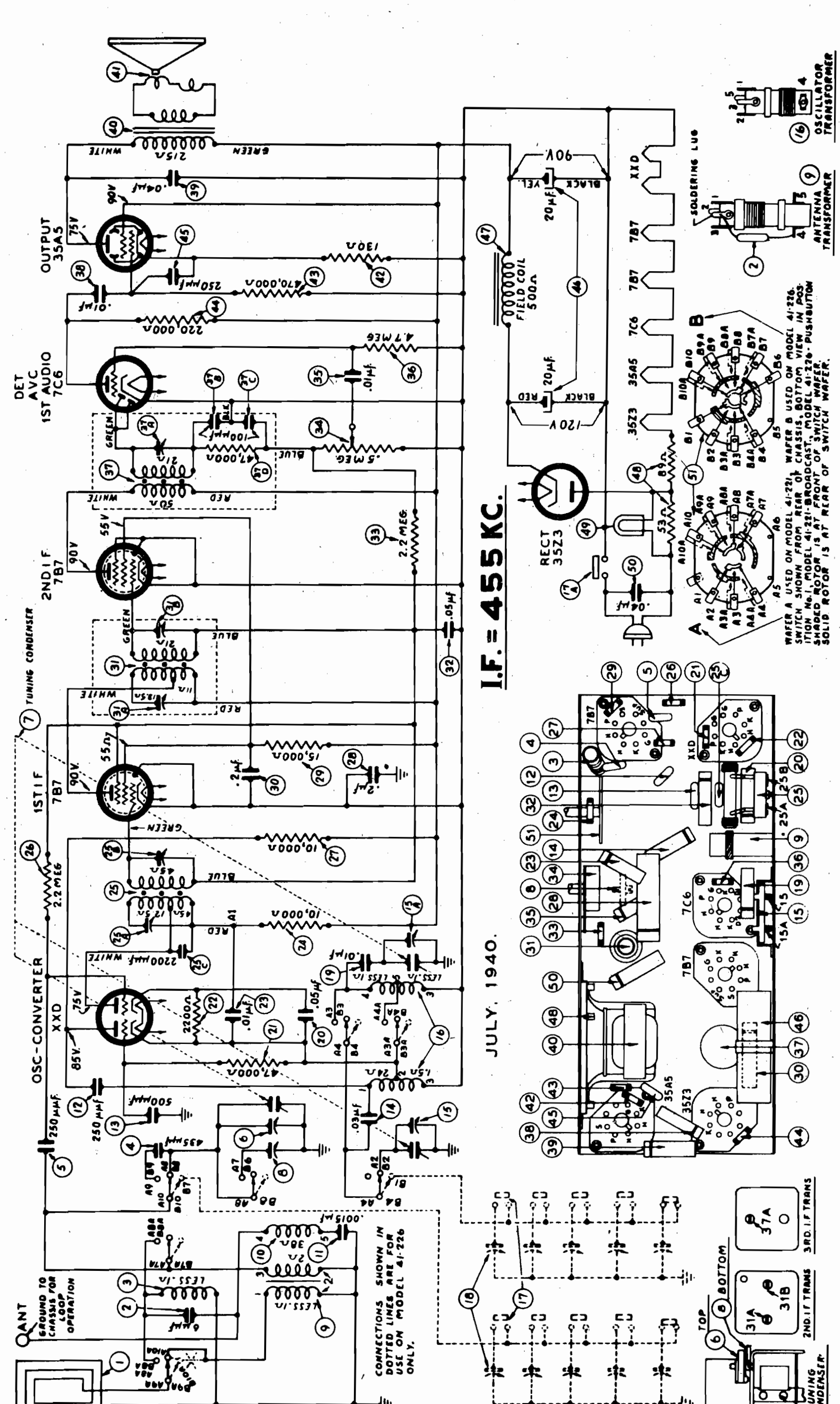
Model 41-221 is manually tuned and is assembled in two type (C & CI.) cabinets. Type "C" is a diagonal grain Sapel wood cabinet with carrying handle. Cabinet Type "CI" use diagonal grained walnut wood with ivory finished bezel, knobs and trim.

Model 41-226 incorporates Electric Push-button tuning in addition to manual tuning and is assembled in a sliced Walnut Cabinet. The electric push-button mechanism consists of six (6) push-buttons. One push-button is used to turn the power off and on. The remaining five (5) push-buttons automatically tune in stations.

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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.



SCHEMATIC DIAGRAM MODEL 41-221 & 41-226
41-231

ALIGNMENT FOR MODELS 41-221, 41-226, 41-231

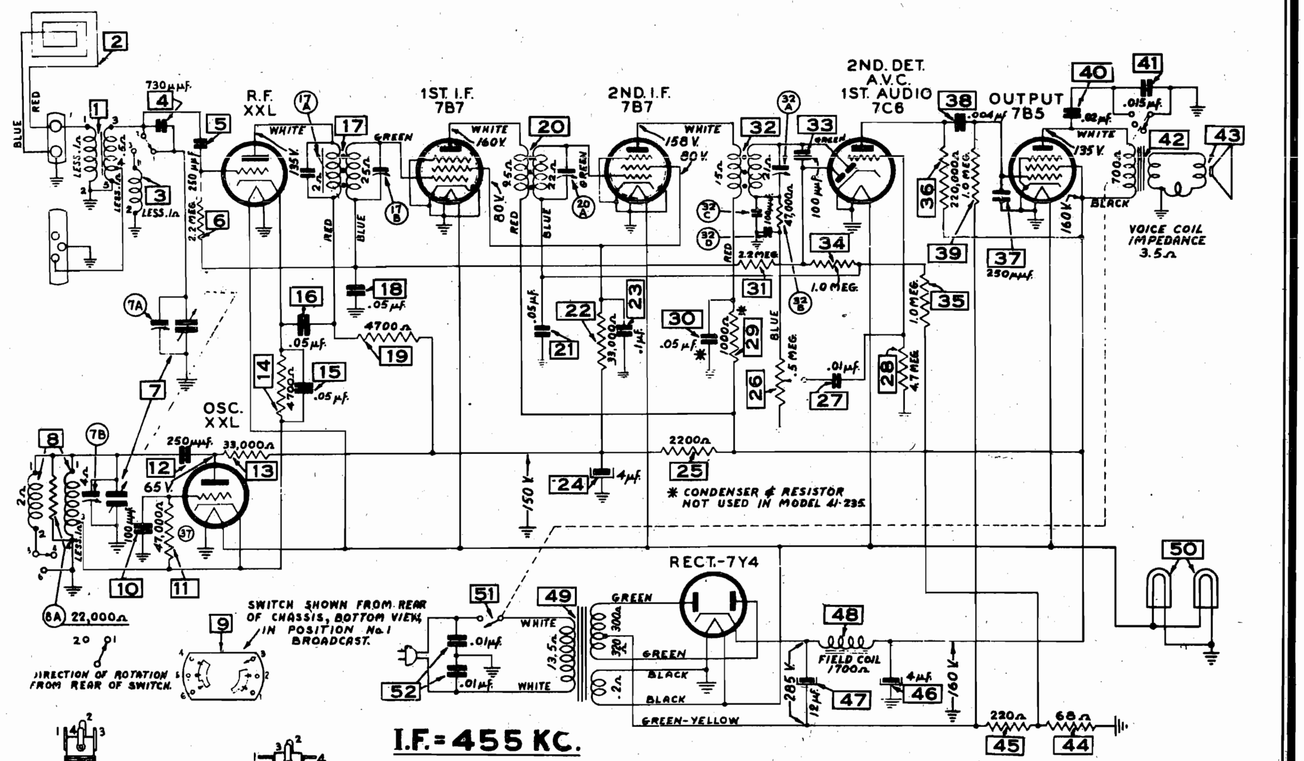
Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of tuning	455 K.C.	540 K.C. Tuning Cond. Closed	Vol Max. Range Switch Brdcst.	37A, 31A, 31B, 25A, 25B	
2	Loop see above instructions	1600 K.C.	1600 K.C.	Vol. Max. Range Switch Brdcst.	15	Note A
3	Loop see above instructions	1500 K.C.	1500 K.C.	Vol. Max. Range Switch Brdcst.	6	
4	Loop see above instructions	12 M.C.	12 M.C.	Range Switch "S. W."	15A, 8	Roll (8) for Max. Note B

NOTE A: —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, set the tuning pointer on the small dot below 550 K.C.

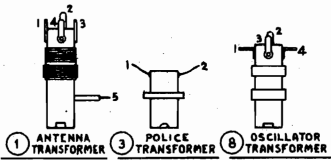
NOTE B — When adjusting oscillator compensator 15A, tune for maximum on the first signal peak from Tight position (compensator closed).

PHILCO RADIO & TELEVISION CORP.

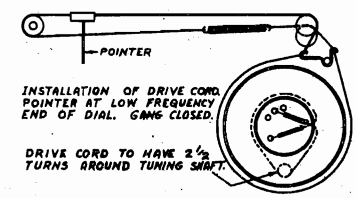
MODELS 41-230, 41-235 (121)

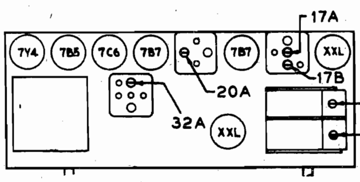


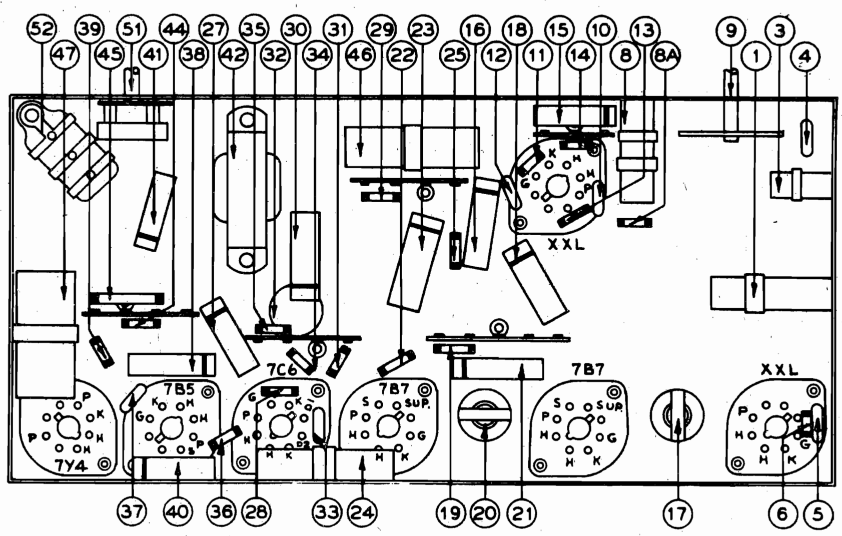
I.F. = 455 KC.



JUNE, 1940







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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet. If adjustments are made outside the cabinet a Service Tuning Scale, Part No. 45-2819, will be required. This scale is placed underneath the pointer on the metal dial plate.

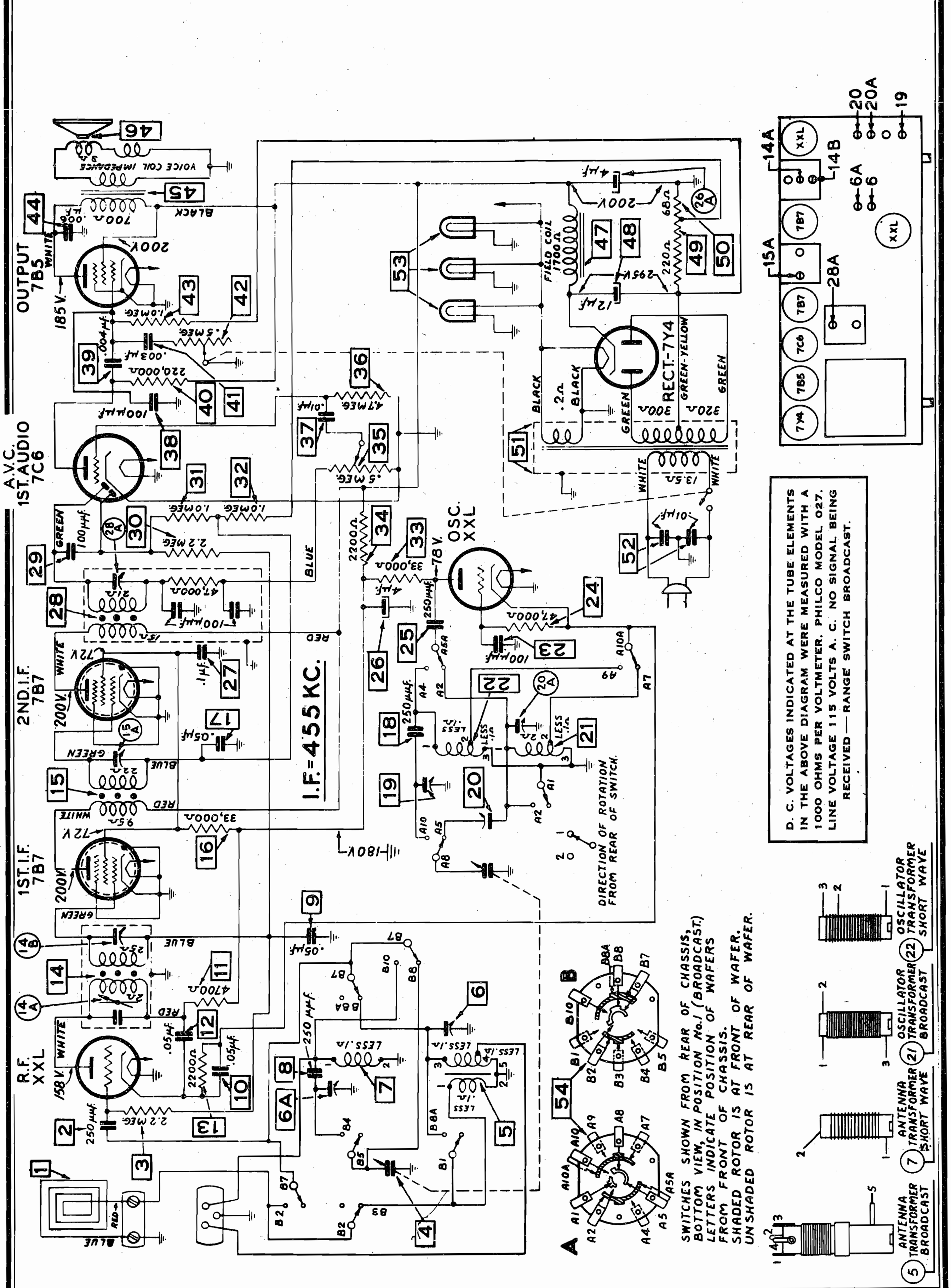
When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond.	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch "Brdcst"	32A, 20A 17B, 17A	
2	Loop—See above Instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch "Brdcst"	7B	Note A
3	Loop—See above Instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	7A	

NOTE A — 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, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

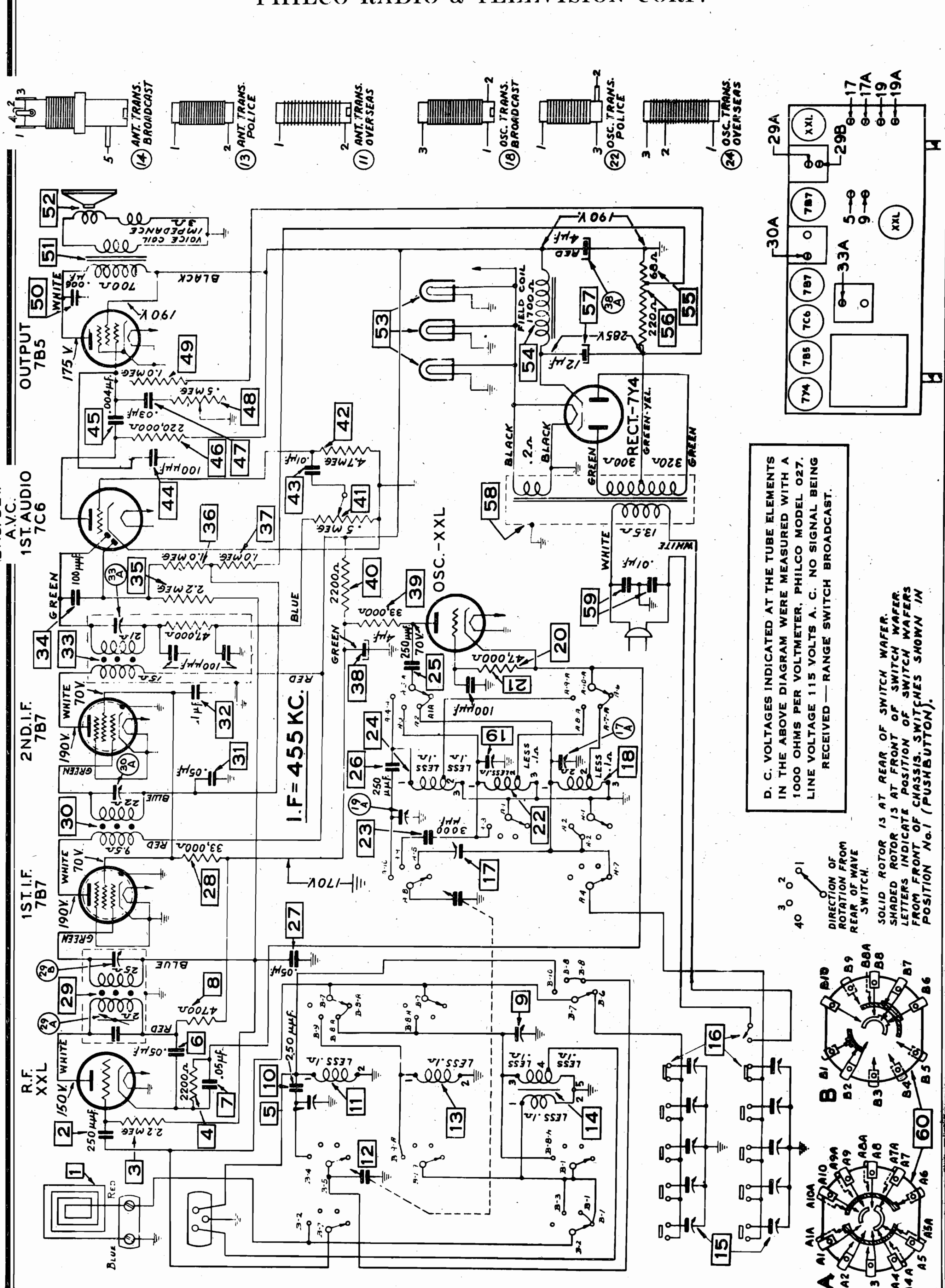
MODEL 41-240 (121)

PHILCO RADIO & TELEVISION CORP.



MODEL 41-245 (121)

PHILCO RADIO & TELEVISION CORP.



MODELS 41-240
41-245

PHILCO RADIO & TELEVISION CORP.

SPECIFICATIONS

Model 41-240

TYPE OF CIRCUIT: Model 41-240, Code 121, is a seven (7) tube A. C. operated super-heterodyne radio employing the Philco Built-in American and Overseas Aerial system. Provisions are also provided for an outside aerial. The Philco Outdoor aerial, Part No. 45-2817 is especially designed for use with this radio and is recommended for maximum performance. In addition, other features of design are:—two tuning ranges; two I. F. stages; Philco loktal tubes; variable tone control; automatic volume control, and a pentode audio output stage.
TUNING RANGES: 540 to 1720 K. C.: 9 to 12 M. C.
INTERMEDIATE FREQUENCY: 455 K. C.
POWER SUPPLY: 115 volts A. C., 60 cycles. To operate the radio on 115 Volt, 25 cycle current, it will be necessary to change power transformers as indicated in the parts list.
AUDIO OUTPUT: 2 watts.
PHILCO TUBES USED: one XXL, 1st detector; one XXL, oscillator; one 7B7, 1st I. F.; one 7B7, 2nd I. F.; one 7C6, 2nd detector, 1st audio, A. V. C.; one 7B5, audio output and a 7Y4 rectifier.
CABINET DIMENSIONS: Height, 11"; Width, 15¼"; Depth, 9⅛".

Model 41-245

TYPE OF CIRCUIT: Model 41-245, Code 121, is a seven (7) tube A. C. operated super-heterodyne radio with electric push button tuning. In addition, the radio employs the Philco Built-in American and Overseas Aerial system for operation without an outside aerial. Provisions are also provided for an outside aerial for sections where signal strength is weak, such as in steel reinforced buildings and other shielded locations. For installations of this type the Philco 1941 Outdoor Aerial, Part No. 45-2817, is recommended. This aerial can be conveniently connected to the radio by inserting the plug attached to the transformer unit into the socket provided at the rear of the chassis. A ground is not required with either type of installation. Other features of design included in the radio are three tuning ranges; covering standard, police, and shortwave frequencies: two I. F. stages, Philco loktal tubes; variable tone control; automatic volume control; and a pentode audio output stage. Six (6) electric tuning push buttons are provided for automatically selecting stations. Five of the push buttons are used for broadcast stations, and one for turning the power of the set "on" and "off". The procedure for adjusting the push buttons will be found in the instructions supplied with the Radio.
TUNING RANGES:
540 to 1720 K. C.: 2.0 to 7.0 M. C.: 9 to 12.0 M. C.
INTERMEDIATE FREQUENCY: 455 K. C.
POWER SUPPLY: 115 volts A. C., 60 cycles. To operate the radio on 115 volt, 25 cycle current, it is necessary to change the power transformers as indicated in the parts list.
AUDIO OUTPUT: 2 watts.
PHILCO TUBES USED: one XXL, 1st detector; one XXL, oscillator: one 7B7, 1st I. F.; one 7B7, 2nd I. F.: one 7C6, 2nd detector, 1st audio, A. V. C.: one 7B5, audio output and a 7Y4 rectifier.
CABINET DIMENSIONS:
Height, 11¾": Width, 16½": Depth, 9⅛"

ALIGNING R. F. AND I. F. COMPENSATING CONDENSERS

THE FOLLOWING PROCEDURE IS THE SAME FOR BOTH MODELS.

Model 41-240

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Settings	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Condenser	455 K. C.	Tuning Cond. closed	Vol. Max. Range Switch "Brdcst"	28A, 15A, 14A, 14B	Note A
2	Loop to Radio Loop See Sig. Gen. above	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	20A, 6	Note B
3	Loop to Radio Loop See Sig. Gen. above	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	20	Rock Comp. to "max." Recheck Operation No. 2
4	Loop to Radio Loop See Sig. Gen. above	9.5 M. C.	9.5 M. C.	Range Switch "S. W."	19, 6A	Note C
5	Loop to Radio Loop See Sig. Gen. above	12 M. C.	12 M. C.	Range Switch "S. W."	19, 6A	Note D

Model 41-245

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Settings	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Condenser	455 K. C.	Tuning Cond. closed	Vol. Max. Range Switch "Brdcst"	33A, 30A, 29A, 29B	Note A
2	Loop to Radio Loop See Sig. Gen. above	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	17A, 9	Note B
3	Loop to Radio Loop See Sig. Gen. above	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	17	Rock Comp. to "max." Recheck Operation No. 2
4	Loop to Radio Loop See Sig. Gen. above	6 M. C.	6 M. C.	Range Switch "Police"	19	Rock Comp. to "max."
5	Loop to Radio Loop See Sig. Gen. above	9.5 M. C.	9.5 M. C.	Range Switch "S. W."	19A, 5	Note C
6	Loop to Radio Loop See Sig. Gen. above	12 M. C.	12 M. C.	Range Switch "S. W."	19A, 5	Note D

NOTE A — Compensator (14A) Model 41-240, must be adjusted before (14B) Model 41-240, and should be done in the following manner. Turn 14A all the way up, then slowly turn down and select the first I. F. peak. Padder 14B is now adjusted to maximum. This procedure applies also to Model 41-245, padder 29A should be adjusted before 29B.

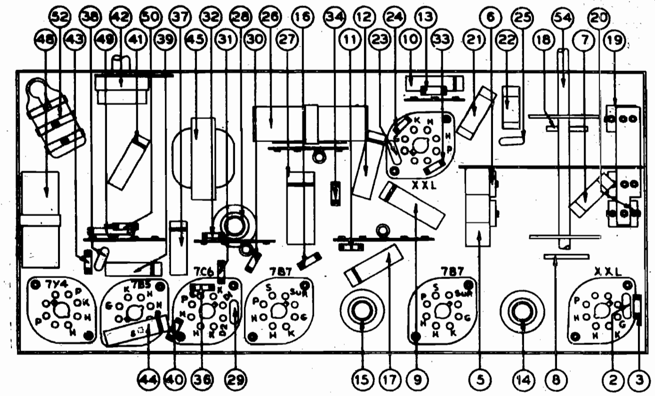
NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE C — Set pointer at 9.5 M. C. and adjust padders (19) Model 240, and (19A) Model 245 to the second peak from tight. Adjust padders (6A) Model 240 and (5A) Model 245 to first peak from tight. (This gives the approximate correct setting of padders for next operation.)

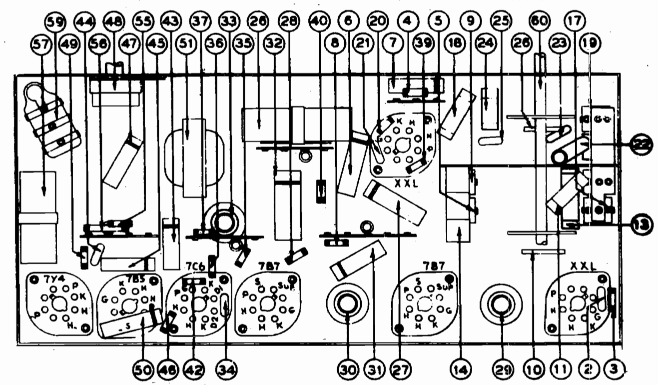
NOTE D — Tune in the 2nd signal peak from the tight position. Padder 19 Model 240, 19A Model 245, then roll padder 6A Model 41-240, 5 Model 41-245, slowly to maximum on the first peak from tight position.

Replacement Parts — Model 41-240

SCHE. No.	DESCRIPTION	PART No.
1	Loop Aerial	76-1092
2	Mica Condenser (250 mmfd.)	60-125257
3	Resistor (2.2 megohms)	33-522154
4	Tuning Condenser	31-2481
	Mounting Rubber	27-4596
5	Aerial Transformer (Broadcast)	32-3461
6	Comp. (Aerial Broadcast) Dual Capacity	31-6373
6A	Compensator (Aerial S. W.) (Part of 6)	
7	Aerial Transformer (S. W.)	32-3462
8	Mica Condenser (250 mmfd.)	30-1179
9	Tubular Condenser (.05 mfd., 200 volts)	30-4519
10	Tubular Condenser (.05 mfd., 200 volts)	30-4519
11	Resistor (4700 ohms, ½ watt)	33-247339
12	Tubular Condenser (.05 mfd., 400 ohms)	30-4518
13	Resistor (2200 ohms, ½ watt)	33-222339
14	1st I. F. Transformer	32-3465
15	2nd I. F. Transformer	32-3466
16	Resistor (33,000 ohms, ½ watt)	33-333339
17	Tubular Condenser (.05 mfd., 200 volts)	30-4519
18	Mica Condenser (250 mmfd.)	30-1179
19	Compensator (S. W. Osc.)	31-6380
20	Compensator Series (Broadcast, Osc.)	31-6352
20A	Comp. Shunt (Brdcst, Osc.) (Part of 20)	
21	Osc. Transformer (Broadcast)	32-3464
22	Osc. Transformer (S. W.)	32-3460
23	Mica Condenser (100 mmfd.)	60-110257
24	Resistor (47,000 ohms, ½ watt)	33-347339
25	Mica Condenser (250 mmfd.)	60-125257
26	Electrolytic Condenser, Dual (4-4 mfd.)	30-2477
26A	Electrolytic Condenser (Part of 26)	
27	Tubular Condenser (.1 mfd., 400 volts)	30-4455
28	3rd I. F. Transformer	32-3467
29	Mica Condenser (100 mmfd.)	60-110157
30	Resistor (2.2 megohms)	33-522339
31	Resistor (1 megohm)	33-510339
32	Resistor (1 megohm)	33-510339
33	Resistor (33,000 ohms)	33-333339
34	Resistor (2200 ohms)	33-222339
35	Volume Control (500,000 ohms)	33-5332
	Palnut	W-2157
36	Resistor (4.7 megohms)	33-547339
37	Tubular Condenser (.01 mfd., 400 volts)	30-4572
38	Mica Condenser (100 mmfd.)	60-110157
39	Tubular Condenser (.004 mfd., 400 volts)	30-4578
40	Resistor (220,000 ohms, ½ watt)	33-422339
41	Condenser (.003 mfd., 400 volt)	30-4469
42	Tone Control	33-5333
43	Resistor (1 megohm)	33-510339
44	Tubular Condenser (.006 mfd.)	30-4591
45	Output Transformer	32-8063
46	Cone Assembly (for Speaker 36-1510-3)	36-4163
47	Field Coil (Replace Speaker 36-1510)	
48	Electrolytic Condenser (12 mfd.)	30-2477
49	Resistor (220 ohms, 1 watt)	33-122436
50	Resistor (68 ohms, ½ watt)	33-068336
51	Power Transformer (110 volts, 60 cycle)	32-8064
	Power Transformer (110 volts, 25 cycle)	32-8075
52	Bakelite Condenser, Dual (.01 mfd.)	3903-ODG
53	Pilot Lamps	34-2068
54	Range Switch	42-1589
	Palnut (Range Switch)	W-2157



MODEL 41-240 — PART LOCATIONS, UNDERSIDE OF CHASSIS



MODEL 41-245 — PART LOCATIONS, UNDERSIDE OF CHASSIS

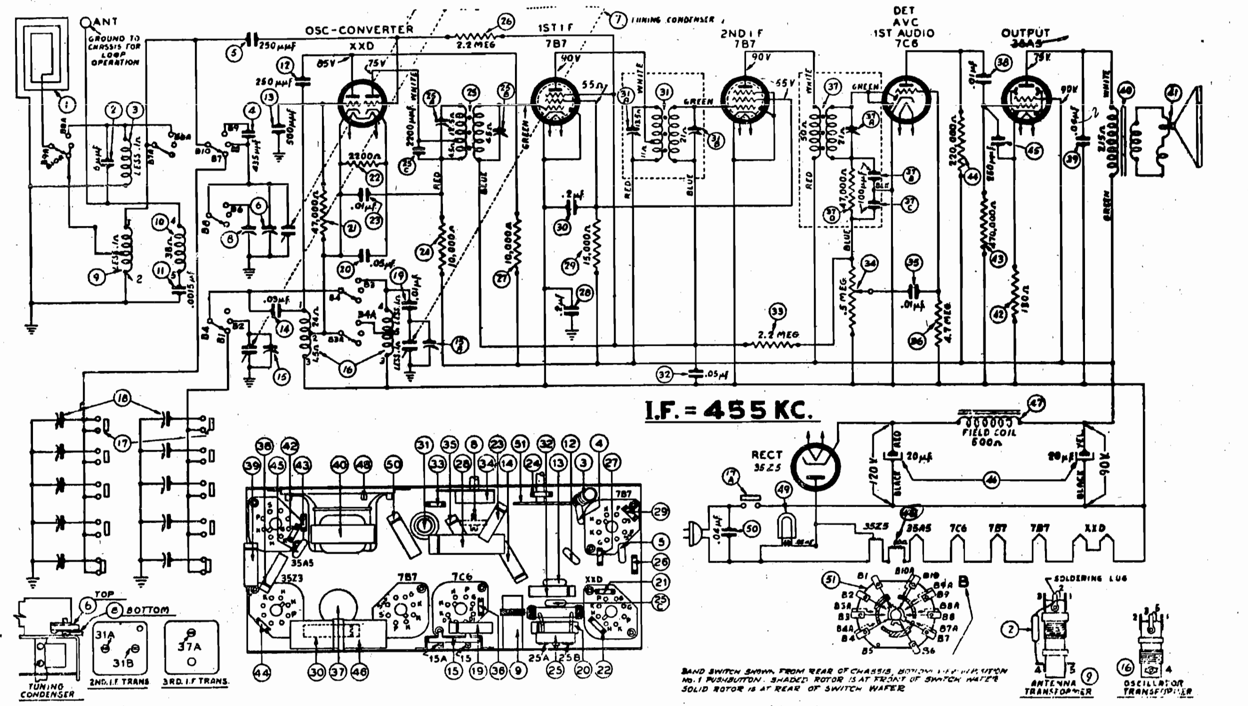
Replacement Parts — Model 41-245

MISCELLANEOUS PARTS

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	76-1092
2	Mica Condenser (250 mmfd., wax)	60-125257
3	Resistor (2.2 megohm, ½ watt)	33-522339
4	Resistor (2200 ohms, ½ watt)	33-222339
5	Compensator (Aerial S. W.)	31-6373
6	Condenser (.05 mfd., 400 volts)	30-4518
7	Condenser (.05 mfd., 200 volts)	30-4519
8	Resistor (4700 ohms, ½ watt)	33-247339
9	Compensator (Aerial Brdcst) (Part of 5)	
10	Mica Condenser (250 mmfd.)	30-1179
11	Aerial Transformer (S. W.)	32-3462
12	Tuning Condenser	31-2471
	Tuning Condenser Rubber Connection	27-9432
	Tuning Condenser Spacer (Mounting)	28-5665
13	Aerial Transformer (Police)	32-3463
14	Aerial Transformer (Broadcast)	32-3461
15	Push-Button Padder Strip Complete	31-6372
16	Push-Button Switch	42-1576
17	Compensator (Broadcast Series)	31-6352
18	Oscillator Transformer (Broadcast)	32-3464
19	Compensator (Police Shunt)	31-6351
19A	Compensator (S. W. Shunt) (Part of 19)	
20	Resistor (47,000 ohms, ½ watt)	33-347339
21	Mica Condenser (100 mmfd.)	60-110157
22	Oscillator Transformer (Police)	32-3459
23	Mica Condenser (3000 mmfd.)	60-230334
24	Oscillator Transformer (S. W.)	32-3460
25	Mica Condenser (250 mmfd.)	30-1119
26	Mica Condenser (250 mmfd.)	30-1179
27	Condenser (.05 mfd., 200 volts)	30-4519
28	Resistor (33,000 ohms, ½ watt)	33-333339
29	1st I. F. Transformer	32-3465
30	2nd I. F. Transformer	32-3466
31	Condenser (.05 mfd., 200 volts)	30-4519
32	Condenser (.1 mfd., 400 volts)	30-4455
33	3rd I. F. Transformer	32-3467
34	Mica Condenser (100 mmfd.)	60-110157
35	Resistor (2.2 megohms)	33-522339
36	Resistor (1 megohm)	33-510339
37	Resistor (1 megohm)	33-510339
38	Electrolytic Condenser (4-4 mfd.)	30-2477
38A	Electrolytic Condenser (Part of 38)	
39	Resistor (33,000 ohms, ½ watt)	33-333339
40	Resistor (2200 ohms, ½ watt)	33-222339
41	Volume Control	33-5332
42	Resistor (4.7 megohms, ½ watt)	33-547339
43	Condenser (.01 mfd., 400 volts)	30-4572
44	Mica Condenser (100 mmfd.)	60-110157
45	Condenser (.004 mfd., 400 volts)	30-4578
46	Resistor (220,000 ohms, ½ watt)	33-422339
47	Condenser (.003 mfd.)	30-4469
48	Tone Control	33-5404
49	Resistor (1 megohm, ½ watt)	33-510339
50	Condenser (.006 mfd., 400 volts)	30-4591
51	Output Transformer	32-8063
52	Cone Assembly	
	(for Speaker 36-1510-4)	36-4168
	(for Speaker 36-1510-3)	36-4163
53	Pilot Lamps	34-2068
54	Field Coil (Replace Speaker 36-1510)	
55	Resistor (68 ohms, 1 watt)	33-068336
56	Resistor (220 ohms, 1 watt)	33-122436
57	Electrolytic Cond. (12 mfd. 400 volts)	30-2409
58	Power Transformer (110 volts, 60 cycle)	32-8064
	Power Transformer (110 volts, 25 cycle)	32-8075
	Power Transformer Shield	56-1535
	Power Transformer Base (Shield)	56-1536
59	Condenser, Dual (.01 mfd.)	3903-ODC
60	Range Switch	42-1575

PHILCO RADIO & TELEVISION CORP.

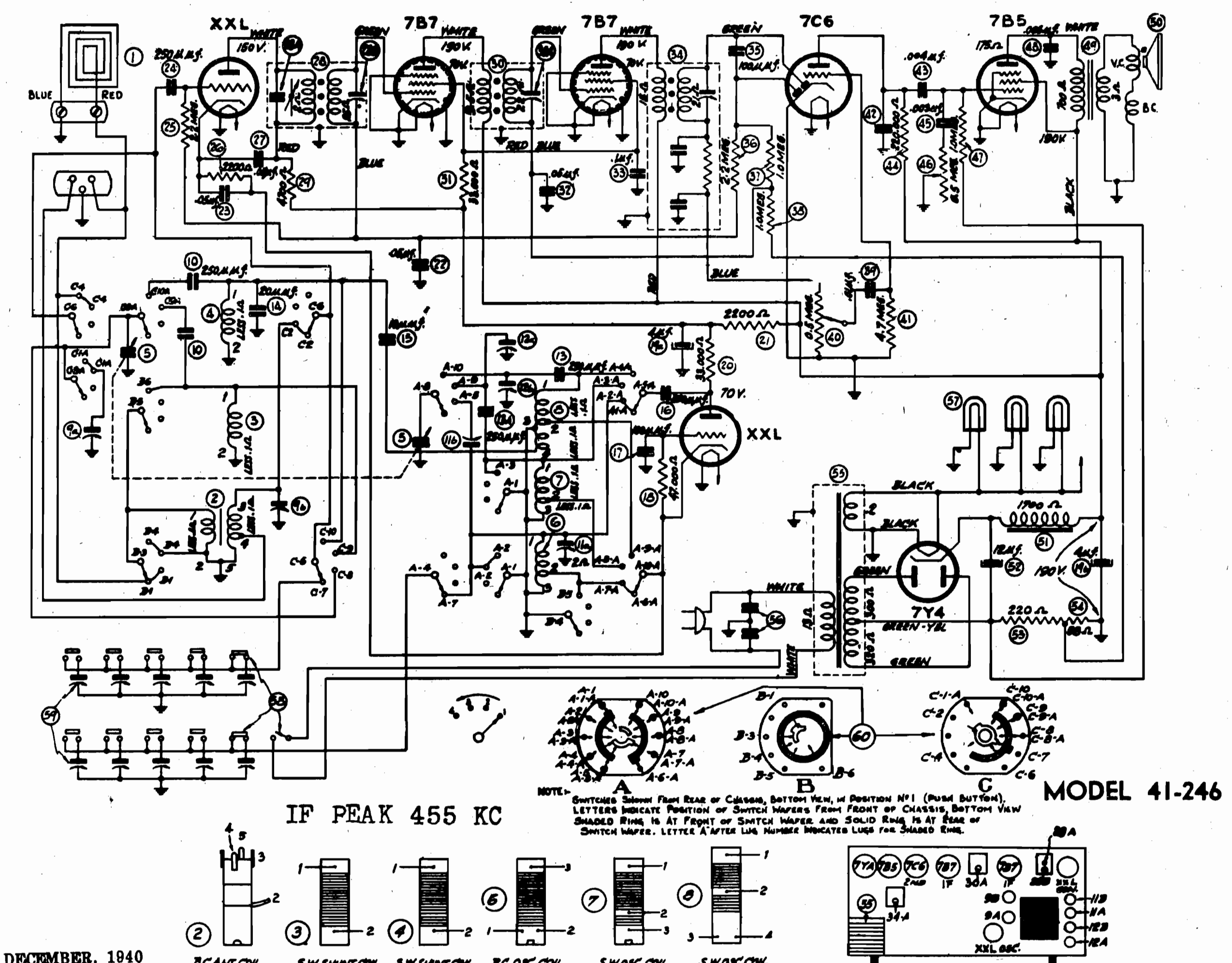
MODELS 41-231, 41-246 (121)



DECEMBER, 1940

SCHEMATIC DIAGRAM MODEL 41-231

FOR ALIGNMENT SEE INDEX
FOR OTHER DATA SEE INDEX



NOTE— SWITCHES SHOWN FROM REAR OF CHASSIS, BOTTOM VIEW, IN POSITION Nº 1 (PUSH BUTTON). LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS, BOTTOM VIEW. SHADED RING IS AT FRONT OF SWITCH WAFER AND SOLID RING IS AT REAR OF SWITCH WAFER. LETTER A AFTER LUG NUMBER INDICATES LUGS FOR SHADED RING.

IF PEAK 455 KC

MODEL 41-246

DECEMBER, 1940

MODELS 41-250
41-255

PHILCO RADIO & TELEVISION CORP.

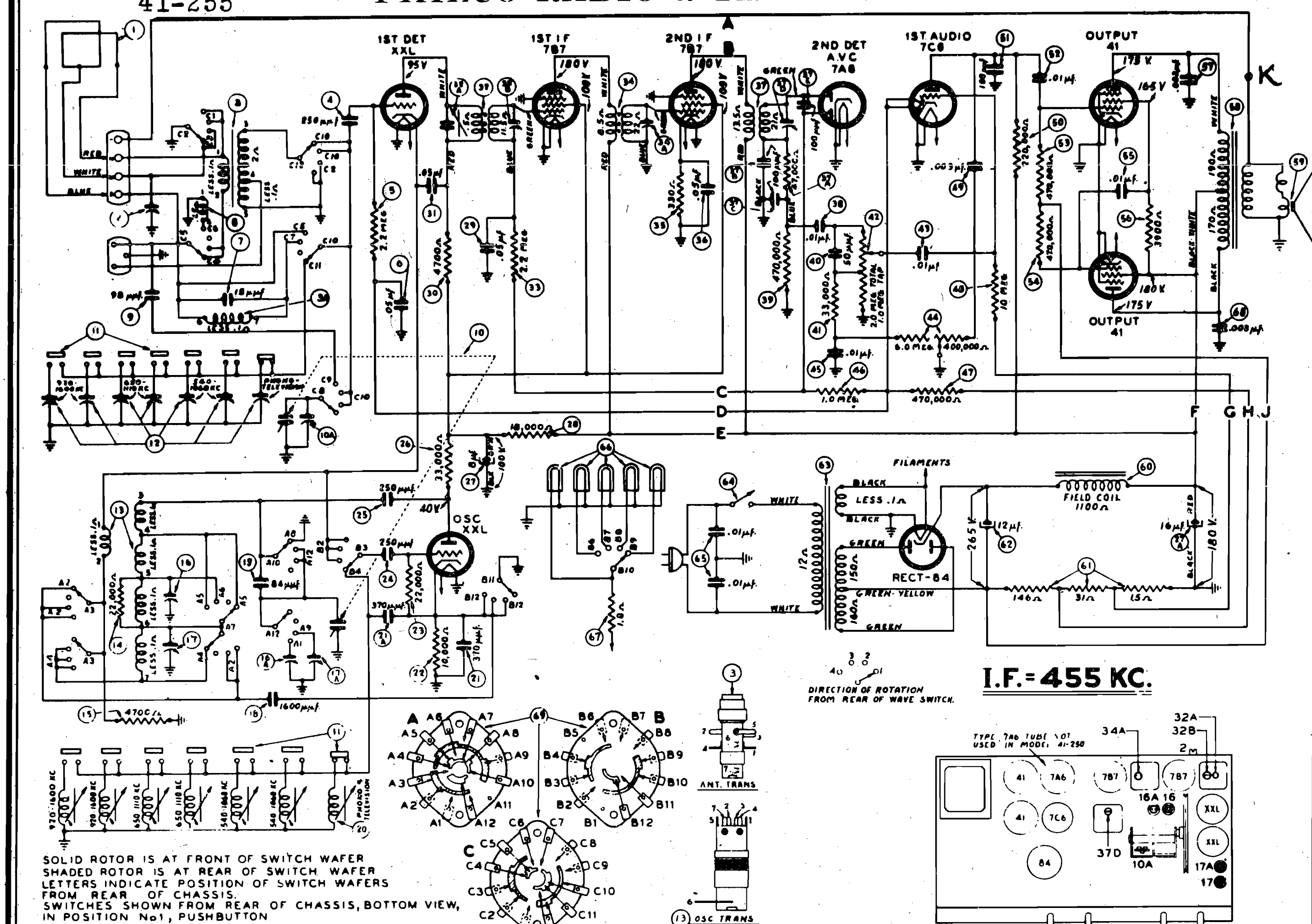


FIG. 1 — SCHEMATIC DIAGRAM — MODELS 41-250, 41-255

The above diagram is the complete electrical circuit for Model 41-255. The same general circuit is also used in Model 41-250 with the exception of the 2nd detector, 1st audio, A. V. C. wiring which is shown in Fig. 4.

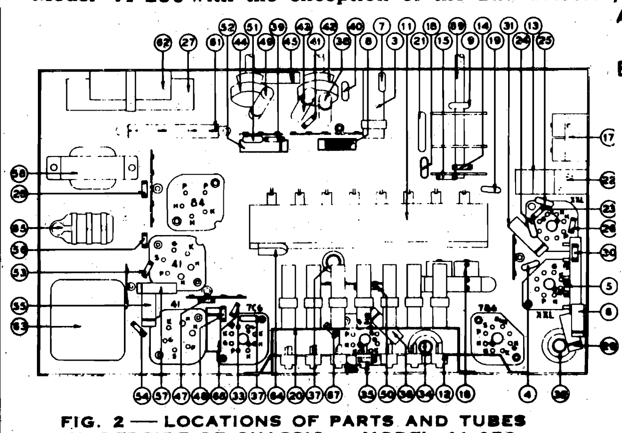
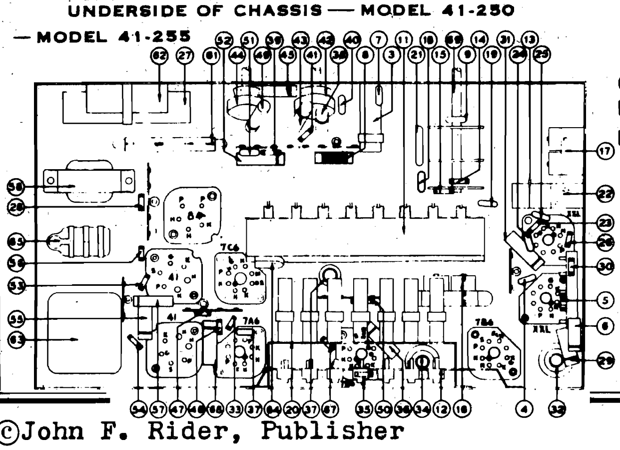


FIG. 2 — LOCATIONS OF PARTS AND TUBES UNDERSIDE OF CHASSIS — MODEL 41-250

— MODEL 41-255



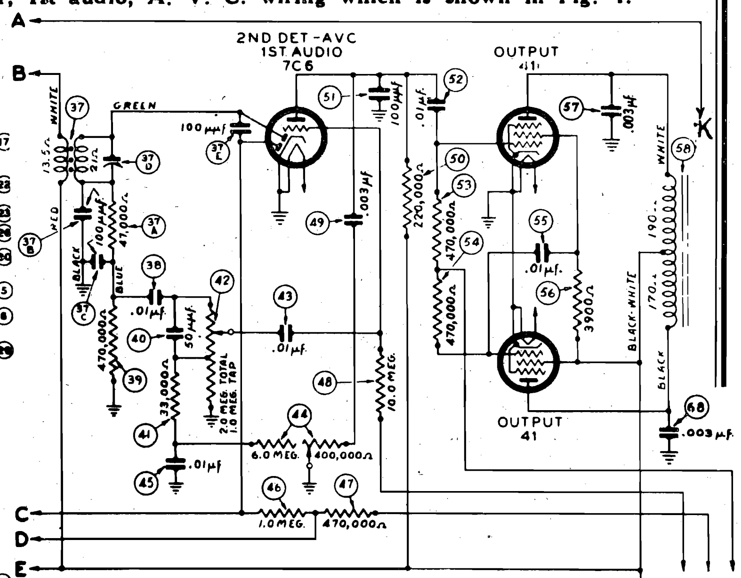
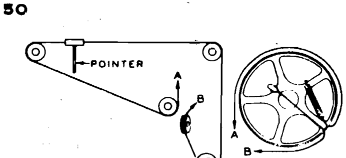


FIG. 4 — 2ND DETECTOR AND AUDIO CIRCUIT MODEL 41-250

FOR ALIGNMENT
AND TUNER
SEE INDEX

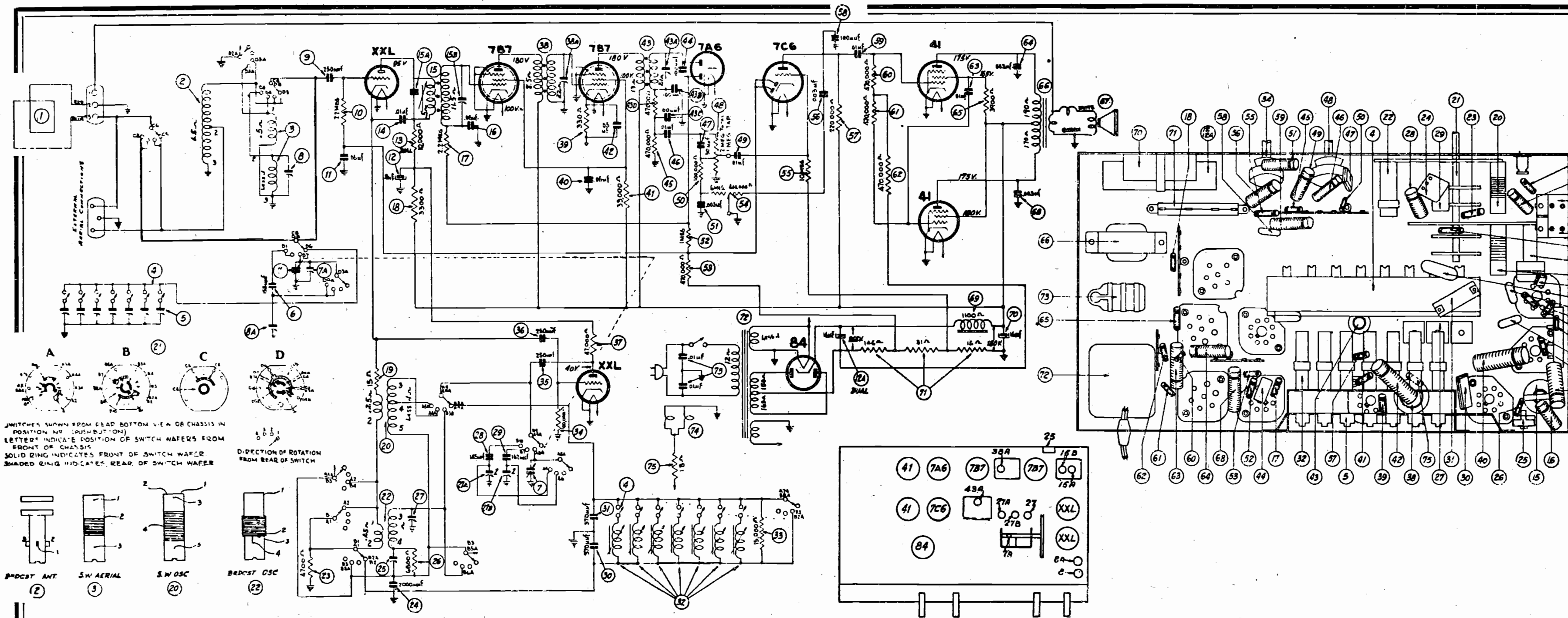
JUNE, 1940



INSTALLATION OF DRIVE CORD POINTER AT LOW FREQUENCY END OF DIAL. GANG CLOSED

PHILCO RADIO & TELEVISION CORP.

MODEL 41-256
(121)



FOR TUNER
SEE INDEX

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Settings	RECEIVER: Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	High side to No. 3 terminal loop panel	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Positions	15A, 15B 38A, 43A	
2	Use loop on generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Broadcast	27, 7A	Note A
3	Use loop on generator	580 K. C.	580 K. C.	Vol. Max. Range Switch Broadcast	25	Roll Tuning Condensers Note B
4	Use loop on generator	Perform operation No. 2 again				
5	Use loop on generator	12 M. C.	12 M. C.	Range Switch "SW-1"	27B, 8A	Note C
6	Use loop on generator	18 M. C.	18 M. C.	Range Switch "SW-2"	27A, 8	Note D

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 the schematic.

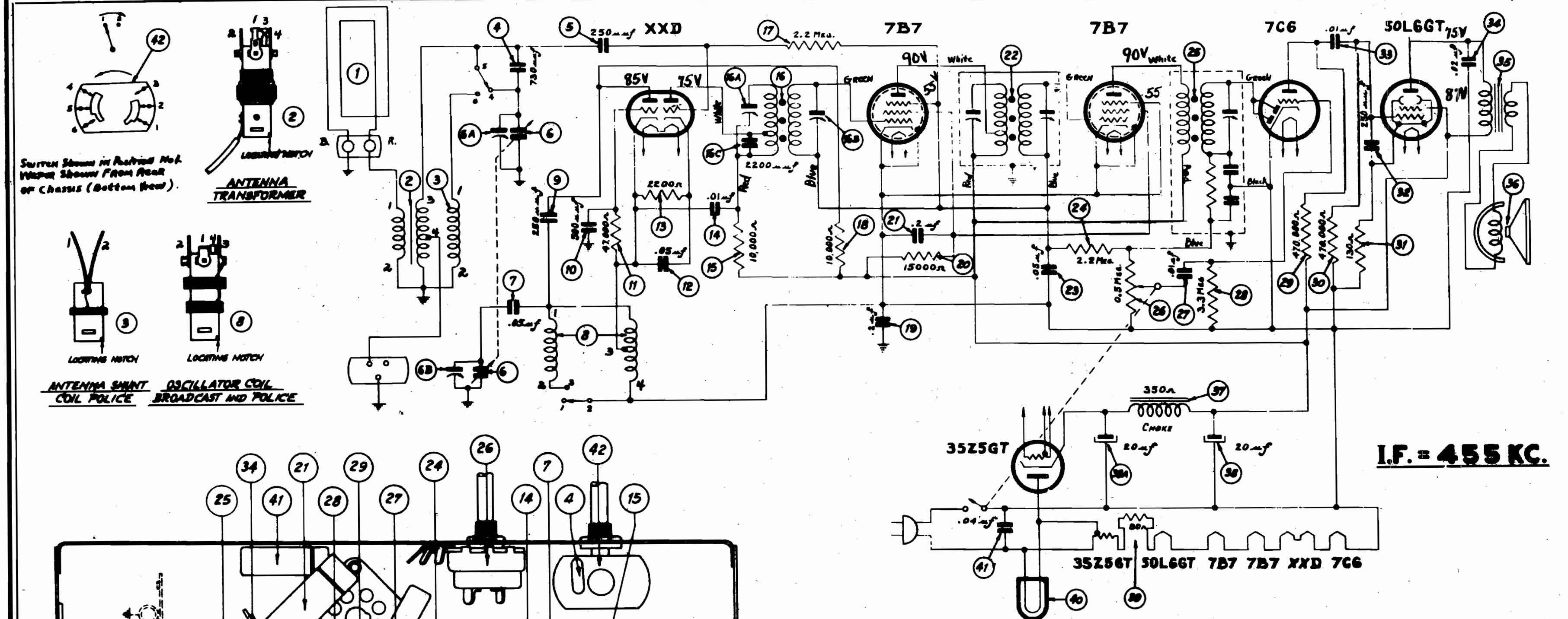
NOTE B—When adjusting the low frequency compensator of the Broadcast or the aerial padders of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First, tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum 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 maximum output reading is obtained.

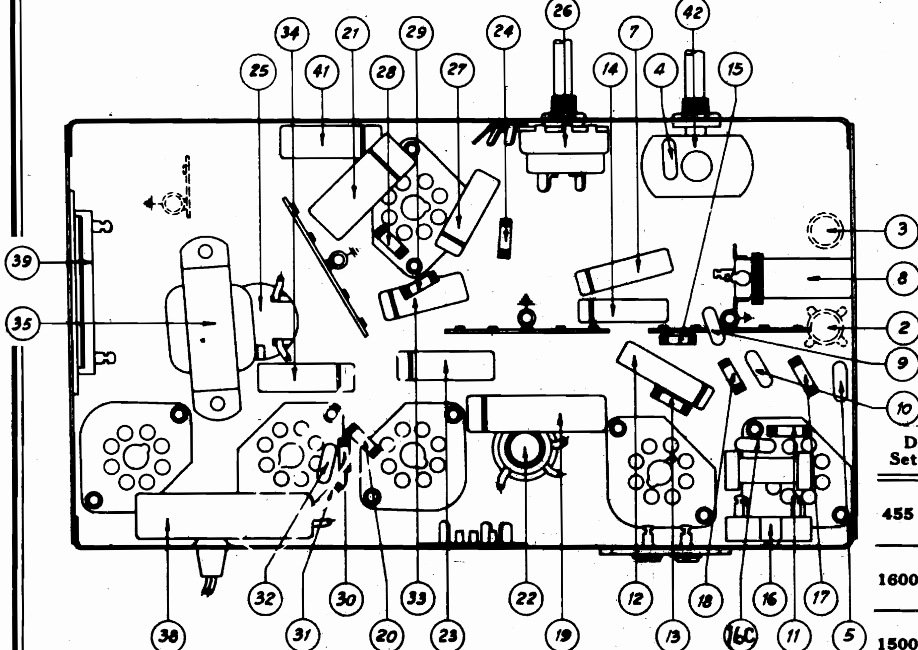
NOTE C—Adjust compensator (27B) to first peak from closed position (maximum capacity). The aerial compensator (8A) must also be adjusted to maximum on the second signal peak by rolling the tuning condenser (See Note B).

NOTE D—Adjust compensator (27A) to the second signal peak from the closed position (maximum capacity). The aerial compensator (8) must also be adjusted to maximum on the first signal peak by rolling the tuning condenser (See Note B).

DECEMBER, 1940

MODEL 41-258 (122) PHILCO RADIO & TELEVISION CORP.





SCHEMATIC DIAGRAM — MODEL 41-258, CODE 122

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 signal generator is then placed close to the loop of the radio.

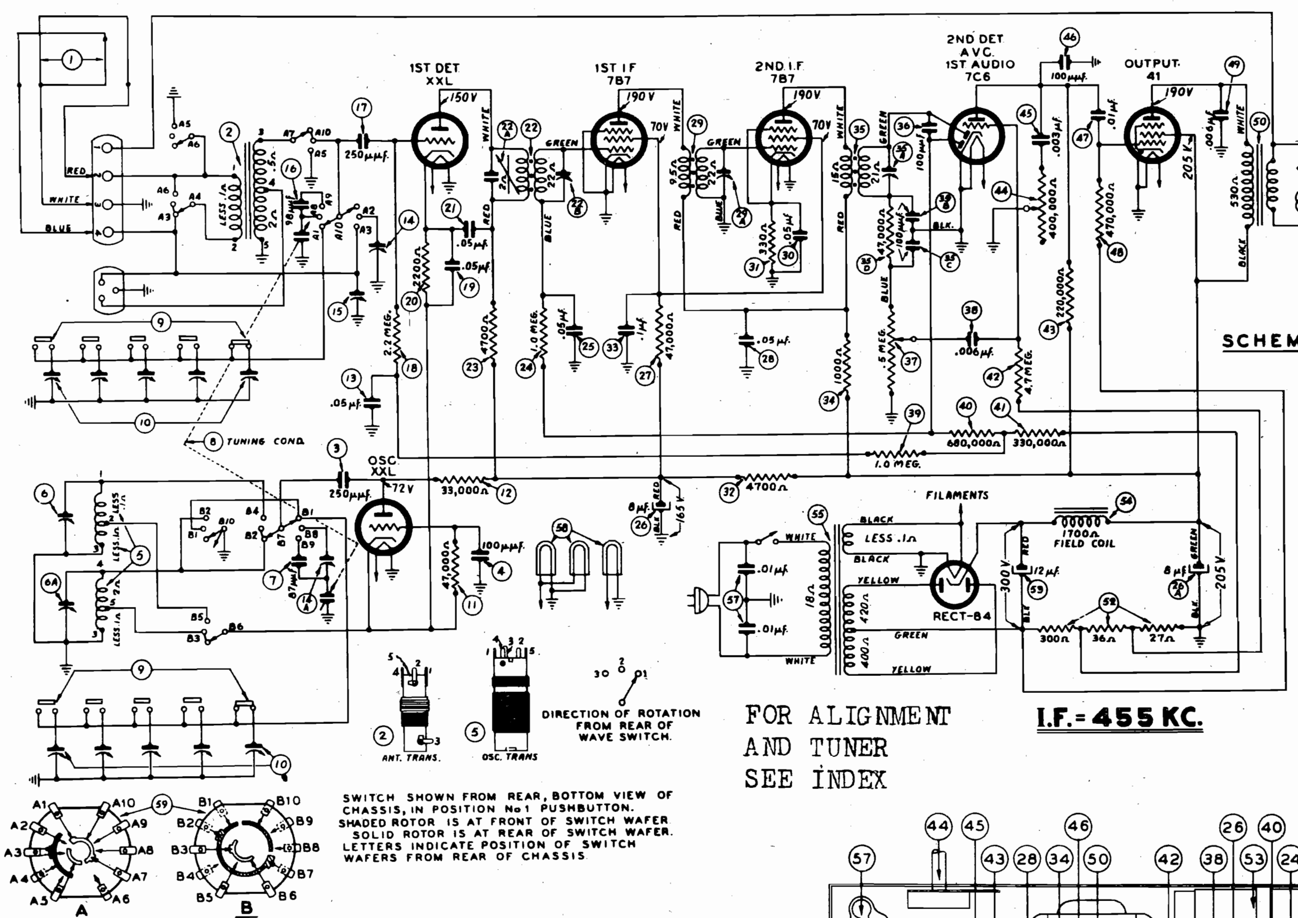
	RECEIVER			
Dial Setting	Dial Setting	Control Settings	Adjust Compensators in order	SPECIAL INSTRUCTIONS
455 K. C.	540 K. C. Tuning Cond. Closed	Vol Max. Range Switch Brdcst.	16A, 16B, 22A, 22B, 25A	
1600 K. C.	1600 K. C.	Vol Max. Range Switch Brdcst.	6B Tuning Condenser	Note A
1500 K. C.	1500 K. C.	Vol Max. Range Switch Brdcst.	6A Tuning Condenser	Note B

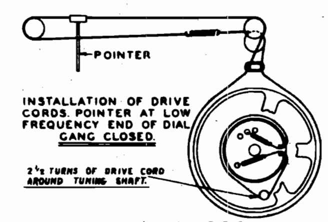
NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 55 on the dial.

NOTE B: The police band padding is automatically adjusted by the standard broadcast padders.

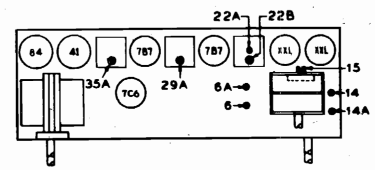
AUGUST, 1940.

PHILCO RADIO & TELEVISION CORP.





SCHEMATIC DIAGRAM MODEL 41-260



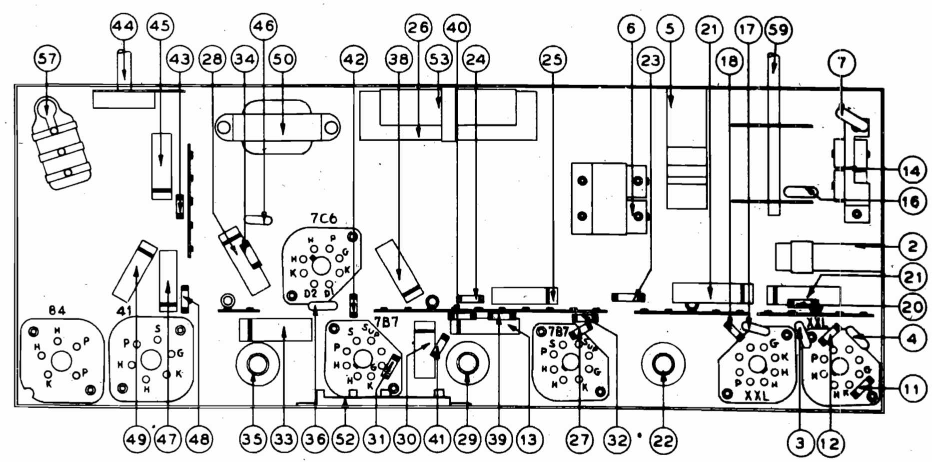
FOR ALIGNMENT
AND TUNER
SEE INDEX

I.F. = 455 KC.

JULY, 1940

Models 41-260 and 41-265 are seven (7) tube alternating current (A. C.) operated superheterodyne radios incorporating electric push button in addition to manual tuning — and the new Philco built-in American and overseas loop aerial system. These models are also designed to receive the sound of a television program tuned in by special type Philco Television Radios.

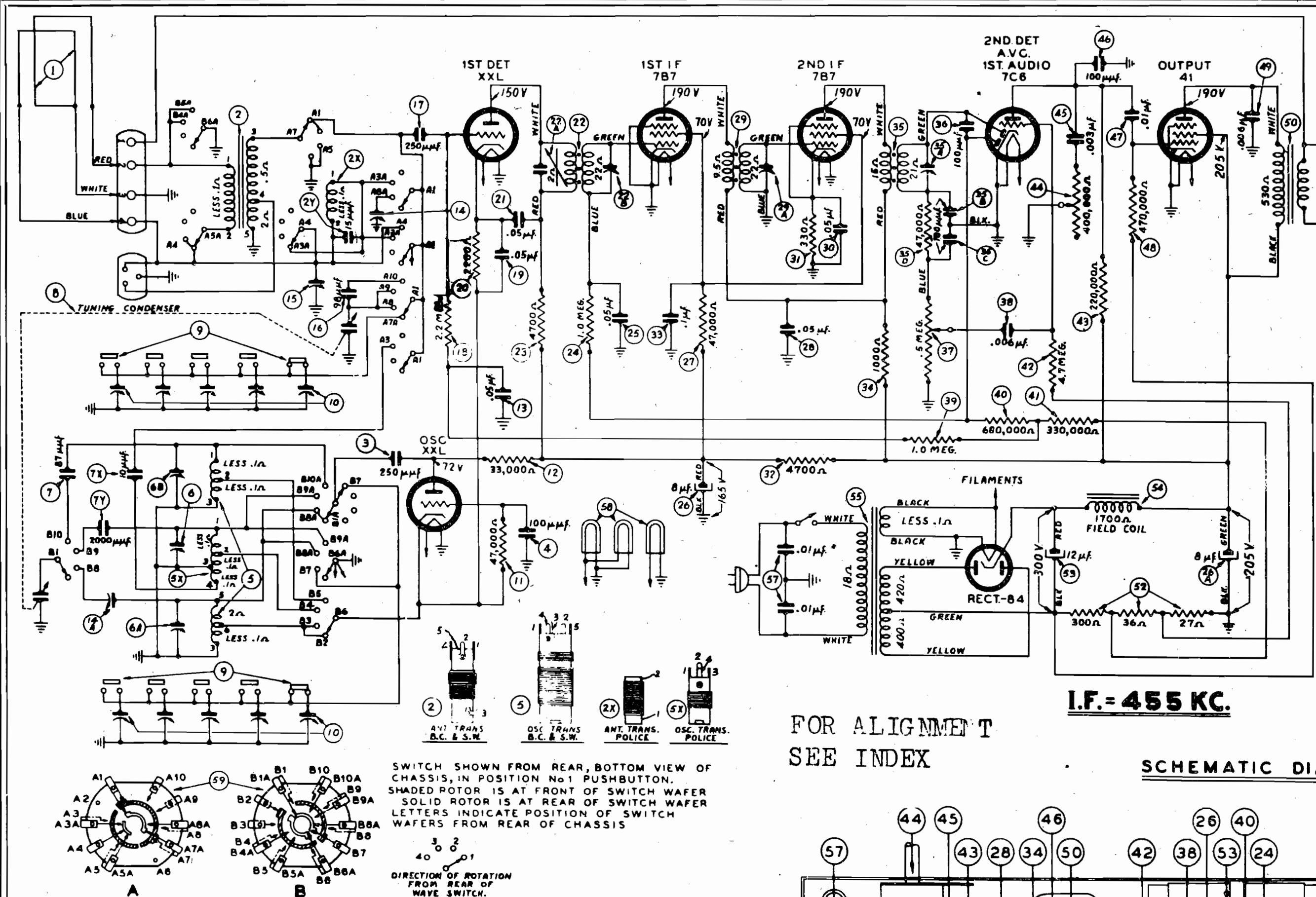
In general, these models are similar with the exception of the tuning ranges and cabinet design. Model 41-260 has two (2) tuning ranges covering 540 to 1720 K. C. and 9.0 to 12.0 M. C. Model 41-265 consists of three (3) tuning ranges covering 540 to 1720 K. C., 2.0 to 7.0 M. C. and 9.0 to 12 M. C.

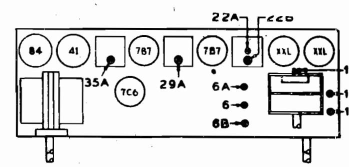


MODEL 41-260 — PART LOCATIONS, UNDERSIDE OF CHASSIS

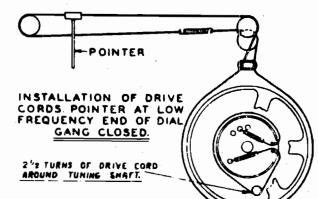
MODEL 41-265

PHILCO RADIO & TELEVISION CORP.



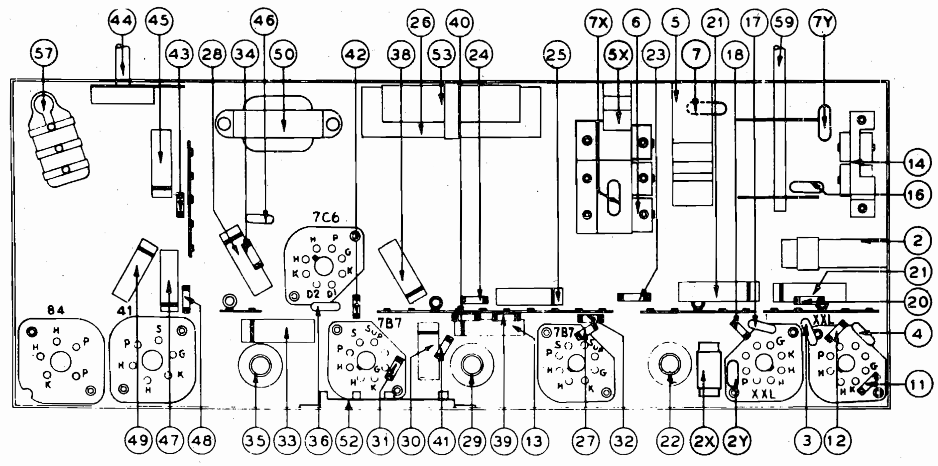


I.F. = 455 KC.



FOR ALIGNMENT
SEE INDEX

SCHEMATIC DIAGRAM MODEL 41-265



MODEL 41-265 — PART LOCATIONS, UNDERSIDE OF CHASSIS

AERIAL CONNECTIONS: The built-in loop aerial system is designed to operate without an outside aerial or ground, and to give exceptionally high receiving performance of stations on standard and shortwave frequencies. Another feature is its noise-reducing characteristic. The loop can be turned to the position in which it picks up a minimum amount of interference, or to the position where best reception is obtained.

To operate the radio in steel reinforced buildings and other shielded locations, where signal strength is weak, the Philco 1941 Outdoor Aerial, Part No. 45-2817, is recommended for maximum receiving performance. The outdoor aerial can be easily connected to the radio by inserting the plug attached to the transformer unit into the socket provided at the rear of the Radio chassis. This aerial can be obtained from your local Philco distributor. A ground connection is not required with either type of installation.

PHILCO RADIO & TELEVISION CORP.

SEE MODELS BELOW

MODELS 41-260, 41-265

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

Audio Output Meter: Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A. C. scale of the meter must be used. (0 to 10 volts).

The audio output meter can also be connected between the plate of the output tube and the ground of the chassis.

Signal Generator: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

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 signal generator is then placed close to the loop of the radio.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

The receiver can be adjusted in the cabinet or removed from the cabinet. If adjustments are made outside the cabinet a Service Tuning Scale, Part No. 45-2825, Model 41-260; and Part No. 45-2826, Model 41-265, will be required. This scale is placed underneath the pointer on the metal dial plate.

Model 41-260

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond.	455 K. C.	Tuning Cond. Closed	Vol. Max. Range Switch "Brdcst"	35A, 29A, 22A, 22B	Note A
2	Loop to Radio Loop See Sig. Gen. Above	1720 K. C.	1720 K. C.	Vol. Max. Range Switch "Brdcst"	6A	Note B
3	Loop to Radio Loop See Sig. Gen. Above	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	14	
4	Loop to Radio Loop See Sig. Gen. Above	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	14A	Rock Comp. to "Max." Recheck Operations Nos. 2, 3
5	Loop to Radio Loop See Sig. Gen. Above	12 M. C.	12 M. C.	Range Switch S. W.	6, 15	Note C

Model 41-265

Operations in Order	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	SPECIAL INSTRUCTIONS
1	Ant. Section of Tuning Cond.	455 K. C.	Tuning Cond. Closed	Vol. Max. Range Switch "Brdcst"	35A, 29A, 22A, 22B	Note A
2	Loop to Radio Loop See Sig. Gen. Above	1720 K. C.	1720 K. C.	Vol. Max. Range Switch "Brdcst"	6A	Note B
3	Loop to Radio Loop See Sig. Gen. Above	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	14	
4	Loop to Radio Loop See Sig. Gen. Above	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	14A	Rock Comp. to "Max." Recheck Operation No. 2
5	Loop to Radio Loop See Sig. Gen. Above	6 M. C.	6 M. C.	Range Switch Police	6	Rock Comp. to "Max."
6	Loop to Radio Loop See Sig. Gen. Above	12 M. C.	12 M. C.	Range Switch S. W.	6B, 15	Note C

NOTE A — Compensator (22A) Model 41-260, must be adjusted before (22B) Model 41-260, and should be done in the following manner: Turn 22A all the way up, then turn down selecting the first I. F. peak, then pad 22B to maximum. This procedure applies also to Model 41-265.
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, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.
NOTE C — Tune in the first signal peak from the tight position of both padders. Roll padder (15) Model 41-260; (15) Model 41-265, slowly to maximum on the first peak.

ADJUSTING ELECTRIC PUSH BUTTON TUNING

MODELS 41-280, 41-285, 41-287, 41-290(121), 41-250, 41-255, 41-256, 41-295, 41-300

To adjust the electric push buttons accurately for reception of broadcast stations, a vacuum tube voltmeter such as Philco Models 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:

Select seven of the most popular stations received in the locality. Insert the station call letters into the spaces above the buttons. The station with the lowest frequency is placed in the second button on the left and the highest frequency is placed in the eighth push button on the right. Each push button is adjusted by two adjusting screws located on the rear of the chassis. Each set of screws is numbered and labeled "Ant.", "Osc." and covers a frequency range as follows:

Push Button	Frequency Range	Frequency Range
1, 2, 3	540-1060 K. C.	540-1030 K. C.
4, 5	650-1110 K. C.	650-1160 K. C.
6, 7	920-1600 K. C	900-1600 K. C.

Looking at the front of the cabinet, the second button on the left is adjusted by adjusting screw No. 1. The next push button by adjusting 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. Press in "Off-On" push button. Turn "Bands" knob to broadcast.

3. Set up the Model 077 Station Setter near the receiver and connect a loop aerial (made from a few turns of wire 12 inch in diameter) 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."

4. Manually tune in the station to be set up on the first push button. 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.

5. Turn "Bands" knob to push button position. Using the insulated screw driver, turn the "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. The push button is adjusted properly to the station at this point.

After setting up the first station the same procedure as outlined above is used for the remaining stations. When these models are set up to receive the sound of a television program tuned in by the special type Philco Television Sets or if it is to be used in conjunction with a Philco Record Player, the lowest frequency push button should be used. To tune in these programs, the same procedure as given for broadcast stations above is used.

Further details for setting up this receiver for operation with Philco Television Sets or Record Players are supplied with the instruments.

MODELS 41-260, 41-265, 41-246, 41-608, 41-609

PROCEDURE FOR SETTING AND OPERATING THE ELECTRIC PUSH BUTTON TUNING

The automatic tuning mechanism of each model is identical and consists of six (6) electric tuning push buttons, five (5) of the push buttons are used for selecting broadcast stations, and one as the power control (On-Off switch).

Select five of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Place each call letter tab in the tab space above each button which includes the frequencies of the desired stations. The frequency range of the buttons and corresponding padders is as follows:

Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
		1	On-Off Switch
1, 2	Ant, Osc	2	540 to 980 kilocycles
3, 4	Ant, Osc	3	540 to 980 kilocycles
5, 6	Ant, Osc	4	710 to 1185 kilocycles
7, 8	Ant, Osc	5	850 to 1600 kilocycles
9, 10	Ant, Osc	6	1185 to 1720 kilocycles

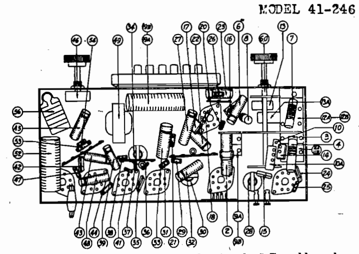
The second button from the left looking at the front of the cabinet corresponds to the two right-hand padder screws looking at the rear and covers the lowest frequency range.

With the "Tuning Range Selector" in broadcast position, tune in the station whose call letters appear above the second button. Then depressing the second button, tune in this station by rotating the No. 2 "OSC" screw (next to the right end of the unit looking at the rear of the chassis). (NOTE: Inherent characteristics of these padders may cause some of them to cover a lower range than required to cover the broadcast band. This may cause the radio to howl or flutter when a station button is depressed. To correct this, loosen the "ANT" padder corresponding to the depressed station button.) Turn the "OSC" screw slowly and listen carefully or the station may be passed without noticing it. After the "OSC" screw has been adjusted for maximum volume, the corresponding "ANT" screw should be adjusted for maximum. For some stations, it may be necessary to readjust the "OSC" screw after the "ANT" screw has been set. Switching the "Tuning Range Selector" from broadcast position to the automatic push button position will enable you to make sure you have the correct station tuned in. When the first station has been set, the same procedure should be followed for the remaining buttons, first tuning in the desired station by means of the Station Selector.

To tune the set with the "Push Buttons", turn "Tuning Range Selector" to push button position and press in the button which corresponds to the call letters of the desired station. The volume of the program may be controlled with the manual volume control.

The lowest frequency station push button labeled "Television" can be adjusted for reception of the sound channel of a television program received by Philco television sets. This push button may also be used in conjunction with a Philco Wireless Record Player.

MODEL 41-246



SIGNAL GENERATOR: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the aerial section (stator plates) of the tuning condenser. Connect the ground or low side of the generator to the chassis.

AUDIO OUTPUT METER: If this type of aligning meter is used, connect it to the voice coil terminals of the speaker or from the plate of the 7B5 tube to the chassis. Adjust the meter for the (0 to 10) volt scale.

VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

After connecting the aligning instruments, adjust the compensators as shown in the tabulation for each model below. Locations of the compensators are shown in the schematic diagram. If the indicating meter pointer goes off scale when adjusting the compensator, reduce the strength of the signal from the generator.

MODEL 41-246

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	Ant. Section of Tuning Condenser	455 K. C.	Tuning Cond. closed	Vol. Max. Range Switch "Brdcst"	34A, 30A 28A, 28B	Note A
2	Loop to Radio Loop See Sig. Gen. above	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	11A, 9B	Note B
3	Loop to Radio Loop See Sig. Gen. above	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	11B	Rock Comp. to "max." Recheck Operation No. 2
4	Loop to Radio Loop See Sig. Gen. above	12 M. C.	12 M. C.	Range Switch "S. W."	12A, 9A	Note C
5	Loop to Radio Loop See Sig. Gen. above	18 M. C.	18 M. C.	Range Switch "S. W."	12B	Note D

NOTE A—Compensator (28A) must be adjusted before (28B), and should be done in the following manner: Turn 28A all the way up, then slowly turn down and select the first I. F. peak. Padder 28B is now adjusted to maximum.

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, set the tuning pointer on the extreme left index line at the low frequnecy end of the broadcast scale.

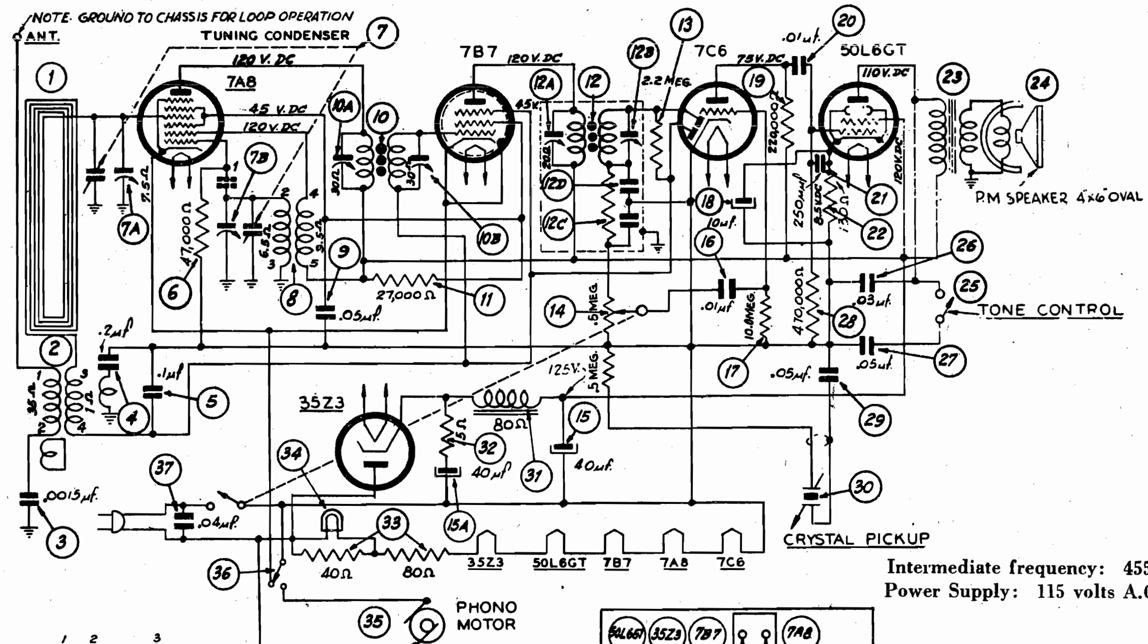
NOTE C—Adjust padder (12A) to the first signal peak from the tight position (maximum capacity).

NOTE D—Adjust padder (12B) to the second signal peak from the tight position (maximum capacity).

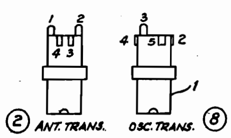
MODEL 41-601 (121)

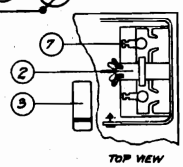
PHILCO RADIO & TELEVISION CORP.

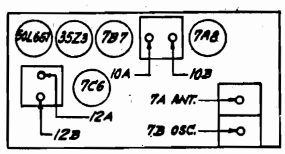
SCHEMATIC DIAGRAM — MODEL 41-601, CODE 121



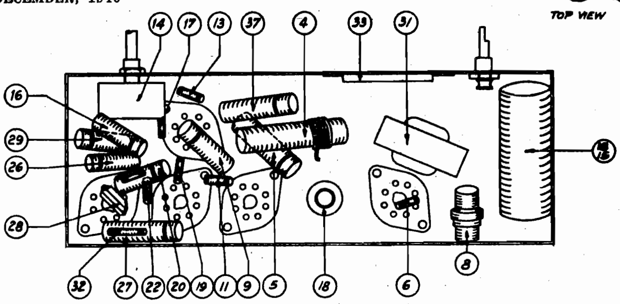
Intermediate frequency: 455 K.C.
Power Supply: 115 volts A.C.







DECEMBER, 1940



The phonograph is automatically started when the pickup is lifted from its rest. A special switch operated by the pickup rest, applies power to the phonograph motor and opens the cathode circuit of the radio. The sound output of the radio and phonograph is controlled by a new type dual volume control which also operates the power switch.

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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

After connecting the aligning instruments adjust the compensators as shown in the tabulation below. Locations are shown on Schematic.

If the indicating 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 the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K.C.	540 K.C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcst.	12A, 12B, 10A, 10B	Note B
2	Loop see above instructions	1600 K.C.	1600 K.C.	Vol. Max. Range Switch Brdcst.	(7B, Note C)	Note A
3	Loop see above instructions	1500 K.C.	1500 K.C.	Vol. Max. Range Switch Brdcst.	(7A, Note D)	

NOTE A: DIAL POINTER CALIBRATION—In order to adjust the receiver correctly, the pointer must be adjusted to track properly with the tuning condenser. To do this, turn the tuning condenser to the maximum capacity (plates fully meshed). With the condenser in this position, set the tuning pointer on the first small line stamped in the scale plate on the left side.

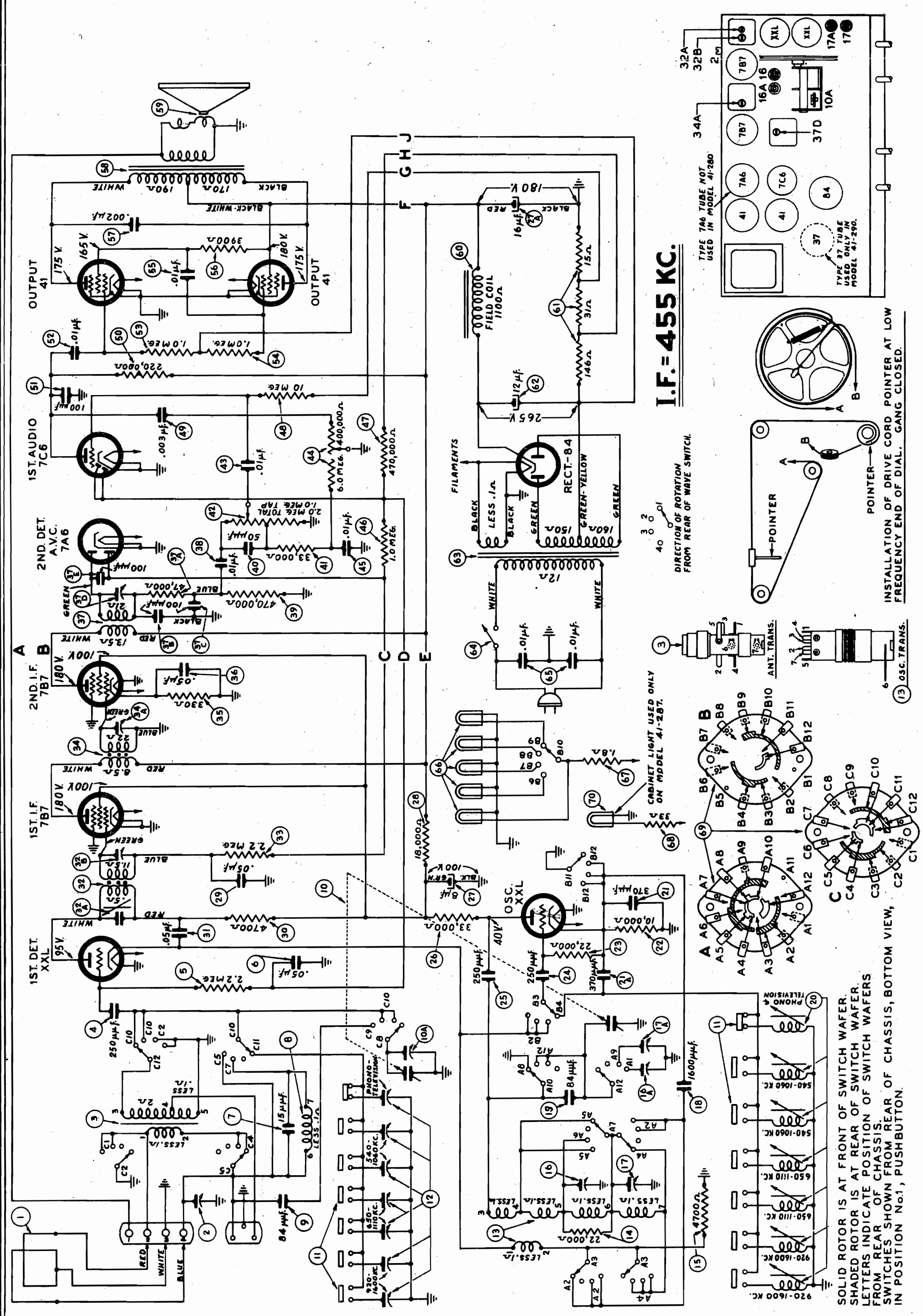
NOTE B—Before adjusting compensators, turn down (10B) to tight position. Then adjust the compensators for maximum output in the following order: 12A, 12B, 10A and 10B.

NOTE C—Turn tuning condenser until dial pointer is on the first small line stamped in the scale plate from right side of chassis. Adjust padder (7B) to maximum at this point. If the radio is adjusted in the cabinet, set dial pointer to 1600 K.C.

NOTE D—Turn tuning condenser until dial pointer is on the second small line stamped in the scale plate from right side of chassis. Adjust padder (7A) to maximum at this point.

PHILCO RADIO & TELEVISION CORP.

MODELS 41-280, 41-285, 41-287, 41-290 (121)

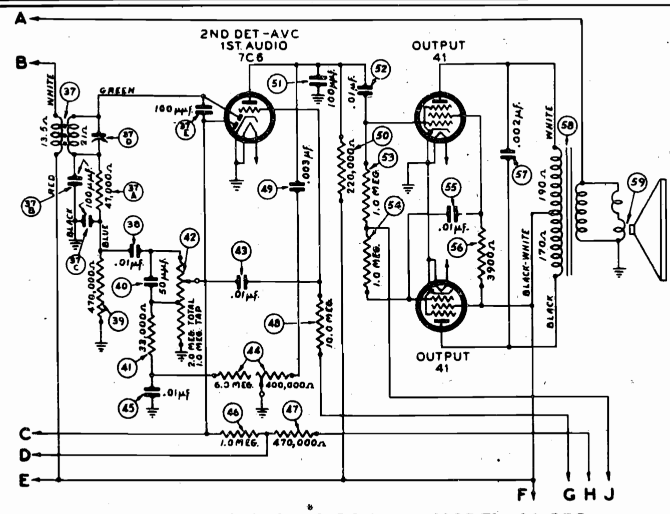


SCHEMATIC DIAGRAM — MODELS 41-280, 41-285, 41-287, 41-290

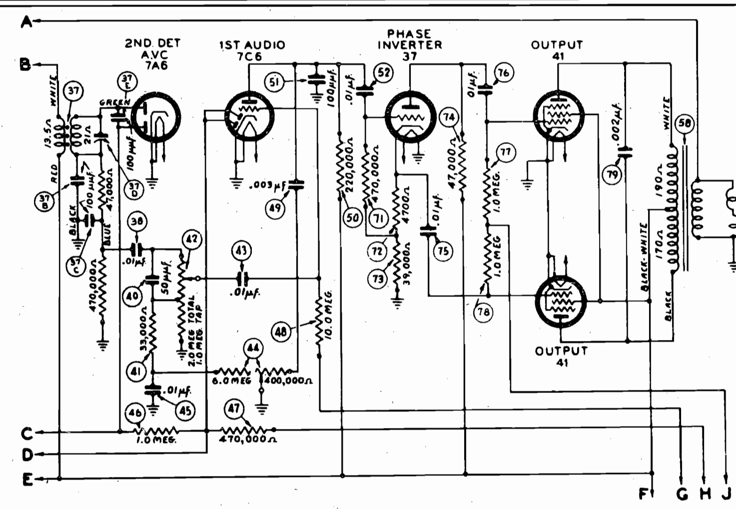
The above diagram is the complete electrical circuit for the Models 41-285, 41-287. The same general circuit is also used in Models 41-280 and 41-290, with the exception of the 2nd detector, 1st audio A. V. C. wiring, Model 41-280 and the audio circuit, Model 41-290.

MODELS 41-280, 41-285
41-287, 41-290

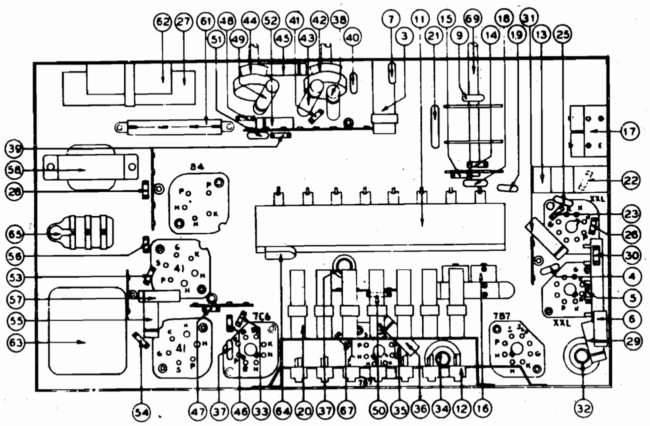
PHILCO RADIO & TELEVISION CORP.



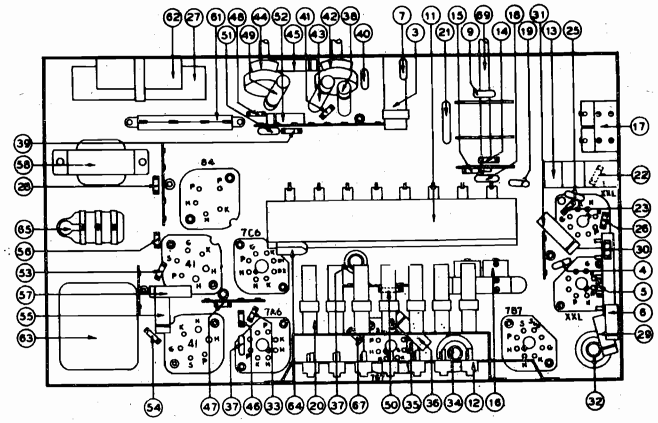
SECOND DETECTOR CIRCUIT — MODEL 41-280



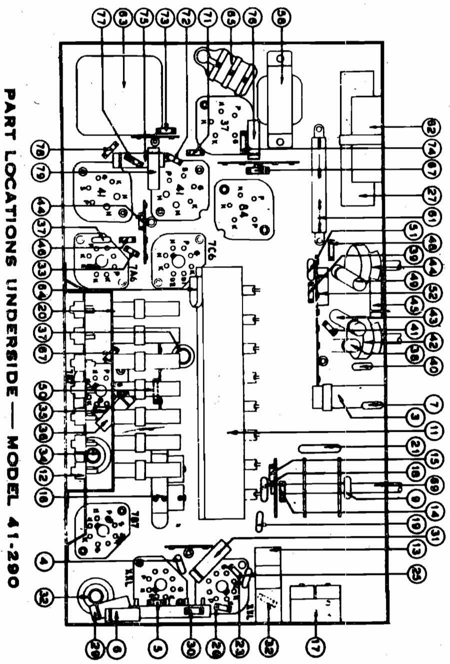
AUDIO CIRCUIT — MODEL 41-290



PART LOCATIONS UNDERSIDE — MODEL 41-280



PART LOCATIONS UNDERSIDE — MODELS 41-285-287



PART LOCATIONS UNDERSIDE — MODEL 41-290

In general, these models are similar with the exception of the **audio circuits, number of tubes** used and **cabinet design.** Model 41-280 is an eight (8) tube radio; Models 41-285 and 41-287 are nine (9) tube radios employing the same chassis but assembled in different cabinets, and Model 41-290 consists of a ten (10) tube chassis. These differences are shown in the schematic diagram and parts lists.

Other features of design included in these models are: Three tuning ranges covering the frequencies listed below: continuously variable tone control; audio bass frequency compensation at low volume; Push-pull pentode audio output circuit with screen Phase inversions; New Type (12) twelve inch speaker and illuminated push button indicators.

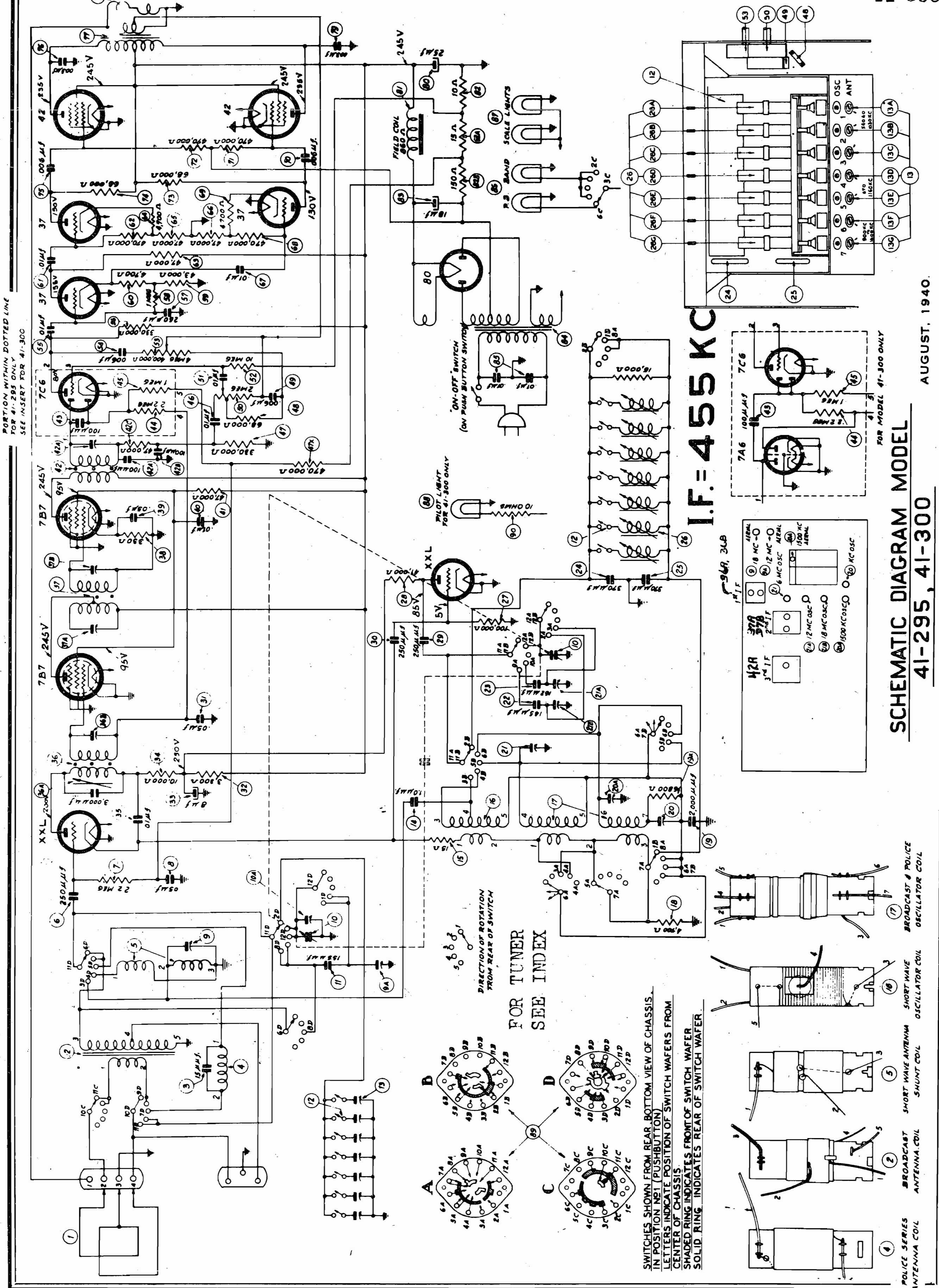
POWER CONSUMPTION: Model 41-280, 41-285-287, 41-290, 60 watts.

FREQUENCY TUNING RANGES: 540 to 1720 K. C.; 2.3 to 7.0 M. C.; 9.0 to 12.0 M. C.

FOR ALIGNMENT
AND TUNER
SEE INDEX

PHILCO RADIO & TELEVISION CORP.

MODEL 41-295
41-300



MODELS 41-295
41-300

PHILCO RADIO & TELEVISION CORP.

Either a vacuum tube voltmeter or an audio output meter may be used as a signal indicator when adjusting the receiver.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

Audio Output Meter: Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A. C. scale of the meter must be used. (0 to 10 volts).

The audio output meter can also be connected between the plate of the output tube and the ground of the chassis.

Signal Generator: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal 4 of the loop aerial terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the ground 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.

After connecting the aligning indicator, adjust the compensators in the order shown in the tabulation below. Locations of the compensators are shown on the schematic diagram. 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	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	High Side to No. 4 Terminal Loop Panel	455 K. C.	580 K. C.	Vol. Max. Range Switch "S.W.1" Position	36A, 36B, 37A, 37B, 42A	
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	20A, 10A	Note A
3	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	20	Roll Tuning Condenser Note B
4	Use Loop on Generator	Repeat Operation No. 2				
5	Use Loop on Generator	6 M. C.	6 M. C.	Range Switch "Police"	21	Note C
6	Use Loop on Generator	12 M. C.	12 M. C.	Range Switch "S. W. 1"	21A, 9A	Note D
7	Use Loop on Generator	18 M. C.	18 M. C.	Range Switch "S. W. 2"	21B, 9	Note E

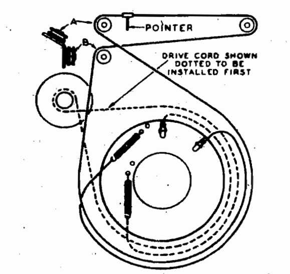
NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in the schematic.

NOTE B — When adjusting the compensator 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 maximum output reading is obtained.

NOTE C — Adjust compensator (21) to the Second signal peak from the tight (closed) position. The tuning condenser should also be Rolled when the padder is being adjusted on this peak. See Note B on how to Roll the Condenser.

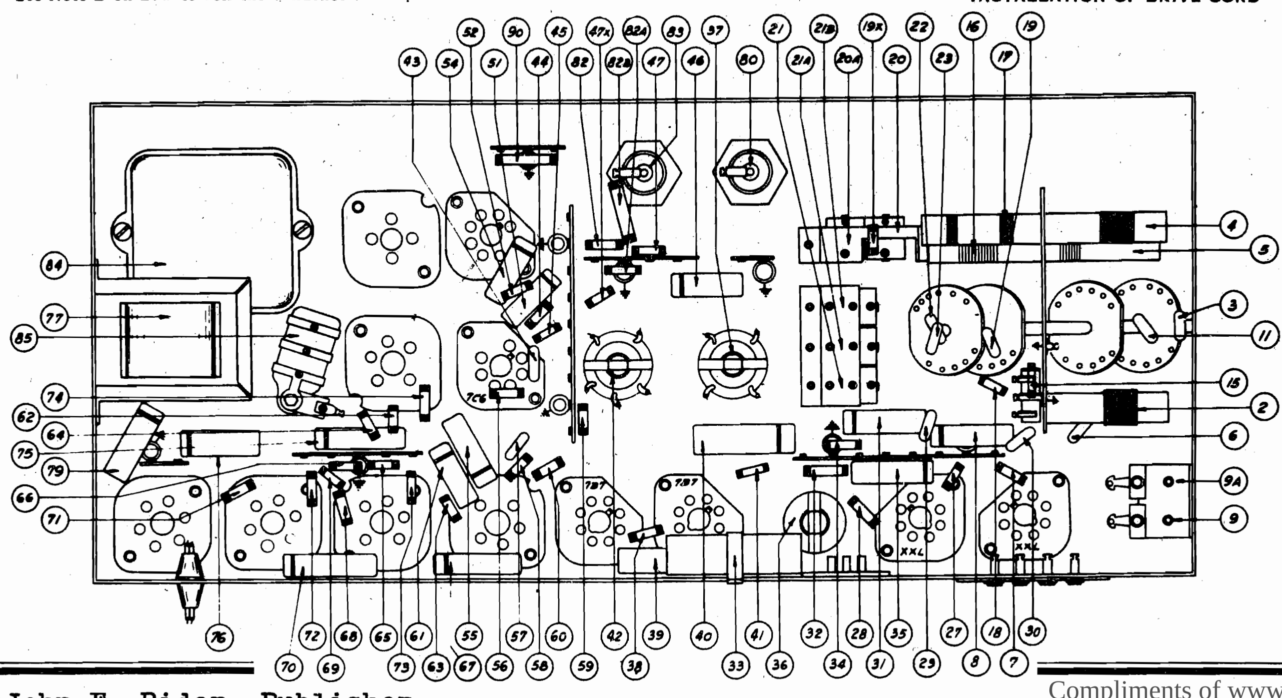
NOTE D — Adjust compensator (21A) to the First signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver dial at 12 M. C. and turning the signal generator to 11.090 M. C.

NOTE E — Adjust compensator (21B) to the Second signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver at 18 M. C. and turning the signal generator to 18.910 M. C. When adjusting compensator (9) roll the tuning condenser. See Note B on how to roll the condenser.



(POINTER AT LOW FREQUENCY END OF DIAL)
TUNING CONDENSER MAXIMUM CAPACITY
(FULLY CLOSED)

INSTALLATION OF DRIVE CORD



PHILCO RADIO & TELEVISION CORP.

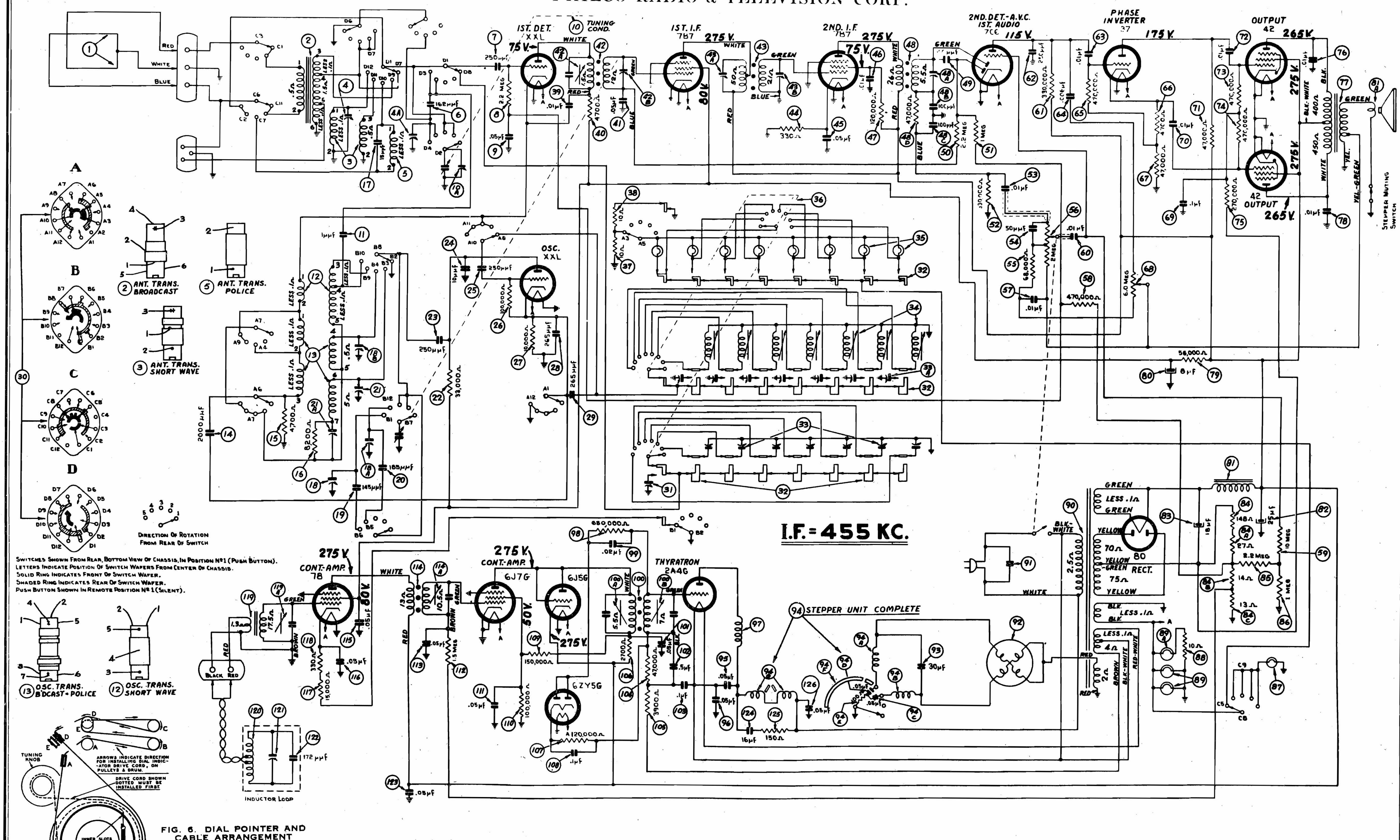


FIG. 5. SCHEMATIC DIAGRAM—MODEL 41-316, CODE 121

THE VOLTAGES INDICATED AT THE TUBE ELEMENTS ABOVE WERE MEASURED WITH A 1000 OHMS PER VOLT VOLTMETER. PHILCO MODEL 027, LINE VOLTAGE 118 VOLTS, A. C. BAND SWITCH (BROADCAST), NO STATION BEING RECEIVED.

SEPTEMBER, 1940.

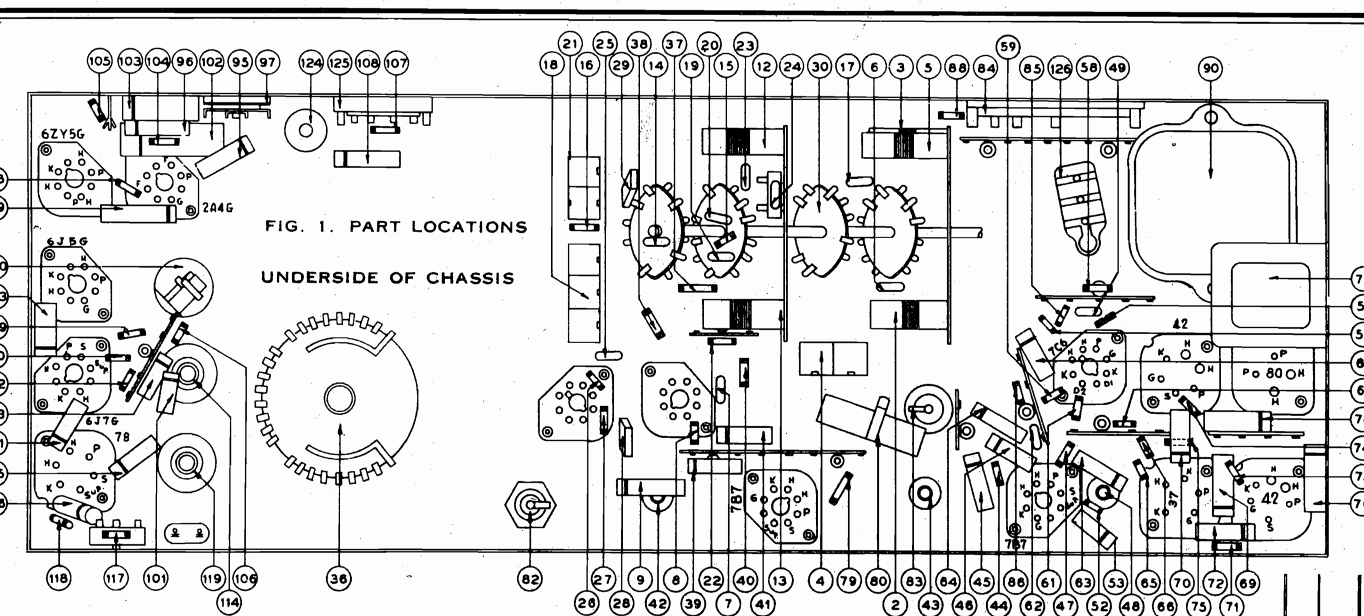
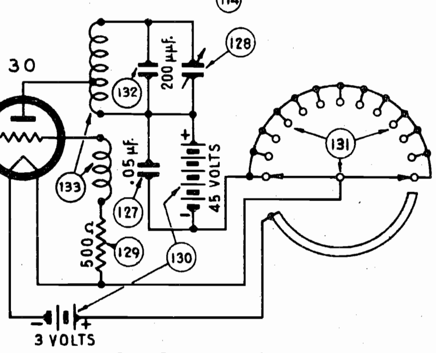


FIG. 1. PART LOCATIONS
UNDERSIDE OF CHASSIS



SCHEMATIC DIAGRAM OF WIRELESS REMOTE CONTROL UNIT

FIG. 2. WIRELESS REMOTE CONTROL UNIT WIRING

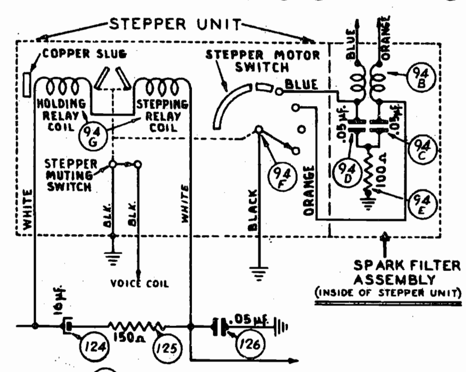


FIG. 3. INTERNAL WIRING OF STEPPER UNIT NUMBERS CORRESPOND TO SCHEMATIC

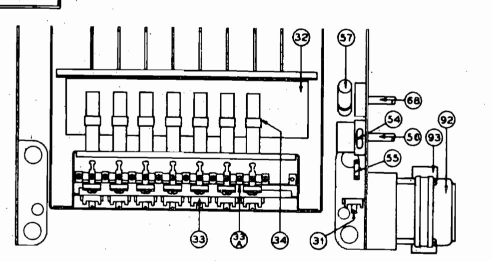
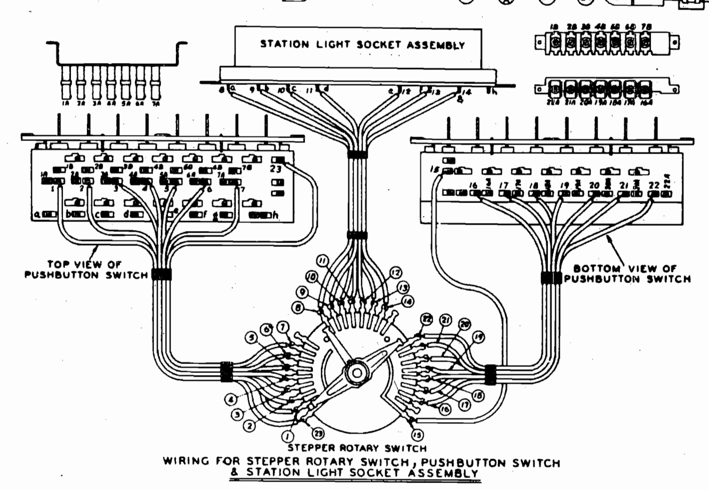


FIG. 8. LOCATION OF PARTS, TUNING UNIT



WIRING FOR STEPPER ROTARY SWITCH, PUSHBUTTON SWITCH & STATION LIGHT SOCKET ASSEMBLY

FIG. 4. CABLE WIRING FROM STEPPER ROTARY SWITCH TO PUSH-BUTTON SWITCH AND STATION LIGHTS

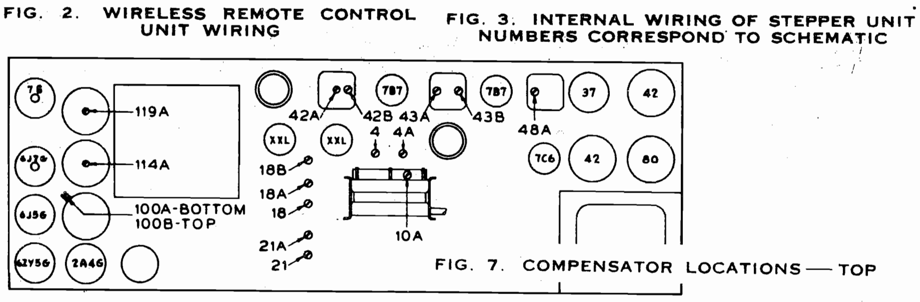


FIG. 7. COMPENSATOR LOCATIONS — TOP

PHILCO RADIO & TELEVISION CORP.

Model 41-316

ADJUSTING CONTROL FREQUENCY AMPLIFIER

The wireless remote control models are shipped with 5 different control frequencies which range from 350 to 400 K. C. These frequencies are identified by code numbers appearing on the serial number ticket and on the rear of the chassis. The code numbers and frequencies are as follows:

Code 5......355 K. C. Code 7......375 K. C.
Code 6......367 K. C. Code 8......383 K. C.
Code 9......395 K. C.

The purpose of the different control frequencies is to prevent interaction between two or more wireless remote control models which are on the same floor or exceptionally close together. When several wireless remote control models are to be located close together, it will be necessary to use different control frequencies. These frequencies should be 20 K. C. apart. For example, if three models are to be operated at the same time and are closely situated, it will be advisable to adjust the control frequency of the first set to 355 K. C., the second set to 375 K. C., and the third set to 395 K. C.

In order to realign or change the control frequency of these models, the following equipment is required:

1. Philco Model 077 signal generator with a loop attached to the output terminal. (A few turns of wire 12 inch in diameter).

2. Philco wireless remote control aligning adapter. Part No. 45-2769.

3. Philco aligning screw driver, Part No. 45-2610.

With this apparatus the control frequency is adjusted as follows:

1. Remove the 2A4G control tube from its socket and replace with the aligning adapter. Connect the red lead of the aligning adapter to the positive terminal of the vacuum tube voltmeter. The black lead of the adapter is connected to the negative terminal of the vacuum tube voltmeter.

2. Remove the 78 control amplifier tube, its shield and the shield of the 6J7G tube. Apply power to the set and turn the range selector disc to "remote".

3. Attach the "high" side of the signal generator output to the grid of the 6J7G tube. Set the generator modulation control to "mod on" and turn the attenuator control about one-fourth on.

4. The control frequency to which the control amplifier is tuned can now be determined by tuning the signal generator between 350 and 400 K. C. When the signal generator is tuned to the control frequency, the vacuum tube voltmeter will show maximum deflection. If this frequency is to be used, leave the signal generator at this point or turn the indicator to any other frequency desired between 350 and 400 K. C.

5. After the control frequency has been found or changed, compensators (100A), (100B) are adjusted for maximum indication on the vacuum tube voltmeter.

6. After adjusting this circuit, replace the 78 tube and shields in their sockets and remove the signal generator lead from the grid of the 6J7G tube.

7. Place the small loop mentioned above into the "high" and "ground" terminals of the signal generator output and place the signal generator near the secondary inductor loop in the bottom of the cabinet. When doing this, do not disturb the setting of the signal generator indicator. The compensators (114A) and (119A) are now adjusted for maximum reading on the vacuum tube voltmeter.

8. Next adjust the secondary inductor loop compensator (121) located in the bottom of the cabinet. This compensator is encased in a cardboard container that is attached to one corner of a loop. Extreme care should be used in adjusting the compensator to the exact point of resonance as the secondary inductor is a very sharply tuned circuit.

9. If the vacuum tube voltmeter pointer goes off scale when adjusting the compensators, turn the attenuator control of the signal generator toward the "off" position. After these compensators are adjusted to maximum, the control amplifier is tuned to the frequency selected.

ADJUSTING WIRELESS REMOTE CONTROL UNIT

The wireless remote control unit is now adjusted to the control frequency of the amplifier as follows:

1. Turn off the signal generator, then dial any one of the stations indicated on the remote control unit by pulling the selector to the stop position; release the selector and at the same time press the stop down and hold it in this position.

2. Now bring the wireless remote control unit close to the receiver. Using a padding wrench, Philco Part No. 3164, tune the compensator (128) Fig. 2, located on the bottom of the remote control unit until a maximum voltage reading is indicated on the vacuum tube voltmeter. When tuning this compensator, it should be done very slowly so as not to pass over the frequency to which the control amplifier is tuned.

3. The remote control unit is now moved a short distance from the radio (several feet). Compensator (128) is then readjusted for maximum voltage reading.

4. After making these adjustments, remove the aligning adapter from the socket and replace the 2A4G tube. The wireless remote control unit should now be adjusted to the same frequency as the control frequency in the receiver.

ADJUSTING REMOTE CONTROL UNIT OPERATING DISTANCE

When shipped from the factory the wireless remote control circuit is adjusted to control the radio from an average distance that has been found to be satisfactory in most installations. In some special cases, however, where the radio and control are situated near large metal objects or installed in metal shielded areas, it may be necessary to change the control circuit to get adequate remote control (increase sensitivity) from certain distances. In these cases, the value of resistor (117) 15,000 ohms, located underneath the radio chassis, should be changed to a lower value that will give the desired range of control. The resistor, however, should not be lowered in value more than is found necessary for the special installation. If the control range is too sensitive, the resistor should be changed to a higher value (more resistance).

ADJUSTING FOR PUSH-BUTTON AND WIRELESS REMOTE CONTROL OPERATION

Broadcast stations can be tuned in automatically from the wireless remote control unit and in addition, can also be tuned in automatically by push-button operation. Eight push-buttons are provided on the radio chassis. One of these (extreme left) is used to select Remote Control Tuning. The remaining push-buttons are used to select stations automatically by push-button operation.

By using the remote tuning unit, seven broadcast stations can be tuned in; the volume can be raised and lowered; a silent position can be selected and the radio can be turned "OFF"

The selected broadcast stations can be set up for push-button and remote tuning control operation by adjusting the padders and coils located in back of the push-button assembly. Three adjustments must be made for each broadcast station selected.

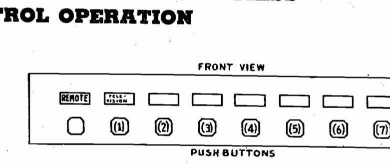
The bottom row marked "ANT" is for the antenna padder for remote control operation; the middle row of adjusting screws is for the oscillator coils used in remote control; the top row of adjusting screws is for the oscillator adjustment for push-button tuning. Each set of three padders is numbered from "1 to 7" corresponding to the numbers shown on the push-buttons in Figure above.

To set up stations on these models for best reception, a Signal Generator PHILCO Model 077; Vacuum Tube Voltmeter PHILCO Model 027 or 028 and Aligning Adaptor, Part No. 45-2767 should be used. With this equipment proceed as follows:

1. Select and remove the desired seven (7) station call letters from the receiver station tab card. Insert the station tabs in the windows of the bezel on the receiver. Place the lowest frequency station in the second window (No. 1 in diagram) on the left of the bezel, and the remaining station tabs in the windows in the order of increasing broadcast frequency.

2. Remove the tabs of the corresponding seven stations from the wireless control call letter card. Insert the LOUD, SOFT and SILENT tabs in the first, second and third spaces, respectively, on the right hand side of the bezel. Insert the tab of the lowest frequency station in the fourth space on the right side of the bezel on the remote control unit dial. Transparent tabs are also supplied. These should be placed over each call letter. Place the remaining call letter tabs around the bezel from right to left (counter-clockwise) in the order of increasing frequency.

3. Remove the 7C6 second detector tube from its socket and insert the aligning adaptor, Part No. 45-2767. 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 of the adaptor.



4. Turn volume control and power switch to the "ON" position, and allow the receiver to heat up. Attach a loop consisting of a few turns of wire to the output terminals of the Model 077 Signal Generator. Turn the signal generator power switch to "MOD ON". Turn the receiver "Band" selector to "Broadcast" and manually tune in the lowest frequency station desired. This station should be between 540 to 1030 K. C. Then tune the signal generator to the frequency of the same station and a beat note will be heard. Leave the signal generator pointer set at this frequency.

5. Press in the "Remote" push-button. Dial the first low frequency station on the remote control unit.

6. Using a padding screw driver adjust No. 1 "OSC Remote" (middle row) until the station identified by the modulated signal of the Signal Generator is tuned to maximum reading on the voltmeter. Next adjust the "No. 1 ANT" padder (bottom row) for maximum indication on the voltmeter.

Press in the No. 1 push-button on the radio and adjust No. 1 "P.BUTTON OSC" padder (top row) for maximum output on the same station.

7. Turn the Signal Generator off the station frequency and readjust the No. 1 "OSC P.BUTTON" padder for maximum; then press REMOTE push-button and readjust No. 1 "Remote OSC" and No. 1 "ANT" padders for maximum reading with the station signal. This should be done with the volume control of the receiver at low volume.

Repeat this procedure for each of the remaining stations to be set up. They should be set up in the order of their increasing frequency.

8. After all stations have been set up for push-button and remote control operation, press in the fifth (5) push-button and adjust the padder "ANT COMPENSATOR" located to the right of the padder strip unit below the dial, for maximum signal strength. See Fig. 8 for compensator (31).

CONNECTING ALIGNING INSTRUMENTS

Either a vacuum tube voltmeter or an audio output meter may be used as a signal indicator when adjusting the receiver.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate terminals of the 42 tubes. Adjust the meter for the 0 to 30 volt A. C. scale.

Signal Generator: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal 3 of the loop aerial terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the ground 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. If the chassis is to be aligned outside the cabinet the loop should be in the same relative position near the chassis as when assembled in the cabinet.

After connecting the aligning indicator, adjust the compensators in the order shown in the tabulation below. Locations of the compensators are shown on Fig. 7. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Opera-tions in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	High side to No. 3 terminal loop Panel.	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Position	48D, 43A, 43B, 42A, 42B	
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Broadcast	21, 10A	Note A
3	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch Broadcast	21A	Roll Tuning Condenser Note B
4	Use Loop on Generator	Repeat operation No. 2 again				
5	Use Loop on Generator	6 M. C.	6 M. C.	Range Switch "Police"	18B	Note C
6	Use Loop on Generator	12 M. C.	12 M. C.	Range Switch "S. W." 1	18A, 4A	Note D
7	Use Loop on Generator	18 M. C.	18 M. C.	Range Switch "S. W." 2	18, 4	Note E

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 Fig. 6.

NOTE B — When adjusting the compensator, 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 maximum output reading is obtained.

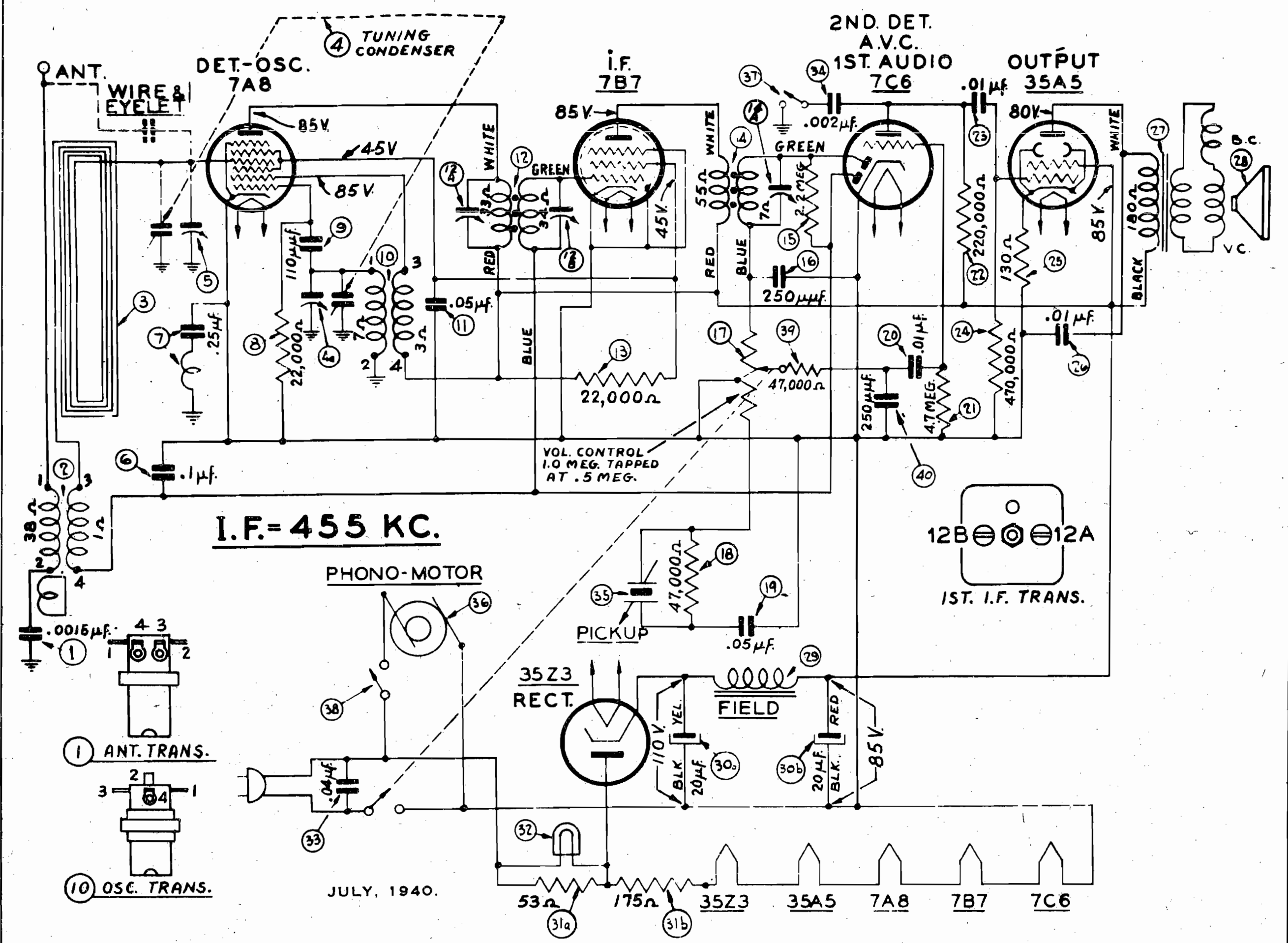
NOTE C — Adjust compensator (18B) to the SECOND signal peak from the tight (closed) position.

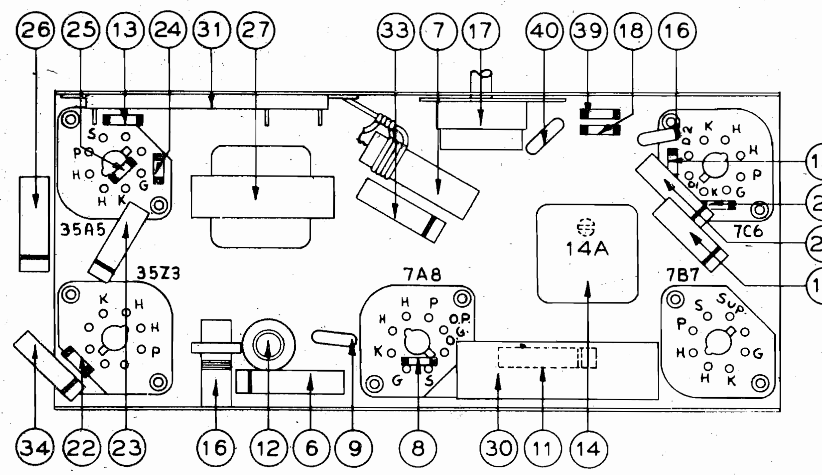
NOTE D — Adjust compensator (18A) to the FIRST signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver dial at 12 M. C. and turn the signal generator to 11.090 M. C.

NOTE E — Adjust compensator (18) to the SECOND signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver at 18 M. C. and turning the signal generator to 18.910 M. C. When adjusting compensator (4) roll the tuning condenser, See Note "B" on how to roll the condenser.

MODEL 41-602

PHILCO RADIO & TELEVISION CORP.



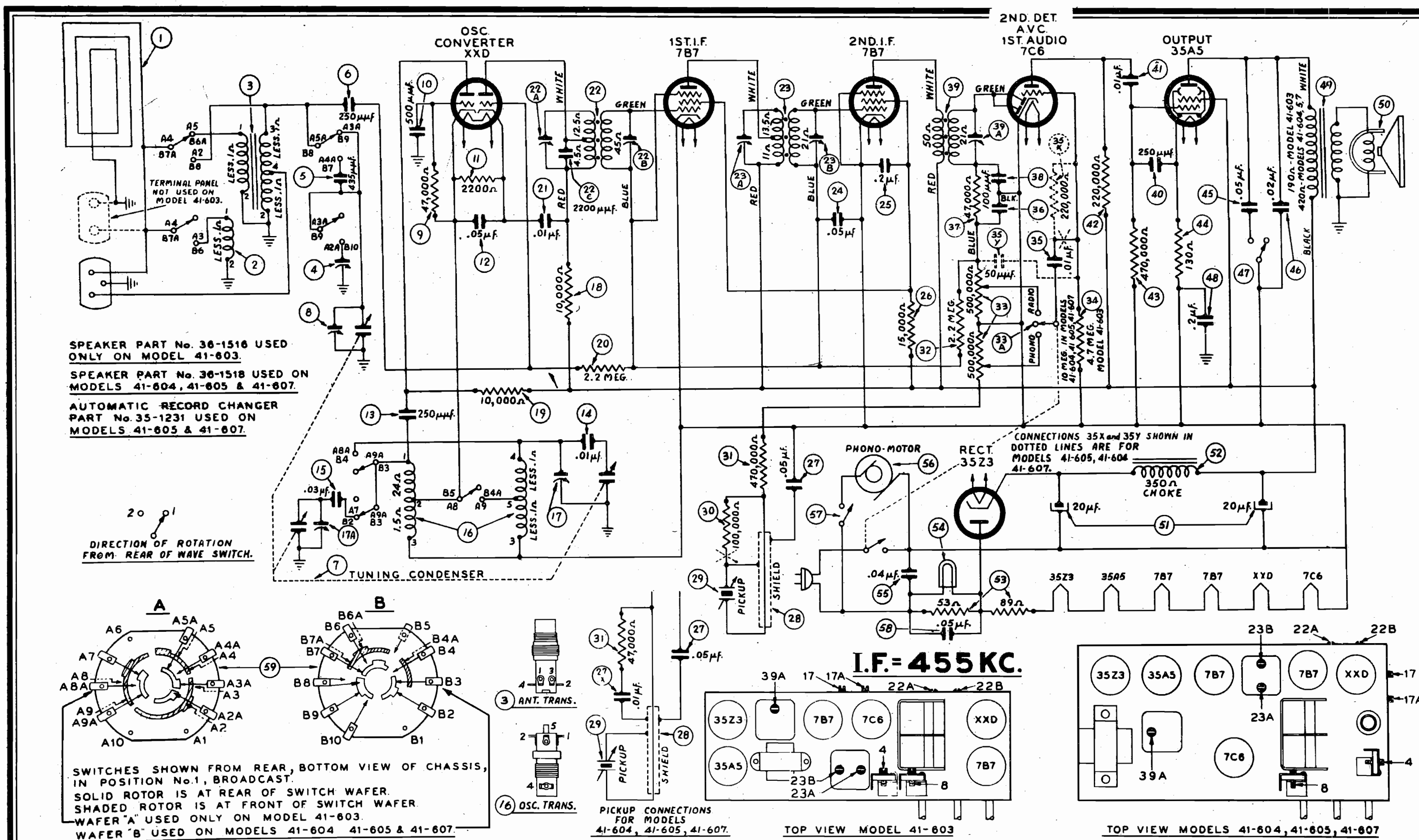


When aligning the R.F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio. After connecting the aligning instruments adjust the compensators as shown in tabulation. Locations of the R.F. compensators are on top of the tuning tuning condenser, oscillator on the front, and aerial on rear. The 1st and 2nd I.F. transformers are on top of the chassis.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol Max. Range Switch Brdcst.	14A, 12A, 12B	
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcst.	4A	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcst.	5	

NOTE A: — 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, set the tuning pointer on the small dot below 550 K. C.

MODELS 41-603, 41-604
41-605, 41-607 PHILCO RADIO & TELEVISION CORP.



MODELS 41-603 41-604 41-605 & 41-607

PHONOGRAPH SECTION

Models 41-603 and 41-604 use the same type phonograph mechanism. This mechanism consists of a manually operated crystal pickup and 115 volt, 60 cycle turntable motor. In addition an automatic motor starting switch is included which starts the motor when the pickup is lifted from its rest.

The phonograph mechanism of the Models 41-605 and 41-607 consists of an Automatic Record Changer which plays twelve 10-inch records or ten 12-inch records at one loading. The record changer can also be manually operated. A crystal pickup is provided on the changer which operates through the audio system of the radio. The same automatic Record Changer is used in both of these models. The service procedure for adjusting the Automatic Record Changer will be found in Radio Service Bulletin No. 358.

JULY, 1940.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 Volts, 60 cycle A. C.

POWER CONSUMPTION: 40 watts, Models 41-603, 41-604.
45 watts, Models 41-605, 41-607.

SEE MODELS BELOW

PHILCO RADIO & TELEVISION CORP.

MODELS 41-280, 41-285, 41-287, 41-290(121)

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Settings	RECEIVER: Adjust Compensators in order	SPECIAL INSTRUCTIONS
1	High side to No. 4 terminal loop panel.	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Positions	32A, 32B 34A, 37D	
2	Use loop on generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Broadcast	16, 10	Note A
3	Use loop on generator	580 K. C.	580 K. C.	Vol. Max. Range Switch Broadcast	17	Roll Tuning Condensers Note B
4	Use loop on generator	Perform operation No. 2 again				
5	Use loop on generator	6 M. C.	6 M. C.	Range Switch "Police"	16A	
6	Use loop on generator	12 M. C.	12 M. C.	Range Switch "S. W."	17A, 2	Note C

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 the schematic.

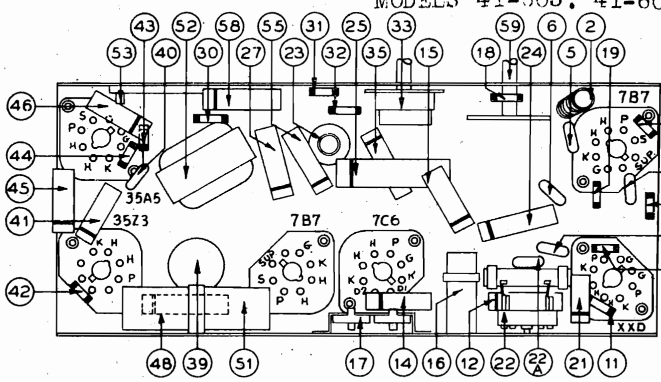
NOTE B — When adjusting the low frequency compensator of Range One (Broadcast) or the aerial padders of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for 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 maximum output reading is obtained.

NOTE C — To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator (17A) to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a first peak is obtained on the output meter. Adjust the compensator for maximum output at this first peak.

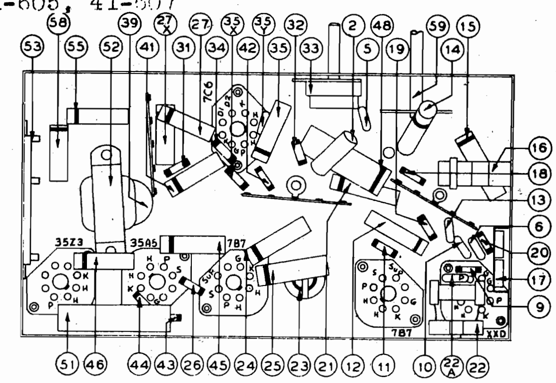
If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 910 K. C. above the frequency being used on any high frequency range.

The aerial padder (2) must be adjusted to maximum by rolling the tuning condenser. If two signal peaks occur when turning the padder, adjust to maximum output on the second signal peak from the tight position (screw all the way down) of the padder.

MODELS 41-603, 41-604, 41-605, 41-607



MODEL 41-603
PART LOCATIONS — UNDERSIDE OF CHASSIS



MODELS 41-604, 41-605, 41-607
PART LOCATIONS — UNDERSIDE OF CHASSIS

Audio Output Meter: If this type of aligning meter is used, connect it to the voice coil terminals of the speaker or from the plate of the 35A5 tube to the chassis. Adjust the meter for the 0 to 10 volt scale.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

Signal Generator: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

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 signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

After connecting the aligning instruments adjust the compensators as shown in the tabulation below. Locations of the compensators are shown in the schematic diagram.

If the indicating meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Settings	RECEIVER: Adjust Compensators in order	SPECIAL INSTRUCTIONS
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol Max. Range Switch Brdcst.	39A, 23A, 23B, 22A, 22B	
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol Max. Range Switch Brdcst.	17A	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol Max. Range Switch Brdcst.	8	
4	Loop see above instructions	12 M. C.	12 M. C.	Range Switch "S. W."	17, 4	Roll (8) for Max. Note B

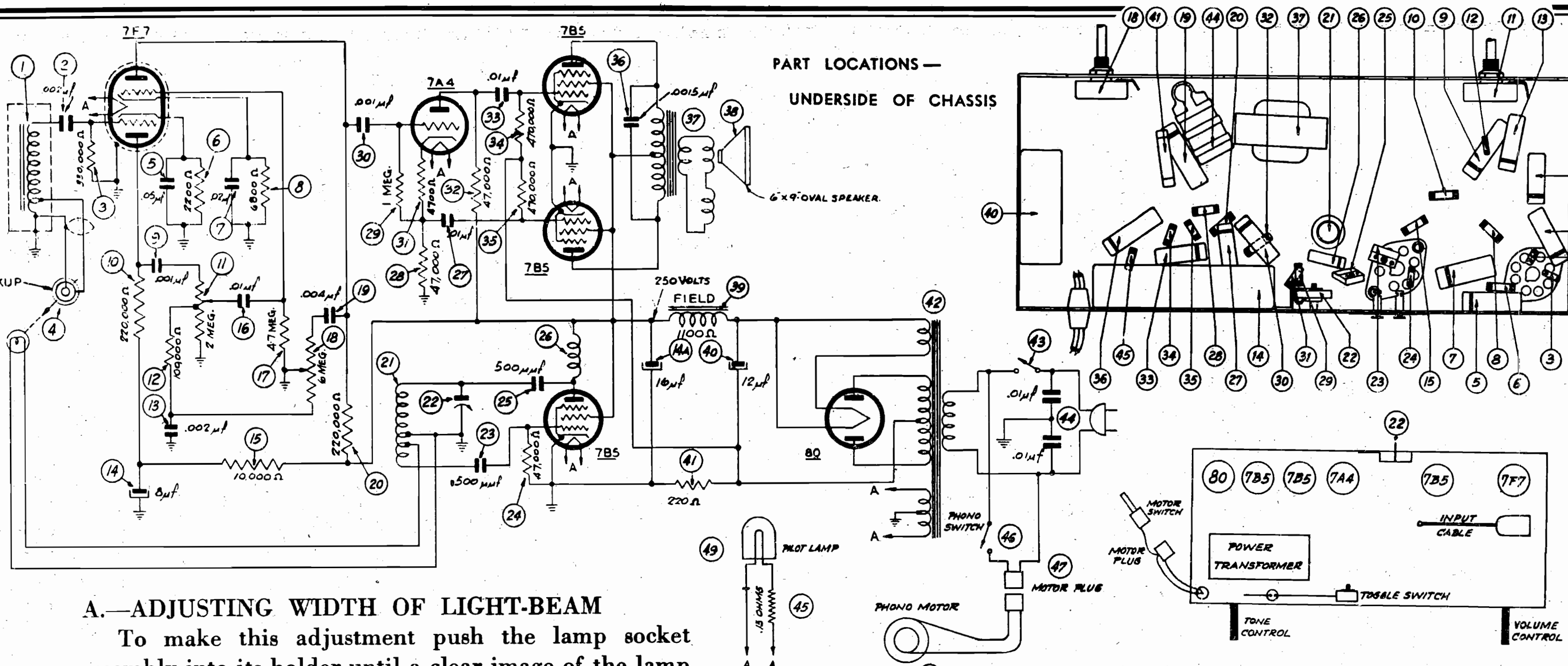
NOTE A: — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 550 K. C.

NOTE B: — When adjusting oscillator compensator 17A, tune for maximum on the first signal peak from Tight position (compensator closed).

When adjusting the aerial padder 4 of the high frequency tuning range; 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 maximum output reading is obtained.

MODEL 41-620

PHILCO RADIO & TELEVISION CORP.



NOVEMBER 1940

A.—ADJUSTING WIDTH OF LIGHT-BEAM

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 5/32" in width. The socket assembly is now rotated so that the spot light is vertical.

B.—POSITIONING THE LIGHT-BEAM

To position the light-beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

C.—ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by compensator (22) located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

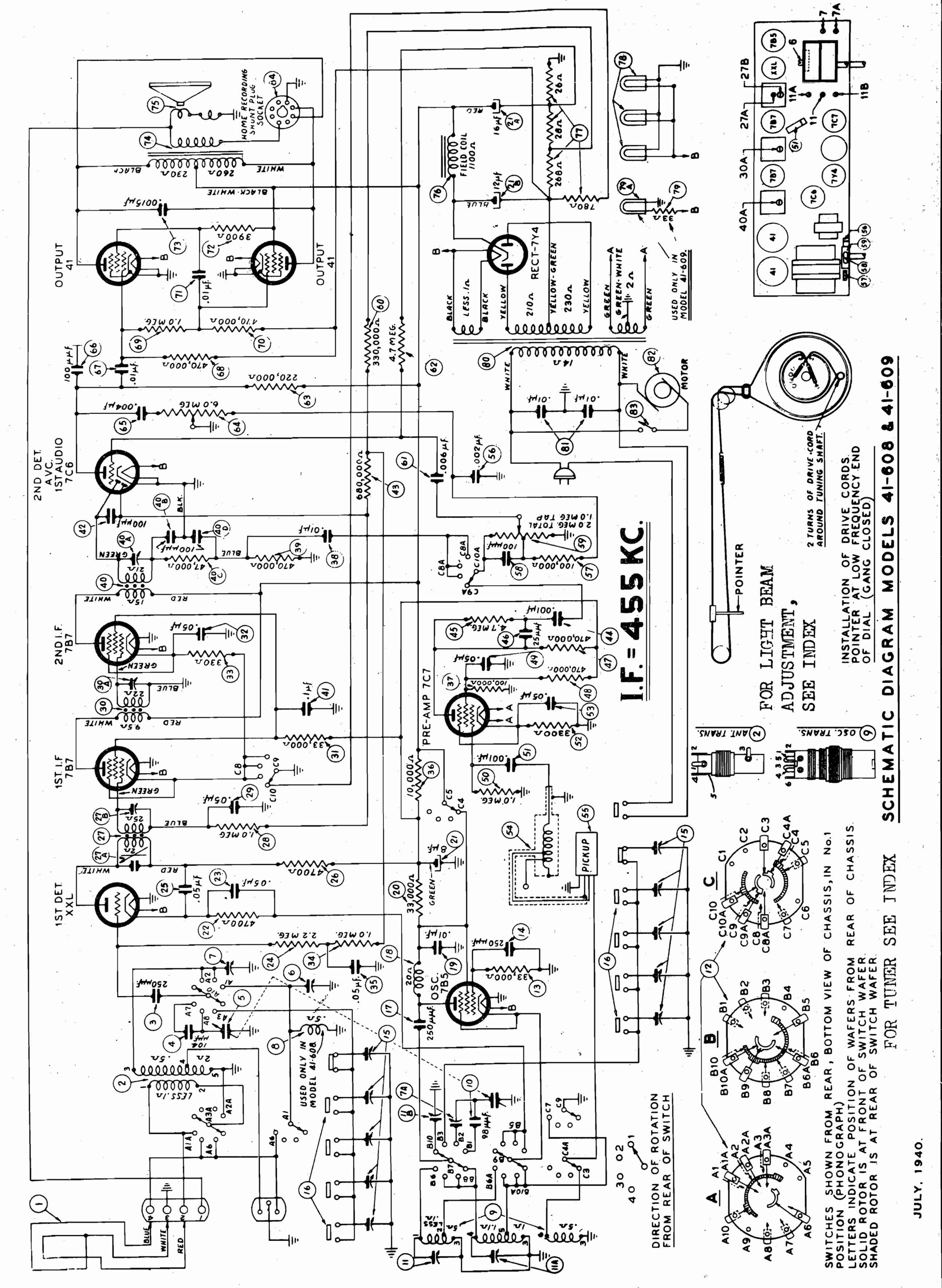
1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

D.—INSTALLING NEW LAMP

When installing a new lamp in the socket, there are two positions in which the lamp can be inserted. Ordinarily, either of these positions can be used. In some cases, however, due to the lamp filament being off center, the lamp must be inserted in the position that gives the best centering of the spot of light on the vibrating mirror.

PHILCO RADIO & TELEVISION CORP.

MODELS 41-608, 41-609 (121)

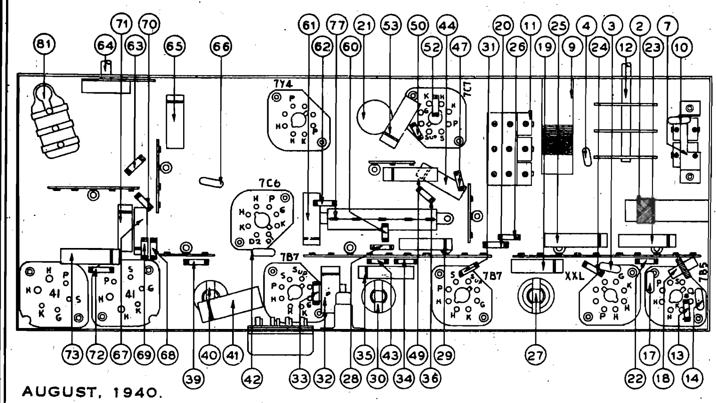


MODELS 41-608, 41-609
Codes 121 and 122

PHILCO RADIO & TELEVISION CORP.

Models 41-608 and 41-609, Code 122, are similar to Models 41-608 and 41,609, Code 121, with the exception of the phonograph amplifier tube and circuit. A type 7C6 tube is used in the phonograph amplifier in the 41-608 and 41-609, Code 122, chassis, whereas a 7C7 tube is used in the Code 121.

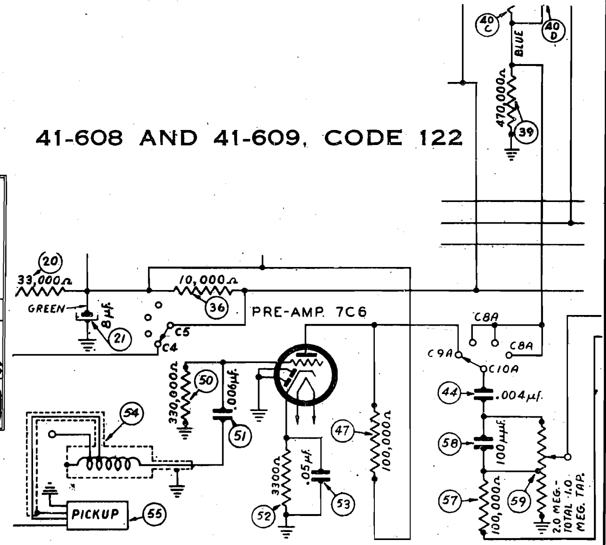
The Code 122 "Specifications", "Light-Beam Reproducer Adjustments" and "Aligning R. F. and I. F. Compensators" instructions are the same as those given for Code 121



AUGUST, 1940.

PART LOCATIONS — UNDERSIDE OF CHASSIS
MODELS 41-608 AND 41-609, CODE 122
NOTE — PARTS 51, 56, 57, 58 AND 59 LOCATED ON TOP OF CHASSIS

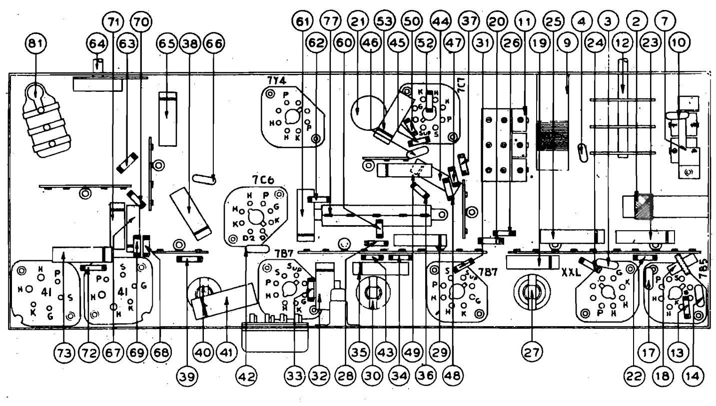
41-608 AND 41-609, CODE 122



TUBE SOCKET VOLTAGES

D. C. voltages were measured with a 1000 ohms per volt voltmeter, Philco Model 027. Line voltage 120 volts A. C., no signal being received — range switch broadcast.

Tube	Location	Radio Pos. D. C. Volt.	Phono. Pos. D. C. Volt.
7B5 Osc.	Plate	27	185
" "	Screen	27	185
" "	Bias (Grid Leak)	7	47
XXL 1st Det.	Plate	130	180
" " "	Bias (Cathode)	6	8
7B7 st & 2nd I. F.	Plate	227	185
"	Screen	72	185
" 2nd I. F.	Bias (Cathode)	1.5	57
7C6 2nd Det. 1st Audio	Plate	165	140
7C6 Preamp.	Plate	45	125
41 Output Phase Inv.	Plate	222	183
" "	Screen	213	177
41 Output	Plate	222	183
" "	Sceern	227	185
	12 mf. elect. to ground	305	290
	16 mf. elect. to ground	227	185
	8 mf. elect. to ground	137	178
ON CODE 121 ONLY			
7C7 Preamp.	Plate	45	65
" "	Screen	20	28



PART LOCATIONS — UNDERSIDE OF CHASSIS
MODELS 41-608, 41-609
NOTE — PARTS 51, 56, 57, 58 AND 59 LOCATED ON TOP OF CHASSIS

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in order	
1	Ant. Section of Tuning Cond. with .1 mfd. Cond.	455 K. C.	Tuning Cond. Closed	Vol. Max. Bands Switch S. W.	27A, 27B 30A, 40A	Note A
2	Loop Signal Generator	1500 K. C.	1500 K. C.	Bands Switch "Brdcst"	11A, 7	Note B
3	Loop Signal Generator	580 K. C.	580 K. C.	Bands Switch "Brdcst"	7A	Roll comp. (7A) to "max." Recheck Operation No. 2
4	Loop Signal Generator	12 M. C.	12 M. C.	Bands Switch S. W.	11, 6	Note C

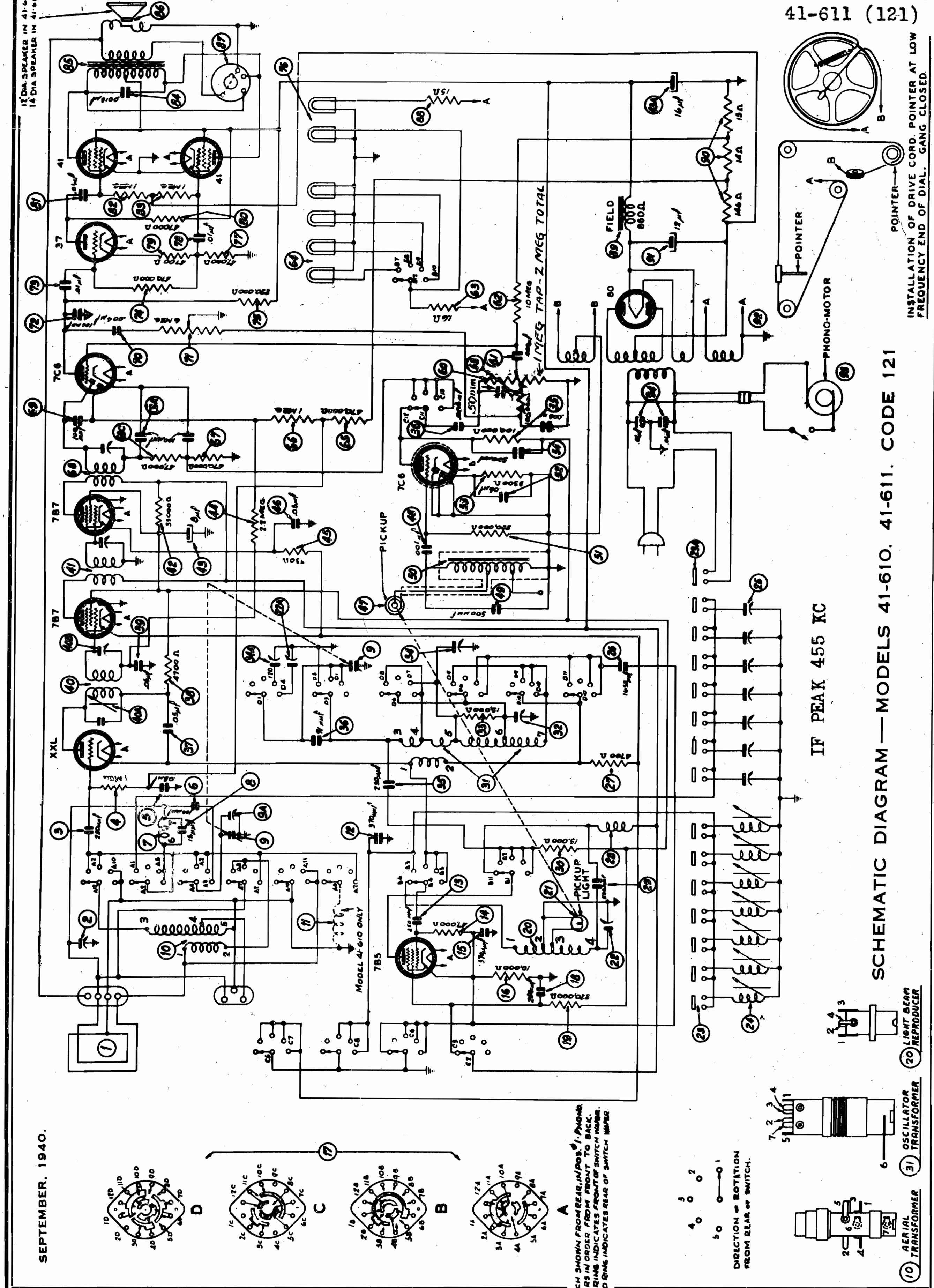
NOTE A — Compensator (27A) must be adjusted before compensator (27B) and should be done in the following manner: Turn (27A) all the way up, then turn down selecting the first I. F. peak, compensator (27B) is now padded to maximum.

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, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE C — Adjust padder (11) to the first signal peak from the tight position. Roll padder (6) slowly to maximum on the second peak from loose position.

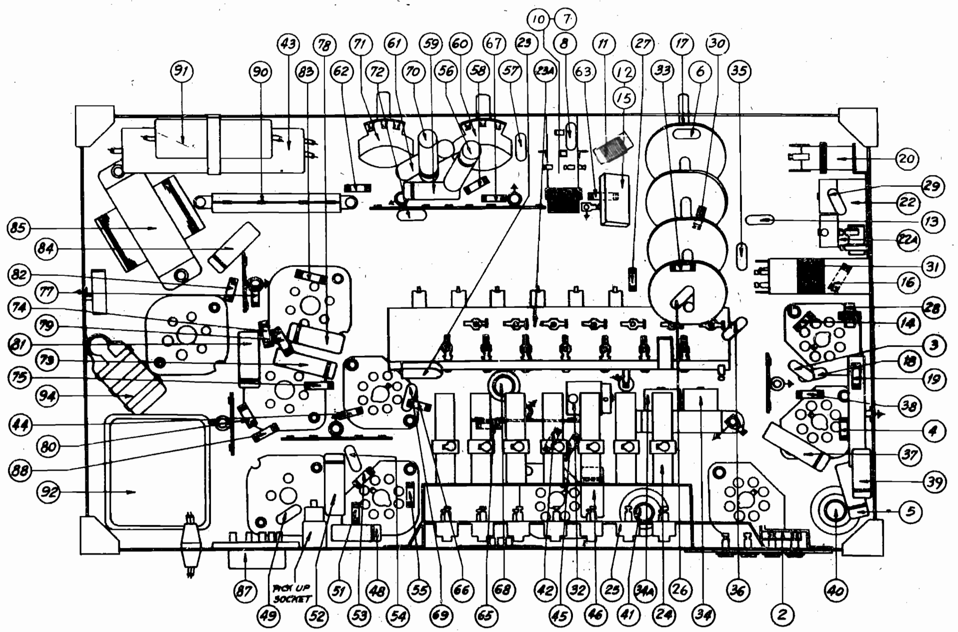
PHILCO RADIO & TELEVISION CORP.

MODELS 41-610
41-611 (121)



MODELS 41-610
41-611 (121)

PHILCO RADIO & TELEVISION CORP.



PART LOCATIONS — UNDERSIDE OF CHASSIS

Audio Output Meter: Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A. C. scale of the meter must be used. (0 to 10 volts).

The audio output meter can also be connected between the plate of the output tube and the ground of the chassis.

Signal Generator: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal 4 of the loop aerial terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the ground 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.

After connecting the aligning indicator, adjust the compensators in the order shown in the tabulation below. Locations of the compensators are shown below. 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	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	High Side to No. 4 Terminal Loop Panel	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Positions	40A, 40B 41A, 68D	
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	34, 9A	Note A
3	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	32	Roll Tuning Condenser Note B
4	Use Loop on Generator	Repeat Operation No. 2 Again				
5	Use Loop on Generator	6 M. C.	6 M. C.	Range Switch "Police"	34A	
6	Use Loop on Generator	12 M. C.	12 M. C.	Range Switch "S. W."	22A, 2	Note C

FOR TUNER AND AUTOMATIC RECORD CHANGER DATA, SEE INDEX

To reproduce the sound from a record, the light beam of the reproducer must be carefully positioned on the light sensitive cell. If the light beam is not carefully set, the sound reproduction will be distorted, weak or, if the light beam is completely on or off the cell, the phonograph will be silent.

If any of these conditions exist, the following adjustment procedure should be made:—

NOTE — These adjustments should be made with the power line voltage at 118 volts A. C.

A. ADJUSTING WIDTH OF LIGHT BEAM

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 3/32" in width. The socket assembly is now rotated so that the spot light is vertical.

B. POSITIONING THE LIGHT BEAM

To position the light beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

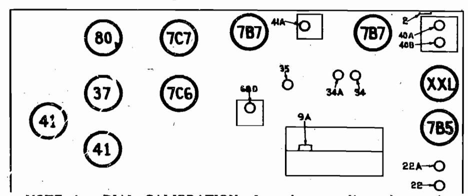
C. ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator No. 22 located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 22 in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

D. INSTALLING NEW LAMP

When installing a new lamp in the socket, there are two positions in which the lamp can be inserted. Ordinarily, either of these positions can be used. In some cases, however, due to the lamp filament being off center, the lamp must be inserted in the position that gives the best centering of the spot of light on the vibrating mirror.



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 the schematic.

NOTE B — When adjusting the low frequency compensator of Range One (Broadcast) or the aerial padders of the high frequency tuning range; 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 maximum output reading is obtained.

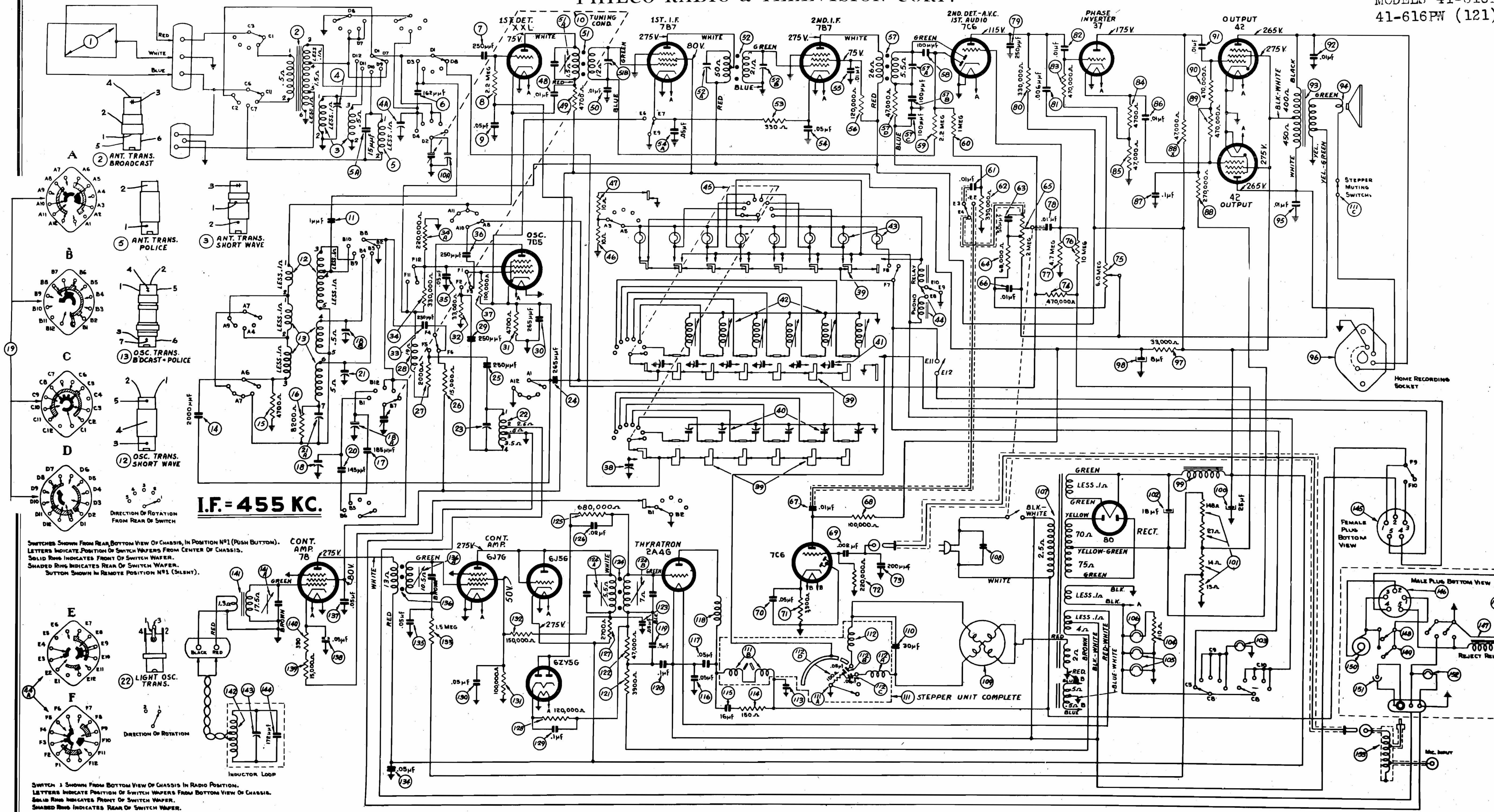
NOTE C — To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator (22A) to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a first peak is obtained on the output meter. Adjust the compensator for maximum output at this first peak.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 910 K. C. above the frequency being used on any high frequency range.

The aerial padder (2) must be adjusted to maximum by rolling the tuning condenser. If two signal peaks occur when turning the padder, adjust to maximum output on the second signal peak from the tight position (screw all the way down) of the padder.

PHILCO RADIO & TELEVISION CORP.

MODELS 41-616P
41-616PW (121)



LINE VOLTAGE 118 VOLTS, A. C. BAND SWITCH (BROADCAST), NO STATION BEING RECEIVED.

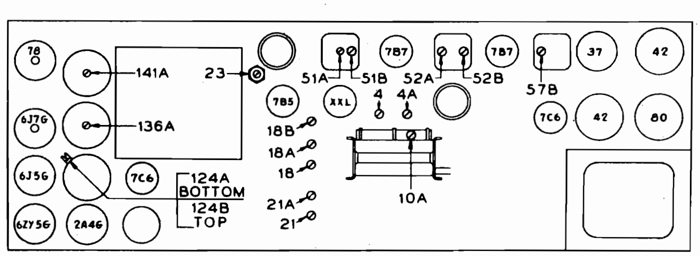


FIG 7. COMPENSATOR LOCATIONS — TOP OF CHASSIS

OCTOBER, 1940.

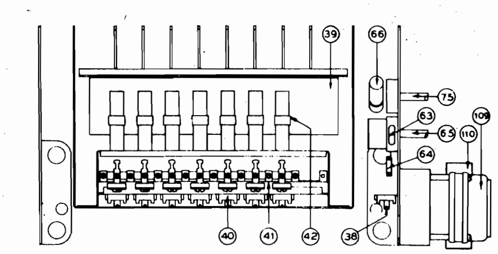


FIG. 8. LOCATION OF PARTS. TUNING UNIT

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MODELS 41-616P
41-616PW (121)

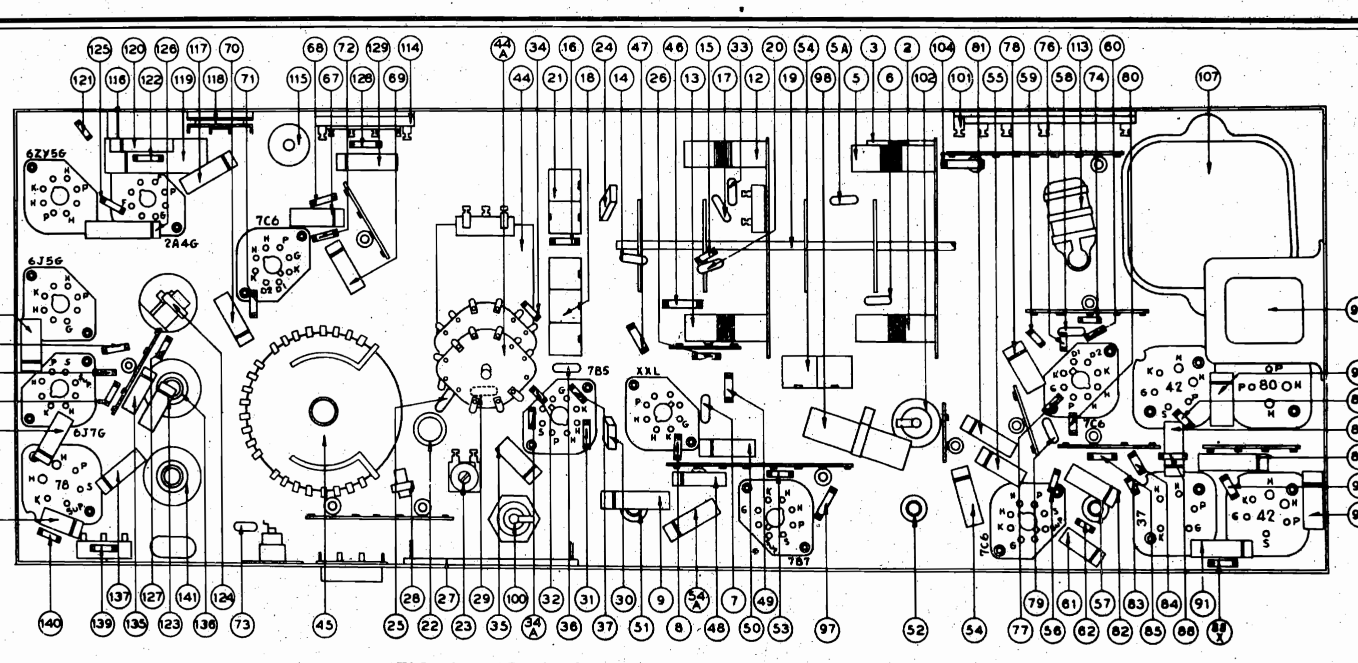


FIG. 1. PART LOCATIONS — UNDERSIDE OF CHASSIS

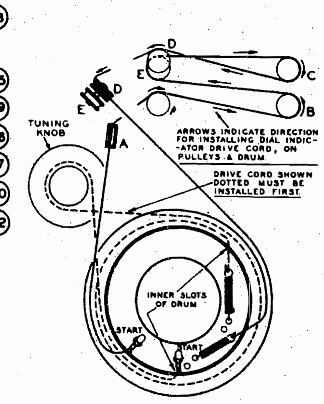


FIG. 4. DIAL POINTER AND CABLE ARRANGEMENT

TUNING BAND FREQUENCIES: 540 to 1720 K. C., 2.3 to 7.0 M. C., 9 to 12 M. C., 13.5 to 18 M. C.
INTERMEDIATE FREQUENCY: 455 K. C.
AUDIO OUTPUT: 10 watts.

POWER SUPPLY: 118 volts, 60 cycle A. C. The radio can also be operated on 118 volts, 50 cycle A. C. To do this it is necessary to replace the record changer motor as indicated in the parts list.
POWER CONSUMPTION: 200 Watts

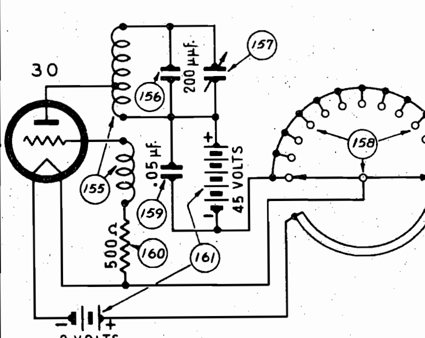


FIG. 3. WIRELESS REMOTE CONTROL UNIT WIRING

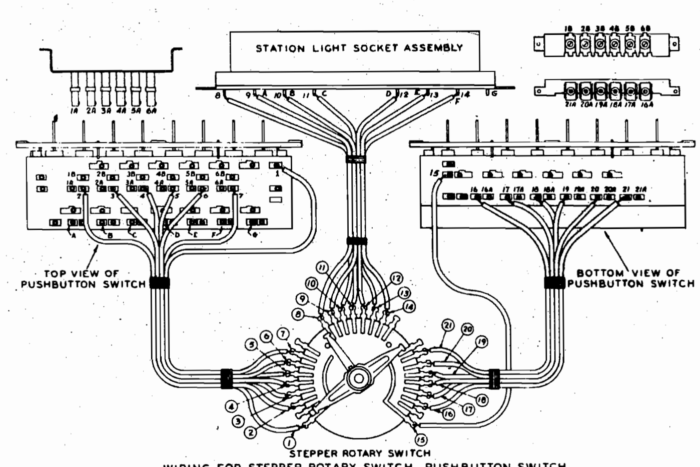


FIG. 5. CABLE WIRING FROM STEPPER ROTARY SWITCH TO PUSH-BUTTON SWITCH AND STATION LIGHTS

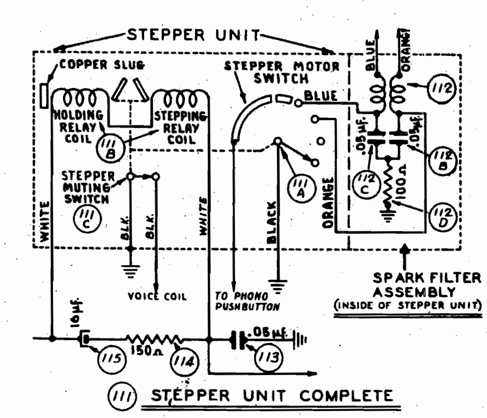


FIG. 6. INTERNAL WIRING OF STEPPER UNIT. NUMBERS CORRESPOND TO SCHEMATIC

MODELS 41-616P
41-616PW (121)

PHILCO RADIO & TELEVISION CORP.

ADJUSTMENT OF WIRELESS REMOTE CONTROL CIRCUITS

Model 41-616, Code 121

ADJUSTING CONTROL FREQUENCY AMPLIFIER

The wireless remote control models are shipped with 5 different control frequencies which range from 350 to 400 K. C. These frequencies are identified by code numbers appearing on the serial number ticket and on the rear of the chassis. The code numbers and frequencies are as follows:

Code 5......355 K. C. Code 7......375 K. C.
Code 6......367 K. C. Code 8......383 K. C.
Code 9......395 K. C.

The purpose of the different control frequencies is to prevent interaction between two or more wireless remote control models which are on the same floor or exceptionally close together. When several wireless remote control models are to be located close together, it will be necessary to use different control frequencies. These frequencies should be 20 K. C. apart. For example, if three models are to be operated at the same time and are closely situated, it will be advisable to adjust the control frequency of the first set to 355 K. C., the second set to 375 K. C., and the third set to 395 K. C.

In order to realign or change the control frequency of these models, the following equipment is required:

1. Philco Model 077 signal generator with a loop attached to the output terminal. (A few turns of wire 12 inch in diameter).

2. Philco wireless remote control aligning adapter. Part No. 45-2769.

3. Philco aligning screw driver, Part No. 45-2610.

With this apparatus the control frequency is adjusted as follows:

1. Remove the 2A4G control tube from its socket and replace with the aligning adapter. Connect the red lead of the aligning adapter to the positive terminal of the vacuum tube voltmeter. The black lead of the adapter is connected to the negative terminal of the vacuum tube voltmeter.

2. Remove the 78 control amplifier tube, its shield and the shield of the 6J7G tube. Apply power to the set and turn the range selector disc to "remote".

3. Attach the "high" side of the signal generator output to the grid of the 6J7G tube. Set the generator modulation control to "mod on" and turn the attenuator control about one-fourth on.

4. The control frequency to which the control amplifier is tuned can now be determined by tuning the signal generator between 350 and 400 K. C. When the signal generator is tuned to the control frequency, the vacuum tube voltmeter will show maximum deflection. If this frequency is to be used, leave the signal generator at this point or turn the indicator to any other frequency desired between 350 and 400 K. C.

5. After the control frequency has been found or changed, compensators (124A), (124B) are adjusted for maximum indication on the vacuum tube voltmeter.

6. After adjusting this circuit, replace the 78 tube and shields in their sockets and remove the signal generator lead from the grid of the 6J7G tube.

7. Place the small loop mentioned above into the "high" and "ground" terminals of the signal generator output and place the signal generator near the secondary inductor loop in the bottom of the cabinet. When doing this, do not disturb the setting of the signal generator indicator. The compensators (136A) and (141A) are now adjusted for maximum reading on the vacuum tube voltmeter.

8. Next adjust the secondary inductor loop compensator (143) located in the bottom of the cabinet. This compensator is encased in a cardboard container that is attached to one corner of a loop. Extreme care should be used in adjusting the compensator to the exact point of resonance as the secondary inductor is a very sharply tuned circuit.

9. If the vacuum tube voltmeter pointer goes off scale when adjusting the compensators, turn the attenuator control of the signal generator toward the "off" position. After these compensators are adjusted to maximum, the control amplifier is tuned to the frequency selected.

ADJUSTING WIRELESS REMOTE CONTROL UNIT

The wireless remote control unit is now adjusted to the control frequency of the amplifier as follows:

1. Turn off the signal generator, then dial any one of the stations indicated on the remote control unit by pulling the selector to the stop position; release the selector and at the same time press the stop down and hold it in this position.

2. Now bring the wireless remote control unit close to the receiver. Using a padding wrench, Philco Part No. 3164, tune the compensator (157) Fig. 3, located on the bottom of the remote control unit until a maximum voltage reading is indicated on the vacuum tube voltmeter. When tuning this compensator, it should be done very slowly so as not to pass over the frequency to which the control amplifier is tuned.

3. The remote control unit is now moved a short distance from the radio (several feet). Compensator (157) is then re-adjusted for maximum voltage reading.

4. After making these adjustments, remove the aligning adapter from the socket and replace the 2A4G tube. The wireless remote control unit should now be adjusted to the same frequency as the control frequency in the receiver.

ADJUSTING REMOTE CONTROL UNIT OPERATING DISTANCE

When shipped from the factory the wireless remote control circuit is adjusted to control the radio from an average distance that has been found to be satisfactory in most installations. In some special cases, however, where the radio and control are situated near large metal objects or installed in metal shielded areas, it may be necessary to change the control circuit to get adequate remote control (increase sensitivity) from certain distances. In these cases, the value of resistor (139) 15,000 ohms, located underneath the radio chassis, should be changed to a lower value that will give the desired range of control. The resistor, however, should not be lowered in value more than is found necessary for the special installation. If the control range is too sensitive, the resistor should be changed to a higher value (more resistance).

LIGHT-BEAM REPRODUCER ADJUSTMENTS

To reproduce the sound from a record, the light beam of the reproducer must be carefully positioned on the light sensitive cell. If the light beam is not carefully set, the sound reproduction will be distorted, weak or, if the light beam is completely on or off the cell, the phonograph will be silent.

If any of these conditions exist, the following adjustment procedure should be made:—

NOTE—These adjustments should be made with the power line voltage at 118 volts A. C.

A. ADJUSTING WIDTH OF LIGHT BEAM

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 3/32" in width. The socket assembly is now rotated so that the spot of light is vertical.

B. POSITIONING THE LIGHT BEAM

To position the light beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

C. ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator No. 23 located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.

2. While the record is playing, turn compensator 23 in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

D. INSTALLING NEW LAMP

When installing a new lamp in the socket, there are two positions in which the lamp can be inserted. Ordinarily, either of these positions can be used. In some cases, however, due to the lamp filament being off center, the lamp must be inserted in the position that gives the best centering of the spot of light on the vibrating mirror.

ALIGNING R. F. AND I. F. COMPENSATORS

EQUIPMENT REQUIRED

1. **Signal Generator:** Covering the frequency range of the receiver, such as Philco Models 077 or 177.

2. **Aligning Indicator:** Either a vacuum tube voltmeter or an audio output meter may be used as an aligning indicator. Philco Models 027 and 028. Circuit testers contain both these meters.

3. **Tools:** Philco Fiber Screw Driver, Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Either a vacuum tube voltmeter or an audio output meter may be used as a signal indicator when adjusting the receiver.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate terminals of the 42 tubes. Adjust the meter for the 0 to 30 volt A. C. scale.

Signal Generator: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal 3 of the loop aerial terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the ground 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. If the chassis is to be aligned outside the cabinet the loop should be in the same relative position near the chassis as when assembled in the cabinet.

After connecting the aligning indicator, adjust the compensators in the order shown in the tabulation below. Locations of the compensators are shown in Figure 7. 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	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	High side to No. 4 terminal loop Panel.	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Position	57A, 52A, 52B, 51B, 51A	
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Broadcast	21, 10A	Note A
3	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch Broadcast	21A	Roll Tuning Condenser Note B
4	Use Loop on Generator	Repeat operation No. 2 again				
5	Use Loop on Generator	6 M. C.	6 M. C.	Range Switch "Police"	18B	Note C
6	Use Loop on Generator	12 M. C.	12 M. C.	Range Switch "S. W." 1	18A, 4A	Note D
7	Use Loop on Generator	18 M. C.	18 M. C.	Range Switch "S. W." 2	18, 4	Note E

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 Figure 4.

NOTE B — When adjusting the compensator, 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 maximum output reading is obtained.

NOTE C — Adjust compensator (18B) to the SECOND signal peak from the tight (closed) position.

NOTE D — Adjust compensator (18A) to the FIRST signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver dial at 12 M. C. and turn the signal generator to 11.090 M. C.

NOTE E — Adjust compensator (18) to the SECOND signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver at 18 M. C. and turning the signal generator to 18.910 M. C. When adjusting compensator (4) roll the tuning condenser, See Note "B" on how to roll the condenser.

SCHE. No.	DESCRIPTION	PART No.
1	Loop Aerial	76-1191
	Sleeve Mounting (2 required)	28-2257
	Sleeve Mounting (1 required)	56-1907
	Washer	28-4186
	Washer	W-151
	Washer	W-425
	Screw	W-288
2	Aerial Transformer (Broadcast)	32-3579
3	Aerial Transformer (Short Wave)	32-3581
4	Compensator (18 M. C.)	31-6391
4A	Compensator (12 M. C.) Part of 4	
5	Aerial Transformer (6 M. C.)	32-3580
5A	Mica Condenser (15 mmfd.)	60-015157
6	Mica Condenser (162 mmfd.)	30-1178
7	Mica Condenser (250 mmfd.)	60-125157
8	Resistor (2.2 megohms)	33-522339
9	Condenser (.05 mfd., 200 volts)	30-4519
10	Tuning Condenser	31-2507
	Coupling	31-2291
	Drive Cord (Tuning Drum)	31-2315
	Drive Cord (Pointer)	31-2316
	Drum and Shaft (Cable)	38-9716
10A	Comp. (1500 K. C., Aerial) Part of 10	
11	Condenser (Consists of Wire and Lug from 810 to D3)	
12	Oscillator Transformer (Short Wave)	32-3578
13	Oscillator Trans. (Police and Broadcast)	32-3582
14	Mica Condenser (2000 mfd.)	60-220324
15	Resistor (4700 ohms)	33-247339
16	Resistor (8200 ohms)	33-282339
17	Mica Condenser (185 mmfd.)	30-1197
18	Compensator (18 M. C.)	31-6362
18A	Compensator (13 M. C.) Part of 18	
18B	Compensator (6 M. C.) Part of 18	
19	Band Switch (R. F. Section)	42-1618
20	Mica Condenser (145 mmfd.)	30-1177
21	Compensator (Oscillator, 1500 K. C.)	31-6365
21A	Compensator (Oscillator, 580 K. C.)	
22	Oscillator Transformer (Supplies power to Phonograph Pick-up)	32-3527
23	Compensator (Adjusting Phonograph Pick-up Light)	31-6394
24	Mica Condenser (265 mmfd.)	31-1196
25	Mica Condenser (280 mmfd.)	60-125157
26	Resistor (15,000 ohms)	33-315339
27	Resistor (2000 ohms, Wirewound)	33-3405
28	R. F. Choke (Phonograph Circuit)	32-3401
29	Mica Condenser (250 mmfd.)	60-125157
30	Mica Condenser (265 mmfd.)	30-1196
31	Resistor (4700 ohms)	33-247339
32	Resistor (33,000 ohms)	33-333339
33	Mica Condenser (250 mmfd.)	60-125157
34	Resistor (330,000 ohms)	33-433339
34A	Resistor (220,000 ohms)	33-422339
35	Condenser (.05 mfd., 200 volts)	30-4519
36	Mica Condenser (250 mmfd.)	60-125157
37	Resistor (100,000 ohms)	33-410339
38	Compensator (Aerial—Push-buttons)	31-6367
39	Push-button Switch	42-1619
40	Compensator Strip (Remote Cont. Aerial)	31-6390
41	Push-button Comp. Strip (Oscillator)	31-6389
42	Oscillator Coil Assem. (Remote Control)	32-3563
	Coils (1-2-3-4)	32-3597
	Coils (5-8)	32-3041
	Iron Core	28-6916
	Coil Clip	28-8910
43	Remote Cont. & Push-button Tuning Lgts.	34-2064
	Socket Assembly	76-1145
	Light Cover	76-1146
44	Phonograph Relay (Remote Control) Complete with Switch	42-1621
44A	Changeover Switch	42-1647
45	Stepper Rotary Switch	42-1620
	Insulating Washer	27-7397
	Insulating Washer	27-8040
	Rubber Sleeve	4169
	Contact Arm	38-9764
	Drive Arm	38-9763
	Nut	28-6987
	Washer	W-467
46	Resistor (10 ohms)	33-010434
47	Resistor (10 ohms)	33-010434
48	Condenser (.01 mfd., 400 volts)	30-4572
49	Resistor (4700 ohms)	33-247339
50	Condenser (.01 mfd., 400 volts)	30-4572
51	1st I. F. Transformer	32-3493
52	2nd I. F. Transformer	32-3494
53	Resistor (330 ohms)	33-133336
54	Condenser (.05 mfd., 400 volts)	30-4518
54A	Condenser (.05 mfd., 400 volts)	30-4518
55	Condenser (.01 mfd., 400 volts)	30-4572
56	Resistor (120,000 ohms)	33-412339
57	3rd I. F. Transformer	32-3566
58	Condenser (100 mmfd.)	60-110157
59	Resistor (2.2 megohms)	33-522339
60	Resistor (1 megohm)	33-510339
61	Condenser (.01 mfd., 400 volts)	30-4572
62	Resistor (330,000 ohms)	33-433339
63	Mica Condenser (50 mmfd.)	60-050137
64	Resistor (68,000 ohms)	33-368339
65	Volume Control	33-5417
	Drive Pulley	56-6111
	Set Screw	W-2105
66	Condenser (.01 mfd., 400 volts)	30-4572
67	Condenser (.01 mfd., 400 volts)	30-4572
68	Resistor (100,000 ohms)	33-410339
69	Condenser (.002 mfd., 400 volts)	30-4579
70	Condenser (.05 mfd., 400 volts)	30-4519
71	Resistor (3300 ohms)	33-233339
72	Resistor (220,000 ohms)	33-422339
73	Condenser (200 mmfd.)	60-120137
74	Resistor (470,000 ohms)	33-447339
75	Tone Control	33-5325
76	Resistor (10 megohms)	33-610339
77	Resistor (4.7 megohms)	33-547339
78	Condenser (.01 mfd., 400 volts)	30-4572
79	Condenser (250 mmfd.)	60-125157
80	Resistor (330,000 ohms)	33-433339
81	Condenser (.006 mfd., 400 volts)	30-4591
82	Condenser (.01 mfd., 400 volts)	30-4572
83	Resistor (470,000 ohms)	33-447339
84	Resistor (4700 ohms)	33-247339
85	Resistor (47,000 ohms)	33-347339
86	Condenser (.01 mfd., 400 volts)	30-4572
87	Condenser (.1 mfd.)	30-4586
88	Resistor (270,000 ohms)	33-427339
88X	Resistor (47,000 ohms)	33-347339
89	Resistor (470,000 ohms)	33-447339
90	Resistor (470,000 ohms)	33-447339
91	Condenser (.01 mfd., 400 volts)	30-4572
92	Condenser (.01 mfd., 1000 volts)	30-4381
93	Output Transformer	32-8138
94	Cone Assembly (For Spkr. 36-1530-4)	36-4181
95	Condenser (.01 mfd., 1000 volts)	30-4381
96	Socket (Home Recording Unit)	27-6150
	Shunt Plug Assembly	76-1103
97	Resistor (33,000 ohms)	33-333439
98	Electrolytic Condenser (8 mfd.)	30-2473
99	Field Coil (Replace Speaker 36-1530)	
100	Electrolytic Cond. (125 mfd., 300 volts)	30-2380
101	Resist. (Wirewound, 148-27-14-13 ohms)	33-3364
102	Electrolytic Cond. (18 mfd., 475 volts)	30-2200
	Insulator	27-8800
103	Pilot Lamp	34-2064
104	Resistor (10 ohms, Cabinet Jewel)	33-010339
105	Pilot Lamp (Push-buttons)	34-2064
106	Pilot Lamp (Cabinet Jewel)	34-2210
107	Power Transformer (115 volts, 60 cycle)	32-8137
108	Power Line Condenser (Inside Plug of Power Cord)	
109	Vol. Cont. Mtr. & Gear Train Complete	35-1237
	Drive Belt	27-9770
	Drive Pulley	56-6111
	Adjusting Bracket	56-2014
110	Electrolytic Condenser (30 mfd.)	30-2361
111	Remote Control Stepper Unit Complete	76-1144
111A	Stepper Contact Wafer	38-9761
111B	Stepper Relay Coils (Holding Coil)	38-9821
	Stepper Relay Coil (Stepping Coil)	38-9823
111C	Stepper Mounting Switch	38-9760
	Rubber Cushion (Bottom of Stepper)	27-4789
	Rubber Liner (Ends)	27-4800
	Rubber Liner (Top)	27-4801
	Rubber Liner (Side)	54-4041
	Cover	76-1160
112	Filter Choke (Spark Filter, Stepper Unit)	32-3276
112A	Filter Choke (Part of 112)	
112B	Condenser (.05 mfd., 200 volts)	30-4444
112C	Condenser (.05 mfd., 200 volts)	30-4444
112D	Resistor (100 ohms)	33-110339
°	Spark Filter Complete, consisting of 112, 112A, 112B, 112C, 112D	38-9898
113	Condenser	3615050
114	Resistor (Wirewound, 150 ohms)	33-3362
115	Condenser (16 mfd., 150 volts)	30-2387
116	Condenser (.05 mfd., 400 volts)	30-4518
117	Condenser (.05 mfd., 400 volts)	30-4518
118	Spark Filter Choke Coil	32-1281
119	Condenser (.5 mfd., 200 volts)	30-4590
120	Condenser (.1 mfd., 200 volts)	30-4586
121	Resistor (3900 ohms)	33-239334
122	Resistor (47,000 ohms)	33-347339
123	Condenser (.05 mfd., 400 volts)	30-4518
124	3rd Control Amplifier Transformer	32-3275
125	Resistor (680,000 ohms)	33-468339
126	Condenser (.02 mfd., 400 volts)	30-4516
127	Resistor (2700 ohms)	33-227339
128	Resistor (120,000 ohms)	33-412339
129	Condenser (.1 mfd., 200 volts)	30-4586
130	Condenser (.05 mfd., 400 volts)	30-4518
131	Resistor (100,000 ohms)	33-410339
132	Resistor (150,000 ohms)	33-415339
133	Resistor (1.5 megohms)	33-515339
134	Condenser (.05 mfd., 400 volts)	30-4518
135	Condenser (.05 mfd., 200 volts)	30-4519
136	2nd Control Amplifier Transformer	32-3087
137	Condenser (.05 mfd., 400 volts)	30-4518
138	Condenser (.05 mfd., 200 volts)	30-4519
139	Resistor (15,000 ohms)	33-315339
140	Resistor (330 ohms)	33-133336
141	1st Control Amplifier Transformer	32-3086
142	Secondary Indicator	76-1159
143	Compensator (Secondary Inductor)	31-6268
144	Mica Condenser (Secondary Inductor)	30-1198
145	Record Changer Cable and Plug Assembly (Chassis)	41-3806
146	Power Cable and Plug Assembly (Record Changer)	41-3560
147	Reject Relay (Part of Changer)	42-1631
148	Power Cycling Switch (Record Changer)	42-1633
149	Radio Recording Power Sw. (Rec. Chngr.)	42-1632
150	Record Changer Motor (115 volts, 60 c.)	35-1272
	Record Changer Motor (115 volts, 50 c.)	35-1273
151	Recording Lamps	34-2432
152	Light Beam Pick-up Complete	35-2209
153	Phono. & Home Recording Input Trans.	32-8148
154	Reject Cycling Switch	42-1830

WIRELESS REMOTE CONTROL UNIT

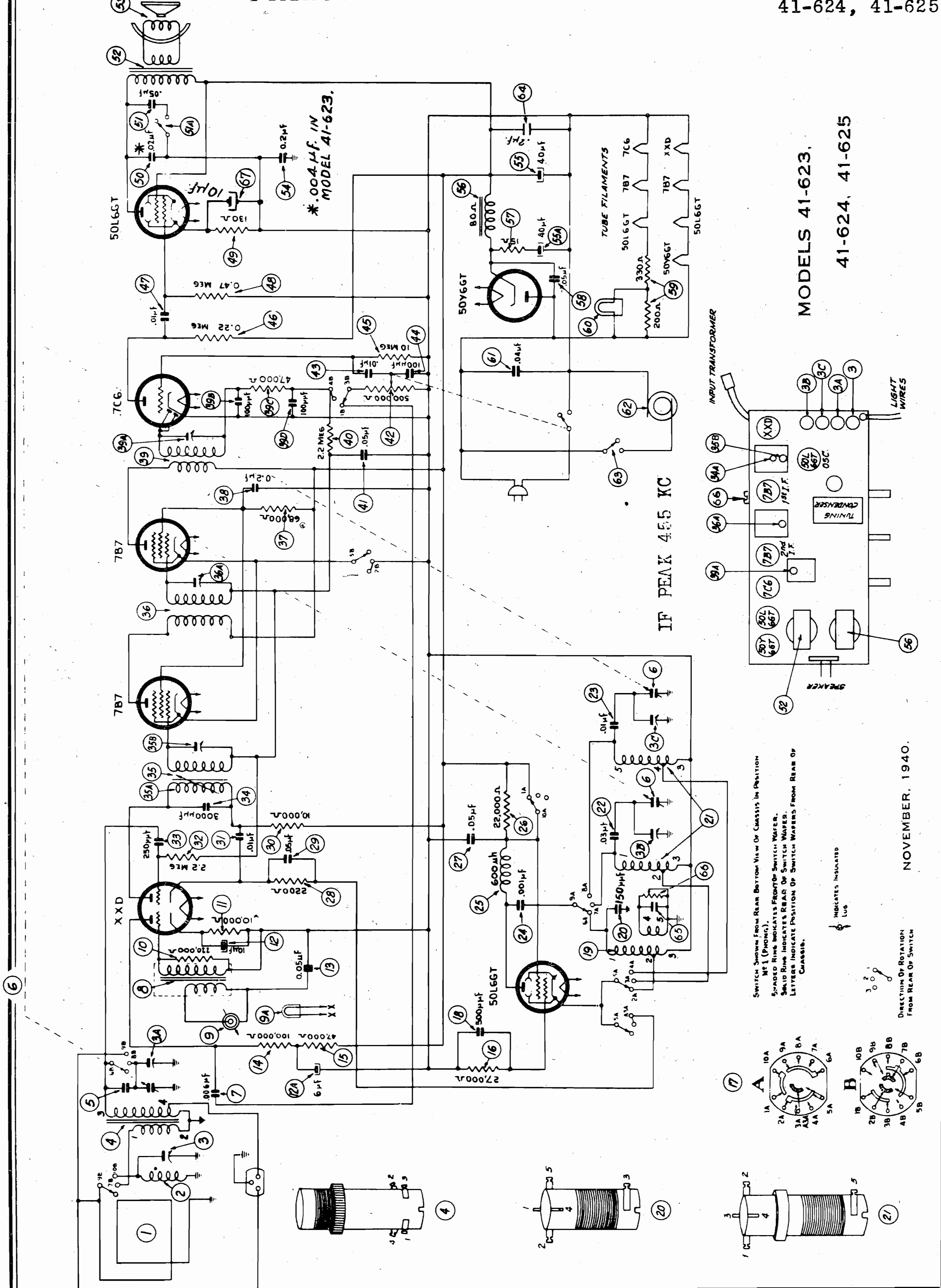
SCHE. No.	DESCRIPTION	PART No.
155	Primary Inductor	32-3097
156	Mica Condenser (200 mmfd.)	30-1115
157	Compensator	31-6268
158	Pulser Unit (Complete)	38-9704
159	Condenser (.05 mfd.)	30-4519
160	Resistor (500 ohms)	33-150339
161	Remote Control Battery Pack	41-8023
	Bezel (Remote Unit)	56-1240
	Dial Tuning Disc	27-4792
	Dial Cap	27-4793
	Finger Stop	27-4794
	Screw	W-2139
	Spacer	27-4795
	Socket (Tube)	27-6119
	Cable (Battery)	41-3447

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Automatic Record Changer (115 v., 50 c.)	35-1264
Automatic Record Changer (115 v., 60 c.)	35-1260
Rubber Cushion (Mounting Changer)	54-4034
Washer	28-3541
Spring	28-8970
Bolt	W-2226
Nut	W-98
Band Indicator Scale	27-5608
Bezel	40-6628
Screw	W-2073
Cabinet (Walnut)	10516A
Cabinet (Mahogany)	10516B
Cable (Phono Input)	41-3554
Cable (Phono Pick-up Light)	41-3607
Cable (Record Changer)	41-3606
Cable (Speaker)	41-3595
Cable (Station Lights to Rotary Switch)	41-3598
Cable (Oscillator Circuit—P. B. Switch to Rotary Switch)	41-3599
Cable (Aerial Circuit—P. B. Switch to Rotary Switch)	41-3600
Cable (Phono Input to 7C7)	L-3268
Cable (7C7 to Phono Switch)	L-3269
Cable (Volume Control to 7C6)	L-3270
Cable (Volume Control to Phono Switch)	L-3271
Cable (I. F. to Phono Switch)	L-3272
Cord (Power)	L-3176
Dial Scale	27-5658
Pointer	56-1033
Clamp (Dial)	56-1034
Control Drum (Volume)	54-4024
Control Drum (Tone Control)	27-4784
Control Drum (Tuning)	27-4786
Control Drum (Wave Switch)	27-4984
Shaft (Control Drums, Left Hand)	28-6924
Shaft (Control Drums, Right Hand, Includes Band Light Shield)	76-1073
Shaft Bearing	56-1036
Bracket (Left Hand Controls)	56-1983
Bracket (Right Hand Controls)	56-1984
Jewel (Pilot Lamp)	27-4777
Knobs (Push-buttons)	54-4009
Socket (Octal Tubes)	27-6058
Socket (Loktal, Oscillator Tube)	27-6129
Socket (Loktal, Bakelite)	27-6131
Socket (Three Prong Aerial)	27-6145
Socket Assembly Dial Lamp)	38-9711
Socket Assembly (Cabinet)	38-9712
Socket Assembly (Band Indicator)	38-9825
Sleeve (Tuning Unit Mounting)	28-2257
Sleeve (Push-button Switch Mounting)	28-3806
Spring (Tilt Front)	28-8982
Spring (Tilt Front)	28-8983
Speaker (Walnut Cabinet)	36-1515
Speaker Mahogany Cabinet)	36-1530
Terminal Panel (Indicator Loop)	38-6533
Tab (Television)	27-5648
Tab (Remote)	27-5665
Tab (Phono)	27-5666
Tab (Kit)	40-6595

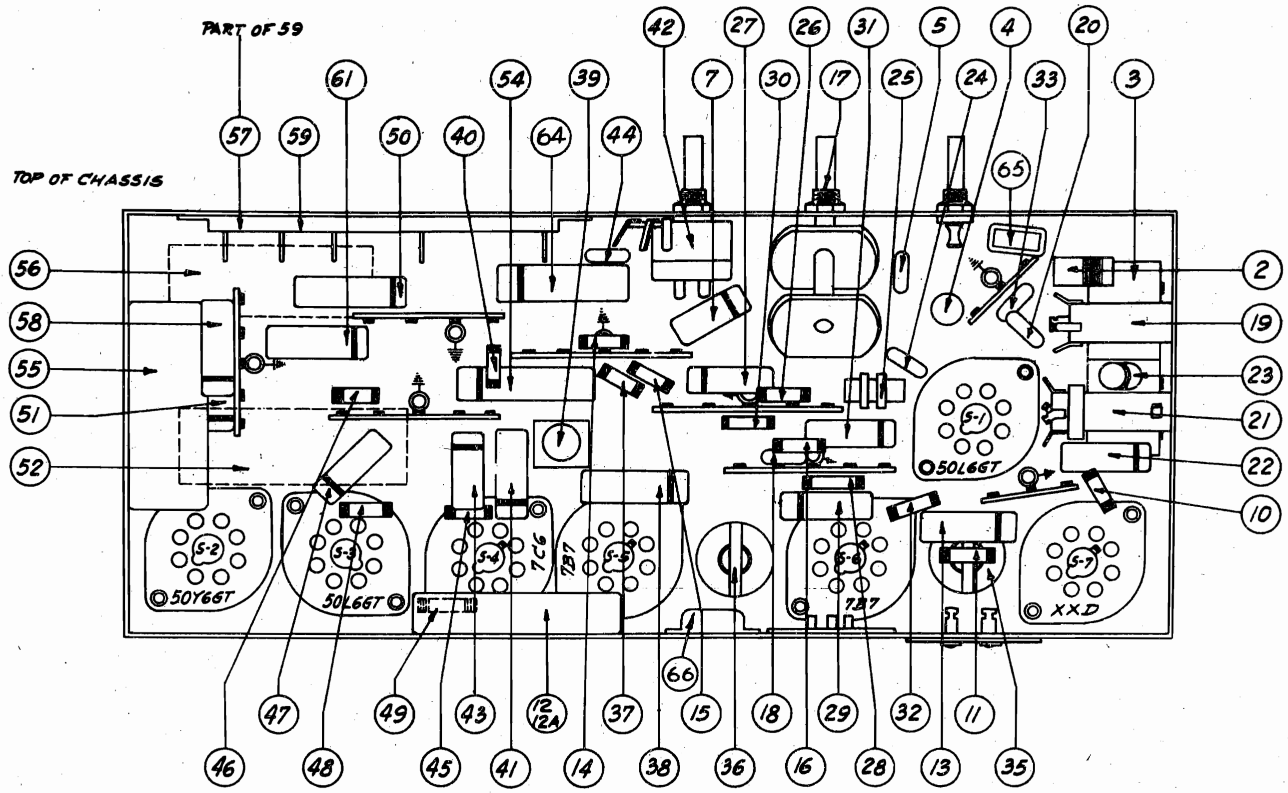
PHILCO RADIO & TELEVISION CORP.

MODELS 41-623, 41-624, 41-625



MODELS 41-623
41-624, 41-625

PHILCO RADIO & TELEVISION CORP.



PART LOCATIONS — UNDERSIDE OF CHASSIS

Models 41-623, 41-624, 41-625 are radio phonograph combinations which are similar in design with the exception of the cabinets, phonograph mechanism and speaker.

CONNECTING ALIGNING INSTRUMENTS

When aligning the R. F. padders a loop aerial is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

Signal Generator. When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

A. ADJUSTING WIDTH OF LIGHT BEAM

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 5/32" in width. The socket assembly is now rotated so that the spot of light is vertical.

B. POSITIONING THE LIGHT BEAM

To position the light beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

C. ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator 66 located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 66 in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcst.	39A, 36A, 35A, 35B	Note A
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcst.	3B	Note B
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcst.	3A	
4	Loop see above instructions	12 M. C.	12 M. C.	Range Switch "S. W."	3C, 3	Roll (3) for Max. Note C

NOTE A: — To adjust the I. F. circuit properly, compensators 36A, 35A and 35B should be depadded first. All compensators are then adjusted to maximum in the order 39A, 36A, 35A and 35B.

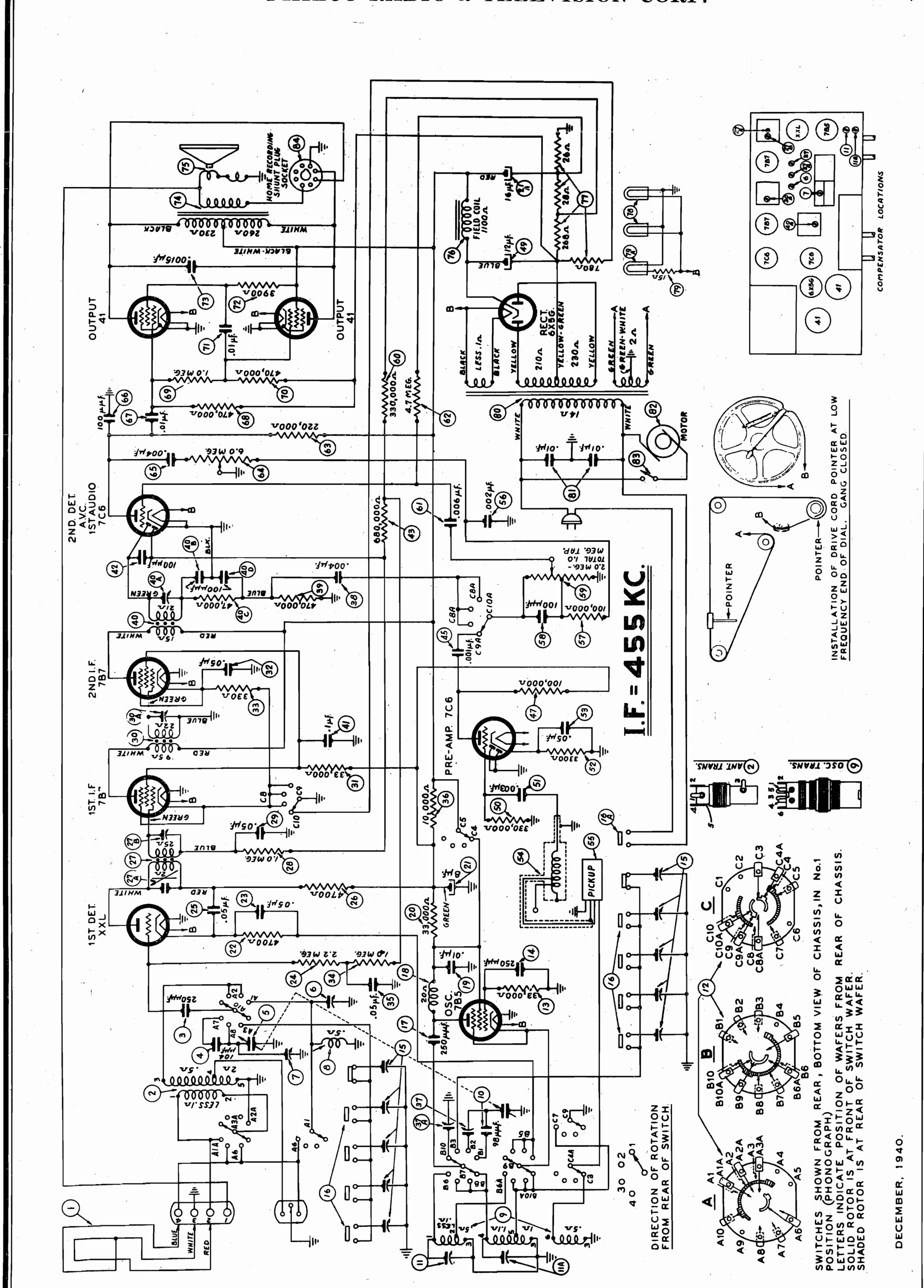
NOTE B: — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 550 K. C.

NOTE C: — When adjusting oscillator compensator 3C, tune for maximum on the first signal peak from Tight position (compensator closed).

When adjusting the aerial padder 3 of the high frequency tuning range; 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 maximum output reading is obtained.

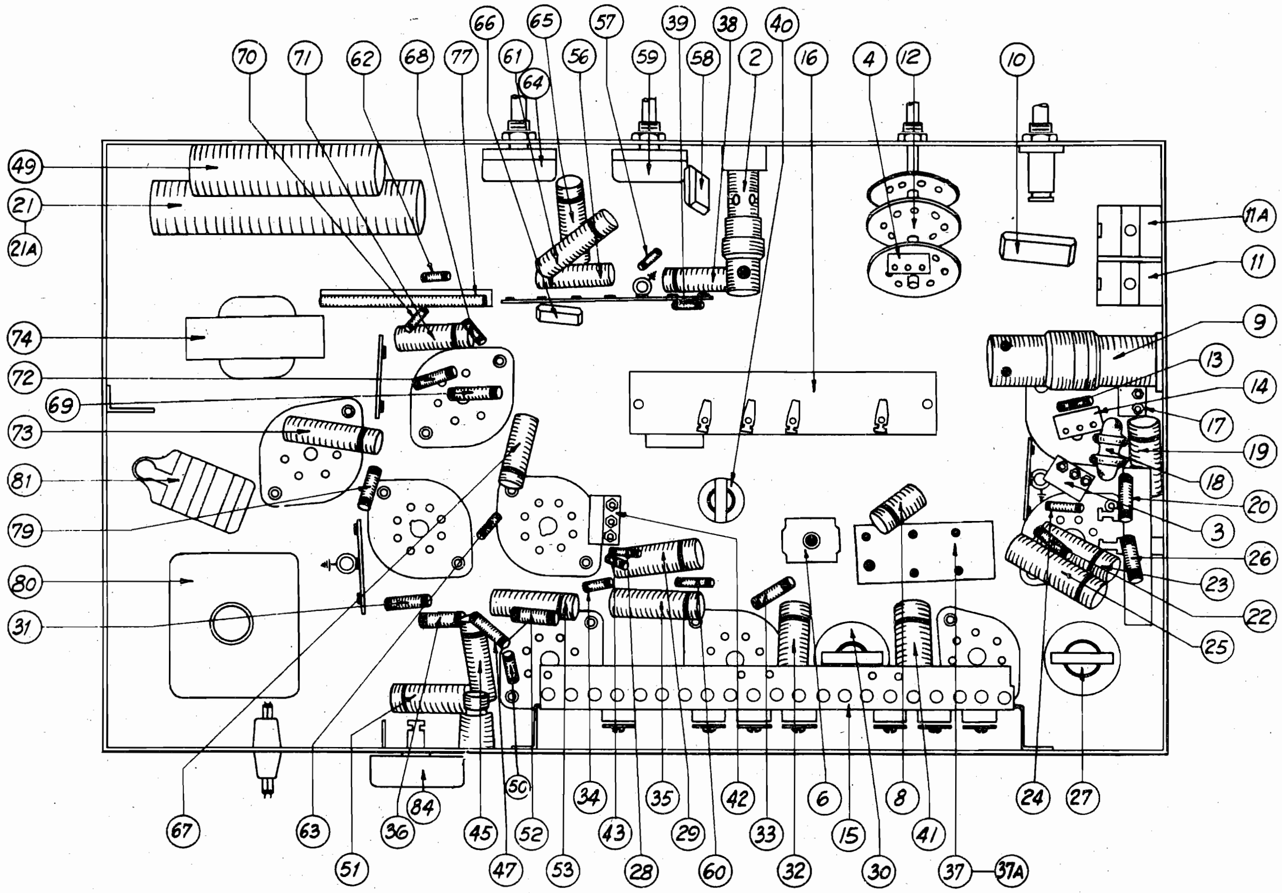
PHILCO RADIO & TELEVISION CORP.

MODEL 41-629(121)



MODEL 41-629 (121)

PHILCO RADIO & TELEVISION CORP.



PART LOCATIONS — UNDERSIDE OF CHASSIS

C. ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator No. 37A located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 37A in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

Signal Generator. When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser Connect the ground or low side of the generator to the chassis

When aligning the R. F. padders a loop aerial is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond. with .1 mfd. Cond.	455 K. C.	Tuning Cond. Closed	Vol. Max. Bands Switch S. W.	27A, 27B 30A, 40A	Note A
2	Loop Signal Generator	1720 K. C.	1720 K. C.	Bands Switch "Brdcst"	11A	Note B
3	Loop Signal Generator	1500 K. C.	1500 K. C.	Bands Switch "Brdcst"	7	
4	Loop Signal Generator	580 K. C.	580 K. C.	Bands Switch "Brdcst"	37	Roll comp. to "max." Recheck Operation No. 2
5	Loop Signal Generator	12 M. C.	12 M. C.	Bands Switch S. W.	11, 6	Note C

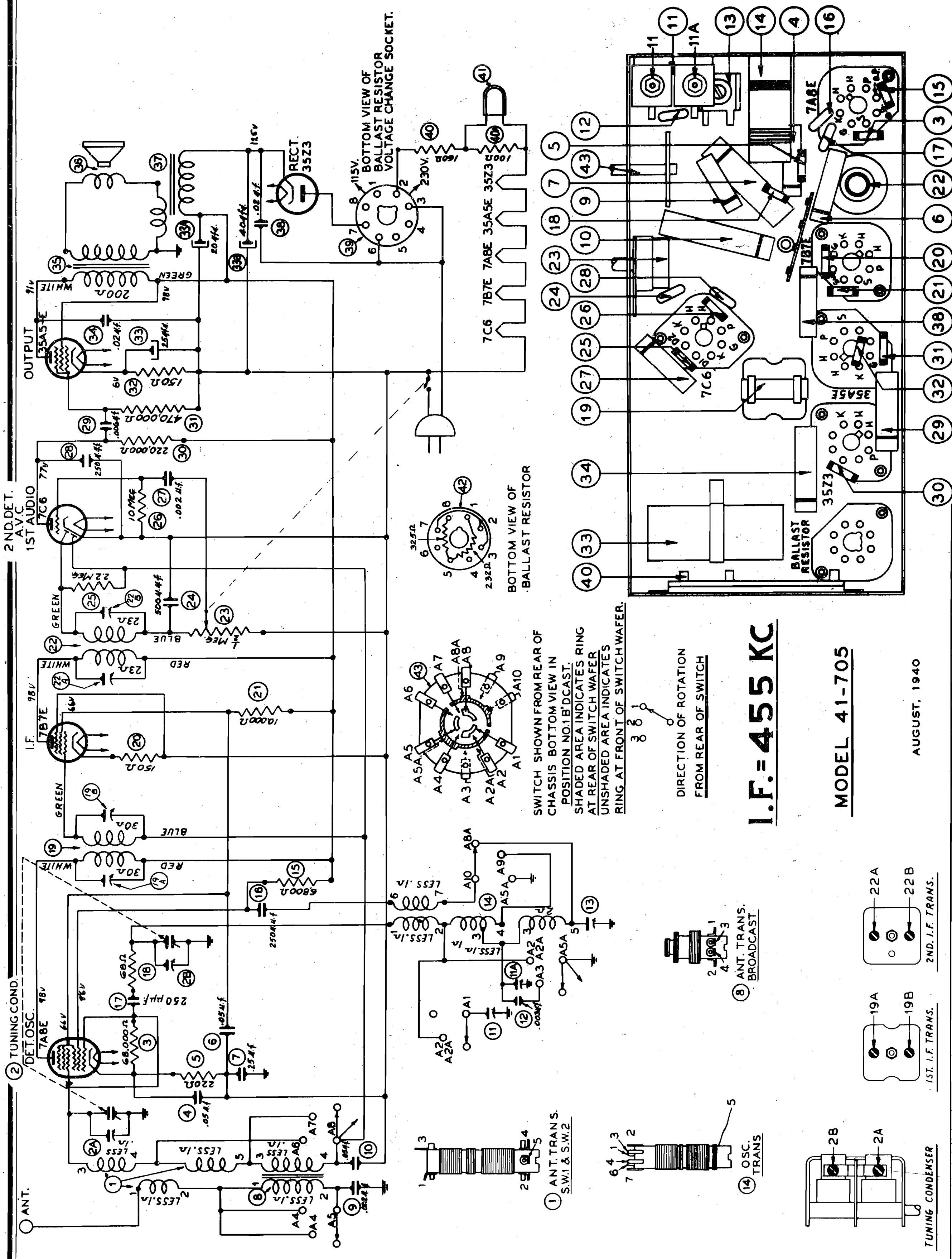
NOTE A — Compensator (27A) must be adjusted before compensator (27B) and should be done in the following manner: Turn (27A) all the way up, then turn down selecting the first I. F. peak, compensator (27B) is now padded to maximum.

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, set the tuning pointer on the extreme left index line at the lowest frequency end of the broadcast scale.

NOTE C — Adjust padder (11) to the first signal peak from the tight position. Roll padder (6) slowly to maximum on the second peak from loose position.

PHILCO RADIO & TELEVISION CORP.

MODEL 41-705



MODELS 41-705
41-708

PHILCO RADIO & TELEVISION CORP.

CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the vacuum tube voltmeter through a 2 megohm resistor to any point in the circuit where the A. V. C. voltage can be measured.
2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 35A5E tube, Model 41-705; 7B5E, Model 41-708. Adjust the meter for the 0 to 30 volt A. C. scale.

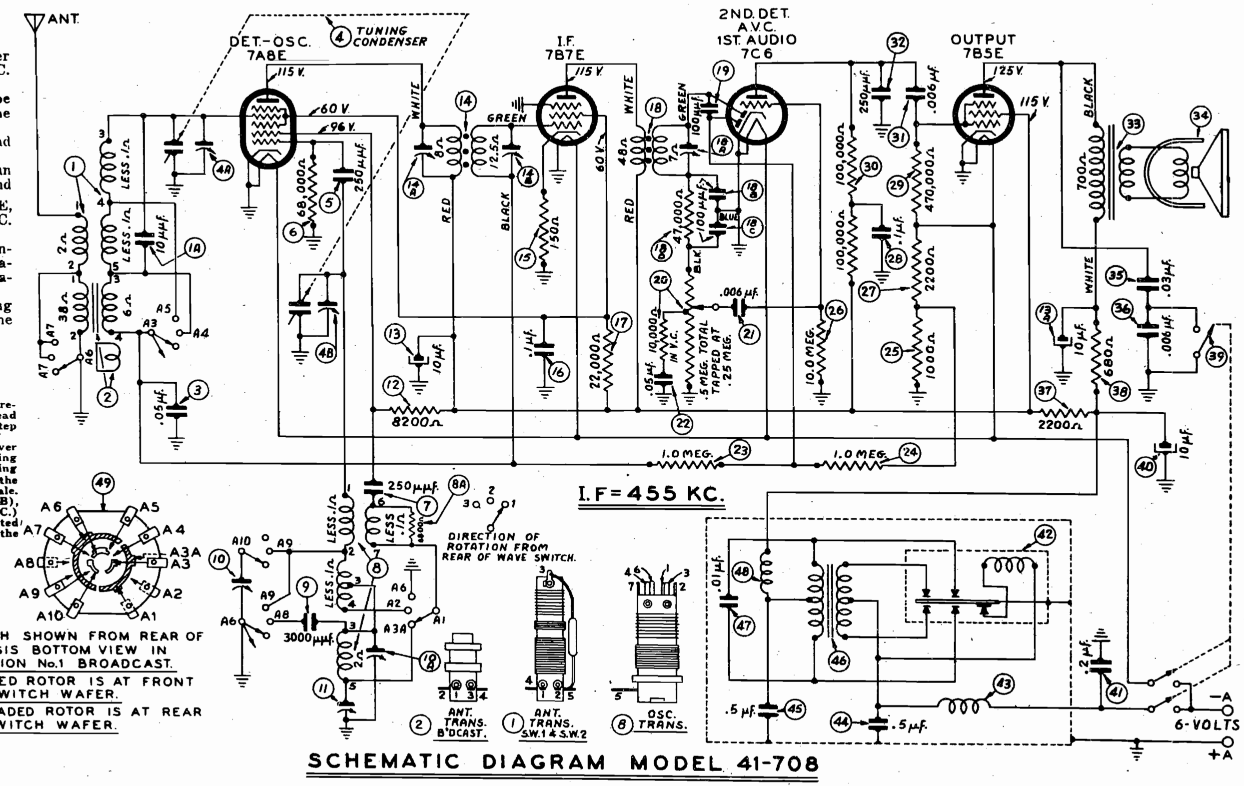
After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below: Locations of the compensators are shown in the schematic diagrams and part locations.

If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

NOTE A — The "Dummy Antenna" consists of a condenser or resistance 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: With the tuning condenser closed (maximum capacity) set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (4B), Model 41-708; (2B), Model 41-705 be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 20,090 M. C.



NOTE

SWITCH SHOWN FROM REAR OF CHASSIS BOTTOM VIEW IN POSITION No.1 BROADCAST.

SHADED ROTOR IS AT FRONT OF SWITCH WAFER.

UNSHADED ROTOR IS AT REAR OF SWITCH WAFER.

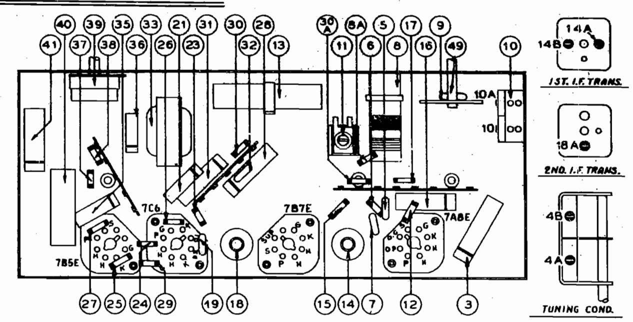
SCHEMATIC DIAGRAM MODEL 41-708

Models 41-705, 41-708

ALIGNING R. F. AND I. F. COMPENSATORS

The procedure is the same for both models.

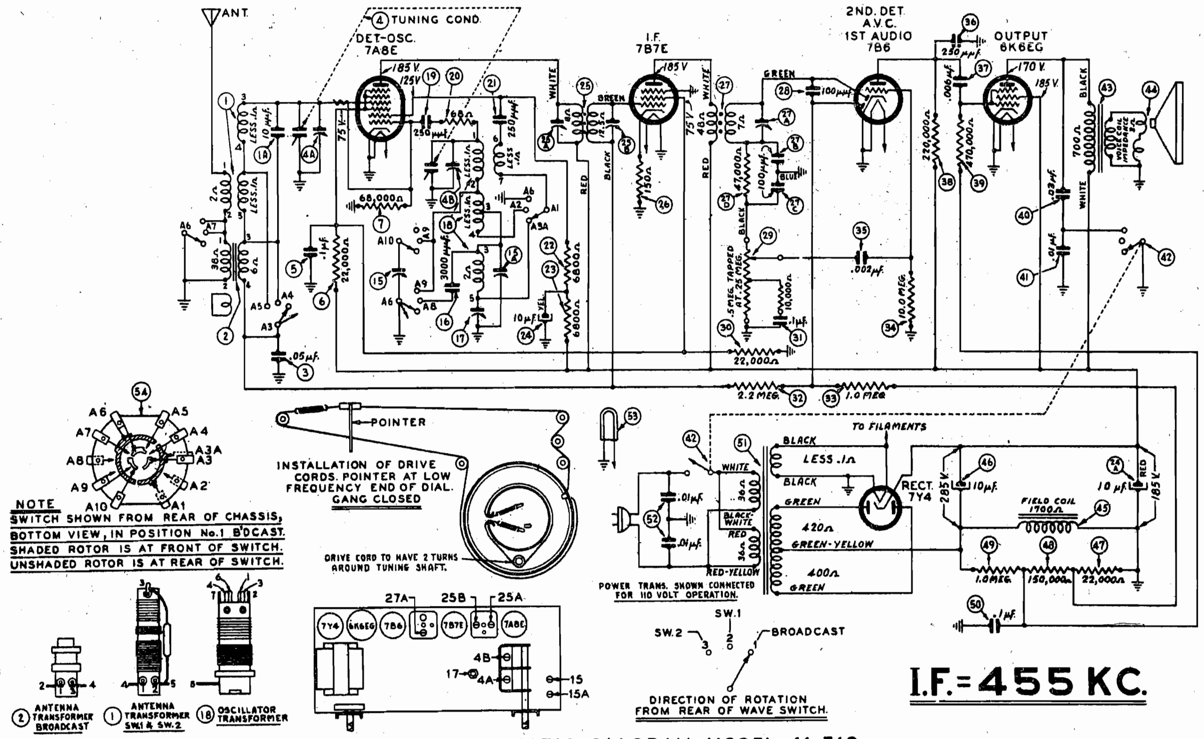
Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dummy Antenna Note A	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Settings	RECEIVER: Adjust Compensators 41-705	RECEIVER: Adjust Compensators 41-708	SPECIAL INSTRUCTIONS
1	Lug of Ant. Tuning Condenser Front Section	.1 mfd.	455 K. C.	580 K. C.	Range Switch Broadcast (Position 1) Vol. Max.	19A, 19B 22A, 22B	14A, 14B 18A	
2	Ant. Lead	400 ohms	21 M. C.	21 M. C.	Range Switch S. W. Position 3	2B, 2A	4B, 4A	Note B Note C
3	Ant. Lead	400 ohms	6.0 M. C.	6.0 M. C.	Range Switch S. W. Position 2	11	10	Roll Gang
4	Ant. Lead	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch Broadcast Position 1	11A	10A	Roll Gang
5	Ant. Lead	200 mmfd.	580 K. C.	580 K. C.	Range Switch Broadcast Position 1	13	11	Roll Gang



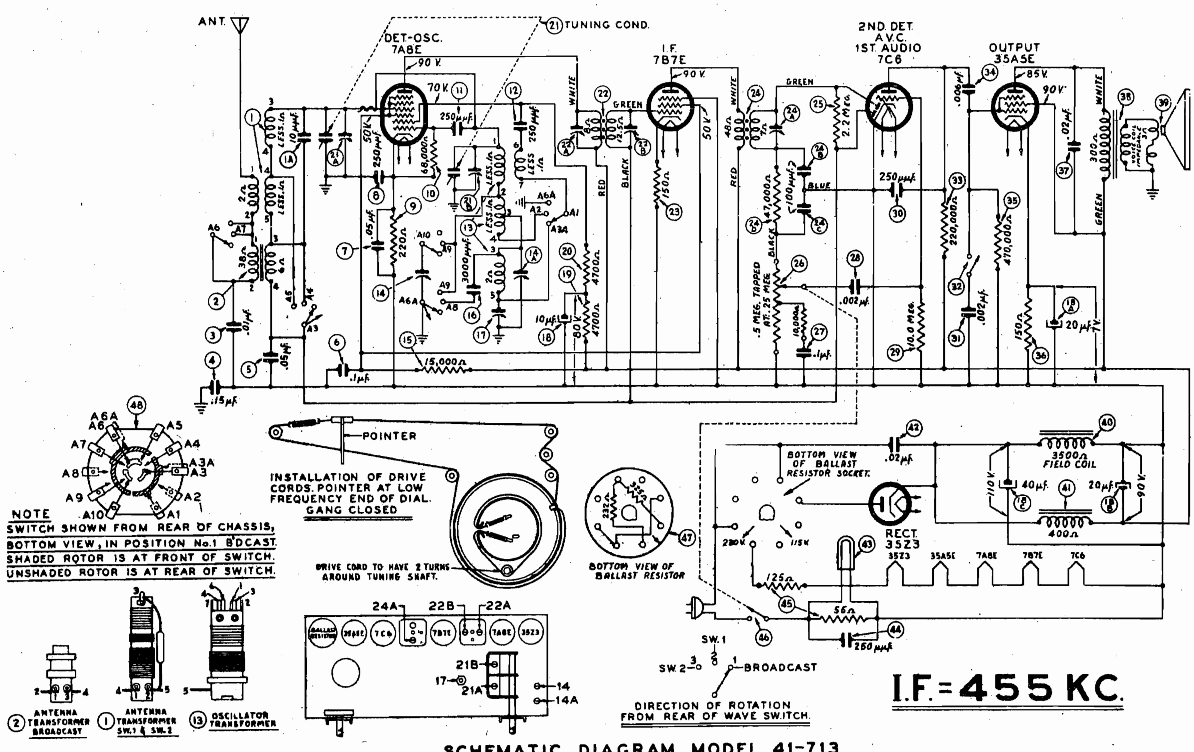
PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-708

PHILCO RADIO & TELEVISION CORP.

MODEL 41-712
MODEL 41-713



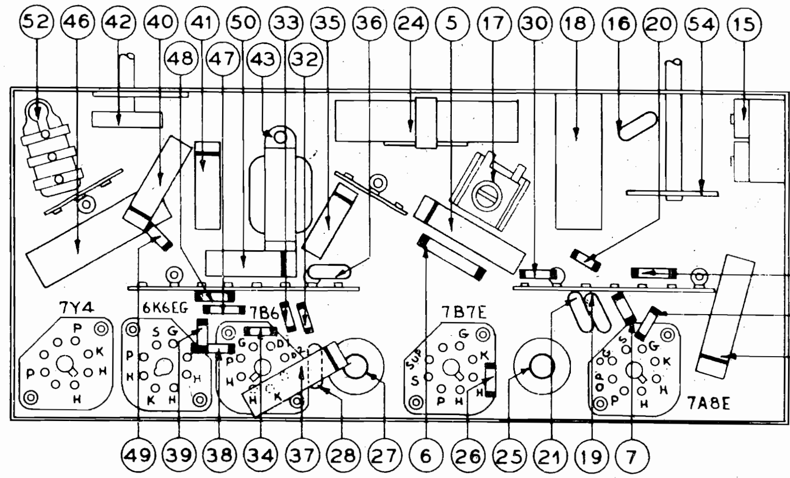
SCHEMATIC DIAGRAM MODEL 41-712



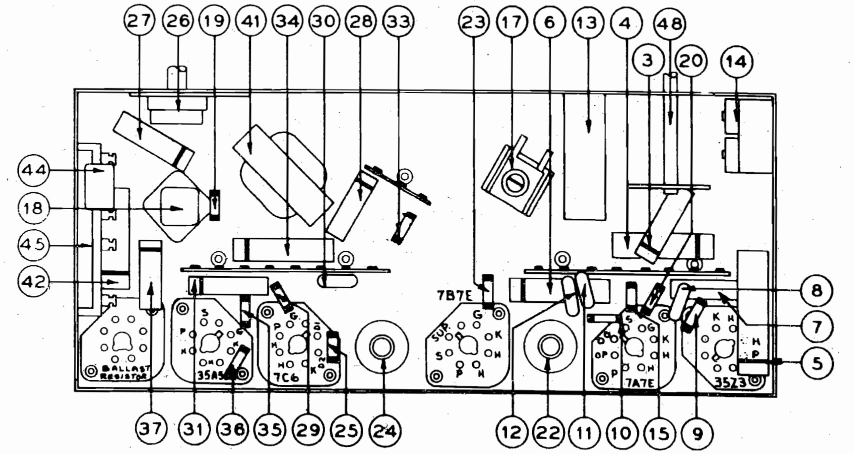
SCHEMATIC DIAGRAM MODEL 41-713

MODEL 41-712
MODEL 41-713

PHILCO RADIO & TELEVISION CORP.



PART LOCATIONS — UNDERSIDE OF 41-712 CHASSIS



PART LOCATIONS — UNDERSIDE OF 41-713 CHASSIS

CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the vacuum tube voltmeter through a 2 megohm resistor to any point in the circuit where the A. V. C. voltage can be measured.
2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 6K6EG tube, Model 41-712; 35A5E Model 41-713. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in the schematic diagram.

If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Models 41-712, 41-713

Operations in Order	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 41-712	RECEIVER: Adjust Compensators 41-713	SPECIAL INSTRUCTIONS
1	Lug of Ant. Tuning Condenser Front Section	.1 mfd.	455 K. C.	580 K. C.	Range Switch Broadcast (Position 1) Vol. Max.	25A, 25B 27A	22A, 22B 24A	
2	Ant. Lead	400 ohms	21 M. C.	21 M. C.	Range Switch S. W. Position 3	4B, 4A	21B, 21A	Note B Note C
3	Ant. Lead	400 ohms	6.0 M. C.	6.0 M. C.	Range Switch S. W. Position 2	15	14	Roll Gang
4	Ant. Lead	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch Broadcast Position 1	15A	14A	Roll Gang
5	Ant. Lead	200 mmfd.	580 K. C.	580 K. C.	Range Switch Broadcast Position 1	17	17	Roll Gang

NOTE A — The "Dummy Antenna" consists of a condenser or resistance 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.

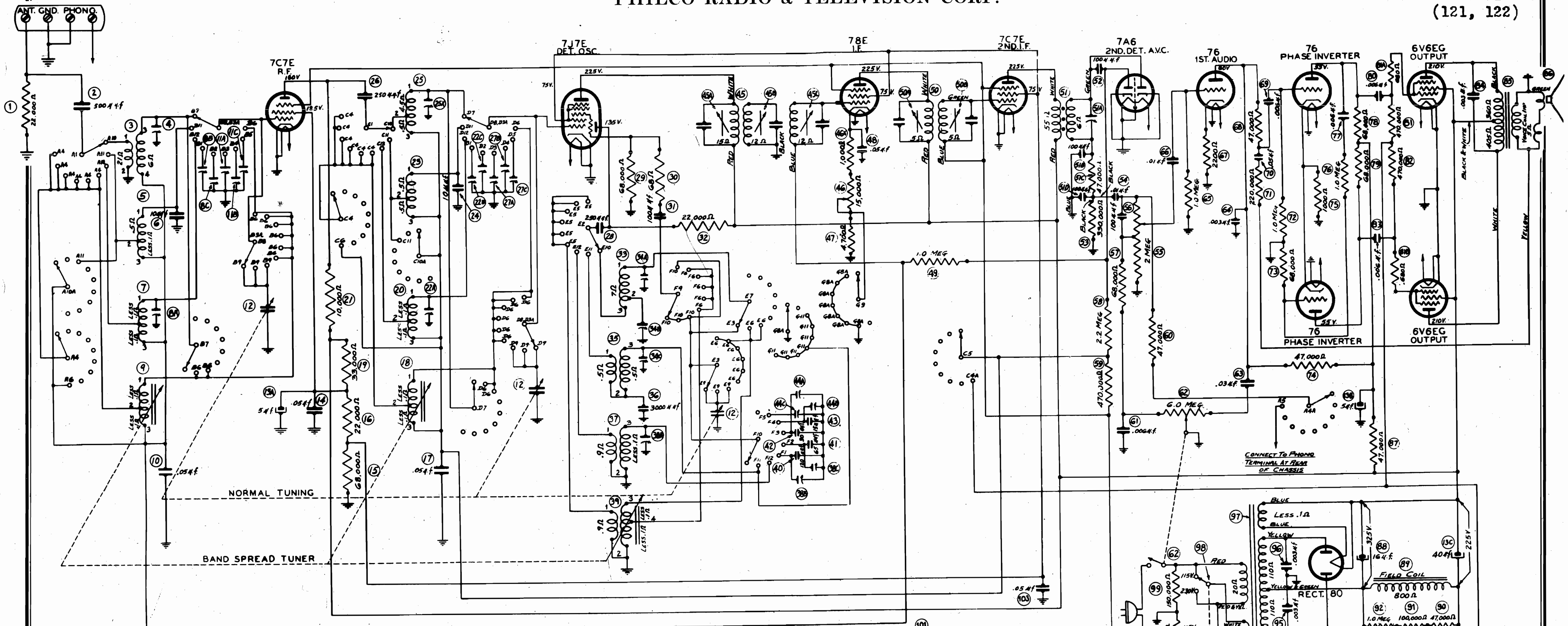
NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity) set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (4B) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted the image signal will be found by turning signal generator dial 910 K. C. below the fundamental signal, which will be 20,090 M. C.

AUGUST, 1940

PHILCO RADIO & TELEVISION CORP.

MODEL 41-788
(121, 122)

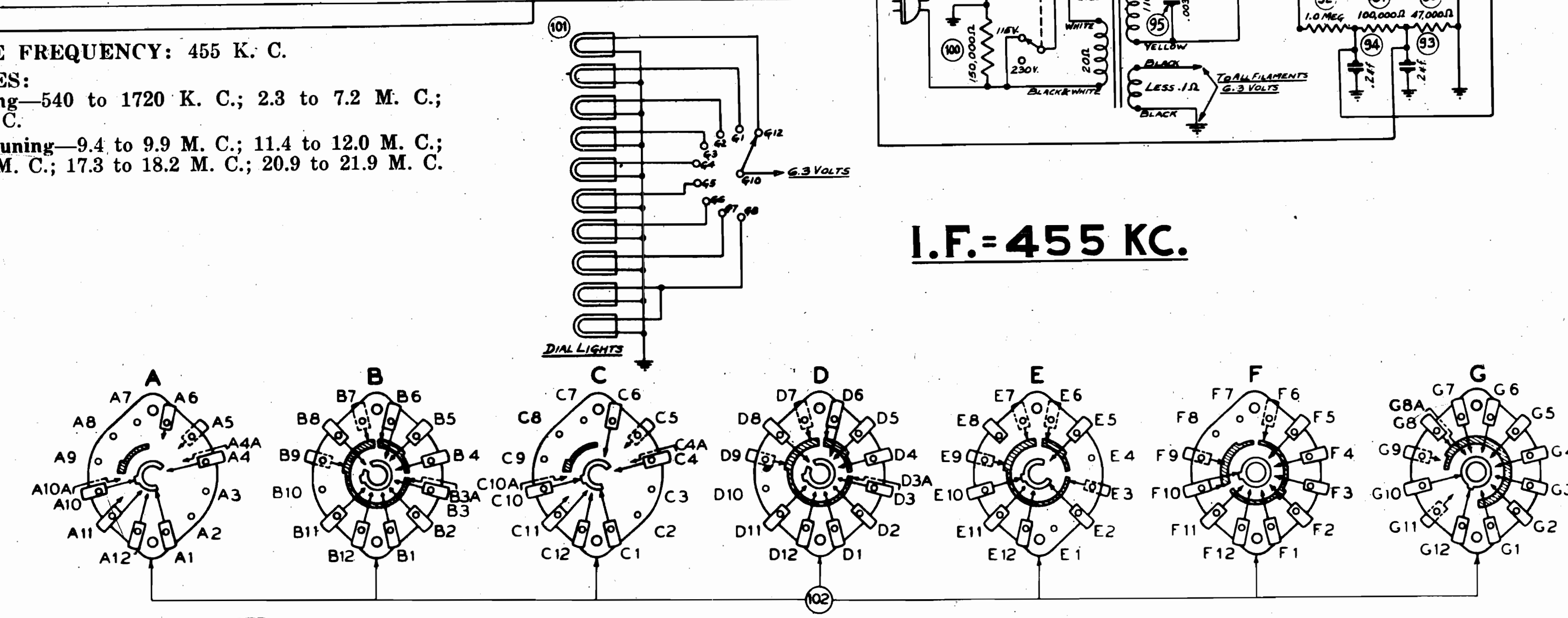


The code numbers (121, 122) of this model refer to the manner in which the power supply is connected for shipment. Code 121 is shipped with the voltage change switch in the 230 volts, 60 cycle A. C. position. Code 122 is shipped with the switch in the 115 volts, 60 cycle A. C. position.

POWER SUPPLY: 115 or 230 volts A. C., 50 to 60 cycle, 90 watts.

INTERMEDIATE FREQUENCY: 455 K. C.

TUNING RANGES:
Standard Tuning—540 to 1720 K. C.; 2.3 to 7.2 M. C.; 7.2 to 22 M. C.
Spread Band Tuning—9.4 to 9.9 M. C.; 11.4 to 12.0 M. C.; 14.8 to 15.6 M. C.; 17.3 to 18.2 M. C.; 20.9 to 21.9 M. C.



I.F.=455 KC.

JULY, 1940

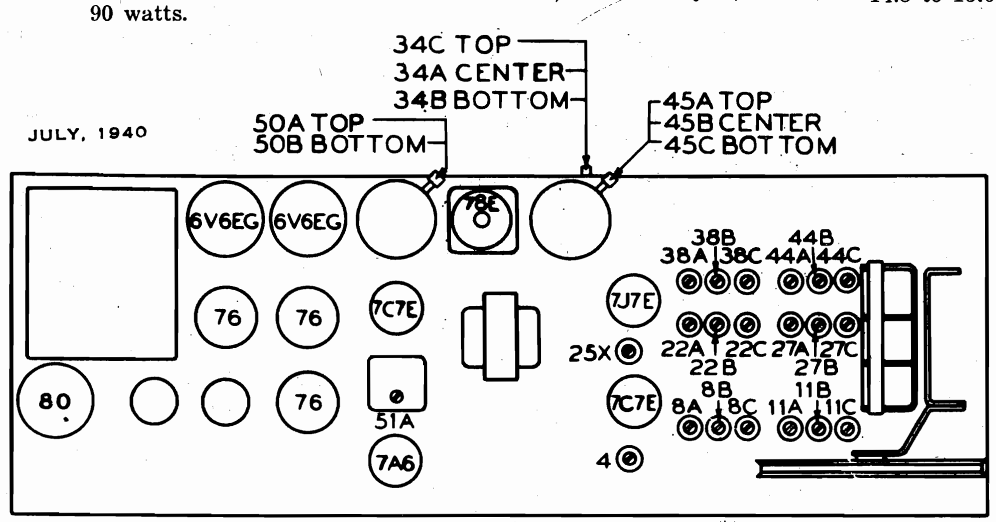


FIG. 6—TUBE AND COMPENSATOR LOCATIONS, TOP OF CHASSIS

NOTE: SWITCHES SHOWN FROM REAR BOTTOM VIEW OF CHASSIS, IN POSITION NO.1 BROADCAST. SHADED ROTOR IS AT FRONT OF SWITCH WAFER. UNSHADED ROTOR IS AT REAR OF SWITCH WAFER. LETTER INDICATES POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS.

PHILCO RADIO & TELEVISION CORP.

MODEL 41-788
(121, 122)

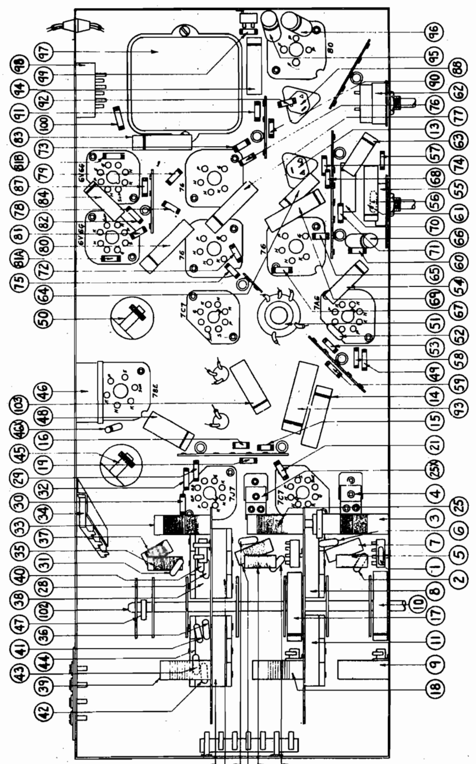


FIG. 4 — PART LOCATIONS, UNDERSIDE OF CHASSIS

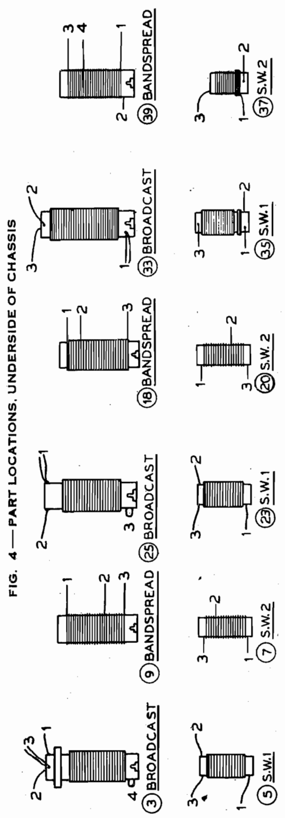


FIG. 5 — R. F. TRANSFORMER WIRING LOCATIONS

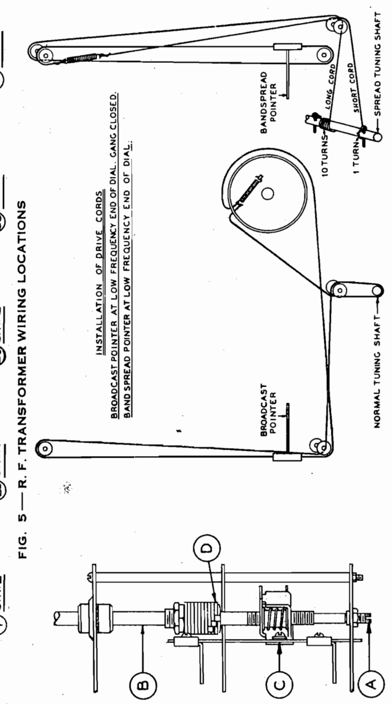


FIG. 1 — BAND SPREAD TUNING MECHANISM

FIG. 2 — INSTALLING TUNING DRIVE CORDS

ADJUSTING NORMAL TUNING RANGES

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	Tuning Condenser Stator Lug Middle Section	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Band Selector "Brdcst"	45A, 45C, 50A, 50B, 51A	Note D
2	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Band Selector "Brdcst"	34A, 25X, 4	Note B
3	Antenna and Ground	200 mmfd.	580 K. C.	580 K. C.	Vol. Max.	34B	Roll Gang
4	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max.	34A, 25X, 4	
5	Antenna and Ground	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Band Selector "S.W.1"	34C	Roll Gang
6	Antenna and Ground	400 ohms	20 M. C.	20 M. C.	Vol. Max. Band Selector "S.W.2"	38A, 22A, 8A	Note C

ADJUSTING BAND SPREAD TUNING RANGES

MECHANICAL ADJUSTMENTS: Before the padders of the band spread tuning ranges are adjusted, the iron cores of the antenna, R. F. and Oscillator transformers must be mechanically set as follows:

1. Turn the band spread tuning control to the extreme clockwise position (highest frequency).
2. Adjust location of "antenna" and "R. F." iron cores so that the end of the iron core is 1/32" inside the end of the transformer. This is done by loosening the screw which holds the iron core bracket and then sliding the bracket until the correct dimension is obtained.
3. The Oscillator transformers and Iron cores are adjusted in the same manner as given for antenna and R. F. Transformer in operation "2" above, except that the end of the iron core is .24" beyond the end of the transformer. (The diameter of a size "C" steel drill corresponds to this dimension).
4. When installing a new oscillator transformer or core, make sure that the iron core slides freely in the transformer. It is important to do this to eliminate backlash in the tuning mechanism. If adjustment is necessary slightly move transformer in the direction required.

After mechanically setting the transformers and iron cores, adjust the padders as given in the following tabulation:

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	Antenna and Ground	400 ohms	9.7 M. C.	9.7 M. C.	Band Selector Position "31M" on Dial	38B, 22B, 8B	Note E — Note F
2	Antenna and Ground	400 ohms	11.7 M. C.	11.7 M. C.	Band Selector Position "25M" on Dial	38C, 22C, 8C	Note F
3	Antenna and Ground	400 ohms	15.2 M. C.	15.2 M. C.	Band Selector Position "19M" on Dial	44A, 27A, 11A	Note F
4	Antenna and Ground	400 ohms	17.8 M. C.	17.8 M. C.	Band Selector Position "16M" on Dial	44B, 27B, 11B	Note F
5	Antenna and Ground	400 ohms	21.5 M. C.	21.5 M. C.	Band Selector Position "13M" on Dial	44C, 27C, 11C	Note F

NOTE A — The "Dummy Antenna" consists of a condenser or resistance 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: With the tuning condenser closed (maximum capacity) set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (38A) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 19.090 M. C.

NOTE D — Before adjusting padders 45A, 45C, 50A, 50B, 51A, turn padder 45B to full clockwise position (all the way out). After the padders are adjusted to maximum, then adjust padder 45B for maximum.

NOTE E — Before adjusting padders, turn the band spread tuning knob to its extreme counter-clockwise position. Set the band spread dial pointer on the first MARK on the left edge (low frequency end) of the 31 meter scale.

NOTE F — To make sure that the dial reads properly after adjusting the compensator with the signal generator as outlined above, a known station on each band near the adjusting frequency should be tuned in with the spread band tuning control. If the dial reading is incorrect, adjust the oscillator compensators on each band until the stations are heard at the correct points on the dial. After adjusting the oscillator compensators to the correct frequency of the known station, the "antenna" and "R. F." compensators should be adjusted to maximum signal.

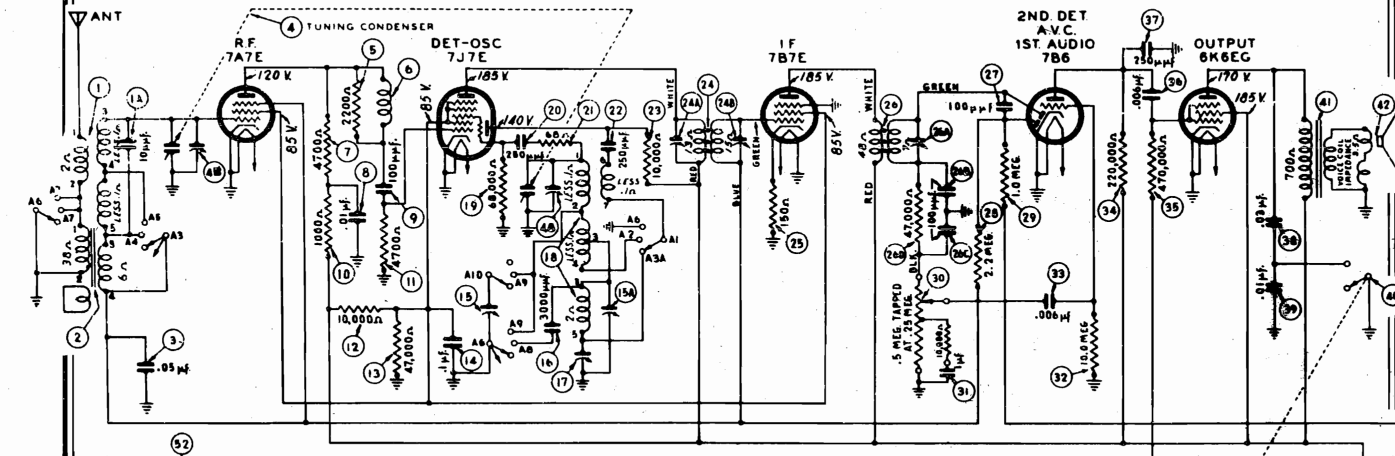
ALTERNATIVE METHOD — Locate a known station near the center of each spread band and "Zero Beat" the signal generator with it at the time of aligning band. This makes available a signal of adjustable strength and known frequency. This method will be found to be simpler when conditions make its use possible because it is much easier to align a receiver to a strong signal.

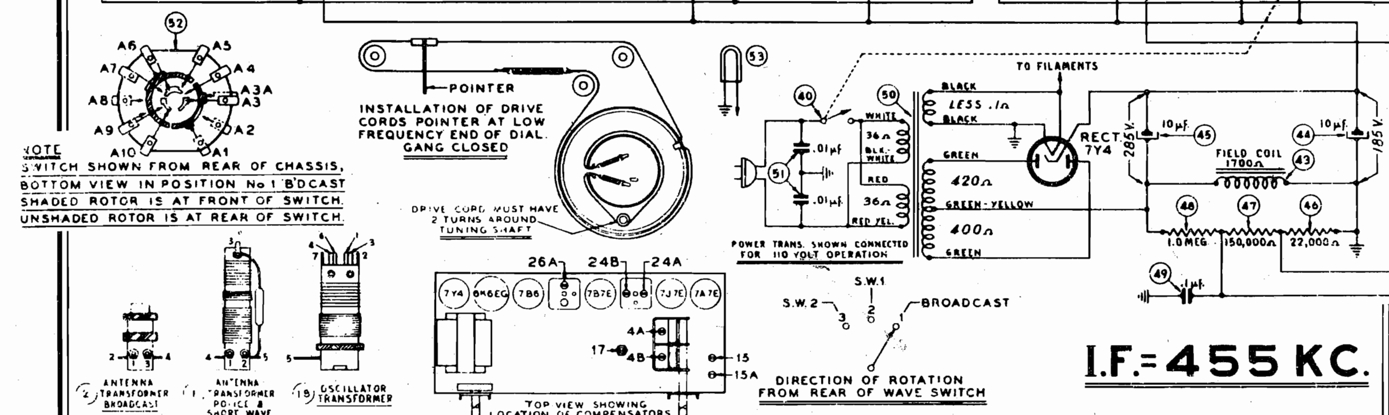
MECHANICAL ADJUSTMENTS OF BAND SPREAD TUNING MECHANISM

1. ADJUSTMENT OF TUNING SHAFT
   End play can be removed by adjusting the rear bearing No. (A) Fig. (1). Care should be taken when adjusting the screw so that shaft does not turn too tightly. In making this adjustment, the screw driver can be inserted in the chassis in line with shaft.
2. INSTALLING NEW BAND SPREAD TUNING SHAFT
   a. Turn shaft (B) until carriage (C) is approximately six (6) threads from knob end of shaft. See Fig. 1.
   b. Turn shaft counter-clockwise at the same time holding the rear stop washer (D) until all other washers are in contact.
   c. Insert the front end of shaft through the rear of the front bearing. Install front ball bearing and then while holding the R. F. unit in a vertical position with the rear end of the radio up, drop the rear ball bearing into position and assemble the retaining screw.

MODEL 41-714

PHILCO RADIO & TELEVISION CORP.

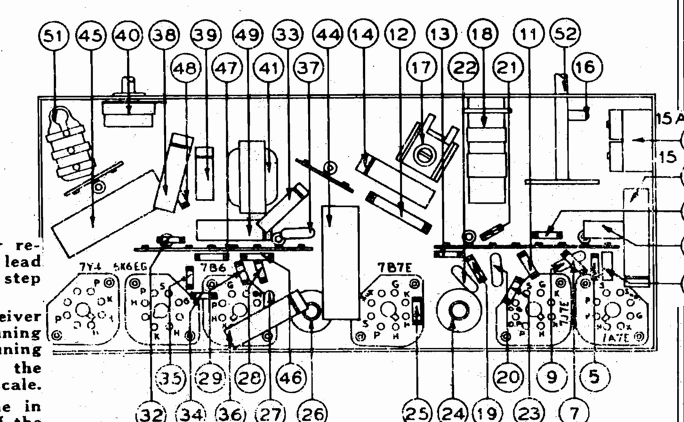




APRIL, 1940.

I.F.=455 KC.

MODEL 41-714



NOTE A — The "Dummy Antenna" consists of a condenser or resistance 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.

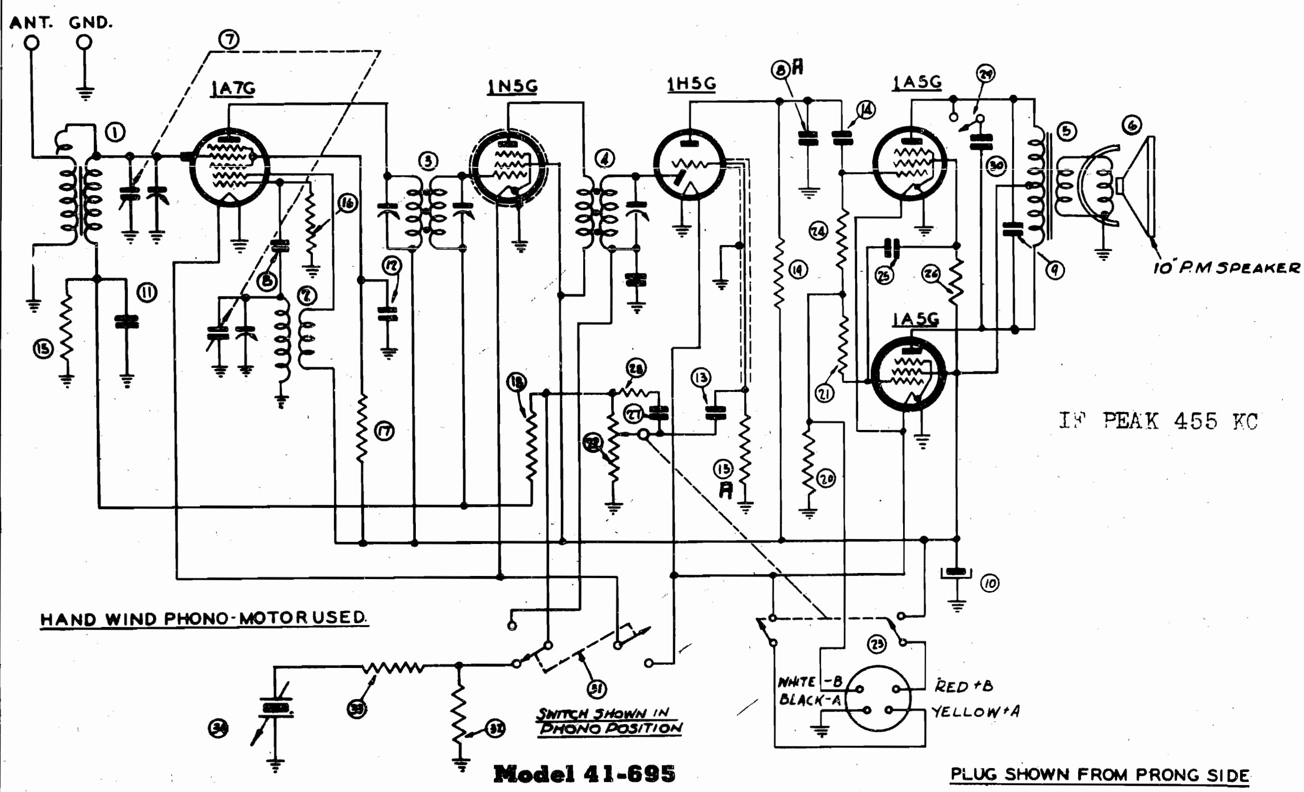
NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity) set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (4B) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 20,090 M. C.

Operations in Order	SIGNAL GENERATOR			RECEIVER		
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators
1	Lug of Ant. Tuning Condenser Front Section	.1 mfd.	455 K. C.	580 K. C.	Range Switch Broadcast (Position 1) Vol. Max.	24A, 24B, 26A
2	Ant. Lead	400 ohms	21 M. C.	21 M. C.	Range Switch S. W. Position 3	4B, 4A Note B Note C
3	Ant. Lead	400 ohms	6.0 M. C.	6.0 M. C.	Range Switch S. W. Position 2	15 Roll Gang
4	Ant. Lead	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch Broadcast Position 1	15A Roll Gang
5	Ant. Lead	200 mmfd.	580 K. C.	580 K. C.	Range Switch Broadcast Position 1	17 Roll Gang

PHILCO RADIO & TELEVISION CORP.

MODEL 41-695



Model 41-695

Model 41-695 is a radio-phonograph combination consisting of a five (5) tube super-heterodyne radio, a manually operated, even-speed, spring-wind Phonograph Motor which uses no current and a crystal pickup.

The radio includes: Super-efficient Philco Farm Radio Tubes, designed for low drain, 1½ volt circuit; High Output Permanent Magnet Speaker; Automatic Volume Control; Push-pull Pentode Audio System with screen phase inversion; Automatic "ON-OFF" indicator, and covers a tuning band from 540 to 1720 K. C.

INTERMEDIATE FREQUENCY: 455 K. C.

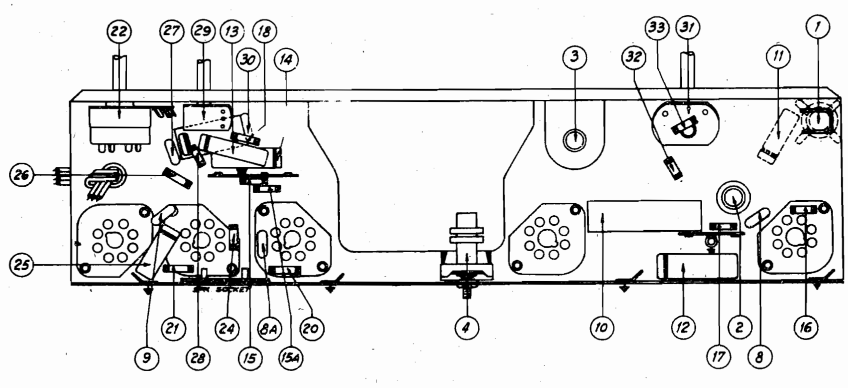
SCHE. No.	DESCRIPTION	PART No.
1	Aerial Transformer	32-3183
2	Oscillator Transformer	32-3184
3	1st I. F. Transformer	32-3198
4	2nd I. F. Transformer	32-3199
5	Output Transformer	32-8107
6	Speaker Cone (For Speaker 36-1522-4)	36-4171
7	Tuning Condenser	31-2457
	Drive Cord (Indicator Drive)	31-2504
	Tuning Shaft	31-2465
	Drive Cord (Pointer Drive)	31-2525
	Drive Drum	76-1176
8	Condenser (100 mmfd.)	60-110157
9	Condenser (730 mmfd.)	60-173127
10	Electrolytic Condenser (10 mfd.)	30-2396
11	Condenser (.05 mfd., 400 volts)	30-4519
12	Condenser (.25 mfd., 100 volts)	61-0112
13	Condenser (.004 mfd., 400 volts)	30-4578
14	Condenser (.01 mfd., 400 volts)	30-4572
15	Resistor (4.7 megohms)	33-547339
16	Resistor (220,000 ohms)	33-422339
17	Resistor (68,000 ohms)	33-368339
18	Resistor (10 megohms)	33-610339
19	Resistor (1 megohm)	33-510339
20	Resistor (560 ohms)	33-156326
21	Resistor (2.2 megohms)	33-522339
22	Volume Control	33-5413
23	Battery Cable	41-3505
24	Resistor (2.2 megohms)	33-522339
25	Condenser (.01 mfd., 400 volts)	30-4572
26	Resistor (10.000 ohms)	33-310339
27	Condenser (50 mmfd.)	60-050157
28	Resistor (100,000 ohms)	33-410339
29	Tone Control Switch	42-1610
30	Condenser (.002 mfd., 400 volts)	30-4579
31	Radio-Phono Switch	42-1609
32	Resistor (10,000 ohms)	33-310339
33	Resistor (47,000 ohms)	33-347339
34	Crystal Pickup and Tone Arm Complete	35-2205

MISCELLANEOUS PARTS

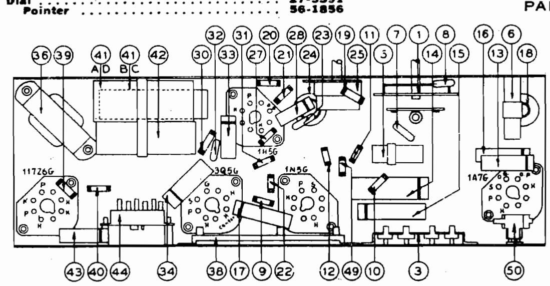
Bezel	27-4975
Glass (Bezel)	27-5610
Speed Clips (Glass Mounting)	56-1876
Speed Clips (Bezel Mounting)	56-1827
Cable (Pickup)	41-3557
Cable (Speaker)	41-3451
Clip (Aerial Transformer)	28-5002
Cabinet	10517A
Clamp (Crank)	56-1968
Dial	27-5591
Pointer	56-1856

SCHE. No.	DESCRIPTION	PART No.
	Indicator	76-1122
	Lever (Indicator)	76-1049
	Cam Assembly	38-9861
	Knob	27-4332
	Motor (Phono.)	35-1238
	Turntable	35-2038
	Coupling	35-2074
	Crank	35-2206
	Spindle	56-6110
	Washer (Coupling)	56-1972

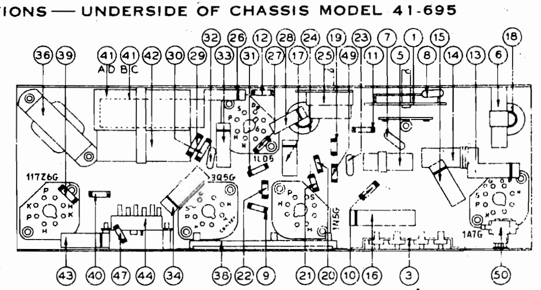
SCHE. No.	DESCRIPTION	PART No.
	Shield (Tube)	56-1566
	Shield Clip	56-1567
	Screw (Brake Mounting)	W-647
	Screw (Motor Mounting)	W-2002
	Screw (Chassis Mounting)	W-2030
	Socket (6 prong)	27-6133
	Socket (Speaker)	27-6115
	Spindle (Motor)	56-6110
	Washer (Chassis Mounting)	W-410



PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-695



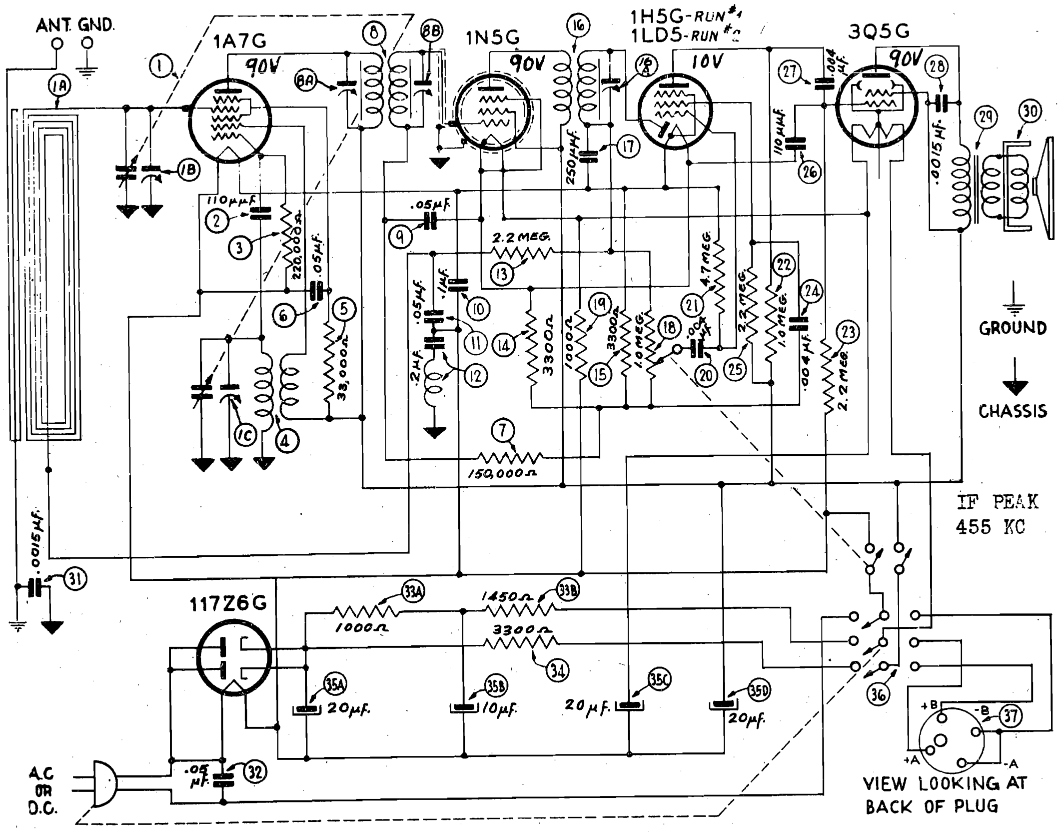
PART LOCATIONS — UNDERSIDE OF CHASSIS
MODEL 41-851, RUN 1



PART LOCATIONS — UNDERSIDE OF CHASSIS
MODEL 41-851, RUN 2

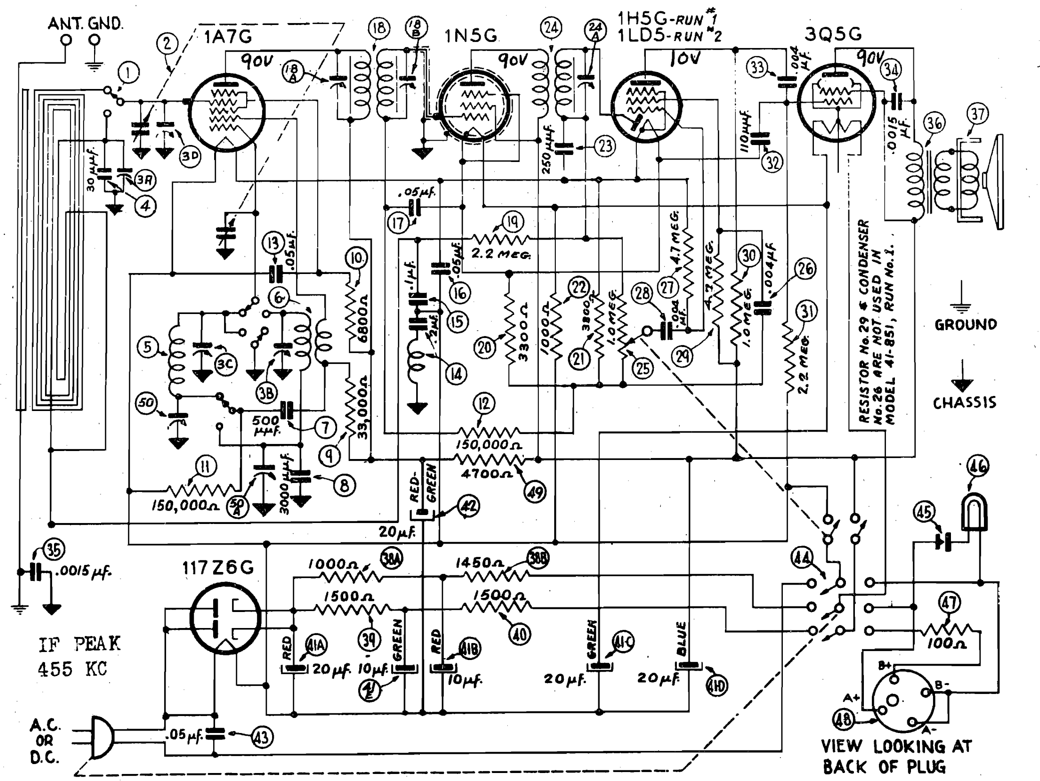
MODEL 41-841
Code 121, Runs 1,2
MODEL 41-851
Code 121, Runs 1,2

PHILCO RADIO & TELEVISION CORP.



Model 41-841, Code 121, Runs 1 and 2

SEPTEMBER, 1940.



Model 41-851, Code 121, Runs 1 and 2

PHILCO RADIO & TELEVISION CORP.

MODELS 41-841, 41-695, 41-851

Vacuum Tube Voltmeter: If a vacuum tube voltmeter is used as an aligning indicator, the negative (—) terminal is connected to the A. V. C. circuit of the receiver through a 2 megohm resistor. The positive (+) terminal is connected to the chassis or ground.

Signal Generator: When adjusting the "I. F." padders the high side of the signal generator is connected through a .1 mfd. condenser to the loop tuning condenser stator lug which connects to the grid of the first detector oscillator tube. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders of the portable models a loop aerial is made from a few turns of wire and connected to the signal generator output terminals. The signal generator is then placed a few feet from the set. The loop aerial of the receiver should be assembled in the cabinet together with the battery when adjusting the R. F. padders.

To align the R. F. padders of the 41-695, connect the signal generator to the aerial through a 225 mmfd. condenser.

Models 41-841, 41-695

The Model 41-841 may be adjusted when operated by battery or 115 volts A. C.-D. C. power.

Operations in Order	SIGNAL GENERATOR		RECEIVER				SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators		
					41-841	41-695	
1	See Paragraph on Signal Generator above	455 K. C.	540 K. C.	Vol. Max.	8A, 8B 16A	3A, 3B 4A	Note A
2	Use Loop on Generator as above	1500 K. C.	1500 K. C.	Vol. Max.	1C, 1B	7B, 7A	

Model 41-851

Operations in Order	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	Special Instructions
1	Stator Plate Lug Loop Tuning Condenser	455 K. C.	540 K. C.	Vol. Max.	18A, 18B, 24A	
2	Loop on Generator	1500 K. C.	1500 K. C.	Range Switch "Brdcst" Vol. Max.	3C, 3D	Note A
3	Loop on Generator	580 K. C.	580 K. C.	Range Switch "Brdcst" Vol. Max.	50	
4	Recheck operation No. "2"					
5	Loop on Generator	6 M. C.	6 M. C.	Range Switch "S. W."	50A	
6	Loop on Generator	15 M. C.	15 M. C.	Range Switch "S. W."	3B, 3A	Note B

NOTE A: DIAL CALIBRATION: Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dot below 550 K. C.

NOTE B: When adjusting compensator be sure to tune in the fundamental signal (15 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 14,090 M. C.

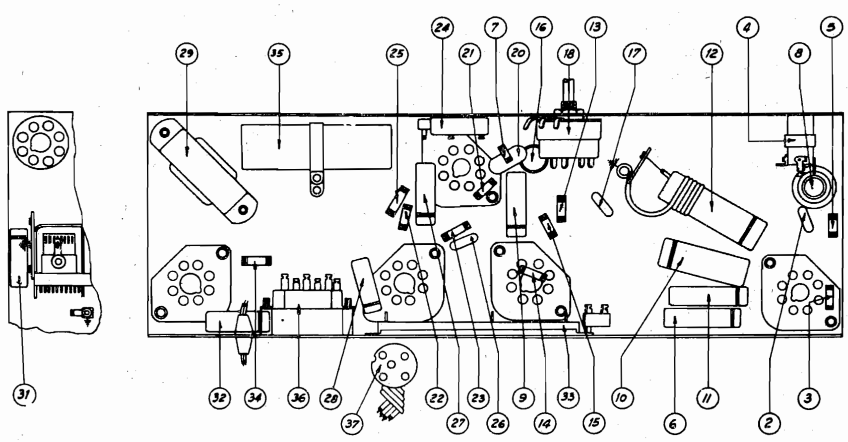
Replacement Parts — Model 41-841, Code 121

IN RUN 1 RADIOS WHICH USE A 1H5G IN THE SECOND DETECTOR CIRCUIT, PARTS 24 AND 25 ARE NOT REQUIRED.

SCHE. No.	DESCRIPTION	PART No.
1	Tuning Condenser	31-2509
	Tuning Shaft	56-6080
	"C" Washer	57-0127
	Drive Cord	31-2380
	Spring	28-8882
1A	Loop Aerial (Part of Cabinet 10473A)	
1B	Comp. (Aerial Adjustment, Part of 1)	
1C	Comp. (Oscillator Adjustment, Part of 1)	
2	Mica Condenser (110 mmfd.)	60-110157
3	Resistor (220,000 ohms, 1/2 watt)	33-422339
4	Oscillator Transformer	32-3424
5	Resistor (33,000 ohms, 1/2 watt)	33-333339
6	Condenser (.05 mfd., 400 volts)	30-4444
7	Resistor (150,000 ohms, 1/2 watt)	33-415339
8	1st I. F. Transformer	32-3583
9	Condenser (.05 mfd., 200 volts)	30-4519
10	Condenser (.1 mfd., 400 volts)	30-4455
11	Condenser (.05 mfd., 200 volts)	30-4519
12	Condenser and R. F. Choke .2 mfd.)	76-1034
13	Resistor (2.2 megohms)	33-522339
14	Resistor (3300 ohms, 1/2 watt)	33-233339
15	Resistor (3300 ohms, 1/2 watt)	33-233339
16	2nd I. F. Transformer	32-3266
17	Mica Condenser (250 mmfd.)	60-125157
18	Volume Control	33-5390
	Palnut	W-2157
19	Resistor (1000 ohms, 1/2 watt)	33-210339
20	Condenser (.004 mfd., 400 volts)	30-4578
21	Resistor (4.7 megohms)	33-547339
22	Resistor (1 megohm)	33-510339
23	Resistor (2.2 megohms)	33-522339
24	Condenser (.004 mfd., 400 volts)	30-4456
25	Resistor (2.2 megohms)	33-522339
26	Mica Condenser (110 mmfd.)	60-110157
27	Condenser (.004 mfd.)	30-4578
28	Condenser (.0015 mfd., 200 volts)	30-4555
29	Output Transformer	32-8139
30	Cone Assem. (For Speaker 36-1526-3)	36-4175
31	Condenser (.0015 mfd., 200 volts)	30-4555
32	Condenser (.05 mfd., 400 volts)	30-4518
33A	Resistor (1000 ohms)	33-3400
33B	Resistor (1450 ohms) Part of 33A	
34	Resistor (3300 ohms, 1/2 watt)	33-233339
35A	Electrolytic Condenser (20 mfd.)	30-2492
35B	Electrolytic Cond. (10 mfd.) Part of 35A	
35C	Elec. Cond. (20 mfd., 25 v.) Part of 35A	
35D	Electrolytic Cond. (20 mfd.) Part of 35A	
36	Automatic Power Changeover Switch	42-1553
37	Battery Cable	41-3592
	Dial	27-5579
	Dial Pointer	27-4868
	Knobs	27-4970
	Speaker	36-1526
	Socket (Tubes, R. F., I. F., Audio)	27-6133
	Socket (Tubes, Rectifier)	27-6137
	Socket (Tubes, 1LD5 Tube, Run 2)	27-6151
	Rubber Grommet (Socket 1LD5 Tube)	54-4020
	Rubber Washer (Socket 1LD5 Tube)	27-4112
	Eyelet (Socket 1LD5 Tube)	W-792
	Screw (Chassis Mounting)	W-2030
	Washer (Chassis Mounting)	W-410

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cord (Power)	L-3199
Clip (Oscillating Coil Mounting)	28-5002
Cabinet	10473A



PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-841, CODE 121, RUNS 1 AND 2

Replacement Parts — Model 41-851, Runs 1 and 2

PARTS 26 AND 29 ARE NOT USED IN EARLY PRODUCTION RUN 1 RADIOS.

SCHE. No.	DESCRIPTION	PART No.
1	Band Switch	42-1570
1A	Loop Aerial (Run Two)	76-1175
	Loop Aerial (Run One)	76-1156
2	Tuning Condenser	31-2459
	Drive Cord	31-2380
	Tuning Shaft	56-6080
	"C" Washer	57-0127
3A	Compensator (Short Wave Aerial)	31-6347
3B	Compensator (S. W. Oscillator) Part of 3A	
3C	Comp. (Brdcst. Oscillator) Part of 3A	
3D	Compensator (Brdcst. Aerial) Part of 3A	
4	Mica Condenser (50 mmfd., Mounted on Loop, Run 2)	60-050127
5	Oscillator Transformer (Broadcast)	32-3431
6	Oscillator Transformer (Short Wave)	32-3577
7	Mica Condenser (500 mmfd.)	60-150137
8	Mica Condenser (3000 mmfd.)	60-230334
9	Resistor (33,000 ohms)	33-333339
10	Resistor (6800 ohms)	33-268339
11	Resistor (150,000 ohms)	33-415339
12	Resistor (150,000 ohms)	33-415339
13	Condenser (.05 mfd., 400 volts)	30-4518
14	Condenser (.2 mfd.) and R. F. Choke	76-1161
15	Condenser (.1 mfd., 400 volts)	30-4455
16	Condenser (.05 mfd., 400 volts)	30-4518
17	Condenser (.05 mfd., 200 volts)	30-4519
18	1st I. F. Transformer	32-3583
19	Resistor (2.2 megohms)	33-522339
20	Resistor (3300 ohms, 1/2 watt)	33-233339
21	Resistor (3300 ohms, 1/2 watt)	33-233339
22	Resistor (1000 ohms, 1/2 watt)	33-210339
23	Mica Condenser (250 mmfd.)	60-125157
24	2nd I. F. Transformer	32-3266
25	Volume Control	33-5390
26	Condenser (.004 mfd., 400 volts)	30-4578
27	Resistor (4.7 megohms)	33-547339
28	Condenser (.004 mfd., 400 volts)	30-4578
29	Resistor (2.2 megohms)	33-522339
30	Resistor (1 megohm)	33-510339
31	Resistor (2.2 megohms)	33-522339
32	Mica Condenser (110 mmfd.)	60-111157
33	Condenser (.01 mfd., 400 volts)	30-4572
34	Condenser (.0015 mfd., 200 volts)	30-4555
35	Condenser (.0015 mfd., 200 volts)	30-4555
36	Output Transformer	32-8139
37	Cone Assembly (For Speaker 36-1506-1)	36-4158
38A	Resistor (Wirewound, 1000 ohms)	33-3387
38B	Resis. (Wirewnd., 1450 ohms) Pt. of 38A	
39	Resistor (1500 ohms)	33-215339
40	Resistor (1500 ohms)	33-215339
41A	Electrolytic Cond. (20 mfd., 150 volts)	30-2452
41B	Electrolytic Cond. (10 mfd., 150 volts)	30-2453
41C	Elec. Cond. (20 mfd., 25 v.) Part of 41B	
41D	Elec. Cond. (10 mfd., 50 v.) Part of 41A	
41E	Elec. Cond. (10 mfd., 150 v.) Part of 41A	
42	Electrolytic Condenser (20 mfd.)	30-2382
43	Condenser (.05 mfd., 400 volts)	30-4518
44	Automatic Power Switch	42-1553
45	Pilot Lamp Switch	56-1487
46	Pilot Lamp	34-2031
47	Resistor (100 ohms, 1/2 watt)	33-110339
48	Battery Cable	41-3592
49	Resistor (4700 ohms)	33-247339
50	Compensator	31-6100
50A	Compensator (Part of 50)	

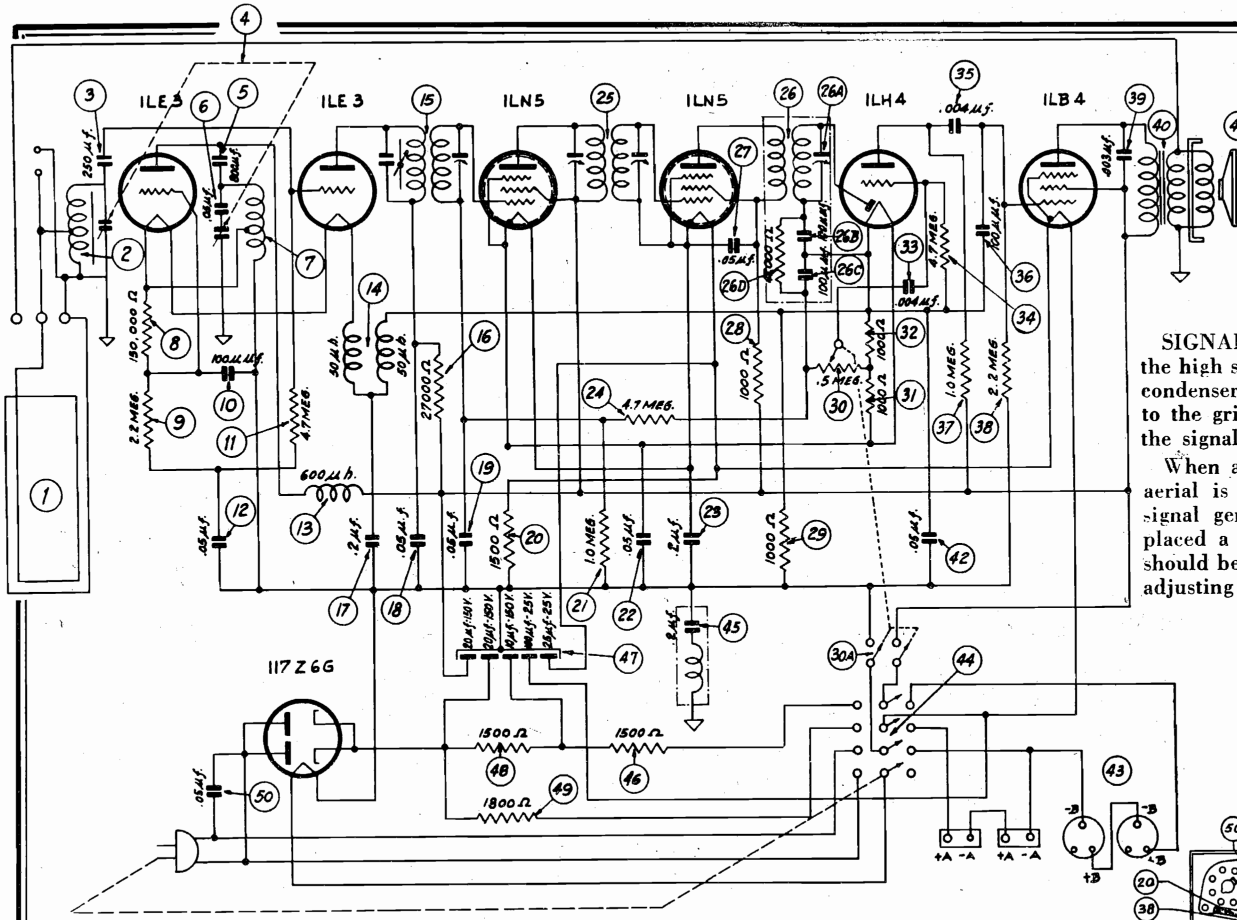
MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cord (Power)	L-3199
Cabinet	10473B
Clip (Coil Mounting)	28-5002
Dial	318-2055
Dial Pointer	27-4868
Indicator Arm Assembly	318-2099
Spring	28-8947
Cam and Hub Assembly	38-9861
Knob (Tuning-Volume)	27-4876
Push-button (Pilot Lamp)	27-4844
Screw (Chassis Mounting)	W-2030
Shield (Tubes)	56-1566
Shield (1N5G Tube)	56-1568
Shield Clip	56-1567
Socket (Loop Terminal)	27-6141
Socket (1LD5 Tube, Run 2)	27-6151
Rubber Grommet	54-4020
Rubber Washer	27-4112
Eyelet	W-792
Socket Assembly (Pilot Lamp)	76-1074
Socket (Tubes)	27-6133
Socket (Rectifier)	27-6137
Snap Fastener (Pilot Lamp)	28-4342
Terminal Panel (Loop)	27-6141
Washer (Chassis Mounting)	W-410

MODELS 41-842, 41-843, 41-844

PHILCO RADIO & TELEVISION CORP.

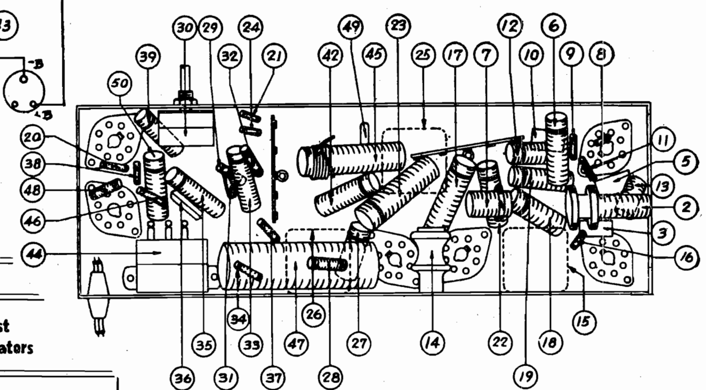
MODELS 41-842, 41-843, 41-844



SIGNAL GENERATOR: When adjusting the "I.F." padders the high side of the signal generator is connected through a .1 mfd. condenser to the loop tuning condenser stator lug which connects to the grid of the first detector tube. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R.F. padders of the portable models a loop aerial is made from a few turns of wire and connected to the signal generator output terminals. The signal generator is then placed a few feet from the set. The loop aerial of the receiver should be assembled in the cabinet together with the battery when adjusting the R.F. padders.

These models may be adjusted when operated by battery or 115 volts A.C.-D.C. power.



UNDERSIDE OF CHASSIS

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Setting	RECEIVER: Adjust Compensators
1	See Paragraph on Signal Generator above	455 K.C.	540 K.C.	Vol. Max.	26A, 25A, 25B, 15A, 15B
2	Use Loop on Generator as above	1500 K.C.	1500 K.C.	Vol. Max.	4B, 4A

Note A

NOTE A: DIAL CALIBRATION—Before adjusting the R.F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity), set the dial pointer on the small dot below 540 K.C.

DECEMBER, 1940

PHILCO RADIO & TELEVISION CORP.

LOUDSPEAKER PARTS DATA

PHILCO 1940 HOME RADIO SPEAKERS

Listed below are the Philco speakers, replacement cones and output transformers used in the 1939 and 1940 Philco home and auto radio line.

In some models two or more different type speakers are used. These speakers, however, are interchangeable and will have the same part number, with the exception of a suffix number -1, -2, etc., added to the part number. The cone assemblies of these speakers are not interchangeable.

It is important when ordering cone assemblies that the correct part number, as indicated on these pages, be specified.

With Replacement Cones and Output Transformers

Speaker	Used In Models	Replacement Cones	Output Transformer
60110	TH-1	36-4130	43118
60112-9	TH-3	36-4119	
36-1266-3	905	36-4146	32-7927
36-1410-1	40-110B	36-4093	32-8066
	39-80B, 39-85B	36-4093	32-7984
36-1426-1	39-17T, 39-19T	36-4083	32-7980
36-1426-3	39-17T, 39-19T	36-4085	32-7980
36-1427-1	905	36-4096	32-7927
36-1435-3	39-70B	36-4090	32-7995
36-1436-1	39-80XF, 39-85XF	36-4094	32-7984
	40-105K, 40-110K	36-4094	32-8066
36-1437-2	39-25XF, 39-30XX	36-4088	32-7978
36-1437-4	39-30XX, 39-25XF	36-4118	32-7978
36-1438-2	39-35	36-4089	32-7978
36-1438-4	39-35XX, 39-31XF, 39-36XX	36-4117	32-7978
36-1439-2	39-25T, 39-30T	36-4087	32-7978
36-1439-8	39-25T, 39-30T	36-4112	32-7978
36-1440-3	39-17F, 39-7CS	36-4086	32-7980
36-1441-2	922 Auto	91-0025	32-8000
36-1442-3	39-70B, 39-75T	36-4090	32-7995
36-1444-1	39-18T	36-4083	32-7986
36-1444-3	39-18T	36-4085	32-7986
36-1445-3	39-18F	36-4086	32-7986
36-1447-3	39-70F, 39-75F	36-4092	32-7995
36-1447-8	39-70F, 39-75F	36-4116	32-7995
36-1449-3	39-19F	36-4086	32-7980
36-1450-2	39-40XX, 39-45XX	36-4089	32-7981
	39-55RX		32-7997
	39-116RX		32-7996
	40-216, 40-205, 40-215RX, 40-516	36-4089	32-7997
	40-510		
	40-195, 40-200	36-4089	32-7981
	40-508, 40-509	36-4089	32-8070
36-1450-4	39-55RX	36-4111	32-7997
	40-508, 40-509		32-8070
	39-116RX		32-7996
36-1451-3	39-71T	36-4090	32-8036
36-1452-2	39-720T	36-4103	32-8018
	40-725T, 40-725, Code 251, 40-2725T		

Speaker	Used In Models	Replacement Cones	Output Transformer
36-1453-4	39-750T	36-4104	32-8019
	40-755T, Code 121		32-8048
36-1455-3	39-744T	36-4107	32-8026
	39-751T		32-8028
	40-748T		32-8026
	40-756T		32-8072
36-1456-3	39-744XX, 39-751XX	36-4108 (39-744)	32-8026
		(39-751)	32-8028
	40-748XX		32-8026
	40-756XX, Code 121		32-8072
36-1459-2	39-770T	36-4106	32-8020
36-1460-3	39-750XX, 39-770XX	36-4105 (39-750XX)	32-8019
		(39-770XX)	32-8020
	40-755XX		32-8048
	40-780XX, 40-755XX, Code 251		32-8058
36-1461-1	TH3-CB, TH3-CB1, 39-7C	36-4114	32-8046
36-1461-2	39-6, 39-7	36-4095	32-8040
36-1469-1	TH-4, TP-4, TP-5, TP-10		
	40-115C, 40-120, 40-124, 40-125, 40-501, 40-502	36-4115	32-8047
36-1469-2	TH-18, TP-20, TP-21, PT-25		
	PT-26, 27, 29, 31, 33, 35, 36, 39, 41, 43, 45, 46, 47, 49, 50, 53, 55, 57, 59, 61, 65, 67, 69, 40-115, 40-120, 40-124, 40-125, 40-501, 40-502	36-4132	32-8044
36-1469-9	TH-4, TH-5	36-4113	32-8044
	40-115C, 40-120, 40-124, 40-125, 40-501, 40-502		
36-1471-3	39-25CS	36-4086	327978
36-1472-3	39-711	36-4110	32-8033
	40-715T		32-8018
36-1473-3	105	36-4120	32-7980
36-1476-3	40-90	36-4121	32-8051
36-1477-3	40-95, 40-110	36-4121	32-8051
36-1478-2	40-130, 40-140, 40-135, 40-145	36-4126	32-8063
36-1478-3	40-130T, 40-140T, 40-135T	36-4085	32-8063
	40-145T		
36-1478-4	40-130, 40-135, 40-140, 40-145	36-4134	32-8063
36-1479-2	40-180, 40-185, 40-190	36-4089	32-8053
36-1479-4	40-180, 40-185, 40-190	36-4117	
36-1480-3	40-158F	36-4086	32-8056
	40-160, 40-165, 40-170, 40-525	36-4086	32-8063
36-1480-4	40-158, 40-160, 40-165	36-4136	32-8056
	40-170, 40-525, 40-526		32-8063
36-1481-3	40-81, 40-82	36-4121	32-8062
36-1482-3	40-74, 40-88	36-4121	32-8096
36-1483-2	40-150T, 40-155T	36-4127	32-8053
36-1483-3	40-150T, 40-155T	36-4124	32-8053
36-1483-4	40-150, 40-155	36-4135	32-8053
36-1484-2	40-503	36-4126	32-8063
36-1484-3	40-503	36-4137	32-8063
36-1485-2	40-2780T	36-4106	32-8058
36-1486-2	40-710C, 40-2710	36-4126	32-8095
36-1487-2	40-506	36-4088	32-8071
36-1487-3	40-506	36-4128	32-8071
36-1488-3	40-95F, Code 122, 40-100F, Code 122	36-4129	32-8051
36-1489-2	40-507	36-4089	32-8071
36-1491-2	40-527	36-4133	32-8063
36-1491-4	40-527	36-4147	32-8063
	40-165K	36-4147	32-8056

SEE MODELS BELOW

PHILCO RADIO & TELEVISION CORP.

MODELS TH-9, TH-18, TH-22

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer TH-9	32-3235
	Antenna Transformer TH-18	32-3233
	Antenna Transformer TH-22	32-3215
2	Tubular Condenser (.0015 mf., 200 v.)	30-4555S
3	Tuning Condenser TH-9	31-2385
	Tuning Condenser TH-18, TH-22	31-2377
4	Wave Switch	42-1497
5	Tubular Condenser (.05 mf., 200 v.)	30-4519S
6	Tubular Condenser (.15 mf., 400 v.)	30-4600
7	Tubular Condenser (.05 mf., 200 v.)	30-4519S
8	Resistor (220 ohms, ¼ watt)	33-122254
9	Resistor (100,000 ohms, ¼ watt)	33-410154
10	Mica Condenser (250 mmf.)	30-1032
11	Short Wave Oscillator Trans. TH-9	32-3236
	Short Wave Oscillator Trans. TH-18	32-3234
	Short Wave Oscillator Trans. TH-22	32-3216
12	BC Oscillator Transformer TH-9	32-3244
	BC Oscillator Transformer TH-18, TH-22	32-3217
13	Dual Padding Condenser TH-9	31-6304
	Dual Padding Condenser TH-18, TH-22	31-6303
14	Mica Condenser (410 mmf.)	30-1089
15	Resistor (4700 ohm, ¼ watt)	33-247134
16	Tubular Condenser (.05 mf., 200 v.)	30-4519
17	1st I. F. Transformer	32-3149
18	2nd I. F. Transformer	32-3150
19	Resistor (2.2 megohms, ¼ watt)	33-522154
20	Mica Condenser (250 mmf.)	30-1032
21	Resistor (8,200 ohm, ¼ watt)	33-282134
22	Volume Control	33-5306
23	Tubular Condenser (.003 mf., 200 v.)	30-4580
24	Resistor (3.9 megohm, ¼ watt)	33-539134
25	Resistor (220,000 ohms, ¼ watt)	33-522154
26	Tubular Condenser (.01 mf., 200 v.)	30-4581
27	Resistor (470,000 ohms, ¼ watt)	33-447154
28	Electrolytic Condenser	30-2402
29	Resistor (130 ohms, 1/3 watt)	33-113336
30	Tubular Condenser (.02 mf., 400 v.)	30-4516
31	Output Transformer (for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
32	Speaker	36-1469
	Cone Assembly (for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-2)	36-4132
	(for Speaker 36-1469-9)	36-4113
33	Field Coil — Part of Speaker No.	36-1469
34	Pilot Lamp	34-2068
35	Line Resistor	33-3367
36	Tubular Condenser (.03 mf., 400 v.)	30-4517
37	Mica Condenser (2200 mmf.)	30-1129

MODEL PT-38

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3233
2	Tubular Condenser (.0015 mf., 200 v.)	30-4555
3	Tuning Condenser	31-2431
4	Wave Switch	42-1497
5	Tubular Condenser (.04 mf., 200 v.)	30-4519
6	Tubular Condenser (.15 mf., 400 v.)	30-4600
7	Tubular Condenser (.05 mf., 200 v.)	30-4519
8	Resistor (220 ohms, ½ watt)	33-122336
9	Resistor (100,000 ohms, ¼ watt)	33-410154
10	Mica Condenser (250 mmf.)	61-0033
11	Short Wave Oscillator Trans.	32-3234
12	BC Oscillator Transformer	32-3217
13	Dual Padding Condenser	31-6331
14	Mica Condenser (410 mmf.)	30-1089
15	Resistor (4700 ohms, ¼ watt)	33-247134
16	Tubular Condenser (.05 mf., 200 v.)	30-4519
17	1st I. F. Transformer	32-3327
18	2nd I. F. Transformer	32-3150
19	Resistor (2.2 megohms, ¼ watt)	33-522154
20	Mica Condenser (250 mmf.)	61-0033
21	Resistor (8,200 ohms, ¼ watt	33-282334
22	Volume Control	33-5306
23	Tubular Condenser (.01 mf., 400 v.)	30-4572
24	Resistor (4.7 megohms, ¼ watt)	33-547154
25	Resistor (220,000 ohms, ¼ watt)	33-522154
26	Tubular Condenser (.01 mf., 400 v.)	30-4572
27	Resistor (470,000 ohms, ¼ watt)	33-447154
28	Electrolytic Condenser	30-2402
29	Resistor (130 ohms, ½ watt)	33-113336
30	Tubular Condenser (.04 mf., 400 v.)	30-4119
31	Output Transformer— (for 36-1469-1)	32-8047
	(for 36-1469-9)	32-8044
	(for 36-1469-2)	32-8044
32	Speaker	36-1469
	Cone Assembly— (for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-9)	36-4113
	(for Speaker 36-1469-2)	32-4132
33	Field Coil—Part of Speaker No.	36-1469
34	Pilot Lamp	34-2068
35	Line Resistor	33-3367
36	Tubular Condenser (.04 mf., 400 v.)	30-4119

MODEL PT-35

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3164
2	Tubular Condenser (.0015 mf., 200 v.)	30-4555S
3	Tuning Condenser	31-2434
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200 v.)	30-4519S
6	Tubular Condenser (.15 mf., 400 v.)	30-4505S
7	Resistor (47,000 ohms, ¼ watt)	33-347154
8	Mica Condenser (110 mmf.)	30-1130
9	Oscillator Transformer	32-3152
10	Tubular Condenser (.05 mf., 200 v.)	30-4519S
11	1st I. F. Transformer	32-3149
12	2nd I. F. Transformer	32-3150
13	Resistor (2.2 meg., ¼ watt)	33-522154
14	Mica Condenser (250 mmf.)	61-0033
15	Resistor (22,000 ohms, ½ watt)	33-322334
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200 v.)	30-4479S
18	Resistor (4.7 meg., ¼ watt)	33-547154
19	Resistor (220,000 ohms, ¼ watt)	33-422154
20	Tubular Condenser (.01 mf., 400 v.)	30-4572S
21	Resistor (470,000 ohms, ¼ watt)	33-447154
22	Resistor (130 ohms, ½ watt)	33-113336
23	Tubular Condenser (.04 mf., 400 v.)	30-4119S
24	Output Transformer, Part of Speaker No. 36-1469-1	32-8047
	Speaker No. 36-1469-9	32-8044
	Speaker No. 36-1469-2	32-8044
25	Speaker	36-1469
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil—Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.04 mf., 400 v.)	30-4119S

MODEL TP-21

SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	38-9937
2	Tuning Condenser	31-2414
3	Tubular Condenser (.05 mf., 200 v.)	40-4519S
4	Tubular Condenser (.25 mf., 400 v.)	30-4604S
5	Resistor (47,000 ohms, ¼ watt)	33-347154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3152
8	Tubular Condenser (.05 mf., 200 v.)	30-4519S
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327134
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 v.)	30-4479S
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 v.)	30-4572S
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 v.)	30-4119S
23	Output Transformer (for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
24	Cone Assembly (for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-2)	36-4132
	(for Speaker 36-1469-9)	36-4113
25	Tubular Condenser (.04 mf., 400 v.)	30-4119S
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil ......Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Push Button Switch	42-1485
31	Padding Condenser Strip	31-6324

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Baffle and Grille Silk	40-6452
Cable (Power)	L-3199
Cabinet	10368A
Cabinet Back	27-4833
Cabinet Feet	27-9337

MODELS PT-49, PT-51

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3168
2	Tubular Condenser (.0015 mf., 200 v.)	30-4555S
3	Tuning Condenser	31-2428
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200 v.)	30-4519S
6	Tubular Condenser (.15 mf., 400 v.)	30-4505S
7	Resistor (47,000 ohms, ¼ watt)	33-347154
8	Mica Condenser (110 mmf.)	30-1130
9	Oscillator Transformer	32-3167
10	Tubular Condenser (.05 mf., 200 v.)	30-4519S
11	1st I. F. Transformer	32-3149
12	2nd I. F. Transformer	32-3150
13	Resistor (2.2 meg., ¼ watt)	33-522154
14	Mica Condenser (250 mmf.)	61-0033
15	Resistor (22,000 ohms, ½ watt)	33-322334
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200 v.)	30-4479S
18	Resistor (4.7 meg., ¼ watt)	33-547154
19	Resistor (220,000 ohms, ¼ watt)	33-422154
20	Tubular Condenser (.01 mf., 400 v.)	30-4572S
21	Resistor (470,000 ohms, ¼ watt)	33-447154
22	Resistor (130 ohms, ½ watt)	33-113336
23	Tubular Condenser (.04 mf., 400 v.)	30-4119S
24	Output Transformer (for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
25	Speaker	36-1469
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.04 mf., 400 v.)	30-4119S
31	Push Button Switch	42-1485
32	Padding Condenser Strip	31-6293

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cable (Power)	L-3199
Cabinet (PT-49)	10366A
Cabinet Back (PT-49)	27-9314
Cabinet (PT-51)	10366B
Cabinet Back (PT-51)	27-9328

MODEL PT-50

SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	32-3179
2	Tuning Condenser	31-2448
3	Tubular Condenser (.05 mf., 200 V.)	30-4519
4	Tubular Condenser (.25 mf., 400 V.)	30-4604
5	Resistor (22,000 ohms, ¼ watt)	33-322154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3182
8	Tubular Condenser (.05 mf., 200 V.)	30-4519
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327334
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 V.)	30-4479
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 V.)	30-4572
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 V.)	30-4119
23	Output Transformer (for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
24	Cone Assembly (for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-2)	36-4132
	(for Speaker 36-1469-9)	36-4113
25	Tubular Condenser (.04 mf., 400 V.)	30-4119
26	Electrolytic Condenser (20-20 mf., 150 V.)	30-2382
27	Field Coil ....Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367

MODELS PT-37, PT-53

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3233
2	Tubular Condenser (.0015 mf., 200 v.)	30-4555S
3	Tuning Condenser	31-2431
4	Wave Switch	42-1497
5	Tubular Condenser (.05 mf., 200 v.)	30-4519S
6	Tubular Condenser (.15 mf., 400 v.)	30-4600S
7	Tubular Condenser (.05 mf., 200 v.)	30-4519S
8	Resistor (220 ohms, ½ watt)	33-122336
9	Resistor (100,000 ohms, ¼ watt)	33-410154
10	Mica Condenser (250 mmf.)	61-0033
11	Short Wave Oscillator Trans.	32-3234
12	BC Oscillator Transformer	32-3217
13	Dual Padding Condenser	31-6331
14	Mica Condenser (410 mmf.)	30-1089
15	Resistor (4700 ohms, ¼ watt)	33-247134
16	Tubular Condenser (.05 mf., 200 v.)	30-4519S
17	1st I. F. Transformer	32-3327
18	2nd I. F. Transformer	32-3150
19	Resistor (2.2 megohms, ¼ watt)	33-522154
20	Mica Condenser (250 mmf.)	61-0033
21	Resistor (8,200 ohms, ¼ watt)	33-282334
22	Volume Control	33-5306
23	Tubular Condenser (.01 mf., 400 v.)	30-4572S
24	Resistor (4.7 megohm, ¼ watt)	33-547154
25	Resistor (220,000 ohms, ¼ watt)	33-522154
26	Tubular Condenser (.01 mf., 200 v.)	30-4581S
27	Resistor (470,000 ohms, ¼ watt)	33-447154
28	Electrolytic Condenser	30-2402
29	Resistor (130 ohms, ½ watt)	33-113336
30	Tubular Condenser (.04 mf., 400 v.)	30-4119S
31	Output Transformer, Part of Speaker No. 36-1469-1	32-8047
	Speaker No. 36-1469-9	32-8044
	Speaker No. 36-1469-2	32-8044
32	Speaker	36-1469
	Cone Assembly (for Speaker 36-1469-1)	36-4115
	(for Speaker 36-1469-9)	36-4113
	(for Speaker 36-1469-2)	36-4132
33	Field Coil—Part of Speaker No.	36-1469
34	Pilot Lamp	34-2068
35	Line Resistor	33-3367
36	Tubular Condenser (.04 mf., 400 v.)	30-4119S

MODEL PT-43

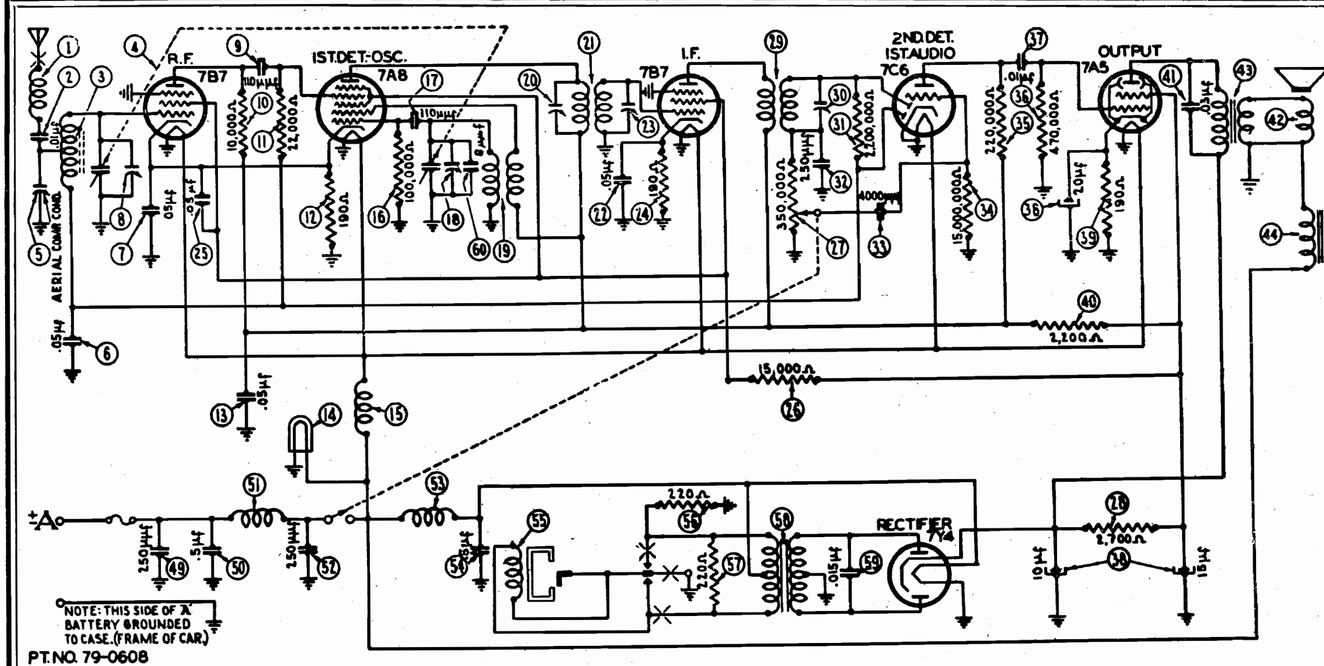
SCHE. No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly (Code 121)	38-9936
	PT-43 (Code 122)	32-3402
2	Tuning Condenser (Code 121)	31-2436
	PT-43 (Code 122)	31-2446
3	Tubular Condenser (.05 mf., 200 v.)	30-4519S
4	Tubular Condenser (.25 mf., 400 v.)	30-4604S
5	Resistor (47,000 ohms, ¼ watt)	33-347154
6	Mica Condenser (110 mmf.)	30-1130
7	Oscillator Transformer	32-3182
8	Tubular Condenser (.05 mf., 200 v.)	30-4519S
9	1st I. F. Transformer	32-3177
10	2nd I. F. Transformer	32-3178
11	Resistor (2.2 megs., ¼ watt)	33-522154
12	Mica Condenser (250 mmf.)	61-0033
13	Resistor (27,000 ohms, ½ watt)	33-327334
14	Volume Control (500,000 ohms)	33-5306
15	Tubular Condenser (.01 mf., 200 v.)	30-4479S
16	Resistor (4.7 megs., ¼ watt)	33-547154
17	Resistor (220,000 ohms, ¼ watt)	33-422154
18	Tubular Condenser (.01 mf., 400 v.)	30-4572S
19	Mica Condenser (250 mmf.)	61-0033
20	Resistor (470,000 ohms, ¼ watt)	33-447154
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.04 mf., 400 v.)	30-4119S
23	Output Transformer (for Speaker No. 36-1469-1)	32-8047
	(for Speaker No. 36-1469-2)	32-8044
	(for Speaker No. 36-1469-9)	32-8044
24	Speaker	36-1469
25	Tubular Condenser (.04 mf., 400 v.)	30-4119S
26	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
27	Field Coil, ...Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cable (Power)	L-3199
Cabinet (PT-43, Code 121)	10451A
Cabinet Back (PT-55, Code 121)	27-4907
Cabinet (PT-55, Code 121)	10446B

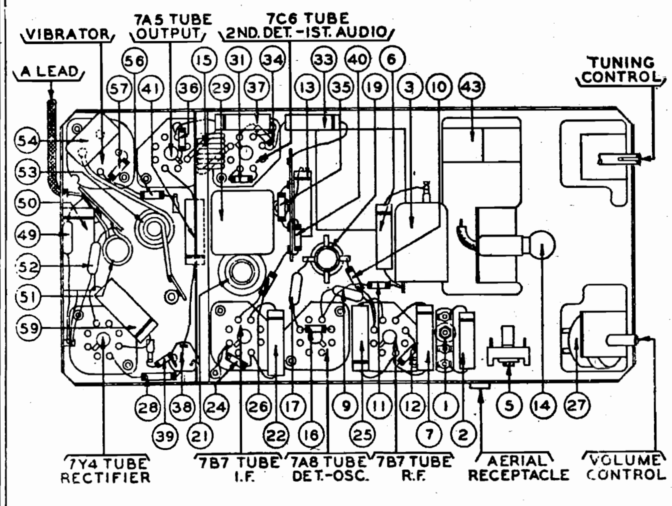
PHILCO RADIO & TELEV. CORP.

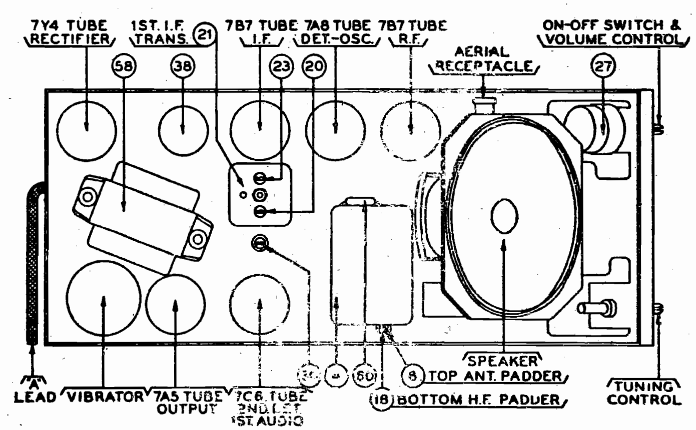
MODEL AR-1



MODEL AR-1 SCHEMATIC

I.F. = 455KC





No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 mfd.)	61-0114
3	Antenna Transformer	65-0195
4	Tuning Condenser	63-0028
5	Aerial Compensator	63-0030
6	Condenser (.05 mfd.)	61-0101
7	Condenser (.05 mfd.)	61-0111
8	First Padder (on Tun. Cond.)	
9	Condenser (110 mmfd.)	30-1031
10	Resistor (10,000 ohms)	33-310154
11	Resistor (22,000 ohms)	33-322154
12	Resistor (190 ohms)	33-119336
13	Condenser (.05 mfd.)	61-0111
14	Pilot Lamp	69-0004
15	Filament Choke	65-0158
16	Resistor (100,000 ohms)	33-410154
17	Condenser (110 mmfd.)	30-1031
18	Second Padder (on Tun. Cond.)	
19	Oscillator Transformer	65-0194
20	Padder (Pri. 1st I.F. Trans.)	
21	First I. F. Transformer	65-0191
22	Condenser (.05 mfd.)	61-0111
23	Padder (Sec. 1st I. F. Trans.)	
24	Resistor (190 ohms)	33-119336
25	Condenser (.05 mfd.)	61-0111
26	Resistor (15,000 ohms)	33-315154
27	Volume Control (350,000 ohms) in On-Off Switch	67-0020
28	Resistor (2700 ohms)	33-227434
29	Second I. F. Transformer	65-0192
30	Padder (Sec. 2nd I. F. Trans.)	
31	Resistor (2,200,000 ohms)	33-522154
32	Condenser (250 mmfd.)	61-0033
33	Condenser (4000 mmfd.)	61-0128
34	Resistor (15,000,000 ohms)	33-615154
35	Resistor (220,000 ohms)	33-422154
36	Resistor (470,000 ohms)	33-447154
37	Condenser (.01 mfd.)	61-0114
38	Filter Condenser (10-15-20 mfd.)	61-0089
39	Resistor (190 ohms)	33-119336
40	Resistor (2200 ohms)	33-222334
41	Condenser (.03 mfd.)	61-0119
42	Cone and Voice Coil (For 73-0027-1)	91-0076
	(For 73-0027-2)	91-0077
43	Output Transformer	65-0258
44	Field Coil	not replaceable
49	Condenser (250 mmfd.)	61-0033
50	Condenser (.5 mfd.)	61-0106
51	"A" Choke	32-1644
52	Condenser (250 mmfd.)	61-0033
53	Vibrator Choke	65-0204
54	Condenser (.5 mfd.)	61-0106
55	Vibrator	83-0025
56	Resistor (220 ohms)	33-122334
57	Resistor (220 ohms)	33-122334
58	Power Transformer	65-0185
59	Condenser (.015 mfd.)	61-0138
60	Condenser (8 mmfd.)	30-1106
	Drive Cord (16½")	55-0588
	Drive Cord (5¾")	55-0589
	Drive Cord (13¾")	55-0652
	Drive Cord (7⅝")	55-0653
	Tuning Shaft	57-0802FA3
	Speaker	73-0027
	Tube Side Cover	318-1964
	Wiring Side Cover	77-0337
	Pointer	57-1421
	Dial	77-0526
	Tuning and Volume Knob	55-0547
	Window Crystal	55-0501

MODELS AR-1, AR-4
AR-9, C-1708

PHILCO RADIO & TELEV. CORP.

ALIGNING PROCEDURE MODEL AR-1

OPERATIONS	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	ADJUST THE AERIAL COMPENSATOR ⑥ TWO TURNS FROM TIGHT				
2	455 K.C.	To Aerial Receptacle on Radio	.1 mfd.	Note 1	30,23,20
3	1580 K.C.	To Aerial Receptacle on Radio	30 mmfd. See Note 2	Note 1	30,23,20 18
4	1400 K.C.	To Aerial Receptacle on Radio	30 mmfd. See Note 2	Set tuning condenser at 1400 K.C.	⑧ Note 3
5	1200 to 1400 K.C.	Note 4	Note 4	Note 4	⑥

Make all adjustments for maximum reading on the output meter.

NOTE 1—Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 2—Connect the aerial lead, Part No. 41-3191, to the aerial receptacle in the radio. Connect a 30 mmfd. Condenser in series between the signal generator and the aerial lead.

NOTE 3—When the aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

NOTE 4—When installing the radio in the car, follow the instructions carefully. Tune in a weak broadcast signal between 1200 and 1100 K. C. on the control scale. Remove the plug button on the side of the radio and adjust the aerial compensator ⑤ for maximum signal.

MODEL AR-4

Make all adjustments for maximum reading on the output meter.

NOTE 1—Connect the aerial lead, Part No. 41-3191, to the aerial receptacle in the radio. Connect a 10 Mmfd. Condenser in series between the signal generator and the aerial 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 aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial 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. Adjust the aerial compensator ⑥ for maximum signal.

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	ADJUST THE AERIAL COMPENSATOR ⑥ TWO TURNS FROM TIGHT				
2	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	30,27,23,21
3	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	30,27,23,21 17
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	④ Note 4
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	⑮ Note 3
6	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	⑰
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	④ Note 4
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	⑮ Note 3
9	1200 to 1400 K.C.	Note 5	Note 5	Note 5	⑥

MODEL AR-9

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE BLACK DOT APPEARS IN THE BAND INDICATOR WINDOW AND STATIONS CAN BE TUNED IN BY MANUAL TUNING.				
2	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	41 39 26 25 41 39 26 25
3	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	69
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	65 Note 4
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	21 Note 3
6	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	69
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	65 Note 4
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	21 Note 3

INSTRUCTIONS FOR ADJUSTING SHORT WAVE PADDERS

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE "RED" DOT APPEARS IN THE BAND INDICATOR WINDOW				
1	10 M.C.	To Aerial Receptacle on Radio	Note 1	Note 2	① OSC. 10 M.C.
2	9.5 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 9.5 M.C. Signal	⑤ ANT. 9.5 M.C.
3	6 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 6 M.C. Signal	③ ANT. 6 M.C.
	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE "WHITE" DOT APPEARS IN THE BAND INDICATOR WINDOW				
1	12.1 M.C.	To Aerial Receptacle on Radio	Note 1	Note 2	② OSC. 12.1 M.C.
2	11.9 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 11.9 M.C. Signal	⑥ ANT. 11.9 M.C.
3	11.7 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 11.7 M.C. Signal	④ ANT. 11.7 M.C.
4	OPERATIONS 2 AND 3 ARE IMPORTANT AND MUST BE REPEATED UNTIL MAXIMUM SIGNAL IS RECEIVED				

Make all adjustments for maximum reading on the output meter.

NOTE 1—Connect the aerial lead, Part No. 41-3191, to the aerial receptacle in the radio. Connect a 10 mmfd. Condenser in series between the signal generator and the aerial 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 aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

Model C-1708

Make all adjustments for maximum reading on the output meter unless otherwise specified.

NOTE 1—Turn the tuning control knob clockwise as far as it will go.

NOTE 2—Connect the Chrysler Antenna lead, Part No. 95-0106, to the antenna receptacle on the radio. Connect a 20 mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 3—Rotate the tuning control when adjusting the Low Frequency screw ⑮. Tune to the signal and adjust the screw for maximum output. Turn the tuning control knob slightly, first one way then the other, for maximum output. Repeat this procedure until no further improvement is noticed.

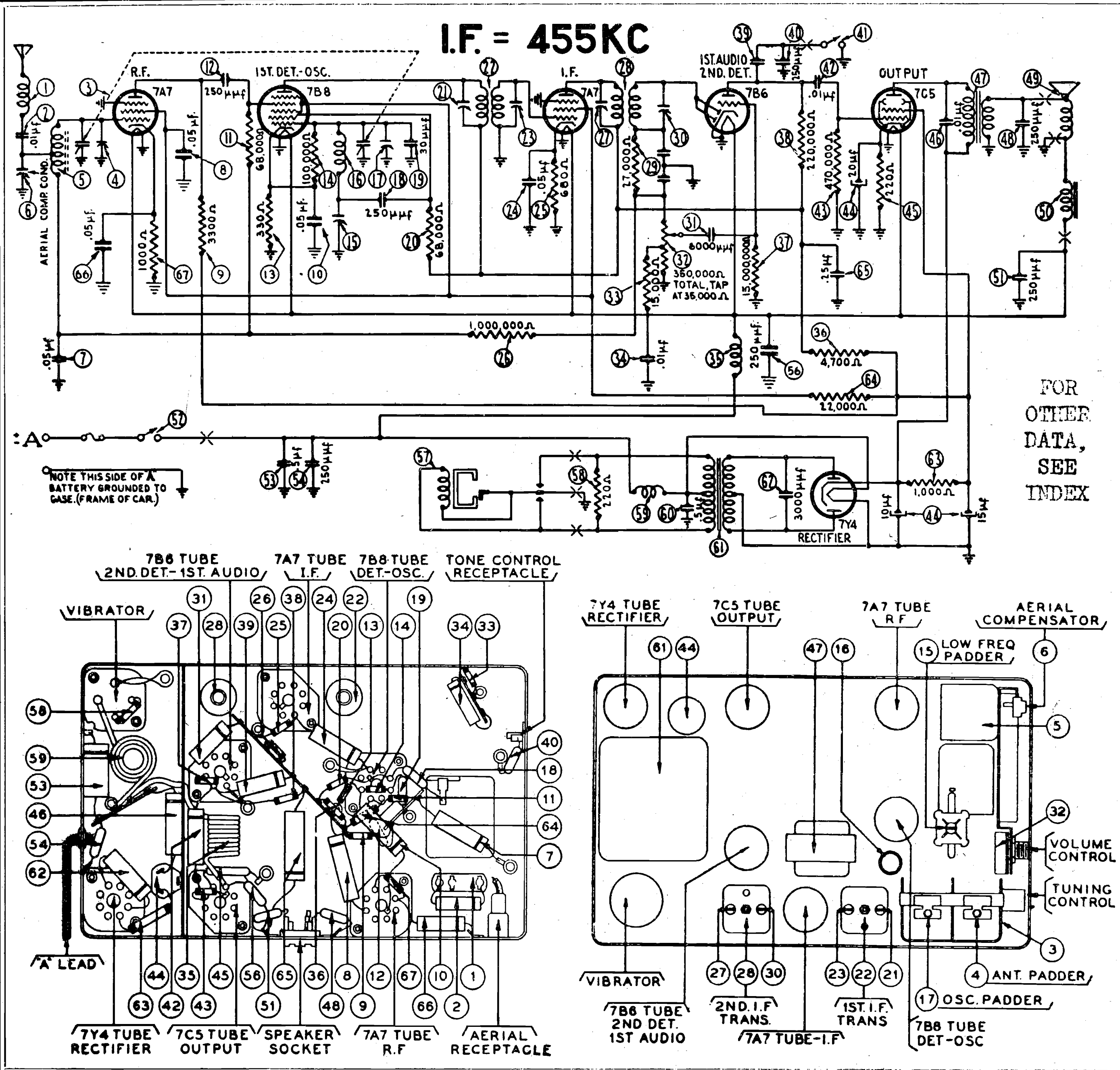
NOTE 4—When the Antenna Stage adjustment is made with the Radio installed in the car, the Radio Antenna lead must be connected to the Cowl Antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna lead but not connected to it and adjust padder ④ for maximum signal at 1400 K. C.

MODEL C-1708

OPERATIONS	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	Press the "DIAL" button and stations can be tuned in by "DIAL" tuning				
1	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 1	27 25 18 16 27 25 18, 16
2	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 1	⑫ minimum
3	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning control at 1400 K. C.	④
4	580 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning control at 580 K. C.	55 Note 3
5	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning control at 1400 K. C.	④ Note 4

MODEL AR-4

PHILCO RADIO & TELEV. CORP.

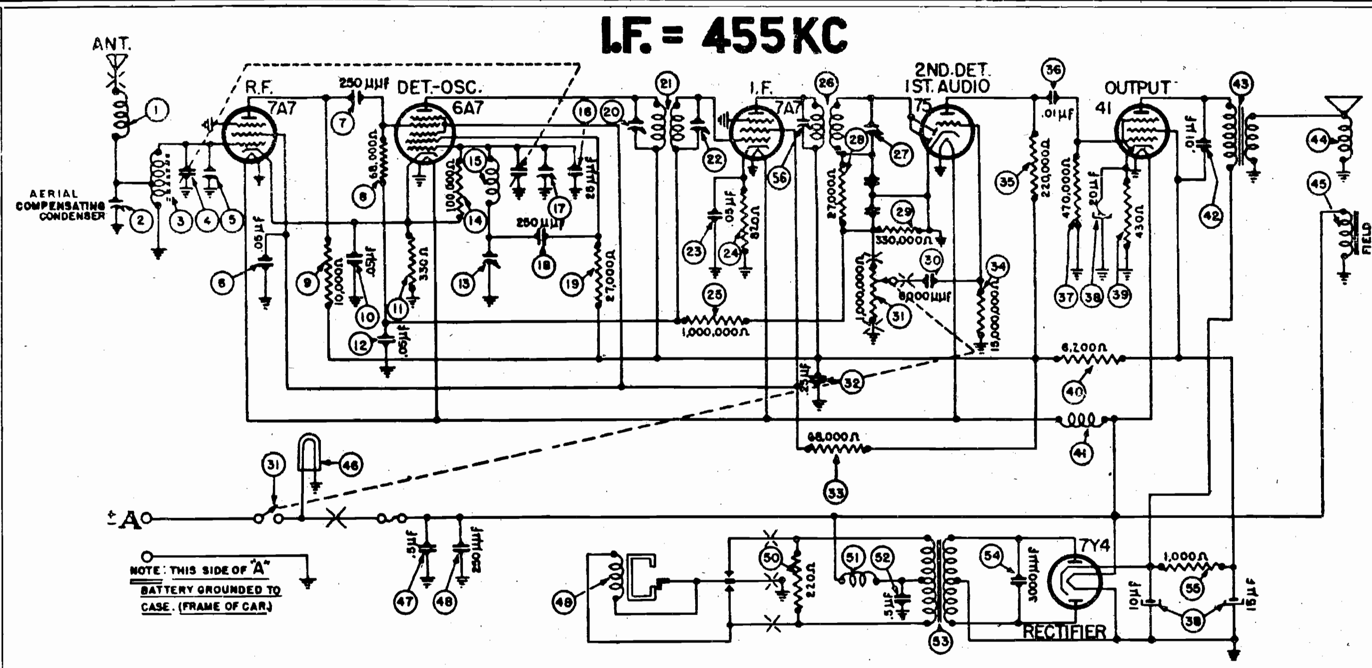


FOR OTHER DATA, SEE INDEX

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0014
3	Tuning Condenser	63-0047
4	Antenna Padder (on Tun. Cond.)	
5	Antenna Transformer	65-0323
6	Aerial Compensator	77-0545
7	Condenser (.05 Mfd.)	61-0101
8	Condenser (.05 Mfd.)	61-0101
9	Resistor (3,300 ohms)	33-233334
10	Condenser (.05 Mfd.)	61-0101
11	Resistor (68,000 ohms)	33-368154
12	Condenser (250 Mmfd.)	61-0033
13	Resistor (330 ohms)	33-133336
14	Resistor (100,000 ohms)	33-410154
15	Low Frequency Padder	63-0048
16	Oscillator Transformer	65-0052
17	Oscillator Padder (on Tun. Cond.)	
18	Condenser (250 Mmfd.)	61-0033
19	Condenser (30 Mmfd.)	60-030337
20	Resistor (68,000 ohms)	33-368334
21	Padder (Pri. 1st I. F. Trans.)	
22	First I. F. Transformer	65-0319
23	Padder (Sec. 1st I. F. Trans.)	
24	Condenser (.05 Mfd.)	61-0101
25	Resistor (680 ohms)	33-168336
26	Resistor (1,000,000 ohms)	33-510154
27	Padder (Pri. 2nd I. F. Trans.)	
28	Second I. F. Transformer	65-0320
29	Resistor (27,000 ohms)	33-327154
30	Padder (Sec. 2nd I. F. Trans.)	
31	Condenser (6,000 Mmfd.)	61-0103
32	Volume Control (350,000 ohms)	67-0032-1
33	Resistor (15,000 ohms)	33-315154
34	Condenser (.01 Mfd.)	61-0114
35	Filament Choke	32-1604
36	Resistor (4,700 ohms)	33-247334
37	Resistor (15,000,000 ohms)	33-615154
38	Resistor (220,000 ohms)	33-422334
39	Condenser (4,000 Mmfd.)	61-0129
40	Condenser (250 Mmfd.)	61-0033
41	Tone Control Switch	85-0111
42	Condenser .01 Mfd.)	61-0100
43	Resistor (470,000 ohms)	33-447154
44	Filter Condenser (10-15-20 Mfd.)	61-0089
45	Resistor (220 ohms)	33-122438
46	Condenser (.01 Mfd.)	61-0124
47	Output Transformer	65-0317
48	Condenser (250 Mmfd.)	61-0033
49	Replacement Cone	
	(For 73-0045-2 Speaker)	91-0086
	(For 73-0045-3 Speaker)	91-0126
	(For 73-0047-2 Speaker)	91-0086
	(For 73-0047-3 Speaker)	91-0126
50	Field Coil	Not Replaceable
51	Condenser (250 Mmfd.)	61-0033
52	On-Off Switch	85-0112
53	Condenser (.5 Mfd.)	61-0106
54	Condenser (250 Mmfd.)	61-0033
56	Condenser (250 Mmfd.)	61-0033
57	Vibrator	83-0025
58	Resistor (220 ohms)	33-122334
59	Vibrator Choke	65-0075
60	Condenser (.5 Mfd.)	61-0137
61	Power Transformer	65-0318
62	Condenser (3,000 Mmfd.)	61-0115
63	Resistor (1,000 ohms)	33-210434
64	Condenser (22,000 ohms)	33-322434
65	Condenser .25 Mfd.)	61-0125
66	Condenser (.05 Mfd.)	61-0111
67	Resistor (1,000 ohms)	33-210336
	Interference Condenser	30-4007
	Distributor Resistor	33-1196

MODEL AR-6

PHILCO RADIO & TELEV. CORP.



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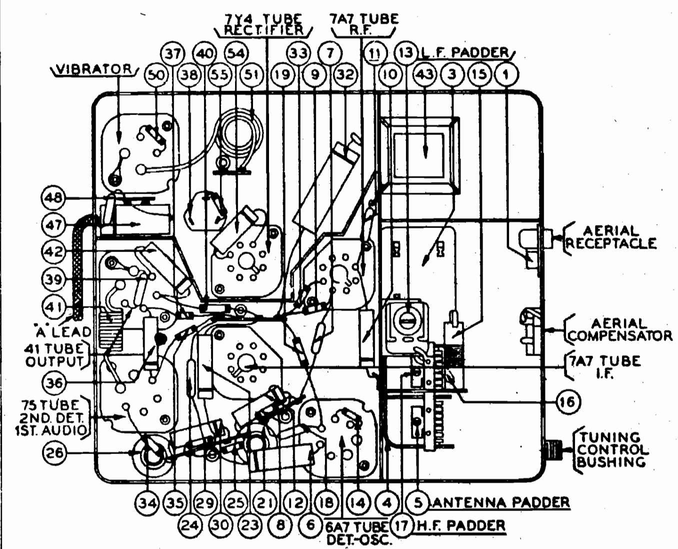
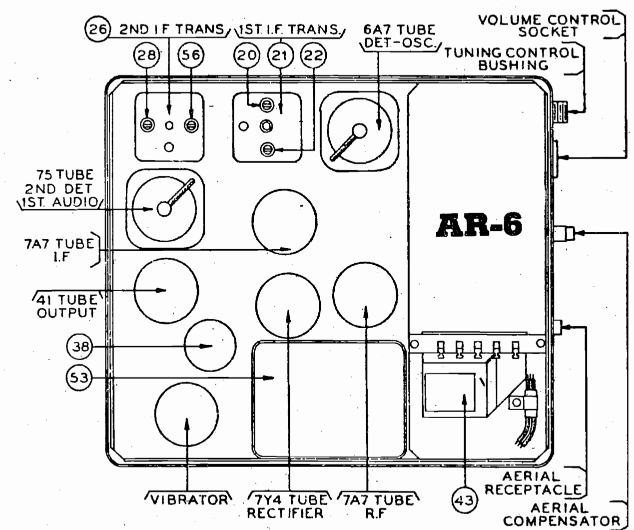
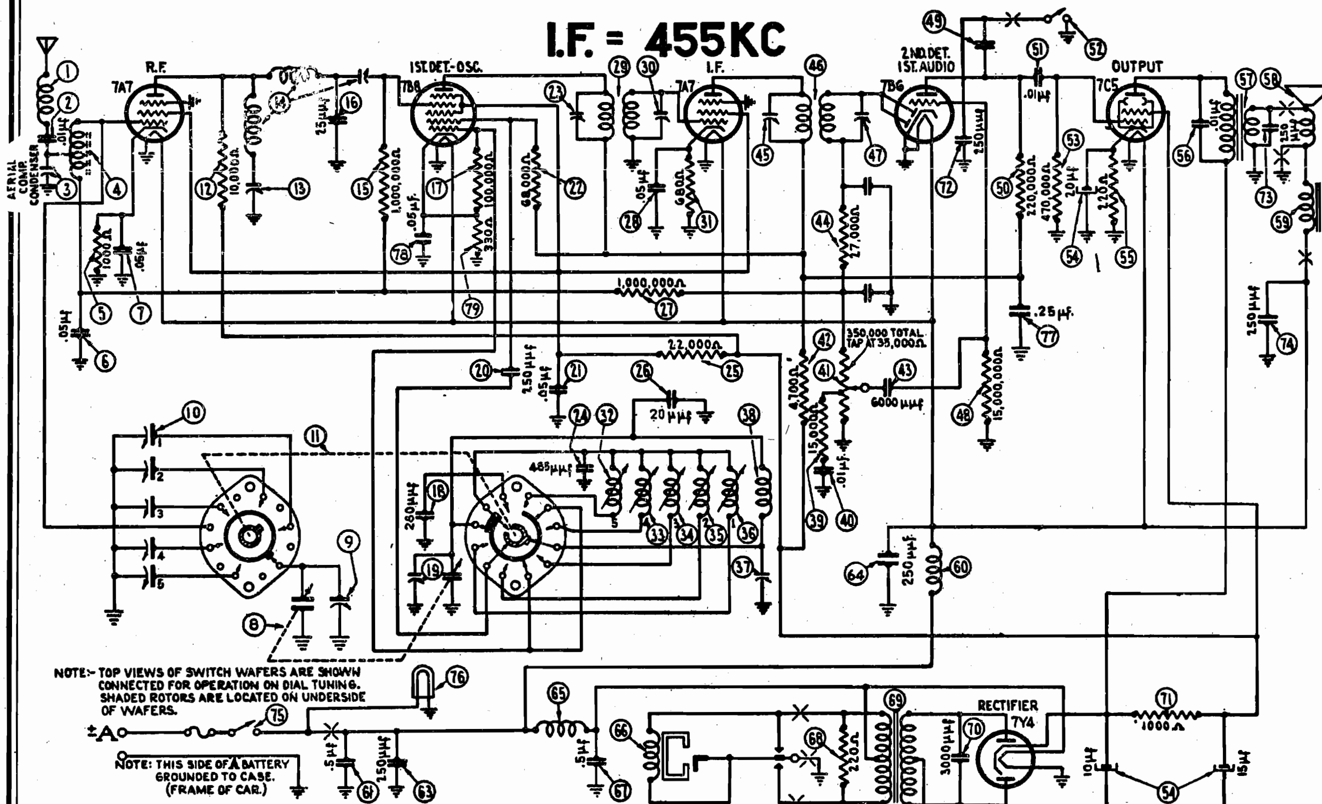


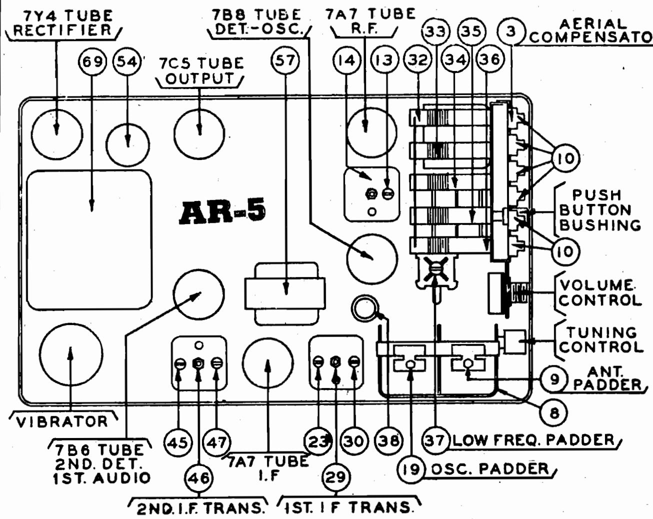


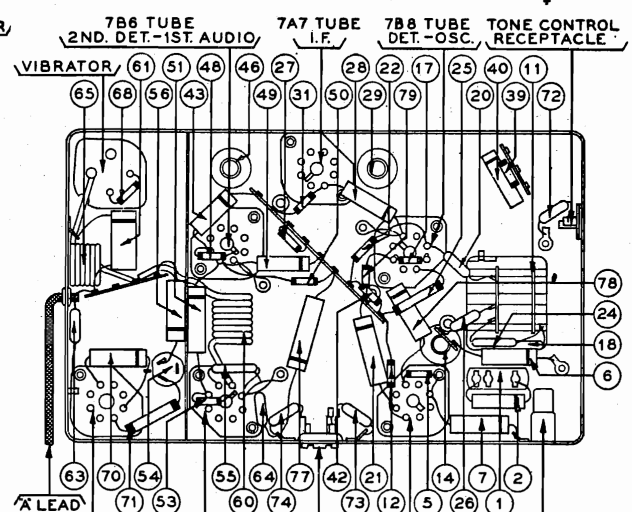
No.	Description	Part No.
1	Aerial Choke	65-0102
2	Aerial Padder	31-6248
3	Antenna Transformer	65-0085
4	Tuning Condenser	63-0016
5	Aerial Padder (on Tun. Cond.)	
6	Condenser (.05 Mfd.)	61-0101
7	Condenser (250 Mmfd.)	61-0033
8	Resistor (68,000 ohms)	33-368154
9	Resistor (10,000 ohms)	33-310334
10	Condenser (.05 Mfd.)	61-0101
11	Resistor (330 ohms)	33-133436
12	Condenser (.05 Mfd.)	61-0111
13	Low Frequency Padder	31-6230
14	Resistor (100,000 ohms)	33-410154
15	Oscillator Transformer	65-0134
16	Condenser (25 Mmfd.)	30-1108
17	Oscillator Padder (on Tun. Cond.)	
18	Condenser (250 Mmfd.)	61-0033
19	Resistor (27,000 ohms)	33-327334
20	Padder (Pri. 1st I. F. Trans.)	
21	First I. F. Transformer	65-0044
22	Padder (Sec. 1st I. F. Trans.)	
23	Condenser (.05 Mmfd.)	61-0101
24	Resistor (820 ohms)	33-182438
25	Resistor (1,000,000 ohms)	33-510154
26	Second I. F. Transformer	65-0230
27	Padder (Sec. 2nd I. F. Trans.)	
28	Resistor (27,000 ohms)	33-327344
29	Resistor (330,000 ohms)	33-433154
30	Condenser (6,000 Mmfd.)	61-0103
31	Volume Control (1,000,000 ohms) & On-Off Switch	33-5268
32	Condenser (.25 Mfd.)	61-0125
33	Resistor (68,000 ohms)	33-368334
34	Resistor (15,000,000 ohms)	33-615154
35	Resistor (220,000 ohms)	33-422334
36	Condenser (.01 Mfd.)	61-0100
37	Resistor (470,000 ohms)	33-447154
38	Filter Condenser (10-15-20 Mfd.)	61-0089
39	Resistor (430 ohms)	33-143438
40	Resistor (6,200 ohms)	33-262434
41	Filament Choke	32-1644
42	Condenser (.01 Mfd.)	61-0120
43	Output Transformer	65-0048
44	Cone & Voice Coil	91-0028
45	Field Coil	Not Replaceable
46	Pilot Lamp	34-2040
47	Condenser (.5 Mfd.)	61-0106
48	Condenser (250 Mmfd.)	61-0033
49	Vibrator	83-0025
50	Resistor (220 ohms)	33-122334
51	Vibrator Choke	65-0075
52	Condenser (.5 Mfd.)	61-0137
53	Power Transformer	65-0159
54	Condenser (3,000 Mmfd.)	61-0115
55	Resistor (1,000 ohms)	33-210334
56	Padder (Pri. 1st I. F. Trans.)	
	4 Prong Socket	27-6044
	6 Prong Socket	27-6036
	7 Prong Socket	27-6037
	Loktal Sockets	27-6131
	Volume Control Socket	55-0945
	Radio Housing	77-0520FC45
	Speaker Unit	73-0029
	Front Cover	57-1389FC45
	"T" Bolt (Radio Mtg.)	28-6161FA3
	Nut (Radio Mtg.)	W518FA1
	Washer (Radio Mtg.)	28-2606FA1
	Interference Condenser	30-4007
	Distributor Resistor	33-1196
	Fuse	7227
	Standard Control Assembly	85-0117
	Dial	55-0304
	Flexible Shaft	57-0631

PHILCO RADIO & TELEV. CORP.

MODEL AR-5







No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0114
3	Aerial Compensator	Part of 10
4	Antenna Transformer	65-0323
5	Resistor (1,000 ohms)	33-210338
6	Condenser (.05 Mfd.)	61-0101
7	Condenser (.05 Mfd.)	61-0111
8	Tuning Condenser	63-0047
9	Antenna Padder (on Tun. Cond.)	
10	Antenna Padder Assembly	77-0512
11	Wafer Switch	77-0506
12	Resistor (10,000 ohms)	33-310334
13	I. F. Wave Trap Padder	
14	R. F. Transformer	65-0321
15	Resistor (1,000,000 ohms)	33-510154
16	Condenser (25 Mmfd.)	30-1067
17	Resistor (100,000 ohms)	33-410154
18	Silver Mica Condenser (280 Mmfd.)	61-0043
19	Oscillator Padder (on Tun. Cond.)	
20	Condenser (250 Mmfd.)	61-0033
21	Condenser (.05 Mfd.)	61-0101
22	Resistor (68,000 ohms)	33-368334
23	Padder (Pri. 1st I. F. Trans.)	
24	Silver Mica Condenser (485 Mmfd.)	61-0144
25	Resistor (22,000 ohms)	33-325434
26	Condenser (15 Mmfd.)	61-0039
27	Resistor (1,000,000 ohms)	33-510154
28	Condenser (.05 Mfd.)	61-0101
29	First I. F. Transformer	65-0319
30	Padder (Sec. 1st I. F. Trans.)	
31	Resistor (680 ohms)	33-168336
32	Oscillator Transformer (550 to 1065 KC)	65-0173
33	Oscillator Transformer (600 to 1165 KC)	65-0172
34	Oscillator Transformer (660 to 1240 KC)	65-0171
35	Oscillator Transformer (750 to 1410 KC)	65-0170
36	Oscillator Transformer (855 to 1580 KC)	65-0169
37	Low Frequency Padder	63-0048
38	Manual Oscillator Transformer	65-0052
39	Resistor (15,000 ohms)	33-315154
40	Condenser (.01 Mfd.)	61-0114
41	Volume Control (350,000 ohms)	67-0032-1
42	Resistor (47,000 ohms)	33-247334
43	Condenser (6,000 Mmfd.)	61-0103
44	Resistor (27,000 ohms)	33-327154
45	Padder (Pri. 2nd I. F. Trans.)	
46	Second I. F. Transformer	65-0320
47	Padder (Sec. 2nd I. F. Trans.)	
48	Resistor (15,000,000 ohms)	33-615154
49	Condenser (4,000 Mmfd.)	61-0129
50	Resistor (220,000 ohms)	33-422334
51	Condenser (.01 Mfd.)	61-0100
52	Tone Control Switch	85-0111
53	Resistor (470,000 ohms)	33-447154
54	Filter Condenser (10-15-20 Mfd.)	61-0089
55	Resistor (220 ohms)	33-122438
56	Condenser (.01 Mfd.)	61-0124
57	Output Transformer	65-0317
58	Replacement Cone	
	(For 73-0045-2 Speaker)	91-0086
	(For 73-0045-3 Speaker)	91-0126
	(For 73-0047-2 Speaker)	91-0086
	(For 73-0047-3 Speaker)	91-0126
59	Field Coil	Not Replaceable
60	Filament Choke	32-1604
61	Condenser (.5 Mfd.)	61-0106
63	Condenser (250 Mmfd.)	61-0033
64	Condenser (250 Mmfd.)	61-0033
65	Vibrator Choke	65-0075
66	Vibrator	83-0025
67	Condenser (.5 Mfd.)	61-0137
68	Resistor (220 ohms)	33-122334
69	Power Transformer	65-0318
70	Condenser (3,000 Mmfd.)	61-0115
71	Resistor (1,000 ohms)	33-210434
72	Condenser (250 Mmfd.)	61-0033
73	Condenser (250 Mmfd.)	61-0033
74	Condenser (250 Mmfd.)	61-0033
75	On-Off Switch	85-0112
76	Pilot Lamp	34-2064
77	Condenser (.25 Mfd.)	61-0125
78	Condenser (.05 Mfd.)	61-0101
79	Resistor (330 ohms)	33-133336
	Hook Bolts (Radio Mtg.)	57-1340FA3
	Nut (Radio Mtg.)	W98FA3
	Tube Side Cover	318-1997
	Wiring Side Cover	57-1345FC45
	4 Prong Socket	**27-6044**

MODELS AR-5, AR-6, AR-7
AR-8, C-1708

PHILCO RADIO & TELEV. CORP.

MODEL C-1708

SETTING UP ELECTRIC TUNING

1. With the antenna installed and connected, turn on the radio and allow it to operate for TWENTY minutes before making adjustments.

The Receiver must be adjusted with the Skyway antenna fully extended and it is recommended that adjustments be made with the car in a shielded area such as under a viaduct or in a steel constructed building. However best results may be obtained using the new signal Antennuator. This permits setting up nearby local stations on the buttons without having the car in a shielded area.

2. Push in the dial button and tune with manual control a weak station between 1350 and 1500 kilocycles. Pull push buttons off. Adjust the antenna compensator with a screw driver by turning the adjusting screw either to the left or right until maximum volume is reached. See illustration.

3. If numbers on buttons are not desired, select and remove from the call letter sheet, five call letter tabs of popular stations received in the area in which the receiver is to be operated, selecting stations within the range of each button as shown in illustration, Model C-1708. Reference to programs published in your local newspaper aids in quick selection of stations. Remove metal caps to install the tabs in push buttons.

4. Push dial button and tune in the station you have selected for the No. 1 button, identify the program and push in the No. 1 push button shaft. Using a small screw driver, turn the No. 1 adjusting screw (inner screw) and tune in the station selected for this position by turning the screw driver counter-clockwise to increase frequency and clockwise to decrease frequency.

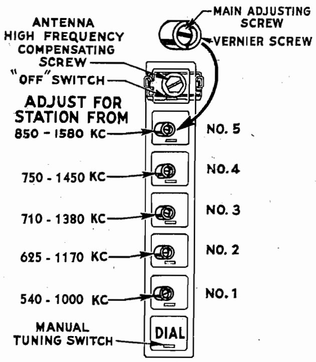
After the station has been tuned in accurately, (see illustration) a finer adjustment can be made by adjusting the vernier screw, which is the outside shell of the adjusting screw. Use a larger screw driver for this operation. Careful adjustment of this screw will insure maximum performance in areas where broadcasting reception is poor.

Proceed in like manner with the adjustment of No. 2, 3, 4 and 5 screws in the order of frequency until all five stations have been tuned in. It is recommended that the above procedure of setting up stations should be repeated in order that accurate adjustments may be insured, for satisfactory reception at some distance from stations.

5. The push buttons may now be replaced on their respective shafts.

The Receiver may be set up before installing in the car, but FINAL adjustments must be made with the radio operating on the antenna in the car. Eight hundred call letter tabs in sheet form are furnished so that at least five popular radio broadcasting stations can be selected.

BE SURE AND SAVE THE UNUSED CALL LETTERS, GIVING THEM TO THE OWNER AS THEY MAY BE NEEDED AT SOME FUTURE TIME IF THE RADIO IS TO BE OPERATED IN A DIFFERENT AREA WHERE THE LOCAL STATIONS ARE NOT THE SAME.



AUTOMATIC ADJUSTING SCREWS

Setting Up Automatic Electric Tuning

MODELS AR-7, AR-8

Turn on the radio and allow it to operate for twenty minutes or longer if possible. During this time, proceed as follows:

1. Remove the plate on the end of the radio which covers the adjusting screws. This is held by snap springs and can easily be pried off.

2. Select and remove from the station call letter sheets, five call letter tabs of the popular stations received in the area where the radio will be operated, selecting stations within the range of each button. Reference to programs published in the local newspaper will aid in the quick selection of the proper stations.

3. In Models 937 and 938 place the call letter tabs in the station selector buttons in the order of the station frequencies, with the call letters of the station of lowest frequency at the left.

Example: Place the call letter tab of station WFIL, whose frequency is 560 K. C., in the left button, and the call letter tab of Station WOR, whose frequency is 710 K. C. in the next button, always progressing from left to right.

In Models 937X, 938KX, AR7 and AR8 insert the numbered station indicating tabs in the station selector buttons. List the highest frequency station as 1, and so on down to the lowest frequency station, which should be 5. The range of each automatic tuning circuit in these models is given below:

850 KC to 1580 KC	850 KC to 1580 KC	750 KC to 1350 KC	550 KC to 1000 KC	550 KC to 1000 KC
1	2	3	4	5

After the station tabs are inserted the following procedure is used in adjusting any of the above models.

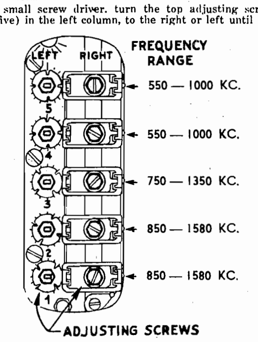
4. Push in the last button — "Dial," This adjusts the Radio so that it can be tuned with the tuning control knob in the conventional manner.

5. Tune in with the dial tuning control knob, the station whose call letters are in the left selector button and note the program. Now push in the selector button corresponding to these call letters.

With a small screw driver. turn the top adjusting screw (number five) in the left column, to the right or left until the same station is tuned in. Then adjust the corresponding screw in the right column, turning right or left until the maximum volume is obtained. If in doubt as to the station, push the "Dial" button and recheck. The adjustment on strong signals can be made best inside a shielded area such as in a reinforced steel building, or under a viaduct.

Continue the above procedure for each push button, working from left to right, and adjusting each pair of corresponding adjusting screws from top to bottom until all five stations are set up and are received correctly when their particular buttons are depressed. It is advisable to repeat the entire adjustment procedure to be sure the settings are correct.

The automatic tuning adjustments may be made before installing the radio in the car, but FINAL adjustments must be made with the radio installed and operating on the antenna in the car.



ADJUSTING SCREWS AND FREQUENCY RANGE

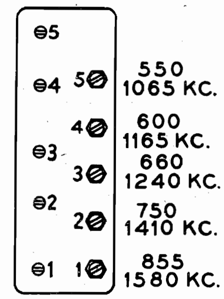
Setting Up Automatic Tuning

MODEL AR-5

Turn on the radio and allow it to operate for twenty minutes or longer if possible. During this time, proceed as follows:

1. Remove the plate on the end of the radio which covers the adjusting screws. This is held by two screws.

2 Select five popular local stations whose frequencies come within the ranges of the five automatic tuning circuits, and list them on the Owner's Reference Label. List the highest frequency station as 1. and so on down to the lowest frequency station, which should be 5.



ADJUSTING SCREWS AND FREQUENCY RANGE

The range of each automatic tuning circuit is given below:

855 KC to 1580 KC	750 KC to 1410 KC	660 KC to 1240 KC	600 KC to 1165 KC	550 KC to 1065 KC
1	2	3	4	5

3. Push in the right knob until "D" appears in the station indicator window. This adjusts the radio so that it can be tuned with the tuning control knob in the conventional manner.

5. Tune in with the dial tuning control knob, the station having the highest frequency, and note the program. Now push in the right hand knob until No. 1 appears in the station indicator window.

With a small screw driver, turn the bottom adjusting screw (number one) in the left column, to the right or left until the same station is tuned in. Then adjust the corresponding screw in the right column, turning right or left until maximum volume is obtained. If in doubt as to the station, push the right knob until "D" appears and recheck. The adjustment on strong signals can be made best inside a shielded area such as in a reinforced steel building, or under a viaduct.

Continue the above procedure for the stations selected for Nos. 2, 3, 4, and 5 position in the given order, working from left to right, and adjusting each pair of corresponding adjusting screws from the bottom to the top until all five stations are set up. It is advisable to repeat the entire adjustment procedure to be sure the settings are correct.

The automatic tuning adjustments may be made before installing the radio in the car, but FINAL adjustments must be made with the radio installed and operating on the aerial in the car.

ALIGNING PROCEDURE MODEL AR-5

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	PUSH IN THE RIGHT KNOB ON THE CONTROL UNTIL "D" APPEARS IN THE STATION INDICATOR WINDOW AND STATIONS CAN BE TUNED IN BY MANUAL TUNING. ADJUST THE AERIAL COMPENSATOR ③ TWO TURNS FROM TIGHT.				
2	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	47 45 50 [illegible] 47 46 50 [illegible]
3	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	13 Min.
4	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	19
5	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	9 Note 4
6	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	37 Note 3
7	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	19
8	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	9 Note 4
9	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	37 Note 3
10	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 aerial lead, Part No. 41-3191, to the aerial receptacle in the radio. Connect a 10 Mmfd. Condenser in series between the signal generator and the aerial 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 aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial 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 areial compensator ③ for maximum signal.

NOTE 6—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. Adjust the aerial compensator ② for maximum signal.

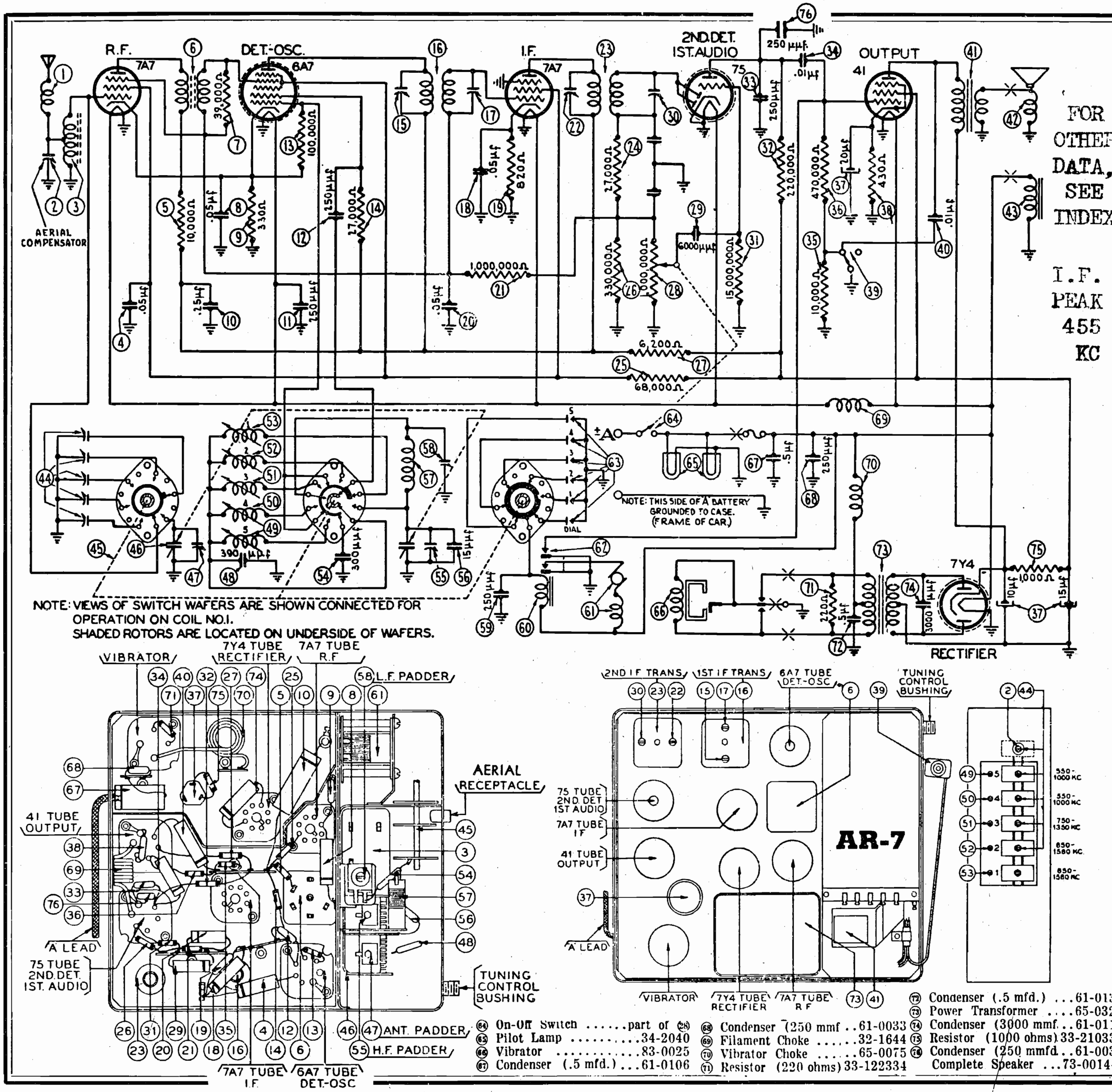
MODEL AR-6

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	ADJUST THE AERIAL COMPENSATOR ② TWO TURNS FROM TIGHT				
2	455 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	[illegible]
3	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	17
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	5 Note 4
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	13 Note 3
6	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	17
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	5 Note 4
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	13 Note 3
9	1200 to 1400 K.C.	Note 6	Note 6	Note 6	2

SEE NOTES ABOVE

PHILCO RADIO & TELEV. CORP.

MODEL AR-7



FOR OTHER DATA, SEE INDEX

I.F. PEAK 455 KC

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Aerial Compensator	part of 44
3	Antenna Transformer	65-0085
4	Condenser (.05 mfd.)	61-0101
5	Resistor (10,000 ohms)	33-310334
6	R. F. Transformer	65-0009
7	Resistor (39,000 ohms)	33-339154
8	Condenser (.05 mfd.)	61-0101
9	Resistor (330 ohms)	33-133336
10	Condenser (.25 mfd.)	61-0125
11	Condenser (250 mmfd.)	61-0033
12	Condenser (250 mmfd.)	61-0033
13	Resistor (100,000 ohms)	33-410154
14	Resistor (27,000 ohms)	33-327334
15	Padder (Pri. 1st I.F. Trans.)	
16	First I. F. Transformer	65-0044
17	Padder (Sec. 1st I.F. Trans.)	
18	Condenser (.05 mfd.)	61-0101
19	Resistor (820 ohms)	33-182438
20	Condenser (.05 mfd.)	61-0111
21	Resistor (1,000,000 ohms)	33-510154
22	Padder (Pri. 2nd I.F. Trans.)	
23	Second I. F. Transformer	65-0230
24	Resistor (27,000 ohms)	33-327154
25	Resistor (68,000 ohms)	33-368334
26	Resistor (330,000 ohms)	33-433154
27	Resistor (6200 ohms)	33-262434
28	Volume Control (1,000,000 ohms) and On-Off Switch	33-5268
29	Condenser (6000 mmfd.)	61-0103
30	Padder (Sec. 2nd I.F. Trans.)	
31	Resistor (15,000,000 ohms)	33-615154
32	Resistor (220,000 ohms)	33-422334
33	Condenser (250 mmfd.)	61-0033
34	Condenser (.01 mfd.)	61-0120
35	Resistor (10,000 ohms)	33-310334
36	Resistor (470,000 ohms)	33-447154
37	Filter Condenser (10-15-20 mfd.)	61-0089
38	Resistor (430 ohms)	33-143438
39	Tone Control Switch	85-0102
40	Condenser (.01 mfd.)	61-0120
41	**Output Transformer**	65-0048
42	Cone and Voice Coil	91-0028
43	Field Coil	(Not Replaceable)
44	Antenna Padders Assy.	77-0172
45	Wafer Switch	77-0207
46	Tuning Condenser	63-0016
47	Antenna Padder (on Tun. Cond.)	
48	Silver Mica Condenser (390 mmfd.)	61-0031
49	Oscillator Transformer (550 to 1000 Kc.)	65-0090
50	Oscillator Transformer (550 to 1000 Kc.)	65-0090
51	Oscillator Transformer (750 to 1350 Kc.)	65-0089
52	Oscillator Transformer (850 to 1580 Kc.)	65-0088
53	Oscillator Transformer (850 to 1580 Kc.)	65-0088
54	Silver Mica Condenser (300 mmfd.)	61-0003
55	H. F. Padder (on Tun. Cond)	
56	Condenser (15 mmfd.)	61-0038
57	Oscillator Transformer (Manual)	65-0134
58	Low Frequency Padder	31-6230
59	Condenser (250 mmfd.)	61-0033
60	Control Magnet	part of 61
61	Motor Assembly	77-0229
62	Relay	part of 61
63	Push Button Switch Assy	85-0114
64	On-Off Switch	part of 28
65	Pilot Lamp	34-2040
66	Vibrator	83-0025
67	Condenser (.5 mfd.)	61-0106
68	Condenser (250 mmf.	61-0033
69	Filament Choke	32-1644
70	Vibrator Choke	65-0075
71	Resistor (220 ohms)	33-122334
72	Condenser (.5 mfd.)	61-0137
73	Power Transformer	65-0326
74	Condenser (3000 mmf.	61-0115
75	Resistor (1000 ohms)	33-210334
76	Condenser (250 mmfd.	61-0033
	Complete Speaker	73-0014-2

MODELS AR-7, AR-8
F-1641

PHILCO RADIO & TELEV. CORP.

MODEL F-1641

SETTING UP AUTOMATIC TUNING

TURN THE RADIO "ON" AND ALLOW IT TO OPERATE FOR AT LEAST TWENTY MINUTES BEFORE MAKING ADJUSTMENTS.

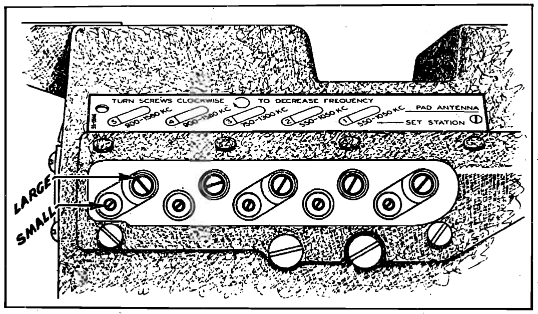
1—Select five popular local stations whose frequencies come within the ranges of the five Automatic Tuning Circuits and list them on the back of the OWNER'S MANUAL under "STATION RECORD," for the Owner's reference, also on the chart above the adjusting screws. List the lowest frequency station as No. "1" and so on down to the highest frequency which should be No. "5." The range of each Automatic Tuning Circuit is given on the chart above each Automatic Adjusting Screw on the Radio and is also reproduced in the Illustration on this page.

2—Remove the cover plate over the Automatic Adjusting Screws from the bottom of the Radio Housing by removing the two snap buttons holding it in place. There are two rows of adjusting screws—the LARGE ones for antenna adjustment and the SMALL ones for setting the stations.

3—Push the Automatic Station Selector, repeating if necessary until the DIAL appears in the dial window. Then tune in with the manual tuning control the selected station having the lowest frequency (No. 1 Station) and note the program so that it can be identified. Push the Automatic Station Selector once and No. "1" will appear in the indicator dial.

4—With a small screw driver turn the SMALL No. 1 adjusting screw until this station is tuned in. Then adjust the LARGE No. 1 screw in the other row until maximum volume is heard. IT IS VERY IMPORTANT THAT THESE ADJUSTING SCREWS BE SET ON A WEAK SIGNAL FROM THE STATION SO THAT THE CIRCUIT WILL BE SHARPLY TUNED TO THE PARTICULAR STATION. BECAUSE OF THE SIGNAL FROM THE STRONG LOCAL STATIONS IT IS NECESSARY THAT THE ANTENNA ROD BE REMOVED FROM THE ANTENNA WHILE THESE ADJUSTMENTS ARE MADE SO THAT A MIMIMUM OF SIGNAL WILL BE RECEIVED AND THUS ASSURE SHARP ADJUSTMENTS OF THE CIRCUITS.

5—Repeat this procedure for the stations selected for the No. 2, 3, 4, and 5 positions in the order given. After all the stations have been adjusted on the Automatic Adjusting Screws this procedure MUST be repeated. This is necessary in order to insure the stations being accurately set up on the adjusting screws.



BOTTOM VIEW OF RADIO SHOWING LOCATION OF ADJUSTING SCREWS

ALIGNMENT NOTES FOR MODEL F-1641
NOTE 1 - CONNECT 30 MMFD COND. IN SERIES BETWEEN SIG. GEN. & ANT. LEAD.
NOTE 2 - TURN COND. ROTOR PLATES COMPLETELY OUT OF MESH AS FAR AS THEY WILL GO.
NOTE 3 - ROCK TUNING COND. BACK & FORTH WHILE ADJUSTING LOW-FREQ. PADDER (45).
NOTE 4 - WHEN THE ANT-STAGE ADJUSTMENT IS MADE WITH THE RADIO INSTALLED IN THE CAR, THE RADIO-ANT. LEAD MUST BE CONNECTED TO THE CAR ANTENNA IN THE USUAL MANNER. CONNECT SIGNAL-GEN. OUTPUT-LEAD TO A WIRE PLACED NEAR THE CAR-ANTENNA, BUT NOT CONNECTED DIRECTLY TO IT.

ALIGNING PROCEDURE MODEL AR-7

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 AERIAL COMPENSATOR (2) TWO TURNS FROM TIGHT.				
2	455 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	(30) [illegible] (17) [illegible] (30) [illegible] (17) [illegible]
3	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	[illegible]
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	[illegible] Note 4
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	[illegible] Note 3
6	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	[illegible]
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	[illegible] Note 4
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	[illegible] Note 3
9	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 aerial lead, Part No. 41-3191, to the aerial receptacle in the radio. Connect a 50 Mmfd. Condenser in series between the signal generator and the aerial 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 aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial 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 aerial compensator (2) (See Figure 3) for maximum signal.

NOTE 6—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 aerial compensator (4) (See Figure 3) for maximum signal.

MODEL AR-8

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 AERIAL COMPENSATOR (4) TWO TURNS FROM TIGHT.				
2	455 K.C.	To Grid of 6A7 Tube	.1 Mfd.	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	[illegible] (14) [illegible] [illegible] [illegible] (14) [illegible] [illegible]
3	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	[illegible]
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	[illegible] Note 4
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	[illegible] Note 3
6	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	[illegible]
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	[illegible] Note 4
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	(57) Note 3
9	1200 to 1400 K.C.	Note 6	Note 6	Note 6	(4)

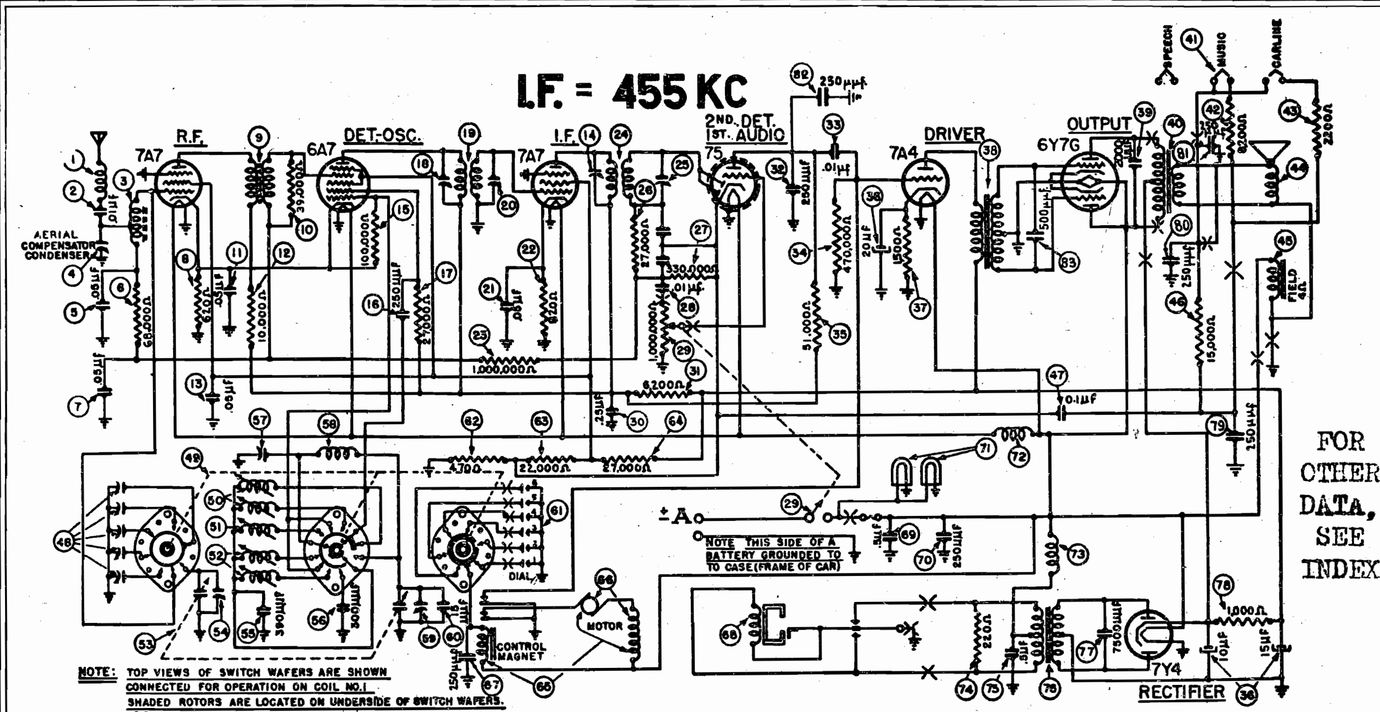
SEE NOTES ABOVE

MODEL F-1641

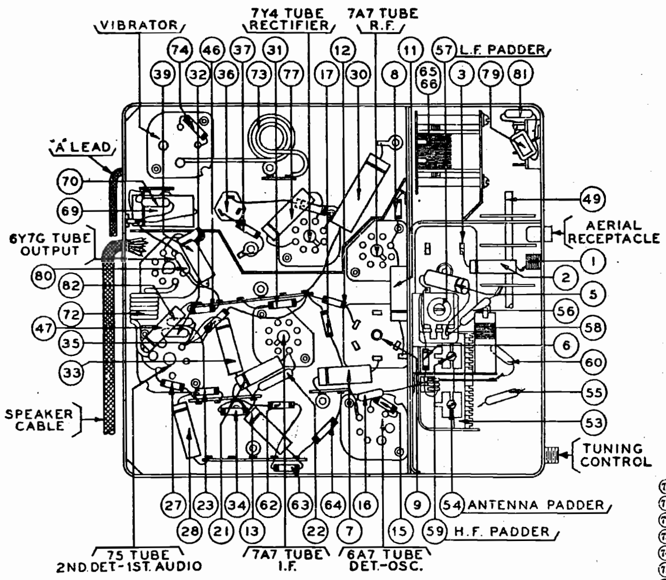
OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning				
2	470 K.C.	To Antenna Receptacle on Radio	.5 Mfd.	Note 2	(28) (26) (17) (15) (28) (26)
3	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Note 2	(46) [illegible] Note 4
4	580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 580 K.C.	(45) Note 3
5	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Note 2	[illegible]

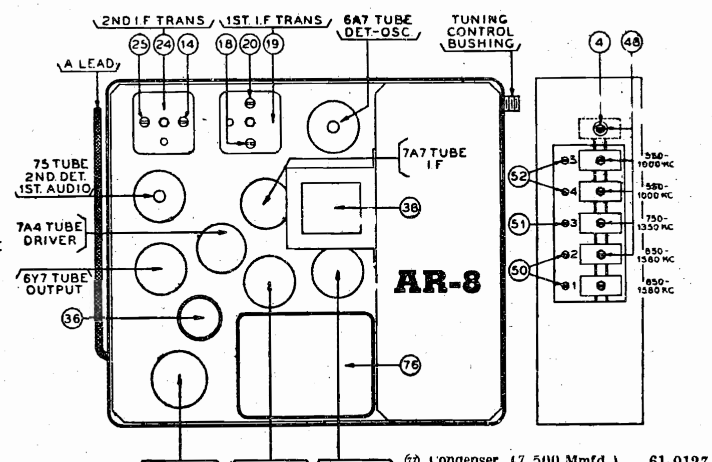
PHILCO RADIO & TELEV. CORP.

MODEL AR-8



FOR OTHER DATA, SEE INDEX

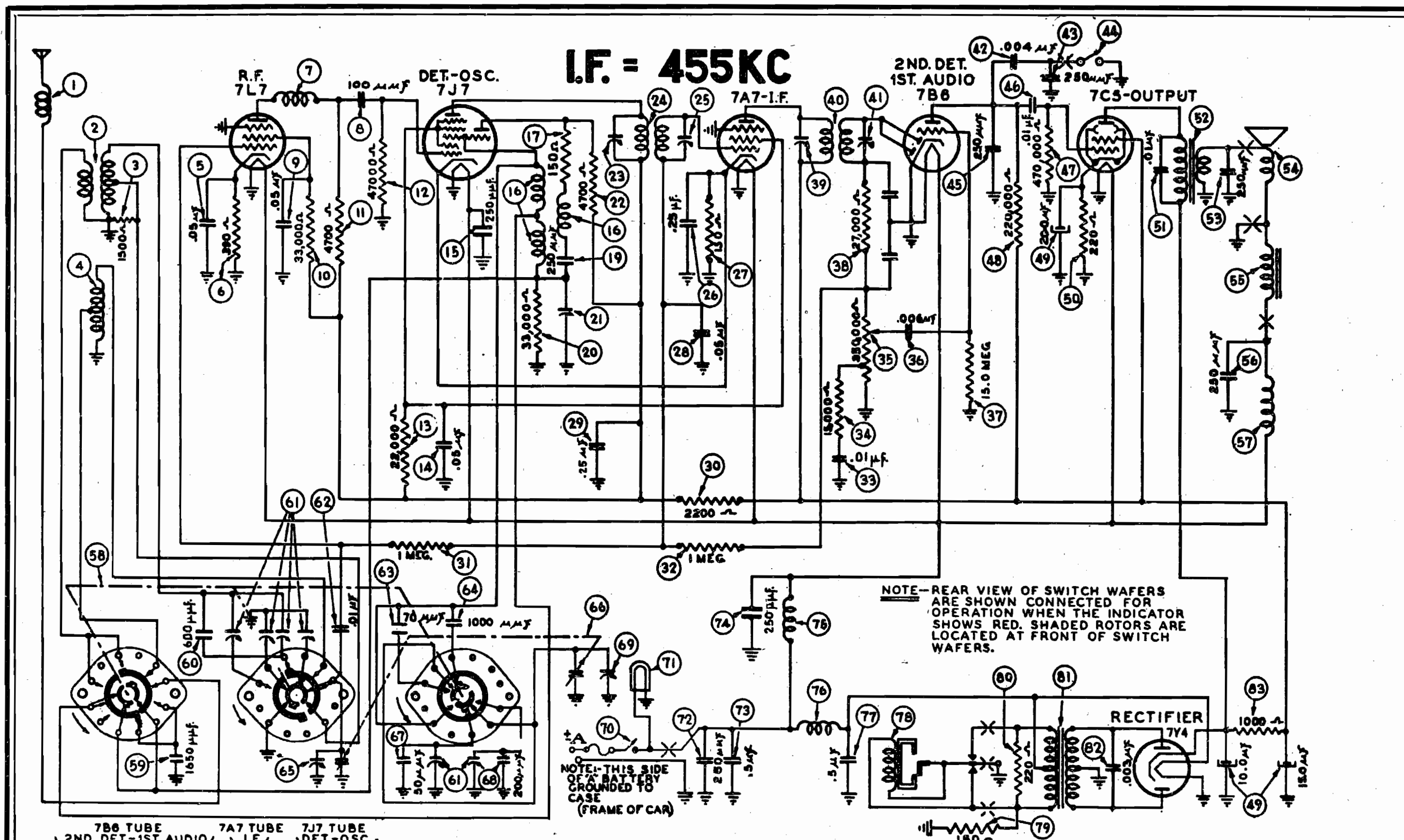


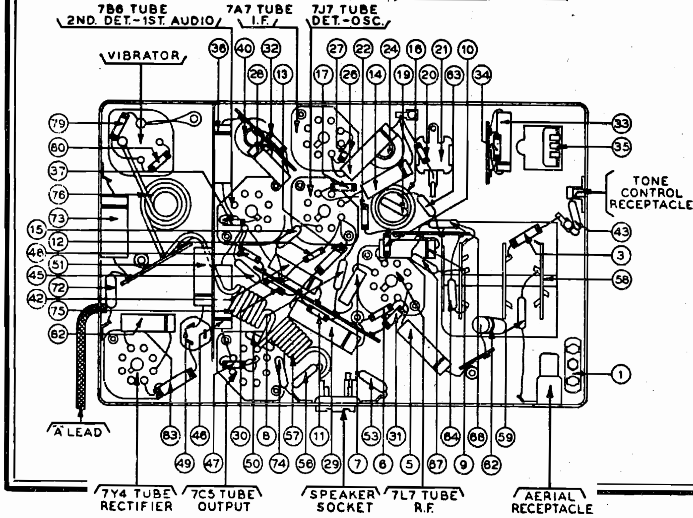


No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0110
3	Antenna Transformer	65-0085
4	Aerial Compensator	Part of 49
5	Condenser (.05 Mfd.)	61-0111
6	Resistor (68,000 ohms)	33-368154
7	Condenser (.05 Mfd.)	61-0101
8	Resistor (620 ohms)	33-162336
9	R. F. Transformer	65-0009
10	Resistor (39,000 ohms)	33-339154
11	Condenser (.05 Mfd.)	61-0101
12	Resistor (10,000 ohms)	33-310334
13	Condenser (.05 Mfd.)	61-0101
14	Padder (Pri. 2nd I. F. Trans.)	
15	Resistor (100,000 ohms)	33-410334
16	Condenser (250 Mmfd.)	61-0033
17	Resistor (27,000 ohms)	33-327334
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.)	61-0101
22	Resistor (820 ohms)	33-182438
23	Resistor (1,000,000 ohms)	33-510154
24	Second I. F. Transformer	65-0230
25	Padder (Sec. 2nd I. F. Trans.)	
26	Resistor (27,000 ohms)	33-327154
27	Resistor (330,000 ohms)	33-433154
28	Condenser (.01 Mfd.)	61-0114
29	Volume Control (1,000,000 ohms) & On-Off Switch	33-5268
30	Condenser (.25 Mfd.)	61-0125
31	Resistor (6,200 ohms)	33-262434
32	Condenser (250 Mmfd.)	61-0033
33	Condenser (.01 Mfd.)	61-0100
34	Resistor (470,000 ohms)	33-447154
35	Resistor (51,000 ohms)	33-351334
36	Filter Condenser (10-15-20 Mfd.)	61-0089
37	Resistor (1,500 ohms)	33-315334
38	Input Transformer	65-0097
39	Condenser (2,000 Mmfd.)	61-0123
40	Output Transformer	65-0093
41	Reception Control	Part of 61
42	Resistor (8,200 ohms)	33-282334
43	Resistor (3,300 ohms)	33-222334
44	Cone & Voice Coil	45-2653
45	Field Coil	Not Replaceable
46	Resistor (15,000 ohms)	33-315334
47	Condenser (.1 Mfd.)	61-0104
48	Antenna Padder Assy.	77-0172
49	**Wafer Switch**	**77-0207**
50	**Oscillator Transformers (850 to 1580 KC)**	**65-0088**
51	Oscillator Transformer (750 to 1350 KC)	65-0089
52	Oscillator Transformers (550 to 1000 KC)	65-0090
53	Tuning Condenser	63-0016
54	Antenna Padder (on Tun. Cond.)	
55	Silver Mica Condenser (390 Mmfd.)	61-0031
56	Silver Mica Condenser (300 Mmfd.)	61-0003
57	Low Frequency Padder	31-6230
58	Oscillator Transformer (Manual)	65-0134
59	Oscillator Padder (on Tun. Cond.)	
60	Condenser (15 Mmfd.)	61-0038
61	Push Button Switch Assy.	77-0539
62	Resistor (470 ohms)	33-147336
63	Resistor (22,000 ohms)	33-322334
64	Resistor (27,000 ohms)	33-327434
65	Control Magnet	Part of 66
66	Motor & Relay Assy.	77-0229
67	Condenser (250 Mmfd.)	61-0033
68	Vibrator	83-0025
69	Condenser (.5 Mfd.)	61-0106
70	Condenser (250 Mmfd.)	61-0033
71	Pilot Lamp	34-2040
72	Filament Choke	32-1644
73	Vibrator Choke	65-0075
74	Resistor (220 ohms)	33-122334
75	Condenser (.5 Mfd.)	61-0137
76	Power Transformer	65-0095
77	Condenser (7,500 Mmfd.)	61-0127
78	Resistor (1,000 ohms)	33-210434
79	Condenser (250 Mmfd.)	61-0033
80	Condenser (250 Mmfd.)	61-0033
81	Condenser (250 Mmfd.)	61-0033
82	Condenser (250 Mmfd.)	61-0033
83	Condenser (500 Mmfd.)	30-1114
	Complete Speaker & Housing	77-0564
	Speaker only	73-0016

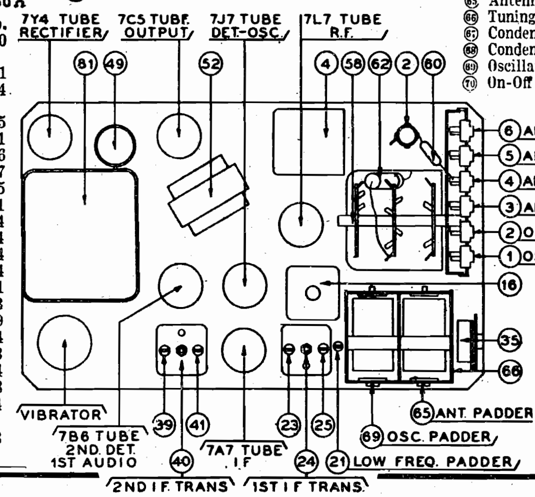
MODEL AR-9

PHILCO RADIO & TELEV. CORP.





No.	Description	Part No.
1	Antenna Choke	65-0340
2	Short Wave Antenna Transformer	65-0341
3	Resistor (1500 ohms)	33-215334
4	Broadcast Antenna Transformer	65-0085
5	Condenser (.05 Mfd.)	61-0101
6	Resistor (390 ohms)	33-139336
7	Choke	65-0337
8	Condenser (100 Mmfd.)	61-0055
9	Condenser (.05 Mfd.)	61-0111
10	Resistor (33,000 ohms)	33-333334
11	Resistor (4700 ohms)	33-247334
12	Resistor (47,000 ohms)	33-347334
13	Resistor (22,000 ohms)	33-322434
14	Condenser (.05 Mfd.)	61-0101
15	Condenser (250 Mmfd.)	61-0033
16	Oscillator Transformer	65-0339
17	Resistor (150 ohms)	33-115334
19	Condenser (250 Mmfd.)	61-0033
20	Resistor (33,000 ohms)	33-333334
21	Low Frequency Padder	63-0048
22	Resistor (4,700 ohms)	33-247334
23	Padder (Pri. 1st I. F. Trans.)	
24	First I. F. Transformer	65-0338
25	Padder (Sec. 1st I. F. Trans.)	



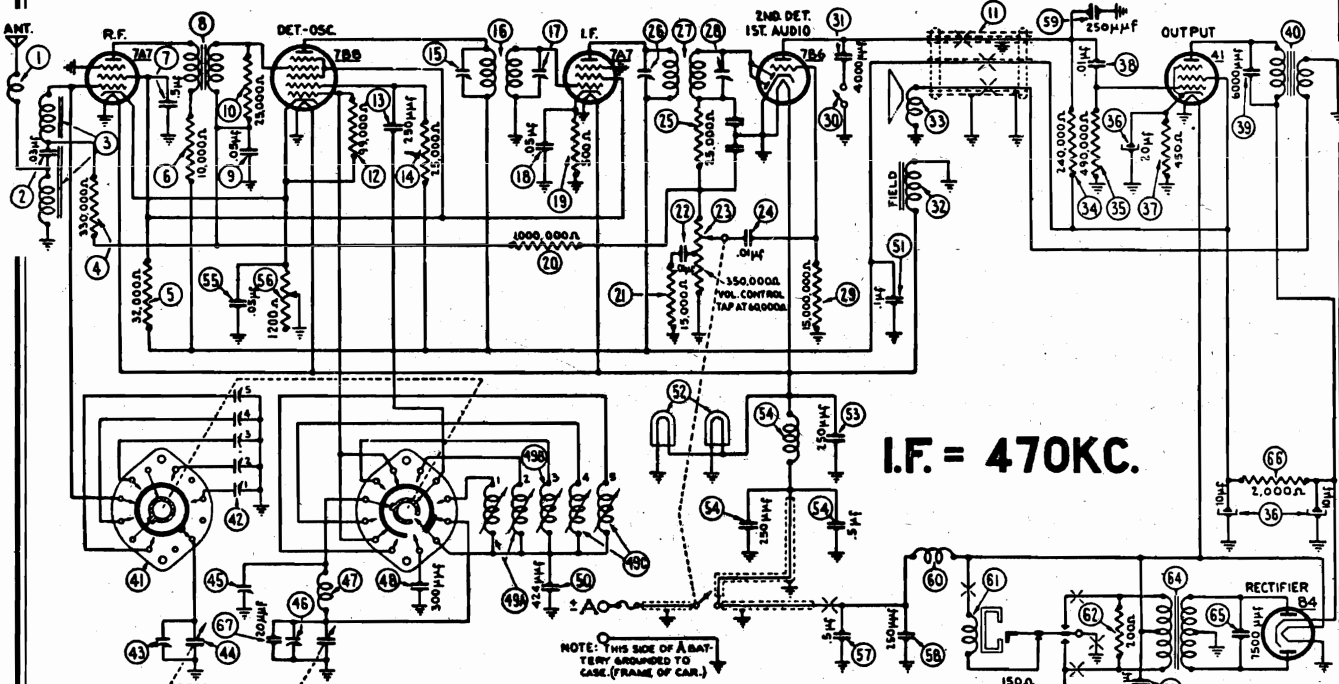
No.	Description	Part No.
26	Condenser (.25 Mfd.)	61-0112
27	Resistor (150 ohms)	33-115334
28	Condenser (.05 Mfd.)	61-0111
29	Condenser (.25 Mfd.)	61-0125
30	Resistor (2200 ohms)	33-222434
31	Resistor (1,000,000 ohms)	33-510154
32	Resistor (1,000,000 ohms)	33-510154
33	Condenser (.01 Mfd.)	61-0114
34	Resistor (15,000 ohms)	33-315154
35	Volume Control (350,000 ohms)	67-0032-2
36	Condenser (6000 Mmfd.)	61-0103
37	Resistor (15,000,000 ohms)	33-615154
38	Resistor (27,000 ohms)	33-327154
39	Padder (Pri. 2nd I. F. Trans.)	
40	Second I. F. Transformer	65-0320
41	Padder (Sec. 2nd I. F. Trans.)	
42	Condenser (4000 Mmfd.)	61-0129
43	Condenser (250 Mmfd.)	61-0033
44	Tone Control Switch	85-0111
45	Condenser (250 Mmfd.)	61-0033
46	Condenser (.01 Mfd.)	61-0100
47	Resistor (470,000 ohms)	33-447154
48	Resistor (220,000 ohms)	33-422334
49	Filter Condenser (10-15-20 Mfd.)	61-0089
50	Resistor (220 ohms)	33-122438
51	Condenser (.01 Mfd.)	61-0124
52	Output Transformer	65-0317
53	Condenser (250 Mmfd.)	61-0033
54	Replacement Cone	
	(For 73-0045-2 Speaker)	91-0086
	(For 73-0045-3 Speaker)	91-0126
	(For 73-0047-2 Speaker)	91-0086
	(For 73-0047-3 Speaker)	91-0126
55	Field Coil	Not Replaceable
56	Condenser (250 Mmfd.)	61-0033
57	Choke	32-1644
58	Wafer Switch	77-0567
59	Silver Mica Condenser (1650 Mmfd.)	5877
60	Silver Mica Condenser (600 Mmfd.)	60-160314
61	Padder Assembly	77-0560
62	Condenser (.01 Mfd.)	61-0110
63	Condenser (70 Mmfd.)	61-0146
64	Condenser (1000 Mmfd.)	61-0079
65	Antenna Padder (on Tun. Cond.)	
66	Tuning Condenser	63-0050
67	Condenser (50 Mmfd.)	61-0140
68	Condenser (200 Mmfd.)	61-0141
69	Oscillator Padder (on Tun. Cond.)	
70	On-Off Switch	85-0112

FOR OTHER DATA, SEE INDEX

No.	Description	Part No.
72	Condenser (250 Mmfd.)	61-0033
73	Condenser (.5 Mfd.)	61-0137
74	Condenser (250 Mmfd.)	61-0033
75	"A" Choke	32-1604
76	Vibrator Choke	65-0075
77	Condenser (.5 Mfd.)	61-0137
78	Vibrator	83-0025
79	Resistor (150 ohms)	33-115334
80	Resistor (220 ohms)	33-122334
81	Power Transformer	65-0318
82	Condenser (3000 Mmfd.)	61-0115
83	Resistor (1000 ohms)	33-210434

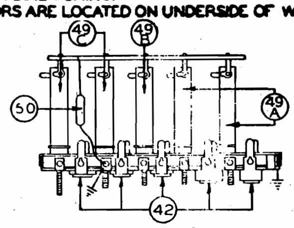
PHILCO RADIO & TELEV. CORP.

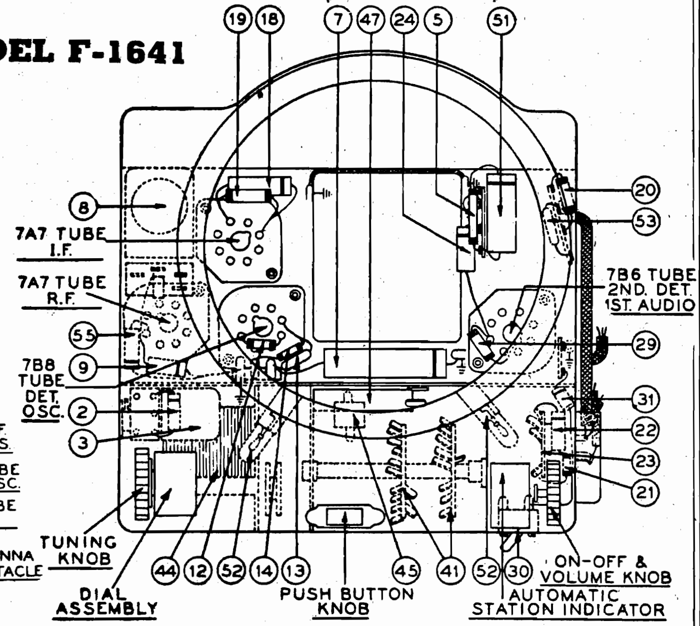
MODEL F-1641

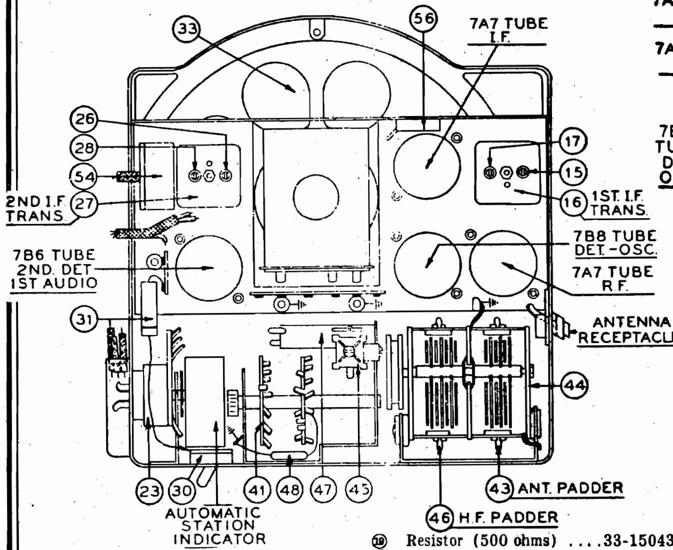


VIEWS OF SWITCH WAFERS ARE SHOWN CONNECTED FOR OPERATION ON DIAL TUNING.
SHADED ROTORS ARE LOCATED ON UNDERSIDE OF WAFERS.

MODEL F-1641





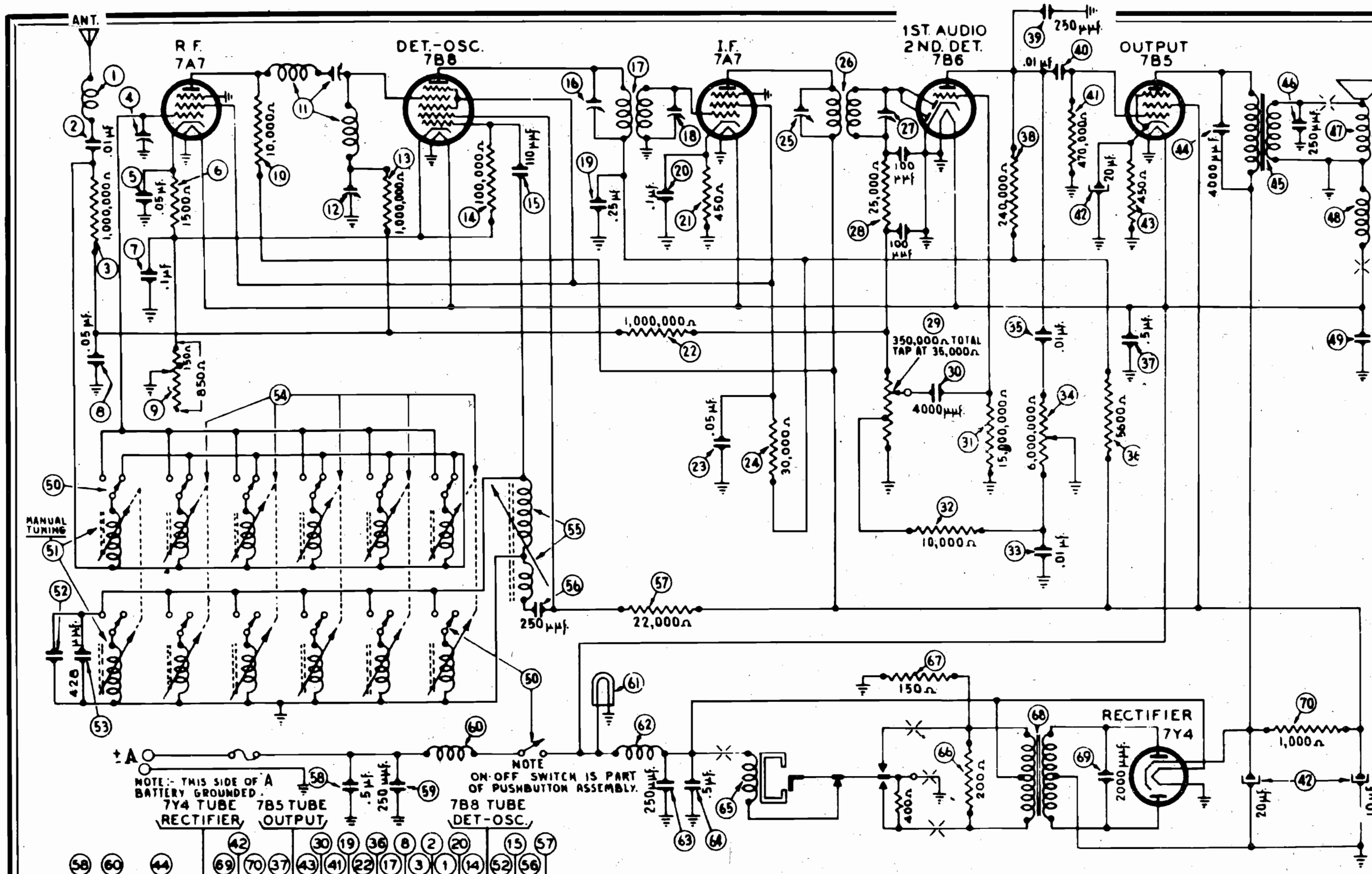


No.	Description	Part No.
1	Antenna Choke	65-0197
2	Condenser (.03 mfd.)	61-0064
3	Antenna Transformer	65-0190
4	Resistor (330,000 ohms)	33-433237
5	Resistor (32,000 ohms)	33-332437
6	Resistor (10,000 ohms)	33-310237
7	Condenser (.5 mfd.)	30-4565
8	R. F. Transformer	65-0189
9	Condenser (.05 mfd.)	30-4444
10	Resistor (25,000 ohms)	33-325244
11	Power Cable	95-0091
12	Resistor (99,000 ohms)	33-399237
13	Condenser (250 mmfd.)	61-0034
14	Resistor (25,000 ohms)	33-325347
15	Padder (Pri. 1st I. F. Trans.)	
16	First I. F. Transformer	65-0177
17	Padder (Sec. 1st I. F. Trans.)	
18	Condenser (.05 mfd.)	30-4569
19	Resistor (500 ohms)	33-150438
20	Resistor (1,000,000 ohms)	33-510237
21	Resistor (15,000 ohms)	33-315237
22	Condenser (.01 mfd.)	30-4479
23	Volume Control (350,000 ohms) and on-off switch	67-0018
24	Condenser (.01 mfd.)	30-4479
25	Resistor (25,000 ohms)	33-325344
26	Padder (Pri. 2nd I. F. Trans.)	
27	Second I. F. Transformer	65-0178
28	Padder (Sec. 2nd I. F. Trans.)	
29	Resistor (15,000,000 ohms)	33-615247
30	Tone Control Switch	85-0093
31	Condenser (4,000 mmfd.)	30-4456
32	Field Coil	Not Replacable
33	Cone Kit	91-0070
34	Resistor (240,000 ohms)	33-424337
35	Resistor (490,000 ohms)	33-449247
36	Filter Condenser (10-10-20 mfd.)	61-0028
37	Resistor (450 ohms)	33-145438
38	Condenser (.01 mfd.)	30-4501
39	Condenser (6,000 mmfd.)	61-0052
40	Output Transformer	65-0180
41	Wafer Switch Assembly	77-0363
42	Antenna Padder Assembly	77-0292
43	First Padder (on Tun. Cond.)	
44	Tuning Condenser	63-0026
45	Low Frequency Padder	63-0031
46	Second Padder (on Tun. Cond.)	
47	Oscillator Transformer (Dial)	65-0007
48	Silver Mica Condenser (300 mmfd.)	61-0003
49a	Oscillator Transformer (1-2)	65-0198
49b	Oscillator Transformer (3)	65-0199
49c	Oscillator Transformer (4-5)	65-0200
50	Silver Mica Condenser (424 mmfd)	61-0067
51	Condenser (.1 mfd.)	30-4455
52	Pilot Lamp	34-2040
53	Condenser (250 mmfd.)	61-0033
54	"A" Filter Assembly	77-0333
55	Condenser (.05 mfd.)	30-4569
56	Sensitivity Control	33-5248
57	Condenser (.5 mfd.)	30-4565
58	Condenser (250 mmfd.)	61-0033
59	Condenser (250 mmfd.)	61-0033
60	Vibrator Choke	65-0204
61	Vibrator	41-3398
62	Resistor (200 ohms)	33-120337
63	Condenser (.5 mfd.)	30-4565
64	Power Transformer	65-0179
65	Condenser (7500 mmfd.)	30-4567
66	Resistor (2,000 ohms)	33-220537
67	Condenser (20 mmfd.)	30-1038
	Loktal Socket	55-0575
	Socket	55-0431
	Drive Cord	55-0428
	Tuning and Volume Knob	55-0426
	Push Button Knob	55-0196
	Dial Assembly (Manual)	85-0091

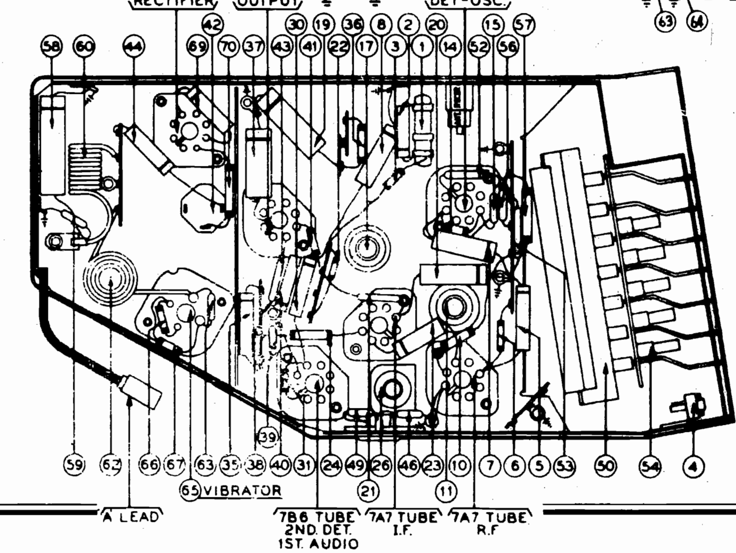
FOR OTHER DATA, SEE INDEX

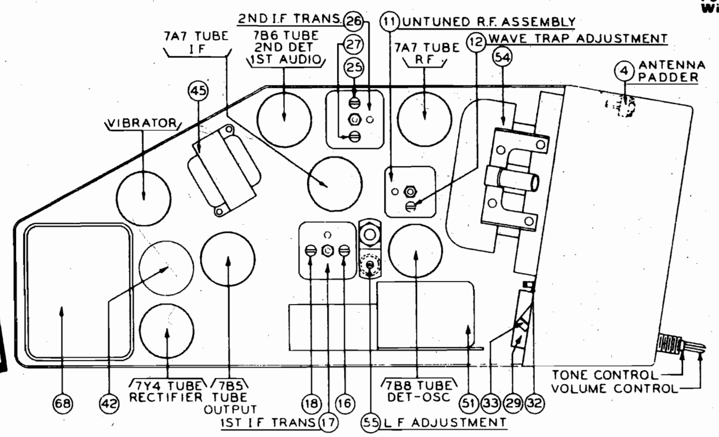
MODEL C-1708

PHILCO RADIO & TELEV. CORP.



SCHE. No.	DESCRIPTION	PART No.
1	Antenna Choke	65-0102
2	Condenser (.01 mfd.)	61-0014
3	Resistor (1,000,000 ohms)	33-510154
4	Antenna Padder	63-0035
5	Condenser (.05 mfd.)	30-4444
6	Resistor (1500 ohms)	33-215334
7	Condenser (.1 mfd.)	30-4499
8	Condenser (.05 mfd.)	30-4444
9	Sensitivity Control (1000 ohms)	67-0025
10	Resistor (10,000 ohms)	33-310454
11	Untuned R. F. Assembly	65-0271
12	I. F. Wave Trap Padder	
13	Resistor (1,000,000 ohms)	33-510154
14	Resistor (100,000 ohms)	33-410154
15	Condenser (110 mmfd.)	30-1031
16	Padder (Pri. 1st I. F. Trans.)	
17	First I. F. Transformer	65-0236
18	Padder (Sec. 1st I. F. Trans.)	
19	Condenser (.25 mfd.)	30-4604
20	Condenser (.1 mfd.)	30-4499
21	Resistor (450 ohms)	33-145438
22	Resistor (1,000,000 ohms)	33-510154
23	Condenser (.05 mfd.)	30-4444
24	Resistor (30,000 ohms)	33-330434
25	Padder (Pri. 2nd I. F. Trans.)	
26	Second I. F. Transformer	65-0237
27	Padder (Sec. 2nd I. F. Trans.)	
28	Resistor (25,000 ohms)	33-325154
29	Volume Control (350,000 ohms)	67-0022
30	Condenser (4000 mmfd.)	30-4334
31	Resistor (15,000,000 ohms)	33-615154
32	Resistor (10,000 ohms)	33-310154
33	Condenser (.01 mfd.)	30-4479
34	Tone Control (6,000,000 ohms)	67-0022
35	Condenser (.01 mfd.)	30-4479
36	Resistor (5600 ohms)	33-256334
37	Condenser (.5 mfd.)	61-0054
38	Resistor (240,000 ohms)	33-424354
39	Condenser (250 mmfd.)	61-0033
40	Condenser (.01 mfd.)	30-4169
41	Resistor (470,000 ohms)	33-447154
42	Filter Condenser (10-20-20 mfd	61-0072
43	Resistor (450 ohms)	33-145438
44	Condenser (4000 mmfd.)	61-0073
45	Output Transformer	65-0235
46	Condenser (250 mmfd.)	61-0033
47	Cone Kit (For 73-0030-2)	91-0086
	Cone Kit (For 73-0030-3)	91-0085
48	Field Coil	Not Replaceable
49	Condenser (250 mmfd.)	61-0033
50	Push-Button and On-Off Switch	85-0097
51	Inductive Tuning Unit	77-0440
52	Thermol Compensator	61-0080
53	Condenser (428 mmfd.)	61-0082
54	Push-Button Switch and Trans.	77-0369
55	Oscillator Tracking Coil	65-0229
56	Condenser (250 mmfd.)	61-0033
57	Resistor (22,000 ohms)	33-322454
58	Condenser (.5 mfd.)	30-4491
59	Condenser (250 mmfd.)	61-0033
60	"A" Choke	65-0248
61	Pilot Lamp	34-2039
62	Vibrator Choke	65-0222
63	Condenser (250 mmfd.)	61-0033
64	Condenser (.5 mfd.)	30-4565
65	Vibrator	83-0017
66	Resistor (200 ohms)	33-120354
67	Resistor (150 ohms)	33-115354
68	Power Transformer	65-0234
69	Condenser (2000 mmfd.)	61-0074
70	Resistor (1000 ohms)	33-210434
	Dial	55-0581
	Drive Cord	55-0688
	Pointer	57-0894
	Window Crystal	55-0679





I.F. = 455 KC.

FOR OTHER DATA, SEE INDEX